Northern Beaches Hospital
Road Connectivity and Network Enhancement Project
Concept Proposal and Stage 1
Submissions Report/Preferred Infrastructure Report
APRIL 2015
Roads and Maritime Services

Northern Beaches Hospital Road Connectivity and Network Enhancement Project

Concept Proposal and Stage 1

Submissions Report & Preferred Infrastructure Report

April 2015

RMS 15.155

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Executive Summary

Background

Roads and Maritime Services (Roads and Maritime) is proposing to carry out a suite of road works to enhance arterial and sub-arterial road network connectivity in the proposed Northern Beaches Hospital Precinct at Frenchs Forest. The Concept Proposal is known as the Northern Beaches Hospital Road Connectivity and Network Enhancement Project.

The Concept Proposal comprises road upgrades to enhance connectivity of the existing road network surrounding the proposed Northern Beaches Hospital at Frenchs Forest, within the Warringah local government area (LGA) on Sydney's Northern Beaches. The Stage 1 Project involves the provision of essential road works to enhance connectivity to the proposed Northern Beaches Hospital (the hospital).

The Concept Proposal is declared State Significant Infrastructure and therefore requires the preparation and public display of an environmental impact statement (EIS) and then approval from the Minister for Planning under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Northern Beaches Hospital Connectivity and Network Enhancement Project EIS considers the environmental, social and economic impacts of the overall project as a Concept Proposal and the Stage 1 connectivity works. The EIS was publicly displayed for information and comment between 22 October and 21 November 2014.

Purpose of this report

In accordance with section 115Z(6) of the EP&A Act, Roads and Maritime as the proponent of the Concept Proposal, has prepared this Submissions Report/Preferred Infrastructure Report in order to respond to the issues raised by submissions received during the EIS exhibition. The report also provides additional information on proposed changes to the Stage 1 Project from that described in the EIS.

Key issues raised by submissions to the EIS

A total of 45 submissions were received in response to the exhibition of the EIS. Five were from government agencies (or advisory bodies), one from a local council and the remainder from members of the community and interest groups.

The key issues raised by community and interest groups related to:

- Justification for the project, including the scale of the proposed Stage 2 work and consideration of future public transport initiatives
- The context of the project with regard to local planning and development pressures
- Traffic and transport, including changes to local traffic arrangements, provision for pedestrians, cyclists and public transport, car parking, alternative transport routes during construction, and suggested design changes to improve performance of specific intersections
• Direct, indirect and cumulative impacts on biodiversity, particularly on threatened species and Duffys Forest Ecological Community, and the adequacy of the proposed biodiversity offset strategy
• Direct and indirect impacts on business
• Reduced amenity in the local area, particularly with regard to the changed landscape character, future land use changes, noise, air quality and loss of vegetation.

Design refinements and additional investigations

A number of design refinements and additional investigations carried out since the exhibition of the EIS are presented in Chapters 5, 6 and 7 of this Submissions Report/Preferred Infrastructure Report. These address commitments made in the EIS and/or address comments received from the community and government agencies.

Preferred Infrastructure Report (Chapter 5):
• Adjustments to and protection of utility services; in order to minimise environmental impacts and reduce the need for temporary or ‘sacrificial’ utility works that would be required between the interfaces with Stage 1 and Stage 2 projects, the preferred approach is to carry out all utility adjustment works as part of the Stage 1 Project
• Assessment of a second construction compound site located on Roads and Maritime land at the intersection of Warringah Road and Wakehurst Parkway; this would facilitate better day-to-day access to materials and plant and equipment that would be in regular use and provide better access to emergency and spill containment products and measures in the event of an incident.

Minor project changes (Chapter 6):
• Revised parking arrangements at the Skyline Shops comprising one disabled parking bay and one loading bay in front of the Skyline Shops, and 20 parking bays providing 90 degree parking along the southern side of Frenchs Forest Road East between Allambie Road and Warringah Road
• Refinements associated with shared paths to connect with the existing or proposed cycleways indicated on the Warringah Bike Plan
• Provision of an additional signalised pedestrian crossing on Frenchs Forest Road West between Bluegum Crescent and Sylvia Place
• Other minor design refinements related to widening on Forest Way, deletion of a proposed marked pedestrian crossing on the western side of the intersection of Wakehurst Parkway and Frenchs Forest Road, and retention of a bus stop on Allambie Road in its current location.

Further assessment (Chapter 7):
• Additional operational traffic and transport assessment drawing on refinements made to the traffic model subsequent to exhibition of the EIS
• Additional assessment of construction and operational noise impacts.
Revised safeguards and management measures

The EIS identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the project have been revised. The adjustments to the measures were made to:

- Make additional commitments based on the assessment of the submissions within this report
- Make additional commitments based on the findings of the studies within this report
- Modify the wording so that the outcome of the commitment is clearer to implement.

These environmental management measures, detailed in Chapter 8 of this Submissions Report, will guide subsequent project development and delivery phases of the project.

Next steps

The Department of Planning and Environment will consider the responses to submissions raised in this Submissions Report/Preferred Infrastructure Report during its assessment of the Concept Proposal. The Secretary will determine whether to make the report publicly available. The Department will then prepare the Secretary’s assessment report in accordance with section 115ZA of the EP&A Act. The Minister for Planning will then decide whether or not to approve the project and identify any conditions of approval that would apply. If approved, Roads and Maritime will continue to consult with community members, government agencies and other stakeholders during the detailed design and construction phases of the Concept Proposal.
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<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACHAR</td>
<td>Aboriginal Cultural Heritage Assessment Report</td>
</tr>
<tr>
<td>AM peak period</td>
<td>6am–10am weekdays</td>
</tr>
<tr>
<td>AoS</td>
<td>Assessment of Significance, prepared under the <em>Threatened Species Conservation Act 1995</em></td>
</tr>
<tr>
<td>ARI</td>
<td>Annual recurrence interval – used to describe the frequency or probability of floods occurring (eg a 100 year ARI flood is a flood that occurs or is exceeded on average once every 100 years)</td>
</tr>
<tr>
<td>BBAM</td>
<td>Biobanking Assessment Methodology</td>
</tr>
<tr>
<td>Concept design</td>
<td>Initial functional layout of a road/road system or other infrastructure – used to facilitate understanding of a project, establish feasibility, and provide a basis for estimating and to determine further investigations needed for detailed design</td>
</tr>
<tr>
<td>Concept Proposal</td>
<td>The Northern Beaches Hospital Road Connectivity and Network Enhancements Project</td>
</tr>
<tr>
<td>DA</td>
<td>Development Application</td>
</tr>
<tr>
<td>DECCW</td>
<td>Department of Environment, Climate Change and Water (former)</td>
</tr>
<tr>
<td>DFEC</td>
<td>Duffys Forest Ecological Community</td>
</tr>
<tr>
<td>DGRs</td>
<td>Director-General's requirements – requirements and specification for the environmental assessment prepared by the Director-General of the (NSW) Department of Planning and Environment under the <em>Environmental Planning and Assessment Act 1979</em></td>
</tr>
<tr>
<td>DP&amp;E</td>
<td>NSW Department of Planning and Environment</td>
</tr>
<tr>
<td>ESD</td>
<td>Ecologically sustainable development</td>
</tr>
<tr>
<td>Ecology</td>
<td>The relationship between living things and the environment</td>
</tr>
<tr>
<td>Ecosystem</td>
<td>A functional unit of energy transfer and nutrient cycling in a given place. It includes all relationships within the biotic community and between the biotic components of the system</td>
</tr>
<tr>
<td>EEC</td>
<td>Endangered ecological community – an ecological community identified by relevant legislation as having endangered status</td>
</tr>
<tr>
<td>Environment</td>
<td>A term for all the conditions (physical, chemical, biological and social) in which an organism or group of organisms, including humans, exists</td>
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<tr>
<td>Term</td>
<td>Meaning</td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
</tr>
<tr>
<td>Environmental impact statement (EIS)</td>
<td>An environmental impact statement is a focussed analysis undertaken for the purposes of Part 5.1 of the (NSW) <em>Environmental Planning and Assessment Act 1979</em>, written generally to comply with the requirements issued by the Secretary of the (NSW) Department of Planning and Environment</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td>(NSW) <em>Environmental Planning and Assessment Act 1979</em></td>
</tr>
<tr>
<td>EPA</td>
<td>(NSW) Environment Protection Authority</td>
</tr>
<tr>
<td>EPBC Act</td>
<td>(Commonwealth) <em>Environment Protection and Biodiversity Conservation Act 1999</em></td>
</tr>
<tr>
<td>Ecological sampling unit (ESU)</td>
<td>An ecological sampling unit represents a patch of vegetation in the study area with similar vegetation type and condition, and similar habitat features</td>
</tr>
<tr>
<td>Groundwater</td>
<td>Subsurface water contained within the saturated zone</td>
</tr>
<tr>
<td>HI</td>
<td>NSW Health Infrastructure</td>
</tr>
<tr>
<td>Hydrology</td>
<td>The study of rainfall and surface water runoff processes</td>
</tr>
<tr>
<td>ICNG</td>
<td>Interim Construction Noise Guideline</td>
</tr>
<tr>
<td>Interchange</td>
<td>A grade separation of two or more roads with one or more interconnecting carriageways</td>
</tr>
<tr>
<td>LEP</td>
<td>Local Environment Plan</td>
</tr>
<tr>
<td>LGA</td>
<td>Local Government Area</td>
</tr>
<tr>
<td>Local road</td>
<td>A road or street used primarily for access to adjoining properties</td>
</tr>
<tr>
<td>LoS</td>
<td>Level of service – a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers; refer following table for LoS definitions</td>
</tr>
<tr>
<td>NBH</td>
<td>Northern Beaches Hospital</td>
</tr>
<tr>
<td>NOW</td>
<td>(NSW) Department of Primary Industries Office of Water</td>
</tr>
<tr>
<td>NPW Act</td>
<td>(NSW) <em>National Parks and Wildlife Act 1974</em></td>
</tr>
<tr>
<td>OEH</td>
<td>NSW Office of Environment and Heritage</td>
</tr>
<tr>
<td>PCD</td>
<td>Pollution control device</td>
</tr>
<tr>
<td>PCT</td>
<td>Plant community type</td>
</tr>
<tr>
<td>PM period peak</td>
<td>3pm – 7 pm weekdays</td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
</tr>
<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>POEO Act</td>
<td>(NSW) <em>Protection of the Environment Operations Act 1997</em></td>
</tr>
<tr>
<td>Proponent</td>
<td>The person or organisation that proposes carrying out a project or activity</td>
</tr>
<tr>
<td>PWG</td>
<td>Parks and Wildlife Group</td>
</tr>
<tr>
<td>RCT</td>
<td>Red-crowned Toadlet</td>
</tr>
<tr>
<td>Roads and Maritime</td>
<td>NSW Roads and Maritime Services</td>
</tr>
<tr>
<td>RTA</td>
<td>NSW Roads and Transport Authority (former)</td>
</tr>
<tr>
<td>Shared path</td>
<td>The portion of the carriageway beyond the traffic lanes adjacent to and flush with the surface of the pavement</td>
</tr>
<tr>
<td>SSI</td>
<td>State Significant Infrastructure</td>
</tr>
<tr>
<td>Threatened</td>
<td>As defined under the (NSW) <em>Threatened Species Conservation Act 1995</em>, a species, population or ecological community is threatened when it is likely to become extinct or is in immediate danger of extinction</td>
</tr>
<tr>
<td>TMC</td>
<td>Transport Management Centre</td>
</tr>
<tr>
<td>TMP</td>
<td>Traffic Management Plan</td>
</tr>
<tr>
<td>TSC Act</td>
<td>The (NSW) <em>Threatened Species Conservation Act 1995</em> is an Act to conserve threatened species, populations and ecological communities of animals and plants</td>
</tr>
<tr>
<td>Urban design</td>
<td>The process and product of designing human settlements, and their supporting infrastructure, in urban and rural environments</td>
</tr>
<tr>
<td>WARR Act</td>
<td>(NSW) <em>Waste Avoidance and Resource Recovery Act 2001</em></td>
</tr>
</tbody>
</table>
**Level of Service (LoS) criteria for intersections**

<table>
<thead>
<tr>
<th>LoS</th>
<th>Average delay per vehicle (seconds)</th>
<th>Traffic Signals, Roundabout</th>
<th>Give Way &amp; Stop Sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Less than 14</td>
<td>Good operation</td>
<td>Good operation</td>
</tr>
<tr>
<td>B</td>
<td>15 to 28</td>
<td>Good with acceptable delays and spare capacity</td>
<td>Acceptable delays and spare capacity</td>
</tr>
<tr>
<td>C</td>
<td>29 to 42</td>
<td>Satisfactory</td>
<td>Satisfactory, but accident study required</td>
</tr>
<tr>
<td>D</td>
<td>43 to 56</td>
<td>Near capacity</td>
<td>Near capacity, but accident study required</td>
</tr>
<tr>
<td>E</td>
<td>57 to 70</td>
<td>At capacity, at signals incidents will cause excessive delays</td>
<td>At capacity, requires other control mode</td>
</tr>
<tr>
<td>F</td>
<td>Greater than 70</td>
<td>Extra capacity required</td>
<td>Extreme delay, major treatment required</td>
</tr>
</tbody>
</table>

1 Introduction and background

1.1 Overview of Northern Beaches Hospital Connectivity and Network Enhancement Project

Roads and Maritime Services (Roads and Maritime) is seeking staged approval for the Northern Beaches Hospital Connectivity and Network Enhancement Project (Concept Proposal) including approval to carry out construction of the Stage 1 Hospital Connectivity Works (Stage 1 Project) which form part of the Concept Proposal (refer to Figure 1.1).

The Concept Proposal is proposed to be assessed in stages under section 115ZD of the Environmental Planning and Assessment Act 1979 (EP&A Act). The Concept Proposal comprises two stages:

- **Stage 1 Project – Hospital Connectivity Works**, which aim to enhance the existing road network in conjunction with the opening of the proposed Northern Beaches Hospital in 2018
- **Stage 2 Project – Network Enhancement Works**, which are directed towards improving broader network capacity particularly along Warringah Road.

The environmental impact statement (EIS) assessed both stages at the Concept Proposal level and provided a detailed environmental assessment of the Stage 1 Project. Subject to approval, this would enable the Stage 1 Project to proceed to construction.

The Concept Proposal addresses the transport task and required access improvements arising from background growth in transport demand in the Frenchs Forest area. It is intended to provide overall transport network benefits accruing to the wider community, beyond access and movement requirements of the Northern Beaches Hospital. These include:

- Increases in through traffic capacity, reducing future traffic congestion levels and improving average travel speed for vehicles
- Provision for bus priority measures, such as dedicated bus lanes on approaches to and departures from major intersections and extended bays, that would benefit public transport customers in the wider precinct in general, not just those accessing the proposed Northern Beaches Hospital
- Improved pedestrian connectivity, including shared paths and pedestrian bridges.

The average travel speed for vehicles travelling along Warringah Road (from west of Forest Way to east of Allambie Road) would improve due to the grade separation of the Forest Way, Hilmer Street and Wakehurst Parkway intersections. With the grade separation of these intersections, there would be a reduction in traffic volumes on the surface road network, with an associated improvement in performance of the surface intersections.

The anticipated improvements include:

- An increase in average peak hour vehicle speeds of around 70 per cent
- A reduction in average delay time per vehicle of almost 80 per cent
- A reduction in the average number of stops per vehicle by about half
- A substantial reduction in the volume of traffic waiting to enter the network due to congestion.
With the carrying out of the Stage 1 Project, travel times for journeys to the hospital along Forest Way, Warringah Road and Wakehurst Parkway are predicted to improve. Travel time savings of up to 30 minutes could be expected for a journey to the hospital along Wakehurst Parkway.
1.2 Northern Beaches Hospital Connectivity and Network Enhancement Project

The Concept Proposal comprises road upgrades to enhance connectivity within the existing road network surrounding the proposed Northern Beaches Hospital at Frenchs Forest, within the Warringah local government area (LGA) on Sydney’s Northern Beaches (refer Figure 1.2). The Concept Proposal comprises the Stage 1 Hospital Connectivity Works (Stage 1 Project), being the provision of essential road works to enhance connectivity to the hospital, and the Stage 2 Network Enhancement Works to improve the broader network capacity (Stage 2 Project). The Concept Proposal would include the following:

- Widening of Warringah Road from west of Fitzpatrick Avenue to east of Allambie Road to include:
  - Subsurface eastbound and westbound travel lanes in a slot (underpass), through the middle of the Warringah Road corridor, generally from west of Forest Way through to east of Wakehurst Parkway
  - Surface eastbound and westbound lanes running parallel to the slot as part of the Warringah Road corridor to provide access to side roads and the Northern Beaches Hospital
  - Upgrades to intersections with Forest Way, Hilmer Street and Wakehurst Parkway at the surface level
- Widening, intersection upgrades, new signalised intersections and potential changes to access along sections of Forest Way, Naree Road, Frenchs Forest Road and Allambie Road
- Widening of Wakehurst Parkway from north of the intersection with Frenchs Forest Road to south of Aquatic Drive
- Provision of a new connection at Aquatic Drive and Wakehurst Parkway
- Traffic management measures along a number of local roads
- Utility relocations including water, sewer mains, telecommunication, electricity and gas services
- Ancillary works for construction including, but not limited to, construction compounds, batch plants and stockpile sites.

More specific detail is provided in the EIS for the Stage 1 Project works which are proposed generally along the Naree Road and Frenchs Forest Road corridor and intersections with Forest Way, the hospital, Wakehurst Parkway, Allambie Road and Warringah Road.

The Stage 1 Project would include:

- Widening and intersection upgrades along sections of Forest Way between Warringah Road and south of Adams Street
- Upgrade of the existing bus stop fronting the Forestway Shopping Centre on Forest Way, to accommodate two buses within the bay
- Widening of Naree Road, Frenchs Forest Road West and a section of Frenchs Forest Road East from the Wakehurst Parkway intersection to about 50 metres west of Skyline Place
Provision of new traffic lights with pedestrian crossings at Naree Road and Forest Way; at Naree Road, Frenchs Forest Road West and Rabbett Street; on Frenchs Forest Road West in the vicinity of Bluegum Crescent (east) replacing an existing raised pedestrian threshold; on Frenchs Forest Road West at a new access to the hospital opposite Gladys Avenue; at Frenchs Forest Road East and Romford Road; and at Frenchs Forest Road East, Patanga Road and Allambie Road.

Widening and upgrading of the intersection of Frenchs Forest Road and Wakehurst Parkway

Provision of dedicated bus lanes along approaches and departures to the Frenchs Forest Road intersection with Wakehurst Parkway

Widening of Wakehurst Parkway from about 330 metres north of the intersection with Frenchs Forest Road to the intersection with Warringah Road

Provision of a seagull intersection at Frenchs Forest Road East and Nandi Avenue to allow all points access

Widening of Allambie Road to the north of the intersection with Warringah Road

Widening and upgrading of the intersection of Warringah Road and Allambie Road

Widening of Warringah Road from west of Allambie Road for about 700 metres to east of Courtley Road.

The Stage 1 Project and Stage 2 Project would include drainage works, landscaping, property acquisition and adjustments, utility relocations (that may be required to extend into surrounding streets), as well as ancillary works during construction. The ancillary works would include, but not be limited to, construction compounds, and stockpile sites. The scope of the Concept Proposal does not include ongoing maintenance works.

The Stage 1 Project comprises the provision of essential road works to enhance connectivity to the hospital. Further design development would inform a more detailed description and assessment of the Concept Proposal for the Stage 2 Project. The latter is the subject of a separate EIS that will be publicly exhibited around mid-2015.

1.3 Need for the Northern Beaches Hospital Road Connectivity and Network Enhancement Project

The Northern Beaches Hospital site is strategically positioned both with regard to its location in the eastern half of the North Sydney Local Health District and within the Northern Beaches road transport network. However, there are existing constraints within surrounding road networks that limit efficient access to the hospital. Implementation of the Northern Beaches Hospital Project without changes to the surrounding road network is not practicable as it would greatly exacerbate already high levels of congestion that impact on traffic movement, particularly during peak travel periods.

The NSW Long Term Transport Master Plan (Transport for NSW, 2012a) identifies Warringah Road as a key strategic transport corridor linking Dee Why and Chatswood. Heavy traffic flows and congestion along Warringah Road during commuter peak periods and, to a lesser degree, during business hours result in low average peak travel speeds, unreliable travel times and disruptions to traffic movements. This impacts both road users and the adjoining community. Warringah Road is already operating at or beyond capacity during peak periods and is expected to experience continued traffic growth in the future.
SITE OF PROPOSED NORTHERN BEACHES HOSPITAL

The Forest High School
Wakehurst Parkway
Frenchs Forest Road East
Frenchs Forest Road West
Naree Road
Fitzpatrick Avenue East
Bantry Bay Road
Maxwell Parade
Chatswood
Fitpatrick Avenue West
Allambie Road
Aquatic Drive
Warringah Road
Rodborough Road

ROAD IMPROVEMENTS

- Road improvements to increase capacity and improve intersection at Naree Road and Forest Way
- Install traffic signals at Rabbett Street
- Install traffic signals at access to the proposed hospital
- Ambulance entry to the proposed hospital
- Widening and upgrade along Warringah Road surface road
- New signalised pedestrian crossing
- Proposed pedestrian overbridge
- Through traffic on Warringah Road separated from turning traffic at Forest Way by way of an underpass
- Through traffic on Warringah Road separated from turning traffic at Hilmer Street by way of an underpass
- Changes to the intersection of Frenchs Forest Road and Wakehurst Parkway and widening of approaches and departures
- Changes to the intersection of Frenchs Forest Road East and Allambie Road
- Through traffic on Warringah Road separated from turning traffic at Wakehurst Parkway by way of an underpass
- Widening along Wakehurst Parkway
- Widening of Allambie Road north of Warringah Road
- Widening of Allambie Road south of Warringah Road
- Install traffic signals at Romford Road
- Install traffic signals at Patanga Road and Allambie Road
- Road improvements on Frenchs Forest Road East
- Widening of Warringah Road to the east and west of the intersection with Allambie Road

KEY
- Stage one road upgrades
  - Hospital connectivity works
  - Network enhancement works
  - Underpass for through traffic
  - Pedestrian overbridge
- Stage two road upgrades

Project area and key features
Figure 1-2
As traffic volumes increase, congestion levels would also increase significantly, resulting in lower average travel speeds and an increase in the average delay per vehicle. Without the road upgrade project, the average travel speed in the evening peak period is predicted to reduce by up to 50 per cent (from 28 kilometres per hour in 2012 to 14 kilometres per hour in 2018), and the average delay per vehicle is predicted to increase by 150 per cent (from 3.5 minutes in 2012 to over nine minutes in 2018).

An analysis of the existing conditions indicates that some intersections currently operate at capacity and the predicted increase in traffic volumes would only increase the level of congestion. A considerable increase in network capacity would be required to maintain, let alone improve, existing service levels given critical intersections are currently operating at or over their effective capacity and that proposed land use changes would exacerbate these conditions.

Existing levels of congestion also affect the reliability of bus services and achievement of target operational speeds which are expected to worsen with increased congestion. This would also constrain the introduction of bus priority initiatives within the corridor.

### 1.4 Assessment and approval process

Roads and Maritime is the proponent and has formed the opinion that the Concept Proposal, particularly with regard to impacts related to noise and vibration, dust and vehicle emissions, traffic and transport, endangered ecological communities and threatened fauna species, is likely to significantly affect the environment and would require an EIS to be prepared under Part 5 of the EP&A Act. The Concept Proposal therefore falls under Part 2 of Schedule 3 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP) and is declared by clause 15 of the SRD SEPP as State Significant Infrastructure (SSI) under section 115U(4) of the EP&A Act.

On 17 April 2014, requirements for the EIS (Director-General’s Requirements (DGRs)) were issued by the Secretary (formerly Director-General) of the Department of Planning and Environment (DP&E). The EIS was prepared in accordance with those requirements and relevant provisions of the Environmental Planning and Assessment Regulation 2000 before being placed on public display (refer to Section 1.4). An EIS for the Stage 2 Project is currently being prepared with exhibition planned for around mid-2015.

Figure 1.3 illustrates the approval process under Part 5.1 of the EP&A Act.
Figure 1.3 State significant infrastructure assessment and approval process
1.5 Key findings of the EIS

1.5.1 Benefits of the project

The main beneficial outcome of the Concept Proposal would be to provide tangible operational traffic benefits through relieving congestion along Warringah Road, Forest Way and Naree Road/Frenchs Forest Road as well as facilitating essential access to the new hospital. This would improve peak period travel speeds and intersection performance resulting in decreased delays.

These operational traffic benefits would be relatively localised along the Naree Road/Frenchs Forest Road corridor for the Stage 1 Project, which would also improve connectivity to the Northern Beaches Hospital. The broader network benefits would be realised with the implementation of the full project (Concept Proposal).

The project includes bus priority measures to improve bus travel times, thereby supporting bus priority initiatives such as a Bus Rapid Transit for the corridor. Improvements to the pedestrian and cycling network are also proposed.

1.5.2 Impacts of the Concept Proposal

A number of potential environmental impacts from the Concept Proposal and Stage 1 Project have been avoided or reduced during the assessment of alternatives, development of the strategic design for the Concept Proposal, and through concept design development for the Stage 1 Project. The Concept Proposal and Stage 1 Project would still result in impacts during construction and operation.

During construction of the Concept Proposal (including the Stage 1 Project) adverse impacts would include:

- Noise and vibration, including potential night time disturbance associated with out-of-hours work, and potential disturbance to occupants of The Forest High School
- Dust and construction plant and vehicle emissions
- Traffic and access impacts, including cumulative impacts from the concurrent construction of the Stage 1 and Stage 2 Projects and hospital construction
- Impacts on an endangered ecological community (Duffy's Forest Ecological Community) and threatened fauna species (Red-crowned Toadlet) that would require offsetting
- Impacts on historic heritage items.

Construction impacts would be minimised through further consideration during detailed design and construction planning, and application of best practice management and mitigation measures including consultation with affected residents.

During operation, adverse impacts would include:

- Increased traffic noise requiring noise attenuation measures
- Visual impacts associated with new road infrastructure
- Changes to access.

While travel time improvements are anticipated along the Naree Road/Frenchs Forest Road corridor due to the Stage 1 Project, increases in travel time are anticipated along Forest Way...
approaching Warringah Road with average travel speeds predicted to decrease from 16 kilometres per hour to 11 kilometres per hour in peak periods. This is expected to be alleviated following completion of the Stage 2 Project. Increases in traffic volumes across the wider study area may also result in additional congestion at intersections that are not proposed to be upgraded as part of the Concept Proposal.

1.6 Purpose and structure of this report

This document comprises the Submissions Report/Preferred Infrastructure Report for the Concept Proposal and Stage 1 Project. It has been prepared in accordance with the requirements for SSI under Part 5.1 and section 115Z(6) of the EP&A Act. Section 115Z(6) provides that:

The Director-General may require the proponent to submit to the Director-General:

a) a response to the issues raised in those submissions, and

b) a preferred infrastructure report that outlines any proposed changes to the State significant infrastructure to minimise its environmental impact or to deal with any other issue raised during the assessment of the application concerned.

Roads and Maritime, as the proponent of the Concept Proposal and Stage 1 Project, has prepared this Submissions Report/Preferred Infrastructure Report to respond to issues raised in submissions received during the exhibition of the EIS. It also describes and assesses design changes made since the exhibition of the EIS.

The Submissions Report/Preferred Infrastructure Report has the following structure:

• Chapter 1 – provides a background to the Concept Proposal and Stage 1 Project, reiterates why the project is needed, describes the planning approval process, reviews the key findings of the EIS and outlines the purpose of the Submissions Report/Preferred Infrastructure Report

• Chapter 2 – outlines the consultation activities carried out prior to and during the public exhibition of the EIS, as well as ongoing consultation proposed during the pre-construction, construction, and commissioning phases

• Chapter 3 – sets out the issues raised in community submissions to the EIS and presents responses to those issues

• Chapter 4 – sets out the issues raised in agency submissions to the EIS and presents responses to those issues

• Chapter 5 – comprises a preferred infrastructure report which describes proposed changes to the Concept Proposal and Stage 1 Project from that presented in the EIS and presents the findings of the assessment of the impacts of these changes

• Chapter 6 – identifies other minor project changes and confirmation of scope

• Chapter 7 – presents further assessment and investigations carried out since exhibition of the EIS

• Chapter 8 – presents the safeguards and mitigation measures for the Concept Proposal, revised to address issues raised during public exhibition of the EIS or as a result of additional assessment.
2 Consultation

2.1 Consultation overview

Prior to and during preparation of the EIS, Roads and Maritime carried out extensive consultation with the community, state and local government agencies, special interest groups and relevant industry stakeholders that have a specific interest in the Concept Proposal and Stage 1 Project. Summaries of the issues raised during the consultation process for the Concept Proposal and Stage 1 Project by government agencies, local government, the community, and special interest groups are detailed in Section 6.4 of the EIS.

The key consultation activities carried out by Roads and Maritime since March 2014 include:

- Nine community information sessions (attended by nearly 2000 people)
- Six community updates and flyers distributed to approximately 20,000 residents and businesses
- Door knocking over 500 properties
- Meetings with government and industry stakeholders
- Face-to-face meetings with individual business, property owners, residents and special interest groups
- Print advertising in local and metropolitan media
- Two community consultation reports have been published on the Roads and Maritime website
- An overview document of the EIS Concept Proposal and Stage 1 Project was published on the Roads and Maritime website, distributed to key stakeholders and made available at community information sessions
- An Options Development and Selection Report (Options Report) was published on the Roads and Maritime website in December 2014.

2.2 EIS exhibition

The EIS was publicly exhibited by DP&E between 22 October and 21 November 2014, being 31 days in total. The EIS was made available for information and comment on the Department’s website and at eight public locations as listed in Table 2.1.

<table>
<thead>
<tr>
<th>Location</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Planning and Environment</td>
<td>23–33 Bridge Street, Sydney</td>
</tr>
<tr>
<td>Nature Conservation Council</td>
<td>Level2, 5 Wilson Street, Newtown</td>
</tr>
<tr>
<td>Warringah Council</td>
<td>725 Pittwater Road, Dee Why</td>
</tr>
<tr>
<td>Dee Why Library</td>
<td>725 Pittwater Road, Dee Why</td>
</tr>
<tr>
<td>Belrose Library</td>
<td>Glenrose Place, Belrose</td>
</tr>
<tr>
<td>Forestville Library</td>
<td>6 Darley Street, Forestville</td>
</tr>
</tbody>
</table>
Community information sessions were conducted to provide an opportunity for people to view detailed maps and to talk about the Concept Proposal and Stage 1 Project with project staff. Table 2.2 provides details of the community information sessions that occurred.

**Table 2.2 Community information sessions**

<table>
<thead>
<tr>
<th>Venue</th>
<th>Address</th>
<th>Date and time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forestville Memorial Hall</td>
<td>Corner of Starkey Street and Warringah Road, Forestville</td>
<td>Saturday 8 November 2014 1.00pm to 5.00pm</td>
</tr>
<tr>
<td>Galstaun Function Centre</td>
<td>5 Grattan Crescent, Frenchs Forest</td>
<td>Tuesday 11 November 2014 5.00pm to 8.00pm</td>
</tr>
</tbody>
</table>

Other consultation activities carried out by Roads and Maritime during the display of the EIS Concept Proposal and Stage 1 Project included:

- Community updates distributed to about 20,000 residents and businesses
- Door knocking of potentially directly impacted properties
- An overview document of the EIS Concept Proposal and Stage 1 Project was published on the Roads and Maritime website, distributed to key stakeholders and made available at community information sessions
- Meetings with government and industry stakeholders
- Face-to-face meetings with individual business, property owners, residents and special interest groups
- Print advertising in local media.

### 2.3 Future consultation

Roads and Maritime will continue to provide opportunities for the community to participate during the ongoing development and delivery of the project.

Roads and Maritime is currently preparing the EIS for the road upgrades proposed in the Stage 2 Project and will submit the EIS to DP&E to place on public exhibition by mid-2015 to seek feedback from the community and stakeholders. The EIS will outline the key features of the proposal and the potential environmental, social and economic impacts during Stage 2 project construction and operation. It will also outline measures to manage and reduce the identified impacts.

Prior to and during construction of both stages, the project team would continue to work with the community to ensure they are informed about the project and have opportunities to provide feedback to the project team.
A more detailed description of the consultation activities and other consultation processes (such as complaints management) that would be carried out during construction is provided in the Draft Community Consultation Framework in Appendix H to the EIS.
3 Response to community submissions

3.1 Respondents and submissions handling process

A total of 45 submissions were received for the Concept Proposal and Stage 1 Project EIS. Of these, 39 were submissions from the community.

Each submission has been examined individually to identify and understand the issues being raised. The content of each community submission was reviewed and categorised according to the key issues (eg traffic and transport) and sub-issues (eg traffic congestion) raised. The issues raised in each submission have been extracted and collated and have been presented as a summary of the specific issues raised by individual submissions. This means that while the exact wording of a particular submission may not be presented in the summary, the intent of each individual issue raised has been captured and corresponding responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided. The community issues raised and Roads and Maritime’s responses to these issues forms the basis of this chapter.

Each community submission was assigned an individual number by DP&E. These numbers are used throughout this chapter. A table listing the submissions and their corresponding number is provided in Appendix A for reference.

A further six submissions were received from government agencies including Warringah Council. Responses to these submissions are provided separately in Chapter 4.

3.2 Overview of community issues raised

The majority of the issues raised by the community are addressed, at least in part, in the EIS. As such, the structure of this chapter generally mirrors the EIS structure, referring to the EIS where relevant and providing additional information to respond to issues raised.

The most common issues raised by the community related to:

• Justification for the project, including the scale of the proposed Stage 2 Project and consideration of future public transport initiatives
• The context of the project with regard to local planning and development
• Traffic and transport, including changes to local traffic arrangements, provision for pedestrians, cyclists and public transport, car parking, alternative transport routes during construction, and suggested design changes to improve performance of specific intersections
• Direct, indirect and cumulative impacts on biodiversity, particularly on threatened species and Duffys Forest Ecological Community (DFEC) and the adequacy of the proposed biodiversity offset strategy
• Direct and indirect impacts on businesses
• Reduced amenity in the local area, particularly with regard to the changed landscape character, future land use changes, noise, air quality and loss of vegetation.

The following sections in this chapter summarise and respond to the issues raised by the community.
3.3 Project need

Submission number(s)
15, 24, 27, 28, 37

Issue description

• The environmental impacts associated with the project should prompt preventative measures in terms of road design and consideration of public transport.

• The project has gone far beyond what is necessary and would have far reaching environmental and social impacts that have not been adequately addressed in the EIS. The project should be scaled back significantly to reduce the impacts.

• Increasing road capacity will increase car dependency and have the potential to increase congestion elsewhere in the road network.

• Future development will expose the haste in which Roads and Maritime sought to secure approval for this proposal and potentially leave a legacy of poor journey management and experience.

• The timetable for the road works is rushed and not enough time is provided to consider modified designs, public transport options, pedestrian and cyclist routes and wildlife corridors.

Response

The strategic justification and need for the Concept Proposal is comprehensively described in Section 3 of the EIS. This refers to relevant planning strategies including the NSW Long Term Transport Master Plan (Transport for NSW, 2012a) which identifies Warringah Road as a key strategic transport corridor linking Dee Why and Chatswood. Heavy traffic flows and congestion along Warringah Road during commuter peak periods and, to a lesser degree, during business hours result in low average peak travel speeds, unreliable travel times and disruptions to traffic movements. This impacts both road users and the adjoining community. Warringah Road is already operating at or beyond capacity during peak periods and is expected to experience continued traffic growth in the future. As traffic volumes increase, congestion levels would also increase significantly, resulting in lower average travel speeds and an increase in the average delay per vehicle.

As described in Section 3.2 of the EIS, the Northern Beaches Hospital is expected to commence operation in 2018. The hospital is located near a number of major arterial routes (Warringah Road, Forest Way and Wakehurst Parkway) which are all heavily used during the morning and evenings peak periods. In addition there are existing constraints within the surrounding road network that would limit efficient access to the hospital. Implementation of the Northern Beaches Hospital without changes to the surrounding road network is not practicable as it would greatly exacerbate already high levels of congestion that impact on traffic movement, particularly during peak travel periods. As traffic volumes increase due to the hospital and background growth, congestion levels would also increase significantly resulting in lower average speeds and an increase in average delay per vehicle. Roads and Maritime is committed to enhancing the road network and providing connectivity to the hospital by 2018 to align with hospital opening.

Design and scale

The Concept Proposal meets the project objectives and on balance was the best performing option. Roads and Maritime acknowledges the expansion of roads associated with Stage 1 and Stage 2 of the Concept Proposal would still result in environmental and social impacts. Roads
and Maritime has carried out extensive consultation during development for the Concept Proposal (refer also to Section 3.6) and has revised various aspects of the original concept design to address potential social and environmental impacts, as documented in the Options Report. The Concept Proposal and Stage 1 Project have been comprehensively assessed against the DGRs and in accordance with applicable guidelines. Roads and Maritime will continue to consult with the community and other stakeholders and will consider opportunities that could enhance project outcomes. Roads and Maritime has sought to address these impacts through the implementation of environmental management measures.

Road safety provisions feature highly in the Concept Proposal and road safety is a top priority for Roads and Maritime. The inclusion of several new pedestrian and cyclist crossing facilities, and improved access to The Forest High School and the Northern Beaches Hospital reflects this. Development of the Concept Proposal, including Stage 1, has been guided by the urban design objectives and principles.

A detailed landscape plan will be prepared, consistent with the urban design objectives and principles presented in Section 11.3 of the EIS. Initially this will address the Stage 1 Project but will be revised to address the Stage 2 Project. The urban design objectives and principles include measures to integrate built elements into the landscape and facilitate ‘greening’ opportunities such as ‘softening’ the barrier effect of Warringah Road.

**Impacts of increased road capacity**

Section 7.4.1 of the EIS considers the potential for induced traffic demand and regional network effects associated with the Concept Proposal. This notes that while the Concept Proposal has been developed to accommodate the predicted increase in background traffic volumes and the likely additional traffic generated by the hospital, no excess road capacity is expected during the morning and evening peak periods. However, as traffic volumes are lower during the off-peak periods, there could be some spare road capacity outside of peak periods which may result in improved travel times along the Warringah Road corridor compared to alternative routes.

The Concept Proposal supports public transport opportunities as noted below which would contribute to reducing dependency on private vehicles for travel. Roads and Maritime is continuing to examine other nearby traffic congestion pressure points along the road corridor to identify complementary measures that would assist in the management of congestion along the corridor. Where proposed, these would be addressed as separate projects. Extensive traffic modelling has been carried out and will continue, as part of the traffic and transport impact assessment for the Stage 2 EIS.

**Public transport**

Public transport infrastructure and active transport elements have been incorporated into the Concept Proposal to encourage a shift in mode share. These include provision of additional bus stops, relocation of a number of stops and bus priority measures such as bus lanes on approach to and departure from key intersections. Initiatives to support active transport include a new pedestrian bridge over Warringah Road at Hilmer Street and provision for a shared path along Warringah Road that connect with the local cycle network as per Warringah Council’s bike plan.

Improvements in road-based public transport would be complementary rather than wholly addressing the road user demands of the Northern Beaches Hospital and broader Northern Beaches in general. The Concept Proposal is also flexible enough to accommodate dedicated kerb side bus lanes at the surface, should they be warranted. Further comment on active transport and public transport-related issues is provided in Sections 3.9.6 and 3.9.8 respectively.
Concept Proposal program

The NSW Government has announced that both stages of the Concept Proposal would be delivered by the time of opening of the Northern Beaches Hospital in 2018. The Stage 1 works are aimed at improving connectivity to the hospital while the Stage 2 works address the network capacity constraints in this section of the Warringah Road corridor.

Roads and Maritime has carried out extensive consultation during the design development process, including alternatives to mitigate environmental and community impacts. A detailed account is provided in the Options Report released in December 2014. This provides comment on the multiple facets of the design development process including consideration of public transport options, shared paths for pedestrians and cyclists, and the effect of the Concept Proposal on wildlife corridors.

3.4 Strategic planning

Submission number(s)
24, 35

Issue description

• Query why Warringah Council’s Hospital Precinct Structure Plan is being carried out after the road works have progressed. The Hospital Precinct Structure Plan and the Sydney Metropolitan Strategy should be guiding public and private investment in the Northern Beaches Hospital Precinct.

• It is recommended a Strategic Framework Plan is prepared for the Northern Beaches Health Precinct to fully address residential and commercial opportunities and densities and supporting infrastructure, including transport. Alternatively, at least postpone the approval of the EIS until the Hospital Precinct Structure Plan is complete in order to fully consider its findings.

• The Department of Planning and Environment and Roads and Maritime Services should carry out comprehensive traffic modelling to include the full build out of land between Frenchs Forest Road East and West and Warringah Road.

• It is recommended that the Stage 1 Project be treated more broadly as enabling infrastructure to facilitate the economic development of Warringah and aim to achieve the goal of the Draft Metropolitan Strategy of Frenchs Forest being a specialised centre.

• A comprehensive plan has not been developed with regard to overall transport planning, road infrastructure and environmental factors.

Response

Section 3.1 of the EIS sets out the strategic planning and policy framework for the Concept Proposal. This considers the various planning documents ranging from the State level (such as The Draft Metropolitan Strategy for Sydney to 2031) down to the local government level, with the latter noting the relationship of the Concept Proposal to Shaping Our Future – Directions for transport, health, housing and jobs for a vibrant sustainable SHOROC region (SHOROC, 2010).

In September 2014, Warringah Council engaged consultants Hames Sharley, to prepare a Hospital Precinct Structure Plan to guide future land uses and development around the Northern Beaches Hospital at Frenchs Forest. Preparation of the plan will consider environmental, social, economic, traffic, transport and accessibility issues as well as the mix of open space and development. Completion of the plan is scheduled for late 2015. Roads and Maritime has been
working with Warringah Council to ensure the Concept Proposal would integrate with the Hospital Precinct Structure Plan and will continue to consult with Council to facilitate appropriate consideration of all relevant issues by both parties. The traffic model used for the EIS has made allowance for changes to land use patterns and the outcomes from the traffic model would be used to inform the EIS for Stage 2.

The Stage 1 Project would facilitate access to the hospital with the connectivity work to be completed by the time of opening of the hospital in 2018. The EIS has demonstrated that the Stage 1 Project alone would not be adequate in dealing with the projected traffic in the medium to long term as a result of land use changes proposed and background traffic growth. The objectives of the Stage 2 Project are to address the existing network capacity issues with completion also scheduled for 2018.

Both the Stage 1 and Stage 2 projects are complementary to future needs including that of the new hospital, of the immediate precinct and in particular to nominal potential future land use changes the Hospital Precinct Structure Plan may identify for the precinct.

Transport for NSW is currently developing a strategic overview of traffic and transport for the wider Northern Beaches area. Progress to date is detailed in the Transport for NSW's Northern Beaches Transport Action Plan and announced by the Minister in June 2014 in a media release1.

3.5 Project development and alternatives

Submission number(s)
1, 7, 12, 17, 20, 21, 27, 28, 31, 37

Issue description

- There is no provision for the widening of Wakehurst Parkway from Narrabeen to the hospital. Wakehurst Parkway is a dangerous and congested road and it will become worse without widening or passing lanes provided for non-ambulance vehicles trying to access the hospital.
- Need to include four to six lanes on both sides of Wakehurst Parkway including emergency lanes.
- The project must consider alternatives in order to save the important wildlife corridor and the homes and business of the local community.
- It is strongly recommended that Wakehurst Parkway be cut under Warringah Road to avoid traffic banking back along both of these roads. If cutting under an underpass is not feasible, then serious consideration and concept development should be applied to ease traffic congestion at this intersection.
- Overpasses and underpasses at the intersection of Warringah Road and Wakehurst Parkway would solve the majority of traffic and congestion issues.
- An overpass on Warringah Road would avoid a cutting and constrain road width. It would also allow for the passage of wildlife, pedestrians, cyclists and local traffic.
- The proposed widening of Warringah Road to 12 lanes (as indicated in the July 2014 Community Update) is excessive and would have significant impacts on the environment,

destroy the wildlife corridors and split the suburb into two. The need for this number of lanes has not been justified.

- The proposed width (of up to 12 lanes) for a one kilometre length of Warringah Road is excessive and will have a negative impact on the surrounding area. The expanded road width is inappropriate in an area with high pedestrian movement and unsuitable adjacent to a high school and a hospital site. Increasing road capacity will increase car dependency and have the potential to increase congestion elsewhere in the road network.

- Frenchs Forest Road should be grade separated from Wakehurst Parkway by way of an overpass. This would allow unimpeded flow for Wakehurst Parkway through traffic, avoid unnecessary excavation of Frenchs Forest Road West, reduce road widening and reduce traffic on Warringah Road.

- Alternative traffic arrangements were proposed by the respondent to improve the level of service at the Adams Street/Forest Way junction in peak hours.

- Prioritising the connection of Aquatic Drive with Wakehurst Parkway in the Stage 1 Project (instead of carrying this out during Stage 2) would divert traffic away from Warringah Road and Frenchs Forest Road East and onto Wakehurst Parkway in the afternoon peak and morning peak periods. If prioritised, construction traffic could be diverted to ease congestion and disruption during this work.

- Stage 1 involves significant expansion of road space that results in excavation of the hillside of Frenchs Forest Road West, vegetation loss and increase in hard surfaces.

- Concerned that there appears to be no increased access to Warringah Road and Forest Way for residents in the section of Frenchs Forest near Sorlie Road. Access to Warringah Road and Forest Way is currently limited and the following alternative traffic arrangements are proposed:
  - traffic lights at Russell Avenue and Fitzpatrick Avenue West
  - change traffic light phasing at Adams Street
  - remove restriction of time for access to Grace Avenue
  - remove on street parking to improve traffic flow around the supermarket on Grace Avenue.

- An alternative design\(^2\) has been provided for the intersections of Warringah Road and Wakehurst Parkway, Frenchs Forest Road and Wakehurst Parkway, Warringah Road and Forest Way, Forest Way and Naree Road, Warringah Road and Allambie Road, Frenchs Forest and Allambie Road. The alternative design would only cost $270 million, significantly reduce congestion, improve air quality and reduce CO\(_2\) emissions, and avoid impacts to Bantry Bay shops.

Response

Section 4 of the EIS provides a comprehensive discussion of the Concept Proposal development and the options and alternatives considered. Additional information is provided in the Options Report that was made publicly available in December 2014. The latter report provides substantial additional information on the Stage 2 Project including further investigations carried out by Roads and Maritime following consultation with the community.

\(^2\) This was provided in the submission which has been reproduced in Appendix B for reference.
Development and evaluation of options

To provide the required transport solution, Roads and Maritime carried out a comprehensive options development and evaluation process that involved government stakeholders and industry. Options were assessed against the project objectives which included minimising impacts to the environment (refer to the Options Report and Section 3.9.1 for further details on the assessment process). The Concept Proposal has been comprehensively assessed against the project objectives and is, on balance, justified as the best performing option.

Section 4.2.6 of the EIS and Section 4.2 of the Options Report identify the Concept Proposal options and document the comparative analysis carried out against the specific project objectives, these being:

- Improve peak period travel speeds and reliability on Warringah Road following the development of the Northern Beaches Hospital and the surrounding precinct
- Improve the network performance surrounding the Northern Beaches Hospital to support the development of the precinct
- To support the activation of the Northern Beaches Hospital Precinct by facilitating access connections to the proposed hospital
- To allow for road based public transport along and across the corridor
- To maintain or improve road safety in accordance with current standards
- To minimise impacts on the environment
- To optimise the design to provide an urban design and landscape outcome that complements the surrounding environs.

Table 6.1 in the Options Report lists the criteria used to evaluate options; the environmental and community impacts criterion includes consideration of impacts to threatened species, populations, ecological communities or their habitats, impacts to Aboriginal archaeological heritage, traffic noise impacts to sensitive land uses/residents, and property acquisition impacts. The issue of wildlife connectivity and habitat fragmentation is discussed in Section 4.2 of the biodiversity specialist report (Appendix F to the EIS) and in Chapter 9 of the EIS. Further comment on fauna connectivity is provided in Section 3.10.6 of this report. Section 6.7 of the Options Report documents the investigation of three alternative alignments to avoid impacting on the Bantry Bay Road shops and businesses.

Grade separation of Warringah Road intersections

As documented in the EIS and Options Report, an overpass option and an underpass option were both considered for the Concept Proposal. While the preliminary traffic modelling found both options were similar in terms of traffic operation, the underpass option was selected as it best met the needs of the hospital and existing road network. In particular, the network performance for the overpass performed poorer than the underpass due to the restricted access at Hilmer Street. The overpass would provide limited access to the hospital from Warringah Road when compared to the underpass. The underpass would be a less visually intrusive structure and have the ability to accommodate bus priority targets in the corridor. For these reasons the Concept Proposal provides for an underpass on Warringah Road in preference to an overpass.

Both the underpass and overpass options would result in the widening of Warringah Road beyond its current width. As such, both options would have a similar impact on fauna connectivity and further comment on this issue is provided in Section 3.9.7. The Concept Proposal provides for
active transport and is considered the most legible network structure. Further information on the analysis of the Stage 2 options would be provided in the Stage 2 EIS.

Section 4 of the EIS also describes an alternative comprising Warringah Road passing over Wakehurst Parkway which is considered functionally equivalent to the suggestion provided in the submission. The performance of this relative to the other alternatives is documented in Section 4.2.6 of the EIS. This confirmed that an underpass would provide the best performance of all the alternatives considered.

**Widening of Warringah Road**

Section 6.6 of the Options Report documents a critical review of the Stage 2 concept design, with particular reference to justification for the proposed number of surface lanes in addition to the four through traffic lanes in the slot. The review confirmed that it is necessary to retain the existing number of surface lanes to allow efficient movement of north-south traffic from Forest Way and Wakehurst Parkway travelling along this section of Warringah Road.

The review concluded that any reduction in lane configuration along Warringah Road would result in higher congestion and a lower level of service that would deteriorate over time. A reduced lane configuration would also reduce the effectiveness of the Stage 2 Project and be incapable of accommodating the projected increase in future traffic. The nature and extent of the associated impacts is acknowledged and a comprehensive assessment would be provided in the Stage 2 EIS which would also identify appropriate impact mitigation and management measures.

**Wakehurst Parkway**

While grade separation of Frenchs Forest Road and Wakehurst Parkway may improve traffic flow along Frenchs Forest Road, it would severely compromise access to the new hospital and also affect access to a number of residential properties on the northern side of Frenchs Forest Road West. The latter would likely required acquisition of property to provide continued access. To the east of Wakehurst Parkway, the topography falls away for about 100 metres before beginning to rise again. Grade separation would likely impact on access to Nandi Avenue through the need to reconfigure the intersection and on the commercial premises opposite from property acquisition. Property acquisition would also be required to maintain the existing connections from Wakehurst Parkway to and from Frenchs Forest Road East. Road widening is required due to increased traffic volumes, related principally to access to the hospital.

Roads and Maritime is currently investigating options to reduce the frequency and severity of flooding on Wakehurst Parkway, however, these do not include widening to increase road capacity. Widening Wakehurst Parkway to up to six lanes in both directions would require further removal of the endangered ecological community Duffys Forest Ecological Community, property acquisition, and would have additional impacts related to noise, air quality, visual amenity, and increased stormwater runoff. The proposed upgrading to the intersection of Wakehurst Parkway and Frenchs Forest Road is limited in scope to accommodating a right turn lane to satisfy future demand to access the hospital precinct from the north and to provide adequate left slip lane capacity in order to maintain sufficient through lane capacity for the southbound traffic towards Warringah Road.

**Forest Way/Adams Street intersection**

The Adams Street/Forest Way intersection is outside the current scope of work and no treatment is planned at this location. However, the performance of this intersection would be further considered during the traffic modelling for the Stage 2 Project and Roads and Maritime would
investigate further intersection improvement works and/or signal phasing should the level of service (LoS) remain unsatisfactory.

**Aquatic Drive intersection**

The Stage 1 Project is directed towards improving connectivity to the Northern Beaches Hospital while the Stage 2 Project relates to enhancing the broader road transport network. Delivery of both stages is anticipated to occur quite close in time given both are planned to be completed in time for the hospital opening in 2018. In view of this, it is considered there is limited value in bringing forward the Aquatic Drive/Wakehurst Parkway connection into the Stage 1 Project.

**Frenchs Forest Road West**

The two lanes on Frenchs Forest Road West are already operating at or near their capacity, carrying in the order of 20,000 vehicles per day. Future traffic growth will occur from the hospital and land use change in the local and wider area. Some of this can be accommodated by construction of new intersections and upgrading existing intersections, however, additional road capacity also needs to be provided in the road network. Development of the concept design for the Stage 1 Project has sought to minimise impacts on property and land use, with widening occurring on the southern side of Frenchs Forest Road West.

**Proposed alternative traffic arrangements**

The concept design for Stage 2 provides for the proposed underpass on Warringah Road to meet the surface roads near Fitzpatrick Avenue West. Accordingly, traffic lights at this location are not feasible. Further details would be provided in the Stage 2 EIS.

As traffic lights would be provided at Naree Road, it would not be practicable to also provide traffic lights at Russell Avenue, given the close proximity of the two intersections. The best outcome in terms of traffic efficiency on Forest Way would be provided through the traffic lights at Naree Road.

Grace Avenue is a local road under the care and control of Warringah Council. Changes to parking arrangements or how this road is accessed are outside the scope of the proposed Stage 1 Project.

**Alternative design**

With regard to the proposed alternative design solution, Roads and Maritime has reviewed the information provided with the submission (refer Appendix B) which is considered to broadly comprise a strategic concept. While detailed traffic modelling would be required to assess the network performance of this alternative design, it is not clear how this would meet the key project objectives to improve peak period travel speeds and reliability on Warringah Road following the development of the hospital and the surrounding precinct.

The alternative option is also not expected to meet the project objective to maintain or improve road safety in accordance with current standards as elements of the design do not appear to comply with applicable road design guidelines such as location of the main hospital entrance in immediate proximity to the intersection of Wakehurst Parkway and Warringah Road. No information has been provided with regard to the basis for the $270 million cost estimate so it is not possible to provide a response to this particular issue. Roads and Maritime is prepared to meet with the community member again to provide a further opportunity to explain this alternative design in more detail.
3.6  Project description

3.6.1  Concept Proposal

Submission number(s)
28, 35

Issue description
• I do not support Stage 1 to commence before the Stage 2 EIS has been considered. The two stages should be considered in conjunction with each other.
• The upgrade is not addressing access to the hospital from the surrounding peninsula.
• Itemised costs of the project including utility works should be provided.
• The proposed connection of Aquatic Drive with Wakehurst Parkway would increase through traffic on Aquatic Drive. This would have adverse impacts to bush land and waterways, and for pedestrians and cyclists accessing the footbridge on Wakehurst Parkway.

Response
Part 5.1 of the EP& Act provides for the staging of State Significant Infrastructure proposals. Where this occurs, a proponent is required to provide a high level assessment of the impacts of the overall project, ie the Concept Proposal. This is followed by further, more detailed assessments of the works proposed for individual stages. The Concept Proposal, which comprises both Stages 1 and 2, has been assessed at a conceptual level in the EIS. The assessment of each stage has been prepared in the context of the Concept Proposal and has considered the effects of each stage on the other. For this project, the EIS also provides a detailed assessment of the Stage 1 hospital connectivity works.

Section 6 of the Traffic and Transport Assessment (Appendix D to the EIS) assesses the transport impacts of the Concept Proposal. This included consideration of the wider Northern Beaches road network. The Stage 1 hospital EIS included a traffic and transport assessment (Appendix D) that provided consideration of access to the hospital from the surrounding network and for the broader Northern Beaches.

The Concept Proposal budget is set at $400 million with $70 million apportioned to the Stage 1 Project and the remainder to the Stage 2 Project. Stage 1 includes amounts for utility works.

The proposed connection of Wakehurst Parkway with Aquatic Drive is needed to provide an alternative option for traffic trying to exit/enter Allambie Business Park at peak times. Currently the only way in and out is via Allambie Road and hence, significant traffic congestion occurs both in the AM and PM peak periods. The proposed connection and potential impacts to waterways, pedestrian and cyclist access, and increase in traffic are currently being assessed as part of the Stage 2 EIS. The connection would result in the loss of Duffys Forest EEC and has been accounted for in the Concept Proposal. The overall clearing amount for the Concept Proposal would be refined once the design of Stage 2 is completed.

3.6.2  Naree Road and Frenchs Forest Road

Submission number(s)
9, 15, 20, 22
Issue description

• What is the proposed widening width of Naree Road to Frenchs Forest Road West and will any houses be demolished?

• How will the retaining wall on Naree Road work and who will pay for the costs of this work?

• The ambulance access should be designed directly into the hospital from Wakehurst Parkway in the section of existing road between Warringah Road and Frenchs Forest Road West.

• Naree Road and Frenchs Forest Road are not currently wide enough to allow for four lanes even with removing on-street parking.

Response

Frenchs Forest Road West will serve as a key transport route to the hospital given that the main hospital entrance will be off this road. The Stage 1 Project includes various works on Frenchs Forest Road West (and Naree Road) to facilitate efficient and safe access to the hospital.

The proposed road widening would be contained within the existing road reservation of 20 metres. The carriageway widening would result in moving the existing kerb and gutter line closer to the properties resulting in 3.5 metre wide footway reservation to contain underground and above ground utilities as well as formed concrete footpath. The resulting carriageway width of 13 metres would allow for line marking providing four lanes. Road widths are detailed in Section 5.3 of the EIS (Stage 1 design). Typical through lane widths for Naree Road and Frenchs Forest Road West include a 3.4 metre kerbside and 3.1 metre centre lane in each direction. Localised widening for the provision of turn bays would be accommodated at intersection approaches. The Stage 1 Project has been designed in accordance with the Roads and Maritime Road Design Guide (RTA, 1998) and subsequent design guide updates, as well as relevant Austroads guidelines and Australian Standards.

Between Forest Way and The Forest High School entrance, widening would be contained within the existing road reserve utilising the existing verge areas on both sides of the roadway. Widening from the school entrance to Wakehurst Parkway would require partial property acquisition to the south of the existing road reserve and this has been allowed for in the design of the hospital.

There would be no need for property acquisition or demolition associated with the widening of Naree Road and Frenchs Forest Road West to the west of The Forest High School. Some strip acquisition would be required on the corner of Naree Road and Forest Way and on the western side of Forest Way. The proposed road widening would be contained within the existing road reservation of 20 metres.

The cost of works associated with retaining walls, including associated property adjustment works, would be met by Roads and Maritime. Since the EIS display, Roads and Maritime has met on site with the affected property owners. The original design has been amended to minimise or eliminate the need for retaining walls along the common boundary. This revised design would be further developed during the detailed design stage. The colour and finishes of any retaining walls required would be developed in accordance with the urban design principles and decided in consultation with affected property owners.

Access for ambulances from the hospital directly onto Wakehurst Parkway is not practicable for safety reasons due to the close proximity of the Warringah Road and Frenchs Forest Road intersections. Roads and Maritime is guided by Health Infrastructure with regard to the hospital access requirements including ambulance access. Design of the hospital layout including location of the Emergency Department has been carried out on the basis of the ambulance access being on Frenchs Forest Road West.
3.6.3 Wakehurst Parkway and Frenchs Forest Road intersection

Submission number(s)
11

Issue description
• It appears that the southbound lanes south of the Wakehurst Parkway and Frenchs Forest Road intersection merge into two lanes for about 200 metres. Confirm this is correct. Are there any delays or queuing as a result of peak hour traffic gridlock at this intersection?

Response
The two left turn lanes from Frenchs Forest Road East would turn into two southbound lanes on Wakehurst Parkway. The left lane would provide for through and left turn movements at the intersection with Warringah Road. The right lane would direct traffic to the right turn lanes at Warringah Road intersection allowing traffic to head in a westerly direction. These two movements would also be available for traffic turning right from Frenchs Forest Road West into Wakehurst Parkway.

The works proposed as part of Stage 1 have been contained within the existing road formation up to the Warringah Road intersection. Roads and Maritime is further investigating the configuration of the Warringah Road/Wakehurst Parkway intersection in the context of the approaching roads to optimise performance of this intersection. Further information on this issue would be provided in the Stage2 EIS.

3.6.4 Wakehurst Parkway and Warringah Road intersection

Submission number(s)
17

Issue description
• There appears to be no consideration for the effect this project will have on the already problematic Wakehurst Parkway/Warringah Road intersection. The intersection already experiences heavy congestion and will only be made worse by the Northern Beaches Hospital including reduced productivity for business, increased levels of pollution, reduced effectiveness of public transport, and blocking of emergency vehicles travelling to the hospital.

Response
Section 4 of the EIS describes the five options considered for the Concept Proposal ranging from the base case or ‘do nothing/do minimum’ through to grade separated options. This identified that the former is not considered a viable option as it would not support the activation of the Northern Beaches Hospital Precinct by facilitating efficient access connections to the hospital, nor would it allow for improved road based public transport along and across the corridor as the existing road network would not accommodate the predicted growth in traffic. The preferred option, ie the Concept Proposal was identified as the option that would best meet the stated project objectives.

The existing and proposed performance of the intersection of Warringah Road and Wakehurst Parkway has received substantial attention from the outset of development of the Concept Proposal. It has always been recognised that this is a key intersection in the study area and assessment of all alternatives and design refinements has included specific consideration of effects on network performance.
3.6.5 Workforce and construction work hours

Submission number(s)
16

Issue description
- The road upgrade would take a long time to complete if the works were carried out primarily during the day but not during the peak times as advised.

Response
Section 5.4.10 of the EIS indicates that the majority of construction works would be undertaken in accordance with the *Interim Construction Noise Guideline* (DECC, 2009), ie:
- 7am and 6pm Monday to Friday
- 8am and 1pm on Saturdays
- No construction works on Sundays or public holidays.

It also notes that some construction activities would need to be carried out outside of standard hours (ie at night) when traffic flows are lower to minimise disruption to traffic and potential safety risks between construction personnel and the live traffic network. As noted in Table 7.7 of the EIS, construction activities during peak periods would be staggered to minimise impacts associated with construction traffic during these periods, with movement of construction traffic limited to out of peak periods.

These standard working hours overlap with AM and PM peak periods. Limiting works to outside of these periods is not considered viable and would prevent completion of the works by 2018. Wherever practicable, construction activities would be carried out during the above recommended standard hours in order to complete the work as soon as possible.

Any work required to be carried out outside of standard hours would involve consultation with affected receivers, and would be undertaken in accordance with the Construction Noise and Vibration Management Plan(s) prepared for the project.

3.7 Consultation

Submission number(s)
15, 28, 33, 36, 37

Issue description
- Naree Road will be transformed into a four lane road with no stopping or parking allowed. As local residents we have not received any visit or direct communication from a representative regarding this hospital proposal.
- There has been no consultation on the proposed design or alternative options. Desirable criteria for road enhancements options should include protecting the environment, integrating public transport, improving amenity for walking and cycling and providing a healthy environment.
- An extension of time for the EIS review process is requested.
- We request an extension of the consultation process so that an improved less destructive road design is prepared, incorporating the precautionary principle.
Response

A response to the issue of changed parking arrangements on Naree Road is provided in Section 3.9.5. Consultation with property owners along Naree Road and the wider community regarding the Concept Proposal and Stage 1 Project commenced in March 2014. This consisted of door knocking and multiple public information sessions that were widely promoted and well attended. A letterbox drop was made in July 2014 to all properties along Frenchs Forest Road West. Copies of the community updates relating to the Concept Proposal that were distributed in the area are available on the Roads and Maritime website3. Face-to-face consultation was also carried out with directly affected property and business owners, and would continue through detailed design and construction. With regard to consultation for the hospital proposal, this is the responsibility of Health Infrastructure.

The options development process is described in detail in the Options Report that was made publicly available in December 2014. Section 4.3 of the report provides an account of the evaluation process for the identified options for the overall project (ie the Concept Proposal, Stage 1 and Stage 2). Section 6.2 describes the evaluation criteria and sub-criteria used to assess options, these comprising:

- Network performance
- Engineering design and constructability
- Environmental and community impacts
- Urban design and landscape
- Cost and economic return
- Delivery risk.

Options were evaluated through a Value Management process that identified the preferred option (ie the Stage 1 hospital connectivity works and the Stage 2 underpass along Warringah Road) as the best performing option with regard to meeting the project objectives.

Consultation was carried out from March to April 2014 and from July to August 2014. This included extensive door knocking, community information sessions, media coverage and printed material online and via mailbox to a wide distribution zone of the study area. The aim of the consultation was to inform the community and key stakeholders about the Project, the planning approval process, and to invite feedback at community information sessions and via written submissions. Issues raised have been considered during design development and have informed development and evaluation of additional options. Appendix C to the EIS provides a detailed list of design changes requested by the community and how each request has been considered or would be considered. One example relates to replacing the pedestrian crossing at Hilmer Street with a pedestrian bridge to enable access across Warringah Road. This would form part of the Stage 2 Project.

Consultation would continue with the ongoing work on the Stage 2 EIS and the upcoming community information sessions which will be aligned with the display of the Stage 2 EIS.

The public exhibition of the Concept Proposal and Stage 1 EIS was managed by the Department of Planning and Environment and was carried out in accordance with applicable statutory

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requirements. It should be noted that comments received after the closing date have also been considered in finalising this Submissions Report.

3.8 Northern Beaches Hospital

Submission number(s)
15, 22, 28, 36, 37

Issue description

• A strong case has not been made as to why the new hospital should be built at Frenchs Forest given the surplus land surrounding both Manly Hospital and Mona Vale Hospital. The destruction of the local habitat without any consultation with the local community is undemocratic.

• Shadowing of the high school created by the hospital will be an issue, especially during winter.

• The Northern Beaches Hospital site will have poor pedestrian amenity with busy roads on three adjacent sides.

• The hospital will be visually obtrusive.

• Hospital patients and visitors will be subject to air pollution with no greenery to absorb the fumes.

Response

The Northern Beaches Hospital is a separate project and comment regarding its location should be directed to Health Infrastructure as the proponent. It is understood that Health Infrastructure provided comment on the issue of the preferred location of the hospital in the submissions report for the Northern Beaches Hospital Concept Proposal and Stage 1 site clearing and enabling works EIS.

Overshadowing of the high school by hospital buildings is a separate issue to this project. It is noted that this was considered in the Stage 2 EIS for the hospital that was on public display from 20 November 2014 to 11 December 2014.

An EIS was prepared to assess the environmental impacts of the Northern Beaches Hospital, including amenity and pedestrian connectivity. Issues associated with the Northern Beaches Hospital should be directed to Health Infrastructure/Department of Planning and Environment.

3.9 Traffic and transport

3.9.1 Assessment methodology

Submission number(s)
15, 28

Issue description

• The traffic counts were taken in late November and early December 2013. Why were the traffic studies not completed during the normal 40 weeks of the year instead of during university, private school and public school holidays?
• A survey to ascertain the reasons for high car usage would be useful to identify factors relating to car dependency.

Response

A detailed description of the traffic and transport assessment methodology is provided in Section 4 of the specialist report (Appendix D to the EIS). This contains traffic data taken at various times of the year over a number of years, including daily traffic volumes from 2011 and 2012. Traffic surveys were carried out at various times for the traffic impact assessment in late November and early December 2013, as well as during baseline noise surveys on site in December 2013 and again in June 2014. The timing of these surveys accounts for variability over time and different periods of the year, including school holidays. Traffic trip times were calculated by Roads and Maritime using weekday traffic information from 1 March 2013 to 31 May 2013 and detailed in the Key Roads Performance Report (Roads and Maritime, 2013). This report detailed average speeds on key routes in the northern beaches, including along Warringah Road and Forest Way. The base model built on the wide array of data collected.

Consideration of factors relating to the high dependency on cars for transport is provided in Section 3.2 of the EIS. This notes that buses are the primary mode of non-car travel that services the Northern Beaches area. There is currently no rail service on the Northern Beaches and the closest train station that bus services focus on is Chatswood, some nine kilometres to the west. The other notable transport hub is at Manly (about 10 kilometres away) which is the terminus for ferry services. The limited available public transport options are a significant contributor to the high level of car usage on the Northern Beaches.

The EIS also notes that the efficiency of bus transport through the Warringah Road corridor is affected by bottlenecks at intersections. These factors contribute to the high usage of cars for private trips. The Concept Proposal provides for various public transport measures and further comment is provided in Section 3.8.8 of this report.

3.9.2 Construction and operational impacts (general)

Submission number(s)

4, 16, 23

Issue description

• Concerns have been raised regarding the potential lack of traffic flow during the construction phase.

• The existing traffic congestion makes short distance trips take longer than needed. Please consider the impact of transport after the hospital is built and the interruption to traffic during road works.

• Consider diverting traffic through Oxford Falls Road by opening Spicer Road North during construction as this would improve safety and reduce the flow of traffic from Forest Way and the new road works to the hospital and provide an alternative route during construction.

• During construction, please consider allowing traffic to enter onto Forest Way from Rabbett Street in the morning peak period. This would reduce the number of cars using Naree Road as attempting to turn onto Forest Way at Naree Road is difficult and dangerous now and likely to become worse once four lanes are built. Alternatively, consider allowing ‘local traffic only’ to enter Forest Way from Rabbett Street during the morning peak instead of ‘no entry’.
Response
Sections 7.3.1 and 7.4.1 of the EIS provide a high level assessment of the potential construction and operational impacts respectively of the Concept Proposal. Sections 7.3.2 and 7.4.2 provide a detailed assessment of the potential construction and operational impacts respectively associated with the Stage 1 Project. Section 7.5 identifies a range of safeguards and mitigation measures to mitigate impacts. Further information is provided in the detailed traffic and transport assessment (Appendix D to the EIS).

The detailed traffic and transport assessment examined the traffic impacts associated with the Concept Proposal and the Stage 1 Project. This identified that following completion of the Stage 1 Project, there would be a slight improvement in performance for most intersections compared to the ‘do minimum’ scenario and no improvement in performance for five intersections. The Stage 1 Project construction activities would generate traffic and transport impacts similar to those identified in Section 7.4.1 of the EIS. More specifically, during construction of the Stage 1 Project there would be increased heavy and light vehicle movements associated with construction activities and personnel. The assessment found there would be a significant impact on motorists during construction if not appropriately managed, and that staging would be a key consideration in managing impacts. Section 8 of the traffic and transport assessment considers the major construction activities and associated works, construction plant and works durations. It identifies mitigation measures that would reduce the impacts of construction activities such as staging partial road closures to allow priority for traffic movements in the peak direction. A traffic management plan would be prepared prior to construction and would include details on all relevant matters including minimising traffic delays as far as practicable. Roads and Maritime (and the construction contractor) would continue to engage with the community to ensure effective and timely communication of potential delays and detours.

Treatments of Oxford Falls Road have previously been raised with Roads and Maritime. This road is outside of the study area. The route suggested as a bypass during construction is a substantial distance from the project site. Details of potential bypass routes would be developed during the construction phase in consultation with key stakeholders such as Warringah Council, Transport Management Centre, and Roads and Maritime.

Currently, access to Forest Way from Rabbett Street is prohibited between 6-10am, Monday to Friday except for buses. This prohibition is imposed due to the large volumes of southbound traffic on Forest Way during the morning peak. The 2012 Base Conditions traffic modelling indicated that the intersection of Frenchs Forest Road West and Rabbett Street is already operating at LoS E during peak periods. The traffic modelling indicates that this would not change considering just the Stage 1 Project. However, traffic modelling carried out for the Concept Proposal indicates the Stage 2 Project would improve flows on Forest Way and would reduce pressure on traffic congestion points including this intersection. On completion of Stage 1 works, the intersection of Naree Road and Forest Way would be signalised allowing for all movements and facilitating safe movement of traffic from Naree Road to Forest Way. Depending on the staging of construction works, temporary traffic lights may be installed at the Naree Road/Forest Way intersection to safely move vehicle and pedestrian traffic around construction areas. This would be clarified during the construction phase of the project.

3.9.3 Operational impact (network performance)
Submission number(s)
6, 13, 15, 18, 22, 23, 24, 36, 37
Issue description

• The proposed Stage 2 works at Forest Way/Warringah Road, Wakehurst Parkway/Warringah Road, Allambie Road/Warringah Road, and Aquatic Drive/Wakehurst Parkway would create extreme traffic congestion with no real solution.

• Increasing the volume of traffic onto Frenchs Forest Road East from Warringah Road, Allambie Road and Wakehurst Parkway is going to create a bottleneck. It is currently impossible to turn right onto Frenchs Forest Road East from the side streets due to cars blocking access. There will still be no space on Frenchs Forest Road East even with the proposed traffic lights.

• Widening Frenchs Forest Road will not resolve the issue of vehicles waiting to turn left onto Wakehurst Parkway from Frenchs Forest Road East. Often these vehicles cannot move even when the lights are green due to congestion from vehicles travelling south on Wakehurst Parkway and attempting to turn right onto Warringah Road. Some vehicles use the bus lane travelling west on Frenchs Forest Road East to turn left into Wakehurst Parkway.

• Frenchs Forest Road East needs to be monitored during peak traffic times to see the roadblock that occurs and not during school holidays.

• Can traffic lights be added to the left turn onto Frenchs Forest Road East from Wakehurst Parkway to ease congestion and allow access for residents along side streets to Frenchs Forest Road East?

• The proposed traffic lights at the intersection of Frenchs Forest Road East and Romford Road will not ease the issue of cars turning right from Romford Road. Traffic on Frenchs Forest Road is often queued back to the Skyline shops due to the line of cars waiting to cross Wakehurst Parkway. Unless Romford Road becomes two lanes, the traffic waiting to turn right will hold up traffic wanting to turn left.

• There is a risk of irrational driver behaviour in the catchment area north of Frenchs Forest Road East if Romford Road is to be the only signalised intersection that allows right turns to Frenchs Forest Road East. All roads feeding into Romford Road are very narrow and have significant levels of resident on-street parking.

• It is possible that traffic lights and pedestrian crossings proposed for Stage 1 are in the wrong location given a number of key development sites, such as the existing Parkway Hotel site, have not been confirmed or modelled.

• Request that the Frenchs Forest Road East and Nandi Avenue intersection is clearly signposted with ‘Keep Clear’ pavement markings and prominent kerbside signage to allow acceptable access to and from Nandi Avenue in times of congestion and to ensure safety is not compromised during peak periods.

• The intersection of Forest Way and Russell Avenue is unsafe without traffic lights and there appears to be no provision for traffic lights as part of the project.

• Adding additional traffic lights on the corner of the Naree Road and Forest Way intersection will mean there will be eight sets of traffic lights along Forest Way between Warringah Road and Crozier Road. This will not speed up traffic.

• The proposal includes an overabundance of traffic lights.

• The proposed Northern Beaches Hospital road upgrades will not adequately improve traffic conditions for all traffic.
• The current road infrastructure around the Northern Beaches Hospital is inadequate to cope with peak period traffic. In order to genuinely relieve some traffic congestion around the hospital site some tunnels or overpasses would need to be built to remove through traffic.

• The road widening of Wakehurst Parkway, Allambie Road and Frenchs Forest Road in addition to the proposal for 12 lanes along Warringah Road will move the congestion further along already clogged roads and cause social dislocation.

Response

Warringah Road
Consideration of impacts on network performance of the Concept Proposal and Stage 1 Project is provided in Sections 6.2 and 7.2 respectively of the traffic and transport assessment and in Section 7.4 of the EIS. Extensive traffic data and modelling has been carried out to establish the context for the Concept Proposal. This found that the Concept Proposal would maintain overall operational efficiency while accommodating the predicted increase in traffic growth to 2036.

Average travel speed for vehicles travelling along Warringah Road (from west of Forest Way to east of Allambie Road) would be expected to improve due to the grade-separation (underpass) of the Forest Way, Hilmer Street and Wakehurst Parkway intersections along Warringah Road. With the grade-separation (underpass) of these intersections, there would be a reduction in traffic volumes on the surface road network, with an associated improvement in performance of the surface intersections.

The Stage 1 Project addresses the anticipated road connectivity needs associated with the Northern Beaches Hospital. Traffic analysis indicates that the Stage 1 Project would provide a significant improvement in network statistics compared to the ‘do minimum’ scenario. For example, in the 2018 morning peak period, modelling indicates a 26 per cent increase in the average vehicle speed and a 27 per cent reduction in the average delay per vehicle. When compared with the 2012 base case, the network performance of the Stage 1 Project in 2018 indicates that average vehicle speeds would essentially be maintained in the morning peak period (two per cent improvement) but would be expected to decrease by about 18 per cent in the evening peak period.

An underpass is proposed as part of Stage 2 along Warringah Road just east of the Wakehurst Parkway intersection to just west of Forest Way to assist with traffic flow and reduce travel times in the area. The Concept Proposal is divided into two stages. Stage 1 is directed at providing efficient connectivity to the Northern Beaches Hospital. Traffic modelling has indicated that Stage 1 alone would have limited network benefits beyond the hospital opening in 2018. Stage 2 is directed towards enhancing network performance and includes the grade separation of a number of intersections along Warringah Road (Forest Way, Hilmer Street, Wakehurst Parkway). Traffic modelling for the Concept Proposal indicates the proposed works would improve network performance compared to the ‘do minimum’ option.

Frenchs Forest Road
The assessment of intersections presented in the EIS and in the Technical Working Paper, (Appendix D to the EIS) identifies that under the Stage 1 Project only, the LoS for the intersection of Frenchs Forest Road East/Romford Road would decline from LoS A-D to LoS E in 2018 and LoS F in 2028. However, it is expected that this intersection performance would be improved with the implementation of the Stage 2 Project, due to the grade separation of Forest Way, Hilmer Street and Wakehurst Parkway intersections along Warringah Road and the transfer of some ‘through’ traffic using Frenchs Forest Road back to Warringah Road. The timing of the Stage 2
Project would closely follow that of Stage 1. A revised assessment of the changes in intersection performance would be presented for discussion in the Stage 2 EIS. Roads and Maritime will further examine opportunities to refine the phasing of traffic lights during detailed design.

Traffic modelling indicates the traffic lights proposed at Romford Road coupled with the increased capacity of Frenchs Forest Road East would improve access of local traffic onto Frenchs Forest Road East. Roads and Maritime would consider line marking or provision of a splay (localised widening of the kerbside traffic lane) at the corner to separate turning movements on Romford Road. If traffic modelling confirms there would be a material benefit to performance, this would be included in the detailed design.

An operational traffic review would be undertaken within 12 months of opening of the Stage 1 Project to confirm the operational traffic impacts of the project on Forest Way, Naree Road, Frenchs Forest Road, Warringah Road and Wakehurst Parkway in close proximity to the hospital. This would take into account relevant factors such as school holiday periods.

The Stage 1 Project includes two dedicated left turn lanes onto Wakehurst Parkway from Frenchs Forest Road East and would increase the holding capacity for cars waiting to turn left. This coupled with the improvements planned for Warringah Road will benefit traffic flow on Wakehurst Parkway and traffic entering from Frenchs Forest Road East.

A left turn slip lane is being constructed to Frenchs Forest Road East from Wakehurst Parkway as part of a separate traffic management project to improve the through capacity of traffic travelling south on Wakehurst Parkway. This has been allowed for in the Base Case for traffic modelling. The Stage 1 Project would provide additional road capacity for traffic using Frenchs Forest Road East compared to the current single lane. This is expected to provide adequate gaps in traffic for motorists to safely access Frenchs Forest Road from side streets.

The existing left turn arrangements from Wakehurst Parkway to Frenchs Forest Road East would be retained, ‘Turn Left With Care’ in order to maintain operational efficiency for southbound traffic movement on Wakehurst Parkway. The new traffic lights at the Frenchs Forest Road East/ Romford Road intersection would improve access for westbound traffic on Frenchs Forest Road East to side streets.

Apart from Patanga Road where access would be limited to left-in only for general traffic and right turn ban into Inverness Avenue, motorists would be able to turn right in and out of other local side streets, thereby reducing the need for all motorists to use the Romford Road traffic lights to enter or leave Frenchs Forest Road East.

Line marking that states ‘Keep Clear’ coupled with kerb side signage ‘Do not queue across intersection’ would be considered as part of detailed design. This would apply only for the eastbound direction and would address safety concerns at the Nandi Avenue/Frenchs Forest Road East intersection.

Forest Way

Figures 2.20 and 2.21 in the Stage 1 traffic report illustrate the spatial distribution of traffic incidents within the Concept Proposal study area. These show that relative to other intersections in the study area, the number of incidents associated with this intersection are low. In view of this, there is not considered to be a material safety issue associated with the existing intersection arrangements. Right turns into Russell Avenue from Forest Way southbound will be assisted via a new right turn bay planned for Stage 1 and the gaps in traffic flow on Forest Way via the new traffic lights at Naree Road. Provision of traffic lights at this location would not be practicable as they would increase the complexity of coordinating these signals with the nearby signals at Naree.
Road, Warringah Road and the existing signalised pedestrian crossing. Traffic lights at this location would also constrain traffic movement along this section of Forest Way.

The additional traffic lights at the Naree Road and Forest Way intersection are needed to provide safe and efficient access for additional traffic entering Frenchs Forest Road West to access the Northern Beaches Hospital. Provision of traffic lights at the Naree Road/Forest Way intersection would improve road safety at this location and provide better pedestrian crossing facilities. The proposed underpass at Warringah Road as part of the Stage 2 works is expected to further assist in improved traffic flow along feeder roads such as Forest Way.

*Other issues*

Stage 1 includes six new signalised intersections. The new traffic lights are required to improve access to local streets and the Northern Beaches Hospital, and to improve pedestrian crossing facilities and road safety. While the traffic and transport assessment for the Stage 1 Project shows that average travel speeds and Levels of Service in the project area would remain similar or decline slightly compared to the Base Case (2012), traffic modelling for the Concept Proposal indicates there would be an improvement in the local network performance compared to the ‘do minimum’ scenario.

The number and locations of traffic lights is based on the traffic modelling which has allowed for growth within the hospital precinct generally but not with regard to any specific location. Development of the Concept Proposal and individual stages has been carried out with consideration of known future development. Any traffic generating development will need to account for its impacts. Planning for the Stage 1 Project has been carried out in close consultation with Warringah Council, Transport for NSW and Health Infrastructure. Further information on intersections associated with the Stage 1 Project is also provided in Section 7.1.2.

Roads and Maritime is continuing to examine other nearby traffic congestion pressure points along the road corridor, particularly at the intersection of Starkey Street and Warringah Road, to identify complementary measures that would assist in the management of congestion along the corridor. Where proposed, these would be addressed as separate projects. Extensive traffic modelling has been carried out and will continue, as part of the traffic and transport impact assessment for the Stage 2 EIS.

### 3.9.4 Operational impact (intersection performance)

**Submission number(s)**

13, 14, 15, 22, 23, 24

**Issue description**

- The Naree Road/Frenchs Forest Road intersection with Forest Way will perform at LoS F at opening (2018) which is difficult to see as acceptable. If more land was purchased for this upgrade, a double right turn could be provided with a more acceptable level of service.

- What can be done to improve the performance of the Frenchs Forest Road/Wakehurst Parkway intersection as it will still perform at LoS F at opening?

- Reduce the right turn lanes from Frenchs Forest Road East to Wakehurst Parkway to one lane.
Response

The traffic and transport assessment has included a detailed examination of existing intersection performance and how this would be affected with regard to the Concept Proposal and the Stage 1 Project. A traffic and transport assessment has been prepared for the Stage 2 Project and the Stage 2 EIS will report on the combined effects of both project stages on intersection performance. The following discussion relates only to the Concept Proposal and the Stage 1 Project.

The intersection of Naree Road with Forest Way would be signalised as part of the Stage 1 Project and road improvements to increase the capacity of this intersection would also be carried out. Naree Road/Frenchs Forest Road would also be widened to provide additional capacity for traffic accessing the hospital. The traffic assessment shows that the Forest Way/Naree Road intersection currently (2012) performs at LoS F, which is considered unsatisfactory. This is due to traffic at the Forest Way and Warringah Road intersection queueing back along Forest Way.

However, the assessment also indicates that the performance of this intersection would be improved with the implementation of the Stage 2 Project due to the grade separation of Forest Way, Hilmer Street and Wakehurst Parkway intersections along Warringah Road. A revised assessment of the changes in intersection performance would be presented in the Stage 2 EIS.

Traffic modelling indicates that the Stage 1 improvements to the intersection of Wakehurst Parkway and Frenchs Forest Road by themselves would not change the intersection performance. However, the large scale engineering treatments planned for Warringah Road in the form of an underpass (Stage 2) are anticipated to benefit the level of service at this intersection. The commitment is for Stages 1 and 2 to be completed by the time the hospital opens in 2018.

The requirements for turning lane numbers and lengths at each of the intersections along the Stage 1 Project have been determined following extensive traffic modelling, taking into account current land use and future land use change, and existing right turn arrangements into Wakehurst Parkway from Frenchs Forest Road East.

3.9.5 Operational impact (car parking)

Submission number(s)
15, 20, 22, 23

Issue description

- If Naree Road becomes a no stopping and no parking road, where will visitors or residents park?

- Naree Road is a local resident only road. Residents on other local roads such as Grace Avenue enjoy a degree of Council protection and enforcement, eg by fining non-resident cars using the southbound lane of Grace Avenue between 7am and 9am on weekdays. However, no similar protection is provided for residents of Naree Road, Frenchs Forest Road West or Rabbett Street.

- Police should not be allowed to park cars in Sylvia Place as it is a resident’s street and there is limited room.

- By creating four lanes in Naree Road and Frenchs Forest Road West, where will the residents park their vehicles?

- Parking at the Forestway Shopping Centre is difficult and this will be increased with the new hospital. Are there plans to resolve this?
Response
The traffic and transport assessment has included consideration of impacts on existing parking arrangements principally with regard to the Stage 1 Project. This is documented in the Working Paper (Appendix D to the EIS) and in Section 7.4.2 of the EIS. A detailed assessment of the impacts of the Stage 2 Project on car parking will be provided in the Stage 2 EIS.

A parking survey was carried out during the preparation of the EIS to determine current levels of parking during weekdays and weekends. The survey examined on street parking use along Naree Road/Frenchs Forest Road, Rabbett Street, Allambie Road/Patanga Road and local roads to the north of Frenchs Forest Road. It was observed that on street parking on Naree Road and Rabbett Street was relatively high on weekdays (42-60 per cent and >80 per cent respectively) which is likely due to the close proximity of these streets to bus stops on Forest Way.

Weekday parking usage on other roads in the area is generally lower. Usage on Frenchs Forest Road West is up to 18 per cent while on Frenchs Forest Road East it is up to 50 per cent likely due to availability of off street parking for business parks. During weekend mornings, parking spaces near the Skyline Shops are almost full. Weekday parking restrictions during the AM and PM peaks along Naree Road and Frenchs Forest Road would have only a minimal impact and there are a number of side streets that could accommodate additional parking during peak periods.

Kerbside parking restrictions during peak periods, particularly along Frenchs Forest Road, are expected to be put in place in order to optimise the additional traffic capacity provided by the Stage 1 Project. Parking on Naree Road; Frenchs Forest Road West between Rabbett Street and Bluegum Crescent (west); and Frenchs Forest Road East between Skyline Place and Inverness Avenue would be permitted outside of AM and PM peaks during weekdays and no restrictions placed over weekends. This would be similar to the limited parking restrictions currently provided in Grace Avenue.

As the main entrance to the hospital will be off Frenchs Forest Road West, access needs to be provided in both directions at all times. Accordingly, between Bluegum Crescent (west) and Wakehurst Parkway, both sides of Frenchs Forest Road West would be sign-posted as a 24-hour clearway at all times.

Use of Sylvia Place for parking of police cars is a separate issue to the project and is the responsibility of Warringah Council.

Changes to parking arrangements at the Forestway Shopping Centre are outside the scope of the Concept Proposal. Parking within the Forestway Shopping Centre is a matter for centre management and Council.

3.9.6 Pedestrians and cyclists
Submission number(s)
2, 3, 5, 8, 13, 15, 22, 24, 28, 32
Issue description
• The proposed road widening and central cutting on Warringah Road is not compatible with pedestrian and cyclist amenity, public transport, or a healthy environment.
• Removal of the pedestrian island on Frenchs Forest Road East near Nandi Avenue is inconvenient for residents accessing the bus stop on the other side of Frenchs Forest Road.
East. There is a need to provide some form of crossing aid. The proposed new crossing is uphill and is an additional 125 metres away.

• The widening of roads will intensify the traffic environment and significantly expand the road space. This will adversely affect pedestrian connectivity and amenity.

• It appears that pedestrian crossings on Frenchs Forest Road East are limited to signalised intersections at Wakehurst Parkway, Romford Road and Patanga Road. These distances (425 metres and 350 metres respectively) are unreasonable for pedestrians to cross Frenchs Forest Road East to access public transport.

• The crossing facilities at the proposed signalised Naree Road intersection would provide a safe crossing for local residents and students accessing the Forestway Shopping Centre and bus stops on Forest Way. The crossing would also assist students attending The Forest High School but not students accessing other schools from the bus stops at Forest Way/Rabbett Street and outside the shopping centre as suggested in the EIS. The crossing at the Naree Road intersection is not on the desire line and students of The Forest High School and the majority of local residents will not use it.

• Reconsider the need for a pedestrian footbridge over Forest Way at the southern end of the Forestway Shopping Centre.

• Due to safety issues, can the pedestrian lights into the Forestway Shopping Centre be moved so that they accommodate both turning traffic and pedestrians?

• The Forest Way pedestrian crossing is used by a high proportion of school children wishing to access bus stops on Forest Way and Rabbett Street. However the pedestrian delay time is considerable and results in unsafe crossings in order to catch a bus in time. The EIS states that it is adequate to serve current levels of demand but more traffic will travel on Forest Way to access the hospital. This is not considered safe and acceptable against the Director General's requirements.

• Pedestrian crossings on Warringah Road would be restricted to bridges traversing 12 lanes which increases security concerns at night.

• The proposal for the pedestrian bridge near Hilmer Street to the high school will increase traffic movement and hospital parking in and around Karingal Crescent, Akora Street and Fitzpatrick Avenue. This is not fair on residents.

• The rejection of a suggestion for a pedestrian bridge over Warringah Road at Maxwell Parade does not meet the Director-General's pedestrian safety requirements. The only safe opportunities to cross Warringah Road for people using public transport are at the footbridge near Forest Way and at the at-grade crossing at Brown Street, which are 1.1 kilometres apart. Due to the distance apart, people are crossing six lanes unsafely to access bus stops in between. Given the hospital will increase traffic and this will exacerbate the safety issue, reconsider the need for a footbridge at Maxwell Parade.

• Where will the footpath be constructed on the north side of Naree Road so residents and the community can walk to either Rabbett Street or Warringah Road to access new proposed traffic lights for a safe crossing? The existing situation is dangerous and will be much worse once four lanes are built.

• NSW Bike Plan action 2.16 applies to this project and a connected network of off-road bicycle facilities should be provided as part of the works. These would include off-road bicycle paths along east-west routes of Warringah Road (northern side), French Forest Road and a small
section of Rodborough Road between Allambie Road and Warringah Road. North-south routes which require bicycle infrastructure include Forest Way, Wakehurst Parkway and Allambie Road.

- There is no mention of a cycleway to link the area surrounding the proposed hospital site. There is a significantly increased safety risk to cyclists if not separated from vehicular traffic.

- Wakehurst Parkway and Warringah Road are subject to significant bicycle traffic and there appears to be no information regarding the location of cycle lanes or provision for cyclists in the widening and upgrade road works.

- Off road cycleways that avoid busy roads, such as Warringah Road, provide a safer and more attractive option for cyclists and should be considered.

- Retain the existing setback, trees and landscape buffer south of Warringah Road as a pedestrian and cycling corridor.

- The proposed work shows a disconnected active transport network and further consideration needs to be given to provide a connected walking and cycling network in the precinct.

- Roads within the project area are used as major bike commuting routes to the city from the Northern Beaches but currently offer no cycling infrastructure.

- Bicycle network signal plans need to be designed to include bicycle lanterns.

Response

The traffic and transport assessment has included consideration of impacts of the Concept Proposal and the Stage 1 Project on pedestrians and cyclists. This is documented in the Working Paper (Appendix D to the EIS) and in Section 7.4.1 (Concept Proposal) and Section 7.4.2 (Stage 1 Project) of the EIS. A detailed assessment of the impacts of the Stage 2 Project on pedestrians and cyclists will be provided in the Stage 2 EIS.

The Concept Proposal has been developed with consideration given to a range of matters including public transport, active (cyclist/pedestrian) transport and amenity. As outlined in Section 5.1.2 of the EIS, one of the urban design principles and objectives guiding design development includes ‘delivering an integrated approach to traffic (including pedestrian and cyclist) public transport and land use’.

In terms of public transport, Transport for NSW is developing wider public transport strategies for the Northern Beaches area. Bus priority measures have been considered in development of the Concept Proposal and are included in the Stage 1 Project. Further work is being carried out in conjunction with Transport for NSW to identify design opportunities for the Stage 2 works to provide for public transport (bus) opportunities through the widened and upgraded Warringah Road. Refer to Section 3.8.8 for further details on the provision for road based public transport.

Pedestrian crossings

In terms of active transport, pedestrian safety and provision of pedestrian crossings are essential components of any road and urban design, particularly for the Stage 1 Project due to the proximity of The Forest High School and the hospital. Pedestrian crossings are proposed at several locations to facilitate safe movement of pedestrians heading to and from the hospital, the school and other attractor nodes such as the Forestway Shopping Centre and the Skyline Shops. In order to avoid impacting properties, it was necessary to remove the pedestrian island near Nandi Avenue given the widening of the road at this location. The two zebra crossings on Frenchs
Forest Road (near The Forest High School and Patanga Road) are to be replaced with signalised pedestrian crossings. Other pedestrian crossing points include:

- **Forest Way/Naree Road intersection**: pedestrian crossings would be provided on two sides of the intersection (currently there are none)
- **Naree Road/Rabbett Street intersection**: pedestrian crossings would be provided on three sides of the intersection (currently there are none)
- **French Forest Road West/new hospital access**: pedestrian crossings would be provided on sides of the intersection
- **Wakehurst Parkway/Frenchs Forest Road intersection**: pedestrians will be able to cross at three of the four sides of the intersection. Currently the pedestrian crossing is provided at two sides only. It should be noted that due to geometrical constraint, it is not possible to provide a marked pedestrian crossing at the western side of the intersection.
- **Frenchs Forest Road/Romford Road intersection**: pedestrian crossings would be provided on three sides of the intersection (currently there are none)
- **Frenchs Forest Road/Patanga Road/Allambie Road**: pedestrian crossings would be provided on three sides of the intersection (currently there are none).

There are currently no formal pedestrian crossing facilities along Frenchs Forest Road East apart from at the Wakehurst Parkway intersection (signalised crossing) and at Patanga Road (non-signalised crossing). The Stage 1 Project will provide two additional signalised intersections with pedestrian crossing facilities at Romford Road and Patanga Road. The standard spacing between bus stops recommended by Transport for NSW is 400 metres. This is considered acceptable with regard to the distances pedestrians would need to walk from the new pedestrian crossings to access the bus stops. Opportunities for rationalisation of bus stops would be further discussed with Transport for NSW during detailed design.

The proposed signalised crossing of the Naree Road and Forest Way intersection would enable pedestrians to connect between attractor nodes such as the Northern Beaches Hospital, The Forest High School, local residents and the Forestway Shopping Centre. The signalised crossing would also provide a safe passage of students accessing bus stops on Forest Way.

The current location of the signalised pedestrian crossing at the Forestway Shopping Centre on Forest Way serves to facilitate access to the adjacent bus stop as well as the shopping centre. The crossing location provides a connection between two modes of transport and aligns with the pedestrian desire line and the shopping centre car park. From a safety perspective, the crossing is to be kept separate from the access points to the shopping centre as the intersections are uncontrolled (unsignalised). In addition, due to the location of the existing pedestrian crossing within close proximity to two busy bus stops, this proposal would be unsuitable. Right turns into Russell Avenue would be assisted via a new right turn bay planned for Stage 1.

Furthermore, pedestrian counts as well as an examination of pedestrian related incidents at this location did not warrant the need for a pedestrian bridge. The existing signalised intersection coupled with new crossing facilities at Naree Road and the upgraded pedestrian bridge over Warringah Road near Forest Way would adequately meet the pedestrian demand in the area. The existing at grade signalised pedestrian crossing provides safe pedestrian passage across Forest Way. Phasing of pedestrian crossings will consider effects on the wider network and would be examined further in detailed design.
The Concept Proposal provides for retention of the existing connectivity across Warringah Road near Forest Way through replacement of the existing pedestrian bridge and improved connectivity through the proposed pedestrian bridge at Hilmer Street. There is also provision for a shared path along Warringah Road. The pedestrian bridges are currently being designed as part of Stage 2 and would be guided by the urban design objectives and principles including Crime Prevention Through Environmental Design (CPTED) principles.

In terms of the pedestrian bridge over Warringah Road at Hilmer Street, it is needed to improve pedestrian connectivity between residents south of Warringah Road and the Northern Beaches Hospital and the high school. The pedestrian bridge would provide an additional safe crossing point for pedestrians, particularly for school students.

The Stage 2 hospital EIS indicates that 1430 car park spaces would be provided within the hospital site and this is expected to reduce the need for use of local streets for parking by hospital staff and visitors. The effect of the new bridge on parking and traffic flow would be assessed as part of the Stage 2 EIS.

The intersection of Warringah Road and Maxwell Parade is outside the scope of work for Stage 1 and Stage 2. However, provision of a pedestrian bridge across Warringah Road would be investigated as part of Stage 2 noting the desirability of locating pedestrian crossings to facilitate safe access to bus stops.

**Footpaths**

Footpaths would be provided on both sides of Frenchs Forest Road and link with existing pathways on Warringah Road and Forest Way at the eastern and western extent of the proposal respectively. A 1.5 metre wide formed concrete footpath would be located 0.8 metres from the back of the new kerb line on the northern side of Naree Road and Frenchs Forest Road. It should also be noted that the southern footway reservation would be formed with concrete for the full width, i.e., 3.5 metres and this would run for the entire length of Naree Road/Frenchs Forest Road between Forest Way and Wakehurst Parkway. There would be signalised pedestrian crossings at the Naree Road/Forest Way intersection and the Naree Road/Rabbett Street intersection to enable safe pedestrian crossing.

**Shared paths**

Off road shared pathways are also proposed in the Stage 1 Project on:

- Allambie Road (western side north of Warringah Road)
- Southern side of Frenchs Forest Road East (Allambie Road–Wakehurst Parkway)
- Wakehurst Parkway (eastern side between Frenchs Forest Road–Warringah Road)
- Forest Way (eastern side between Naree Road–Warringah Road).

The shared path proposed for Stage 1 along Frenchs Forest Road East connects with the proposed Stage 2 shared path at the intersections of Warringah Road/Allambie Road and Warringah Road/Wakehurst Parkway. Preparation of traffic signal plans would be carried out as part of detailed design. Bicycle lanterns with crossing facilities would be provided at signalised intersections as required to cater for cyclists. The proposed shared paths presented in the EIS have been further developed in consultation with Council to enhance their functionality and to connect with shared paths proposed by Council. Further details on the proposed cyclist infrastructure are provided in Chapter 5 and those relating to the Stage 2 Project will be provided in the Stage 2 EIS.
3.9.7 Property access

Submission number(s)
10, 15, 22

Issue description

• With the proposed Naree Road widening, how would residents reverse out of driveways given the steep angles and lack of view?

• The summary material provided does not detail how this road widening will actually impact on access to driveways for the residents and future parking arrangements.

• Residents of Bluegum Crescent will be unable to turn right in and out of either end of the street. This design does not allow access directly to the Forestway Shopping Centre and any areas west, north or south in addition to entering the street when coming from the east.

• Locating the proposed hospital entrance adjacent to The Forest High School exit will create congestion and problems particularly at the start and end of school. Changes to the right hand turn from Wakehurst Parkway into Frenchs Forest Road west and inclusion of no stopping will add additional confusion in the area. The ‘pick up’ area proposed within the school grounds will not solve the problem. Is there any information available as to the number of cars picking up students on any given day?

Response

The Concept Proposal would affect access to a number of existing businesses and residential properties and the impacts of this are addressed in Chapter 10 of the EIS. Those associated with the Stage 1 Project have been considered in detail and safeguards and management measures identified to mitigate impacts. The Stage 2 EIS would provide a detailed consideration of access impacts associated with the Stage 2 Project. The summary document is only intended to provide an overview of the EIS. Detailed consideration of issues such as future parking arrangements is provided in the Stage 1 EIS.

In terms of driveway access, Section 5.4.9 of the EIS states that there is potential for access to individual properties along the Stage 1 Project construction area and adjacent connecting roads to be affected by construction activities. Property access would be maintained throughout construction of the project, unless otherwise agreed with property owners and businesses, and any impacts would be short-term. Parking has been discussed in Section 3.9.6.

Since the EIS display, Roads and Maritime has met with four affected property owners on Naree Road. To minimise the impact of level changes at the common boundary, Roads and Maritime has revised the concept design by regrading the road, replacing the two-way with one-way cross fall to minimise the level change at these critical properties. Preliminary design for several driveways on Naree Road have also been prepared. The design would be further refined during the detailed design stage. This would include consultation with the property owners with regard to consideration of measures such as the installation of convex mirrors to aid drivers to reverse out of their driveways safely. No property adjustment work can proceed without Roads and Maritime first obtaining the property owner’s consent.

Access to Bluegum Crescent (west) would not be affected by the proposed widening of Frenchs Forest Road West from two to four lanes and right turns in would still be permitted. However, due to road widening in the vicinity of the new signalised intersection at the main hospital access to accommodate a right turn bay, access to Bluegum Crescent (east) would be restricted to left in and left out only. With the exception of Patanga Road, right turn movements into other streets off
Frenchs Forest Road East would be permitted. Existing access arrangements to the Forestway Shopping Centre would remain unchanged.

The decision to locate the main hospital entrance off Frenchs Forest Road West was made by Health Infrastructure. Health Infrastructure presented the three hospital entrances in the Concept Proposal and Stage 1 site clearing and enabling works EIS that was placed on public display in November 2013. Given the hospital entrance is located adjacent to the school, Roads and Maritime has worked closely with both parties to ensure safe and efficient access is provided. This has included removing the service access road and relocating it within the Northern Beaches Hospital site. Roads and Maritime has been working closely with the Department of Education and Communities and The Forest High School to ensure the school’s needs are met in terms of safe travel for staff, visitors and students by car, bus or on foot. Other measures have also been considered to provide adequate parking on site. Roads and Maritime meets with The Forest High School monthly to ensure they are involved in the planning of the road works.

3.9.8 Public transport

Submission number(s)
3, 15, 19, 22, 24, 28, 34, 36

Issue description

• Queries why the Government is upgrading roads, which encourages car use instead of committing money to other forms of transportation such as a railway line or light rail linking this area and the northern beaches with the existing rail network. Construction of dedicated bus lanes along all the major roads in the study area and the establishment of separated bike lanes similar to those on the M7 would also give people other transport options.

• Public transport should have been addressed within a Strategic Framework Plan for the Health Precinct. If density had been addressed in a strategic planning document for the area, then a Bus Rapid Transit would be required. Stage 2 consists of no dedicated bus lanes out of a total of 12 lanes on Warringah Road. If there is no commitment to a Bus Rapid Transit for the Warringah Road upgrade, please consider a bus lane on Frenchs Forest Road.

• The proposed work provides access for car drivers around the hospital but they are insufficient to get residents from parts of the peninsula to the hospital. There is a need for public transport.

• Cost effective improvements to public transport should be implemented before spending money on road widening and grade separation.

• What proportion of $400 million is to be invested in public transport? Public transport should be the first priority to relieve traffic congestion at peak hours.

• The proposal is to allocate $67 million to new commuter parking which would be better directed to bus services which would reduce car usage.

• The proposed central cutting would not connect with a kerbside bus service along Warringah Road or with the bus interchange at Forest Way. The project does not promote public transport.

• Providing a kerb-side express bus service along Warringah Road instead of Frenchs Forest Road would improve public transport travel times and encourage people to use public transport.
• Public transport infrastructure, such as a dedicated kerb side bus lane, should be a priority for Stage 1 and 2.
• There is a need to trial bus priority lanes on the east-west route to improve travel times and encourage people to use public transport.
• Localised bus services that connect to bus routes would reduce car usage and the need for expansive road works.
• Better bus connections across the wider network should be provided to encourage shift from car use to public transport use.
• Improving bus services and routes could result in immediate improvements to existing public transport.
• There is a need to create a public transport 'hub' in the currently poorly serviced area.
• There are not enough buses on Warringah Road and Wakehurst Parkway to provide alternative transport for car users.
• An additional service should be provided on the 36 bus route instead of reducing the number of bus stops. Eliminating bus stops might speed up services but would disadvantage people from accessing local destinations.
• Redirecting the 280 bus service from Warringah Road to Frenchs Forest Road would overlap the 136 bus route and reduce the already limited services along Warringah Road.
• Without local transport initiatives such as local bus services there could be a proliferation of park and ride facilities near to transport nodes. These facilities create congestion near transport nodes and take up space in valuable areas.
• Large commuter car parks for all day parking can result in unproductive 'dead' space, which occupies prime land near to transport nodes and shopping centres.
• Shuttle buses to service some suburbs or local peak hour express services are practical measures to alleviate the difficulty of walking or cycling the local topography.
• The bus stop on the corner of Forest Way and Warringah Road requires modification to accommodate more buses, as buses currently block southbound traffic turning left into Warringah Road in the morning peak period.
• Please ensure the upgraded bus bay fronting the Forestway Shopping Centre allows for two articulated 'bendy' buses as these are what Forest Coaches and Sydney Buses use.
• Provision should be made for at least four buses, at the existing bus bay at the Forestway Shopping Centre, not two as proposed.
• Please include an upgrade of the current bus bay opposite the Forestway Shopping Centre at the intersection with Rabbett Street and Forest Way. This is an important bus bay for morning peak travel to the city and Chatswood. It currently only allows for one bus and only just fits an articulated 'bendy' bus, leading to congestion.
• Warringah Road is a more suitable road for express bus services than Frenchs Forest Road, which needs to allow for all stops service.
• The current bus interchange on Forest Way should be retained and integrated into the bus and road network. The Northern Beaches Hospital site is not conveniently located for a major intersection serving bus transport along Forest Way.
Transport and traffic congestion are complex issues that require cost effective and practical measures that reduce car dependency.

Response

Public transport has been a consideration since the outset of design development for the Concept Proposal. Section 3.1.8 of the Stage 1 EIS and Section 4.5.1 of the Options Report acknowledge Sydney’s Bus Future and note that it designates Warringah Road via Frenchs Forest Road as a ‘Suburban’ bus corridor with a speed target of 18-25 kilometres per hour between Chatswood and Dee Why/Brookvale. It further notes that in order to meet this performance benchmark, bus priority elements are to be included as part of the project. The Concept Proposal also incorporates measures, such as shared paths for pedestrians and cyclists, to allow a shift in mode share such as bus priority measures that are in line with Sydney’s Bus Futures, and pedestrian and cyclist infrastructure.

Investigation of viable strategic transport solutions for the Concept Proposal examined the potential for public transport to meet the project objectives. Warringah Road and Frenchs Forest Road have been designated as ‘Suburban’, medium-level regional bus corridor in Sydney’s Bus Future (Transport for NSW, 2013) strategy. For the short to medium term Transport for NSW has designated target average bus speeds of between 18 kilometres per hour and 25 kilometres per hour. To improve operating conditions for buses and support the intended service level increases, intersection based bus priority treatments and mid-block interventions are required.

Public transport alone would not be adequate but improvements to road-based public transport would be complementary to the preferred road-based transport solution by supporting the road user demands for the Northern Beaches including the hospital. In terms of non-road based public transport Section 4.1 of the EIS describes other types of public transport alternatives considered for the Concept Proposal. As discussed, while there are currently no plans for a rail link to Sydney’s Northern Beaches, the timeframe for developing, constructing and commissioning such a project would mean that it would not be operational in time to support the opening of the hospital in 2018 or to address increasing congestion on the existing road network. In this regard, a range of suitable bus transport improvements has been included in the Concept Proposal where possible. Decision-making with regard to bus transport planning, including introduction of new services and discontinuation of existing services rests with Transport for NSW.

Bus priority measures are proposed at key intersections as part of the Stage 1 Project in order to meet the projected increase in bus traffic along Frenchs Forest Road following opening of the hospital. Bus priority measures include new dedicated bus lanes on approach to and departure from the Frenchs Forest Road and Wakehurst Parkway intersection; a bus zone extending from the dedicated westbound bus lane on French Forest Road West for a distance of about 480 metres (to the school entrance); the retention of existing bus priority measures at the intersection of Wakehurst Parkway and Warringah Road; and the Warringah Road bus right turn only into Frenchs Forest Road East would be upgraded. Further work is being carried out in consultation with Transport for NSW to identify design opportunities for the Stage 2 works to allow for bus priority measures through the widened and upgraded Warringah Road.

There are limited bus priority measures in an east-west direction already in place at the intersection of Warringah Road and Allambie Road; and at the intersection of Warringah Road and Wakehurst Parkway. These would be retained and further enhanced by additional bus priority measures at Frenchs Forest Road and Wakehurst Parkway.
Any changes to bus stops, bus routes or timetables would be at the discretion of Transport for NSW. Roads and Maritime has consulted with Transport for NSW during development of the Concept Proposal to ensure bus stops and routes have been integrated into the design.

While the Concept Proposal supports opportunities for public transport, the $400 million budget does not include the introduction of local bus services, park and ride facilities, the provision of commuter parking or local shuttle bus services. This is the responsibility of Transport for NSW and/or Warringah Council. Roads and Maritime will continue to consult with Transport for NSW and Warringah Council with regard to opportunities for these facilities and services. The Concept Proposal does not include the provision of commuter parking.

The extension of the indented bus bay in the southbound direction on Forest Way would require property acquisition. Transport for NSW may undertake further studies and investigation to work out how best to utilise this area for future bus interchange activities, however, this would occur separate to the Concept Proposal.

The extended bus bay at the Forestway Shopping Centre would accommodate two 14.5 metre long buses at any one time and one articulated bus only. The indented bus bay could not be extended further to accommodate two articulated buses without impacting the signalised pedestrian crossing on Forest Way opposite the shops and Russell Avenue intersection with Forest Way. Providing space for four buses at this bus bay as suggested would result in substantial property impacts at this location. Roads and Maritime has been working closely with Transport for NSW which has advised on the usage at this bus stop and the provisions included in the current proposal are considered appropriate. In addition to property impacts, there is insufficient space to accommodate four buses in between intersections and pedestrian traffic lights on Forest Way.

The bus bay at Rabbet Street would be upgraded as part of the Stage 2 works in consultation with Transport for NSW.

Bus services would be provided along the surface lanes on Warringah Road. Details of the proposed bus service arrangements, including locations of bus stops along Warringah Road adjacent to the slot would be provided in the Stage 2 EIS. Only local bus services are proposed along Frenchs Forest Road. There is potential for express bus services to be provided on Warringah Road and options would be examined further with Transport for NSW.

The current bus interchange on Forest Way is outside the scope of the Stage 1 Project. Any proposal by Transport for NSW to upgrade the interchange would be considered in the Stage 2 EIS. It is noted that bus stops would be provided on Warringah Road and Frenchs Forest Road West adjacent to the hospital.

Transport for NSW is currently reviewing the bus network that services the wider Northern Beaches area, to inform the design and delivery of the Northern Beaches Bus Rapid Transit (BRT) project (including kerbside BRT between Mona Vale and the Sydney CBD). Completion of the Northern Beaches BRT is a key action in the NSW Government’s Northern Beaches Transport Action Plan, released in June 2014. Further information on the Action Plan is available on the Transport for NSW website⁴.

As part of its work to deliver the Northern Beaches Transport Action Plan Transport for NSW is working with Warringah Council and Roads and Maritime to identify and investigate medium and long-term bus servicing scenarios for the Frenchs Forest precinct, to complement the Concept

Proposed service improvements may include an improved cross-regional bus service connecting Manly and Dee Why to Chatswood via Frenchs Forest. This east–west service is shown in the Northern Beaches Transport Action Plan, connecting at Frenchs Forest with a direct route from Terrey Hills to the Sydney CBD. Services will be progressively upgraded to operate at a minimum frequency of every 15 minutes in both directions from 6am to 7pm every weekday, and every 10 minutes during commuter peak periods within these times. With the completion of the Concept Proposal, consideration can be given to the operation of some peak services as limited stop expresses using Warringah Road in place of Frenchs Forest Road, for faster commuter travel.

For the longer term, a new east-west bus route parallel to Frenchs Forest Road and Warringah Road will be explored with Warringah Council in the context of Council’s planning for the future local road network in the Frenchs Forest precinct. Also in the long term, the conversion of Warringah Road surface-level kerbside lanes, and/or the reconfiguration of signalised intersections, to support peak period bus priority operations would be able to be investigated, subject to customer demand and an assessment of wider road network impacts from changed traffic management conditions.

3.10 Biodiversity

3.10.1 Biodiversity offsets

Submission number(s)
20, 27, 28, 29, 30, 33, 34, 35, 37, 44

Issue description

- It is important to look after wildlife.
- The proposed offsets are inadequate.
- The proposed mitigation measures and offsets are insufficient and non-existent. The remaining areas not already destroyed must be allowed to stay intact. Land outside Duffys Forest Ecological Community cannot be considered as an offset.
- Opposed to offsets as extinction of an EEC that cannot be offset. No local offsets are included and the identification of offsets until after clearing is unacceptable.
- The Concept Proposal will have a large residual impact on biodiversity values as the proposed avoidance and mitigation measures are insufficient to reduce the impact to an acceptable level. The biobanking assessment did not include any offsets for the likely significant impacts on other threatened species as a consequence of the disruption of an important regional wildlife/vegetation corridor.
- If the project is approved, offset sites must be chosen in the vicinity to the works to help protect the local catchment areas.
- The offset sites should be identified in close surrounds of the area rather than outside the locality.
- We do not agree with the trading of biodiversity, however substitutes must be sourced locally and agreed prior to work commencing.
- The offset sites are not within the same location that would help to protect the rest of the affected catchments.
• Impacts on DFEC should be minimised as far as possible and appropriate local offsets should be used to compensate for such impacts.

Response
The development of the Concept Proposal and Stage 1 Project has sought to minimise impacts on biodiversity as far as practicable, however there would still be a range of unavoidable impacts. These have been assessed in detail and documented in the specialist biodiversity assessment (Appendix F to the EIS) and in Chapter 9 of the EIS. A biodiversity offset strategy has been prepared for the Concept Proposal and Stage 1 Project to offset significant residual impacts to threatened species, populations and communities. The first priority of the offset strategy is to secure an area(s) of land within the locality that contains similar biodiversity values to those being impacted by the project. Roads and Maritime is currently investigating potential offset sites in consultation with OEH and Warringah Council.

The biodiversity offset strategy has the following objectives:

• To provide options for offsetting residual significant impacts on threatened species, populations and communities, and a framework for delivery of these options
• To be consistent with the NSW offset principles for major projects (OEH 2013) and Roads and Maritime’s Guideline for Biodiversity Offsets (Roads and Maritime 2011) as well as the Draft NSW Offset Policy for Major Projects (OEH 2014)
• To fully offset residual significant impacts on Duffys Forest Ecological Community (DFEC) and the Red-crowned Toadlet in accordance with the principles of the Offset Strategy
• To present a framework for setting the scope and quantum of the biodiversity offsets that is transparent and justifiable on environmental, social and economic grounds
• To investigate as a priority ‘like for like’ offsets.

The biodiversity offset strategy has been prepared in the context of the NSW Biodiversity Offsets for Major Projects policy. Offsets for the project have been calculated using the OEH Biobanking Assessment Methodology (BBAM) and associated credit calculator. This assessment methodology is the accepted reliable and transparent assessment of losses and gains in accordance with government policy. The credits required to offset impacts from the Concept Proposal according to the BBAM are 176 ecosystem credits for Duffys Forest Ecological Community (DFEC) and 36 species credits for the Red-crowned Toadlet. These credit calculations will be revised following the detailed impact assessment for the Stage 2 Project. The first priority of the offset strategy is to secure an area(s) of land within the locality that contains similar biodiversity values to those being impacted by the project (ie DFEC). Roads and Maritime is currently investigating potential offset sites in consultation with OEH and Warringah Council.

Assessing the ‘connectivity value’ is one component of determining the ‘landscape value’ of a site under the BBAM. The BBAM sets out a stepwise assessment method for connectivity value that considers connecting links, vegetation patch size and condition. Assessment of connectivity value has been undertaken consistent with the BBAM as part of the biobanking assessment for the project. The Assessments of Significance (AoS) have been prepared in accordance with the Threatened Species Assessment Guidelines: Assessment of Significance (DECC 2007). The AoS requires consideration of criteria that relate to habitat fragmentation and isolation, and these criteria have been considered in all AoS (refer Appendix 4 to the Biodiversity Specialist Report). The AoS identified that there were likely to be significant impacts on DFEC and the Red-crowned Toadlet. The AoS identified that there would not be any significant residual impact with regard to other threatened species or EECs. The Biodiversity Offset Strategy for the project provides a
commitment to fully offset the residual significant impacts on threatened species, populations and communities resulting from the project. Credits calculated using the BBAM will guide the quantity of offsets required.

The biodiversity assessment found that loss of a worst case assessment of 5.1 hectares of DFEC would place the local occurrence of the community at risk of extinction and that a significant impact on this EEC is likely. Mitigation measures have been developed to reduce potential indirect impacts. These include establishing exclusion zones around areas of DFEC outside of the construction impact area pre-construction, placing construction access tracks and ancillary facilities in previously cleared/disturbed areas, using species known to occur in DFEC during site restoration and undertaking weed control in accordance with Roads and Maritime biodiversity guidelines. Impacts that cannot be mitigated would be offset in accordance with the OEH principles for the use of biodiversity offsets in NSW.

3.10.2 Construction and operational impacts

Submission number(s)
30, 33, 34

Issue description

• Changes to runoff patterns will impact habitat in rock formations, and acidity and nutrient changes will facilitate weed invasion.

• The proposed road upgrade will remove a large area of bush land, impact wildlife corridors, change runoff patterns, impact habitat in rock formations, cause weed invasion from acidity and nutrient changes and degrade habitat from light and noise levels.

• If flows within waterways, particularly Curl Curl and Trefoil Creeks are intended to be altered, there must be specific mitigating measures to ensure the continuous survival of keynote species such as the Climbing Galaxias and Red-crowned Toadlet.

• Light will deter fauna movement within the corridor and noise will further degrade fauna habitat.

Response

Potential biodiversity impacts from the Concept Proposal and Stage 1 Project are described in Section 4 of the biodiversity assessment. Potential impacts identified and assessed include clearing of native vegetation including 5.1 hectares of DFEC that is part of an identified wildlife corridor (Smith and Smith 2005), bushrock removal, weeds, noise, vibration, light, injury and mortality, and introduction of pest and pathogens. Potential impacts on surface water bodies and aquatic ecosystems have been assessed for the Concept Proposal and Stage 1 Project.

Section 16.4 of the Stage 1 EIS provides a consideration of operational water quality impacts associated with both the Concept Proposal and the Stage 1 Project. This identified that if left untreated, gross pollutants and increased nutrients/contaminants in drainage runoff associated with the increased extent of impervious surfaces could impact on receiving water quality. Table 16.2 in the EIS identifies that existing water quality in Upper Middle Creek exceeds ANZECC guideline levels for Total Nitrogen (TN), and nitrate/nitrite. Guideline levels for Total Phosphorus (TP) are exceeded in some locations but not in others.

Tables 5.3, 5.4 and 5.5 in Appendix M (Hydrology and Flooding Technical Paper) to the Stage 1 EIS summarise the predicted changes in pollutant loads (Gross Pollutants, Total Suspended
Solids (TSS), TP, TN) associated with the Stage 1 Project, with results being presented for unmitigated Stage 1 Project impacts and residual impacts following treatment of runoff as follows:

- Middle Creek is predicted to experience increases in total nutrients of 5-10 per cent for TP and 4-7 per cent for TN
- TP and TN will be reduced by 6-16 per cent and 6-17 per cent respectively in the upper reaches of Trefoil Creek but increase by 3-4 per cent further downstream.

The increases in nutrients are not expected to have a significant impact on aquatic ecosystems or groundwater-dependent ecosystems.

Further investigation of impacts on aquatic ecosystems and groundwater dependent ecosystems, including those in Curl Curl Creek, is being carried out for the Stage 2 Project. This will include consideration of cumulative impacts from both the Stage 1 Project and the hospital project. The ultimate water quality treatment strategy for the Concept Proposal would be confirmed during detailed design of each of the Stage 1 and Stage 2 Projects. This would address all relevant water quality management issues including changes in physical properties such as pH.

The Stage 1 Project is not considered to have a material impact on wildlife connectivity. An additional lane would be added to Frenchs Forest Road East at its intersection with Wakehurst Parkway which would represent about a 10 per cent increase in width. There would also be a temporary impact associated with construction work for drainage infrastructure immediately to the north of Frenchs Forest Road East and with the use of the land on the corner of Warringah Road and Wakehurst Parkway. These impacts are not considered to be significant.

Accordingly, impacts on fauna connectivity are associated principally with Stage 2 from the increased road width and creation of the slot. Mitigation measures have been identified to minimise direct, indirect and cumulative impacts of the Concept Proposal and would be reviewed and revised as required for the Stage 2 Project. These include fauna connectivity and road kill prevention measures that are currently being developed to provide safe passage of fauna in the study area. Opportunities for improvements have been identified such as culverts, rope crossings and fauna fencing. These will be detailed in the Stage 2 EIS. Further discussion on impacts on connectivity is provided in Section 3.10.6.

The Red-crowned Toadlet was identified in the study area during field survey for the Concept Proposal in the upper reaches of the Trefoil Creek and Curl Curl Creek catchments. The Stage 1 Project would remove a small amount of foraging habitat, however this is unlikely to have a significant impact on the species. Impacts of the Concept Proposal were assessed at a high level and are currently being investigated in greater detail for the Stage 2 Project, and the assessment will be informed by the detailed surface and groundwater investigations. The Climbing Galaxias was not targeted in field surveys as it is not listed as threatened. It is noted that this species prefers clear, tumbling waters in the headwaters of streams flowing through forested land which is not considered to occur in the Concept Proposal study area.

The concept drainage design for the Stage 1 Project has been developed to minimise downstream impacts associated with changes in runoff and receiving water quality. This will also be a design objective for the Stage 2 drainage design.

It is considered unlikely that the Concept Proposal would result in changes to existing levels of light from the existing Warringah Road, Wakehurst Parkway and surrounding roads such that there would be a substantial additional impact upon native fauna species. Operation of the Concept Proposal would result in a minor reduction in habitat areas not currently affected by light.
3.10.3  Cumulative impact

Submission number(s)
27, 33, 34, 36

Issue description

• There has been a big loss of Duffys Forest on the Northern Beaches Hospital site and the road works would result in greater losses.

• The clearing of vegetation on and around the proposed hospital site may have the potential to change groundwater flows that could affect Red-crowned Toadlet habitat to the north and south of Trefoil Creek and Curl Curl Creek however these cumulative impacts are unknown and are not identified clearly enough in the Biodiversity Assessment report.

• Given the Northern Beaches Hospital has already removed Duffys Forest Endangered Ecological Community, I strongly object to any road plans that would further impact on vegetation and Duffys Forest Ecological Community.

• The cumulative impact of the major developments in the area is likely to be a major gap in the important wildlife/vegetation corridor, leading to increased isolation of Manly Dam Reserve and the Bantry Bay section of Garigal National Park, threatening the long-term genetic viability of their fauna and flora populations, and making recolonisation less likely should those populations die out. This would also weaken the ability of Warringah’s fauna and flora to adapt to climate change.

• There is no documentation detailing the comprehensive studies carried out to assess the cumulative effects of the project on the health and viability of the remainder of the Manly Dam catchment.

Response

Cumulative impacts on biodiversity are discussed in Section 4.10 of the biodiversity specialist report (Appendix F to the EIS) and in Sections 9.4 and 9.5 of the Stage 1 EIS. The principal cumulative impacts identified relate to the removal of DFEC and changes to groundwater flows that could affect Red-crowned Toadlet habitat to the north and south in Trefoil Creek and Curl Curl Creek respectively. A third cumulative impact relates to a reduction of connectivity to bushland areas to the north and south. As noted in the previous section, impacts on wildlife connectivity relate principally to the Stage 2 Project and are discussed in Section 3.10.6.

Cumulative impacts on DFEC relate to the Northern Beaches Hospital development which removed about five hectares of DFEC, and both the Stage 1 Project and Stage 2 Project which collectively would result in the removal of about another five hectares of DFEC. It should be noted that the latter is an estimate developed for the Concept Proposal and a more accurate estimate would be developed for the Stage 2 Project. Development of the concept design for the Concept Proposal and Stage 1 Project has sought to avoid and minimise clearing of DFEC as far as practicable. As part of the biodiversity offset strategy, Roads and Maritime is investigating potential DFEC offset sites in the Warringah LGA in consultation with OEH and Warringah Council. Section 9.6.2 of the EIS identifies a range of complementary safeguards and management measures to mitigate impacts on DFEC.

The assessment for the Stage 1 Project identified that the work would be unlikely to affect groundwater dependent ecosystems (ecological communities that depend on groundwater for their ongoing viability) given that works are largely near-surface and unlikely to intersect the water table. The Stage 2 EIS for the hospital development notes that the hospital design has been
developed with the objective of no material change in surface runoff and water quality characteristics. The detailed hydrological investigation for the Roads and Maritime Stage 2 Project includes consideration of impacts on groundwater and groundwater-dependent ecosystems. Roads and Maritime is carrying out further consultation with Health Infrastructure with regard to the impacts of the Stage 2 hospital development on groundwater and the Stage 2 EIS will provide a consideration of the cumulative impacts of these two projects on groundwater.

The biodiversity assessment acknowledges that the study area is located within a 'Priority 1 Vegetation Corridor' identified by Smith and Smith (2005), being the only area still connecting bushland in Oxford Falls to Manly. This corridor is already substantially affected by the existing road network and recent site works for the Northern Beaches Hospital development has removed about five hectares of DFEC vegetation. The Concept Proposal involves expansion of existing roads and subsurface works that would contribute to reduced wildlife connectivity. This was considered in the assessments of significance for threatened fauna. It was concluded that the Concept Proposal is unlikely:

- To affect connectivity to the extent that any local population of threatened fauna would be at risk of extinction
- To fragment or isolate areas of habitat.

Fauna connectivity and road kill prevention measures are currently being developed to provide safe passage of fauna in the study area. Opportunities for improvements have been identified such as culverts, rope crossings and fauna fencing. These will be detailed as part of the Stage 2 EIS.

The Concept Proposal is located at a high point in the landscape and occupies about nine hectares of the Manly Dam catchment which has a total area of about 700 hectares. The Concept Proposal will be one of multiple influences on environmental conditions within the catchment. As noted previously, potential impacts on hydrology and water quality have been assessed in detail for the Stage 1 Project and at a conceptual level for the Concept Proposal (refer Section 16.4 of the Stage 1 EIS). This noted that if left untreated, gross pollutants and increased nutrients/contaminants in drainage runoff associated with the increased extent of impervious surfaces from the Concept Proposal could impact on receiving water quality. As noted in Section 3.10.2, treatment would be provided for gross pollutants but not nutrients, the latter not being expected to have a significant impact on aquatic ecosystems or groundwater-dependent ecosystems.

Further investigation of impacts on aquatic ecosystems and groundwater dependent ecosystems is being undertaken for the Stage 2 Project and will include the Manly Dam catchment. This will include consideration of cumulative impacts from both the Stage 1 Project and the hospital project. The project includes a comprehensive suite of safeguards and management measures, including a water quality treatment strategy, which will assist in mitigating impacts on the Manly Dam catchment. These would be further developed for the Stage 2 Project and reported in the Stage 2 EIS.

3.10.4 Loss of vegetation and habitat
Submission number(s)
20, 27, 33
Issue description

• There would be significant losses of endangered species and habitat.
• The proposed connection of Aquatic Drive and Wakehurst Parkway would cause a significant loss of vegetation and should be abandoned.
• How much vegetation is going to be removed in Naree Road/Frenchs Forest Road West as a result of the works and what is the number of trees to be replanted?

Response

The EIS acknowledges the impact on biodiversity through the loss of vegetation and habitat. Development of the concept design for the Concept Proposal and the Stage 1 Project has sought to avoid and minimise biodiversity impacts as far as practicable.

The EIS documented the potential loss of vegetation associated with the Concept Proposal which included the proposed connection of Wakehurst Parkway with Aquatic Drive. This area of vegetation comprises DFEC and has been accounted for in the calculation of the area of DFEC affected by the Concept Proposal. This connection is being assessed as part of the Stage 2 Project to provide an alternate access point for businesses located between Warringah Road and Aquatic Drive. At present access to these business premises from the west is only available via the intersection of Warringah Road and Allambie Road which is already operating beyond its capacity.

Vegetation in the existing footway along Naree Road/Frenchs Forest Road West would have to be removed including street trees. It is proposed to concrete the entire footway reservation on the southern side of Naree Road and Frenchs Forest Road West while the northern side would have a 1.5 metres wide formed concrete footpath. There is opportunity to landscape the space (0.8 metres) between kerb and gutter and the formed concrete footpath and between the footpath and property boundary (1.2 metres). Details would be finalised during the detailed design stage of the project.

3.10.5 Threatened flora and fauna

Submission number(s)
27, 29, 30, 34, 37

Issue description

• We oppose the eradication of the endangered Duffys Forest Ecological Community due to the risk of local extinction and high likelihood of presence of threatened species.
• An alternative less destructive road design should be prepared and the precautionary principle applied to consider Duffy's Forest EEC and possible threatened plants. Oppose the eradication of an EEC with the risk of local extinction and potential to inhabit threatened species. The proposed clearing of 5.1ha of Duffys Forest will place the local community at risk of extinction.
• DFEC is endangered and an additional 5.1ha of clearing will likely result in the extinction of the whole southern patch.
• The proposal clearing of vegetation is vast and will place the southern proportion of DFEC at risk of extinction.
• The widening of roads would have many direct and indirect cumulative environmental impacts including significant impacts to the Red-crowned Toadlet and Duffys Forest Ecological Community, loss of potential threatened species habitat, and impacts to creeks.
• Some impacts are dismissed too readily and not considered thoroughly, such as impacts to the Red-crowned Toadlet. This species can exist in moist areas away from the main creeks and aquatic habitat, which has been not been properly addressed in the EIS.

• The EIS identified five endangered plant species that are likely to occur in the area to be cleared and an additional 18 that could occur. Plant species are frequently dormant for some years and their existence should not be dismissed because they weren't found during the survey period.

• Of the 23 endangered plant species identified, five are identified as high risk of occurrence and their absence cannot be assumed from the limited field investigations undertaken. The road upgrade plans are treating the native environment like a worthless commodity.

• The Climbing Galaxias fish inhabiting Curl Curl Creek will be placed at risk of extinction if water flows are not contained and water quality degrades.

• There has been no communication between Health Infrastructure and Roads and Maritime about the value of the environment, particularly Duffys Forest Ecological Community.

• If the project is approved, seed collection and soil translocation should be carried out.

Response
A detailed description of the methodology for the biodiversity assessment is provided in Section 2 of the Biodiversity Specialist Report (Appendix F to the EIS). This is consistent with relevant NSW and Commonwealth guidelines, and with accepted industry best practice. The biodiversity assessment methodology and survey design has been carried out to maximise the likelihood of detection of threatened species should they occur in the study area. The assessment has been prepared by experienced, appropriately qualified ecologists in accordance with OEH threatened species survey and assessment guidelines and industry best practice.

Flora
The ecological survey design was developed in accordance with accepted industry practice, including acceptability to OEH and took a risk-based approach for species with a medium to high risk of occurring. The five flora species are easily recognisable when not in flower and a precautionary approach has been followed that assumes potential habitat exists. Assessments of Significance (AoS) were completed for species with a medium to high likelihood of occurring, and include the five species noted. Multiple surveys were carried out over a full range of seasons and the timing of surveys coincided with periods when there was the greatest opportunity to detect these five species.

Additional flora surveys were carried out in ESU 5c and ESU 12 during the EIS exhibition period (October) as this was the earliest appropriate flowering time for the threatened plants that were being targeted. This did not identify any threatened flora within the survey units. Survey results for the ESUs are presented in Appendix 2 of Appendix F of the EIS. An unexpected finds procedure will also be adopted as part of the CEMP to manage any unexpected finds.

The Concept Proposal would remove about five hectares of DFEC. The likelihood of there being an adverse effect on the extent of an ecological community such that its local occurrence is likely to be placed at risk of extinction is one of a number of criteria considered in an AoS. The AoS undertaken for DFEC found that this was likely and that implementation of appropriate offsets would be required. Impacts would be offset through the biodiversity offset strategy prepared for the Concept Proposal and would be refined as part of the Stage 2 assessment. Section 5 of the
Biodiversity Specialist Report contains a comprehensive range of safeguards and mitigation measures to manage impacts on DFEC and other vegetation and habitat.

**Fauna**

The Red-crowned Toadlet has been found within the study area in the upper reaches of the Trefoil Creek and Curl Curl Creek catchments. Section 16.4 of the Stage 1 EIS provides a consideration of operational water quality impacts associated with both the Concept Proposal and the Stage 1 Project. This identified that water quality could be affected by gross pollutants and increased nutrient/contaminant runoff from the increased extent of impervious surfaces. The assessment found the removal of a small amount of foraging habitat for the Stage 1 Project would be unlikely to have a significant impact on the species and that impacts on the upper reaches of Trefoil Creek are actually reduced. However, impacts to the species from the remainder of the Concept Proposal (ie Stage 2) were unable to be fully assessed as the detailed surface and groundwater investigation for the Stage 2 Project had not yet been undertaken. A precautionary approach was applied and it was assumed that changes to surface and groundwater conditions may have a significant impact on this species. This assessment is being revised as part of the Stage 2 Project to incorporate the results of detailed surface and groundwater investigations, and will be documented in the Stage 2 EIS.

A precautionary approach has been applied in the AoS for the Red-crowned Toadlet and it is assumed that a significant impact is likely as a result of impacts from the Concept Proposal (but not the Stage 1 Project). The AoS for this population would be reviewed for the Stage 2 Project. Impacts on the Red-crowned Toadlet would be offset through the biodiversity offset strategy.

The Climbing Galaxiidae, which is not listed as threatened, prefers clear, tumbling waters in the headwaters of streams flowing through forested land. The hydrology assessment for the Concept Proposal identified that water quality in Curl Curl Creek, may change due to an increase in nutrients (Total Nitrogen, Total Phosphorus) by 3-4 per cent. This would be assessed as part of the Stage 2 Project.

Detailed biodiversity and water quality/hydrology assessments are being prepared for the Stage 2 Project that would document potential downstream impacts and propose management measures. Impacts to Curl Curl Creek catchment will be detailed as part of the Stage 2 EIS.

A design objective for the Stage 2 drainage design will be for post-development flows to minimise downstream impacts on hydrology and water quality. The design will include consideration of water quality management infrastructure, notwithstanding there is a diverse range of other activities within the catchment that influence water quality.

Other impacts on fauna relate to a reduction in habitat including reduced connectivity and habitat fragmentation, and the risk of fauna being struck by vehicles. Section 5 of the Biodiversity Specialist Report contains a comprehensive range of safeguards and mitigation measures to manage impacts on fauna. These include measures to facilitate fauna connectivity and to mitigate the risk of road kill.

**Other matters**

There has been regular consultation between Roads and Maritime and Health Infrastructure since mid-2012 via an inter-departmental committee and an interface reference group that were specifically established to facilitate the exchange of information and coordinate activities for the hospital and road projects. This has included consideration of the environmental impacts of the two projects.
Seed collection would be considered but would be subject to the timing of the pre-construction period and availability of safe access. Collection activities would be carried out in accordance with relevant Roads and Maritime guidelines. Soil translocation would be considered and would be subject to the identification of a suitable receiving site(s).

3.10.6 Wildlife connectivity and habitat fragmentation

Submission number(s)
27, 28, 29, 30, 33, 35, 36, 37, 38, 44

Issue description
• The importance of the bushland and wildlife corridors through this area has been underestimated and would be substantially destroyed by the proposal. The impacts to connectivity need to be properly assessed and minimised.
• Road widening on Wakehurst Parkway and Warringah Road would result in the loss of trees and wildlife corridor, which is an important link between Narrabeen Lagoon Catchment and Manly Dam Catchment.
• Concerns that the north-south wildlife corridor will be lost after the roadworks are completed.
• The road widening and slot will prevent the movement of fauna through the wildlife/vegetation corridor. The project must ensure that a reasonable, safe crossing for wildlife is designed.
• Ecological connectivity will be decimated by the destruction of two existing wildlife corridors.
• The regional wildlife corridor assessment is incorrect as it only assesses the increased width of Warringah Road and does not assess the proposed slot as being a physical barrier.
• Connectivity must be included for all species to prevent species becoming extinct in the otherwise isolated patch of vegetation. Roadkill data clearly confirms the movements of large terrestrial animals and the precautionary principle must be applied.
• The combined vegetation clearing and road widening effects of the proposal threaten to have a severe impact on the effectiveness of the Priority 1 north-south wildlife corridor in maintaining a vegetation/wildlife link across the urban landscape. The widening of Warringah Road is likely to prevent all movement of non-flying terrestrial fauna across this section of the road.
• The Biodiversity Assessment Report understates the seriousness of the impact of the proposal on the regional wildlife/vegetation corridor.
• Lack of scientific certainty should not be used as an excuse not to take appropriate steps to counter the potentially harmful consequences of a proposed development. Maintaining landscape connectivity is a central principle of current best practice biodiversity conservation, and is critical for increasing the resilience of reserve networks to potential threats associated with climate change.
• The existing road network may be inhibiting fauna movements but it is not preventing them. The connectivity of the area requires protection.
• The Assessments of Significance for individual threatened species in the Biodiversity Assessment Report fail to recognise that significant fauna habitat fragmentation and isolation is likely to occur as a result of this project. The Biodiversity Assessment Report should have recognised the seriousness of this impact, and the Concept Proposal should have
incorporated effective measures to ensure that a functioning north-south wildlife/vegetation corridor is maintained through the area.

- Options for maintaining and enhancing wildlife connectivity across the Concept Proposal area should be addressed at the Concept Proposal stage not deferred to the Stage 2 EIS.

- The regional north-south wildlife corridor assessment is incorrect as it only assesses the increased width of Warringah Road and does not assess the proposed slot as being a physical barrier. The wildlife corridor along the southern side of Warringah Road will be totally destroyed.

- The regional wildlife corridor assessment is incomplete as it only assesses the increased width of Warringah Road and does not assess the proposed slot as being a physical barrier. It is incorrect to state the Concept Proposal would not affect connectivity significantly because if a spotted tail quoll (recently confirmed in Narrabeen Lagoon) attempted to cross Warringah Road it wouldn't be possible.

- Connectivity should not only target threatened fauna but all species known in both Manly Dam and Narrabeen Lagoon catchments.

- Road kill data clearly confirms the movements of large terrestrial animals and the precautionary principle must be applied.

- A viable framework should be developed ensuring satisfactory design, implementation and upkeep of the network of wildlife corridors.

- The regional wildlife corridor will be destroyed by the slot and road barrier.

- The large terrestrial wildlife will be lost if the project, particularly the slot, is approved. The assessment ignores the physical barriers created by this destructive road design.

- There is a potential that DFEC will be at risk of extinction and two wildlife corridors will be destroyed as a result of the proposed works. There are also no long term mitigation measures for factors such as waterway degradation, weed invasion, habitat destruction and feral animal intrusions.

- The road design should facilitate wildlife movement between bushland areas on the eastern side of Wakehurst Parkway, or provide wildlife crossings of Warringah Road and Frenchs Forest Road.

Response

The issue of wildlife connectivity and habitat fragmentation is discussed in Section 4.2 of the biodiversity specialist report (Appendix F to the EIS) and in Chapter 9 of the EIS. Assessments of Significance are provided in Appendices 4 and 5 of the biodiversity specialist report. Discussion is provided in the context of the existing environment, the Concept Proposal, and the Stage 1 Project.

The Stage 1 Project is not considered to have a material impact on wildlife connectivity. An additional lane would be added to Frenchs Forest Road East at its intersection with Wakehurst Parkway which would represent about a 10 per cent increase in width. There would also be a temporary impact associated with construction work for drainage infrastructure immediately to the north of Frenchs Forest Road East and with the use of the land on the corner of Warringah Road and Wakehurst Parkway. These impacts are not considered to be significant. Accordingly, impacts on fauna connectivity are associated principally with Stage 2 from the increased road width and creation of the slot.
Impacts on wildlife connectivity and habitat fragmentation relate largely to the Stage 2 Project, particularly with regard to the increased width of Warringah Road, and a precautionary approach has been adopted with regard to determining the magnitude of impacts and the mitigation measures. A detailed assessment of impacts along with safeguards and mitigation measures will be provided in the Stage 2 EIS.

The biodiversity assessment acknowledges that the study area is located within a ‘Priority 1 Vegetation Corridor’ identified by Smith and Smith (2005), being the only area still connecting bushland in Oxford Falls to Manly. This corridor is already substantially affected by the existing road network and will be further affected by the proposed Northern Beaches Hospital development. The existing roadside environment is degraded and subject to ongoing edge effects. The Concept Proposal involves expansion of existing roads and subsurface works that would contribute to reduced wildlife connectivity. This was considered in the AoS for threatened fauna and it was concluded that the Concept Proposal is unlikely to:

- Affect connectivity to the extent that any local population of threatened fauna would be at risk of extinction
- Substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

This notwithstanding, fauna connectivity and road kill prevention measures are currently being developed to facilitate safe passage of fauna, particularly terrestrial species, through the study area. Opportunities for improvements have been identified such as culverts, rope crossings and fauna fencing, and has considered both north-south and east-west connectivity. These will be detailed in the Stage 2 EIS.

While Warringah Road may have some functionality as a wildlife corridor, the value of this is likely to be limited given the highly modified landscape, adjacent development and the volume of traffic carried by Warringah Road. The Stage 2 Project would remove vegetation on the southern side of Warringah Road to accommodate the slot for through traffic. The urban design objectives and principles for the Concept Proposal include an objective to ‘reinforce the lush and green character of the area and express the bushland character’. The Stage 2 Project would include development of a detailed landscaping plan which would identify replacement species and planting guides. This would assist in mitigating the loss of existing vegetation along Warringah Road.

The impact of the slot on north-south fauna connectivity is considered only at a high level in the EIS and in relation to the Concept Proposal. The Stage 2 EIS will include a detailed consideration of this issue.

Opportunities to mitigate impacts in relation to wildlife connectivity have been investigated as part of the assessment for the Stage 2 EIS. These fall into the following three general types:

- Crossing structures, which provide alternate means to cross the road
- Movement barriers, which aim to reduce road kill by preventing fauna from entering the road reserve
- Modification of existing conditions which are used to favour fauna attempting to cross the road.

The AoS have been prepared in accordance with the Threatened Species Assessment Guidelines: Assessment of Significance (DECC 2007). The assessments require consideration of a range of criteria that address habitat fragmentation and the potential for a threatened species or ecological community to become extinct. Full copies of the AoS are provided in Appendix 4 to the Biodiversity Specialist Report.
Section 5 of the Biodiversity Specialist Report provides a range of safeguards and management measures to mitigate impacts on wildlife connectivity. These include measures to support maintenance of the north-south habitat corridor and wildlife connectivity. It is noted that this issue relates principally to the Stage 2 Project, being related to the increased width of Warringah Road. The impacts of the Concept Proposal on connectivity are discussed in Section 4.2 of the Biodiversity Specialist Report. This notes that the Concept Proposal is not likely to affect connectivity to the extent that it would result in a significant impact to threatened fauna. This is due to the physical barrier that is already presented by the existing road network. This notwithstanding, options are being investigated to facilitate fauna movement and mitigate potential impacts on connectivity. The approach to developing these options includes identifying target species, proposing measures to facilitate connectivity, including fauna crossings, and proposing suitable locations for these types of measures. The biodiversity specialist report is being revised to address the impacts associated with the Stage 2 Project and would form an appendix to the Stage 2 EIS.

3.11 Hydrology, water quality and flooding

Submission number(s)
20, 27, 28, 33, 38, 44

Issue description
• There is no consideration or outcome regarding flooding on Wakehurst Parkway.
• The impacts on the nearby catchments and creeks, including the associated flora and fauna, are likely to be significant and difficult to control.
• The proposed major excavations for the lengthy underpass would significantly affect the groundwater hydrology of the ridge top areas and drainage in the upper catchments. This needs to be avoided or minimised.
• The increase in road surfaces will have impacts on waterways due to changes in flow regime, vegetation removal and pollutants from cars.
• The plateau along Warringah Road makes it less suitable for tunnels and cuttings. The proposed depth of the underpass would create a physical barrier and intercept groundwater. An overpass should be considered as an alternative to the underpass.
• The road design would interfere with groundwater.
• The Save Manly Dam Catchment Committee oppose the project as the catchment will unnecessarily suffer due to lack of sufficient standards of environmental sustainability and the longer term impact.
• Concerned about the adverse impacts on the environment of increases in impervious surfaces causing nutrient-rich surface runoff, increased flow rate downstream and siltation of the catchment.

Response
Section 16.4 of the EIS outlined the operation water quality impacts of the Concept Proposal and Stage 1 Project. It found that if left untreated there would be an increase in pollutant loads in the downstream receiving waterways. With the implementation of three in-line pollution control devices at each of the three drainage lines in Stage 1, there would be an improvement in pollutant loads entering waterways. The residual impacts to water quality following treatment include:
• Increases in total nutrients of 5-10 per cent for TP and 4-7 per cent for TN in Middle Creek.
• TP and TN will be reduced by 6-16 per cent and 6-17 per cent respectively in the upper reaches of Trefoil Creek but increase by 3-4 per cent further downstream.

The increases in nutrients to these catchments are not expected to have a significant impact on aquatic ecosystems or groundwater-dependent ecosystems. No further mitigation measures are required.

The Stage 1 construction work would not result in flooding to Wakehurst Parkway. Section 16.2 of the EIS outlines that the section of Wakehurst Parkway which runs to the north of the Stage 1 Project is subject to flooding during relatively frequent storm events due to inlet capacity constraints on two drainage structures that cross the road about 40 metres and 280 metres north of Frenchs Forest Road West. A detailed water quality and hydrological impact assessment is currently being prepared for Stage 2 and would be available for comment as part of the Stage 2 EIS. Both Stage 1 and Stage 2 projects are designed to minimise increases in flows downstream. A separate but complementary project is being investigated in parallel with the Concept Proposal which would reduce the frequency of closure of Wakehurst Parkway during or after major storm events.

The hydrology, water quality and flooding assessment prepared for the Concept Proposal and Stage 1 EIS identified that most potential surface and groundwater impacts are expected to relate to the Stage 2 Project, particularly as a result of construction of the underpass. Investigations and assessments for the Stage 2 Project are being finalised. Feasible and reasonable options are being considered as part of Stage 2 to address groundwater impacts. The Stage 2 EIS will be placed on public exhibition later in the year. The assessments have also considered the impacts on groundwater dependent ecosystems.

Surface water quantity and quality impacts from the Concept Proposal and Stage 1 were assessed in Chapter 16 of the EIS. The EIS noted that the Concept Proposal would result in an increase in the volume of stormwater runoff due to the increased area of road pavement. It is anticipated that this would also result in an increase in pollutant loads which may influence receiving water quality. The increased area of road pavement could also affect groundwater recharge and potentially indirectly impact soak and aquatic habitats for frogs and other groundwater-dependent species within or outside the Concept Proposal footprint. These impacts would be assessed in detail in the Stage 2 EIS.

The Stage 1 Project would involve some widening of Frenchs Forest Road which may lead to a minor increase in stormwater runoff volumes, however, this is not anticipated to have a major impact on receiving waterways. Similarly, while the Stage 1 Project has the potential to impact on water quality from transported pollutants, the incremental impact on the condition of receiving waterways would not be expected to be significant.

The design of Stage 2 is being developed to ensure there is no or minimal change in downstream flows. A surface water management strategy would be developed for each stage of the Concept Proposal and the subsequent drainage design would be finalised during the detailed design of the Stage 1 and Stage 2 Projects. The surface water strategy would aim to mitigate the impacts of any anticipated increase in pollutant loads and also address requirements for spill containment.

Impacts on groundwater from the underpass would be addressed in more detail in the Stage 2 EIS. The Options Report details the reasoning as to why an overpass option was not pursued for the Concept Proposal. In particular, traffic modelling indicated that the overpass would enable only limited access to the hospital from Warringah Road, would restrict access at Hilmer Street and would have an increased visual impact and less potential to mitigate traffic noise compared to
the underpass option. The Options Report is available as a PDF to download from the Roads and Maritime website5.

The Concept Proposal includes a comprehensive suite of safeguards and management measures to reduce impacts on the Manly Dam catchment. These would be further developed for the Stage 2 Project and reported in the Stage 2 EIS.

3.12 Landscape character and visual impact

Submission number(s)
25, 26, 28, 35

Issue description
- Planting of vegetation along the roadside of Frenchs Forest Road West needs to be included to soften the visual impact of the upgrade and maintain the character of the area.
- Request the new Northern Beaches Hospital and road works enhance the beautiful Frenchs Forest area with good design and style. Any replacement of trees should honour their loss.
- Object to replacing the elegant footbridge across Warringah Road. Do not replace with the type that is designed to carry large advertisements. Any new structure should be aesthetically pleasing and should not carry advertisements.
- The excessive increase in road width and central cutting will create a car-dominated environment. The road expansion will remove a landscaped buffer on southern side of Warringah Road that is currently used for walking and cycling. The proposed shared path would be adjacent to the road with no landscape setback.
- The upgrade is not designed to support the developed character of the area.

Response
A landscape character and visual impact assessment was prepared for the Concept Proposal and Stage 1 Project. West of the intersection with Wakehurst Parkway, Frenchs Forest Road West is predominantly fronted by single-lot, one and two storey residential development on the northern verge, with a variety of land uses on the southern verge. Land uses on the southern side consist of one and two storey residential development, the Northern Beaches Hospital site (dense bushland at the time of the assessment, The Forest High School (established 1961) and Frenchs Forest Police Station. A strong vegetative character underpins this section of Frenchs Forest Road. Road verges would be planted wherever possible, particularly near the hospital and along Frenchs Forest Road West. There are limitations to what can be planted as road widening would take part of the existing footpath reservation to avoid/minimise property acquisition. The EIS acknowledges the need for vegetation along Frenchs Forest Road/Naree Road and provisions for street plantings are being considered. There are some opportunities on the northern side of the road but very limited opportunities on the southern side due to the wider footpath that has been provided at Warringah Council’s request. Roads and Maritime would consult further with Council to assess whether there is an opportunity for a lesser width that would accommodate street plantings.

5  www.rms.gov.nsw.au/roadprojects and search ‘Northern Beaches Hospital’
One of the Concept Proposal objectives is to optimise the design to provide an urban design and landscape outcome that complements the surrounding environs. An urban design framework has been prepared to provide guidance for the Concept Proposal in context with the development of the Northern Beaches Hospital precinct. The urban design objectives and principles for the Concept Proposal are detailed in Section 5.1.2 of the Stage 1 EIS and include an objective to ‘reinforce the lush and green character of the area and express the bushland character’. Where possible, landscape strategies will involve the establishment of mature vegetation and canopy trees. A detailed landscaping plan is being prepared for the Stage 1 Project to identify replacement species and planting guides, and would include DFEC species.

The existing pedestrian bridge across Warringah Road near Forest Way would be replaced with a new upgraded shared path bridge in the same location. There is no proposal for commercial advertisements to be placed on the new bridge. The existing bridge would remain in place while the new bridge is built alongside to ensure pedestrians always have a grade separated facility at this location. This would be assessed as part of the Stage 2 Project.

As stated in the Stage 1 EIS and in Section 3.3.1 of this report, the Concept Proposal has evolved to address capacity constraints in the traffic network and to facilitate access to the Northern Beaches Hospital. The Options Report provides a detailed account of investigations into options to reduce the project width along Warringah Road. The report confirmed that the preferred option would best meet the project objectives.

The landscape design for the Concept Proposal has sought to minimise visual and amenity impacts where possible, and to integrate the shared paths into the landscape addressing amenity related issues within the design constraints. Further opportunities to mitigate visual amenity impacts would be considered as part of the Stage 2 assessment.

Section 5.1 of the Stage 1 EIS notes that the aim of the urban design is to ensure that the Concept Proposal is physically and visually integrated with its surrounding environment. The Stage 1 works are complementary to future needs including that of the new hospital, of the immediate precinct and in particular to potential future land use changes the Hospital Precinct Structure Plan may identify for the precinct.

### 3.13 Socio-economic, land use and property

**Submission number(s)**
28, 34, 35

**Issue description**
- The extensive road works would have adverse amenity impacts including the loss of vegetated buffer south of Warringah Road.
- The loss of trees will reduce the aesthetic amenity particularly for pedestrians and cyclists.
- This infrastructure project will not be healthy for the residents, society, future generations and nature. Good air quality, quiet surroundings and mental well-being from natural flora and fauna surroundings will be lost.
- The proposed works will destroy the locality and the identity as a family-oriented community.
- The proposed shared paths would be adjacent to busy roads with higher levels of air pollution and traffic noise which would be stressful and unpleasant.
• Residents and small businesses will be forced to leave their homes and premises due to a compromised quality of living or acquisition.

Response

The EIS has identified a range of amenity impacts that may arise as a result of the Concept Proposal, including loss of vegetation which provides screening to properties and businesses. The design includes improved provisions for pedestrians and cyclists, providing safe crossing points and widened pathways. Development of the design has been guided by urban design principles which have sought to identify and manage amenity impacts where possible through the design process. Where receivers are affected by road traffic noise in exceedance of the noise criteria they would be eligible for treatment where reasonable and feasible. The Stage 2 EIS will detail the proposed location of the pedestrian and cyclist infrastructure. The Stage 2 EIS will also describe the road design and landscaping features along Warringah Road.

The Concept Proposal, specifically the Stage 2 Project, would result in the westbound surface traffic lanes moving to the south of their current location to accommodate the through traffic lanes in the slot. This would bring traffic closer to the residences in Bantry Bay Road, Hilmer Street, and Karingal Crescent. The widening of Warringah Road on its southern side would also require the removal of existing vegetation. The Concept Proposal and Stage 1 EIS acknowledges that this would affect local amenity such as through increased traffic noise and the altered landscape from removal of vegetation. A range of mitigation measures have been identified to address reduced amenity. Noise mitigation in the form of acoustic treatment of existing individual dwellings would be considered, where feasible and reasonable at receivers that exceed the Road Noise Policy criteria. The Concept Proposal and Stage 1 EIS acknowledges the need to compensate for the removal of vegetation along Warringah Road and the detailed landscaping plans will address this. The Stage 2 EIS will detail the road and shared user path design and the proposed landscaping features along Warringah Road.

Section 3 of the EIS sets out the need for the Concept Proposal. As noted, it comprises road upgrades to enhance connectivity of the existing road network surrounding the proposed Northern Beaches Hospital at Frenchs Forest, within the Warringah LGA on Sydney’s Northern Beaches. The Stage 1 Project involves the provision of essential road works to enhance connectivity to the Northern Beaches Hospital. Roads and Maritime acknowledges there would be impacts associated with the project, and development of the proposal has sought to mitigate impacts as far as practicable. Further specific details on mitigation and management of impacts related to the Stage 2 work will be provided in the Stage 2 EIS.

The impacts on community cohesion are discussed in Section 10 of the EIS which acknowledges that the Concept Proposal would result in a change in community cohesion. However, the Concept Proposal would provide effective connectivity to and around the hospital when it opens in 2018. It would also improve accessibility, connectivity and safety for road users, pedestrians and cyclists at other locations across the study area.

The routes of the shared paths have been developed in consultation with Warringah Council and accord with Council’s Bike Plan. While there would be an increase in vehicle numbers using the existing road network, the improvement in traffic flow would result in fewer idling vehicles and better dispersion of emissions providing improved local air quality. The separation of through traffic (in the underpass) from local traffic (on surface roads) is also anticipated to improve local amenity including for users of the shared paths.

The Concept Proposal and Stage 1 EIS acknowledge that there would be some unavoidable impacts on a number of residential and business properties, and in particular the businesses on
the southern side of Warringah Road at Bantry Bay Road (the latter associated with the Stage 2 Project). Acquisition of properties required for the project would be undertaken in accordance with the Land Acquisition (Just Terms Compensation) Act 1991 as indicated in Section 10.5 of the EIS. This section also identifies a range of other measures to mitigate impacts on amenity. Further detail on mitigation measures for the Stage 2 Project would be detailed in the Stage 2 EIS.

The potential acquisition of businesses at Bantry Bay Road is likely to impact the services and retail choice available to the local community. The loss of local shopping areas could reduce the convenience for the surrounding community of having nearby shops. The significance of these impacts on the local community depends on whether the local retail offering is replaced, to what extent it is replaced, when it is replaced and where it is replaced. A detailed assessment of the socio-economic impacts to Bantry Bay shops would be presented in the Stage 2 EIS.

### 3.14 Air quality

**Submission number(s)**

28

**Issue description**

- The increased road capacities will generate an increase in traffic which will cause an increase in air pollution.

- Adjacent high rise buildings, such as the hospital, would affect air flow and potentially restrict the dispersal of air pollutants. Pedestrians and cyclists will be exposed to the highest level of air pollution.

**Response**

The Concept Proposal is needed to accommodate the existing and projected increase in traffic from natural growth; Northern Beaches Hospital and associated development; and nominal changes to land use that may result from future adoption of Warringah Council’s Hospital Precinct Structure Plan. The increase in traffic has been accounted for in the air quality impact assessment documented in the Concept Proposal and Stage 1 EIS. While there would be an increase in vehicle numbers using the existing road network and vehicles would travel closer to sensitive receivers, the improvement in traffic flow would result in fewer idling vehicles and better dispersion of emissions. Detailed air quality modelling would be carried out for the Stage 2 project and would account for the increase in traffic from the hospital and other influences such as land use change, traffic growth, etc.

### 3.15 Cumulative impacts and interactions

**Submission number(s)**

13, 24

**Issue description**

- Interest was expressed as to how the Department of Planning and Environment will recommend approval when the cumulative impacts of the proposal on the surrounding area cannot be adequately addressed.
Has the impact of the closure of Glenrose Shopping Centre for major redevelopment been considered in the cumulative traffic and transport assessment?

Response

The cumulative impacts of the Concept Proposal have been considered in Section 19 of the EIS. There would be further planning work carried out and continued collaboration with Health Infrastructure, The Forest High School and Warringah Council as the project moves forward towards delivery to make sure the impacts of major building and engineering works taking place at the same time would be appropriately managed. The wider community would be consulted about the strategy for delivery of these key infrastructure projects for the intended opening of the hospital in 2018.

Following submission of the Submissions Report/Preferred Infrastructure Report to the Department of Planning and Environment, the Department will prepare its own assessment report that will form the basis for the determination of the Concept Proposal and Stage 1 Project, and any conditions should approval of the project be recommended. As part of this process, the Department would consider all impacts, both individually and collectively, associated with the both the Stage 1 Project and the Concept Proposal. It is anticipated that where there may be uncertainty with regard to a specific impact or impacts, the Department would adopt a precautionary position. It should also be noted that the Stage 2 EIS will provide a detailed examination of the collective impacts of Stages 1 and 2, and other developments, particularly the Northern Beaches Hospital project.

The redevelopment of the Glenrose Shopping Centre was not specifically considered in the cumulative impact assessment. The Statement of Environmental Effects prepared by McKenzie Group (2013) for the proposed redevelopment noted that traffic generation would be intensified to a minor degree from the existing operation on the site and that Glen Street and the surrounding road network would not be adversely impacted. It is unlikely that this development would have a material effect on the Concept Proposal.
4 Response to agency submissions

4.1 Respondents

In addition to the community submissions addressed in Chapter 3, one submission was also received from Warringah Council, along with a number of government agencies.

Five government agencies (or advisory bodies) made submissions on the EIS, some of which included recommendations for Conditions of Approval. Submissions were received from the following agencies:

- Department of Education and Communities (DEC)
- Environment Protection Authority (EPA)
- Office of Environment and Heritage (OEH)
- Department of Primary Industries Office of Water (NOW)
- Health Infrastructure (HI).

4.2 Overview of agency issues raised

Responses to government agencies and Warringah Council have been provided in tabular format addressing comments raised by each. Issues raised by the government agencies generally relate to their respective statutory responsibilities as follows:

- Department of Education and Communities – operation of The Forest High School
- EPA – management of noise, vibration, water quality and air quality impacts during construction and operation
- OEH – characterisation, assessment and mitigation of impacts on biodiversity (particularly threatened species and endangered ecological communities), and on historic and Aboriginal heritage
- NSW Office of Water – management and mitigation of impacts on surface water resources and groundwater, including water quality.

Health Infrastructure’s submission did not raise any specific issues but noted the value of the close consultation between itself and Roads and Maritime, and committed to continuing to work with Roads and Maritime in coordinating delivery of the hospital and road infrastructure projects.

Warringah Council’s submission covers a wide range of issues. A large number relate to traffic and transport including the traffic modelling, pedestrian and cyclist connectivity, public transport, and parking. Other issues relate to impacts on Council infrastructure, stormwater management, biodiversity, and processes to facilitate appropriate consideration of the proposal in assessing development applications that may be affected by the proposal.

Table 4.1 presents the issues raised by Warringah Council and government agencies and provides a response to each. As noted above, responses to community comments are provided in Chapter 3.
### Table 4.1 Government agency issues and responses

<table>
<thead>
<tr>
<th>Agency submission</th>
<th>Roads and Maritime response</th>
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| **Traffic and transport**                                                        | A traffic and transport assessment (Appendix D to the EIS) was prepared that examined both the Concept Proposal (at a conceptual level) and the Stage 1 Project (detailed assessment). Design development has been carried out in accordance with urban design principles and objectives developed specifically for the project. Roads and Maritime has investigated changes to school access and staff parking aimed at providing a suitable and safe access within an appropriately designed setting, in line with the existing landscape character of the school, and the project’s urban design principles and objectives. This has been undertaken in consultation with the school and further information is provided in Section 2 of this report. Development of the Concept Design for Stage 1 has considered safety issues relating to access to the school, and incorporates various features that facilitate safe separation of transport modes. These include:  
  • Provision of signalised pedestrian crossings at the main entrance to the hospital at Gladys Avenue (which can be accessed by students, staff and visitors to the school)  
  • Provision of a signalised pedestrian crossing on Frenchs Forest Road West in the vicinity of Bluegum Crescent (east) replacing a raised pedestrian crossing  
  • A 3.5m wide concrete footpath along the southern side of Frenchs Forest Road West/Naree Road between Forest Way and Wakehurst Parkway  
  • Provision of additional staff parking spaces within the school. Roads and Maritime would continue to consult with the Department, The Forest High School and other stakeholders during detailed design to ensure appropriate consideration of all relevant issues relating to |
<table>
<thead>
<tr>
<th>Agency submission</th>
<th>Roads and Maritime response</th>
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<tbody>
<tr>
<td><strong>Noise impacts</strong></td>
<td>safe access to the school.</td>
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<tr>
<td>2</td>
<td>The noise assessment for the Concept Proposal and Stage 1 Project (Appendix E to the EIS) was carried out in accordance with relevant NSW guidelines. This identified that parts of the school would be affected by certain construction activities with the main corridor works and car park works identified as the construction scenarios of greatest noise impact, resulting in exceedances of the highly noise affected level (75 dBA). Section 8.5.2 of the EIS notes that there would be operational road noise impacts at three locations within the school that would exceed assessment criteria, and that the affected buildings would be eligible for consideration of noise mitigation. Where required, design of treatments to buildings would include appropriate technical input by an acoustic specialist. Operational noise impacts associated with both stages of the Project would be assessed and presented in the Stage 2 EIS.</td>
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<thead>
<tr>
<th>Consultation</th>
<th>Roads and Maritime would continue to include The Forest High School Working Group on consultation activities related to managing project impacts that affect the school (refer also to Sections 6.5.2 and 6.5.3 in the Stage 1 EIS).</th>
</tr>
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<td>3</td>
<td>It is noted that the Forest High School Working Group has been a successful forum to identify and appropriately manage construction and operational issues in regard to the Northern Beaches Hospital and associated road works. It is recommended that this forum continue during the course of road and hospital works. The continuation of the Forest High School Working Group with both the Roads and Maritime and Health Infrastructure NSW (with Healthscope) will be important to effectively manage: • Noisy construction works • Dust emissions • Temporary access arrangements • Any short term affects to utilities</td>
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<td>Agency submission</td>
<td>Roads and Maritime response</td>
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<tr>
<td>• Longer term operational issue</td>
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<tr>
<td>• Implementation procedures and timeframes for new transport</td>
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<tr>
<td>infrastructure (eg road corridor widening, bus bays, parking,</td>
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<td>intersections, pedestrian lights, pedestrian pathways etc.), and</td>
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<tr>
<td>• Ongoing community consultation and engagement</td>
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<th>Environment Protection Authority</th>
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<tr>
<td><strong>Air quality</strong></td>
</tr>
<tr>
<td><strong>1</strong> Off road diesel emissions</td>
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<tr>
<td>The environmental impacts associated with off road diesel equipment can be a major source of</td>
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<td>fine particles. The EPA recommends that the proponent assess the environmental impacts</td>
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<td>associated with heavy vehicles including off road diesel equipment and plant used in the</td>
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<td>construction of the project. This should include but is not limited to:</td>
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<tr>
<td>• Compliance with relevant and current emission standards as described in Australian design</td>
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<tr>
<td>rules for heavy duty engines and vehicles.</td>
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<tr>
<td>• Strategies for minimising air emissions from off road diesel equipment including but not</td>
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<tr>
<td>limited to graders, bulldozers, loaders etc.</td>
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<tr>
<td>• Confirmation that all off road diesel equipment will meet best available diesel emissions</td>
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<tr>
<td>standards or be fitted with an appropriate diesel exhaust treatment device where possible.</td>
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<td>The EPA recommends this information is sought through the conditions of approval</td>
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</table>

Air emission standards for mobile non-road diesel plant and equipment are identified in the *NSW Government Resource Efficiency Policy* (OEH, 2014d). These will be integrated into procurement activities for the project. In accordance with the Policy, the successful contractor will be required to report on the use and performance of off-road diesel plant and equipment.

It is noted that existing Australian design rules for heavy duty engines and vehicles relate to on road vehicles and currently there are no Australian Standards for emissions from off-road diesel plant and equipment.

Section 14.3.1 of the EIS acknowledges that emissions from construction plant and equipment including heavy vehicles and off-road equipment may impact air quality during construction. Emissions from diesel construction plant would be managed through an Air Quality Management Plan that would form part of the CEMP.

| **2** Air Quality Management Plan                                                                 |
| Recommended Condition of Approval:                                                              |
| 1. The proponent must develop and implement an Air Quality Management Plan prior to the        |
| commencement of project operations. As a minimum, the Air Quality Management Plan should include:|
| • Identification of sources (including stockpiles and open work areas)                          |

As stated in Section 14.5 of the EIS, an Air Quality Management Plan would be prepared and implemented through the CEMP and would generally encompass the matters noted. The Plan would include air quality monitoring (dust emissions) during construction.
<table>
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<th>Agency submission</th>
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| **dust emissions** during construction) and quantification of airborne pollutants;  
  • Key monitoring indicator(s);  
  • Monitoring method(s);  
  • Location, frequency and duration of monitoring;  
  • Mitigation measures to minimise impacts;  
  • Record keeping;  
  • Response mechanisms; and  
  • Compliance reporting | This would be identified as a management objective for the Air Quality Management Plan. Safeguards and management measures would include, but not be limited to:  
  • Minimising areas of exposed surfaces through construction site planning and programming.  
  • Implementation of control measures to minimise dust emissions from stockpile sites and other areas.  
  • Covering of truck loads when transporting materials to and from the site.  
  • Avoiding/modifying construction activities during high wind periods.  
  • Progressive rehabilitation of completed sections of works  
  • Regular review of the efficacy of dust suppression measures and revision of these as required. |
| 3  
  2. The proponent must ensure that construction work is carried on by such practicable means as may be necessary to minimise dust emissions on the premises, and prevent dust emissions from the premises. | |
| **Noise and vibration** | |
| 4  
  The EPA has reviewed the Noise and Vibration Assessment prepared by SLR (610. 13422-R1) dated 9 October 2014 and provides the following comments:  
  The assessment contains discussion in Section 6 regarding increases in traffic volumes and noise levels along Frenchs Forest Road in Stage 1 of the works as vehicles use this as an alternative route to Warringah Road. Some discussion should also be provided in the report on the expected likely duration of this increased traffic noise exposure, prior to | The noise assessment for the Concept Proposal and Stage 1 Project (Appendix E to the EIS) was carried out in accordance with relevant NSW guidelines. This identified that there would be exceedances of the construction noise management objective and the *Road Noise Policy* base criteria.  
  The Stage 2 works are planned for completion in 2018 by the time of hospital opening. Section 7.4.2 of the EIS notes that there is potential for increased traffic on Frenchs Forest Road following completion of |
Agency submission

the completion of Stage 2 works.

Roads and Maritime response

Stage 1 work due to the increased capacity but that some through traffic may switch back to Warringah Road following completion of the Stage 2 work which are also planned for completion by the time of hospital opening.

As such, while the duration of the period where Frenchs Forest Road could experience increased traffic volumes is not precisely known, it is unlikely to be an extended period. The time delay between completion of Stage 1 and Stage 2 works could be between 6 and 12 months, subject to timing of approvals of both stages.

The Stage 2 EIS would include consideration of the cumulative traffic noise impacts for Stage 1 and Stage 2 to review the predicted changes in traffic noise on Frenchs Forest Road following completion of the Stage 2 Project.

5

Regarding residual architectural property treatments in Section 8.7 of the assessment, it is stated that for multi-level buildings, Roads and Maritime policy is only to consider architectural treatment options at the ground and first floor levels, however the EPA is unable to find any reference to this policy in RTA Environmental Noise Management Manual. The Assessment should include a reference to specific Roads and Maritime documentation outlining this policy position.

Roads and Maritime only considers noise levels at the ground and first floor for noise barrier design. Otherwise higher levels will unreasonably skew barrier design.

For a residential building comprising only of a sole occupancy, architectural treatment at all floors may be considered. For multi-unit residential buildings, Roads and Maritime predicts noise levels at all levels. However, due to common design limitations in existing multi-level residential apartment buildings it is not generally considered reasonable and feasible to retrofit items such as supplementary glazing, introduce forced air ventilation or alter the façade.

All floors of a residential building are assessed during modelling. Roads and Maritime considers noise mitigation where reasonable and feasible. A further feasible and reasonable review of architectural treatments at multi storey apartments would be completed during the detailed design.

6

Recommendations for inclusion in Conditions of Approval:

1. DP&E should include a condition requiring respite periods or alternative accommodation for receivers expected to be affected by construction noise above the ‘highly noise affected’ level.

Roads and Maritime notes that the provision of respite periods or similar mitigation is a usual requirement of construction noise and vibration management plans for major transport infrastructure projects. This and other relevant mitigation measures would be addressed during preparation of the Construction Noise and Vibration Management Plan.
<table>
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<th>Agency submission</th>
<th>Roads and Maritime response</th>
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<tr>
<td><strong>7</strong> 2. DP&amp;E should include a condition requiring Roads and Maritime to consider architectural treatment of all floors of a residential building, including multi-unit buildings, once the need for architectural treatment of that building has been established from modelling the road traffic noise impact on the most affected floors.</td>
<td>Please refer to response provided for EPA Issue 5.</td>
</tr>
</tbody>
</table>

### Surface water and groundwater quality

| **8** The EIS provides limited information regarding the environmental management measures relating to surface water and groundwater for the construction phase of the project. Given the sensitivity of the receiving environment the EPA recommends that best practice environmental management techniques are implemented to ensure the protection of the receiving environment. The EPA recommends that this is addressed through the conditions of approval. Recommended Conditions of Approval: 1. The Proponent must not cause or permit any waters to be polluted, as defined under Section 120 of the Protection of the Environment Operations Act 1997. | A flooding and hydrology investigation (Appendix M to the EIS) was prepared for the Concept Proposal and Stage 1 Project by a suitably qualified specialist and in accordance with industry best practice. This identified potential impacts in relation to:  
- Construction activities/works that temporarily alter existing surface drainage arrangements and surface water quality.  
- Groundwater, such as localised drawdown, changes to recharge patterns, and possible impacts on groundwater-dependent ecosystems.  
- Changes to the surface hydrological regime through alteration of existing drainage patterns.  
- Changes to water quality, principally through the increase of impervious area and the associated increased potential for build-up of contaminants from vehicles.  
A Surface and Groundwater Water Monitoring Program has commenced and is aimed at addressing a potential Condition of Approval. Baseline groundwater and surface water monitoring commenced in November and December 2014 and aims to establish an adequate baseline data set. The Program would be submitted to the Secretary for approval prior to the commencement of construction of the project or as otherwise agreed by the Secretary. A copy of the Program would be submitted to OEH, NOW, EPA, DPI (Fishing and Aquaculture) prior to its implementation.  
**Construction:**  
Construction-related impacts would be managed through preparation of a Soil and Water Management Plan for each stage of the Concept Proposal. The Plans would be prepared by a suitably qualified and... |
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<th>Agency submission</th>
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| **2.** Prior to works commencing the Proponent must develop a comprehensive Water Management Plan (WMP). The WMP must include but not be limited to:  
a) address construction and operation monitoring, management and response arrangements  
b) identification and estimation of the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point for the construction and operation phases  
c) an assessment of the potential impact of discharges on receiving surface waters and human health  
d) the type, location and size of the proposed water sensitive urban design systems  
e) a Surface Water Quality Monitoring Program (SWQMP)  
f) a Soil and Water Management Plan (SWMP) to cover soil erosion and sediment control measures for any areas that may be disturbed | experienced specialist, and would identify all applicable statutory requirements relating to managing the risk of pollution of waters.  
**Operation:**  
Design development has considered opportunities to avoid or mitigate opportunities on soil and water resources. For example, the drainage design for the Stage 1 Project provides for three in-line pollutant control devices for all three drainage lines and for scour protection at drainage outlets.  

As discussed in the response provided for EPA Issue 8, as Surface and Groundwater Monitoring Plan has commenced to establish baseline data.  
Monitoring would continue during construction and, where required, during operation to identify any potential impacts. As discussed, a Soil and Water Management Plan would also be prepared. |
| **3.** The assessment of the potential impact of discharges on receiving waters must include but not be limited to:  
a) detailed assessment of baseline data on current water quality in any receiving waters that could be affected by the project  
b) a statement of the ambient Water Quality Objectives (WQOs) and the environmental values for the receiving water relevant to the proposal  
c) a statement of the indicators and associated trigger values or criteria for the identified environmental values  
d) assessment of the significance of any identified impacts on surface waters including consideration of the relevant ambient water quality | Assessment of the impacts of discharges on receiving waters has been carried out as part of the EIS (for both the Concept Proposal and the Stage 1 Project) and is documented in Appendix M to the EIS and Section 16 of the EIS. Appendix M outlines surface water management strategies for both construction and operation. As noted in the response to EPA Issue 8, Soil and Water Management Plans would be prepared and implemented for the Stage 1 and Stage 2 works.  
The ultimate operational water quality treatment strategy for the Concept Proposal (covering both stages) would be developed/confirmed during the respective detailed design stages and would |
### Agency submission

Outcomes. Demonstration of how the proposal will be designed and operated to:
- a) protect the WQOs for receiving waters where they are currently being achieved; and
- b) contribute towards achievement of the WQOs over time where they are currently not being achieved.
- e) use of the appropriate level of protection for each contaminant (for example, contaminants that bio-accumulate should have a 99% protection level).

### Roads and Maritime response

address the matters noted. Further information would be provided in the Stage 2 EIS.

| 11 | The SWQMP must be prepared by a suitably qualified and experienced person and include but not be limited to:
|    | a) a statement of the ambient Water Quality objectives and environmental values for the receiving waters relevant to the proposal
|    | b) a statement of the indicators and associated trigger values or criteria for the identified environmental values
|    | c) trigger values for action and associated actions or mitigation measures if trigger values are exceeded
|    | d) a water quality monitoring program with relevant analytes and with a sampling distribution and frequency appropriate to the nature and extent of potential pollution and activities being conducted onsite
|    | e) location of discharge points and monitoring locations

Preparation of the Soil and Water Management Plans referred to in the response to EPA Issue 8 would consider and address the matters noted.

| 12 | The SWP must be prepared by a suitably qualified and experienced person and include but not be limited to:
|    | a) soil erosion and sediment control measures that comply with the practices and principles contained in Managing Urban Stormwater - Soils and Construction, Volume 1 (the Blue Book)
|    | b) soil erosion and sediment control measures appropriate for contaminated land that ensure stormwater from contaminated areas are not permitted to contaminate clean areas or discharge to waters
|    | c) design calculations and sizing for all clean water diversion bunds and sediment basin(s) on site
|    | d) plan drawings showing the locations for soil erosion and sediment

Please refer to response provided for EPA Issue 8.
<table>
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<td>control practices for the site</td>
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<tr>
<td>e) written text detailing the installation, monitoring and maintenance requirements for all of the soil erosion and sediment control practices</td>
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<tr>
<td>f) drawings of any engineering structures such as sediment basin(s) and clean water division structures, including design standards and management regimes to return the system to design capacity following rainfall events</td>
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3. **Office of Environment and Heritage**

**Biodiversity**

1. The OEH previously commented on the adequacy of the Biodiversity Assessment Report (our ref DOC14/206970-06 dated 29 September 2014). The previous comments on the adequacy of the environmental assessment are still relevant as no changes have been made to the Assessments of Significance.

OEH therefore reiterate the following points:
- Section 2.4 of Appendix F Limitations still states that further flora surveys are required in Ecological Sampling Units 5c and 12. This has not been updated to advise if further surveys were undertaken, and if not, when they will be and how the results will be considered given the EIS is now on exhibition.

A biodiversity investigation (Appendix F to the EIS) was prepared for the Concept Proposal and Stage 1 Project by a suitably qualified specialist and in accordance with industry best practice. The biodiversity report included a number of limitations as follows:
- The timing of the August 2014 survey in ESU 5c was not suitable for detection of some threatened orchids that could occur at the location. This ESU was surveyed in response to a revision of the drainage design to avoid impacts on Red-crowned Toad habitat and had not been previously surveyed (ie at times more suited to detection of the threatened orchid species).
- ESU 12 was added to the study area early in 2014 as one of the design options included part of this site. This was only surveyed during April 2014 for four consecutive days/nights, as compared to all other ESUs that were surveyed over three seasons during 2013. However, this design option has been discarded and the Concept Proposal will now avoid this area.
- Flora surveys within ESUs focussed on collection of plot and transect data. Other species may be present in low abundances within the study area that were not located within surveyed plots and transects and that were not the target species for threatened flora searches.
- No reference sites for cryptic species or those that flower sporadically were surveyed as part of the project.
### Agency submission

#### 2

The Assessments of Significance (AoS) for potentially occurring species argue that the species of interest have not been recorded within the area, and therefore will not be placed at risk of extinction as a result of the proposal. This is not logical. These assessments should have been carried out with the assumption that they do occur in the area but were not picked up in surveys.

### Roads and Maritime response

- Vegetation in the north-western corner of the proposed construction compound site was ground truthed as low condition DFEC, however no detailed plot survey was carried out as no vegetation clearing would occur within the compound site.

- Fauna surveys were targeted towards specific species, so a lack of observational data for some species identified as having potential habitat in the study area through desktop assessment should not be taken as necessarily indicating that a species is absent from the site. Habitat assessment was undertaken in the study area to address this limitation.

- Multiple surveys were carried out seasonally over the course of a year for this project. Ideally comprehensive surveys would include multiple surveys over a period of a number of years to enable a more complete assessment of species present.

Additional flora surveys were carried out in ESU 5c and ESU 12. These were carried out during the EIS exhibition period (October) as this was the earliest appropriate flowering time for the threatened plants that were being targeted. No threatened plants were found within the study area. Survey results for ESU 12 will be included in the Stage 2 EIS. An unexpected finds procedure will also be adopted as part of the CEMP to manage any unexpected finds.

- The first question of the AoS involves consideration of impacts on the life cycle of a threatened species, population or ecological community. The life cycle of a plant includes germination, growth to maturity, flowering, pollination, fruiting, seeding and eventual death. If no individuals are present then they do not go through the life cycle. No individuals were detected in the study area during seasonal targeted surveys that were carried out for over a year in accordance with OEH survey and assessment guidelines.

Other than one probably inaccurate *Callistemon linearifolius* (which has been specifically explained in the AoS and its likelihood of occurrence was discussed with both OEH and Warringah Council environment staff) there are no other historical records of threatened plants in the construction impact area and therefore it is considered reasonable to assume there is no soil seed bank lying dormant within the study area.
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<td>OEH notes that Section 4.2 of Appendix F states that 'options to facilitate fauna connectivity would be considered in consultation with OEH and Warringah Council as to whether they are beneficial or feasible'. However, OEH does not consider that there is enough data provided in the EIS to judge whether such measures will be beneficial or feasible. More data is required on the fauna species that are currently crossing the subject roads, and the probable frequency of such events.</td>
<td>Roads and Maritime has taken a risk-based approach for species with a medium to high risk of occurring. Past survey records are only one consideration in an assessment and presence (or otherwise) of suitable habitat is another key consideration, particularly in regard to survey design. Information required to adequately undertake an AoS for a species that is present within the study area would include population size and age class and location of individuals which is not available when assuming it is present. The life cycle of an animal varies depending on specific requirements of a species. The potential impact on both breeding and non-breeding habitat has been considered in all the AoS for threatened fauna. This involves whether specific breeding habitat features are present, whether animals were recorded during seasonal surveys or have been historically recorded in the study area or surrounding region, whether they are highly territorial or more likely to be only occasional visitors and the availability of breeding and non-breeding habitat in the broader region. The life cycle question is only one criterion of the AoS which has been assessed in addition to likely impact on habitat, field survey results and historical records of threatened fauna and flora within the locality. The AoS have been prepared to be consistent with the Threatened Species Assessment Guidelines: Assessment of Significance (DECC 2007).</td>
</tr>
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| 3 | A wildlife connectivity strategy will be prepared as part of the Stage 2 EIS. This will include an assessment of options, target species, constraints and potential locations. This has also considered available information of use of the corridor with regard to fauna species and frequency of usage. As a general comment, it is noted that there is limited information in this regard and the wildlife connectivity strategy has taken a precautionary approach to the extent practicable. Options fall into the following three types:  
  • Crossing structures, which provide alternate routes to traverse the road  
  • Movement barriers, which aim to reduce road kill by preventing fauna from accessing the road reserve  
  • Modification of existing conditions which are used to favour fauna |

Northern Beaches Hospital Road Connectivity and Network Enhancements Project – Submissions Report  
Roads and Maritime Services
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| 4. Attempting to cross the road. The feasibility of options is being reviewed by Roads and Maritime and will include consultation with OEH. | Unavoidable impacts on biodiversity, particularly DFEC and RCT, would be mitigated and managed through the project-specific biodiversity offset strategy outlined in Section 9.6.1 of the EIS and Appendix F. This would be consistent with the NSW offset principles for major projects (OEH 2013) and Roads and Maritime’s Guideline for Biodiversity Offsets (Roads and Maritime 2011) as well as the Draft NSW Offset Policy for Major Projects (OEH 2014) and would:  
  - Provide options for offsetting residual significant impacts on threatened species, populations and communities, and a framework for delivery of these options  
  - Aim to fully offset residual significant impacts on DFEC and RCT in accordance with the principles of the Offset Strategy  
  - Present a framework for setting the scope and quantum of the biodiversity offsets that is transparent and justifiable on environmental, social and economic grounds  
  - Investigate as a priority ‘like for like’ offsets.  

The requirement for agreement from the Deputy Director General of Parks & Wildlife Group and consideration by OEH of potential additions in relation to state-wide conservation priorities is understood.  
The offset strategy states that the first priority is to secure DFEC offset sites, followed by retirement of DFEC credits if available. Roads and Maritime is continuing to investigate potential DFEC offset sites, both within and outside of the Warringah LGA. Roads and Maritime will continue to consult with OEH during development of the offset strategy. |

The Assessments of Significance found that the proposed roadworks will have a significant impact on Duffys Forest Endangered Ecological Community (DFEC) and the Red-crowned Toadlet (RCT). The Biobanking Assessment Report calculates that the credits required to offset this loss will be 176 ecosystem credits (19 hectares) for the Concept Proposal or 53 credits (6 hectares) for Stage 1. For the RCT 36 species credits (36 hectares) were required for the Concept Proposal or 7 credits (1 hectare) for Stage 1.  
Section 7.3.4 states that offset sites will be secured through a Biobank Agreement or as additions to the National Parks estate. The Director General's Requirements issued for this project required offsets to be consistent with the NSW offset principles for major projects (state significant development and state significant infrastructure (OEH 2013). This policy does provide for offsets to be secured through the dedication of land under the National Parks and Wildlife Act 1974 (NPW Act), and the establishment of biobanking sites with Biobanking Agreements under the Threatened Species Conservation Act 1995.  
Under this policy if an offset is proposed that may involve the transfer of land to the OEH for reservation under the NPW Act, then consultation must occur with the relevant Parks and Wildlife Group (PWG) Branch Director at the earliest possible stage. No commitment should be made to accept an offset involving new reserves without the agreement of the Deputy Director General, PWG. Similarly, no commitment should be made to accept offsets involving other forms of in-perpetuity protection without the agreement of the relevant sponsoring body.  
Therefore if the transfer of land to National Parks estate is proposed, then PWG staff will need to be included early in the consultation process. Before such an offer is accepted, OEH would need to determine whether the offset lands are consistent with the NPWS Reserve Establishment Guidelines, and a comprehensive assessment would need to be undertaken of the site/s conservation values and management requirements, as well as a determination of whether the
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<td>site meets state-wide conservation priorities.</td>
<td>Roads and Maritime has already undertaken a significant amount of work investigating potential offset sites that contain DFEC. Potential impacts of the Stage 2 Project are currently being assessed and will be reported in the State 2 EIS. The Biobanking Assessment Report will be updated to include a final biobank credit calculation for both project stages and this will be included in the Stage 2 EIS. Roads and Maritime intends to secure appropriate offsets as soon as practicable and will continue to consult with OEH on all relevant matters.</td>
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<td>5 Section 7.3.4 states that if no DFEC credits are available, the proponent will purchase and retire equivalent PCT credits. If these are not available, credits in the same vegetation formation will be purchased. Section 7.3.5 states that offsets will be determined in consultation with OEH and Council. Although the retirement of equivalent PCT credits would meet the Offsets Policy this may result in no DFEC credits being purchased, which clearly would be undesirable and would not be supported by OEH. OEH notes that Roads and Maritime has already undertaken preliminary assessments of possible DFEC offset sites and acknowledges that there are difficulties in finding adequate and larger areas of DFEC. OEH supports the Roads and Maritime process to identify suitable DFEC offsets and requests further consultation as the offset strategy is developed. OEH requests this consultation occur throughout the development of the Offset Strategy and prior to any credits being purchased.</td>
<td>Assessment of cumulative impacts (ie both stages) has only been at concept level for Stage 2, and a more detailed assessment would be provided in the Stage 2 EIS. This will allow a more accurate characterisation of the impacts of the overall project, and the final offsets strategy including timing. Roads and Maritime would prepare the offsets strategy in consultation with OEH. It is noted that the planning approval for Stage 1 of the Northern Beaches Hospital required full implementation of the biodiversity offset strategy for that project to be completed within 12 months of approval. Roads and Maritime anticipates the Department of Planning and Environment would impose a similar requirement for both stages of the project.</td>
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<td>6 Section 7.3.5 Limitations does not provide a timeframe for securing the offsets. It is acknowledged that the assessment has considered the cumulative impacts of the proposed works for both Stage 1 and Stage 2 and that further detailed design and the construction works may alter the extent of the impacts so the areas to be impacted will be refined over the project. OEH considers that offsets should be identified and secured as soon as possible and that the Offset Strategy should be in place and be required to be implemented in as short a time as possible following the commencement of on ground works.</td>
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<td>7 OEH does not consider that there is adequate data to be able to comment on the efficacy of any proposed wildlife connectivity measures. In addition, the proponent has not prepared a Wildlife Connectivity Strategy as recommended in accordance with the Roads and Maritime’s Connectivity Guidelines. OEH does not consider this issue has been adequately addressed to date and requests further advice and</td>
<td>Assessment of connectivity impacts has only been carried out at conceptual level for Stage 2, and a more detailed assessment would be provided in the Stage 2 EIS. As noted previously in this report, the Stage 1 Project is not considered to have a significant impact on wildlife connectivity with the impacts primarily associated with the</td>
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<td>consultation on this matter.</td>
<td>Stage 2 Project. Preparation of a Wildlife Connectivity Strategy will include consultation with OEH. Please note that Roads and Maritime's Connectivity Guidelines are still in draft format and have yet to be officially adopted.</td>
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### Aboriginal cultural heritage

**8** OEH has reviewed the EIS and the Aboriginal Cultural Heritage Assessment Report (ACHAR). It is noted that there are two newly recorded sites within the Stage 1 area: Trefoil Creek 1 and Trefoil Creek 2. No other recorded sites are located within the study area. OEH also notes that the current area of impact identified for the proposal shows that both sites are outside the area of proposed impact and therefore will not be impacted.

OEH concurs with this management recommendation and considers that every effort should be made to avoid any impact at all to these sites. However, OEH also notes that the detailed design for this proposal has not yet occurred and that there is a potential that once the detailed design has occurred, there is a possibility that the sites may be impacted. The EIS states on page 286 that if this happens appropriate management and mitigation measures will be formulated. As already stated, OEH considers that no impact should occur to these sites and that the detailed design should take the presence of these sites into consideration and avoid them at all costs.

### Department of Primary Industries Office of Water

#### In-line pollutant control devices

**1** Section 16.4.2 of the EIS indicates to offset potential increases in pollution loads resulting from the Stage 1 project, in-line pollutant control devices would be considered at drainage line 1, drainage line 2 and drainage line 3 (page 345). It is unclear if the control devices are proposed to be located within the drainage lines or adjacent to the roads mentioned. Details are required on this and also what the 'in-line pollutant control devices' involve.

The nature and location of pollutant control devices (PCD) would be confirmed during detailed design but would typically be located immediately adjacent to drainage lines, primarily to facilitate maintenance and thereby avoid the risk of any such works impacting on the drainage line. The reference to ‘in-line’ refers to the integration of the PCD into the built drainage system up-gradient from the drainage outlet.

As indicated in Section 16.4.2 of the EIS, the PCDs would principally...
Section 16.4.2 notes the location of the inline devices would be determined during detailed design (page 345). The Environmental Management measures (page 395) refer to Appendix M, Figure 8.1 for location but this figure does not appear to be included in Appendix M.

The locations of the three PCDs on Figure 8.1 in Appendix M are shown as follows:

- PCD1 – Sheet 1
- PCD2 – Sheet 3
- PCD3 – Sheet 4

Subsequent to exhibition of the EIS, the location of PCD3 has been moved to the end of the cul de sac in Winslea Avenue.

As discussed in the response provided for NOW Issue 1, the nature and location of PCD’s would be confirmed during detailed design.

While the EIS notes construction of the Stage 1 project is unlikely to directly impact on the headwaters of Trefoil Creek (Section 9.3.2, page 219), it is unclear if the in-line pollutant control pollutants resulting from the project are treated outside the drainage lines and not on-line in watercourses.

The Office of Water Guidelines for Riparian Corridors on Waterfront Land outline that stormwater runoff should be treated before discharging into the riparian corridors. It is recommended pollutants resulting from the project are treated outside the drainage lines and not on-line in watercourses.

It is recommended the following environmental management measure/condition of approval is included:

- stormwater runoff from the project will be treated before it discharges into the local drainage lines and creeks and riparian corridors.

Groundwater

Section 16.3.2 of the EIS indicates there is potential for the proposed cuttings near the intersection of Wakehurst Parkway and Frenchs Forest Road to intercept the shallow groundwater (page 338). It indicates impacts on the shallow water table would be monitored and managed as

The proposed cutting along Frenchs Forest Road west of the intersection with Wakehurst Parkway would involve moving the existing rock cutting by approximately 35 metres on the southern side and by 10 metres on the northern side. In addition to moving the retaining wall...
### Agency submission

part of the Stage 1 Project construction and some drawdown of the shallow water table may occur and this would be monitored (page 338). Details are required on the volume of groundwater that is likely to be intercepted and then discharged into the local streams.

### Roads and Maritime response

adjacent to the proposed boundary, the road alignment would have to be lowered by up to 1.5 metres to meet the road design requirements. The ground water monitoring undertaken at this location indicated that the ground water level is more than 3 metres from the existing road level. Therefore, it is highly unlikely that the Stage 1 Project would intercept groundwater at this location. Excavation for services installation and pavement for the proposed Stage 1 work is relatively shallow and therefore is not likely to intercept groundwater.

### It is suggested the environmental management measures (Table 20.1) are amended to specify that groundwater monitoring will also include pre-construction and ongoing monitoring of the shallow water table (page 394).

### A Surface and Groundwater Water Monitoring Program has commenced which aims to establish a baseline data set pre-construction. The monitoring program would continue during the construction period.

### Groundwater licences

Table 20.1 in the EIS notes consultation will be undertaken with the Office of Water concerning the need for groundwater extraction licences or approvals prior to construction (page 395). The Office of Water repeats that while the RMS is exempt from the requirement of an access licence for road construction it is requested the project quantifies and minimises the take of groundwater.

### Further impact assessment, including groundwater modelling, is currently being carried out for the Stage 2 EIS. This is primarily aimed at understanding the groundwater impacts associated with construction of the subsurface slot. These results will be presented in the Stage 2 EIS. As a general management principle, Roads and Maritime would seek to minimise the volume of water abstracted as far as practicable.

### Creeks

The potential impact of discharging groundwater to the local streams, including impacts on the natural flow regime of watercourses should be assessed.

### Please refer to response provided for NOW Issue 6 with regard to the Stage 1 Project.

The Stage 2 project will involve excavation works that will intersect the local groundwater table in order to construct the slot for east-west through traffic. Assessment of impacts on groundwater (both construction and operation) will relate primarily to this stage of the project. Further details in this regard will be provided in the Stage 2 EIS.

### The drainage system for the Stage 1 Project has only three outlets that would discharge to natural drainage lines and each of these would incorporate a PCD as previously noted. The design will provide for suitable scour protection at the outlet of each PCD. Drainage from other sections of the Stage 1 Project would discharge to Warringah
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<td>instability along all local watercourses (including those watercourses which are not identified as Red-crowned Toadlet) and also maintain as close as practicable the existing hydrologic regime of all local watercourses.</td>
<td>Council’s stormwater management system. While Table 16.4 relates to the Stage 1 Project, development of the drainage design for the Stage 2 Project will similarly aim to minimise material changes to the hydrologic regime of receiving drainage lines. Further details will be provided in the Stage 2 EIS.</td>
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| It is recommended the following environmental management measure/condition of approval is included to prevent the local creeks potentially affected by the project:  
- surface water is to be managed to prevent scour and bank instability along all local watercourses (including those watercourses identified as Red-crowned Toadlet) and to maintain the existing hydrologic regime of all local watercourses. | Please refer to response to NOW Issue 10. |

**Stockpiles**

| 12 | Appendix L includes a safeguard measure that bulk stockpiles of materials should be located greater than 100 m from any drainage line (Section 6.1.4.1, page 45). It is suggested the environmental management measures are amended to specify the distance that stockpiles are to be located from drainage lines and creek channels (Table 20.1 in the EIS). | Section 6.1.4.1 of Appendix L is referring to ancillary sites for construction. Assessment of ancillary sites will be undertaken with reference to a set of criteria that a range of environmental sensitivity factors including proximity to drainage lines. These are reflected in the assessment for the additional ancillary site found in Chapter 5. It is noted that there are already a substantial number of constraints with regard to suitable potential locations for ancillary sites within the project corridor and it may not be practicable to be located 100 metres away from drainage lines. The SWMP would provide details for stockpile management to ensure erosion and sedimentation management is in accordance with Managing urban stormwater: soils and construction (the ‘Blue Book’). |

**Warringah Council**

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<td>1</td>
<td>A number of differences have been identified in the proposed design between that shown in the Urban Design Report and the main EIS report. These differences need to be clarified as some aspects of the designs shown in the documents are not agreed to by council and need</td>
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<td>to be addressed. This list has been compiled from a review to date and may be added to as further reviews are carried out. Some of the matters identified include: Frenchs Forest Road/Rabbett Street/Naree Road - The Urban Design report and Section 5.2.3 of the EIS provides pedestrian crossings on three legs of the intersection. Figure 5.1 of the EIS provides pedestrian crossings on only two legs of the intersection. It is considered that pedestrian crossing facilities should be provided on all legs of this signalised intersection, to comply with Roads and Maritime guidelines.</td>
<td>with urban design principles and objectives developed specifically for the project. Rationalisation of marked pedestrian crossings has been carried out in consultation with Roads and Maritime’s Network Optimisation group. Roads and Maritime confirms that crossing facilities are proposed on three sides of the Naree Road/Rabbett Street/Frenchs Forest Road West intersection. The eastern side of the intersection would not be marked due to the heavy volumes of traffic making right turn in and left turn out from Rabbett Street on to Frenchs Forest Road West.</td>
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<td>2 Frenchs Forest Road East - the Urban Design report provides for a marked foot crossing of Frenchs Forest Road, between Nandi Avenue and Romford Road intersections. This would not comply with Roads and Maritime Technical Directions as there are two lanes of travel in each direction.</td>
<td>Pedestrian safety and provision of pedestrian crossings is an essential component of any road and urban design, particularly for this project due to the proximity of the school and the hospital. Pedestrian crossings are proposed at several locations to facilitate safe movement of pedestrians. It was necessary to remove the pedestrian island near Nandi Avenue given the widening of the road at this location and is considered an acceptable departure from Roads and Maritime Technical Directions.</td>
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<td>3 Frenchs Forest Road East/Warringah Road - The Urban Design report does not provide this as a signalised intersection and with a marked pedestrian crossing away from the intersection. There would be safety concerns with this arrangement for pedestrians. The EIS provides this as a signalised left turn for eastbound vehicles, with a pedestrian crossing provided at the intersection. This is the preferred operation of the intersection.</td>
<td>The primary purpose of introducing new signals on Warringah Road eastbound is to allow buses to cross three lanes of traffic safely when they leave Warringah Road to enter Frenchs Forest Road East. Detailed design would provide for a new signalised pedestrian crossing across Frenchs Forest Road East at this location for safe pedestrian crossing while maintaining an acceptable level of service for buses and other vehicles.</td>
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<td>4 Frenchs Forest Road/Wakehurst Parkway - The Urban Design provides pedestrian crossings on three legs of the intersection. The EIS provides crossings on all four legs of the intersection. It is considered that the crossings should be provided on all legs of the intersection. This also relates to council's comment below regarding the continuation of the pedestrian path on the northern side of Frenchs Forest Road.</td>
<td>In order to optimise network performance, the existing arrangement (ie no marked pedestrian crossing) would be retained on the western side of the intersection of Wakehurst Parkway and Frenchs Forest Road. A new marked pedestrian crossing would be provided on the northern side of the intersection to provide safe pedestrian connectivity through this intersection. As indicated in Section 3 of the Urban Design Report and Landscape Character and Visual Assessment Report (Appendix I to the EIS) there would also be a continuous footpath along both sides of Frenchs Forest Road. The proposed retaining walls on the western side of the</td>
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<td><strong>5</strong> Allambie Road, north of Warringah Road - The Urban Design indicates the retention of the bus stops on both sides of Allambie Road. The EIS plans provide that these bus stops will be removed. What is planned for the bus stops in this area?</td>
<td>The bus stop in the southbound direction on Allambie Road would be retained in its current location. The bus stop in the northbound direction would be relocated to just around the corner from Allambie Road on Frenchs Forest Road East. Relocation of this bus stop has been agreed with Transport for NSW.</td>
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<td><strong>6</strong> Allambie Road/Warringah Road - the Urban Design report appears to recommend that a pedestrian crossing also be retained across Allambie Road south at the intersection whereas the EIS does not provide for this. The retention of this crossing is considered a safer option as there are no other crossing facilities provided on Allambie Road south of Warringah Road.</td>
<td>In order to optimise network performance, it is proposed to move the marked pedestrian crossing on Warringah Road from the eastern side to the western side and retain the existing crossings on Allambie Road.</td>
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<td><strong>7</strong> Frenchs Forest Road West - The Urban Design report indicates that the footpath on the northern side of Frenchs Forest Road West will be terminated approximately 40 m west of the Wakehurst Parkway. The EIS provides that the path will continue to Wakehurst Parkway. Council considers that the pathway should continue to Wakehurst Parkway as terminating the path in this location is unsafe. This area is also a connection to a walking track that runs North South on the West side of Wakehurst Parkway.</td>
<td>Please refer to response provided for Warringah Council Issue 4.</td>
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<td><strong>8</strong> Modelling The traffic modelling highlighted that the intersection of Forest Way and Adams Street was operating with a poor Level of Service (LoS) (pg.124 and 130) however, it is not proposed to undertake any works at the intersection, whether as part of the hospital works or as network enhancement works, to improve the LoS at this location. One of the major impacts on the operation of the intersection is the lack of a right turn bay (northbound) for Forest Way.</td>
<td>The Adams Street/Forest Way intersection is outside the current scope of work and no treatment is planned at this location. Work planned for the Naree Road/Forest Way intersection and the subsequent Stage 2 Project are expected to alleviate pressure at Adams Street/Forest Way intersection. The intersection performance would be monitored following completion of Stages 1 and 2 of the proposal and should the monitoring identify continued performance issue, Roads and Maritime would investigate implementing further traffic management measures to improve the level of service at this intersection.</td>
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<td><strong>9</strong> Modelling The EIS highlights that there will be some improvement to the operation of the Warringah Road/Forest Way intersection in 2018. The improved</td>
<td>Roads and Maritime would monitor the performance of the intersection of Forest Way and Adams Street following completion of construction works for the project. Should this identify a continued performance</td>
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<td>LoS of the intersection of Warringah Road/Forest Way is welcome however, the continued poor performance of the Forest Way/Adams Street intersection identifies that some works are required at this intersection, specifically the provision of right turn bays to ensure to a greater degree that, three through lanes of traffic are available on Forest Way and the increased potential for crashes as vehicles change lanes to get around a right turning vehicle. In addition a two lane approach on Adams Street (east) to the intersection should be considered.</td>
<td>issue, further investigation would be carried out with regard to work that could be implemented (as a separate project) that would improve traffic flow. Please also refer to response provided to Warringah Council Issue 8.</td>
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10 **Cycle connectivity**

The need for cycle connections to be provided to the hospital from the surrounding cycle network is an important consideration. This section highlights that the proposed 3.5 m path on the southern side of Frenchs Forest Road West would not be provided as a shared path along its entire length, due to the grades of 12-15 per cent near the intersection with Wakehurst Parkway. This highlights the need to provide a shared path along the northern side of Warringah Road, where the grades are suitable along the entire length for a shared path provision. This could be provided in the section west of Wakehurst Parkway (along the frontage of the Northern Beaches Hospital) to Forest Way with the connections provided to Frenchs Forest Road East and the off-road shared path on Warringah Road east of Wakehurst Parkway.

The Concept Proposal has been developed with consideration given to a range of matters including public transport, active (cyclist/pedestrian) transport and amenity. As outlined in Section 5.1.2 of the EIS one of the urban design principles and objectives guiding design development includes ‘delivering an integrated approach to traffic (including pedestrian and cyclist), public transport and land use’. Figure 7.4 in the EIS identifies this route and indicates it would be further investigated in Stage 2.

Since exhibition of the EIS, Roads and Maritime has confirmed off road shared pathways in the Stage 1 Project on:
- Allambie Road (on the western side between Warringah Road and Frenchs Forest Road East)
- Frenchs Forest Road East (on the southern side between Allambie Road and Wakehurst Parkway)
- Wakehurst Parkway (on the eastern side between Frenchs Forest Road and Warringah Road)
- Forest Way (on the eastern side between Naree Road and Warringah Road).

The shared path proposed for Stage 1 along Frenchs Forest Road East connects with the proposed Stage 2 shared path at the intersections of Warringah Road/Allambie Road and Warringah Road /Wakehurst Parkway. The proposed shared paths presented in the EIS have been further developed in consultation with Council to enhance their functionality and to connect with the routes proposed by Council. Further detail on the proposed cyclist infrastructure is discussed further in Chapter 6.
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<td>11</td>
<td>It is also considered that a link should be provided on Rodborough Road between the Allambie Road roundabout and the proposed pathway along the southern side of Warringah Road, and on the western side of Allambie Road, north of Aquatic Drive.</td>
</tr>
<tr>
<td>12</td>
<td><strong>Cycle connectivity</strong>&lt;br&gt;It is acknowledged that the shared paths throughout the precinct would be provided at 2.5 m in width. It is considered that in those areas where pedestrian activity is higher, such as around the Forestway Shopping Centre or any of the bus stops, that there should be a transition to a wider path area to ensure the safe passage of cyclists and pedestrians.</td>
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<tr>
<td>13</td>
<td><strong>Cycle connectivity</strong>&lt;br&gt;There does not appear to be any continuation of cycle facilities on Wakehurst Parkway from north of Frenchs Forest Road to Warringah Road. This would require cyclists to mix with general traffic and increase the potential for conflict and crashes. It is understood that, through meetings with Roads and Maritime, a shared path will be provided on the eastern side of Wakehurst Parkway between Warringah Road and Aquatic Drive. Further details are required regarding this area.</td>
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<tr>
<td>14</td>
<td><strong>Cycle connectivity</strong>&lt;br&gt;The passage of cyclists northbound on Allambie Road to Patanga Road with the proposed changed intersection configuration at Frenchs Forest Road needs to be addressed as this is not clear from the documentation provided.</td>
</tr>
<tr>
<td>15</td>
<td><strong>Cycle connectivity</strong>&lt;br&gt;The section of Forest Way, south of Naree Avenue does not provide any cycle facilities at the present time. This section of Forest Way has been identified for investigations as part of Stage 1 and also in Stage 2 near the intersection with Warringah Road. This section provides an important connection in the cycle network and it is imperative that a suitable and safe facility is provided.</td>
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<td>16</td>
<td><strong>Cycle connectivity</strong>&lt;br&gt;The provision of overhead bridges should also cater for cyclists.</td>
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| **17** Pedestrian connectivity | Pedestrian safety and provision of pedestrian crossings is an essential component of any road and urban design, particularly for the Stage 1 Project due to the proximity of The Forest High School and the hospital. Pedestrian crossings are proposed at several locations to facilitate safe movement of pedestrians heading to and from the hospital, the school and other attractor nodes such as the Forestway Shopping Centre and the Skyline shops. Existing pedestrian access along Frenchs Forest Road and Warringah Road east and west of the hospital would be maintained and improved.

In addition to improved pedestrian connectivity at existing and proposed signalised intersections there would be provision of a signalised pedestrian crossing on Frenchs Forest Road West in the vicinity of Bluegum Crescent (east) and a wider footpath on the southern side along Frenchs Forest Road West as part of the Stage 1 Project. This will facilitate safe access to attractor nodes such as the Forestway Shopping Centre, Northern beaches Hospital and The Forest High School.

Figure 5.5 in the EIS identifies existing and proposed bus stops. These are located on the aforementioned pedestrian routes. The locations of new and existing bus stops has been reviewed based on advice provided by Transport for NSW. A figure showing the revised bus stop locations is provided in Chapter 5. |
<p>| <strong>18</strong> Pedestrian connectivity | Existing pedestrian access would be maintained and/or improved. Design development would consider all relevant matters including disabled access requirements and would be carried out in accordance with the Australian Standards, Austroads Design Standards, Guides, Codes, and Roads and Maritime Road supplements. |
| <strong>19</strong> Pedestrian connectivity | Pedestrian counts as well as an examination of pedestrian-related incidents at this location indicated that an additional pedestrian bridge was not warranted. The existing signalised intersection coupled with new crossing facilities at Naree Road and the proposed upgrade of the pedestrian bridge over Warringah Road near Forest Way will be |</p>
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<td><strong>20</strong> Pedestrian connectivity</td>
<td>adequate to meet the pedestrian demand in the area. The proposed signalised crossing of the Naree Road and Forest Way intersection would enable pedestrians to connect between attractor nodes such as the Northern Beaches Hospital, The Forest High School, local residents and the Forestway Shopping Centre.</td>
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<td>The intersection of Forest Way and Russell Avenue requires improved facilities for pedestrians crossing Russell Avenue. Council requests Roads and Maritime to consider suitable changes to the intersection through the provision of a pedestrian refuge in Russell Avenue and changes to the kerb returns to slow traffic turning left.</td>
<td>This will be investigated during detailed design.</td>
</tr>
<tr>
<td><strong>21</strong> Pedestrian connectivity</td>
<td>Please refer to response provided for Warringah Council Issue 4.</td>
</tr>
<tr>
<td>As highlighted in the Introduction, the discontinuation of the pedestrian path along the northern side of Frenchs Forest Road approximately 40 metres west of the intersection with Wakehurst Parkway is not supported. Pedestrians may choose to walk across eight lanes of traffic to reach the pathway on the southern side of Frenchs Forest Road. This is an unsafe situation. It is considered that the pathway should be continued to the intersection and crossings at Wakehurst Parkway shown in Figure 5.2. This area also has a critical link on the western side of Wakehurst Parkway north of the Frenchs Forest Road intersection which connects to the pathway in Frenchs Forest Road.</td>
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<td><strong>22</strong> Pedestrian connectivity</td>
<td>The following design will be adopted for the northern footpath on Frenchs Forest Road: 0.8 metre wide verge behind kerb; 1.5 metre wide formed concrete footpath (as agreed with Council at the early stages of planning); and a 1.2 metre wide verge to the common property boundary. This would minimise property adjustment works and would meet the natural surface levels within the road reservation wherever possible.</td>
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<td>Council prefers that the pathway on the northern side of Frenchs Forest Road West to be located adjacent to the property boundary and 2 m in width. There are safety concerns with this pathway being located adjacent to the kerb with the volume of traffic forecast to be using this section of Frenchs Forest Road.</td>
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<td><strong>23</strong> Public transport</td>
<td>Roads and Maritime has noted this suggestion. Section 4.5.1 of the Options Report acknowledges Sydney's Bus Future and notes that it designates Warringah Road via Frenchs Forest Road as a ‘Suburban’ bus corridor with a speed target of 18-25 km/h between Chatswood</td>
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<td>As highlighted in the EIS and Transport for NSW documents, buses are the only public transport provided for the Northern Beaches area. This is of more importance with the construction of a major hospital at this</td>
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<td>location. The major transport link from the NBH to the wider transport network and destinations makes it an important aspect that, not only is the network enhanced in the short term, but that it should also consider the long term public transport requirements. In this regard it is important for Roads and Maritime and Transport for NSW to consider now the reservation of future widening/transport corridors that need to be reserved to cater for the future development.</td>
<td>and Dee Why/Brookvale. It further notes that in order to meet this performance benchmark, bus priority elements have been included as part of the project. There are currently five bus stops along Frenchs Forest Road between Allambie Road and Rabbett Street. The traffic modelling has identified that bus travel speeds are in the order of 13-14 km/h with the reduced travel speed largely attributable to buses stopping at all stops. The modelling shows that the above target speed range could be achieved with an express bus service that stopped only twice (eg near the Skyline Shops and the Northern Beaches Hospital). However, future year bus routes from Transport from NSW currently do not include any express bus services. Transport for NSW has advised Roads and Maritime that investigations to date have largely focussed on the Pittwater Road corridor but that investigations into the Warringah Road corridor would commence in the near future. The need for the provision of express bus services would be considered as part of this. Concept design development has included consideration of measures to support public transport initiatives. Further information regarding the Stage 2 Project would be provided in the forthcoming EIS. This would incorporate any new information from Transport for NSW.</td>
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24 Public transport
The attractiveness of public transport in the future, in order to reduce the reliance on the car, to access the hospital is an important consideration and the ability to adequately expand and/or enhance the system in the future is one of the key elements of this. | Please refer to response provided for Warringah Council Issue 23. |

25 Public transport
Currently there are approximately 46 scheduled route services in the AM peak two hours that operate along the section of Forest Way on the approach to the intersection of Warringah Road. School services are in addition to these. The bus stop in Forest Way at the intersection with Rabbett Street is a highly utilised stop for passengers joining these services and also interchanging between other services. This stop therefore fulfils a major role in the local and regional transport system. | Section 4.5.1 of the Options Report notes that in developing the proposal, Roads and Maritime has used available information provided by Transport for NSW on future regional and local bus routes and service levels on the Northern Beaches. Chapter 5 of the EIS indicates that the Stage 1 Project includes extension of the existing bus bay on Forest Way to accommodate two buses (refer to Figure 5-1). Decision-making with regard to bus transport planning, including |
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<td>Consideration must be given to improving the operation and facilities at this location. The EIS Traffic report provides for the discontinuance of some bus services and changes to other services to cater for the NBH. The removal of the route 137 service would impact on the residents of Bantry Bay who rely on bus services to access local facilities and the regional network.</td>
<td>introduction of new services and discontinuation of existing services rests with Transport for NSW.</td>
</tr>
<tr>
<td><strong>26</strong> Public transport The proposed changes to bus stops will require the removal or relocation of existing bus shelters. The removal of any advertising shelters represents a financial and maintenance impact for Council. Any new shelters proposed, and to be constructed as part of the Stage 1 works, should comply with council's design requirements and disability standards for accessible public transport. Any cost implications of changes to bus shelters will need to be borne by Roads and Maritime.</td>
<td>Construction of new and relocated bus shelters would be carried out in accordance with Council's design requirements and applicable disability access standards. Roads and Maritime would undertake appropriate consultation with Council in this regard. Roads and Maritime would fund the cost of new and relocated shelters. Removal of existing shelters identified for relocation would not occur until the new shelter had been constructed and therefore it is anticipated there would be no material impact on Council's financial position with regard to advertising revenue and maintenance costs.</td>
</tr>
<tr>
<td><strong>27</strong> Public transport The proposed increase in length of the northbound bus bay in Forest Way at the Forestway Shopping Centre should include the reconfiguration of the waiting facilities to provide for its intended purpose.</td>
<td>Reconfiguration of the waiting facilities would be further considered during the detailed design phase.</td>
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<td><strong>28</strong> Public transport Section 7.3.2 provides for the potential relocation of school bus operations servicing The Forest High School on Frenchs Forest Road to Warringah Road during the Stage 1 construction. Should this proposal be considered for further investigation then it must include the provision of an indented bus bay, in addition to the existing traffic lanes, to remove the waiting buses from a busy and congested section of road and to ensure safety for school children waiting to board buses.</td>
<td>The EIS does not make reference to the potential relocation of school bus operations to Warringah Road during construction of Stage 1. Given the existing volumes of traffic on Warringah Road, this is not supported from both a safety consideration or from a network congestion/efficiency point of view. School bus operations would continue to use Frenchs Forest Road West during Stage 1 works with students delivered to the school. This would be managed under a Construction Traffic Management Plan that would address the safe operation of school bus services.</td>
</tr>
<tr>
<td><strong>29</strong> Public transport It is also understood that enhanced bus services will use Frenchs Forest Road.</td>
<td>Section 7.4.2 of the EIS notes that Transport for NSW is proposing to modify bus routes within the study area and provide more frequent services during peak periods, including along Frenchs Forest Road. The final nature of any such changes to or augmentation of existing</td>
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| **30** Road construction and potential rat runs  
While there will likely be impacts on the wider regional network during the construction phases, it should be acknowledged that there will be impacts on the local road network within the proximity of the proposals. Oxford Falls Road, Morgan Road, Government Road will all likely to incur additional traffic volumes as a result of the works being undertaken. Grace Avenue is also likely to see increased traffic volumes.  
Section 7.3.2 of the EIS acknowledges the potential impacts of Stage1 construction activities on the wider network, and the possibility of motorists electing to use alternative routes. It is acknowledged that there is also potential for increased traffic on local roads associated with through traffic seeking to bypass Frenchs Forest Road during the Stage 1 construction work. It is not possible to be precise as to the volumes of traffic that might use alternative local routes.  
Roads and Maritime would carry out regular monitoring of local streets that exhibit increases in traffic and consult with Council with regard to temporary measures that could be implemented to manage safety and related issues. |

| **31** Road construction and potential rat runs  
Oxford Falls Road and Morgan Road are narrow, rural type roads with poor horizontal alignments. The increased traffic along this route will lead to increased crash potential and impacts on residents. At the eastern end, where Oxford Falls Road intersects with Iris Street, an increase in traffic movements at this intersection will lead to increased delays for local residents and potential safety issues at the intersection due to restricted sight distance and drivers taking increased risks when turning at the intersection.  
Please refer to response provided for Warringah Council Issue 30. |

| **32** Road construction and potential rat runs  
Similarly, Grace Avenue is a narrow residential street which is not equipped to incur the additional traffic volumes. This could be exacerbated during the construction phases of the road project.  
Please refer to response provided for Warringah Council Issue 30. |

| **33** Road construction and potential rat runs  
These potential 'rat runs' will need to be monitored by RMS and council. Potential strategies and activation points should be identified to construct or manage traffic by RMS.  
Please refer to response provided for Warringah Council Issue 30. |

| **34** Car parking  
The Traffic and Transport Assessment carried out parking occupancy surveys of a number of streets within the area. While it identified that a substantial amount of weekday daytime parking occurred around Naree  
Roads and Maritime acknowledges that there would be changes to parking arrangements associated with the Stage 1 Project. Roads and Maritime would continue to work with Council to determine if further parking can be implemented on local roads adjacent to Frenchs Forest Road. |
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| Road, Rabbett Street and was most likely associated with commuter parking, it indicated that the parking occupancy was manageable as the level of parking and potential availability on other side streets off Frenchs Forest Road "there are only a handful of sections in which parking demand would need to be managed. These include Naree Road, Rabbett Street and Patanga Road."¹  
The removal of parking on Frenchs Forest West needs to be carefully considered as the adjoining side streets along this section of road are generally narrow (>7m) and extensive parking associated with the school and hospital will impact on access for residents and emergency services. ¹ Traffic and Transport Assessment// Issue C: p.26 (GTA Consultants 2014) | Road and Naree Road. It is noted that the Stage 2 EIS for the Northern Beaches Hospital indicates that 1,430 car parking spaces would be provided within the hospital and is expected to be sufficient for staff, patients and visitors, and that the need for off-site parking is expected to be negligible.  
As noted in Section 7.5 of the EIS, an operational traffic review would be carried out within 12 months of opening of Stage 1. This would include car parking surveys of local side streets and issues related to The Forest High School. The results would be used to identify any additional feasible and reasonable measures to address identified issues.                                                                                                                                 |
| 35 Car parking  
Management of the parking is required to be considered and addressed by RMS. There may be the opportunity for traffic management such as road closures at Frenchs Forest Road in order to control some of this parking. Warringah Council is opposed to the imposition of permit parking schemes on the local roads surrounding the NBH as this provides a financial and administrative burden on Council and does not comply with RMS mandatory guidelines. Should these matters be overcome, Council may consider this further. | Consideration of temporary road closures would be considered as part of preparation of the Construction Traffic Management Plan and would involve consultation with Council.  
Please refer to response provided for Warringah Council Issue 34.                                                                                                                                                                                   |
| 36 Car parking  
The matter of car parking around the Skyline shops must consider the access between any proposed car parking and the shops. This centre attracts a substantial amount of passing trade which requires ready access and minimum time required to access the shops, purchase requirements and then proceed to other destinations. If the proposed parking impacts on these aspects, then it would impact on the patronage of the shops. Currently, no solution is provided by RMS at this stage. | Roads and Maritime has provided further information on car parking arrangements at the Skyline Shops in Section 6.1 of this report.  
Please refer to response provided for Warringah Council Issue 34.                                                                                                                                                                                  |
| 37 Land acquisition  
A process of land acquisition needs to be in place with Warringah Council and, if works are near residents, appropriate infrastructure needs to be considered to minimise the impact on residents at no cost to | The need for property acquisition for Stage 1 is acknowledged in Section 10.3.2 of the EIS (and more broadly for the overall project in Section 10.3.1). All such acquisitions would be carried out in accordance with the Roads and Maritime Land Acquisition Guide.                                                                 |
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<td>Council.</td>
<td>(RTA, 2010) and relevant provisions of the <em>Roads Act 1993</em> and <em>Land Acquisition (Just Terms Compensation) Act 1991</em>. Matters such as altered access arrangements would be discussed with individual property owners, and Council as appropriate. Any required works would be undertaken at no cost to Council.</td>
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<td><strong>38</strong> Classification of roads</td>
<td>There is no proposal at this stage to alter the classification of the roads on which both stages of the work are proposed to be carried out, ie. Warringah Road, Forest Way and Wakehurst Parkway will remain designated as State Roads, Allambie Road (south of Warringah Road) will remain designated as a Regional Road and the remainder as local roads.</td>
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<tr>
<td>The EIS document indicates that RMS is not proposing to reclassify Frenchs Forest Road as a state road as traffic volumes along the road, even with the NBH, do not justify this occurring. In other parts of the document it is highlighted that Frenchs Forest Road currently carries a volume of traffic far exceeding its current role as a collector road (15-20,000 vpd).&lt;sup&gt;2&lt;/sup&gt;</td>
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<td>(EIS Vol. 1 p.87 - Traffic management and access – 2014)</td>
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<tr>
<td><strong>39</strong> Classification of roads</td>
<td>Roads and Maritime notes Council’s objection. Please also refer to response provided for Warringah Council Issue 38.</td>
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<td>Warringah Council strongly objects to Frenchs Forest Road being classified as a local or Regional Road and reiterates that Frenchs Forest Road should be classified as a State Road given the existing and future traffic volumes and the configuration of the street as a four lane traffic oriented road with minimal kerbside parking and providing a key connection to employment areas and a major regional facility.</td>
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<td><strong>40</strong> Infrastructure</td>
<td>The EIS acknowledges active transport modes within the precinct, both existing and future. Issues related to these would be considered during detailed design. Please refer to response provided for Warringah Council Issue 26 with regard to removal/relocation of bus shelters.</td>
</tr>
<tr>
<td>The transport network in the precinct does not only consist of vehicles. cyclist, pedestrians and users of public transport are in the precinct. Often these types of major works impact on the transport system and existing infrastructure may become obsolete or new infrastructure is required. Consideration needs to be given to seating, bus stops, bus shelters and the like. These should be developed and installed to a high standard.</td>
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<td><strong>41</strong> Signage</td>
<td>This would be addressed during detailed design for Stage 2. Development and finalisation of the wayfinding strategy would include consultation with Council. Development of the strategy would address all relevant issues including number of signs, and types and locations of directional signage for all road users.</td>
</tr>
<tr>
<td>A wayfinding strategy and plan needs to be included in the process for motorists, pedestrians and cyclists. This strategy for directing all of the user’s needs to be clear and without a proliferation of signs in the area. This may require a review, and replacement, of existing signage in the</td>
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<td><strong>Traffic management</strong>&lt;br&gt;Management issues associated with the construction phases of the project are identified above however, the following matters also need to be addressed with the operational phases of the project.</td>
<td>Noted; please refer to responses provided.</td>
</tr>
<tr>
<td><strong>Patanga Road</strong>&lt;br&gt;The effective closure of the street at Frenchs Forest Road will have an impact on the Skyline shops (as highlighted under the Parking section), local residents and service vehicles to the surrounding area. Vehicles that enter Patanga Road will need to be able to turn around without making use of resident's driveways. This is particularly important for any trucks that might pull into the street to access the shops or Frenchs Forest Road.</td>
<td>The proposed traffic changes at this intersection would allow:&lt;ul&gt;&lt;li&gt;Right turns from Patanga Road to Frenchs Forest Road East for buses and waste collection vehicles&lt;/li&gt;&lt;li&gt;Left turn from Frenchs Forest Road East to Patanga Road for all traffic&lt;/li&gt;&lt;li&gt;Left turn from Patanga Road to Frenchs Forest Road East for all traffic.&lt;/li&gt;&lt;/ul&gt;Signage would be provided to inform drivers of the access restrictions on Patanga Road. Patanga Road traffic would be monitored following completion of the project and any additional traffic management required along Patanga Road would be considered in consultation with Council.</td>
</tr>
<tr>
<td><strong>Design criteria</strong>&lt;br&gt;The EIS provides for road crossfalls of 3-6.5 per cent and footpath crossfalls of 4 per cent. Council's design requirements are that road crossfalls should not exceed 3 per cent for parking or kerbside lanes and that footpath crossfalls are to be 2.5-3 per cent.</td>
<td>These requirements would be included as design parameters/objectives for detailed design. Some departures from the standards may be required at some locations to match the existing pavement profile and footpath and/or minimise property impacts.</td>
</tr>
<tr>
<td><strong>Street lighting</strong>&lt;br&gt;With the proposed changes and upgrading of roads there will be a requirement for street lighting to be upgraded. Council does not consider that it should be asked to fund the upgrades. The costs for this work are the responsibility of Roads and Maritime.</td>
<td>The cost for any required upgrading of street lighting would be met by Roads and Maritime.</td>
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Northern Beaches Hospital Road Connectivity and Network Enhancements Project – Submissions Report
Roads and Maritime Services
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<td><strong>47</strong></td>
<td><strong>Road Maintenance and Construction Traffic</strong>&lt;br&gt;The construction of Stage 1 road works during 2015-2017 is noted together with the need for pavement reconstruction and widening (pg. 77). Council has deferred pavement works in Frenchs Forest Road West pending detailed design of the road works for the hospital. The condition of Frenchs Forest Road West is deteriorating and the potential exists for accelerated wear during the hospital construction phase with the additional construction traffic. Roads and Maritime should consider the existing road conditions in scheduling reconstruction works and liaise with Council to preserve road conditions in a safe and efficient manner.</td>
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**Biodiversity**

<p>| <strong>48</strong> | <strong>Offsets</strong>&lt;br&gt;Biodiversity Assessment Report (Vol.2, App. 3) – pg. 43, Table 3, pg. 65 Site Value Attributes&lt;br&gt;Site values attributes recorded by plot/transect for Ecological Sampling Unit (ESU) 11 appears to be an error. According to Table 3, native groundcovers were not recorded along a 50m transect within ESU 11. Table 3 also identifies that Exotic Plant Cover within ESU 11 along a 50m transect was 95 per cent cover. Based on a site inspection by Council officers, the extent of both native groundcover and exotic species is likely to be substantially different to that appearing in Table 3. The site value score generated by the Biobanking tool for ESU 11 is therefore likely to be inaccurate.&lt;br&gt;Reference to ESU 11 on page 65 states “Clearing from Stage 1 Project is mostly within modified linear strips of roadside vegetation (ESUs 9, 10, 11, 13, 14, 15). Some clearing of hollow bearing trees may be required in these areas, but the frequently mown understorey has little value as fauna habitat, other than occasional foraging by bandicoots.” ESU 11 is not a frequently mown area.&lt;br&gt;<strong>Recommendation</strong>&lt;br&gt;That assessment data relating to ESU 11 is audited and where an error has occurred that the Biobanking assessment is amended to attribute a more accurate site value score to ESU 11. It is acknowledged this | This ESU has been re-surveyed and new plot data will be included in the Stage 2 biodiversity report and used to carry out biobanking credit calculations in relation to offsets. This information will be included in the Stage 2 EIS. |</p>
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<td>vegetation condition attributed to ESU 11 may not be a factor in determining the extent of offsets required using the Biobanking methodology.</td>
<td>Coastal Upland Swamp is known to occur within 10 kilometres of the study area. This will be reflected in the EIS for the Stage 2 Project. Biodiversity report has been amended for the Stage 2 EIS to acknowledge Coastal Upland Swamp does occur within 10 kilometres of the study area as confirmed in Figure 9-3. Notwithstanding, the conclusions for the assessment of impacts for the Concept Proposal remain the same – no significant impact has been identified for this community. No changes to potential impact, none occurs within project area.</td>
</tr>
<tr>
<td>Occurrence and Assessment of the Coastal Upland Swamp EEC Report Reference - Biodiversity Assessment Report (Vol.2, App. 3) Table 13 - pg. 118, Figure 4 - pg. 23), Figure 6 - pg. 48, Page 69-70; Environmental Impact Statement (Vol. 1) Figures 9-3 - pg. 204; Surface Water Management Strategy (Vol. 3, App. M) (Lyall &amp; Associates), Table E1 - Pg. E2, App. E. The Biodiversity Assessment Report (Vol. 2, Table 13, pg.118) indicates that this EEC does not occur within a 10km radius of the site, however Figure 4 (pg. 23) and Figure 6 (pg.48) within the same report and Figures 9-3 of Environment Impact Statement (Vol. 1, pg. 204) contradicts this which shows the occurrence of vegetation attributed to the Coastal Upland Swamp EEC outside of the study area adjacent to the Wakehurst Parkway in the north. According to the Table E1 of the Surface Water Management Strategy (Vol. 3, App. M, pg. E2) hydrological changes are anticipated due to redirection of flows to the western side of the Wakehurst Parkway that may impact the swamp downstream from F25 (refer Appendix A below). A reduction in flows particularly the 2 year ARI from 1.4 to 0.22 however of more concern is the potential reduction in more frequent flows (ie &lt;2 year ARI) which may be supporting the swamp. This is further supported by the Biodiversity Assessment Report (pg. 69, 70) which states &quot;changes in hard surface area and potential change to groundwater recharge resulting from the Concept Proposal will indirectly impact soak and aquatic habitats for frogs and other groundwater dependant species outside or within the study area&quot;. The EIS assumes there will be no additional/reduced flows from the Hospital site, post development. If this conclusion changes, the assessment will need to be updated to reflect any change in hydrology and the associated impacts on downstream environments, including the identified swamp. Recommendation That the potential occurrence of the Coastal Upland Swamp EEC be...</td>
<td></td>
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<tr>
<td>Agency submission</td>
<td>Roads and Maritime response</td>
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<tr>
<td>verified on the ground where any changes in hydrology are proposed. The study area should be extended to include areas that are potentially indirectly impacted by hydrological changes. Assessment should be undertaken to determine the potential impact on the reduction of flows to the swamp particularly more frequent flows (ie &lt;2 year ARI). The assessment must be updated if there are any proposed changes to hydrology resultant from the Hospital site development that differ from the assumptions made in the EIS. It is acknowledged that the report proposes further assessment of GDE’s and associated sensitive receivers once the construction designs are finalised.</td>
<td>Unavoidable impacts on biodiversity, would be mitigated and managed through the project-specific biodiversity offset strategy outlined in Section 9.6.1 of the EIS and Appendix F. This would be consistent with the NSW offset principles for major projects (OEH 2013) and Roads and Maritime’s Guideline for Biodiversity Offsets (Roads and Maritime 2011) as well as the Draft NSW Offset Policy for Major Projects (OEH 2014) and would: • Provide options for offsetting residual significant impacts on threatened species, populations and communities, and a framework for delivery of these options • Aim to fully offset residual significant impacts on DFEC and RCT in accordance with the principles of the Offset Strategy • Present a framework for setting the scope and quantum of the biodiversity offsets that is transparent and justifiable on environmental, social and economic grounds • Investigate as a priority ‘like for like’ offsets. The latter remains unchanged. The outcomes of the consultation regarding establishment of offset sites will be reported in the EIS for the Stage 2 Project, taking into consideration the impacts of those works.</td>
</tr>
</tbody>
</table>
| **50** Offsets 
Biodiversity Assessment Report (Vol.2, App. 3) – pg. 93 Offset Measures 
It is understood that "Establishing offset sites in consultation with OEH and Warringah Council is Roads and Maritime's first priority to achieve the objectives of the Offset Strategy provided this can be achieved within a suitable timeframe and cost.” Furthermore, the report acknowledges that limited consultation on offsets has been undertaken to date. | Development of the concept design for the Concept Proposal and... |
<table>
<thead>
<tr>
<th>Agency submission</th>
<th>Roads and Maritime response</th>
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<tbody>
<tr>
<td>Based on the current preferred option for the Mona Vale Road Upgrade, as well as Stage 2 of the hospital road upgrades, further loss of the Duffys Forest Ecological Community and local connectivity will result from the upgrades. The cumulative loss of these three projects on this EEC and landscape connectivity is considered significant. <strong>Recommendation</strong> That Roads and Maritime account for the cumulative impacts of all three major projects on the Duffys Forest Ecological Community and actively pursue local offsets within the Warringah LGA (firstly seeking to offset by securing other Duffys Forest sites in the LGA, and secondly other significant ecological outcomes such as connectivity and threatened species). Where the cost of potential offsets is for the hospital connectivity upgrades is considered too great, pooling offset requirements associated with the Mona Vale Road upgrades and Stage 2 of the Hospital road upgrades should be considered where an improved outcome can be achieved.</td>
<td>Stage 1 Project has sought to minimise impacts on DFEC as far as practicable, and has been carried out in the context of the area of DFEC affected by the hospital development. As part of the biodiversity offset strategy, Roads and Maritime is investigating potential offset sites in the Warringah LGA in consultation with OEH and Council to cover both this project and the Mona Vale Road East and West upgrades. This is the priority offset measure with impacts also being offset (in order of priority) through purchase and retirement of biobanking credits, supplementary measures such as research and/or education programs related to the impacted biodiversity. Section 9.6.2 of the EIS identifies a range of complementary safeguards and management measures to mitigate impacts on DFEC.</td>
</tr>
<tr>
<td>52 Environmental management measures</td>
<td>The current design for the proposed new western car park within The Forest High School would avoid the Powerful Owl hollow bearing nest tree (<em>Angophora costata</em>) but would necessitate removal of the identified roost tree that is in the middle of the existing carpark. Further investigations will be carried out during detailed design to identify opportunities to avoid this impact. While this species is known to return to the same breeding sites they have a very large home range and often have more than one site/tree that they use. Males prefer to roost in a tree close to the nest site during breeding season and often use the same roost tree(s). There are suitable trees and tall shrubs nearby that could also be used for roosting. Should removal of the tree be required it would be undertaken outside of the breeding season. If detailed design identified an opportunity to retain the tree, Roads and Maritime would ensure that hardstand does not encroach on the tree protection zone (TPZ). A porous material would be used around the base of the tree along with fencing around the perimeter of the TPZ to avoid cars driving over the roots.</td>
</tr>
<tr>
<td>Biodiversity Assessment Report (Vol.2, App. 3) – pg. 182 Assessment of Significance - Powerful Owl Urban Design Report and Landscape Character and Visual Impact Assessment – pg. 54</td>
<td>The assessment of impacts on this species acknowledges the high site fidelity shown by Powerful Owls and that all large hollows would be retained. Council is aware that a known nest tree occurs in the study area immediately adjacent to the proposed works. The Urban Design Report indicates that a roost tree used by the male bird for roosting during nesting is proposed for removal. No acknowledgement of the significance or otherwise of the known nest hollow and associated roosting tree/s is included in the report. The proposed works are not considered to be consistent with the Recovery Plan for this species. Council officers are also aware of a Powerful Owl which was hit by a car and killed in 2012 adjacent to ESU 5 on Wakehurst Parkway. <strong>Recommendation</strong> The Assessment of Significance for the Powerful Owl be amended to</td>
</tr>
</tbody>
</table>
### Agency submission

account for the known occurrence of a nest hollow within the study area. Where necessary, impact mitigation should also be amended accordingly.

### Hydrology, water quality and flooding

<table>
<thead>
<tr>
<th>53</th>
<th><strong>Water quality devices</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Further clarification is required regarding the maintenance responsibilities including ease of access for water quality devices PCD1 and 3 which are located on council land, including during construction works and beyond. It is assumed PCD2 will be managed by Roads and Maritime as it is on Roads and Maritime land.</strong> It is suggested additionally PCD be relocated to the end of the cul de sac in Winslea Avenue to better improve maintenance access and additionally treat more of the surface flow from a larger upstream catchment.</td>
</tr>
</tbody>
</table>

### Roads and Maritime response

| 53 | A flooding and hydrology investigation (Appendix M to the EIS) was prepared for the Concept Proposal and Stage 1 Project by a suitably qualified specialist and in accordance with industry best practice. Section 16.4.2 of the EIS notes that Roads and Maritime would consult with Council during detailed design with regard to provision of the three proposed in-line pollution control devices. This would include consideration of maintenance-related issues for PCD1 and PCD3. Roads and Maritime confirms it will manage PCD2. Roads and Maritime agrees to the suggested relocation of PCD3 to the Winslea Avenue location. |

<table>
<thead>
<tr>
<th>54</th>
<th><strong>Stormwater drainage impacts</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>The three stormwater designs need to be assessed in consideration of all Health Infrastructure and Roads and Maritime EIS's (Stage 1 - RMS, Stage 2 - RMS, Stage 2 - HI) to ensure a coordinated solution is developed that considers the cumulative impacts of all proposals.</strong></td>
</tr>
</tbody>
</table>

### Roads and Maritime response

| 54 | Section 16.4.1 of the EIS notes that a drainage management strategy has been developed for the Stage 1 Project and would be developed further for the Stage 2 Project to mitigate impacts of the overall project (Concept Proposal). Roads and Maritime has consulted regularly with Health Infrastructure with regard to issues relating to interaction of their respective projects. This would continue during detailed design and include consideration of issues such as cumulative drainage impacts. Council would be consulted with regard to matters related to its stormwater drainage infrastructure. Drainage design development by Roads and Maritime has considered the proposed drainage design for the hospital site. |

<table>
<thead>
<tr>
<th>55</th>
<th><strong>Stormwater drainage impacts</strong></th>
</tr>
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<tbody>
<tr>
<td></td>
<td><strong>The Lyall and Associates Water management strategy demonstrates significant stormwater flow reductions to catchment 2 and specifically drainage line 2 (Trefoil Creek). The strategy assumes that the hospital site will be providing on site stormwater detention as part of the development works to limit flows to maintain pre-development conditions.</strong></td>
</tr>
</tbody>
</table>

### Roads and Maritime response

<p>| 55 | The Stage 2 hospital EIS includes a stormwater management strategy (Appendix O). This indicates that on-site detention would be provided such that post-development flows are less than or equal to pre-development flows. Roads and Maritime will consult with Health Infrastructure during detailed design with regard to allowing for runoff from the developed hospital site. However, it is the responsibility of Health Infrastructure to demonstrate satisfactory compliance with Council's requirements with |</p>
<table>
<thead>
<tr>
<th>Agency submission</th>
<th>Roads and Maritime response</th>
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<tbody>
<tr>
<td>Confirmation is to be provided that the NBH development will be providing on site stormwater detention in accordance with Councils OSD Technical specification to limit flows to state of nature conditions.</td>
<td>regard to stormwater runoff from the hospital site.</td>
</tr>
</tbody>
</table>

**Development Assessment**

<p>| 56 | What system is in place for properties affected by the Stage 1 and 2 road works to get detailed timings and plans in case they are looking to develop their land through a DA or CDC? | As noted in Section 5.2.11 of the EIS, acquisition of affected properties would be carried out in accordance with the Roads and Maritime Land Acquisition Guide (RTA, 2010) and relevant provisions in the Roads Act 1993 and Land Acquisition (Just Terms Compensation) Act 1991. Roads and Maritime has commenced consultation with affected business and property owners, and this would continue through to completion of the acquisitions. Information on timing and related issues would be made publicly available via the project website. Development proposals for properties adjoining Roads and Maritime roads are referred to Roads and Maritime for comment. For development proposals adjoining locals roads, Council would have the discretion to consult with Roads and Maritime. |
| 57 | Council considers it is essential that all DAs for properties adjoining the proposed road works be referred to the RMS for comment. How does the Roads and Maritime want this to happen to avoid developments being approved that subsequently cannot be built or need major modifications due to acquisition of land or changes to roads and access driveways. | All affected property owners have been informed of the potential acquisition of their properties. With regard to assessment of development applications on land identified for acquisition, Roads and Maritime will seek advice from its property section, and consult further with Council once advice has been received. |
| 58 | Council will be informing applicants through its Prelodgement Meeting and Duty Planning enquiries process for any future developments which may need to consider the Roads and Maritime road works in their planning, design and assessment. | Roads and Maritime has noted this and would also provide Council with suitable information to facilitate the provision of advice to applicants with regard to circumstances requiring the referral of development applications to Roads and Maritime. |
| 59 | A detailed Construction and Traffic Management Plan should be prepared to minimise and manage disruption to surrounding residential properties and through-traffic, including noise, dust, kerbside parking, bus stops, construction traffic and staff parking and machinery/materials storage. Cumulative effects of all proposals (Stage 1 - Roads and Maritime, Stage 2 - Roads and Maritime, Stage 3 – Health Infrastructure) | Section 7.5 of the EIS indicates a detailed construction traffic management plan (TMP) would be prepared and implemented for the Stage 1 Project. Where appropriate, this would include consideration of relevant matters associated with the Stage 2 Project (such as access to construction compound sites, etc). Preparation of the plan would include consultation with Health Infrastructure to accommodate, where |</p>
<table>
<thead>
<tr>
<th>Agency submission</th>
<th>Roads and Maritime response</th>
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</thead>
<tbody>
<tr>
<td>should be considered.</td>
<td>reasonable and feasible, construction traffic issues associated with hospital construction. Additionally, an Interface Agreement between Health Infrastructure and Roads and Maritime is being prepared to ensure that the planning and delivery of both projects is coordinated.</td>
</tr>
<tr>
<td>60 A final full list of all affected properties should be provided to Council so</td>
<td>Subject to obtaining planning approval, Roads and Maritime would provide this information to Council.</td>
</tr>
<tr>
<td>that a layer can be created in Council's GIS system for DA assessment and referral</td>
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<tr>
<td>purposes.</td>
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<tr>
<td>61 The proposal to relocate the public carparking in front of the Skyline Shops</td>
<td>Roads and Maritime has investigated alternative options to provide compensatory parking to replace the 16 on-street car parking bays outside the Skyline Shops that would be removed as part of the Stage 1 Project. Further information is provided in Section 6.1 of this report.</td>
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<td>is uncertain.</td>
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<td>Prior to any removal of this parking, an alternative should be found which</td>
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<td>provides for convenient parking for users of the centre and which can be relied</td>
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<td>upon legally and in perpetuity. Disabled access, loading and unloading, public</td>
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<td>domain (paving, landscaping) and waste management must also be considered in the</td>
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<td>adjustment to the road reserve in front of the shops.</td>
<td></td>
</tr>
<tr>
<td>62 Roads and Maritime should carry out a check of any existing development</td>
<td>During detailed design, Roads and Maritime would identify any such development consents and assess the extent to which they might be affected by the project. Resolution of any identified issues would be carried out in consultation with Council and the affected consent holder(s).</td>
</tr>
<tr>
<td>approvals which will be affected by the road works. In this regard, if a</td>
<td></td>
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<td>development consent requires certain matters to be provided (such as parking</td>
<td></td>
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<td>and signage) and the road works will impact on that provision, alternative</td>
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<tr>
<td>arrangements may be required and may involve modifying such consents.</td>
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<td>63 Consideration be given to street tree replacement in accordance with</td>
<td>This would be undertaken in the context of a detailed landscape plan that would be prepared for the project (refer Section 11.6 of the EIS). Development of the landscape plan would include consultation with Council.</td>
</tr>
<tr>
<td>Warringah Councils requirements.</td>
<td></td>
</tr>
<tr>
<td>64 <strong>Development Assessment–Stage 2</strong></td>
<td>This issue will be addressed in the EIS for the Stage 2 Project.</td>
</tr>
<tr>
<td>Development Assessment would like to see the following details for the</td>
<td></td>
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<tr>
<td>Stage 2 road works.</td>
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<tr>
<td>Construction Traffic Management plans to show how the flow of through traffic</td>
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<tr>
<td>can reasonably be maintained during construction to allow commuters to get to</td>
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</tr>
<tr>
<td>work and local residents to move around.</td>
<td></td>
</tr>
<tr>
<td>Agency submission</td>
<td>Roads and Maritime response</td>
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</tbody>
</table>
| **65** Development Assessment–Stage 2  
Any adjustments to footpaths and roadworks must consider vehicular access to private properties that are affected (for example Naree Street properties). In relation to driveway gradients and turning bays in front setbacks, any solution would need to comply with Councils LEP/DCP requirements. | Please refer to response provided for Warringah Council Issue 64. |
| **5** Health Infrastructure  
1 Thank you for the opportunity to review the Stage 1 EIS for the above works. As you are aware Health Infrastructure (HI) has been working closely with Roads and Maritime to ensure that our hospital proposal and the surrounding road works support this important Government project. We have reviewed the Roads and Maritime EIS and have no specific comments in relation to the documentation. HI will continue to work closely with Roads and Maritime to ensure that coordination between the two projects is achieved. Any issues that may arise out of the construction phases of the projects can be managed on the basis of this relationship. | Roads and Maritime has noted this and acknowledges the value of the consultation process carried out to date and would continue to regularly engage with Health Infrastructure to ensure timely consideration and resolution of issues related to both projects in order to minimise impacts to the local community and to road users. |
5 Preferred infrastructure report

5.1 Overview

During and subsequent to the exhibition of the EIS, Roads and Maritime has identified a number of design and/or project changes. These changes do not substantially alter the Stage 1 Project and are a result of opportunities identified to further minimise and manage environmental impacts or in response to concerns raised in public submissions and other community and stakeholder engagement mechanisms, as well as ongoing design development and construction programming.

As required by section 115Z(6) of the EP&A Act, Roads and Maritime has prepared a preferred infrastructure report (PIR) to document these design and/or project changes, assess their impacts and where required, provide additional measures to manage and mitigate impact.

The additional construction compound sites are shown in Figure 5-1. The preferred project is shown in Figures 5.2 to 5.5.

5.2 Adjustment and protection of utility services

5.2.1 Background

As detailed in Section 5.1.3 of the EIS, utility service investigations indicated that water mains, sewer mains, gas, telecommunications, optic fibre and electrical transmission lines would require protection, relocation or adjustment as part of the Concept Proposal (including the Stage 1 Project and Stage 2 Project areas). Table 5.1 identifies the services likely to be affected as part of the Concept Proposal.

Table 5.1 Services requiring relocation or adjustment

<table>
<thead>
<tr>
<th>Utility type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>• High pressure mains for Northern Beaches regional supply</td>
</tr>
<tr>
<td>Water</td>
<td>• Reservoir supply main for Sydney City and Northern Beaches</td>
</tr>
<tr>
<td></td>
<td>• Trunk supply main for Warringah regional and local supply</td>
</tr>
<tr>
<td>Sewer</td>
<td>• Gravity sewer mains connections from the hospital site and Skyline Business Park</td>
</tr>
<tr>
<td></td>
<td>• Local gravity sewer overflow to drainage system</td>
</tr>
<tr>
<td>Electricity</td>
<td>• 132kV pilot cable</td>
</tr>
<tr>
<td></td>
<td>• 33kV overhead regional and local supply</td>
</tr>
<tr>
<td></td>
<td>• 11kV overhead and underground local supply</td>
</tr>
<tr>
<td>Communications</td>
<td>• International ocean crossing fibre optic cable and dual terrestrial connections</td>
</tr>
</tbody>
</table>
Utility adjustments specific for the Stage 1 Project area were detailed in Section 5.2.10 of the EIS and reflect the utility types in Table 5.1. The relocation or adjustment of these utilities would precede construction of the Stage 1 Project’s key road elements.

The approval of the Stage 1 Project would only facilitate utility adjustments within the Stage 1 Project area and adjacent side streets. However, to minimise environmental impacts associated with the need for a number of temporary or ‘sacrificial’ utility works that would be required between the interfaces with Stage 1 and Stage 2 projects, the preferred approach is to include all utility adjustment works from the Stage 2 Project area into the Stage 1 Project. Subject to approval, this would enable all utility services, adjustments and protection works to occur prior to key road construction activities of Stage 1 commencing.

5.2.2 Justification

Utility adjustments form a critical and complex enabling work as part of the Concept Proposal. To facilitate effective management of this work there is a need to carry out the Stage 1 and Stage 2 utility adjustments concurrently due to the overlap between both project areas.

Due to multiple interfaces with Stage 1 and Stage 2 Project areas at Forest Way, Warringah Road, Wakehurst Parkway and Allambie Road and the existing utility network within the Concept Proposal study area, a number of temporary or ‘sacrificial’ works would be required should utility adjustments be undertaken in a staged approach. These temporary or ‘sacrificial’ works would then need to be removed when the permanent relocation is completed as part of the Stage 2 Project. This approach would result in additional inconvenience and impacts to residences and road users in addition to rework and cost.

Additionally, telecommunication service providers typically require that any optic fibre adjustment be from ‘node to node’ in nominated pits with splicing not preferred and/or feasible. This requirement may not allow for telecommunication service adjustments to be carried out in a staged approach as envisaged in the EIS.

A concurrent approach to the utility adjustments allows utility owners to undertake the work at one time with an overarching strategy for the adjustments. This approach provides greater efficiency and allows for a utility design that considers and minimises impacts to the environment, community and road users.

Another benefit of the concurrent approach to utility adjustments would be in the reduced construction program for the Stage 2 Project, as the associated utility infrastructure enabling works would have been completed. This would reduce the total time that the community and road users are exposed to amenity and traffic related construction impacts.
5.2.3 Description of works

As discussed in Sections 5.1.3 and 5.2.10 of the EIS, utility investigations indicated that gas, water, sewer, electricity and communications would require relocation or adjustment. Utility investigation to date includes ‘Dial before you Dig’ queries as well as visual surveys to determine the full extent of existing utilities services in the Concept Proposal study area. No new utilities have been identified since exhibition of the EIS.

The proposed adjustment and relocation strategy detailed in Section 5.2.10 of the EIS for the Stage 1 works would also be applicable to the utility adjustment works described in this PIR. This would include:

- Further detailed utility investigations (revised ‘Dial before you Dig’ queries and/or pot-holing to confirm location of buried services)
- Ongoing consultation with utility owners
- Ongoing detailed design
- Carrying out utility works in accordance with environmental safeguards and utility owner requirements and construction methods.

Notwithstanding, there is a preference to keep relocated utilities within the road corridor for maintenance purposes. Common trenches would be provided under proposed footpaths/ shared paths for telecommunications, gas and sewer where possible.

Disturbed areas within the Stage 2 Project area would be stabilised and subsequently reinstated as part of Stage 2 Project. In the event that the Stage 2 Project does not proceed, the areas disturbed by the utilities relocations in the Stage 2 Project area would be rehabilitated.

As discussed in Section 5.4.10 of the EIS, there may be a need to undertake proposed utility adjustment works outside of the standard working hours to minimise disruption to daily traffic and disturbance to surrounding land owners and businesses.

Preliminary designs, which have been carried out in consultation with utility owners, have identified possible layouts for relocations and adjustments. Table 5.2 provides the general locations for each utility relocation and adjustment work.

<table>
<thead>
<tr>
<th>Utility</th>
<th>General locations for relocations and adjustments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gas</td>
<td>• Wakehurst Parkway, Warringah Road, Forest Way, Frenchs Forest Road West, Fitzpatrick Avenue East, Hilmer Street, Aquatic Drive, Primrose Avenue and Bantry Bay Road.</td>
</tr>
<tr>
<td>Water and Sewer</td>
<td>• Wakehurst Parkway, Warringah Road, Forest Way, Frenchs Forest Road West and East, Hilmer Street, Fitzpatrick Avenue East, Bantry Bay Road, Aquatic Drive and Allambie Road.</td>
</tr>
<tr>
<td></td>
<td>• Existing rising mains (pressure reducing valve facilities) are located on the corner of Cobb Street and Frenchs Forest Road West and Skyline Place and Frenchs Forest Road East. Preliminary discussions indicate that these would be avoided.</td>
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<tr>
<td></td>
<td>• A new sewer connection point is proposed for the hospital site either via Bantry Bay Road.</td>
</tr>
</tbody>
</table>
### Utility | General locations for relocations and adjustments
--- | ---
 | Bay Road and Warringah Road or via Wakehurst Parkway north of Frenchs Forest Road West.
Electricity | • Rabbett Street, Frenchs Forest West and East, Warringah Road, Bantry Bay Road, Aquatic Drive, Wakehurst Parkway, Fitzpatrick Avenue East, Romford Road and Patanga Road.
Communications | • Forest Way, Frenchs Forest Road West and East and Warringah Road
• Preliminary discussions with utility owners suggest a joint telecommunications trench for multiple services within the same corridor.

The final alignment and strategy for relocations and adjustment would be confirmed during detailed design in consultation with utility owners.

#### 5.2.4 Potential impacts

The majority of utility relocations would be undertaken within the existing Concept Proposal area. However, some utilities would require relocation outside this area as predicted in Section 5.2.10 of the EIS. Where relocations extend beyond the Concept Proposal area it is anticipated that these relocations would remain within existing road reserve, either under the road or adjacent footpaths. Due to configuration of various networks, some local roads such as Aquatic Drive, Allambie Road, Rodborough Road, Rabbet Street, Fitzpatrick Avenue East and Bantry Bay Road may be subject to utility adjustments.

The main impacts of the utility adjustments would be associated with excavation works and the need to maintain clear zones for relocated overhead electricity. Impacts from the Stage 1 utility adjustments were considered in the EIS as part of the wider construction activities but not specifically detailed. The impacts resulting from the utility adjustments within the Stage 2 Project area would be consistent with that described for the Stage 1 Project. These would include amenity impacts relating to noise and vibration including the potential for out of hours work, visual impacts, potential erosion and sedimentation risks, potential access disruption to local residents or road users and minor tree removal/trimming to maintain clear zones. There may also be traffic impacts associated with temporary road closures which may be required, such as for worker safety.

The majority of utility relocation and/or adjustment works would be contained with in the footpath reservation of Forest Way, Warringah Road, Wakehurst Parkway, Naree Road, Frenchs Forest Road, Allambie Road and Aquatic Drive. Detailed traffic control plans would be prepared by the construction contractor to safely divert vehicular and pedestrian traffic around work sites. In addition, there may be instances where utilities may require road crossings. These works would be undertaken under a road occupancy license with prior approval from Traffic Management Centre. The contractor would be required to strictly adhere to any conditions imposed by Traffic Management Centre including restriction of work hours, the minimum number of lanes to remain open, and all other relevant matters.

Specifically in terms of noise and vibration impacts, it is anticipated that there would be exceedances of construction noise management levels (NML) for residential, commercial and
other sensitive receivers within the Stage 2 area, similar to those predicted for the Stage 1 Project. Section 8.4.2 of the EIS provides consideration of utility relocations within the broader main corridor works and Table 8.14 of the EIS provides worst case exceedances during standard construction hours and during out of hours works. Due to the nature of the utility adjustments, the worst case exceedances of the NML would be within the lower end of the ranges provided and would be effectively managed through the implementation of the environmental management measures provided in Section 8.6 of the EIS for Stage 1 work.

In addition, following review of the constraints within the Concept Proposal area, it was identified that impacts associated with utility relocation and adjustment along Warringah Road (within the Stage 2 Project area) required further consideration within the PIR and is detailed as follows.

As described in Section 6.2 of this report, off road shared paths are proposed as part of the Stage 1 Project. Off road shared cyclist/pedestrian paths would also be provided on both sides of Warringah Road as part of the Stage 2 Project, which would connect to the Stage 1 shared paths and the local cycle network consistent with Warringah Council's bike plan. A description and assessment of the Stage 2 off road shared paths would be documented in the Stage 2 EIS.

However, as detailed above for maintenance purposes and to limit the construction footprint, common trenches for utilities are intended to be provided under the proposed Stage 2 off road shared paths. The area of impact associated with utility trenching along Warringah Road is consistent with the Concept Proposal impact area described in Section 9.3.1 of the EIS. This includes potential removal and indirect impacts on DFEC. This impact area is also included within Table 9.4 of the EIS (ie vegetation anticipated to be cleared as part of the Concept Proposal).

Minor tree removal and/or trimming may also be required depending on the relocation/adjustment of the overhead electricity particularly on the northern side of Warringah Road. Where possible, impacts would be minimised through detailed utility design and in consultation with the utility owner. An additional safeguard to those detailed in the EIS is proposed to further minimise impacts to vegetation in this area.

The EIS identified a surviving pear tree of the Former Holland’s Orchard Trees on the northern road verge of Warringah Road adjacent to The Forest High School. Section 13.3.1 of the EIS assessed the potential impacts on heritage items from the Concept Proposal and identified that this pear tree may be impacted by construction activities during the Stage 2 Project. However, it was subsequently identified that this tree would be affected by the utility relocations that would occur as part of the Stage 1 Project.

Accordingly, it is considered appropriate that the impacts on DFEC and the pear tree instead be included with other impacts of the Stage 1 Project.

An addendum to the statement of heritage impact (SOHI) has been prepared to consider the potential impact on the pear tree from utility trenching and is attached in Appendix C. While the heritage significance will be affected as a result of the tree being impacted it was acknowledged that the tree is in an incongruous setting. The addendum to the SOHI recommends a number of management measures that would be implemented prior to works that would impact the tree. The impact on the tree and the proposed management measure has also been discussed with Warringah Council (12 February 2015). Council recommended a number of options for management of the pear tree, including use of an arborist to confirm likelihood of survival of tree if relocated, taking cuttings for propagation, suggestions on a receiving site and a commemorative
plaque. These options were considered and included within the new mitigation for the management of pear tree provided in Section 5.2.5.

5.2.5 Environmental management measures

Due to the minor nature of the works, it is considered that the environmental management measures provided in the EIS for the Stage 1 work would be applicable to the utility adjustments in this PIR. However, additional measures have been identified to manage excavations around tree roots, particularly along the northern side of Warringah Road and to manage the impact to the pear tree of the Former Holland’s Orchard Trees. These are as follows:

- Excavations required in proximity to retained trees which may impact the critical root zone are to be carried out in consultation with a suitably qualified and experienced arborist to ensure roots are not damaged in a way that could detrimentally affect tree health.
- Prior to works that will impact the pear tree a suitably qualified and experienced arborist would examine the tree to determine if relocation is a viable option. If relocation is not viable, propagation will be undertaken. Warringah Council and the Department of Education and Training will be consulted regarding a receiving site for the relocated or propagated tree. Archival recording of the pear tree will precede relocation or propagation.

5.3 Additional construction compound site

5.3.1 Background

During the EIS process for the Concept Proposal and Stage 1, a construction compound site was identified at a location on Aquatic Drive, Frenchs Forest. This site was assessed and detailed in Section 5.4.8 of the EIS. Section 5.4.8 of the EIS also noted the potential for additional sites to be identified during detailed design and/or construction. Subsequent to the exhibition of the EIS, Roads and Maritime has identified an additional construction compound site to the north-east of the intersection of Wakehurst Parkway and Warringah Road.

5.3.2 Need and justification

Investigations into an additional construction compound site were carried out to identify any opportunities for a location that was closer to the work site to facilitate better day-to-day access to materials, stockpiling, and plant and equipment.

Section 5.4.8 of the EIS identified the site at Aquatic Drive as having sufficient area to store the quantity of materials anticipated to be required for a phased construction program for both Stage 1 and Stage 2. However, a site within or immediately adjacent to the work site would facilitate better day-to-day access to materials and plant and equipment that would be in regular use. It would also provide better access to emergency and spill containment products and measures in the event of an incident.

The location of the additional construction compound site is to the immediate northeast of the intersection of Wakehurst Parkway and Warringah Road. The site is ideally located as it is immediately adjacent to the Stage 1 Project area and within the Stage 2 Project area (the site would also be used for the Stage 2 Project subject to approval). The site has additional benefits
as it is in an already highly disturbed environment, would reduce impacts on the road network when used in conjunction with the compound site at Aquatic Drive, and would also reduce noise and other amenity-related impacts on residents.

### 5.3.3 Site description and purpose

The additional construction compound site is located on Lot 11 and Lot 12, DP 109259 (refer to Figure 5.1). These lots are owned by Roads and Maritime and are bordered by Warringah Road and Wakehurst Parkway to the south and west respectively. Existing vegetation separates the lots from Frenchs Forest Road to the north and commercial properties near the Skyline Business Park to the east.

The site is about one hectare in area; it has been previously used by Roads and Maritime as a stockpile location for maintenance purposes but is currently disused. The existing vegetation has been mapped as Urban Native and Exotic Cover in the Biodiversity Assessment Report (Appendix F to the EIS) and is largely disturbed and interspersed with urban exotic/native weed vegetation. This notwithstanding, the site has been mapped as occurring within the Priority 1 Wildlife Corridor (Smith and Smith 2005) and Grey-headed Flying-fox were recorded in the vicinity of the site during the field surveys for the EIS. In addition, the surrounding vegetation is identified as DFEC which is in moderate to good condition (ESUs 6a and 6b identified in Section 9.2.3 of the EIS).

The use of the additional construction compound site would be mainly for material storage (including stockpiling). The types of materials expected to be stored and/or stockpiled in this location would be similar to those listed in Section 5.4.5 of the EIS. The site would consist of a hardstand area and would also provide an administrative office, amenities and lunch sheds for site personnel and vehicle parking. It is anticipated that vehicle parking would be limited to about 6-8 light vehicles. Buildings used on the site would be temporary prefabricated buildings and the site would be securely fenced with temporary fencing. All necessary signage advising the general public of access restriction would be provided.

Access to the site would be from Warringah Road and would be controlled (ie left in/left out only) to minimise impacts on the traffic network. The site would be utilised for the duration of the construction periods for both the Stage 1 and Stage 2 Projects (subject to approval).

The additional construction compound site would mainly operate during standard working hours as detailed in the *Interim Construction Noise Guideline* (DECC 2009). On occasions, there would be a need for the site to operate outside of standard construction hours to assist in the coordination of works detailed in Section 5.4.10 of the EIS and also in association with the delivery of materials.

At this stage, no batching is proposed at the site. Should a temporary batching plant be required to be established, additional environmental assessment would be undertaken.

Figure 5.1 provides an indicative site layout and shows the location of the access point. The final layout would be confirmed by the construction contractor during detailed design.
5.3.4 Assessment

As detailed in Section 5.4.8 of the EIS, the selection of any additional compound sites would be considered against the site selection criteria detailed in Table 5.8 of the EIS. These are provided in Table 5.3 together with consideration of the key environmental issues associated with use of the site.

**Table 5.3 Compound site selection criteria**

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Discussion</th>
<th>Criterion met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Located more than 50 metres from a waterway.</td>
<td>The additional compound site is not located within 50 metres of a waterway. Further consideration of erosion and sedimentation impacts is provided below.</td>
<td>✓</td>
</tr>
<tr>
<td>Located within or adjacent to land where the SSI is being carried out.</td>
<td>The additional compound site adjoins the Stage 1 and Stage 2 Project areas east of the intersection of Warringah Road and Wakehurst Parkway.</td>
<td>✓</td>
</tr>
<tr>
<td>Have ready access to the road network.</td>
<td>The additional compound site has ready access to Warringah Road. Further consideration of traffic and transport impacts is provided below.</td>
<td>✓</td>
</tr>
<tr>
<td>Located to minimise the need for heavy vehicles to travel through residential areas.</td>
<td>The additional compound site is located adjacent to Wakehurst Parkway and Warringah Road. This location minimises the need for heavy vehicles to travel through residential areas. Further consideration of traffic and transport impacts is provided below.</td>
<td>✓</td>
</tr>
<tr>
<td>Sited on relatively level land.</td>
<td>The site is on relatively level land.</td>
<td>✓</td>
</tr>
<tr>
<td>Separated from nearest residences by at least 200 metres (or at least 300 metres for a temporary batching plant).</td>
<td>The additional compound site is separated from the nearest residences by at least 200 metres. The site will not be used for a temporary batching plant. Further consideration to noise and vibration impacts is provided below.</td>
<td>✓</td>
</tr>
<tr>
<td>Not require vegetation clearing beyond that already required by the SSI.</td>
<td>Vegetation removal would be required in some locations (less than 0.7 hectares). However, this vegetation is highly disturbed and consists of urban exotic/native weed vegetation. Further consideration of biodiversity impacts is provided below.</td>
<td>✗</td>
</tr>
</tbody>
</table>
### Criterion Discussion

<table>
<thead>
<tr>
<th>Criterion</th>
<th>Discussion</th>
<th>Criterion met?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not impact on heritage items (including areas of archaeological sensitivity) beyond those already impacted by the SSI.</td>
<td>No heritage items are located on or directly adjacent to the additional compound site.</td>
<td>✓</td>
</tr>
<tr>
<td>Not unreasonably affect the land use of adjacent properties.</td>
<td>It is not anticipated that land uses of adjacent properties would be unreasonably affected.</td>
<td>✓</td>
</tr>
<tr>
<td>Be above the 20 year ARI flood level unless a contingency plan to manage flooding is prepared and implemented.</td>
<td>The additional compound site is above the 20 year ARI flood level.</td>
<td>✓</td>
</tr>
<tr>
<td>Provide sufficient area for the storage of raw materials to minimise, to the greatest extent practical, the number of deliveries required outside standard construction hours.</td>
<td>In conjunction with the compound site identified in the EIS, the additional site would assist in minimising the number of deliveries required outside standard construction hours.</td>
<td>✓</td>
</tr>
</tbody>
</table>

### Traffic and transport

The additional construction compound site is located adjacent to Wakehurst Parkway and Warringah Road and has ready access to the main arterial road network via Warringah Road. Figure 5.11 of the EIS details the haulage routes for the Stage 1 Project. The additional compound site is ideally located within the context of the proposed routes and would not require an additional haulage route during construction.

As detailed in Section 7.3.2 of the EIS, the estimated construction traffic movements during the Stage 1 Project are expected to reach 100 heavy and 100 light vehicle movements per day, or up to 15 heavy and 15 light vehicle movements per hour during the morning and evening peak hours, on the assumption that 15 per cent of total daily movements occur during the peak hours. For the purposes of the EIS, it was considered that only a proportion of these total movements would use the construction compound site on Aquatic Drive.

The additional construction compound site would supplement the site on Aquatic Drive and would mainly be used for material storage including stockpiling. As such, it is envisaged that up to 20 heavy and 10 light vehicle movements per day would use the additional compound site. The additional compound site would therefore reduce heavy and light vehicle movements on Allambie Road and Aquatic Drive resulting in reduced traffic-related impacts on these roads.

The effect of construction compound traffic on arterial road traffic flow is not anticipated to be substantial given that Warringah Road currently carries up to 80,000 vehicles per day while Wakehurst Parkway carries 20-30,000 vehicles daily. The proposed heavy and light vehicle movements have already been assessed within Section 7.3.2 of the EIS.

Localised impacts may occur in proximity to the site access point which may have flow on impacts to the arterial road network. However, the location of the access point together with restricting access to left in/left out only would minimise potential impacts and allow them to be managed.
appropriately. The proximity of a signalised intersection would also assist in managing impacts associated with vehicles entering and exiting the site.

Considering the above impacts, the proposed safeguards and mitigation measures developed for Stage 1 Project traffic and transport impacts (Table 7.8 of the EIS) are adequate. The additional compound site would be subject to a site-specific traffic control plan under the proposed construction traffic management plan. This would ensure adequate access arrangements are included as well as the detail of required signs and other traffic management devices.

Noise and vibration

Noise and vibration impacts associated with use of the additional compound site would mainly result from site establishment and operation and associated construction vehicle movements. The site is separated from the nearest residences on Frenchs Forest Road East (NCA-17) by at least 200 metres. Noise impacts may also be experienced at residences within NCA-12 (Frenchs Forest Road West) and NCA-9 (Bantry Bay Road). Commercial receivers may also be impacted in NCA-15 and NCA-16.

A noise assessment has been prepared for the additional compound site and the Noise Management Level (NML) exceedances are summarised in Table 5.4. The methodology and construction noise scenario used were based on the assessment carried out for the main compound site on Aquatic Drive and as described in Chapter 8 of the EIS.

**Table 5.4 Summary of airborne construction NML exceedances for additional compound site**

<table>
<thead>
<tr>
<th>Receiver type</th>
<th>Worst case NML exceedance</th>
<th>at most affected receiver (dB)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Standard construction hours</td>
<td>Out of Hours Works</td>
</tr>
<tr>
<td>Residential</td>
<td>3–15</td>
<td>1–36</td>
</tr>
<tr>
<td>Commercial</td>
<td>2–14</td>
<td>2–14</td>
</tr>
</tbody>
</table>

The predicted noise levels indicate worst-case exceedances of the NMLs of up to 15 dBA and 36 dBA for construction at the nearest residence to the works during standard construction hours and out-of-hours works respectively. These exceedances are for NCA14 (which contains the proposed additional site compound) and are based on the works being at the closest position within the works area to the receiver. Commercial receivers are predicted to be subject to NML exceedances of up to 14 dBA.

The implementation of the safeguards and mitigation measures identified for the Stage 1 Project (refer to Table 8.21 of the EIS) including procedures for notifying residents and business owners of construction activities likely to affect their amenity would manage the potential impacts identified in Table 5.5.

Vibration impacts are not anticipated due to the activities being carried out at the additional compound site.

Section 8.4.2 of the EIS also considered impacts from construction vehicle movements. The establishment and operation of the additional compound site is not anticipated to result in any additional impact from construction vehicle movements. Use of this site would not contribute any
additional heavy or light vehicles above those already assessed for the Stage 1 Project and the associated vehicle movements would be mainly confined to the existing arterial road network.

Biodiversity

The additional compound site is vegetated and has been mapped as Urban Native and Exotic Cover in the Biodiversity Assessment Report (Appendix F of the EIS). This area has been previously cleared and used by Roads and Maritime as a stockpile location for maintenance purposes. The vegetation is largely disturbed and the groundcover is weedy with a dense midstorey of *Acacia saligna* regrowth. As shown in Figure 5.4, it is proposed to remove the vegetation mapped as Urban Native and Exotic Cover which equates to about 0.7 hectares to facilitate the establishment and operation of the site. The surrounding DFEC would not be impacted by the additional compound site and would be protected from inadvertent damage with the implementation of an exclusion zone (perimeter fencing/screening) established around the site where the site borders identified DFEC.

As described above, the additional compound site is located within a Priority 1 Wildlife Corridor (Smith and Smith 2005) and Grey-headed Flying-fox was recorded in the vicinity of the site during the field surveys for the EIS. The removal of about 0.7 hectares of weedy and largely disturbed vegetation is not anticipated to impact on the wildlife corridor or Grey-headed Flying-fox. Wildlife connectivity in this area is already severely limited by the existing road network and the recent removal of vegetation at the Northern Beaches Hospital site. This notwithstanding, the surrounding DFEC would not be impacted by the additional site compound and would still provide for a vegetated corridor in this area for opportunistic fauna movements following completion of construction works.

Another impact typically associated with vegetation removal is an increase in edge effects with the spread of weeds. Due to its urbanised location and the existing mosaic of weedy and largely disturbed vegetation and moderate to good condition DFEC, it is anticipated that edge effects already exist in this area. It is not anticipated that the removal of about 0.7 hectares of weedy and largely disturbed vegetation and operation of the additional site compound would result in additional edge effects to the DFEC. Safeguards and mitigation measures identified for the Stage 1 Project (refer to Table 9.8 of the EIS) would be adequate in managing risks associated with edge effects, eg weed management.

Following completion of the construction works, the site would be revegetated with local native trees, shrubs and groundcovers that occur in DFEC. This would provide a number of associated benefits to the existing DFEC as well as fauna in the form of habitat and foraging resources.

Soils and water quality

The removal of about 0.7 hectares of vegetation and operation of the additional site compound could result in potential erosion, sediment and water quality impacts. Drainage from the site generally flows south into the Curl Curl Creek catchment through existing pavement drainage system on Warringah Road and an unnamed drainage line.

Erosion and subsequent sedimentation resulting from the additional compound site, if uncontrolled, could potentially degrade water quality from increased sediment load. Spillages of fuel during refuelling and leakages of hydraulic and lubricating oil from plant and equipment can also lead to the pollution of surface water.
The risk of these impacts, and the severity of the impact, is considered low due to the relatively small scale of the additional compound site (about one hectare in area) and would be effectively managed through the implementation of erosion and sediment controls during establishment and operation of the additional compound site. Safeguards and mitigation measures identified for the Stage 1 Project (refer to Table 15.3 of the EIS) would be adequate in managing the identified risks associated with erosion, sedimentation and water quality. The additional compound site would be subject to site-specific erosion and sediment control measures, including measures to monitor and manage stockpiles and the inclusion of a stabilised access point to minimise mud tracking onto Warringah Road. These measures would be developed as part of the soil and water management plan required for the Stage 1 Project.

Section 16.2.2 of the EIS identified an area of minor flooding potential on Warringah Road immediately west of Wakehurst Parkway. This area is at the location of the sag and experiences flooding from storms as frequent as the 2 year ARI event. However, due to the compound site’s elevation relative to the location of the sag, it would not be impacted by this flooding.

Another potential impact associated with the additional compound site would be generation of dust. The additional compound site is separated from the nearest residences by at least 200 metres and the risk of impacting on them is considered low. However, dust generation, if uncontrolled, may have a potential safety issue to road users due to the proximity of the site to Warringah Road and Wakehurst Parkway.

Stockpiles would be covered, or stabilised where possible, to minimise dust generation during windy conditions. In addition, dust generation would be further mitigated through the implementation of safeguards and management measures outlined in Section 14.5 of EIS. These measures would include the use of dust suppression techniques such as the use of soil binders or water carts during construction.

5.3.5 Environmental management measures

Establishment and operation of the additional compound site would result in negligible additional environmental impacts beyond those described in EIS. The main impact from the establishment of the site involves the removal of 0.7 hectares of vegetation and potential increases in noise levels during establishment and operation of the site.

There are a number of potential benefits and opportunities associated with the use of the additional compound site including:

- Reducing heavy and light vehicle movements on Allambie Road and Aquatic Drive resulting in reduced traffic related impacts on these local roads as well as associated noise and other amenity related impacts.
- Revegetation of a highly disturbed site following construction to complement the existing DFEC as well as providing habitat and foraging resources for existing fauna.

It is considered that the environmental management measures provided in the EIS and applicable to the compound site on Aquatic Drive would also apply to the additional compound site. Accordingly, no supplementary environmental management measures are required.
Extend

Provide right pedestrian crossing and signalised

Avenue

Wakehurst Parkway

New hospital site

Frenchs Forest Road West

New bus stop

Naree Road

Bus facility / bus lane

Frenchs Forest Road West

3.5 metre wide footpath along southern

Naree Road

New bus stop

Warringah Road

Bus facility / bus lane

Dareen Street

Footway

Warringah Road

When

Footway

Warringah Road

Bus facility / bus lane

Iris Street

Footway

Warringah Road

Bus facility / bus lane

Batter outside footway area

Business Park

 Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path

Upgrade area

New hospital site

Median

Retaining wall

Footway

Shared path
Extend at Forest Way and signalised e u n e v A e c a r G
two to four lanes Naree Road from
to Warringah Road and 1.5 metre footpath to Chatswood Road.

Additional eastbound through lane along Warringah Road

Retain existing bus stop

Signalised bus right turn bay

1.5 metre footpath along northern and southern side of Frenchs Forest East Road

Extend existing right turn bay

Relocate parking from shop frontage to 90 degree parking on the southern side. 
6 Minor project changes and confirmation of scope

6.1 Skyline Shops parking arrangements

As described in Section 7.4.3 of the EIS, there are currently 16 on-street car parking bays outside the Skyline Shops. As part of the upgrade and signalisation of the Frenchs Forest Road East/Patanga Road/Allambie Road intersection, these existing on-street car parking provisions would have to be re-designed and re-configured to meet the current road safety standards.

The EIS described concerns raised by the property owner of adjacent vacant land to where Roads and Maritime proposed to relocate these parking bays. Roads and Maritime committed to investigating alternative options to provide on-street parking along the widened section of Frenchs Forest Road East between Allambie Road and Warringah Road, in consultation with Council and local businesses.

Since exhibition of the EIS, Roads and Maritime has confirmed the proposed on-street car parking provisions to address the loss of parking outside the shops. The confirmed parking arrangement provides one disabled parking bay and one loading bay in front of the Skyline Shops, with 20 parking bays providing 90 degree parking along the southern side of Frenchs Forest Road East between Allambie Road and Warringah Road (as shown in Figure 5-4). This has been developed in consultation with Warringah Council and business owners.

Construction methodologies associated with this parking configuration are consistent with those described in the EIS, with works proposed in generally the same location. All activities would be located within the existing road reservation. The environmental impacts anticipated with these activities would therefore be consistent with those described in the EIS. No additional mitigation measures are required.

Access to Skyline Shops from the on street parking on the Southern side of Frenchs Forest Road East would be via the new signalised pedestrian crossing at Patanga, Allambie/Frenchs Forest Road intersection. The intersection provides for crossings on three sides of the intersection.

6.2 Pedestrian and shared paths

Section 5.2.3 of the EIS explained that Roads and Maritime would continue investigations to consider options to provide shared paths (being off-road cycleway and pedestrian footpath) aiming to connect with the existing or proposed cycleways indicated on the Warringah Bike Plan. Investigations were proposed at the following locations (as indicated in Figure 7.4 of the EIS):

- Forest Way from Naree Road to about 170 metres north of Warringah Road.
- Wakehurst Parkway between Frenchs Forest Road East and Warringah Road.
- Frenchs Forest Road East between the intersection of Wakehurst Parkway and Allambie Road.
- Patanga Road between Frenchs Forest Road East and the existing Council cycleway.
- Allambie Road between Warringah Road and Frenchs Forest Road East.
Roads and Maritime confirms the shared paths and footpaths for Stage 1 are as outlined as follows, and as shown on Figures 5.2 to 5.5:

- A 1.5 metre wide footpath along the western side and a 2.5 metre wide shared path along the eastern side of Forest Way south of Naree Road (connecting to shared paths proposed for the Stage 2 Project).
- A 1.5 metre wide footpath along the north side of Naree Road, Frenchs Forest Road West and Frenchs Forest Road East (as identified in the EIS).
- A 3.5 metre wide footpath along the southern side of Naree Road and Frenchs Forest Road West.
- A three metre wide shared path along the southern side of Frenchs Forest Road East between Wakehurst Parkway and Allambie Road.
- A 2.5 metre wide shared path along the western side of Allambie Road and a 1.5 metre wide footpath along the eastern side of Allambie Road between Frenchs Forest Road East and Warringah Road (connecting to shared paths and footpaths proposed for the Stage 2 Project).
- A 2.5 metre wide shared path along the eastern side of Wakehurst Parkway and a 1.5 metre wide footpath along the western side of Wakehurst Parkway between Frenchs Forest Road and Warringah Road (connecting to shared paths and footpaths proposed for the Stage 2 Project).
- A 1.5 metre wide footpath along the southern side of Frenchs Forest Road East between Allambie Road and Warringah Road.

Construction methodologies associated with the provision of these shared paths and footpaths are consistent with those described in the EIS. While a number of paths would be slightly wider than the footpaths originally proposed in the EIS, work would be constrained to within the existing road reservation. The environmental impacts anticipated with these activities would therefore be consistent with those described in the EIS. No additional mitigation measures are required.

6.3 Signalised pedestrian crossing – The Forest High School

Since exhibition of the EIS, Roads and Maritime, in consultation with The Forest High School, has identified a further signalised pedestrian crossing location between Bluegum Crescent and Sylvia Place, replacing the existing raised pedestrian threshold opposite the school (refer Figure 5.2). Provision of this additional signalised pedestrian threshold would further improve pedestrian safety in this location without affecting the efficiency of traffic movements.

Construction activities would be consistent with those described in the EIS for other signalised intersections with similar impacts anticipated.

Operational impacts would also be generally consistent with those described in the EIS. The signalised crossing would improve pedestrian safety and result in minor changes to traffic behaviour along Frenchs Forest Road West.

The signalised pedestrian crossing would introduce an additional noise source to the local area associated with pedestrian push buttons. This would be consistent with the impacts described in
the EIS for other new intersections. An assessment of tactile noise was carried out for the signalised pedestrian crossing which followed the same assessment methodology as undertaken in the EIS (refer Appendix D). The assessment predicted exceedances of compliance noise goals at the nearest residential receiver during the day, evening and night.

Noise management strategies to mitigate these impacts are consistent with those described in the EIS.

6.4 Other minor design refinements

The following other minor design refinements have been identified since exhibition of the EIS:

- Widening on Forest Way to the western side only (refer Figure 5-1)
- A marked pedestrian crossing is no longer proposed for the western side of the intersection of Wakehurst Parkway and Frenchs Forest Road (refer Figure 5-3)
- Retention of a bus stop on Allambie Road in its current location.

The principal features of these are summarised as follows.

**Widening on Forest Way**

Through a minor reduction in lane widths, it has been possible to limit widening to just the western side of Forest Way. This has allowed retention of the existing footpath on the eastern side of Forest Way and avoided the need for a retaining wall. This has also considerably reduced the impact on the Forest Alliance Church (heritage-listed Methodist Church) would now not be impacted.

The impact on properties to the south of Russell Avenue is less than 10 per cent in terms of the area required for acquisition while the additional area required of properties to the north of Russell Avenue is between 10 per cent and 20 per cent. The impacts on these properties are still the same as the original design, ie impacts on driveways, parking, drainage and changes in levels along the new boundary.

**Deletion of proposed pedestrian crossing**

The design presented in the EIS proposed a new marked pedestrian crossing on the western leg of the intersection of Wakehurst Parkway and Frenchs Forest Road West. However, further examination of this identified that the pedestrian crossing would impede the right turn for traffic from Wakehurst Parkway southbound into Frenchs Forest Road West. As such this marked pedestrian crossing is no longer proposed. Provision for pedestrians wishing to cross Frenchs Forest Road West is provided at the signalised intersection at the hospital entrance. Pedestrians would also be able to cross Frenchs Forest Road using the signalised crossing on the eastern leg of the intersection.

**Allambie Road bus stop**

The Concept Proposal and Stage 1 EIS proposed to relocate the bus stop on the eastern side of Allambie Road between Warringah Road and Frenchs Forest Road East to south of Warringah Road. It is now proposed that the bus stop would be remain in its existing location.
7 Further assessment

This chapter outlines additional investigations and assessment carried out since the exhibition of the EIS. In addition to a number of minor updates and amendments, it draws on and includes:

- A revised traffic and transport working paper which includes updated traffic modelling based on further refinements to the traffic model
- An addendum to the noise and vibration assessment which includes an assessment of noise impacts attributable to the hospital alone (without the road works) and further assessment to support the Preferred Infrastructure Report.

7.1 Updated traffic and transport assessment

Since public exhibition of the EIS, Roads and Maritime has continued to refine the traffic model for the project and has carried further operational traffic and transport assessment investigations. The results and findings of the updated modelling and additional assessment are provided as Appendix D to this Submissions Report/Preferred Infrastructure Report.

The revised assessment includes a quantitative assessment of impacts on the regional road network and updates traffic model predictions for the Stage 1 Project.

The key findings are the operational traffic assessment for the Stage 1 Project are presented below, with a particular focus on network and intersection performance.

7.1.1 Assessment methodology

The assessment methodology for the revised Traffic and Transport working paper remains the same as the exhibited assessment, as described in detail in Appendix D. Further clarification is provided to explain how the spatial redistribution of staff trips from the Manly and Mona Vale Hospitals has been considered for the assessment. In summary:

- For the 2018 scenario, it has been assumed that staff transferring to the Northern Beaches Hospital would continue to reside at their current residential address.
- For the 2028 scenario, it has been assumed that the spatial distribution of staff work trips may change as hospital workers change residence locations and/or employers (some staff are likely to cease work or no longer work at the hospital and new staff may commence over the first 10 years of operation).

7.1.2 Stage 1 operational impacts

As described in the traffic and transport assessment for the EIS, the Stage 1 Project addresses the anticipated road connectivity needs associated with the Northern Beaches Hospital.

The traffic and transport assessment is based on the operation of the Stage 1 Project only. It does not include the additional traffic and transport benefits that would be accrued from the overall Concept Proposal, including the Stage 2 Project which is subject to a separate EIS that will be placed on public exhibition over coming months. Accordingly, it should be noted that some
of the traffic impacts presented in this assessment would be mitigated when all works are completed.

For example, the Stage 1 Project works alone would result in an increase to through traffic using Frenchs Forest Road due to the increased capacity provided. Upon completion of the Stage 2 Project works it is expected that some through traffic using Frenchs Forest Road would transfer back to Warringah Road, and therefore, traffic volumes on Frenchs Forest Road may be lower after the completion of the Stage 2 Project, compared to after the completion of the Stage 1 Project. Other benefits are also anticipated to flow to the Stage 1 Project as a result of the grade separation of key intersections associated with the Stage 2 Project. Where relevant, this is discussed in the impact assessment that follows.

Network performance

Traffic analysis indicates that the Stage 1 Project would provide a significant improvement in network statistics compared to the ‘do minimum’ scenario. For example, in the 2018 morning peak period, modelling indicates a 26 per cent increase in the average vehicle speed and a 27 per cent reduction in the average delay per vehicle. The modelling also predicts a reduction in the level of ‘unreleased demand’ (the number of vehicles trying to enter the existing road network, but prevented because of congestion) due to the additional capacity associated with the improvements to the road network. In the morning and evening peak periods there is predicted to be a 32 per cent and 45 per cent reduction in the level of unreleased demand respectively.

When compared with the 2012 base case, the network performance of the Stage 1 Project in 2018 indicates that average vehicle speeds would essentially be maintained in the morning peak period (only a two per cent improvement) but would be expected to decrease by about 18 per cent in the evening peak period. It is also predicted that the future levels of unreleased demand in 2018 would be more than six times the current (2012) levels in the morning peak and nearly three and a half times the 2012 levels in the evening peak.

The average speed and total travel time for the 2012 base year and the 2018 and 2028 ‘do minimum’ scenarios are illustrated in Figure 7.1 and Figure 7.2. The figures demonstrate the improvements anticipated by the project compared to the base case and in the context of ‘existing’ traffic in 2012 (prior to the hospital being operational in 2018).
Figure 7.1 Comparison of average speeds (km/h)

Figure 7.2 Comparison of total travel time (hours)
The Stage 1 Project would generally provide sufficient road capacity for the traffic generated within the immediate study area to access the existing road network. However, traffic may not be able to enter the study area from some intersections on the periphery where upgrades are not proposed.

**Intersection performance**

An assessment of intersection performance for the Stage 1 Project is provided as follows. As noted previously, the assessment is based on the operation of the Stage 1 Project only and does not include the additional traffic and transport benefits that would accrue from the overall Concept Proposal which includes the Stage 2 Project. Accordingly, further benefits would be expected with further network enhancement associated with Stage 2.

The operation performances of the intersections within the study area are predicted to generally improve following the Stage 1 Project compared to the ‘do minimum’ scenarios for 2018 and 2028 as shown in Table 7.1. Five of the 12 intersections would operate with at LoS E or better during 2018 and three of the 12 intersections in 2028 with the Stage 1 Project. This compares to only two of 12 intersections during the 2018 and 2028 ‘do minimum’ scenarios.

Further, four of the five intersections along Frenchs Forest Road would operate at LoS E or better in 2018 with two of the five intersections in 2028. The Frenchs Forest Road/Romford Road and Frenchs Forest Road/Rabbett Street intersections are predicted to operate at LoS F in 2028 compared to LoS E or better in 2018.

While not specifically illustrated by the LoS data, the additional capacity on the Frenchs Forest Road corridor would result in some east-west traffic that currently uses Warringah Road using the Frenchs Forest Road corridor instead. This would in turn result in a slight improvement of the operation of the Warringah Road corridor compared to the ‘do minimum’ scenario.

However, while the Stage 1 Project would improve the performance of a number of intersections compared with the 2018 and 2028 ‘do minimum’ scenarios, when compared with the 2012 base scenario most of the intersections perform either at the same LoS or worse.
Table 7.1 Changes in intersection performance – 2018 AM and PM peak periods

<table>
<thead>
<tr>
<th>Intersection</th>
<th>2012 Base case scenario</th>
<th>2018 Do minimum scenario</th>
<th>2018 Stage 1 Project scenario</th>
<th>2028 Do minimum scenario</th>
<th>2028 Stage 1 Project scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warringah Road and Forest Way</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Warringah Road and Hilmer Street</td>
<td>LoS A-D</td>
<td>LoS F</td>
<td>LoS E</td>
<td>LoS F</td>
<td>LoS A-D</td>
</tr>
<tr>
<td>Warringah Road and Wakehurst Parkway</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Warringah Road and Allambie Road</td>
<td>LoS E</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Warringah Road, Ellis Road and Government Road</td>
<td>LoS A-D</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Forest Way and Naree Road</td>
<td>LoS A-D</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Frenchs Forest Road West and Rabbett Street</td>
<td>LoS E</td>
<td>LoS F</td>
<td>LoS A-D</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Frenchs Forest Road West, main hospital entrance, and Gladys Avenue</td>
<td>N/A</td>
<td>LoS A-D</td>
<td>LoS A-D</td>
<td>LoS E</td>
<td>LoS A-D</td>
</tr>
<tr>
<td>Frenchs Forest Road and Wakehurst Parkway</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Frenchs Forrest Road East and Romford Road</td>
<td>LoS A-D</td>
<td>LoS F</td>
<td>LoS E</td>
<td>LoS F</td>
<td>LoS F</td>
</tr>
<tr>
<td>Frenchs Forest Road East, Patanga Road and Allambie Road</td>
<td>LoS A-D</td>
<td>LoS A-D</td>
<td>LoS A-D</td>
<td>LoS A-D</td>
<td>LoS A-D</td>
</tr>
</tbody>
</table>

The forecast intersection average delays for peak periods for the 2018 and 2028 ‘do minimum’ and Stage 1 Project scenarios are illustrated in Appendix D.

7.1.3 Environmental management measures

Environmental management measures are consistent with those identified in the Section 7.1.6 of the EIS.
7.2 Additional noise and vibration assessment

The operational traffic noise assessment carried out for the EIS and included as Appendix E was based on traffic modelling that assumed the Northern Beaches Hospital was operational in both the year of opening and the future (design) year, with and without the project. As such, the assessment did not consider the changes to the acoustic environment as a result of the hospital alone.

Additional noise modelling has been undertaken to examine this scenario and the report is provided as Appendix E. The additional modelling focused on the ‘No-Build’ (ie do minimum) scenarios with revised traffic volumes that did not include traffic generated by the hospital. This facilitated assessment of the cumulative impact of the opening of the hospital together with the proposed road upgrades.

Using the existing noise model, traffic volumes for the study area excluding traffic generated by the Northern Beaches Hospital were incorporated into two new No-Build scenarios (2018, 2028) encompassing the daytime and night-time periods (four additional assessments in total).

The assessment showed that noise levels excluding traffic generated by the hospital were 0 dB to 0.2 dB lower across the study area than the noise levels that include traffic generated by the hospital. The number of residential receivers eligible for consideration of noise mitigation would remain unchanged, however, two additional non-residential receivers are eligible for consideration of noise mitigation. These are the ground floors of Building D/B Block and Building E/A Block 2 at The Forest High School. In the event that Stage 2 does not proceed, Roads and Maritime would further consider this issue in consultation with The Forest High School.
8 Revised safeguards and management measures

The EIS for the project identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submissions, the environmental management measures for the project (refer to Chapter 20 of the EIS) have been revised.

The adjustments to the measures were made to:

- Make additional commitments based on the issues raised in the submissions within this report
- Make additional commitments based on the findings of the studies within this report
- Modify the wording so that the outcome of the commitment is clearer.

Where new commitments have been added or new text has been added to an existing measure it has been italicised. Where a commitment has been deleted or text from the commitment deleted it appears as strikethrough text.

Should the project be approved, the environmental management measures in Table 8-1 will guide the subsequent project development phases (design and construction) of the Northern Beaches Hospital Connectivity and Network Enhancement Concept Proposal and Stage 1 Project.

Definitions

The following definitions apply in relation to the revised environmental management measures:

Pre-construction

Work in respect of the project that includes:

a. Undertaking design, survey, acquisitions, utility investigations, fencing, investigative drilling or excavation, archaeological salvage or investigative work, environmental investigations, building/road dilapidation surveys

b. Establishing ancillary facilities/construction work sites (in locations meeting the criteria identified in the Conditions of Approval or fully assessed in the EIS and/or the Submissions Report/Preferred Infrastructure Report, and with proposed and adequate mitigation)

c. Minor clearing or translocation of native vegetation associated with b) above

d. Installation of environmental impact measures, fencing, enabling works

e. Early works that do not require clearing of native vegetation (eg cycle route detours, precast batching plant establishment)

f. Other activities determined by the Environmental Representative to have minimal environmental impact (eg adjustments to services/utilities). Note – work where heritage, threatened species, populations or endangered ecological communities would be affected by that work, is classified as construction, unless otherwise approved by the Secretary in consultation with OEH.
Construction

All work in respect of the project other than that defined as a preconstruction activity/work.

Operation

The operation of the project, but not including commissioning trials of equipment, or temporary use of parts of the project during construction.
Table 8.1 Revised safeguards and management measures

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traffic and transport</td>
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<tr>
<td>Concept Proposal</td>
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<tr>
<td>Construction traffic impacts</td>
<td>• A construction traffic management plan would be developed and implemented as part of Stages 1 and 2 of the Concept Proposal. The construction traffic management plan would focus on maintaining general traffic flow and specifying appropriate site accesses and construction traffic routes.</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td></td>
<td>• Detailed construction staging would inform each stage of the Concept Proposal.</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td></td>
<td>• Subject to safety reasons and other environmental impacts (eg noise), construction traffic movements would be limited to off-peak periods, with peak period construction staggered to minimise construction traffic during these periods.</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td></td>
<td>• Priority would be given to the use of the arterial road network for construction vehicle access routes.</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td></td>
<td>• The Construction Traffic Management Plan would include consideration of:</td>
<td>Contractor</td>
<td>Construction</td>
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<tr>
<td></td>
<td>- management of impacts on waste collection from properties affected by construction of retaining walls along Naree Road and Forest Way</td>
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<td>- maintenance of traffic flows</td>
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<td></td>
<td>• Council would be consulted with regard to maintaining safe vehicle passage along Frenchs Forest Road during construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
<td>Timing</td>
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</tbody>
</table>
| Cumulative construction traffic impacts | • Consultation would be undertaken with Health Infrastructure to coordinate scheduling of construction activities and deliveries.  
• Consultation would be undertaken with Health Infrastructure, regarding the need for construction access to the hospital site to focus on the Warringah Road/Bantry Bay Road intersection. | Roads and Maritime | Pre-construction Construction |
<p>| Property access              | • Access to properties along affected roads would be maintained during construction. The need for any alternative and/or temporary access arrangements would be agreed with affected property managers/owners. | Contractor         | Construction      |
| Road and footpath crossfalls | • Council’s requirements would be included as design parameters/objectives for detailed design.                                                                                                                                   | Roads and Maritime | Pre-construction |
| Street lighting              | • The cost for any required upgrading of street lighting would be met by Roads and Maritime                                                                                                                                             | Roads and Maritime | Pre-construction |
| Rat running during construction | • Regular monitoring of local streets that exhibit increases in traffic and would be carried out and would include consultation with Council with regard to temporary measures that could be implemented to manage safety and related issues. | Roads and Maritime | Construction      |
| Shared paths                | • Shared paths would generally conform to a three metre width as a desirable minimum and a 2.5 metre width as an absolute minimum to avoid impacting on utilities and trees, etc.                                                              | Roads and Maritime | Pre-construction |</p>
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
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</table>
| Pedestrian connectivity and access | - Design development would consider all relevant matters including disabled access requirements and would be carried out in accordance with the Australian Standards, Austroads Design Standards, Guides, Codes, and Roads and Maritime Road supplements  
- Roads and Maritime would consider provision of a pedestrian refuge in Russell Avenue and changes to the kerb returns to slow traffic turning left.  
- The design for the northern footpath on Frenchs Forest Road would adopt a 0.8 metre wide verge behind kerb and a 1.5 metre wide formed concrete footpath as agreed with Council.                                                                 | Roads and Maritime | Pre-construction |
| Public transport            | - Construction of new and relocated bus shelters would be carried out in accordance with Council’s design requirements and applicable disability access standards. This would include appropriate consultation with Council.  
- Reconfiguration of the waiting facilities associated with the northbound bus bay in Forest Way at the Forestway Shopping Centre would be further considered during detailed design. | Roads and Maritime | Pre-construction |
| Car parking                 | - Continue to work with Council to determine if further parking can be implemented on local roads adjacent to Frenchs Forest Road and Naree Road.                                                                                                                                                                                                                       | Roads and Maritime | Pre-construction |
| Signage                     | - Development and finalisation of the wayfinding strategy would include consultation with Council.  
- Development of the strategy would address all relevant issues including number of signs, and types and locations of directional signage for all road users.                                                                                                                                                               | Roads and Maritime | Pre-construction |
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
</table>
| Access to Skyline Shops                    | • For vehicles wishing to access the Skyline Shops, compensatory parking would be provided along Frenchs Forest Road East  
   • Signage would be provided to inform drivers of the access restrictions on Patanga Road. | Roads and Maritime | Pre-construction |
|                                            | • Patanga Road traffic would be monitored post completion of the project and any additional traffic management required along Patanga Road would be considered in consultation with the Council. | Roads and Maritime | Post-construction |
| Operational performance of Warringah Road and Wakehurst parkway intersection | • The performance of the intersection of Forest Way and Adams Street would be monitored following completion of construction works for the project.  
   • Should this identify a continued performance issue, further investigation would be carried out with regard to work that could be implemented (as a separate project) that would improve traffic flow. | Roads and Maritime | Post-construction |
| Stage 1 Project                            |                                                                                                  | Contractor      | Pre-construction |
| Construction traffic impacts               | • A construction traffic management plan would be developed and implemented as part of the Stage 1 Project. The construction traffic management plan would focus on maintaining general traffic flow and specifying appropriate site accesses and construction traffic routes. It would include:  
   - Traffic Control Plans showing the access arrangements and the details of required signs and devices.  
   - Pedestrian and Cyclist Management Plans.  
   - Consultation strategy for access requirements to adjacent properties including The Forest High School and Frenchs Forest Police Station.  
   - Hours of operation, including prohibitions on queuing outside sites prior to commencement of work.  
   - Road safety audit requirements.  
   - Any localised improvements/adjustments to existing traffic |
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
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<tbody>
<tr>
<td></td>
<td>management arrangements.</td>
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<tr>
<td></td>
<td>• Preparation of the plan would include consultation with Health Infrastructure to accommodate, where reasonable and feasible, construction traffic issues associated with hospital construction.</td>
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<td></td>
<td></td>
<td>Contractor</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td></td>
<td>• Subject to safety reasons and other environmental impacts (e.g. noise), construction traffic movements would be limited to off-peak periods, with peak period construction staggered to minimise construction traffic during these periods.</td>
<td>Contractor</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td></td>
<td>• Priority would be given to the use of the arterial road network for construction vehicle access routes.</td>
<td>Contractor</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td>Cumulative construction traffic impacts</td>
<td>• Consultation would be undertaken with Health Infrastructure to coordinate scheduling of construction activities and deliveries.</td>
<td>Roads and Maritime</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td></td>
<td>• Consultation would be undertaken with Health Infrastructure regarding the need for construction access to the hospital site to focus on the Warringah Road/Bantry Bay Road intersection.</td>
<td>Roads and Maritime</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td>Property access</td>
<td>• Access to properties along affected roads would be maintained during construction. The need for any alternative and/or temporary access arrangements would be agreed with affected property managers/owners.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Use of additional construction compound site</td>
<td>• Use of the additional compound site would be subject to a site-specific traffic control plan under the proposed construction traffic management plan.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• The surrounding DFEC would be protected from inadvertent damage with the implementation of an exclusion zone (perimeter fencing/screening) established around the site where the site borders identified DFEC.</td>
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<tr>
<td></td>
<td>• Following completion of the construction work, the site would be revegetated with local native trees, shrubs and groundcovers that occur within DFEC.</td>
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</tbody>
</table>
### Impact

<table>
<thead>
<tr>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stockpiles would be covered, or stabilised where possible, to minimise dust generation during windy conditions.</td>
<td>Roads and Maritime</td>
<td>Operation</td>
</tr>
<tr>
<td>An operational traffic review would be undertaken within 12 months of opening of the Stage 1 Project to confirm the operational traffic impacts of the project on Forest Way, Naree Road, Frenchs Forest Road, Warringah Road and Wakehurst Parkway in close proximity to the hospital. The assessment would be based on actual traffic counts and will assess the level of service at major intersections within the assessed road network. Where necessary, the outcomes of the operational traffic review would be used to identify any additional feasible and reasonable measures to be implemented where it is determined that the level of service has significantly deteriorated as a result of the Stage 1 Project, compared to the levels described in Section 7.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Detailed design would consider the need for the additional crossing legs at the intersections of Romford Road/Frenchs Forest Road West and Wakehurst Parkway/Frenchs Forest Road West</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Roads and Maritime would continue to consult with the Department of Education and Communities, The Forest High School and other stakeholders during detailed design to ensure appropriate consideration of all relevant issues relating to safe access to the school.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

### Noise and vibration

#### Concept Proposal

<table>
<thead>
<tr>
<th>General construction noise and vibration impacts</th>
<th>Contractor</th>
<th>Pre-construction Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Construction Noise and Vibration Management Plan would be prepared for the Stage 1 Project and Stage 2 Project. The plan would provide details of noise and vibration management measures and procedures to be undertaken during construction to minimise and manage noise impacts on sensitive receivers.</td>
<td>Contractor</td>
<td>Pre-construction Construction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operational road traffic noise</th>
<th>Roads and Maritime</th>
<th>Pre-construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational noise impacts associated with both stages of the Project would be assessed and presented in the Stage 2 EIS</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>
### Impact

<table>
<thead>
<tr>
<th>Noise impacts generally</th>
</tr>
</thead>
</table>

- Roads and Maritime would continue to include The Forest High School Working Group on consultation activities related to managing project impacts that affect the school

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roads and Maritime</td>
<td>Pre-construction Construction</td>
</tr>
</tbody>
</table>

### Stage 1 Project

#### General noise and vibration impacts

- A Construction Noise and Vibration Management Plan would be prepared for the Stage 1 Project. The plan would provide details of noise and vibration management measures and procedures to be undertaken during construction to minimise and manage noise impacts on sensitive receivers, including:
  - Noise and vibration monitoring and reporting requirements
  - A map showing the locations of all sensitive receivers
  - Specific mitigation treatments, management methods and procedures to be implemented to control noise and vibration during construction
  - Construction timetabling to minimise noise impacts including time and duration restrictions, respite periods and frequency
  - Procedures for notifying residents, business owners, schools and other sensitive receivers of construction activities likely to affect their amenity through noise and vibration
  - Contingency procedures to be implemented in the event of non-compliances and/or noise complaints.

<table>
<thead>
<tr>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>Contractor</td>
<td>Construction</td>
</tr>
</tbody>
</table>

#### Construction hours

- Where reasonable and feasible, works would be undertaken within ICNG recommended working hours.
- Where works are required to be undertaken outside of recommended working hours, all appropriate approvals would be obtained prior to works, and all affected receivers would be notified of all relevant details relating to the works.
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction vibration</td>
<td>• Where reasonable and feasible, use lower vibration generating items of excavation plant and equipment eg smaller capacity rockbreaker hammers.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Use dampened rockbreakers and/or ‘city’ rockbreakers to minimise the impacts associated with rockbreaking works.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• If vibration-intensive works are required within the safe working distances, vibration monitoring or attended vibration trials would be undertaken to ensure that levels remain below the cosmetic damage criterion.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Building condition surveys would be completed both before and after the works to identify the existing condition and any damage due to the Stage 1 Project works.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Impacts on sensitive receivers</td>
<td>• Local residents would be advised of hours of operation (including out of hours works) and duration of works, and supplied with a contact name and number for queries and complaints regarding noise and vibration matters.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Complaints received are to be recorded and attended to promptly in accordance with the Roads and Maritime Draft Community Consultation Framework.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Operational road traffic noise</td>
<td>• Noise mitigation in the form of acoustic treatment of existing individual dwellings will be considered, where feasible and reasonable at receivers that exceed the RNP noise criteria.</td>
<td>Roads and Maritime</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Consideration of the feasible and reasonable noise management strategies presented in Section 8.5.2 would be undertaken during detailed design, and appropriate noise management measures implemented for the operation phase.</td>
<td>Roads and Maritime</td>
<td>Detailed design Operation</td>
</tr>
</tbody>
</table>
### Impact

<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
</table>
| Operational road traffic noise | - Within 12 months of the commencement of operation of the project an operational noise review will be undertaken. This will include:  
  - Monitoring to compare actual noise performance of the project against predicted noise performance  
  - An assessment of the performance and effectiveness of applied noise mitigation measures together with a review and if necessary, reassessment of all feasible and reasonable mitigation measures  
  - Identification of any additional feasible and reasonable measures that will be implemented with the objective of meeting the criteria in the NSW Road Noise Policy (EPA 2011), when these measures will be implemented and how their effectiveness will be measured and reported. | Roads and Maritime | Operation                     |

### Biodiversity

#### Concept Proposal

<table>
<thead>
<tr>
<th>General biodiversity impacts</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- A Construction Flora and Fauna Management Plan would be prepared for the Stage 1 Project and Stage 2 Project. The plan would provide details of biodiversity management measures and procedures to be undertaken during construction to minimise and manage impacts on flora and fauna.</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>- <em>Operational impacts would be offset through the biodiversity offset strategy developed for the Concept Proposal.</em></td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>- <em>The biodiversity assessment would be updated for the Stage 2 Project and would incorporate additional information developed subsequent to the assessment for the Concept Proposal and Stage 1 Project.</em></td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Loss of DFEC and threatened species habitat</td>
<td>- Offset residual impacts on DFEC and Red-crowned Toadlet habitat in accordance with the NSW offset principles for major projects (state significant development and state significant infrastructure) (OEH 2013).</td>
<td>Roads and Maritime</td>
<td>Pre-construction Construction</td>
</tr>
</tbody>
</table>

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Northern Beaches Hospital Road Connectivity and Network Enhancements Project – Submissions Report  
Roads and Maritime Services  
8–11
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loss of DFEC and other native vegetation</td>
<td>• Establish exclusion zones around the areas of DFEC and other native vegetation to be retained within the construction impact area, including those within the construction site compound.</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Threats to threatened species habitat</td>
<td>• Implement sediment and erosion controls in accordance with the Blue Book (Landcom 2004) during construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Investigate reasonable and feasible options for sustaining moisture in Red-crowned Toadlet breeding habitat during detailed design for the remainder of the Concept Proposal area.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>• Nest boxes would be installed in accordance with the Roads and Maritime Biodiversity Guidelines. The number and type of nest boxes required would be based on the number, quality and size of hollows that would be removed from the Concept Proposal area.</td>
<td>Contractor</td>
<td>Pre-construction Construction</td>
</tr>
<tr>
<td></td>
<td>• Should removal of the tree used by the Powerful Owl in the grounds of The Forest High School be required it would be undertaken outside of the breeding season.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>• Should detailed design identify an opportunity to retain the tree, provision would be made to ensure that the hardstand does not encroach on the tree protection zone (TPZ).</td>
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<tr>
<td></td>
<td>• A porous material would be used around the base of the tree along with fencing around the perimeter of the TPZ to avoid cars driving over the roots.</td>
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</tr>
<tr>
<td>Habitat corridor and wildlife connectivity</td>
<td>• Detailed design would aim to minimise vegetation clearing and indirect impacts on vegetation within the area mapped by Warringah Council as Priority 1 Wildlife Corridor during construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td></td>
<td>• Options for maintaining wildlife connectivity across the project area as part of Stage 2 EIS would be investigated where reasonable and feasible. This would include identifying species known to occur in the locality, particularly threatened species that would benefit from connectivity enhancement and determining the types of crossings that</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
<td>Timing</td>
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</tr>
<tr>
<td>General biodiversity impacts</td>
<td>A Construction Flora and Fauna Management Plan would be prepared for the Stage 1 Project. The plan would provide details of biodiversity management measures and procedures to be undertaken during construction to minimise and manage impacts on flora and fauna, including:</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>- Management strategies for pre-construction, construction and post-construction activities including control measures for pre-clearing process</td>
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<tr>
<td></td>
<td>- A map showing the DFEC and other native vegetation to be retained</td>
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<tr>
<td></td>
<td>- Fauna rescue and release procedure</td>
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<tr>
<td></td>
<td>- Procedure for controlling the introduction and spreading of weeds and pathogens</td>
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<tr>
<td></td>
<td>- Proposed strategies for re-use of coarse woody debris and bushrock</td>
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<tr>
<td></td>
<td>- Unexpected threatened species finds procedure consistent with the Roads and Maritime Biodiversity Guidelines (RTA 2011) to manage any unexpected finds during construction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of DFEC and other native vegetation</td>
<td>Establish exclusion zones around areas of DFEC and other native vegetation to be retained outside of the construction impact area.</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>Locate construction access tracks and additional ancillary facilities in previously cleared/disturbed areas.</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td>Detailed design would aim to minimise impacts on DFEC and other moderate to good condition native vegetation.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
<td>Timing</td>
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</tbody>
</table>
| Threats to threatened species habitat | • Implement sediment and erosion controls in accordance with the Blue Book (Landcom 2004) during construction.  
• Nest boxes would be installed in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011). The number and type of nest boxes required would be based on the number, quality and size of hollows that would be removed.  
• Investigate reasonable and feasible options for sustaining moisture in Red-crowned Toadlet breeding habitat during detailed road design for the remainder of the Concept Proposal area. | Contractor       | Construction |
| Spread of invasive species    | • Undertake weed management and control in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011) during and post-construction.                                                                                                                                                                                                                       | Contractor      | Construction |
| Introduction of diseases      | • Should *Phytophthora cinnamomi* be identified, follow protocol to prevent introduction or spread of *Phytophthora cinnamomi* and Myrtle Rust consistent with Roads and Maritime Biodiversity Guidelines – Guide 7 (Pathogen Management) (RTA, 2011) during construction. The protocols used should be either the Sydney Region Pest Management Strategy or Best Practice Guidelines for *Phytophthora cinnamomi* (DECC 2008) and the DPI hand-out prepared for Myrtle Rust response 2010-11: Preventing spread of Myrtle Rust in bushland or the OEH Interim Management Plan for Myrtle Rust in Bushland (2011). | Contractor       | Construction |
|                              | • Implement measures to prevent the spread of chytrid fungus in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011) including the hygiene protocol standards for the control of disease in frogs.                                                                                                                                                                                                                             | Contractor       | Construction |
| Habitat corridor and wildlife connectivity | • Prioritise investigation of offset sites that contribute to maintenance of wildlife connectivity in the local area.                                                                                                                                                                                                                                                   | Roads and Maritime | Pre-construction, Construction, Post-construction |
|                              | • Detailed design would aim to minimise vegetation clearing and indirect                                                                                                                                                                                                                                                                                                                                                  | Contractor       | Construction |
### Impact

<table>
<thead>
<tr>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts on vegetation within the area mapped by Warringah Council as Priority 1 Wildlife Corridor during construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Undertake revegetation in accordance with Roads and Maritime Biodiversity Guidelines (RTA 2011) and detailed landscape plan prepared for the project.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Ensure revegetation works use local native trees, shrubs and groundcovers that occur in DFEC.</td>
<td>Contractor</td>
<td>Post-construction</td>
</tr>
<tr>
<td>Impact on native fauna and their habitat</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>• Identify areas of suitable habitat nearby for release of any fauna species encountered during construction in accordance with Roads and Maritime Biodiversity Guidelines (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Restrict use of pesticides to control weeds during and post-construction, particularly near watercourses and immediately before/during wet weather.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Roads and Maritime</td>
<td>Road and Maritime</td>
<td>Construction</td>
</tr>
<tr>
<td>• Implement reasonable and feasible measures to prevent pollution of waterways and drainage lines in the area downstream of the proposed works during and post-construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Should bushrock removal be required, it should be replaced in suitable areas as part of post-construction restoration in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Should removal of dead wood and trees be required it should be replaced in suitable areas as part of post-construction restoration in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Undertake staged habitat removal of hollow-bearing trees and bushrock in accordance with the Roads and Maritime Biodiversity Guidelines (RTA 2011).</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>• Avoid impacts on potential Koala habitat in ESU 4 and avoid the removal of any remaining Koala habitat in ESU 4.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
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<tr>
<td>--------------------------------------------</td>
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</tr>
<tr>
<td>Impacts on threatened flora and their habitat</td>
<td>- Undertake pre-clearing surveys for threatened plants that could potentially occur in the construction impact area. Any threatened plants identified would be managed in accordance with the unexpected threatened species finds procedure consistent with the Roads and Maritime Biodiversity Guidelines (RTA 2011).</td>
<td>Contractor</td>
</tr>
</tbody>
</table>

**Socio-economic, land use and property**

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<tbody>
<tr>
<td></td>
<td></td>
<td>Investigations into alignment refinements along Warringah Road would be undertaken to avoid or minimise property impacts to the south during the preparation of the Stage 2 EIS.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Access to businesses along affected roads would be maintained during construction. The need for any alternative and/or temporary access arrangements would be agreed with affected property managers/owners and a signage strategy would be implemented to explain new access arrangements where required.</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

| Traffic and Access | Develop, implement and communicate the construction traffic management plan with the aim of minimising traffic impacts and disruptions.                                                                                       | Contractor       | Pre-construction |

| Community Consultation | Develop and implement a consultation program consistent with the Roads and Maritime Draft Community Consultation Framework that will ensure businesses, residents and others stay informed about the type, timing and duration of construction impacts and any mitigation measures being put in place (refer to Section 7.1.3). | Roads and Maritime | Pre-construction |
### Impact

#### Environmental management measures

- **Warringah Council** would be provided with suitable information to facilitate the provision of advice to applicants with regard to circumstances requiring the referral of development applications to Roads and Maritime.

- **Subject to obtaining planning approval, a final full list of all affected properties** would be provided to Warringah Council so that a layer can be created in Council’s GIS system for DA assessment and referral purposes.

- **Development consents that would be affected by road works would be identified during detailed design and the extent to which they might be affected would be assessed.**

<table>
<thead>
<tr>
<th>Impact</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local Development</td>
<td>Roads and Maritime</td>
<td>Pre-construction Construction</td>
</tr>
</tbody>
</table>

#### Stage 1 Project

<table>
<thead>
<tr>
<th>Business and Economic Impacts</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undertake consultation with local land owners and businesses impacted by project about the duration, location and timing of construction and the potential impacts on business operations.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

- Access to businesses along affected roads would be maintained during construction. The need for any alternative and/or temporary access arrangements would be agreed with affected property managers/owners and a signage strategy would be implemented to explain new access arrangements where required.

- Roads and Maritime will investigate alternative options to provide on-street parking along the widened section of Frenchs Forest Road East between Allambie Road and Warringah Road. Further consultation would be undertaken with Council and local businesses.

<table>
<thead>
<tr>
<th>Property Impacts</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide compensation to those property owners directly impacted by project in accordance with <em>Land Acquisition (Just Terms Compensation) Act 1991</em>.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
</tr>
<tr>
<td>--------------------------------</td>
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</tr>
<tr>
<td>Local Amenity Impacts</td>
<td>• Undertake consultation with the local community about the duration, location and timing of construction and the potential impacts throughout the construction phase.</td>
<td>Roads and Maritime</td>
</tr>
<tr>
<td></td>
<td>• Noise mitigation in the form of acoustic treatment of existing individual dwellings will be considered, where feasible and reasonable at receivers that exceed the RNP noise criteria.</td>
<td>Roads and Maritime</td>
</tr>
<tr>
<td></td>
<td>• Reduce visual impacts of project on residents through the implementation of design elements and safeguards noted in the landscape character and visual impact assessment (refer to Section 3.12).</td>
<td>Contractor</td>
</tr>
<tr>
<td>Community Services</td>
<td>• Undertake consultation with schools, child care centres, medical facilities and recreational facilities throughout construction about the duration, location and timing of construction and the potential impacts on their activities.</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>• Ensure access is maintained to community facilities and open space throughout construction. The need for any alternative and/or temporary access arrangements would be agreed with affected property managers/owners and a signage strategy would be implemented to explain new access arrangements where required.</td>
<td>Contractor</td>
</tr>
<tr>
<td>Traffic and Access</td>
<td>• Develop, implement and communicate traffic management plan with the aim of minimising traffic impacts and disruptions (refer to Section 7.1.3).</td>
<td>Contractor</td>
</tr>
<tr>
<td>Community Severance and Cohesion</td>
<td>• Ensure existing pedestrian and cyclist networks are maintained or provide alternate arrangements where needed.</td>
<td>Contractor</td>
</tr>
<tr>
<td>Community Consultation</td>
<td>• Develop and implement a consultation program consistent with the Roads and Maritime Draft Community Consultation Framework that will ensure businesses, residents and others stay informed about the type, timing and duration of construction impacts and any mitigation measures being put in place (refer to Section 7.1.3).</td>
<td>Roads and Maritime</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
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</tr>
<tr>
<td><strong>Landscape character and visual impact</strong></td>
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<tr>
<td><strong>Stage 1 Project</strong></td>
<td></td>
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</tr>
<tr>
<td>Visual impacts</td>
<td>• A detailed landscape plan will be prepared for the project. The landscape plan will build on the finding of the Urban Design, Landscape Character and Visual Working Paper and will include detailed set out, species and planting guides.</td>
<td>Contractor</td>
</tr>
<tr>
<td>Construction visual impacts</td>
<td>• The visual impact of construction site compound on adjacent residential areas will be minimised through the careful planning and positioning of temporary offices, other plant and material laydown areas, and specific management of lighting and potential for light spill within the identified construction site compound.</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>• Vegetation currently located between construction site compound and adjacent residential areas will be retained where practicable to screen views.</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>• Landscaping would be progressively introduced to provide screening between adjacent residences and the road corridor.</td>
<td>Contractor</td>
</tr>
<tr>
<td><strong>Aboriginal heritage</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Concept Proposal and Stage 1 Project</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Refinements to detailed design construction impact area</td>
<td>• Prior to construction, a review of the detailed design would be undertaken against the construction impact area shown in Figure 13 Appendix J. If changes to the current construction impact area are considered to cause an impact to identified sites Trefoil Creek 1 and/or Trefoil Creek 2, an updated impact assessment would be undertaken and appropriate management and mitigation measures formulated.</td>
<td>Roads and Maritime</td>
</tr>
<tr>
<td>Impact</td>
<td>Environmental management measures</td>
<td>Responsibility</td>
</tr>
<tr>
<td>--------------------------------------------</td>
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</tr>
<tr>
<td>Newly recorded sites within the Stage 1 area: Trefoil Creek 1, Trefoil Creek 2.</td>
<td>• Avoidance of impacts on these two sites would be a clear design objective for detailed design. Periodic reviews would be carried out during detailed design to monitor design development and ensure these sites are not impacted.</td>
<td>Roads and Maritime</td>
</tr>
<tr>
<td>Unexpected finds</td>
<td>• If buried Hawkesbury Sandstone platforms are uncovered during clearing and grubbing works, works would cease to allow for these platforms to be assessed for possible Aboriginal engravings or rock markings.</td>
<td>Contractor</td>
</tr>
<tr>
<td></td>
<td>• Should any Aboriginal finds be uncovered during construction, their management should be in accordance with the Roads and Maritime Unexpected Finds Protocol. All staff should be made aware of their obligations under various Federal and State heritage legislation during their site induction and copies of this Protocol should be on site and available at all times to all staff.</td>
<td>Contractor</td>
</tr>
<tr>
<td>Awareness of Aboriginal heritage</td>
<td>• Aboriginal cultural awareness training for all relevant staff and contractors would be undertaken prior to commencing work onsite.</td>
<td>Contractor</td>
</tr>
</tbody>
</table>

### Non-Aboriginal heritage

#### Stage 1 Project

<table>
<thead>
<tr>
<th>General non-Aboriginal impacts</th>
<th>A Construction Heritage Management Plan would be prepared for the Stage 1 Project. The plan would provide details of management measures and procedures to be undertaken during construction to minimise and manage impacts on non-Aboriginal heritage, including:</th>
<th>Contractor</th>
<th>Pre-construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Management measures to be implemented to prevent and minimise impacts on heritage items</td>
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<td></td>
<td>• Procedures for dealing with previously unidentified heritage objects;</td>
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<tr>
<td></td>
<td>• Heritage training and induction processes.</td>
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<tr>
<td></td>
<td>• A heritage induction is to be carried out in advance of the proposed</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>
## Impact

<table>
<thead>
<tr>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northern Beaches Hospital Road Connectivity and Network Enhancements Project</strong>&lt;br&gt;<strong>Roads and Maritime Services</strong>&lt;br&gt;Impact&lt;br&gt;Environmental management measures</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td><strong>Pear tree, Former Holland’s Orchard Trees</strong>&lt;br&gt;• Excavations required in proximity to retained trees which may impact the critical root zone are to be undertaken in consultation with a suitably qualified and experienced arborist to ensure roots are not damaged in a way that could detrimentally affect tree health.&lt;br&gt;• Prior to works that will impact the pear tree a suitably qualified and experienced arborist would examine the tree to determine if relocation is a viable option. If relocation is not viable, propagation will be undertaken. Warringah Council and the Department of Education and Training will be consulted regarding a receiving site for the relocated or propagated tree. Archival recording of the pear tree will precede relocation or propagation</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
<tr>
<td><strong>Demolition of local heritage item: Former Methodist Church</strong>&lt;br&gt;• Prior to any modification or demolition of the Former Methodist Church, archival recording is to be undertaken of the Former Methodist Church in accordance with the NSW Heritage Office guidelines How to Prepare Archival Records of Heritage Items and Photographic Recording of Heritage Items using Film or Digital Capture.&lt;br&gt;• Following any demolition of the Former Methodist Church, opportunities would be explored to provide heritage interpretation on an ongoing/permanent basis so that the significance of the site as the original location of the Former Methodist Church is communicated. Where heritage interpretation is undertaken, it should be developed in accordance with the NSW Heritage Office guidelines Interpreting Heritage Items and Places</td>
<td>Contractor</td>
<td>Post-construction</td>
</tr>
<tr>
<td><strong>Unexpected finds</strong>&lt;br&gt;• Should any non-Aboriginal finds be uncovered during construction, their management should be in accordance with the Roads and Maritime Unexpected Finds Protocol. All staff should be made aware of their obligations under various Federal and State heritage legislation during their site induction and copies of this Protocol should be on site and</td>
<td>Contractor</td>
<td>Pre-construction</td>
</tr>
</tbody>
</table>

works. All relevant staff, contractors and subcontractors should be made aware of their statutory obligations for heritage under the *Heritage Act 1977* and *National Parks and Wildlife Act 1974*. Warringah Council and the Department of Education and Training will be consulted regarding a receiving site for the relocated or propagated tree. Archival recording of the pear tree will precede relocation or propagation.
<table>
<thead>
<tr>
<th>Impact</th>
<th>Environmental management measures</th>
<th>Responsibility</th>
<th>Timing</th>
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</thead>
<tbody>
<tr>
<td>Available at all times</td>
<td>available at all times to all staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air quality</td>
<td><strong>Concept Proposal</strong></td>
<td></td>
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</tr>
<tr>
<td>General air quality</td>
<td>- An Air Quality Management Plan will be prepared for each construction stage of the Concept Proposal. The plan would detail air quality control measures and procedures to be undertaken during construction.</td>
<td>Contractor</td>
<td>Construction</td>
</tr>
<tr>
<td>Stage 1 Project</td>
<td><strong>General air quality impacts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- An Air Quality Management Plan will be prepared to detail air quality control measures and procedures to be undertaken during construction, including:</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td>- air quality and dust management objectives consistent with DECCW guidelines</td>
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<td>- emissions from diesel construction plant</td>
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<td>- potential sources and impacts of dust, identifying all dust-sensitive receptors</td>
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<td>- mitigation measures to minimise dust impacts to sensitive receivers and to the environment</td>
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<td>- a monitoring program to assess compliance with the identified objectives</td>
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<td>- contingency plans to be implemented in the event of non-compliances and/or complaints about dust.</td>
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<td></td>
<td>- The Air Quality Management Plan would include safeguards and management measures including, but not limited to:</td>
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<td>- minimising areas of exposed surfaces through construction site planning and programming.</td>
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<td></td>
<td>- implementation of control measures to minimise dust emissions from</td>
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<tr>
<td>Impact on local air quality during construction.</td>
<td>- Areas of exposed surfaces are to be minimised through construction site planning and programming, to reduce the area of potential construction dust emission sources.</td>
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<td>- Control measures, such as compaction stabilisation or covering would be implemented in order to minimise dust from stockpile sites.</td>
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<td>- Dust suppression measures, such as the use of water carts or soil binders, would be used in any unsealed surfaces and other exposed areas.</td>
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<td>- All trucks would be covered when transporting materials to and from the site.</td>
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<td>- Construction activities that would generate dust would be avoided or modified during high wind periods.</td>
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<td>- Work activities would be reviewed if the dust suppression measures are not adequately restricting dust generation.</td>
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<td>- Rehabilitation of completed sections would be progressively undertaken.</td>
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| Exhaust emissions                           | • Construction plant and equipment would be maintained in good working condition in order to limit impacts on air quality.  
• Where practicable, vehicles will be fitted with pollution reduction devices.                                                                                                                                          | Contractor     | Construction |
| Geology, soils and contamination             |                                                                                                                                                                                                                                |                |              |
| Concept Proposal                             |                                                                                                                                                                                                                                |                |              |
| Managing impacts on soil in general         | • A Soil and Water Management Plan will be prepared for each construction stage of the Concept Proposal in accordance with the principles and guidelines set out Soils and Construction – Managing Urban Stormwater series, comprising Volume 1 (Landcom, 2004) and Volume 2D – Main Roads (DECC, 2008). | Contractor     | Pre-construction |
| Warringah Road ‘slot’ cut face may be susceptible to erosion and slope stability during construction | • As part of future stage(s) design development, subsoil drainage would be incorporated into the ‘slot’ to ensure the ongoing stabilisation of face. The extent of the drainage network would be finalised during detailed design. | Roads and Maritime | Pre-construction |
| Impact to contaminated land                 | • Preparation of a Phase 2 assessment would be required prior to construction of the Stage 2 Project. Outcomes and management measures identified in the Phase 2 assessment would be incorporated into the CEMP for the Stage 2 Project. | Roads and Maritime | Pre-construction |
| Stage 1 Project                             |                                                                                                                                                                                                                                |                |              |
| Managing impacts on soil in general         | • A Soil and Water Management Plan will be prepared for each construction stage of the Concept Proposal in accordance with the principles and guidelines set out Soils and Construction – Managing Urban Stormwater series, comprising Volume 1 (Landcom, 2004) and Volume 2D – Main Roads (DECC, 2008), including:  
  – Consideration of soil erodibility  
  – Management strategies to be used to minimise surface and | Contractor     | Pre-Construction |
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<tr>
<td>Groundwater impacts</td>
<td>- Identification of water treatment measures, discharge points and erosion and sediment control measures&lt;br&gt;- Sedimentation basin construction and management&lt;br&gt;- Measures to monitor and manage spoil, fill and materials stockpile sites&lt;br&gt;- Dewatering procedure&lt;br&gt;- Water quality monitoring and checklists</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<tr>
<td>Disturbance of contaminated or potentially contaminated land</td>
<td>- A Contaminated Land Management Plan will be prepared in accordance with the Contaminated Land Management Act 1997, relevant EPA Guidelines and Roads and Maritime Guideline for Management of Contamination (RMS 2013) and will include at a minimum:&lt;br&gt;  - Contaminated land legislation and guidelines including any relevant licences and approvals to be obtained&lt;br&gt;  - Identification of locations of known or potential contamination and preparation of a map showing these locations&lt;br&gt;  - Identification of rehabilitation requirements, classification, and transport and disposal requirements of any contaminated land within the construction footprint&lt;br&gt;  - Contamination management measures including waste classification and reuse procedures and unexpected finds procedures for unanticipated discovery of contaminated material during construction.</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<tr>
<td>Inappropriate disposal of excavated material that cannot be reused in the project</td>
<td>- Excavated material that is not suitable for on-site reuse or recycling will be transported to a site that may legally accept that material for reuse or disposal.&lt;br&gt;- Excavated material leaving the site will be classified in accordance with the Waste Classification Guidelines so that correct resource recovery and or off-site disposal occur.</td>
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## Impact

### Construction accidental spills

- An emergency spill response procedure will be prepared to minimise the impact of spills including details on the requirements for managing, cleaning up and reporting.
  - **Responsibility:** Contractor  
  - **Timing:** Pre-construction

- Spill kits and adequate quantities of suitable material to counteract spillage would be kept readily available.
  - **Responsibility:** Contractor  
  - **Timing:** Construction

- Any potential hazardous or contaminant materials (for example, fuels, curing compounds, and oils) would not be stored within 50 metres of any waterways or drainage lines, flood prone areas, or on slopes steeper than 1:10. Storage areas would be impervious and adequately bunded.
  - **Responsibility:** Contractor  
  - **Timing:** Construction

- The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas. Refuelling would be attended at all times.
  - **Responsibility:** Contractor  
  - **Timing:** Construction

- Vehicle wash-downs and/or concrete truck washouts would be undertaken within a designated bunded area of an impervious surface or undertaken off-site.
  - **Responsibility:** Contractor  
  - **Timing:** Construction

- Machinery would be checked daily to ensure that there are no oil, fuel, or other liquid leaks.
  - **Responsibility:** Contractor  
  - **Timing:** Construction

### Operation accidental spills

- Detailed design would consider reasonable and feasible measures to optimise pollution mitigation.
  - **Responsibility:** Contractor  
  - **Timing:** Pre-construction

## Hydrology, water quality and flooding

### Concept Proposal

**Operational impacts on water quality**

- The ultimate operational water quality treatment strategy for the Concept Proposal (covering both stages) would be developed/confirmed during the respective detailed design stages and would address the matters noted by the EPA in its submission (Issue 10).
  - **Responsibility:** Roads and Maritime  
  - **Timing:** Pre-construction
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| **Impact on Council stormwater infrastructure** | - Council would be consulted with regard to matters related to its stormwater drainage infrastructure.  
- Health Infrastructure would be consulted during detailed design with regard to allowing for runoff from the developed hospital site.                                                                                              | Roads and Maritime     | Pre-construction  |
| **Sedimentation of surrounding watercourses and drainage lines** | - A Soil and Water Management Plan will be prepared for each construction stage of the Concept Proposal in accordance with the principles and guidelines set out Soils and Construction – Managing Urban Stormwater series, comprising Volume 1 (Landcom, 2004) and Volume 2D – Main Roads (DECC, 2008). *This would also consider and address the matters noted by the EPA in its submission (Issue 11).* | Contractor             | Pre-construction  |
| **Contamination of surrounding watercourses and/or groundwater** | - An emergency spill response procedure will be prepared to minimise the impact of spills including details on the requirements for managing, cleaning up and reporting. The requirements of the plan are detailed in Section 15.5 of the EIS. | Contractor             | Construction      |
| **Management of groundwater quantity and quality** | - Consultation with the EPA and NSW Office of Water would be undertaken prior to construction, regarding monitoring and the management of groundwater quality from contamination sources. Parameters to be monitored would be agreed with the EPA and the NSW Office of Water.  
- Pre-construction monitoring of groundwater quality, groundwater flows and groundwater levels would continue to be undertaken to establish existing groundwater quality, flow paths and levels of the Concept Proposal. | Roads and Maritime     | Pre-construction  |
<p>| <strong>Groundwater flow impacts</strong>                | - Monitoring of the Red-crowned Toadlet habitat would be undertaken prior to and during construction to determine any groundwater impacts on the habitat.                                                                                | Roads and Maritime     | Pre-construction Construction |</p>
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<tr>
<td>Interception of groundwater during construction</td>
<td>- Groundwater flows intercepted by project structures (slots and cuttings) would be collected, treated as necessary and recharged into water courses or stormwater.</td>
<td>Contractor</td>
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<td>- Engineering methods, such as cross drains, would be used to capture and manage groundwater flows during construction.</td>
<td>Contractor</td>
<td>Construction</td>
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<tr>
<td>Water sharing plans</td>
<td>- Consultation with NSW Office of Water would be undertaken concerning relevant water sharing plans and the need for groundwater extraction licences or approvals prior to construction.</td>
<td>Roads and Maritime</td>
<td>Pre-construction</td>
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<tr>
<td>Stage 1 Project</td>
<td><strong>Erosion and sediment control (construction)</strong></td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td>- A Soil and Water Management Plan will be prepared for each construction stage of the Concept Proposal in accordance with the principles and guidelines set out Soils and Construction – Managing Urban Stormwater series, comprising Volume 1 (Landcom, 2004) and Volume 2D – Main Roads (DECC, 2008), including:</td>
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<td></td>
<td>- Consideration of soil erodibility</td>
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<td></td>
<td>- Management strategies to be used to minimise surface and groundwater impacts, including identification of water treatment measures, discharge points and erosion and sediment control measures</td>
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<td></td>
<td>- Sedimentation basin construction and management</td>
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<td>- Measures to monitor and manage spoil, fill and materials stockpile sites</td>
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<td>- Dewatering procedure</td>
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<td>- Water quality monitoring and checklists.</td>
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| Surface water quality during operation | • Three in-line pollutant control devices would be designed and installed at the following locations:  
  – Drainage Line 1 – Cobb Street (refer to Appendix M Figure 8.1, Sheet 1 of 4 for location)  
  – Drainage Line 2 – Outlet of new piped stormwater drainage line in Wakehurst Parkway road reserve north of Stage 1 Project (refer to Appendix M Figure 8.1, Sheet 3 of 4 for location)  
  – Drainage Line 3 – Patanga Road (refer to Appendix M Figure 8.1, Sheet 3 of 4 for location)  
  – Drainage Line 3 – End of cul de sac in Winslea Avenue | Contractor | Pre-construction  
Construction |
| Scour of bank drainage line and potential channel erosion. | • Outlet scour protection, such as a rock rip rap apron with an energy dissipation structure, would be considered as part of the detailed design at the pipe outlet in the drainage line downstream (west) of Wakehurst Parkway. | Contractor | Pre-construction |
| Interception of groundwater during construction | • Groundwater flows intercepted by project structures, such as cuttings, would be collected, treated as necessary and recharged into watercourses or stormwater.  
• Engineering methods, such as cross drains, would be used to capture and manage groundwater flows during construction. | Contractor | Construction |
| Resource use and waste management | | | |
| Concept Proposal | • A Resource and Waste Management Plan will be prepared for each construction stage of the Concept Proposal to identify the hierarchy for sourcing and use of resources.  
• Wastes would be managed consistent with the WARR Act principles of | Contractor | Pre-construction  
Construction |
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<td>avoidance, reduction, reuse and recycling.</td>
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<td><strong>Stage 1 Project</strong></td>
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| Inappropriate handling and/or disposal of waste | • A Resource and Waste Management Plan will be prepared to identify the hierarchy for sourcing and use of resources. The plan will adopt the Resource Management Hierarchy principles of the WARR Act and include:  
  – Identification the waste streams that will be generated during construction  
  – A waste register detailing types of waste collected, amounts, date, time, and details of disposal  
  – A resource management strategy detailing beneficial reuse options for surplus and/or unsuitable material. | Contractor | Pre-construction |
<p>|        | • All wastes, including contaminated wastes, will be identified and classified in accordance with Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes. | Contractor | Construction |
|        | • Disposal of any non-recyclable waste will be in accordance with the POEO Act and Waste Classification Guidelines: Part 1 Classifying Waste. | Contractor | Construction |
| Inappropriate disposal of excavated material that cannot be reused in the Stage 1 Project | • Excavated material that is not suitable for on-site reuse or recycling will be transported to a site that may legally accept that material for reuse or disposal. | Contractor | Construction |
|        | • Excavated material leaving the site will be classified in accordance with the Waste Classification Guidelines so that correct resource recovery and or off-site disposal occur. | Contractor | Construction |</p>
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<tr>
<td>Greenhouse gas and climate change</td>
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<td>Concept Proposal and Stage 1 Project</td>
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<td>Energy consumption during construction</td>
<td>• Energy (fuel/electricity) efficiency would be assessed in selecting plant and equipment. Where reasonable and feasible, plant and equipment with higher energy efficiency ratings would be selected.</td>
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<td>• Use of locally sourced materials to reduce transport emissions where reasonable and feasible.</td>
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<td>• Flyash content within concrete would be specified where feasible.</td>
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<td>Pre-construction</td>
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<td>• The feasibility of using biofuels (biodiesel, ethanol, or blends such as E10 or B80) would be investigated by the contractor, taking into consideration the capacity of plant and equipment to use these fuels, ongoing maintenance issues and local sources. Works would be planned to minimise fuel use.</td>
<td>Contractor</td>
<td>Construction</td>
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<td>Re-use of excavated road materials</td>
<td>• Reuse of excavated road materials would be maximised as far as possible where they are cost, quality and performance competitive to reduce use of materials (with embedded energy).</td>
<td>Contractor</td>
<td>Pre-construction</td>
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<td>Energy consumption during operation</td>
<td>• Investigate opportunities to use renewable energy sources to operational requirements such as power control systems, lighting and signage where reasonable and feasible.</td>
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<td>Post-construction</td>
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<tr>
<td>Cumulative impacts and interactions</td>
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<td>Roads and Maritime Construction</td>
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<tr>
<td>Concept Proposal and Stage 1 Project</td>
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<td>Roads and Maritime Construction</td>
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<td>Cumulative impacts</td>
<td>• Broad consultation would be undertaken with potentially affected local community and key stakeholders in coordination with proponents of other nearby projects.</td>
<td>Roads and Maritime Construction</td>
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<td>• Consultation would be undertaken with proponents of other nearby projects to increase the overall awareness of project timeframes/staging and impacts and to provide a more coordinated approach to managing construction in the area.</td>
<td>Roads and Maritime Construction</td>
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</table>
9 References


NSW Department of Environment and Climate Change (2008c) Managing Urban Stormwater – Soils and Construction, Volume 2D Main Road Construction, Sydney NSW.

NSW Health Infrastructure (2013) Northern Beaches Hospital Stage 1 EIS, October 2013.


NSW Office of Environment and Heritage (2012a), BioBanking Assessment Methodology.

NSW Office of Environment and Heritage (2013a) OEH principles for the use of biodiversity offsets in NSW.

NSW Office of Environment and Heritage (2014b) Draft NSW Biodiversity Offsets Policy for Major Projects (state significant development and state significant infrastructure).


NSW Office of Environment and Heritage (2014d) NSW Government Resource Efficiency Policy.


### Appendix A  Private submissions

Private submissions (individuals and community groups)

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<tr>
<th>Sub #</th>
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<td>1</td>
<td>Frenchs Forest</td>
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<td>Davidson</td>
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<td>Forestville</td>
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<td>Narrabeen</td>
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