

APPENDIX **G**

Preliminary Construction Traffic Management Plan





THE NORTHERN BEACHES HOSPITAL (STAGE 2)

STATE SIGNIFICANT INFRASTRUCTURE APPLICATION SSI_6792

(STAGE 2)

Environmental Impact Statement Appendix G: Preliminary Construction Traffic Management Plan

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STAGE 2 NORTHERN BEACHES HOSPITAL

State Significant Infrastructure Application SSI_6792 (Stage 2)

Environmental Impact Statement Appendix G - Preliminary Construction Traffic Management Plan

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1 EXECUTIVE SUMMARY

The Northern Beaches Hospital Project (NBH Project) aims to establish a partnership between the NSW State Government and a health services provider for the provision of a new hospital facility to service the Northern Beaches community. The proposed NBH is located approximately 15 km north of the Sydney CBD within the suburb of Frenchs Forest.

This report documents a *Preliminary Construction Traffic Management Plan* that is required by the Stage 2 Director Generals Requirements (DGRs) for the project. The Preliminary Construction Traffic Management Plan outlines the management of construction traffic for the Northern Beaches Hospital Project, including type and size of vehicles accessing the site, proposed parking provisions, pedestrian and cycle connectivity improvements and mitigations to address potential traffic impacts.

Crucial to the overall traffic and transport assessment of the proposed Northern Beaches Hospital is the external road network adjacent to the site. The Roads and Maritime Services (RMS) proposes to carry out road works to enhance road network and connectivity to the proposed Northern Beaches Hospital. The Stage 1 *Hospital Connectivity Works* are directed towards facilitating enhanced connectivity to the hospital site.

The key traffic and transport management objective for the Northern Beaches Hospital during construction is to reduce potential traffic impacts and deliver a construction traffic management plan to proactively address any potential impacts that can be mitigated so that operational efficiency of the network and safety can be maintained.

Construction of Stage 2 is scheduled to commence in 2015, and it is expected that the project will be completed in 2018.

The proposed primary access to the site during construction will be located along Warringah Road, initially using Bantry Bay Road access during bulk excavations while the southern entry (Gate 1) is being constructed. The southern entry is consistent with the construction access from the Stage 1 works. Once constructed, the southern entry into Hospital Road will be the main access for construction. The peak daily generation is expected to occur during excavation and structure phase and subsequently be reduced for the following construction stages for the hospital and car park building construction and fit-out.

During the peak excavation and concrete structure phase there will be an estimated 240 truck movements during construction and spread out throughout the day with an average of 22 truck movements per hour. This volume is approximately 0.6% of the current Average Annual Daily Traffic (AADT) on Warringah Road and is considered negligible. This increase in traffic volume associated with the construction works will be temporary for the duration of the construction period and is not expected to have a negative effect on the adjacent road network capacity.

For the duration of the construction works, there will be provision for parking for the workforce and site management staff on site. Hoardings will be installed during site establishment and shall remain throughout the construction works.

Approximately 100 car park spaces will be provided within the site boundary for construction workers and site management staff. Measures will be implemented to encourage the use of public transport, car-pooling and shuttle bus service, etc. Construction car parking will only be available to those who car-pool with no less than the carrying capacity of the vehicle. The car pooling scheme can potentially allow up to 500 workforce to serve the site by utilising the internal car parking more efficiently.

The site will permit stand-by traffic to wait on the eastern Haul road which will mitigate construction traffic from parking on surrounding roads.

Construction queuing on Warringah Road will be limited as the site gate is set back within the site allowing queuing to be maintained within the site. Full time qualified traffic controllers will manage pedestrians when vehicles are entering or leaving the site.

A shared path on the western boundary of the site will be constructed as part of the Stage 1 works, which will provide public access and connectivity between Frenchs Forest Road and Warringah Road.

Site personnel will access the project site through turnstiles placed along the southern hoarding line. These are activated via an electronic security pass provided once inducted into the site safety procedures. Pedestrian paths will be identified within the Project Site with a view to causing least disruption during construction works.

A preliminary assessment has been undertaken for the cumulative effects of construction traffic on the adjacent roads to the Northern Beaches Hospital site. The commencement of construction works for the Stage 1 NBH Road Connectivity and Network Enhancement Project of the RMS will also be in early 2015 but is anticipated to be completed in mid-2017. The overlap of construction traffic movements will slightly increase traffic demand on the already congested network.

Construction access for the Stage 1 Road Connectivity works would principally be on French's Forest Road, during this phase the Stage 2 NBH works will access from Warringah Road, thus allowing separation of the concurrent projects.

The Stage 2 RMS works is anticipated to commence in late 2015 and to be completed in 2018. It is expected though that the bulk of truck movements associated with the NBH construction works would be concentrated in the early stages of the construction works involving excavation and would subsequently be reduced with most truck movements confined within the NBH site.

The opportunity to collectively manage and minimise the construction traffic impacts will be identified through consultation with RMS and the road works contractor.

In summary, possible mitigation measures identified for the duration of the construction works include:

- Appropriate signs warning of trucks entering will be erected on the approach to any access point as per requirements of the certified Traffic Control Plan.
- Promote car-pooling and utilise site car-parking more efficiently
- Stand-by construction traffic such as concrete or haulage trucks to be confined within the site boundary or sent back to original point of departure.
- Minimise construction traffic impacts on Warringah Road by allowing queuing within the site.
- Appropriate signs will be erected warning road users and in particular vulnerable road users such as cyclists and pedestrians of restricted road and shoulder spaces due to construction activities.
- Implementation of effective arrangements including advance warning signs and emergency access arrangements for any closure to the road.
- Vehicles transporting material to and from the construction site will be covered immediately after loading (prior to traversing public roads) to prevent wind-blown dust emissions and spillages

- In the event of a spillage of materials from construction vehicles, spilled material will be removed as soon as possible and spill kits will be available on the site.
- Access will be maintained to neighbouring properties and other land uses throughout the construction period.
- Haulage vehicles will be filled to capacity to minimise vehicle movements.
- Incorporate traffic management measures as part of the Construction Management Plan (CMP).

Traffic Control Plans will be prepared for the project works.

- Traffic Control Plans for specific road construction staging scenarios, depicting vehicle, pedestrian, bus and cyclist restrictions and protection measures.

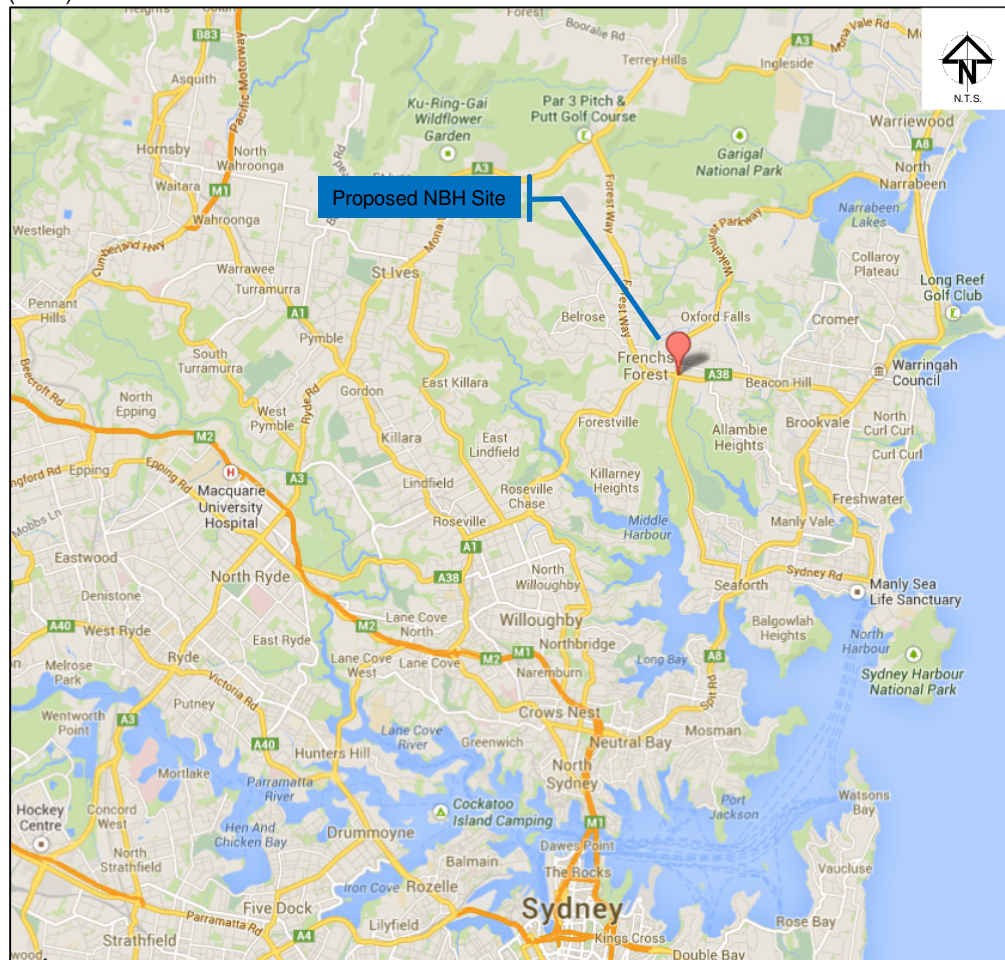
2 INTRODUCTION

The Northern Beaches Hospital Project (NBH Project) aims to establish a partnership between the NSW State Government and a health services provider for the provision of a new hospital facility to service the Northern Beaches community. Health Infrastructure NSW (HI) has issued a Request for Proposal (RFP) to design, construct, commission, operate and maintain the proposed hospital.

Hyder Consulting Pty Ltd (Hyder) has been engaged by Thiess Pty Ltd (Thiess) to provide traffic and transport advice to inform the NBH (Stage 2) project. The required traffic and transport advice includes matters relating to construction traffic management and this report documents a Construction Traffic Management Plan for the proposed development.

2.1 SITE LOCATION

The site for the proposed NBH is located approximately 15 km north of the Sydney CBD (refer **Figure 2-1**) within the suburb of Frenchs Forest and Warringah Council Local Government Area (LGA).



(background image source: www.google.com/maps)

Figure 2-1: Locality Map

The site is bound by Frenchs Forest Road West, Warringah Road, Wakehurst Parkway and The Forest High School (refer **Figure 2-2**) and has a total area of approximately 6.3 ha.



(background image source: www.google.com/maps)

Figure 2-2: Site Plan

2.2 PLANNING PATHWAY

In October 2013, a Staged Infrastructure Application (SSI_5982) was lodged by Health Infrastructure (HI) for this project. The application was divided into two parts:

(i) Concept Proposal and Stage 1

- Concept Proposal for the site; and
- Stage 1 - Site clearance and preparatory works.

(ii) The proposed Stage 2 NBH development

- Bulk excavation works
- Construction of a nine storey Hospital building
- Staff, patient and visitor car parking, including construction of an eight storey multi-deck Car Park
- Site works including internal roads, pathways and landscaping
- Utility amplification works

The Director General's Requirements (DGRs) for environmental assessment were issued by Department of Planning and Infrastructure (DP&I) on 19 June 2013 for both parts of the application.

A State Significance Infrastructure Application (SSIA) and Environmental Impact Statement (EIS) was prepared to address the DGRs associated with the Concept Proposal and Stage 1 and submitted in October 2013.

Public exhibition of the SSIA and EIS closed on 28 November 2013 and a significant number of submissions were received.

A Submission Report / Preferred Infrastructure Report was subsequently prepared and lodged with DP&I in February 2014 in response to the submissions received and to seek approval for additional services diversion works.

The Stage 1 SSIA and EIS was approved by Department of Planning and Environment (DP&E) on 22 June 2014.

The DP&E advised on 10 November 2014 that the Stage 2 NBH SSIA and EIS should be lodged under project title reference 'SSI 6792'.

2.3 OBJECTIVE

The objective of this report is to:

- Address item 6. *Transport and Accessibility* of the Director General's Requirements for the NBH (Stage 2) in respect to construction traffic and accessibility.
- Provide a Construction Traffic Management Plan, the objectives of which are to:
 - Protect the safety of on-site personnel, pedestrians and motorists
 - Manage construction activities so that they do not adversely compromise safe traffic flow within and surrounding the site
 - Minimise environmental impacts due to construction traffic
 - Manage construction traffic so that it does not interrupt traffic on the adjacent road network

2.4 DIRECTOR GENERAL'S REQUIREMENTS

This Construction Traffic Management Plan was undertaken to fulfil the Environmental Assessment Requirements issued by the Director General for the preparation of the Environmental Impact Statement (EIS) for Stage 2 of the Northern Beaches Hospital staged infrastructure application (SSI_5982).

Section 6 of the general requirements relates to Transport and Accessibility (Construction and Operation) and requires reference to:

- Guide to Traffic Generating Developments (RTA)
- Planning Guidelines for Walking and Cycling
- EIS Guidelines – road and related facilities (DP&I)

The issues to be considered relevant to construction are outlined in **Table 2-1**.

Table 2-1 Director General Requirements

Issue Description	Relevant Section of Report	Response
Detail proposed access arrangements to the hospital, including: ➤ augmentation requirements and intersection upgrade treatments; ➤ the type and size of vehicles accessing the site; and, ➤ measures to mitigate any associated pedestrian, cycle and traffic impacts.	Section 2.3 Section 5.4.1 Section 6.5 Section 8.	Improvements to the external road network are being proposed as part of the RMS road enhancements and network connectivity project. The scope of this study is focused on localised traffic for the site. The proposed primary access to the site during construction will be located along Warringah Road, initially using Bantry Bay Road access during bulk excavations while the Southern entry into Hospital Road is being constructed. Once constructed, the southern entry into Hospital Road will be the main access for construction.
Prepare a Transport Accessibility Study that addresses the following:		
➤ The proposed access and parking provisions, including: - an assessment of car parking supply; and - compliance with the relevant Australian standards and parking codes;	Section 5.7	Temporary parking facilities will be provided within the site during construction and will allow for 100 vehicles. The parking spaces will comply with AS2890 for parking.
➤ Details existing pedestrian and cycle movements within the vicinity of the site; and,	Section 4.5	A shared path on the western boundary of the site will be constructed as part of Stage 1, which will provide public access and connectivity between Frenchs Forest Road and Warringah Road. Site personnel will access the Project Site through turnstiles placed along the southern hoarding line. These are activated via an electronic security pass provided once inducted into the site safety procedures. Pedestrian paths will be identified within the Project Site with a view to causing least disruption during construction works
➤ Describe measures to be implemented to promote sustainable means of transport	Section 4.6.2	Measures will be implemented to encourage the use of public transport, car pooling and shuttle bus service, etc. Construction car parking will only be available to those who car-pool with no less than 5 people.

Issue Description	Relevant Section of Report	Response
➤ Estimate the total daily and peak hour trips generated by the proposed development, including accurate details of the current and future daily vehicle movements and ; ➤ Assess the impacts of the traffic generated on the local network, including intersection capacity and any potential need for upgrading of road works (if required), having regards to local planning controls.	Section 4.6	During peak bulk excavation and structure periods there will be an estimated 240 truck movements during construction and spread out throughout the day with an average of 22 truck movements per hour. This volume is approximately 0.6% of the current Average Annual Daily Traffic (AADT) on Warringah Road and is considered negligible. This increase in traffic volume associated with the construction works will be temporary for the duration of the construction period and is not expected to have a negative effect on the adjacent road network capacity.

2.5 DESCRIPTION OF THE PROJECT

The proposed Stage 2 NBH development includes:

- Bulk excavation works
- Construction of an nine storey Hospital building
- Staff, patient and visitor car parking, including construction of a eight storey multi-deck Car Park
- Site works including internal roads, pathways and landscaping
- Utility amplification works

2.6 PURPOSE OF THIS CONSTRUCTION TRAFFIC MANAGEMENT PLAN

This Preliminary Construction Traffic Management Plan (CTMP) outlines the management of construction traffic for the project. Traffic for Stage 2 of the NBH project is based on the description of construction works provided by the construction contractor Thiess and on current site conditions as documented in the Transport Accessibility Report for Stage 2 of the NBH project.

This report includes an overview of the proposed construction works and has been prepared to identify and assess the potential impacts from the proposed construction activities on the local road network and then to develop strategies in order to mitigate the potential impacts throughout the construction and operation of the Project.

This CTMP outline forms a component of the Preliminary CMP provided in Appendix U of the NBH (Stage 2) EIS.

3 PREVAILING SITE CONDITIONS

3.1 EXISTING ROAD NETWORK

The NBH project site is well connected to the surrounding road network. The key roads providing access to the site lie along major strategic road corridors that carry high volumes of traffic.

The key roads at the vicinity of the site include:

- Warringah Road – is a major state arterial road under the care and maintenance of the Roads and Maritime Services (RMS) carrying approximately 80,000 vehicles per day in both directions. It is one of three strategic arterial routes providing access to the Northern Beaches Peninsula. Warringah Road is a divided road with three lanes per direction and indented turning lanes at key intersections. It has a posted speed limit of 70 km/h. In the vicinity of the site, it is an existing bus corridor with limited bus stops around the retail activity at Hilmer Street mainly to serve the residential area south of Warringah Road.
- Frenchs Forest Road – is a local road under the care of Warringah Council and fronted by residential development as well as the Forest High School. It has an undivided two lane / two way configurations and provides the east-west connection between Wakehurst Parkway and Forest Way. Frenchs Forest Road carries approximately 8,000 vehicles per day in both directions.

At the approach to Wakehurst Parkway, the intersection is flared to provide additional lanes. The road corridor is narrow and characterised predominantly with buses and school related traffic in the morning peak. It has a posted speed limit of 50 km/h.

- Wakehurst Parkway - a state arterial road under the care and management of the RMS. It provides the link between Narrabeen and Seaforth. It has a divided road configuration with two through lanes, dual right turn lanes, and a left-turn slip lane in the northbound direction. In the southbound direction, it has a single through lane and a dedicated bus lane. The road carries approximately 21,000 vehicles per day in both directions. It has a posted speed limit of 70 km/h.
- Forest Way – is the main access road to the suburbs of Belrose and Davidson. It is a local road under the care and management of Warringah Council. It provides the north-south link from Mona Vale Road to Warringah Road. It is an undivided road with three lanes per direction. At its intersection with Warringah Road, it has a left-turn slip lane with two right turn lanes to Warringah Road. It carries approximately 25,000 vehicles per day in both directions and has a posted speed limit of 50 km/h.

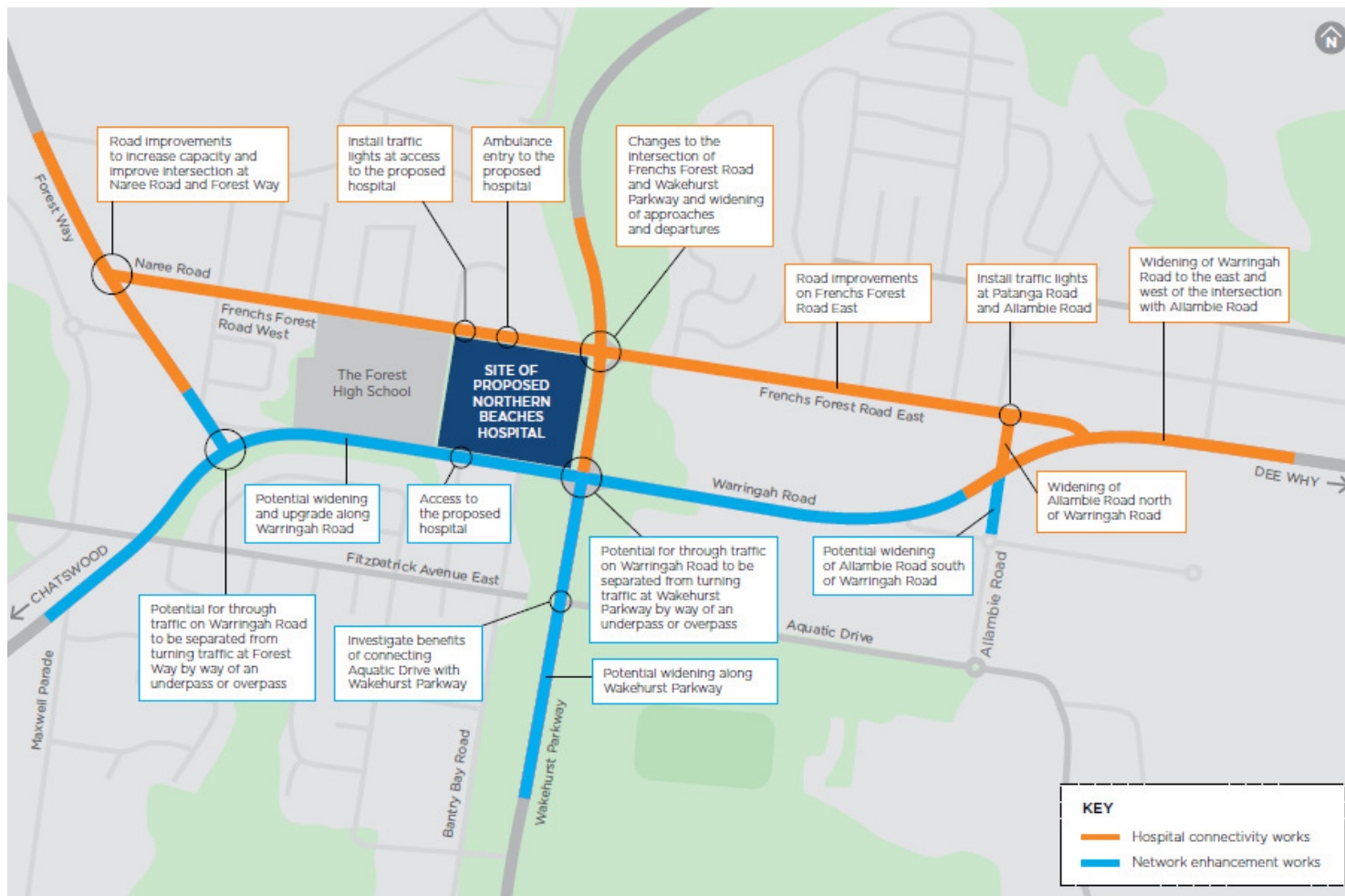
Considering the network connectivity to the NBH site and traffic distribution from a wider network context, four key intersections lie along the main access routes to the NBH site:

- Wakehurst Parkway / Frenchs Forest Road signalised intersection
- Warringah Road / Wakehurst Parkway signalised intersection
- Warringah Road / Forest Way signalised intersection
- Naree Road / Forest Way give way/yield intersection

The Roads and Maritime Services (RMS) proposes to carry out road works to enhance road network and connectivity to the proposed Northern Beaches Hospital. The package of works is referred to as the *Northern Beaches Hospital – Connectivity and Network Enhancements Project*.

To address the identified significant road network capacity constraints, the scope of works proposed by RMS in the Stage 1 Hospital Connectivity Works is substantial and includes:

- Widening of a section of Frenchs Forest Road West and East from the hospital site to Allambie Road.
- Provision of a new signalised intersection on Frenchs Forest Road West as a new access to the hospital and on Frenchs Forest Road East, Patanga Road and Allambie Road.
- Provision of dedicated kerb side bus lanes along Frenchs Forest Road West and East approaches and departures to the intersection with Wakehurst Parkway.
- Changes to the intersection of Frenchs Forest Road and Wakehurst Parkway.
- Widening of Allambie Road to the north of the intersection with Warringah Road.
- Widening of Warringah Road around 500 metres west of the intersection with Allambie Road to the vicinity of Courtley Street in the east.
- Widening and intersection upgrades along sections of Forest Way between Warringah Road and the vicinity of Adams Street.
- Widening and intersection upgrades along Naree Road and Frenchs Forest Road West.
- Reconfiguring of access between Forest Way and Naree Road.



Source: Northern Beaches Hospital – Connectivity and Network Enhancements Staged Infrastructure Application Report

Figure 3-3: Key Features of the RMS Staged Infrastructure Application

3.2 EXISTING TRAFFIC VOLUMES

This section summarises the peak hour traffic flows on key intersections within the vicinity of the site study area. The intersection turning movement data was used to identify the current capacity problems at key intersections. The traffic data also provides a basis to consider likely traffic changes that would result from the future growth and proposed improvement options. The results are based on survey data recorded from key intersections in 2011 and 2012.

Table 3-2 summarises Friday and Saturday afternoon (PM) peak hour traffic volumes on key roads in the study area.

Table 3-2 Peak Hour Traffic Volumes at Key Roads

Road (Section)	AADT	AM Peak		PM Peak	
		Peak Direction Volume	VCR	Peak Direction Volume	VCR
Warringah Road (between Hilmer St and Forest Way)	80,000	3,250	1.1	3,600	1.2
Wakehurst Parkway (between Warringah Road and Frenchs Forest)	21,000	1,250	0.4	1,200	0.4
Frenchs Forest Road (between Allambie Road and Wakehurst Parkway)	8,000	830	0.8	1,016	1.1
Frenchs Forest Road (between Wakehurst Parkway and Naree Road)	7,000*	643	0.6	546	0.5
Forest Way (between Naree Road and Warringah Road)	25,000	2,230	0.7	1,939	0.7

*Approximate

4 CONSTRUCTION TRAFFIC IMPACT ASSESSMENT

4.1 CONSTRUCTION SCOPE

The Construction scope involves the following works:

- Construction of the main Hospital
- Construction of the multi-level Car Park
- Utility services amplification works
- Internal roads, pavements and landscaping

4.2 CONSTRUCTION TIMING

Construction of Stage 2 is scheduled to commence in 2015, and it is expected that the project will be completed in 2018.

4.3 HOURS OF OPERATION

Standard hours of construction for the duration of the construction program are anticipated to be between 7:00 am and 6:00 pm, Monday to Friday and 7:00am to 5:00pm on Saturdays. No work is anticipated to be carried out on Sundays and public holidays.

Discussion on proposed hours of operation is provided in the Stage 2 Noise and Vibration Report (refer to Appendix E of the NBH (Stage 2) Environmental Impact Statement).

4.4 CONSTRUCTION VEHICLE ACCESS

4.4.1 VEHICLE TYPES

Construction vehicles likely to be generated by the proposed construction activities include:

- Articulated vehicles for the delivery of machinery and tower cranes;
- Medium and heavy trucks for construction material removal and delivery;
- Concrete trucks, mobile cranes and concrete pumps; and
- Delivery vehicles and vans.

4.4.2 CONSTRUCTION ROUTES

The construction routes will generally be influenced by the location of concrete batching plants, the source of the construction materials and equipment and the location of the fill sites.

For the Royal North Shore Hospital project which is of similar scale to the proposed Northern Beaches Hospital, concrete was supplied from plants in the Artarmon area. It is most likely that concrete for this project will be supplied from the same plants.

4.4.3 VEHICLE ACCESS

The proposed access to the site during construction will be located along Warringah Road. Bantry Bay Road will initially be used during bulk excavation and while the southern entry (Gate 1) to Hospital Road is being constructed (shown in Figure 4.4).

The southern entry is consistent with the construction access from the Stage 1 works. It is noted that in the Stage 1 consultation with community stakeholders, this entry was identified as the preferred option.

Access gates will be set back from Warringah Road to allow construction vehicles to queue within the site and minimise impact on through traffic on Warringah Road. Full time ticketed traffic controllers will be manage pedestrians at the site access locations for vehicles entering or leaving the site.

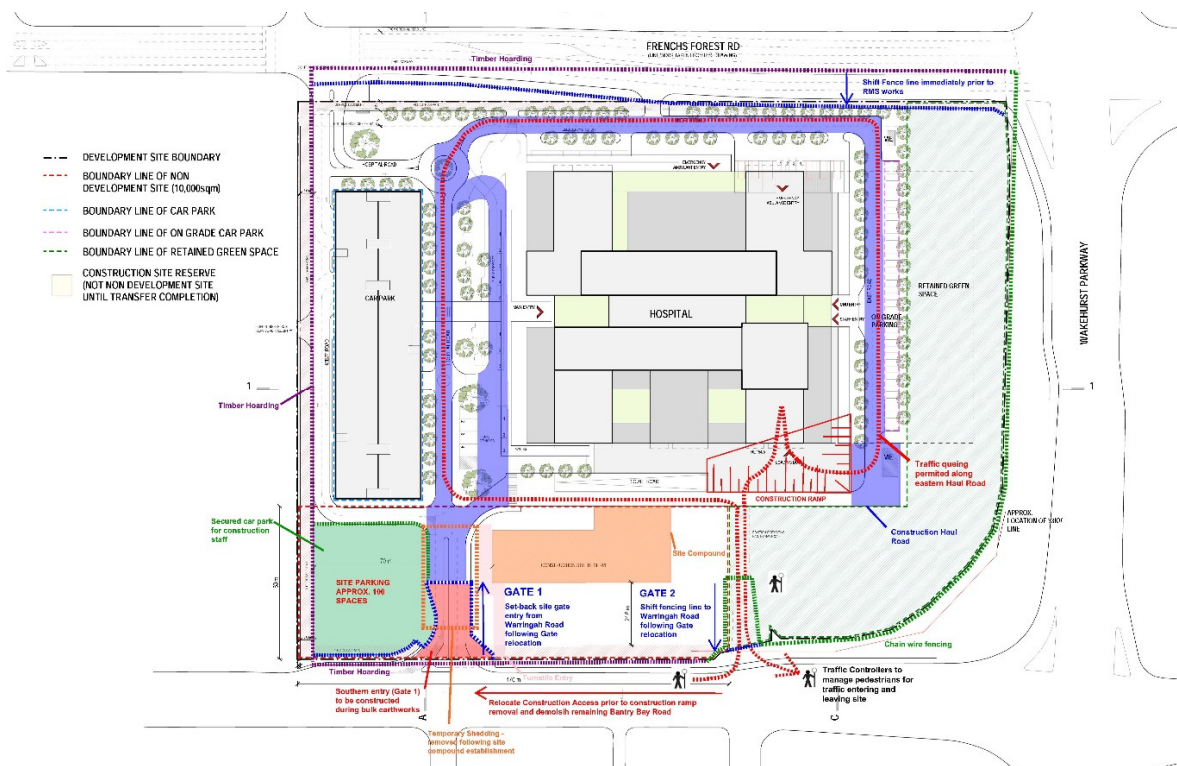


Figure 4-4 Site layout, parking and accommodation during Hospital Road entry construction

Following the construction of the main access onto Hospital Road the Bantry Bay Road access will be made obsolete and the site fence will be relocated to the site boundary along Warringah Road (shown in Figure 4-5)

On site construction access routes have been established, within the construction boundary, along the western, northern and eastern boundary of the site and mainly according to the proposed layout of the internal road network to facilitate materials handling for tower/crawler cranes and forklifts. Hoists will transport personnel and lighter materials within each building structure.

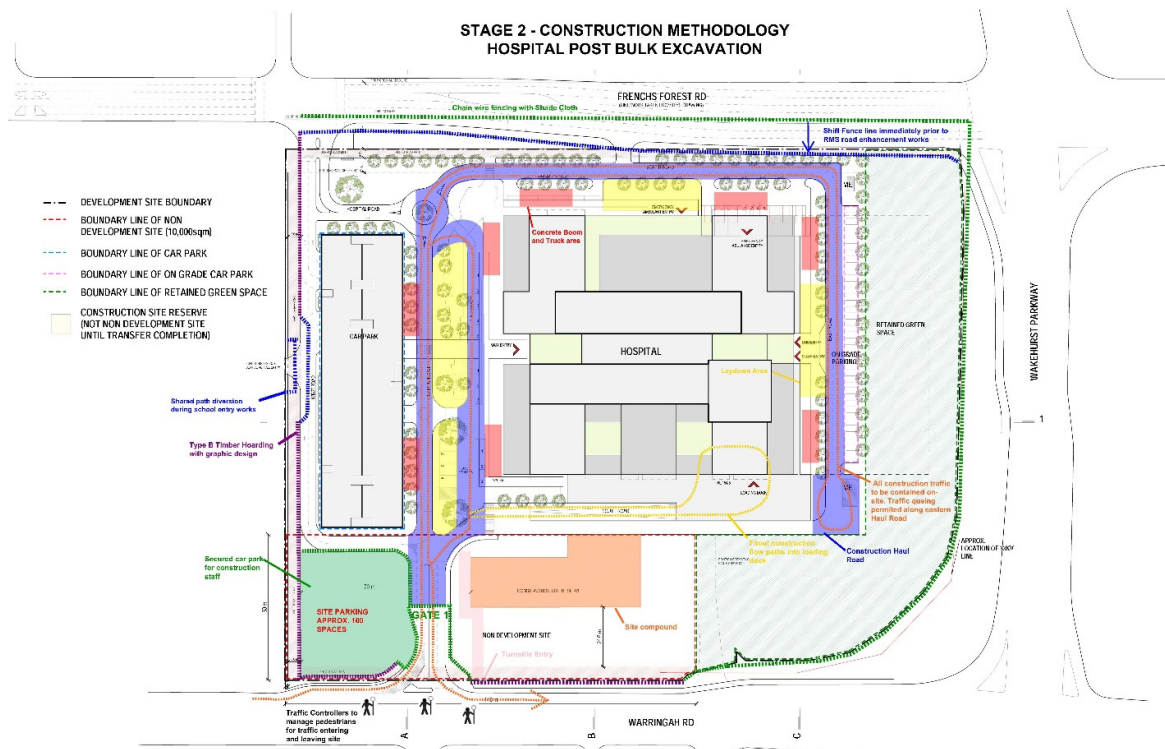


Figure 4-5 Site layout, parking and accommodation Post Bulk Excavation

4.5 PEDESTRIAN ACCESS

A shared path on the western boundary of the site will be constructed as part of Stage 1, which will provide public access and connectivity between Warringah Road and Frenchs Forest Road.

Site personnel will access the project site through turnstiles placed along the southern hoarding line. These are activated via an electronic security pass provided once inducted into the site safety procedures. Pedestrian paths will be identified within the Project Site with a view to causing least disruption during construction works.

Fence and timber hoardings will be installed during site establishment and shall remain throughout the construction works. Hoardings and fencing will be relocated in consultation with RMS immediately prior to their works.

4.6 CONSTRUCTION TRAFFIC

4.6.1 CONSTRUCTION VEHICLE TRAFFIC GENERATION

The forecast traffic generated during the construction phase is minimal in comparison to the existing road traffic surrounding the site. The estimated peak vehicle movements is estimated to be 60 truck movements four times a day or equivalent to 240 truck movements a day. The peak daily generation is expected to occur during bulk excavations and subsequently be reduced for the following construction stages for the hospital and car park building construction and fit-out.

The truck volumes are indicative and are not likely to be exceeded. The approximate frequency of up to 120 trucks per day or 240 truck movements per day (or an average of 22 truck movements per hour) will be low and is approximately 0.6% of the current AADT volume on Warringah Road. This traffic volume associated with the construction works is considered negligible and will be temporary for the duration of the construction period. It is not expected to have a negative effect on the adjacent road network capacity.

4.6.2 CONSTRUCTION STAFF TRAFFIC GENERATION

Approximately 100 car park spaces will be provided within the site boundary for construction workers and site management staff. Measures will be implemented to encourage the use of public transport, car-pooling and shuttle bus service, etc. Construction car parking will only be available to those who car-pool with no less than the carrying capacity of the vehicle. The car pooling scheme can potentially allow up to 500 workforce to serve the site by utilising the internal car parking more efficiently.

4.7 CUMULATIVE TRAFFIC IMPACTS

A preliminary assessment has been undertaken of the cumulative effects of construction traffic on the adjacent roads to the Northern Beaches Hospital site given that NBH construction works will be carried out concurrently with the Stage 1 and Stage 2 RMS works.

Construction work for the NBH will commence in early 2015 and be completed in 2018. The Stage 1 RMS Road Connectivity works also commence in early 2015 and are anticipated to be completed in mid-2017. The Stage 2 Network Enhancement works by RMS is scheduled to commence in late 2015 and be completed in 2018.

- **Stage 1 RMS Works**

Construction access to the hospital site will be from Warringah Road while construction traffic for the Stage 1 Road Connectivity works will principally be on Frenchs Forest Road. Accordingly the cumulative impacts of the concurrent works are not considered significant.

- **Stage 2 RMS Works**

As stated previously, the traffic volume associated with the hospital construction works is negligible in comparison with the current traffic volumes on Warringah Road. Further, it is anticipated that the bulk of truck movements associated with the NBH construction works will be concentrated in the early stages of the construction works during the bulk excavation works. Based on current understanding of the timing of RMS works, it is anticipated that the hospital bulk excavation works will be substantially complete before commencement of significant works on Warringah Road.

The opportunity to collectively manage and minimise the construction traffic impacts will be identified through consultation with RMS and the road works contractor.

5 CONSTRUCTION TRAFFIC MANAGEMENT PLAN

5.1 KEY ISSUES

The key issues addressed in this Construction Traffic Management Plan are:

- Safety and amenity of road users and the public;
- Site security, site access and signage;
- Information signage, distance information and advance warning signs;
- Speed limit signage;
- Traffic transfer arrangements and procedures;
- Separation of the Public from all construction activities;
- Maintaining egress though and around the site;
- Ease of access for site personnel;
- Protection of the public due to materials handling vehicle movements; and
- Potential traffic congestion from construction activities.

5.2 REGULATORY REQUIREMENTS

- Conditions of the Infrastructure Approval.
- Any conditions of licenses or permits under the Environmental Planning and Assessment Act 1979 and Regulations.
- Road Transport (Safety and Traffic Management) Act 1999.
- Roads Act 1993.
- Occupational Health and Safety Act 2000.
- Occupational Health and Safety Regulation 2001.
- Permit and/or license conditions existing for Contractors.

5.3 PERFORMANCE CRITERIA

- No safety incidents;
- Adherence to any relevant permits and/or licence conditions;
- Minimal delays to traffic on the road sections affected by the construction;
- No complaints in relation to on-site construction traffic from neighbouring property owners or residents in the local area;
- Level of access afforded through the use of designated access and egress points;
- Responses to all issues, queries and concerns; and
- Compliance with all relevant standards, regulations and codes.

5.4 MITIGATION MEASURES

- Appropriate signs warning of trucks entering will be erected on the approach to any access point.
- Minimise construction vehicle queuing for vehicles entering the site from Warringah Road. The site gate is set back within the site allowing queuing to be maintained within the site
- Full time qualified traffic controllers will manage pedestrians when vehicles are entering or leaving the site.
- Promote car-pooling and utilise site car-parking more efficiently
- Stand-by construction traffic such as concrete or haulage trucks to be confined within the site boundary or sent back to original point of departure.
- Appropriate signs will be erected warning road users and in particular vulnerable road users such as cyclists and pedestrians of restricted road and shoulder spaces due to construction activities.
- Implementation of effective arrangements including advance warning signs and emergency access arrangements for any closure to the road.
- Vehicles transporting material to and from the construction site will be covered immediately after loading (prior to traversing public roads) to prevent wind-blown dust emissions and spillages
- In the event of a spillage of materials from construction vehicles, spilled material will be removed as soon as possible and spill kits will be available on the site.
- Access will be maintained to neighbouring properties and other land uses throughout the construction period.
- Haulage vehicles will be filled to capacity to minimise vehicle movements.
- Traffic Control Plans will be prepared for the project works and for specific road construction staging scenarios, depicting vehicle, pedestrian, bus and cyclist restrictions and protection measures.

5.5 DESCRIPTION OF TRAFFIC MANAGEMENT CONTROLS

Traffic Control Plans

Traffic Control Plans will be produced by a qualified and licenced traffic control organisation and will be issued to the relevant authorities as required.

Liaison with Stakeholders

The following key Stakeholders have been identified:

- Forest High School;
- Warringah Council;
- Roads and Maritime Services (RMS); and
- Transport for NSW.

This Traffic Management Plan will be developed in consultation (where appropriate) with the relevant stakeholders noted above.

5.6 PROCEDURES

The procedures set out below describe how the key issues will be addressed.

Site Security, Site Access and Signage

The issues have been considered in determining the location of site accesses are:

- Safety of travelling public, including pedestrians and cyclists.
- Safety of construction workers and equipment.
- Ease of access for emergency vehicles.
- Site security.

Road User Delay Management

Message boards shall be erected at either end of the project along Warringah Road to advise motorists, cyclists and pedestrians of any lane closures or detours. These message boards shall be constantly updated to ensure accurate and up to date information is available to the public regarding any scheduled lane closures of Warringah Road.

Delays to road users during construction will be minimised by providing experienced and qualified traffic control personnel.

Where traffic has to be stopped or diverted at particular times this will be planned properly and in advance so that the durations of inconvenience are kept to a minimum and large traffic queues are prevented as far as practical.

Information Signage, Distance information and Advance Warning Signs

All signage including: project identification signs, traffic management signs, information signs and regulatory signs shall be established prior to the project commencing, retained during the project as required and reinstated or replaced upon completion.

Signposting covers information, regulatory, warning and guide signs as defined in national and RMS standards all of which contribute to safety to road users. The types and classes of signs are:

- Information Signs – used for project identification as per the requirements of the approving authority
- Regulatory Signs – used to prohibit dangerous traffic movements.
- Warning Signs – used to provide advance notice of road hazards ahead.

Safety principles for these signs are:

- Before approval is given for a new sign a demonstrated need should be established.
- All signs should convey a clear message to all users under all conditions.
- The sign support structure should not create a safety hazard in itself.

All signs will be manufactured and erected in accordance with Australian Standards AS1742, AS1742.1 to 1742.13, AS1743 and AS1744.

Regulatory Signs

Regulatory signs are maintained to support the enforceability of road traffic regulations.

Typical regulatory signs are:

- Stop/Give Way.
- Movements/Turns.
- Speed Limits.
- Stopping/Standing/Parking.

All regulatory signs will be shown on the Traffic Control Plans.

A register of regulatory signs will be maintained showing the actual time of erection as well as location, type and size. Regulatory signs will be erected and located in accordance with the RMS Traffic Control at Worksite Manual (2010).

Warning Signs

Warning signs are used to alert drivers to hazardous or potentially hazardous conditions which may not be apparent or discernible to the drivers due to in part to the road geometry or environmental conditions. These signs therefore are devised to advise drivers of road conditions, which require caution and possibly a reduction in speed for their own safety and safety of other drivers and pedestrians.

Typical warning signs include:

- Curves or winding roads.
- Intersections.
- Advisory speed.
- Clearances.
- Obstacles.

In the construction phase, signs will be obtained and erected as shown on layout plans and Traffic Control Plans.

Guide Signs

Guide signs could be:

- Direction signs.
- Other minor guide signs.

Direction signs are maintained to provide clear information to drivers on travel destinations thereby assisting the efficient operation of the road network.

Typical direction signs include:

- Advance direction.
- Intersection direction.
- Reassurance.
- Location direction.

Speed Limit Signage

The current speed limit on Warringah Road is 70km/hour. Speed limit restrictions will be enforced on-site to ensure the safety of site personnel.

Other Traffic Control Devices

Other devices of use include barrier boards, plastic mesh fencing, temporary post mounted delineators, cones, flaps, traffic warning lamps, temporary pavement markings, boom gates and portable traffic signals. These items will be provided as required.

Emergency Vehicle Access

There shall be no change to access for emergency vehicles around the project limits.