

# **NORTHERN BEACHES HOSPITAL – CONNECTIVITY AND NETWORK ENHANCEMENTS**

## **Stage 2 Network Enhancement Works**

Staged infrastructure application report

July 2014



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# Document controls

<b>Title:</b>	<b>Northern Beaches Hospital – Connectivity and Network Enhancements Stage 2 – Network Enhancement Works Staged Infrastructure application report</b>
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# Executive summary

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In March 2014, Roads and Maritime Services (Roads and Maritime) submitted the Northern Beaches Hospital – Connectivity and Network Enhancements Project Stage 1 and Concept Proposal State Significant Infrastructure application (Roads and Maritime, 2014b) as the first stage of a two staged application. The Stage 1 application included the overall concept design for the project as a whole and Stage 1 Connectivity Works. Environmental assessment requirements for this Concept Proposal and Stage 1 application were issued on 17 April 2014 under section 115Y of the *Environmental Planning and Assessment Act 1979 (EP&A Act)*.

The purpose of this application report is to assist the formulation of environmental assessment requirements by the Secretary for the Stage 2 – Network Enhancement Works environmental impact statement (**EIS**). Roads and Maritime propose to carry out road works to enhance road network connectivity to the broader network in the area. The works are to be known as the Northern Beaches Hospital – Stage 2 Network Enhancement Works (**the project**).

The project aims to:

- Assist in the management of journeys in connection with anticipated future intensification of medical, commercial and residential land uses surrounding the Northern Beaches Hospital (NBH).
- Mitigate the worsening of traffic congestion on the Warringah Road and Wakehurst Parkway arterial road corridors and their principal feeder roads.
- Enhance access arrangements by car, bus and active transport for the NBH's employees, patients, outpatients and visitors.
- Mitigate intersection delays to facilitate improved access to the NBH and the surrounding employment precincts.

The project comprises:

- Widening of Warringah Road from west of Fitzpatrick Avenue East (and Fitzpatrick Avenue West) to the west of Allambie Road to include:
  - Westbound travel lanes, at surface level on the southern side of the Warringah Road corridor for the length of the proposal.
  - Eastbound travel lanes, at surface level on the northern side of the Warringah Road corridor (using existing road pavement), for the length of the proposal.
  - Subsurface eastbound and westbound travel lanes in slot (underpass), through the middle of the Warringah Road corridor, generally from west of Forest Way through to east of Wakehurst Parkway for more than one kilometre.
  - The provision of a new pedestrian overbridge across Warringah Road on the western side of the intersection with Hilmer Street.
  - The removal and replacement of the existing pedestrian overbridge across Warringah Road west of the intersection of Forest Way.
- Widening of Wakehurst Parkway from the intersection of Warringah Road to south of Aquatic Drive.
- Upgrades to Warringah Road and its intersection with Forest Way, Hilmer Street and Wakehurst Parkway at surface level to provide for all traffic movements and provide for subsurface grade separated through traffic.

- Upgrades or adjustments to existing intersections of Warringah Road with the following local roads and approaches:
  - Fitzpatrick Avenue East.
  - Bantry Bay Road (including closing of the left turn into Bantry Bay Road from Warringah Road eastbound).
  - Rodborough Road.
  - Allambie Road.
  - Forest Way.
- Providing a new connection at Aquatic Drive and Wakehurst Parkway.
- Substantial utility relocations, including water, sewage, telecommunication, electricity and gas services, along Warringah Road, Wakehurst Parkway and a number of surrounding local roads.
- Ancillary works during construction including, but not limited to, construction compounds, sedimentation basins, batch plants and stockpile sites.

Preliminary environmental assessments carried out for this application report have identified the following key environmental issues for the Secretary's environmental assessment requirements:

- Traffic and transport impacts.
- Noise and vibration impacts.
- Biodiversity impacts.
- Socio-economic, land use, property and utilities impacts.
- Urban design (including landscape character and visual impact) impacts.
- Geology, soils and contamination impacts.
- Hydrology, water quality and flooding impacts.
- Resource use and waste management.

The preliminary environmental assessments have also identified the following as non-key environmental issues which would not necessitate specific Secretary's environmental assessment requirements:

- Aboriginal heritage impacts.
- Historic heritage impacts.
- Greenhouse gas impacts.
- Cumulative impacts.



# Contents

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1	Introduction.....	1
	1.1 Overview of the project .....	1
	1.2 Purpose of this document .....	5
2	Background .....	7
	2.1 Strategic context and project need.....	7
	2.2 Project objectives.....	7
	2.3 Consultation .....	7
	2.4 Selection of the preferred project.....	9
	2.5 Recommended option.....	11
3	Project description.....	13
4	Environmental issues .....	15
	4.1 Overview .....	15
	4.2 Key Issues .....	15
	4.3 Non-key Issues .....	29
5	Conclusion.....	36
6	References .....	37

**Attachment A:** Requirements of the *Environmental Planning and Assessment Regulation 2000*

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# Abbreviations and glossary

Term	Definition
AHD	Australian height datum
AHIMS	Aboriginal Heritage Information Management System
Carriageway	The portion of a roadway devoted to vehicular traffic generally delineated by kerbs, a verge or a median
CBD	Central Business District
CEMP	Construction environmental management plan
CHAR	Cultural Heritage Assessment Report
CO	Carbon monoxide
Culvert	An enclosed channel for conveying water below a road
DFEC	Duffys Forest Ecological Community
DP&E	Department of Planning and Environment
EEC	Endangered ecological community
EIS	Environmental impact statement
EMS	Environmental management system
Environmental assessment (process)	A specialised part of the decision-making process, where the environmental impact of a development or proposal or activity is considered in detail, together with other aspects of the development
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW).
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth).
Grade separation	The use of an underpass or overpass to separate road, rail or other traffic that cross each other, so that crossing movements do not conflict.
Habitat	The place where an organism lives.
HI	NSW Health Infrastructure
Interchange	A grade separated junction between roads where the local road passes above or beneath the highway via bridge or underpass structure with one or more interconnecting roadways
IRG	Interface Reference Group
km/h	Kilometres per hour
LALC	Local Aboriginal Land Council

<b>Term</b>	<b>Definition</b>
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act
LGA	Local government area
MLALC	Metropolitan Local Aboriginal Land Council
NBH	Northern Beaches Hospital
NO <sub>2</sub>	Nitrogen dioxide
NSLHD	Northern Sydney Local Health District
OEH	Office of Environment and Heritage (formerly Department of Environment, Climate Change and Water)
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PEI	Preliminary Environmental Investigation
PM <sub>10</sub>	Airborne particulate matter (such as airborne dust or silt) with equivalent aerodynamic diameter of 10 microns or less
PM <sub>2.5</sub>	Airborne particulate matter with equivalent aerodynamic diameter of 2.5 microns or less
RNP	NSW Road Noise Policy
SEARs	Secretary's environmental assessment requirements
SEPP	State environmental planning policy
SHOROC	Shore Regional Organisation of Councils
SHR	NSW State Heritage Register
SRD SEPP	State and Regional Development SEPP 2011
TEC	Threatened ecological community. Ecological communities that are listed under the TSC Act as critically endangered, endangered or vulnerable, depending on their risk of extinction
TfNSW	Transport for NSW
Threatened	A species, population or ecological community that is likely to become extinct or is in immediate danger of extinction
TSC Act	<i>Threatened Species Conservation Act 1995</i>
WSUD	Water sensitive urban design

# 1 Introduction

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## 1.1 Overview of the project

Roads and Maritime is proposing to carry out development that is State Significant Infrastructure (**SSI**), and therefore requires approval from the Minister administering the *Environmental Planning and Assessment Act 1979* (**EP&A Act**). The SSI in question is a suite of road works to enhance arterial and sub-arterial road network connectivity in the proposed Northern Beaches Hospital (NBH) precinct at Frenchs Forest.

The overall project (Concept Proposal) is known as the Northern Beaches Hospital – Connectivity and Network Enhancements Project. The project is proposed to be approved in stages under section 115ZD of the EP&A Act. More detail on the staged assessment approach is provided in Section 1.2.

The two stages generally include:

- Stage 1 – Northern Beaches Hospital Connectivity Enhancement Works (**Stage 1 Connectivity Works**) and Concept Proposal (**overall project**).
- Stage 2 – Northern Beaches Hospital Network Enhancement Works (**Stage 2 Network Enhancement Works**).

The Stage 1 Connectivity Works are generally along Forest Way, Naree Road, Frenchs Forest Road (including access for the proposed hospital) and Allambie Road. The works also include widening a section of Warringah Road, Wakehurst Parkway (north of Warringah Road) and an upgrade of its intersection with Frenchs Forest Road.

In March 2014, Roads and Maritime submitted the Northern Beaches Hospital – Connectivity and Network Enhancements Stage 1 Hospital Connectivity Works and Concept Proposal staged infrastructure application (**Stage 1 SSI Application**).

Director General Requirements (now known as Secretary Environmental Assessment Requirements, or **SEARs**) were issued on 17 April 2014 for the Concept Proposal and Stage 1. An EIS for the Stage 1 SSI Application is currently being prepared.

The Stage 2 Network Enhancement Works are the subject of this SSI Application. The Stage 2 Network Enhancement Works include broader network upgrades to Warringah Road and Wakehurst Parkway to complement and support the Stage 1 Connectivity Works.

The Stage 2 works generally include network enhancements to the following roads within Frenchs Forest:

- Warringah Road from west of Fitzpatrick Avenue East (and Fitzpatrick Avenue West) to the east of Allambie Road
- Wakehurst Parkway from the intersection with Warringah Road to about 500 metres south of Warringah Road.
- Aquatic Drive from the intersection with Wakehurst Parkway to about 200 metres east.
- Allambie Road from the intersection with Warringah Road south to the intersection with Rodborough Road.

The indicative location of the overall project is shown in Figure 1-1. Some additional road works outside the above area may be considered during the detailed design

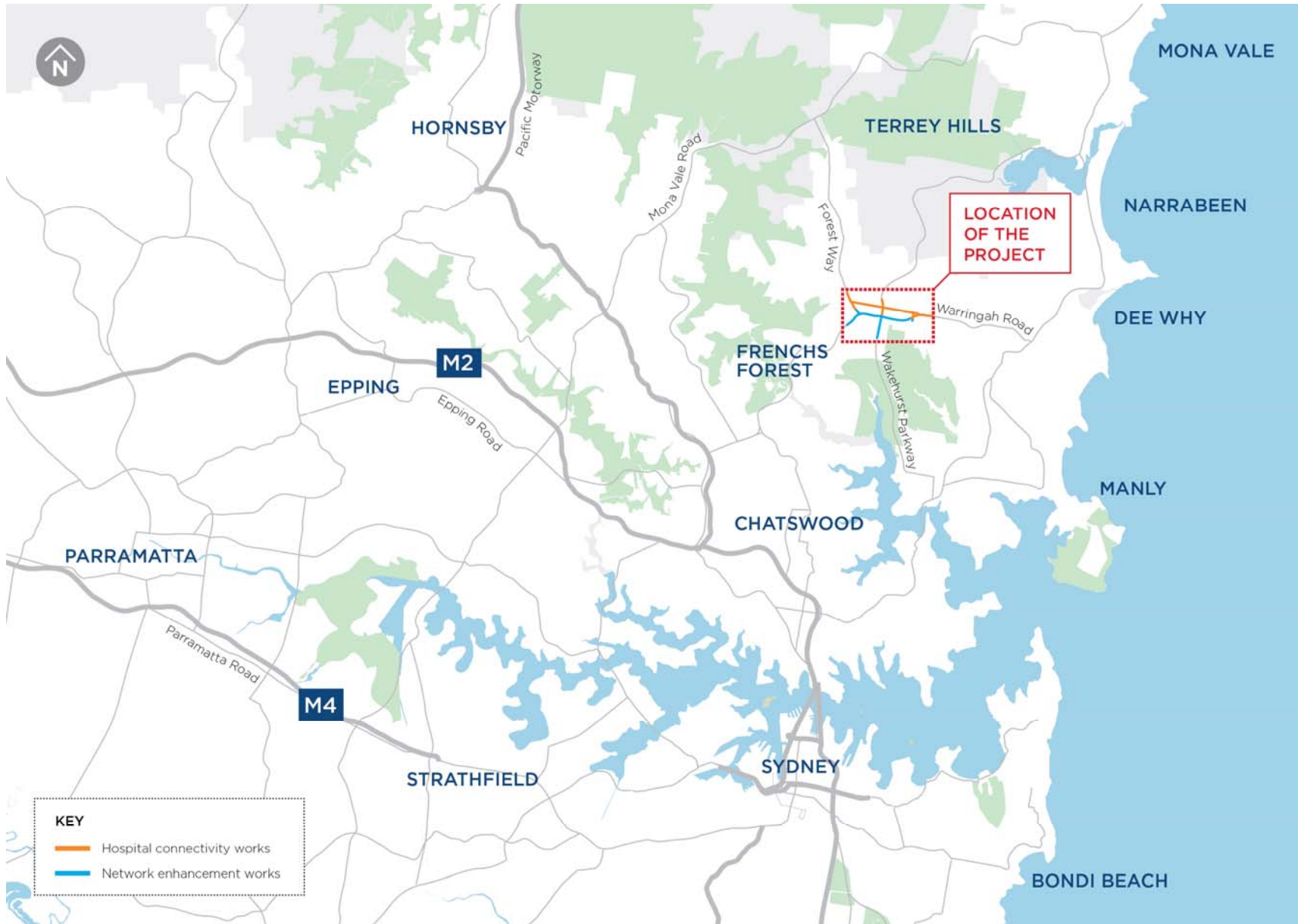
process. If so, this will be described and assessed in the environmental impact statement for the Stage 2 application.

The project aims to:

- Assist in the management of journeys in connection with anticipated future intensification of medical, commercial and residential land uses surrounding the NBH.
- Mitigate the worsening of traffic congestion on the Warringah Road and Wakehurst Parkway arterial road corridors and their principal feeder roads.
- Enhance access arrangements by car, bus and active transport for the NBH's employees, patients, outpatients and visitors.
- Mitigate intersection delays to facilitate improved access to the NBH and the surrounding employment precincts.

The project is proposed to be approved under section 115ZD of the EP&A Act, with requisite details of Stage 2 being provided with this application so as to obtain approval for Stage 2 of the project.

A more detailed description of the project is provided in Section 3. Key features of the project are shown in Figure 1-2.



**Figure 1-1 Location and regional context**



**Figure 1-2 Project area and key features**



## 1.2 Purpose of this document

Roads and Maritime has prepared this application report as part of a staged infrastructure application under section 115ZD of the EP&A Act. Section 115ZD allows a staged infrastructure application to set out a concept proposal for the proposed infrastructure and for detailed proposals for separate parts of the infrastructure to be the subject of subsequent applications for project approval. Where there are requisite details, the staged infrastructure application may allow for approval to carry out the first stage without further approval needing to be obtained.

As outlined in section 1.1 above, the Stage 1 SSI application was submitted in March 2014 and SEARs for Stage 1 were issued in 17 April 2014. Design development for the Stage 2 Network Enhancement Works has now developed sufficiently such that the Stage 2 SSI application can be submitted. This SSI application comprises the Stage 2 Network Enhancement Works.

The overall project is declared to be SSI by clause 15 and Schedule 4 of the SRD SEPP, by force of section 115U(4) of the EP&A Act. The project does not require development consent under Part 4 of the EP&A Act. Accordingly, as per clause 15 and Schedule 4 of the SRD SEPP, the project is SSI under Part 5.1 of the EP&A Act and requires the approval of the Minister for Planning and Environment. Further detail on the application of Schedule 4 of the SRD SEPP can be found in the Stage 1 SSI Application (Roads and Maritime, 2014b).

The requirements of clause 192 of the *Environmental Planning and Assessment Regulation 2000* for applications seeking approval of the Minister for Planning to carry out SSI are addressed in Attachment A to this report.

The purpose of this application report is to assist the formulation of environmental assessment requirements by the Secretary under section 115Y of the EP&A Act. The application report:

- Describes the project.
- Discusses the potential environmental issues for the project.
- Identifies key environmental issues for the project.

This application report and the SEARs will inform the preparation of an EIS for Stage 2 of the overall project. The form and content of the EIS would be in accordance with clauses 6 and 7 of Schedule 2 to the *Environmental Planning and Assessment Regulation 2000*.

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## 2 Background

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### 2.1 Strategic context and project need

The Stage 1 SSI Application outlines the strategic need for the project in line with the proposed NBH. Generally, in enhancing the network capacity and road network connectivity in the local area, the project is consistent with relevant supporting Government plans and strategies, including:

- Draft Metropolitan Strategy for Sydney to 2031 (Department of Planning and Environment, 2013).
- State Infrastructure Strategy – New South Wales 2009-09 to 2017-18 (NSW Treasury, 2008).
- Long Term Transport Master Plan (TfNSW, 2012).

In addition, the local road network has been identified as having capacity limitations that make it prone to congestion and heavy delays particularly during the AM and PM peak periods. The need for this project to increase capacity and improve the network capabilities is outlined in section 2.1 of the Stage 1 SSI Application.

### 2.2 Project objectives

The strategic aims of the project relate to provision of a road network solution that optimises connectivity of the arterial and sub-arterial road network to the NBH and its environs. At a wider level, the project also aims to reinforce Warringah Road and Wakehurst Parkway as key arterial connections between the beachside suburbs of Sydney's north and Chatswood and Sydney's CBD.

#### *Specific objectives*

- To support the activation of the NBH precinct by facilitating access connections to the proposed NBH.
- 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 area.

### 2.3 Consultation

#### 2.3.1 *Community involvement*

A communications and engagement strategy (Roads and Maritime, 2014) has been prepared for the overall project which outlines how Roads and Maritime will consult and communicate with the local community and key stakeholders.

In March 2014, Roads and Maritime announced the Northern Beaches Hospital Connectivity and Network Enhancements project to the community. As part of this announcement Roads and Maritime initiated the 'early consultation phase' and invited the community to provide their views on the overall project from 14 March to 30 April

2014. Communication activities undertaken during this phase of consultation included door knocking approximately 500 local residents and businesses, distributing around 20,000 Community Updates to the broader community and hosting three information sessions attended by approximately 700 people.

More than 100 written submissions were received during this consultation phase. Many of those lodging submissions requested they be registered on the stakeholder list to receive regular project updates. Currently, this register includes more than 1000 stakeholders.

A Community Consultation Report (Roads and Maritime, July 2014) has been prepared to respond to issues raised during community consultation. Generally, the most common issues that were raised by the community were related to:

- Congestion on the local and arterial road network.
- NBH infrastructure.
- Future traffic arrangements and movements.
- Future consultation processes.
- Environmental issues.
- Future access and pedestrian movements.

Community and stakeholder consultation and information will be provided on an ongoing basis throughout the development of the project.

### ***2.3.2 Aboriginal community involvement***

Roads and Maritime has commenced consultation with the Metropolitan Local Aboriginal Land Council (MLALC) as part of the project. A site survey was undertaken with a representative of the MLALC and a senior archaeologist from Kelleher Nightingale Consulting Pty Ltd between 9 and 11 April 2014. The study area was surveyed on foot, primarily focusing on the streets and bushland surrounding Frenchs Forest Road, Warringah Road, Wakehurst Parkway and Forest Way. Consultation with the MLALC and Aboriginal community was undertaken in accordance with the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigations (PACHCI).

### ***2.3.3 Government and agency stakeholder involvement***

The Northern Beaches Hospital Interface Reference Group was established in 2012 to provide for inter-agency discussion around the NBH and transport infrastructure in and around the hospital site. The Interface Reference Group includes representatives from Roads and Maritime, Health Infrastructure, Transport for NSW and Warringah Council. Further details regarding the Interface Reference Group are provided in the Stage 1 SSI Application.

Consultation with Warringah Council and Shore Regional Organisations of Councils (SHOROC) has also been regular and ongoing, and includes, as relevant:

- Representation on the project working group (led by Roads and Maritime).
- Project presentations and briefings to senior Council staff and SHOROC as requested.
- Warringah Council and SHOROC attendance at value management workshops.

Roads and Maritime will continue to consult with government authorities, the Aboriginal community, specialist interest groups, utilities and service providers, the public, including community groups, and adjoining and affected landowners, throughout the development of the project. The stakeholder register will continue to be updated as required, and those registered will be provided regular updates on progress of the project. The Stage 2 EIS will document consultation progress, consultation undertaken, the issues raised and how they have been addressed.

## **2.4 Selection of the preferred project**

The overall Concept Proposal, as described in the Stage 1 SSI Application, has been formulated to provide enhanced road network connectivity to the proposed NBH and to enhance the network's capacity to accommodate the operational impact of the hospital and possible future intensification of current levels of development in the vicinity of the hospital. It aims to support Warringah Road and Wakehurst Parkway as key arterial connections between the beachside suburbs of Sydney's north and Chatswood and Sydney's CBD.

As a stage of the overall Concept Proposal, the project (forming Stage 2) has evolved from an iterative design and evaluation process and it began in response to the main hospital access being located on Frenchs Forest Road West. Development of strategic options progressed from minor works at primary intersections to provide access to the proposed NBH into a broader network wide solution to improve network performance and connectivity to the hospital. Options identification and assessment has been a collaborative process that has included representatives from industry and Government.

A significant amount of traffic modelling has been done to assess strategic options. A micro-simulation model has been developed that extends across the whole project area. The model was prepared to assess the performance of options for the AM and PM peak periods for the base case year (2012) and future year scenarios (2021 and 2036). The results from the model for each peak period and year were then referred to as part of a comparative assessment of the network performance of each option.

The selection of the preferred option has been based on its performance against the project objectives in particular how the options could provide suitable access to the NBH and also provide for the ongoing operation of the arterial and local road network i.e. network performance.

These options are outlined below.

### ***Option 1 – Base Case or 'do minimum'***

This option would provide upgrades to the local network that would provide connectivity to the hospital by opening in 2018. It would include:

- Provision of a main hospital entrance on Frenchs Forest Road West, and a secondary left in left out entrance to the hospital from Warringah Road.
- Provision of a right turn facility from Warringah Road westbound into Wakehurst Parkway northbound.
- Provision of a right turn facility for Wakehurst Parkway southbound into Frenchs Forest Road West.
- The upgrade of Frenchs Forest Road West to four lanes, including right turn bays.

This option did not provide suitable road network performance or aid in alleviating congestion on the broader road network. As a result, this option was considered unacceptable and was not considered further.

### ***Option 2 – Rudimentary hospital connectivity***

Option 2 included the base case works (Option 1) plus:

- Major intersection upgrade at Frenchs Forest Road and Wakehurst Parkway including the provision of:
  - Double right turn from Frenchs Forest Road West into Wakehurst Parkway.
  - Double right turn from Frenchs Forest Road East into Wakehurst Parkway.
  - Double right turn from Wakehurst Parkway into Frenchs Forest Road East.
- Allambie Road and Patanga Road intersection upgrade.
- Provision of a double right turn from Warringah Road into Allambie Road (north), plus an extended single right turn to 80 metres east of Courtly Road.

Although connectivity to the hospital was improved in Option 2, allowing for greater flows of traffic to enter Frenchs Forest Road, it was similar to Option 1 in that it did not provide suitable road network performance or aid in alleviating congestion on the broader road network. As a result, this option was considered unacceptable and was not considered further.

### ***Option 3 – Hospital connectivity and minor network enhancements***

Option 3 included all works outlined in Options 1 and 2, plus:

- Provision of a signalised intersection at Forest Way and Naree Road.
- Frenchs Forest Road East (and West) upgrade to four lanes plus right turn lanes.
- Provision of a signalised intersection at Frenchs Forest Road West and Rabbett Street.
- New traffic signals at Frenchs Forest Road East and Allambie Road (improving on the intersection upgrade at Allambie Road and Patanga Road in Option 2).
- Upgrade to the Warringah Road and Allambie Road (north) intersection.

Option 3 did provide some degree of network performance improvement in the short term that would indicate the achievement of the project objective of supporting the activation of the NBH Precinct, namely, through facilitating access connections to the hospital by 2018 and by ensuring the network travel speeds are similar to the existing.

In the longer term the network performance of this option would diminish and this was considered unacceptable.

As a result, a further set of options that included the works proposed in Option 3 together with either an underpass (Option 4) or overpass (Option 5), and with other works along Warringah Road, were investigated to address the broader congestion needs primarily of Warringah Road, Wakehurst Parkway and Forest Way.

### ***Option 4 – Network enhancements through grade separation underpass***

Option 4 included an underpass on Warringah Road in addition to the works identified in Option 3. The underpass option allows for travel lanes in each direction of through traffic to travel uninterrupted along the middle of the Warringah Road corridor at a sub-surface level. Surface roads would run parallel to the underpass as part of the

Warringah Road corridor to provide access to local roads to the side and the NBH. The underpass would go under the Wakehurst Parkway, Hilmer Street and Forest Way intersections allowing for through traffic to continue without stopping at traffic signals.

This option was considered to achieve satisfactory longer term network performance in 2036. It would reduce the potential need for additional work in the future, have the ability to meet future bus priority targets for the corridor and would allow for the staged construction of works while maintaining network capacity.

Option 4 would also have the benefit of reducing visual impacts and have a greater potential to mitigate noise as a result of through traffic being in an underpass. Option 4 would also provide a clearer road network structure, would have less impact on future development by maintaining full access to Hilmer Street and provide for greater access for the NBH from Warringah Road.

### ***Option 5 – Network enhancements through grade separation overpass***

Option 5 included an overpass on Warringah Road in addition to the works identified in Option 3. The overpass option allows for travel lanes in each direction of through traffic to pass over Wakehurst Parkway and continue past the Hilmer Street intersection at grade (surface level). An underpass would also be required at the Forest Way intersection to provide continuous east-west flow of travel on Warringah Road. Surface roads would run parallel as part of Warringah Road to provide access to side roads and adjacent facilities.

Traffic modelling indicates Option 5 could provide for sufficient traffic operation in the longer term and reduce the potential need for additional work in the future. In addition, it should also have the ability to meet future bus priority targets for the corridor and allow for staged construction of works while maintaining network capacity.

The network performance of Option 5 is less than that of Option 4. This is in part due to the restricted access at Hilmer Street that Option 5 creates. Further, Option 5 enables only limited access to the proposed NBH from Warringah Road. Option 5 has an increased visual impact and less potential to mitigate traffic noise when compared to Option 4. Therefore, Option 5 was not considered the preferred strategic option.

## **2.5 Recommended option**

Based on the iterative development and assessment of options in addressing the project objectives, it was determined that Option 4 would best meet the needs of the NBH and the surrounding precinct as this would:

- Provide the most favourable network performance in the longer term (e.g to 2036).
- Be more user friendly and provide more direct and flexible access for local access traffic.
- Be better able to provide an integrated solution for road based public transport.
- Have an improved ability to separate traffic streams and conflict zones, have better grades, transitions and simplified vehicle weaving, improving its ability to provide a more efficient option in terms of network performance and improved road safety outcomes.
- Have a lower visual impact and lower noise impact when compared to an overpass.
- Provide a better value for money solution.

The preferred overall project (forming the Concept Proposal) therefore includes all the works identified in Option 3 plus the Option 4 underpass.

The works included in Option 3 form the Stage 1 Hospital Connectivity Works. The Stage 1 SSI Application provides a more detailed description of that project.

The underpass along Warringah Road identified as Option 4 is the subject of this Stage 2 Network Enhancement Works SSI application. A more detailed description of the Stage 2 Network Enhancement Works (Option 4) can be found in Section 3.

The project development process is ongoing with further design and options investigations continuing as part of a collaborative process with representatives from industry and Government.



### 3 Project description

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The project comprises the Stage 2 Network Enhancement Works, being the upgrade of Warringah Road and Wakehurst Parkway to improve broader network performance through the area. The project also includes some minor upgrades to local roads that connect to these arterial roads, as well as Forest Way, Aquatic Drive and Allambie Road. The location of the project is shown in Figure 1-1. Key features of the project are shown in Figure 1-2.

The scope of the project comprises:

- Widening of Warringah Road from west of Fitzpatrick Avenue East (and Fitzpatrick Avenue West) to the west of Allambie Road to include:
  - Subsurface eastbound and westbound travel lanes in slot (underpass), through the middle of the Warringah Road corridor, generally from west of Forest Way through to east of Wakehurst Parkway for more than one kilometre.
  - 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
  - The provision of a new pedestrian overbridge across Warringah Road on the western side of the intersection with Hilmer Street.
  - The removal and replacement of the existing pedestrian overbridge across Warringah Road west of the intersection of Forest Way.
- Widening of Wakehurst Parkway from the intersection of Warringah Road to south of Aquatic Drive.
- Upgrades to Warringah Road and its intersection with Forest Way, Hilmer Street and Wakehurst Parkway at surface level to provide for all traffic movements and provide for subsurface grade separated through traffic.
- Upgrades or adjustments to existing intersections of Warringah Road with the following local roads and approaches:
  - Fitzpatrick Avenue East.
  - Bantry Bay Road (including closing of the left turn into Bantry Bay Road from Warringah Road eastbound.
  - Rodborough Road.
  - Allambie Road.
  - Forest Way.
- Providing a new connection at Aquatic Drive and Wakehurst Parkway.
- Substantial utility relocations, including water, sewage, telecommunication, electricity and gas services, along Warringah Road, Wakehurst Parkway and a number of surrounding local roads.
- Ancillary works during construction including, but not limited to, construction compounds, sedimentation basins, batch plants and stockpile sites.

For the purposes of this report, the scope of the project would not include ongoing maintenance works.



## 4 Environmental issues

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### 4.1 Overview

Key issues are those that may have high or moderate impacts (actual or perceived) and detailed assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts. Non-key issues are those that may have low to moderate impacts. Impacts can be mitigated by the application of standard environmental management measures.

A high level qualitative environmental risk review has been undertaken for the project based on information provided in the PEI (SMEC, 2013a) and the various specialist studies that have been undertaken to date for the Stage 1 EIS. The level of environmental risk was assessed through a consideration of the environmental impacts of the project and the ability to manage those effects to minimise harm to the environment.

While the approach to environmental risk review is qualitative, it provides an important step in the process of project planning and assessment of the environmental impacts. In particular, it is used to guide scoping of environmental investigations and assessments for the project and also to guide project design, and assist in identifying appropriate mitigation measures and management responses.

This chapter provides an overview of the key and non-key environmental issues and identifies the further detailed assessments that Roads and Maritime will undertake as part of the Stage 2 EIS process. These issues are outlined at the end of this chapter and are considered to be of lesser consequence taking into consideration the project scope, the existing environment, and the implementation of standard management and safeguard measures. It is expected that these other environment issues would not likely be key issues; however the potential impact of these other environmental issues will be assessed in the environmental impact statement

Preliminary consideration has been given to the provisions of the EPBC Act. Based on a search of the EPBC Act Online Protected Matters Search Tool and investigations undertaken to date as part of the Stage 1 EIS, it is considered unlikely that the project would have a significant impact on any matter of National Environmental Significance.

The project area in which the Stage 2 works generally fall is described in Section 1.

### 4.2 Key Issues

As explained in Section 4.1, key issues are those that may have high or moderate impacts (actual or perceived) and detailed assessment is necessary to determine the level of potential impact and to develop appropriate measures to mitigate and manage the impacts. This section outlines the key issues identified for the Stage 2 EIS.

#### 4.2.1 *Traffic and transport*

An overview of the existing traffic and transport environment for the project is outlined in Section 4.2 of the Stage 1 SSI Application report. Refer to that section for an overview of traffic and transport issues.

## Summary of issues

Consultation has been undertaken with the local community and stakeholders across March – April 2014 by Roads and Maritime for the project and in late 2013 by DP&E as part of the NBH EIS exhibition (SSI 13\_5982). Common issues identified in response to consultation have been largely concerned with traffic congestion on local and arterial roads, vehicle and pedestrian access to local facilities and future traffic arrangements and movements.

### Construction

The project has the following potential traffic and transport related construction impacts:

- Temporary disruptions and delays to traffic due to the narrowing of lanes, speed restrictions, additional spoil and truck movements and temporary road closures.
- Managing cumulative construction traffic impacts associated with the hospital and the Stage 1 road works which may be under construction at the same time.
- Construction staging which would impact on traffic movement, access roads and different communities.
- The potential for a temporary shift of traffic movements from roads within the project area to alternative routes, particularly during peak periods as motorists try to avoid congestion caused by road works.
- Temporary impacts on pedestrian and cycle access.
- Negative impact on bus travel times with consequent delays for commuters.

### Operation

The project has the following potential traffic and transport related operational impacts:

- There would be permanent changes to existing traffic movements on Warringah Road, Wakehurst Parkway, Aquatic Drive and Allambie Road. In particular, through traffic on Warringah Road would generally be separated and in slot (underpass).
- Changes in vehicle movements arising from network changes.
- Changes to access into local roads and adjacent properties.
- Impacts on intersecting and parallel road networks.
- Improved opportunities for public transport services and improved travel times.
- Improved pedestrian and cyclist accessibility.

## Proposed further assessments

Traffic and transport are likely to be key issues for the assessment and a detailed traffic and transport impact assessment would be required for the Stage 2 Network Enhancement Works. This assessment would be included in the EIS and would identify potential impacts and nominate mitigation measures to minimise impacts.

The detailed assessment would include the following, as relevant:

- An assessment of construction traffic impacts including route identification, number, frequency and size of construction related vehicles, the nature of existing traffic, and the need to close, divert or otherwise reconfigure elements of the road network associated with construction of the project, including:

- An assessment of traffic impacts on the surrounding network over the staged construction period.
- An assessment of cumulative traffic impacts.
- Recommendations for appropriate traffic and transport management and mitigation measures.
- An assessment of operational traffic impacts including an assessment of existing local and regional traffic volumes and traffic patterns against forecast volumes and potential changes to traffic patterns associated with the project and public transport impacts.
- Forecast traffic volumes for Warringah Road and Wakehurst Parkway and the local road network, based on detailed traffic modelling for the project and the local and regional road networks.
- Travel time analysis.
- An assessment of the performance of key interchanges and intersections by undertaking a Level of Service analysis at key locations.
- An assessment of the impacts of the project on road users including motorists, public transport, freight, pedestrians and cyclists and on local and regional road networks.
- Road safety analysis for operation.
- Maintaining a safe environment for road users, including buses, pedestrians and cyclists which would be a priority during construction. The potential for safety impacts, due to temporary road arrangements or the proximity of construction activities to normal traffic would be assessed.

#### **4.2.2 Noise and vibration**

An overview of the existing noise and vibration environment for the project is outlined in Section 4.3 of the Stage 1 SSI Application report. Refer to that section for the overview of noise and vibration issues.

#### **Summary of issues**

##### Construction

The project would require substantial excavation along Warringah Road to provide for the subsurface through lanes which would be in slot through the centre of the Warringah Road corridor. Excavations would also be required to provide for the subsurface grade separated interchanges at the intersections of Warringah Road/Wakehurst Parkway and Warringah Road/Forest Way. This excavation would likely require piling and rock breaking.

Construction activities would involve the operation of plant and machinery that would have associated noise and vibration emissions, and that could impact on nearby receivers, both in relation to amenity and the structural integrity of buildings and other sensitive structures.

Construction of the project has the potential for the following noise and vibration related impacts:

- Areas of construction activity along the project may affect residential and non-residential sensitive receivers to varying degrees. The level of impact from

construction works experienced by receivers would depend on the proximity to the works, the types of activities, the duration of activities, the existing noise level and the time of day.

- Increased noise levels during out-of-standard construction hours may affect sensitive receivers. Construction activities typically occur during daytime hours. However, due to the need to maintain road network capacity and for safety reasons, work may need to be undertaken outside normal working hours.
- Increases in road traffic noise levels for receiver locations are expected around the areas of major construction, which would provide a new source of traffic noise for sensitive receivers.
- Potential vibration impacts on nearby buildings and other structures due to short offset distances between the works and sensitive receiver locations.

Recommended noise guidelines for construction are set out in the *Interim Construction Noise Guideline (ICNG)* (DECC, 2009). The guidelines for construction noise are based on the anticipated length of the proposed construction period. As the construction program would be longer than three weeks, it would be classified as a major construction project.

Accordingly, a quantitative assessment would be required and the following criteria would apply:

- Recommended standard hours: background plus 10 dB(A) and LAeq 75 dB(A).
- Outside recommended standard hours: background plus 5 dB(A).

Noise emissions associated with certain construction activities would likely not be able to comply with the ICNG. Further, there may be a requirement for some 'out of standard working hours' work to be undertaken to minimise impacts on traffic.

There are no set NSW guidelines for assessment of vibration, but it is generally accepted that for continuous vibration a level of 5 mm/s is safe for residential construction (German Standard DIN 4150-1986). Normal construction techniques, excluding blasting, would not increase vibration levels more than 1.5 mm/s at a 30 metre distance. It is not anticipated that the project would require blasting as part of the Stage 2 Network Enhancement Works. If vibratory works occur within 30 metres of residences there may be potential for property damage.

### Operation

The project would bring traffic noise sources closer to sensitive receivers than currently exists. It may also involve changes to or removal of structures that currently provide screening or blockage of noise emissions from traffic on major transport routes. In addition, a section of Warringah Road would be in slot (underpass) providing changes in noise emissions to existing conditions.

Criteria for assessment of road traffic noise are set out in the NSW Government's *Road Noise Policy (RNP)* (DECCW, 2011). Under the RNP, road projects are classified as either 'new road' or 'redevelopment of an existing road'. The latter definition would apply to the proposal.

With regard to residential land use, this would comprise 'Existing residences affected by noise from redevelopment of existing freeway/arterial/sub-arterial road' and the noise assessment criteria would therefore be:

- Day (7am to 10pm), LAeq, (15 hour) – 60 dB(A).

- Night (10pm to 7am),  $L_{Aeq, (9 \text{ hour})} - 55 \text{ dB(A)}$ .

For other sensitive land uses, the noise assessment criteria are presented in Table 4 of the RNP.

In addition to these assessment criteria, the RNP also requires consideration be given to the increase in the total traffic noise level due to a proposal. The RNP notes that residences experiencing increases in total traffic noise level above 12 dB(A) should be considered for mitigation as described in Section 3.4 of the RNP.

Where impacts are found to exceed the RNP guideline noise levels, feasible and reasonable management measures would be considered.

A number of sensitive receivers are located immediately adjacent to Warringah Road and would already be affected by existing traffic noise.

### **Proposed further assessment**

A detailed noise and vibration impact assessment working paper would accompany the Stage 2 Network Enhancement Works EIS. This assessment would identify potential impacts and nominate mitigation measures to minimise impacts.

Further noise and vibration assessment of the project would include the following, as applicable:

- A detailed assessment of construction and operation noise and vibration impacts, including the consideration of areas where out of hours or night-time works can be undertaken with minimal impacts. This assessment would include monitoring and measuring existing noise levels, predicting future traffic noise levels (modelling), and development of appropriate noise mitigation/attenuation measures.
- Consideration of potential vibration impacts on sensitive or potentially sensitive heritage items in Brick Pit Reserve (this would need to be informed by the recommended historic heritage investigation; refer to Section 4.3.2).

The assessment of noise and vibration impacts for construction and operation would be undertaken in accordance with the following guidelines as relevant:

- Department of Environment, Climate Change and Water (DECCW) (2011) *NSW Road Noise Policy*.
- Roads and Traffic Authority (2011) *Interim approaches to apply the Road Noise Policy*.
- Roads and Traffic Authority (2001) *Environmental Noise Management Manual*.
- Department of Environment and Climate Change (DECC) (2006) *Assessing Vibration – a technical guideline*.
- Department of Environment and Climate Change (DECC) (2009) *Interim Construction Noise Guidelines*.
- Standards Australia (1997) *Australian Standard AS2670.2 Evaluation of human exposure to whole-body vibration*.
- British Standards Institution (1993) *BS7385: Part 2 Evaluation and measurement of vibration in buildings, 0 580 22188 1*.
- British Standards Institution (1992) *BS 6472:1992 Evaluation of Human Exposure to Vibration in Buildings*.

- British Standards Institution (2009) *BS5228:2009 Part 2 Code of Practice for noise and vibration control on construction and open sites - Vibration*.
- Deutsches Institut für Normung (1999) *DIN 4150: Part 3 – 1999 Effects of vibration on structures*.

### **4.2.3 Biodiversity**

An overview of the existing biodiversity environment for the project is outlined in Section 4.4 of the Stage 1 SSI Application report. Refer to this section for an overview of the biodiversity issues.

#### **Summary of issues**

The project would be likely to impact on Duffys Forest Ecological Community (**DFEC**), and the habitat of known threatened flora and fauna within the project area. Vegetation removal that may be required for the proposed works would likely contribute to loss of parts of this Endangered Ecological Community (**EEC**) affecting habitat and further fragmentation of the wildlife corridor. Removal of DFEC is considered significant, largely because only 15 per cent of the original area of DFEC currently exists in the region as fragmented patches.

Based on preliminary project information, assessments of significance under the TSC Act and the EPBC Act for all species which were found to occur or have potential to occur in the study area were prepared for the project (SMEC, 2013a). These significance assessments identified likely significant impacts on DFEC. No significant impact on any other threatened species or communities were identified.

Hollow-bearing trees have been identified in bushland between Frenchs Forest Road West and Warringah Road (SMEC, 2013a). It is also likely that these exist in other parts of the project area. Hollow-bearing trees provide habitat for threatened species such as the Powerful Owl and Eastern Bent-wing Bat which have been recorded within the project area. Ephemeral creeks and ponds also exist in parts of the project area, providing potential habitat for the Red-crowned Toadlet.

Noxious and invasive weeds are known to occur in parts of the project area. Continued weed invasion and encroachment could have potentially severe consequences for habitat of flora and fauna occurring in the area.

Construction and operation of the project has the potential for the following biodiversity related impacts:

- Clearing of TSC Act listed DFEC.
- Clearing of mixed native and exotic vegetation and associated habitat for native fauna, eg the Powerful Owl, Red Crowned Toadlet and the Eastern Bent-wing Bat.
- Potential impacts on habitat corridor and wildlife connectivity.
- Potential impacts on groundwater dependant ecosystems.
- Possible introduction or spread of noxious and environmental weeds or diseases.
- Possible increase in mortality/injury to fauna species during construction and operation.

#### **Proposed further investigations**

Biodiversity is considered a key issue for the SEARs and a detailed biodiversity impact assessment working paper would accompany the Stage 2 EIS. This assessment would



identify potential impacts, including cumulative impacts, and nominate mitigation measures to minimise impacts.

Further assessment of the project's impacts on biodiversity would include:

- Detailed impact assessment as required under the NSW EP&A Act and the EPBC Act for any threatened species, populations and ecological communities considered likely to be present in the study area.
- Identification of feasible and reasonable mitigation measures relevant to the construction stages of the project consistent with the *Biodiversity Guideline – Protection and managing biodiversity on RTA projects* (RTA, 2011) and *RMS Draft Wildlife Connectivity Guidelines* (RMS, 2011b) for operational stages of the project.
- Investigations as to potential for project design to avoid impacts on DFEC as far as practicable, particularly high quality remnants.
- Development of an offset strategy for residual impacts to DFEC. This would be part of a strategic offset strategy that considers proposed offsets for other developments in the local area that also impact DFEC. A strategic offset strategy, developed in accordance with the NSW Office Environment and Heritage requirements would assist in delivering a better regional outcome for the remaining patches of this highly restricted EEC.

#### **4.2.4 Socio-economic, land use, property and utilities**

An overview of the socio-economic, land use, property and utility issues for the project is outlined in Section 4.5 of the Stage 1 SSI Application report. Refer to this section for an overview of the socio-economic environment.

##### **Summary of issues**

The project would provide improved access and connectivity for local and regional business and communities, including to the new proposed NBH, the Forest High School and Skyline Business Park. The project would also improve access and connectivity to potential employment lands outside the study area, providing opportunity for future economic growth and employment opportunities.

##### Construction

Construction of the project has the potential for the following socio-economic related impacts:

- Impacts associated with property acquisition, including potential unfamiliarity of residents and business owners with the property acquisition process, timing of the process and the potential need to relocate.
- Impacts on amenity for local residents and users of schools/community facilities, due to increased dust and noise from construction activities.
- Impacts on Bantry Bay shops (including the petrol station). Such impacts would include property acquisition and demolition of some shops; requiring patrons of these shops to travel elsewhere to access similar services.
- Changed access and traffic delays during construction including for motorists, local residents, public transport users, businesses, emergency services and visitors to community facilities near the project.

- Impacts on road safety for vehicles, cyclists and pedestrians particularly at proposed interchange upgrade locations.
- Potential temporary changes to access for pedestrians and cyclists near construction works.
- Impact on local businesses, particularly those located within the study area affected by traffic delays and temporary access changes.
- Changes to traffic arrangements and the accessibility of community facilities, both public and private, located outside of the project area, but dependent on the main roads for access.
- Sections of roads surrounding the project area may need to be temporarily closed to the public during construction.
- Temporary and potentially permanent relocations of utilities in the project area.

### Operation

Operation of the project has the potential for the following socio-economic related impacts:

- The amenity of residents is likely to be affected by increased road traffic and from moving the road closer to properties.
- The loss of local businesses at Bantry Bay shops, which would also require patrons of these shops to travel elsewhere.
- Community perceptions about increased severance or segregation between the north and south of Warringah Road, due to the intensification of use on the arterial road.
- Potential for improved connection for locals and visitors to a range of land uses within the study area and the broader region.
- Potential changes to existing land uses adjacent to the upgraded road works resulting from full or partial acquisition of some properties for the road corridor which could impact on the following uses:
  - Surrounding residences.
  - Businesses, including industrial and commercial, some of which would be permanently relocated.
- Existing access arrangements to the surrounding residential and commercial areas may be altered.
- Land required for the project would be permanently changed to road infrastructure. This may include land currently zoned as Neighbourhood centre (B1), Local centre (B2), Business park (B7), Environmental conservation (E2), Low density residential (R2) and Public recreation (RE1).

The project would also have the following benefits:

- Provide direct and safe access to health services for the community.
- Address future growth demands.
- Improve public transport services.
- Improve accessibility to employment in the precinct, encouraging its growth with attendant benefits for trip containment and sustainable transport use.

- Improve the liveability and productivity of the area through provision of a better public transport system and accessibility.

### **Proposed further assessments**

A detailed socio-economic impact assessment working paper would accompany the Stage 2 Network Enhancement Works EIS. This assessment would identify potential impacts and nominate mitigation measures to minimise impacts.

The socio-economic impact assessment would assess the whole of life potential impacts of the project, including positive and negative direct and indirect impacts, and would include:

- A description of the socio-economic profile for the communities and businesses surrounding the project including, but not limited to:
  - Social characteristics, including population and demography; families and housing; travel behaviour; socio-economic indicators for areas; and need for assistance.
  - Economic characteristics, including labour force, income and employment; and business and industry.
- Identification of community values that may be affected by the project, such as population and demography community services and facilities, local access and connectivity, amenity and character and business and industry.
- Detailed assessment of the potential impacts (positive and negative) of the project on the socio-economic values of the study area for both construction and operation. An assessment of business impacts and business viability would also be undertaken. Consideration would also be given to the community's perceived impacts of the project, as community perceptions about possible impacts may influence tolerance of change.
- Identification of appropriate management and safeguard measures, including measures to enhance the project's benefits to avoid, manage or mitigate its potential impacts.
- Consultation with the public, managers of community facilities, and stakeholders to inform a description of existing values, impacts and management and safeguard measures.

A detailed assessment on land use and property impacts would be undertaken. This would include:

- The identification of the local land uses, existing access arrangements and potential property acquisition for both public and private land adjacent to the project.
- Consultation with directly affected property owners about property acquisition, including timing, compensation arrangements and potential impacts.
- Assessment of the potential impacts of the project on the property and land use arrangements during construction and operation of the project.
- Identification of reasonable and feasible project-specific management and safeguard measures to avoid, manage or minimise these impacts and to maximise benefits.
- Management and safeguard measures would be implemented to avoid, minimise or manage disruptions to utilities.

#### **4.2.5 Urban design and visual amenity**

An overview of the existing urban design and visual amenity environment for the project is outlined in Section 4.6 of the Stage 1 SSI Application report. Refer to this section for an overview of the visual amenity issues.

#### **Summary of issues**

##### Construction

Construction of the project has the potential for the following urban design and visual assessment related impacts, particularly to the adjoining visual catchment:

- Visual impacts associated with construction activities, sites/compounds including machinery, temporary structures and physical impacts on existing public open space and use of land.
- Impacts to visual amenity of road users during construction.
- Removal of visual screens and vegetation planting along the road corridors to facilitate construction may cause negative visual impacts to motorists and adjoining residents and businesses.
- Exposure of subsurface ground layers resulting from cuttings.

##### Operation

The operation of the project has the potential for the following urban design and visual assessment related impacts:

- Visual impacts relating primarily to design. As such, design development would provide for consideration of opportunities to 'design out' or minimise visual impacts where practicable and cost effective.
- Additional road infrastructure in the project area would make the road more visually dominant in the landscape. This would include (but not be limited to) a substantially wider road surface along Warringah Road, grade separated interchanges via an underpass at two major intersections and associated large open cuts, and grade separated pedestrian crossings.
- Removal of vegetation would potentially reduce the level of screening of views, particularly near residential receivers in Karingal Crescent, and in Hilmer Street and Bantry Bay Road to the south of Warringah Road.
- Changes to the driving experience at underpass sections.
- Works adjacent to Wakehurst Parkway could have the potential to reduce vegetation, and therefore screening capacity.
- Mitigation of traffic noise may require some form of noise barrier which would introduce a new built element into the local landscape. Design considerations should be integrated into the overall design development process and be consistent with the mitigation strategy developed for the overall project.

#### **Proposed further assessment**

A detailed urban design and landscape impact assessment working paper would be included as part of the Stage 2 Network Enhancement Works EIS. This assessment would identify potential impacts and nominate mitigation measures to minimise impacts.

An urban design approach will be adopted for the ongoing design of the project to help minimise visual impacts and the impact on landscape character, and to ensure a well-designed project with good access and connectivity, an appropriate landscape setting and well-designed structures that fit sensitively into the area.

The urban design strategy would include identification of appropriate management, mitigation and safeguard measures which would need to be considered.

Design development would seek to maximise use of existing road corridors and minimise the removal of vegetation where practicable, particularly where it presently screens existing road infrastructure.

#### **4.2.6 Soils, water quality and contamination**

An overview of the existing soils, contamination and water quality issues for the project is outlined in the Stage 1 SSI Application report. Refer to this report for an overview of soils and water quality issues.

#### **Summary of issues**

##### Construction

Various land uses have been identified in the project area that represent potential sources of contamination. These include both existing and historic activities. Three potential fill areas which may contain material of unknown origin have also been identified in the investigation area.

If contamination is identified, there is likely to be an ongoing need to manage and/or monitor construction and risk to receptors. This could affect the location of proposed construction elements and/or the methods of construction.

Spoil generated by excavation for the project may be from contaminated land on and/or adjacent to the project and, if not managed appropriately, could potentially impact upon receptors during construction.

As the project area is located across a natural topographic high point draining to multiple catchments down gradient, the need to stabilise and consolidate exposed soils and materials will be important in preventing poor water quality and mass movement of soils down gradient into waterways.

Currently, the vegetated portion of the investigation area assists as a hydrologic and physical buffer in slowing runoff velocities and stabilising soil particularly where slopes exceed 10 degrees adjacent to roads and formal drainage discharge points. Minimising the removal of vegetation and installing scour protection measures would be required around drainage outlets to reduce scour and erosion.

Construction of the project has the potential for the following impacts:

- Direct erosion impacts due to the exposure and mobilisation of soils during construction.
- Potential increase in erosion and sediment pollution loads from earthworks and construction activities.
- Potential disturbance and exposure of contaminated soils and other materials with the potential to impact on both environmental and human health.

## Operation

The operation of the project has the potential for the following impacts:

- Increase in sediment and pollution loads in stormwater due to the removal of buffer vegetation, increased road surface and increased vehicular traffic. This has the potential to impact on water quality through road runoff containing suspended solids, nutrients from atmospheric fallout and other pollutants from vehicle, tyre and pavement wear.
- The project is unlikely to impact on contaminated land once construction has been completed.

### **Proposed further assessment**

Further investigations and assessments are required to detail the potential soil, water and contamination issues that this project presents, including:

- Consideration of disposal of spoil and any associated management measures.
- Further investigations to better inform understanding of the local water flows, including water quality.
- Assessment of any impacts associated with the disturbance of contaminated land, including management during construction and offsite disposal of contaminated material.
- Assessment of the risk of erosion and sedimentation in accordance with the Roads and Maritime *Erosion and Sedimentation Management Procedure* (RTA, 2004).
- Consideration of any increases in discharge from the road drainage system, and potential impacts on water quality.

Where applicable, further assessments would be undertaken in accordance with the NSW EPA endorsed guidelines and the *Contaminated Land Management Guideline* (RTA, 2005). The environmental assessment would include appropriate management measures to mitigate any potential soil, water quality and contamination impacts to an acceptable level.

### **4.2.7 Hydrology and flooding**

An overview of the existing hydrology and flooding environment for the project is outlined in Section 4.12 of the Stage 1 SSI Application report. Refer to this section for an overview of flooding and hydrology issues.

### **Summary of issues**

#### Construction

Design of the proposed network enhancements would need to consider existing surface flow patterns and additional surface drainage capacity with any increased impervious surface area. Designs would also need to consider surface flow patterns and drainage issues associated with the grade separation of Warringah Road being in slot for a length of the project.

Construction of the project has the potential for the following hydrology and flooding related impacts:

- Potential to encounter sub surface waters due to grade separation of Warringah Road.
- Potential for drainage issues across the existing road pavement, which is under live traffic.

### Operation

The operation of the project has the potential for the following hydrology and flooding related impacts:

- Potential reduction in the groundwater recharge area as a result of increased road surface and grade separation of Warringah Road.
- Potential drainage issues as a result of the grade separation of Warringah Road.
- Increased runoff from the increased roadway (impervious pavement) resulting in larger stormwater flows.
- Potential modification of downstream flooding behaviour as a result of new bridges, batters and culverts.

### **Proposed further assessment**

A hydrology and flooding assessment would be prepared as part of the environmental assessment to determine the impacts of the proposed works. The assessment would inform the design of the project and would detail management and safeguard measures for hydrology and water quality across the project area. This assessment would include, but not be limited to:

- Further investigations to better inform understanding of the local groundwater regime.
- Consideration of the impacts of projected climate variability.
- Consideration of any increases in discharge from the road drainage system, and potential impacts on receiving waterways or water bodies.

The hydrology and flooding assessment would be prepared in accordance with relevant guidelines, including the *Water Policy and Code of Practice for Water Management* (RTA, 1999).

### **4.2.8 Resource use and waste management**

An overview of the existing resource use and waste management issues for the project is outlined in Section 4.13 of the Stage 1 SSI Application report. Refer to the Stage 1 SSI Application report for an overview of these issues.

### **Summary of issues**

#### Construction

Construction of the project has the potential for the following resource use and waste management related impacts:

- Depletion of natural resources, such as virgin quarried materials and sand required as construction materials.

- Creation of demolition wastes (building materials, vegetation, kerbs and pavements).
- Creation of excavation wastes.
- Creation of vegetation waste from the removal of trees, shrubs and groundcovers.
- Packaging materials such as crates, pallets, cartons, plastics and wrapping materials.
- Creation of general waste from construction sites (including office wastes, scrap materials and biodegradable wastes).
- Hazardous material waste.
- Generation of sediment, hydrocarbons (oils and greases) and gross pollutants.
- Spill and leaks from vehicles.
- Litter generated by road users.
- Waste generated from operational maintenance activities.

### Operation

The project is unlikely to impact on resource use and waste management during operation.

### **Proposed further assessment**

The Stage 2 Network Enhancement Works EIS would provide further assessment, including:

- Identification of the indicative resource requirements for the project and an assessment of the resource use impacts of the project.
- Identifying opportunities to use recycled materials within pavements provided they are fit for purpose and meet engineering requirements.
- Identification of strategies to minimise the export of excavated materials off-site, maximising re-use opportunities and minimising the volume of excavated material disposal to landfill.
- Identification of specific waste impacts of the project and the waste management approach, to be outlined within the CEMP.
- Strategies for reducing waste such as the use of recycled materials, bulk delivery of goods to minimise packaging and arrangements with suppliers to return any unused construction materials.



### **4.3 Non-key Issues**

As explained in Section 4.1, non-key issues are those that may have low to moderate impacts. Impacts can be mitigated by the application of standard environmental management measures. This section outlines the non-key issues identified for the Stage 2 EIS.

#### **4.3.1 Aboriginal heritage**

Section 4.7 of the Stage 1 SSI Application report provides an outline of the existing Aboriginal heritage issues within the project area. Aboriginal Heritage was identified as a Key Issue for both the Stage 1 and Concept Proposal as part of the Stage 1 SSI Application.

Since the Stage 1 SSI Application was lodged, Roads and Maritime has commenced the Stage 2 PACHCI assessment, which included further Aboriginal heritage Information Management System searches and a site walkover with representatives of the MLALC (refer to section 2.3.2 above). The findings of the site walkover and assessment have identified that there are no known Aboriginal sites or culturally sensitive areas identified within the project area for the Stage 2 Network Enhancement Works.

As a result of this additional information and results of further investigations, it is now considered that Aboriginal heritage would be a non-key issue for the Stage 2 Network Connectivity Works.

#### **Summary of issues**

##### Construction

The project area has been subject to ground disturbing activities over a long period of time during the original road construction, associated ancillary activities and the development of the densely populated city of Sydney. Despite this, there are still areas of known Aboriginal cultural heritage significance, as well as areas of potential Aboriginal archaeological significance, within the urban landscape which must be considered in design and construction plans.

A potential impact on Aboriginal heritage could be the discovery of previously undetected or unrecorded Aboriginal heritage sites during construction. This risk is being mitigated through early consideration of Aboriginal heritage issues in parallel with design development to seek to avoid impact.

##### Operation

The project is not expected to impact on Aboriginal heritage during operation.

#### **Proposed further assessment**

An Aboriginal heritage survey report would be prepared consistent with Stage 2 of the PACHCI for the Stage 2 Network Enhancement Works EIS. This assessment would identify potential impacts and nominate mitigation measures to minimise impacts.

The Aboriginal heritage survey report would be prepared in accordance with the following policy documents and heritage guidelines:

- RTA (2011) *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI).
- DECCW (2010) *Aboriginal Cultural Heritage Consultation Requirements for Proponents*.
- DECCW (2010) *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*.

The preparation of an Aboriginal heritage survey report would fulfil the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). This assessment would also include:

- Ongoing consultation with OEH and the local Aboriginal community throughout the environmental impact assessment process.
- The development of management measures to identify opportunities to minimise impacts on Aboriginal heritage.

Appropriate management and safeguard measures would be identified in the Aboriginal heritage survey report. For unexpected finds, application of the Roads and Maritime *Unexpected Finds Procedure* (Roads and Maritime, 2012), or a project-specific variant, would identify relevant reporting and assessment actions to be initiated. This could include the requirement to test a potential archaeological deposit or to seek necessary approvals under the *National Parks and Wildlife Act 1974*.

### **Management and safeguard measures**

- If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find would cease and the Roads and Maritime Services Aboriginal cultural heritage advisor and the senior regional environmental officer would be contacted immediately. The steps in the Roads and Maritime Services Standard Management Procedure: Unexpected Archaeological Finds would then be followed.

#### **4.3.2 Historic heritage**

An overview of the existing historic heritage for the project is outlined in Section 4.10 of the Stage 1 SSI Application report. Refer to the Stage 1 SSI Application report for the overview of non-Aboriginal heritage issues.

### **Summary of issues**

#### Construction

The following item has the potential to be impacted by the project:

- Former Holland's Orchard Trees (I62) adjacent to Warringah Road.

Additionally, the following potential impacts have been identified:

- Potential impacts on the heritage values of Brick Pit Reserve, located to the south of Warringah Road between Wakehurst Parkway and Bantry Bay Road.
- Uncovering of previously unknown historic heritage material during construction, given that buildings were generally located adjacent to transport routes, which are in the same general locations as present transport routes.

## Operation

The project is not expected to impact on non-Aboriginal heritage during operation.

### **Proposed further assessments**

The potential for additional non-Aboriginal heritage items to be impacted would be further investigated as part of the environmental impact assessment, including:

- Updated searches of non-Aboriginal heritage items.
- Detailed historical research to identify potential non-Aboriginal archaeological sites. This would include analysis of historic maps, plans and aerial photos in archives and libraries, such as Mitchell Library, State Archives and Local Studies Libraries.
- An understanding and assessment of the visual heritage aspects to the local area.
- Understanding/assessing the significance of all known State and local heritage items adjacent to the project in accordance with the Burra Charter and *Assessing Heritage Significance, NSW Heritage Manual 2*, (NSW Heritage Office, 2001), and *Assessing Significance for Historical Archaeological Sites and Relics* (Heritage Branch, 2009), including cumulative impacts and cultural landscape impacts.
- An assessment of potential impacts to local heritage items adjacent to the project, including the Brick Pit Reserve.
- Where required, archaeological investigations to determine the presence of potential archaeological items and any potential impacts as a result of the project.
- Consultation with stakeholders such as the Heritage Branch, Office of Environment and Heritage and local councils.
- Community consultation to identify additional heritage places and intangible heritage values of the project area.
- Identification of appropriate management and safeguard measures to minimise impact on the heritage values of the area.

### **Management and safeguard measures**

Implementation of the standard approaches outlined below is expected to mitigate and manage any potential non-Aboriginal heritage impacts identified. Standard management and safeguard measures would be detailed in the Stage 2 Network Enhancement Works EIS. These would include:

- For unexpected finds, application of the *Unexpected Finds Procedure* (Roads and Maritime, 2012) or a procedure that is project specific, which would identify relevant reporting and assessment actions to be initiated. This may include the requirement to test a potential archaeological deposit or to seek necessary approvals under the Heritage Act.
- Known heritage sites would, where required, be identified and avoided during construction through implementing no-go zones.
- Where direct impact cannot be avoided, photographic archival recording would be undertaken in accordance with the *Heritage Council of NSW Guidelines* (NSW Heritage Office, 1998).
- Potential vibration impacts would be assessed and appropriate mitigation measures implemented that recognise the heritage values to be maintained.

### **4.3.3 Air quality**

An overview of the existing air quality environment for the project is outlined in Section 4.8 of the Stage 1 SSI Application report. Refer to this section for an overview of air quality issues.

#### **Summary of issues**

The project has the potential to impact on local air quality during both the construction and operational phases.

#### Construction

Construction of the project has the potential for the following air quality related impacts:

- Temporary, localised increases in dust (particulate matter) during clearing, earthworks and construction activities. The nature of any increase in dust would depend on the scale of activities and quantities of material handled.
- Temporary, localised increases in air quality impacts from emissions, such as exhaust fumes, generated by the operation of machinery and other construction vehicles. The impact of these emissions would be limited to the construction phase.

#### Operation

The operation of the project has the potential for the following air quality related impacts:

- Potential increases in near roadside air pollutant concentrations due to changes in traffic volumes. The nature of any changes in concentrations would depend on the projected traffic volumes, mode of travel, road grade and mix of vehicles.
- Potential impacts to air quality (perceived or otherwise) associated with the underpass (slot) arrangement.

#### **Proposed further assessment**

Further assessment would involve a qualitative air quality impact assessment of the project, covering both construction and operational phases. The assessment would assist in the development of air emission management measures, where relevant and would include:

- Identification of best practice air quality management measures and practices for construction activities.
- Identification of sensitive receivers for air quality and activities and weather conditions potentially impacting air quality.
- An assessment of air quality impacts during construction and operation, including potential impacts on air quality, due to the net effect of emissions to air from the project and existing sources.
- Identification of feasible and reasonable management measures (particularly dust suppression measures) to be implemented during construction.

### **4.3.4 Greenhouse gas and climate change**

An overview of the existing greenhouse gas and climate change issues for the project is outlined in Section 4.9 of the Stage 1 SSI Application report. Refer to the Stage 1 SSI Application for an overview of these issues.

## Summary of issues

### Construction

Construction of the project has the potential for the following climate change related impacts:

- Direct generation of greenhouse gas emissions due to construction works, such as the transport of materials, operation of plant and equipment and operation of the compound and ancillary facilities.
- Indirect generation of greenhouse gas emissions that are produced off-site such as the consumption of electricity for lighting and signage and the energy used to produce construction materials, such as concrete, bitumen and steel.

### Operation

The operation of the project has the potential for the following climate change related impacts:

- Generation of greenhouse gas emissions due to the operation of the road.
- Increased damage to road surfaces through more frequent inundation or extreme rainfall.
- More frequent geotechnical issues including erosion impacts, resulting in sediment loss from the site.

## Proposed further assessments

Further assessment of greenhouse gas and climate change impacts for the project would include:

- Quantification of operational greenhouse gas emissions, including embodied emissions and compare against existing scenarios.
- Quantification of construction greenhouse gas emissions.
- Identification of measures to avoid and reduce emissions from both operation and construction of the project.

## Management and safeguard measures

Climate change issues are commonly encountered on all road projects and are generally adequately managed through the development of construction management plans and appropriate consideration of climate change issues during the detailed design process. Best practice management measures and safeguards would be implemented during construction of the project, such as:

- Identification of ways to improve efficiency and provide resilience against the impacts of climate change through design of the project.
- Assessment of energy efficiency when selecting construction equipment.
- Undertaking periodic maintenance of equipment to retain fuel efficiency.
- Adoption of low greenhouse intensity material where appropriate and where it meets engineering requirements.
- Establishing recycling practices, including partial replacement of cement with fly ash and using recycled aggregate and recycled content in steel.

- Establishing “green” supply procurement guidelines in consultation with design engineers to ensure quality is not compromised.

Management of risks posed by climate change for road infrastructure involves the completion of a climate change risk assessment and detailed discussions with project design engineers to adequately design and plan for predicted changes in climatic conditions.

#### **4.3.5 Cumulative impact**

An overview of cumulative impacts is provided in Section 4.15 of the Stage 1 SSI Application report.

#### **Summary of issues**

The following cumulative impacts may arise from the proposed Stage 2 Network Enhancement Works:

- Construction of the proposed hospital is planned to occur around the same time as the proposed Stage 2 Network Enhancement Works, potentially creating cumulative impacts on traffic and transport, access, noise, air quality and visual amenity.
- The Stage 1 Northern Beaches Hospital Connectivity Works would likely occur at the same time as the proposed Stage 2 Network Enhancement Works, potentially creating cumulative impacts on traffic and transport, access, noise, air quality and visual amenity.
- Upgrades to Mona Vale Road, another important east-west connector on the Northern Beaches, located north of the project area, are in the planning stage, potentially creating cumulative impacts on traffic and transport.

The project has the potential for cumulative impacts during both the construction and operational phases should other large scale developments within the Sydney region be planned and delivered during the same timeframe as the project. Potential issues include:

- Construction noise and vibration (particularly night time works).
- Construction traffic.
- Air quality impacts from construction activities.
- Visual impact and amenity effects of construction compounds and associated sites and activities.
- Non-Aboriginal and Aboriginal heritage impacts.
- Ecological impacts such as impacts to biodiversity, hydrology and resource usage.
- Economic and social impacts including construction fatigue due to large and ongoing construction works for surrounding residents and businesses.

Construction impacts on communities adjacent to the project are expected to be a key issue and would be addressed in detail in the EIS.

#### **Proposed further assessment**

Additional project specific investigations and assessments would be undertaken to detail the potential cumulative impacts that this project would present as well as proposed mitigation and management measures. This would include:

- Identification of other relevant major projects proposed with impacts that may interact with the project.
- Identification of potential amenity issues for the community, including air quality/visual/noise/vibration, socio-economic and property acquisition considerations due to cumulative impacts of the construction of both the proposed hospital and both stages of the proposed Northern Beaches Hospital Connectivity and Network Enhancements Project.
- Assessment of potential impacts, including cumulative impacts on threatened ecological communities and flora and fauna species listed under the TSC Act and/or the EPBC Act and their habitats.
- Assessment of the potential cumulative impacts on traffic, transport and access.

## 5 Conclusion

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Roads and Maritime is proposing to undertake road works to enhance the broader road network along Warringah Road and Wakehurst Parkway at Frenchs Forest. These works would include road widening and grade separation of sections of Warringah Road, widening and intersection upgrades to Warringah Road and Wakehurst Parkway and some upgrades to sections of adjacent local roads.

The project is being assessed as part of a staged assessment process under section 115ZD of the EP&A Act. The whole project is known as the Northern Beaches Hospital Connectivity and Network Enhancements project. In March 2014, Roads and Maritime submitted the Stage 1 SSI Application, and SEARs for this first stage were issued on 17 April 2014. The preparation of an EIS for Stage 1 has commenced.

This application report has been prepared to assist the formulation of environmental assessment requirements by the Secretary under section 115Y of the EP&A Act for the Stage 2 Network Enhancement Works of the overall Northern Beaches Hospital Connectivity and Network Enhancements project. This SSI Application comprises the Stage 2 Network Enhancement Works.

The project is declared to be SSI by clause 15 and Schedule 4 to the SRD SEPP, under section 115U(4) of the EP&A Act.

The key environmental issues arising from the project include:

- Traffic and transport impacts.
- Noise and vibration impacts.
- Biodiversity impacts.
- Socio-economic, land use, property and utilities' impacts.
- Urban design impacts (including visual impact).
- Geology, soils and contamination impacts.
- Hydrology, water quality and flooding impacts.
- Resource use and waste management.



## 6 References

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Department of Environment and Conservation (2005) *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

DECCW, 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*, Department of Climate Change and Water (2010).

Department of Planning and Infrastructure (2013) *Draft Metropolitan Strategy for Sydney to 2031*.

NSW Roads and Traffic Authority (2005) *Contaminated Land Management Guideline*, Environment Branch, Surry Hills.

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NSW Treasury (2008) *State Infrastructure Strategy – New South Wales 2009-09 to 2017-18*.

Roads and Maritime Services (2014), *Communications and Engagement Strategy, January 2014 – June 2018 – Northern Beaches Hospital enabling road network project (Draft)*.

Roads and Maritime Services (2014a), *Northern Beaches Hospital Connectivity and Network Enhancements, Community Consultation Report (Draft)*.

Roads and Maritime Services (2014b), *Northern Beaches Hospital – Connectivity and Network Enhancements Project Concept Proposal and Stage 1 state significant infrastructure application*.

SMEC (2013a) *Northern Beaches Hospital Supporting Road Works Project – Preliminary Environmental Investigation*, report prepared for Roads and Maritime Services, SMEC Environment, Sydney.

TfNSW (2012), *Long Term Master Plan, Transport for New South Wales*.

# Attachment A

## Requirements of the Environmental Planning and Assessment Regulation 2000

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Clause 192 of the *Environmental Planning and Assessment Regulation 2000* requires that an application for approval of the Minister to carry out State significant infrastructure must include:

- (a) details of any approval that would, but for section 115ZG of the Act, be required for the carrying out of the State significant infrastructure, and
- (b) details of any authorisations that must be given under section 115ZH of the Act if the application is approved, and
- (c) a statement as to the basis on which the proposed infrastructure is State significant infrastructure, including, if relevant, the capital investment value of the proposed infrastructure.

### ***Approvals that would otherwise apply***

Approvals that would be required to carry out the SSI, if not for section 115ZG of the EP&A Act, include:

- An approval under Part 4, or an excavation permit under section 139, of the *Heritage Act 1977*.
- An Aboriginal heritage impact permit under section 90 of the *National Parks and Wildlife Act 1974*.

### ***Authorisations if the application is approved***

Authorisations that would, if it is approved, be required to be given for the project under section 115ZH of the EP&A Act include:

- An environment protection licence under Chapter 3 of the *Protection of the Environment Operations Act 1997* (for any of the purposes referred to in section 43 of that Act).

### ***State significant infrastructure statement***

The project is declared to be SSI by clause 15 and Schedule 4 of the SRD SEPP, under section 115U(4) of the EP&A Act. Schedule 4 relevantly provides:

*Development carried out by or on behalf of a public authority that has a capital investment value of more than \$30 million on land identified as being within the Northern Beaches Hospital Precinct on the State Significant Infrastructure Sites Map.*

Components of the project fall within the Northern Beaches Hospital Precinct as shown on the State Significant Infrastructure Sites map. Those components have a capital investment value exceeding \$30 million.