



**Planning &
Environment**

Northern Beaches Hospital Connectivity & Network Enhancement Works: Stage 2 (SSI 6622)

Independent Traffic & Transport Review

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1. Introduction

Roads and Maritime Services (RMS) is seeking approval for the Stage 2 Project Network Enhancement Works (Stage 2 Project) which forms part of the Northern Beaches Hospital (NBH) – Road Connectivity and Network Enhancements Project Concept Proposal.

The NBH Road Connectivity and Network Enhancements Project includes two stages:

- Stage 1 – Hospital Connectivity Works which aim to enhance the existing road network to facilitate the opening of the proposed Northern Beaches Hospital in 2018.
- Stage 2 – Network Enhancement Works which are directed towards broader network capacity enhancement, particularly along Warringah Road (the subject of this assessment review).

This report details an independent review of the traffic and transport impact assessment for the proposed Project and has been prepared by *Samsa Consulting Pty Ltd*, Transport Planning & Traffic Engineering Consultants, for *NSW Department of Planning and Environment* (DP&E) as part of its project assessment process.

1.1 Objectives & Scope of Work

The Department of Planning and Environment (DP&E) requires an independent peer review of the subject Project's traffic and transport assessment for Stage 2 of the Project. The review includes the following tasks.

Preliminary Review

- Site familiarisation visit of the Project area to observe and assess pertinent traffic and transport matters.
- Review the traffic and transport assessment in the Environmental Impact Statement (EIS) and comment on the technical adequacy and completeness of the assessment taking into account relevant guidelines, requirements and legislation. The review includes:
 - Adequacy of surveys and modelling that have informed the assessment, including consideration of the assumptions and results of the VISSIM models used and especially any updates to the modelling for Stage 2.
 - Project's construction and operational traffic and transport impacts for Stage 2 works, including cumulative and induced impacts with particular focus given to the Forest High School and residents along Frenchs Forest Road West and East as well as to impacts on the wider road network.
 - Project's construction and operational traffic and transport impacts for Stage 2 works, including cumulative and induced impacts with particular focus given to the Forest High School and residents along Frenchs Forest Road West and East as well as to impacts on the wider road network.
 - Consideration of the adequacy of the information presented and whether it is sufficient to enable an assessment of the Project's impacts to be made.
- Consider whether additional information is required to address gaps in the traffic

and transport impact assessment.

- Meetings with the proponent's design and assessment teams to discuss methodology and results.
- Prepare a report on the findings of the Preliminary Review identifying gaps in the assessment and/or further information required by the proponent (gap analysis) as well as any other matters raised.
- Meeting with DPE staff following completion of the Preliminary Review to discuss the consultant's review and recommendations, including identification of additional traffic and transport information, and recommendations for additional traffic and transport impact assessment, where applicable.

Post Exhibition Document and Submissions Review

- Consolidate the findings of the Preliminary Review, following DP&E review.
- Review the appropriateness and effectiveness of management and mitigation measures recommended for the Project.
- Review agency, council and public submissions on the traffic and transport impact assessment.
- Review the RMS response to the gap analysis assessment matters identified during the preliminary review, the traffic and transport impacts raised in submissions and undertake a review of the Preferred Infrastructure Report (PIR) document and the proposed project amendments.
- Meeting with DPE staff following completion of the Submissions review to discuss the consultant's review and response to agency comments on the EIS and adequacy of the RMS's response.
- Prepare a Final Report on the findings of both of the above reviews, including:
 - Adequacy and completeness of the traffic and transport impact assessment in the EIS and subsequent PIR / Submissions Report.
 - Compliance of the project with applicable legislation, guidelines and best practice.
 - Adequacy and appropriateness of the management and mitigation measures recommended.
 - Development of recommended actions and conditions of approval (in conjunction with DP&E staff) that could be applied to avoid, minimise, mitigate, and/or manage the residual traffic and transport impacts.
 - Meeting with DPE staff prior to finalisation of report to present the consultant's review and recommendations (14 hours)

In undertaking the review, the main document reviewed was SMEC "*Northern Beaches Hospital Road Connectivity and Network Enhancement Project, Stage 2 – Environmental Impact Statement (EIS)*", July 2015, which incorporated the GTA Consultants "*Northern Beaches Hospital, Stage 2 EIS – Network Enhancement Works, Traffic and Transport Impact (TTI)*", 14/07/2015.

Other documents that were referenced / reviewed include the following:

- GTA Consultants "*Northern Beaches Hospital Connectivity and Network Enhancements, Traffic and Transport Assessment*", 16/10/2014

- GTA Consultants “*Northern Beaches Hospital Connectivity and Network Enhancements, Traffic and Transport Assessment*”, 18/03/2015
- SHOROC “*Submission regarding Northern Beaches Hospital road connectivity and network enhancement project Environmental Impact Statement – Stage 2 Network Enhancement Work (SSI 6622)*”, 21 August 2015
- SMEC “*Northern Beaches Hospital Road Connectivity and Network Enhancement Project, Environmental Impact Statement*”, October 2014
- SMEC “*Northern Beaches Hospital Road Connectivity and Network Enhancement Project: Stage 2, Submissions Report*”, November 2015
- DP&E Secretary's Environmental Assessment Requirements (SEARs), 8 September 2014
- Submissions received from the general community, government agencies (Warringah Council) and other organisations.

1.2 Report Structure

The remainder of this report is presented as follows:

Chapter 2 describes the proposed Project.

Chapter 3 provides a review of the traffic and transport assessment undertaken for the project.

Chapter 4 provides conclusions and recommendations.

2. Project Details

2.1 Background

The proponent, Roads and Maritime Services (RMS) is seeking approval for the Stage 2 Project Network Enhancement Works (Stage 2 Project) which forms part of the Northern Beaches Hospital (NBH) – Road Connectivity and Network Enhancements Project Concept Proposal. RMS has submitted a staged infrastructure application (*Application No.SSI 6622*) for the Northern Beaches Hospital Connectivity and Network Enhancement Works Stage 2, as State Significant Infrastructure under *Part 5.1* of the *Environmental Planning and Assessment Act 1979*.

The Northern Beaches Hospital Connectivity and Network Enhancement Works Stage 2 comprises road upgrades directed towards broader network capacity enhancement in the vicinity of the NBH precinct, particularly along Warringah Road. This stage is meant to complement and augment The Stage 1 project works, which propose to provide essential road works to enhance connectivity to the NBH.

The Stage 2 project is needed at a strategic level to:

- Assist in the management of journeys in connection with anticipated future intensification of medical, commercial and residential land uses surrounding the new 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 employees, patients, outpatients and visitors.
- Facilitate improved access to the NBH and the surrounding employment precincts.
- Have key infrastructure components in place for the proposed NBH opening in 2018.

2.2 Project Description

The Stage 2 Project is proposed generally to be carried out in the following locations:

- Warringah Road between west of Fitzpatrick Avenue East to west of Allambie Road.
- Forest Way between Warringah Road and the Stage 1 Project tie-in (about 100 m north of the Warringah Road intersection).
- Wakehurst Parkway from the intersection with Warringah Road to about 120 m south of Aquatic Drive.
- Aquatic Drive for about 100 m east from the intersection with Wakehurst Parkway.
- Allambie Road between Warringah Road and Rodborough Road.

On Warringah Road, the Stage 2 Project is incorporated largely within the existing road-reserve to the north, and extends beyond the existing road-reserve to the south by up to 30 metres.

The Stage 2 Project would include broadly the following key project elements:

- Provision of four through lanes on Warringah Road (two lanes in each direction for east-west through traffic) within a grade separated open slot for about 1.3 km.
- Ingress and egress points from and to the slot include:
 - Western extent: Warringah Road near Fitzpatrick Avenue East.
 - Eastern extent: Warringah Road from about 350 m east of the Wakehurst Parkway grade-separated intersection.
 - Provision of a two-lane on-ramp (merging into one lane) from Wakehurst Parkway (southbound) into the slot (westbound).
- Widening of Warringah Road from west of Fitzpatrick Avenue East to 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 project.
 - Eastbound travel lanes at surface level on the northern side of the Warringah Road corridor (using existing road pavement), for the length of the project.
- The intersections of Warringah Road with Forest Way, Hilmer Street and Wakehurst Parkway to form a surface level bridge over the slot to provide all traffic movements at surface level and allow east-west through traffic in the slot to pass beneath uninterrupted.
- Upgrades or adjustments to existing intersections of Warringah Road with the following local roads and approaches:
 - Fitzpatrick Avenue East (including the closing of the left turn into Fitzpatrick Avenue East from Warringah Road westbound).
 - Rodborough Road.
 - Allambie Road.
- Widening of Wakehurst Parkway from the intersection of Warringah Road to south of Aquatic Drive.
- Provision of a new connection at Aquatic Drive including right-in from Wakehurst Parkway (northbound), left-in from Wakehurst Parkway and left-out movements from Aquatic Drive and Wakehurst Parkway.
- Provision of shared (pedestrian and cyclist) bridges at the following locations:
 - Across Warringah Road west of the intersection of Forest Way (removal and replacement of the existing pedestrian bridge).
 - Across Warringah Road on the western side of the intersection with Hilmer Street (new pedestrian bridge).
- Removal of the existing pedestrian crossing across Warringah Road at Hilmer Street.
- Shared paths and footpaths on sections of Warringah Road, Wakehurst Parkway, Forest Way, Aquatic Drive and Allambie Road.

The Stage 2 Project would also include drainage works, landscaping, property acquisition and adjustments. The ancillary works would include but not be limited to, construction compounds and stockpile sites.

The location of the proposed Project and its key features is shown in *Figure 2.1* following.



Figure 2.1: Proposed Project Location and Key Features

2.3 Summary of Submissions

A total of 55 submissions were received in response to the exhibition of the EIS. Six were from government agencies (or advisory bodies), one from Warringah Council, one from Shore Regional Organisation of Councils (SHOROC) and the remainder from members of the community and interest groups.

The key traffic and transport-related matters raised were as follows:

- Justification for the project, including the scale of the proposed Stage 2 Project and consideration of future public transport initiatives.
- Project context with regard to local planning and development.
- Traffic and transport, including changes to local traffic arrangements, provision for pedestrians, cyclists and public transport, car parking, alternative transport routes during construction and suggested design changes to improve performance of specific intersections.

2.4 Project Amendments

A number of minor design refinements were carried out since the exhibition of the EIS with an aim to address commitments made in the EIS, address comments received from the community and government agencies, or resulting from further work carried out since exhibition.

Traffic and transport-related amendments include the following:

- Refinement of the design for the intersection of Warringah Road and Forest Way and its approaches, as follows:
 - Forest Way southbound – an unsignalised left-turn slip lane on the approach to Warringah Road (with an unsignalised marked pedestrian crossing), while the configuration at the intersection would comprise one left-turn lane, one right-turn bus lane and two right-turn lanes. The left-turn lane at the intersection would provide for access to Hilmer Street to avoid lane merge issues to the east of the intersection. All traffic would operate in a single traffic signal phase with no separate bus phase. The proposed dedicated short left-turn lane would replace the shared existing left and right-turn lane that is adjacent to the bus lane.
 - Warringah Road eastbound – a bus lane is proposed on the approach and departure sides of the intersection (instead of the chevron line-marked area). The two-lane slip lane at the unsignalised marked pedestrian crossing would also be converted to a single lane.
 - Warringah Road westbound – two right-turn lanes into Forest Way commencing from the departure side of Hilmer Street. The kerbside lane would be used for westbound through traffic, the middle lane would be a shared through and right-turn lane and the outer lane would be a right-turn lane.
- Refinement of the design for the intersection of Warringah Road and Wakehurst Parkway and its approaches, as follows:
 - Wakehurst Parkway southbound – remove the dedicated left-turn slip lane and provide three right-turn lanes, one through lane and one shared through / bus lane (left-turn permitted) at the intersection approach. The bus lane (also allowing left-turn

movements) would commence to the north of the intersection to facilitate access by buses entering from Frenchs Forest Road.

- Warringah Road eastbound – a short section of bus lane (about 20 m) on the approach side of the intersection and extending around 70 m on the departure side of the intersection together with three general traffic through lanes and two right-turn lanes into Wakehurst Parkway, with the left turn slip lane remaining.
- Warringah Road westbound – two through lanes and a bus lane of around 20 m on the approach side of the intersection with a left-turn slip lane. On the departure side, the approach bus lane would align with the nearside lane so a departure bus lane is not required.
- Refinements eastbound on Warringah Road between Wakehurst Parkway and Allambie Road – original design involved three eastbound surface road lanes without a merge to Allambie Road (north) and two eastbound lanes out of the slot directly into two right-turn lanes at Allambie Road (south). Design refinements now propose two surface road lanes merging to one nearside lane before the slot exit with the unused carriageway now to be hatched line marked and retained. The right-turn lane in the slot would become two right-turn lanes.
- Refinements on Allambie Road northbound at the Warringah Road and Allambie Road intersection – original design proposed one left-turn slip lane, one through lane and a short dedicated short right-turn lane. Design refinements now propose one through lane and two right-turn lanes on the approach side of the intersection. The left turn movement to Warringah Road westbound would continue to be provided from Rodborough Road.
- Revised safeguard – road safety audit to be undertaken for the intersection of Madison Way and Aquatic Drive to assess potential road safety issues. The audit is to be undertaken with consideration of existing traffic conditions together with future traffic conditions and increases in traffic resulting from the new access at Aquatic Drive / Wakehurst Parkway.

3. Review of Traffic & Transport Assessment

3.1 Secretary's Environmental Assessment Requirements (SEARs)

The environmental assessment requirements for the assessment of traffic and transport impacts (SEARs issued by the DP&E) include the following.

- Detailed assessment and modelling of operational traffic and transport impacts with consideration of:
 - Assessment of impacts and/or benefits on the local and regional road network including in relation to and beyond those associated with the Northern Beaches Hospital, considering potential future land use patterns and intensification in the area detailed in regional planning documents.
 - Key intersections, and the level of service/performance of intersections upstream and downstream of the project area.
 - Impacts on property and business access and on-street parking provision, including permanent and temporary (construction) changes to access and parking.
 - Operational implications for public transport (particularly with respect to strategic bus corridors and bus routes) and opportunities to improve public transport services and patronage, including the need to move or upgrade public transport infrastructure.
 - Safety and access impacts on road users (including cyclists and pedestrians) and consideration of opportunities to integrate cycleway and pedestrian elements with surrounding networks and attractors (existing and proposed). This should include impacts associated with The Forest High School and Frenchs Forest Public School, informed by surveys of traffic movements and mode distribution associated with the schools.
- Detailed assessment of construction traffic and transport impacts of the proposal (including ancillary facilities) and associated management measures, in particular:
 - Impacts to the road network including safety and level of service, pedestrian and cyclist access, maintenance of construction access to the Northern Beaches Hospital site, and disruption to public transport services and access to properties.
 - Impacts of potential shifts of traffic movements to alternative routes outside the proposal area.
 - Availability of on-street parking within and surrounding the project area.
 - Impacts to school related traffic (bus, service, emergency and private vehicles) both on-site and on-street, and pedestrian and cycle movements.
 - Route identification and scheduling of transport movements, including movements to transport spoil.
 - Number, frequency and size of construction related vehicles including passenger, commercial and heavy vehicles.
 - Nature of existing traffic on construction access routes including consideration

of peak traffic times.

- The need to close, divert or otherwise reconfigure elements of the road network associated with construction of the proposal

having reference to the cumulative construction impacts of other developments preparing for or under construction, including concurrent construction associated with subsequent stages of this proposal and/or the Northern Beaches Hospital proposal.

- Details of stakeholder consultation regarding access disruption, including The Forest High School, Frenchs Forest Public School, Northern Beaches Hospital, and emergency services.

The Secretary's requirements for the environmental assessment (SEARs) formed the basis of matters considered in the independent review. Issues identified during the review are characterised in the following sections.

Where the proponent has provided relevant responses, these have been included below each identified issue / comment (*in blue italics*). Additional comments on proponent responses are included *[in red and brackets]*.

3.2 Assessment Methodology and Modelling Tasks

In general, it is considered that the methodology and analysis of traffic and transport impacts has been undertaken quite rigorously and in adequate detail. Moreover, it is considered that the SEARs have generally been addressed adequately.

There is some ambiguity with respect to the wording used in the assessment, which is considered to be largely non-committal for various project components. This is mainly used for bicycle, pedestrian, parking and public transport measures. It is considered that firm and positive commitments are desirable in conjunction with associated timeframes and responsibilities for the various measures so that greater confidence can be made in the assessment of the proposal.

This ambiguity / lack of commitment could be mitigated by detailing responsibilities for a post-operations review including (as a minimum) who would be responsible for the review assessment (eg. Warringah Council, RMS, Sydney Buses / TfNSW), who would be responsible for implementation of any actions arising from the review, what timeframe would be agreed to and how any works would be funded.

With respect to the modelling tasks, the use of the VISSIM model (on-going from the Stage 1 and Concept Proposal assessment) is considered to be appropriate. The model scenarios used ('Do Minimal', Stage 1 and Concept Proposal for the years 2018 / 2021 and 2036) are considered to be adequate and further model development was undertaken for Stage 2 of the Project.

The model network statistics / results used in the assessment are considered to be comprehensive in determining future-year traffic operations and impacts. These included the number of vehicles that have left and remain in the network, total distance and time travelled, average vehicle speed, average and total vehicle delay, average number of stops per vehicle, unreleased time and unreleased demand. These parameters provide a suitable indication of network performance and importantly, provide key statistics that can be used to compare scenarios.

Notwithstanding the general adequacy of the modelling tasks, the following comments are provided for consideration:

- Please clarify the distribution development for NBH staff between 2018 and 2028 based on the trip length and distribution pattern of Hornsby Hospital staff. In *Tables 3.4 and 3.6* of the TTI, 'to/from Wakehurst Parkway', 'to/from Forest Way' and 'to/from Warringah Road (west)' significantly change with respect to the percentage of NBH staff that would travel in that direction – respectively 32% to 3%, 7% to 21% and 3% to 29%. There seems to be a general shift from north of the NBH precinct to the west. It is unclear why this would occur and how spatial / directional distribution relates to trip length for another, albeit similar hospital but in a different location. It is noted and acknowledged that this approach used by the proponent was agreed as appropriate at a workshop.

The demand assumptions underpinning the TTIA were determined at a workshop convened by RMS in July 2014, involving representatives of RMS, TfNSW, Health Infrastructure, Warringah Council, and consultants (SMEC, TMA, URaP, GTA). One of the inputs determined was the assumed distributions of residences for NBH staff.

These were based on the following premises:

- *On opening, most of the staff working at the NBH would be relocated from Manly and Mona Vale Hospitals. These two hospitals would be downscaled to support NBH as the primary regional hospital. Further local community health facilities being planned would also accommodate some of the staff displaced from Manly and Mona Vale. The distribution of NBH staff residences for 2018 has therefore been based on the existing distribution of staff residences at Manly and Mona Vale Hospitals – determined from ABS Census (2011) Journey-to-Work.*
- *Health Infrastructure advised that within 10 years, a number of cycles of staff turnover would occur at NBH, and there would be opportunities for staff to move between NBH and other hospitals and community health facilities in the Northern Beaches and across Sydney. This would result in a refresh of the distribution of NBH staff residential locations, oriented towards a mature employment catchment for the hospital.*
- *In order to establish a distribution of staff residential locations specific to the future NBH, the current distributions at RNSH and Hornsby Hospital were examined. Hornsby was considered to be more representative of the accessibility conditions of the NBH, as the RNSH sits directly above a railway station.*
- *This distribution was established by calculating the number of workers at the hospital in each SA1 within each 1km distance band, in proportion to the total number of workers in that SA1. This pattern was then applied to the population around the proposed NBH, resulting in an average trip length of 8.3 km.*

[Acceptable response by proponent.]

- In *Table 4.1* (page 32 of the TTI), heavy articulated (Class 6-12) vehicle volumes seem very low. Please confirm that these are correct.

These were taken directly from Figure 3.8a on page 27 the following document by RMS: Northern Beaches Hospital Precinct, Frenchs Forest Enabling Roadworks Package Project Evaluation and Justification Working Paper, February 2014.

The volumes in question are for Heavy Articulated Vehicles – Austroads Class 6-12. The Northern Beaches has a low proportion of heavy industry and construction activity

compared with other parts of Sydney, and its peninsular nature mean that its arterial road network is not used frequently as a conduit between other regions for heavy vehicle movements.

[Acceptable response by proponent.]

- In Table 5.7 (page 63 of the TTI), all the 2028 average vehicle speeds in the PM peak hour increase in comparison to the 2018 average vehicle speeds. Please clarify why this result would occur, considering that there would be more vehicles and congestion in 2028. This seems counter-intuitive.

The table shows only negligible differences in vehicle speeds and any differences are assumed to be due to the stochastic nature of the simulation model for the assessment.

[Acceptable response by proponent.]

- In Tables 6.1 and 6.2 (pages 67 and 69 of the TTI), it is unclear why the Stage 2 total traffic demand is not the same (or greater) than the Stage 1 demand. It is considered that the improved road network and traffic conditions would likely attract traffic to the area and if anything, demand should increase or at least remain stagnant. Please clarify.

The analysis of both the Stage 1 Project and the Stage 2 Project was undertaken assuming the same traffic demands in both cases. This was to provide a fair comparison between the two project stages and to identify the relative merits of Stage 2.

The tables show only negligible differences in total demand. The same 'target' demands were input in both cases. Any differences are due to the stochastic nature of the simulation model for the assessment and are not significant. Each second of the simulation period, trip demands from each entry point to the network are simulated from observed statistical distributions. The table presents the total of all trips at all entry points over each second of the simulation period.

Whether Stage 2 would generate additional traffic is another question. If it does, there would be an economic benefit derived from the choices drivers would make to do so. Neither this economic benefit nor the impacts of any eventual additional traffic (should it occur) have been considered. Exploring this also opens up the question of diverting traffic out of the corridor due to the upgrade of Mona Vale Road and other arterials.

Examination of the STFM scenarios for these cases by RMS has shown that any such effect is likely to be minor, with the additional traffic offset by diversions to other corridors also being upgraded.

[Acceptable response by proponent.]

- In Section 5.6.1 of the TTI, traffic growth is forecast to increase by 12% in the AM peak and 11% in the PM peak over 6 years (2012 - 2018) and then 5% in the AM peak and 4% in the PM peak over 10 years (2018 - 2028). The latter seems very low with less than 0.5% annual growth. Please clarify / discuss these growth rates and how they compare with Sydney generally, particularly in light of comments made for the previous Stage 1 / Concept Proposal submission and the BTS model data used.

The trip generation for the NBH has been based on the revised staff, hospital bed and outpatient numbers, as well as deliveries.

[Noted – this could be further addressed via a detailed traffic operations review.]

Section 3.4.1 notes that the North East Subregional Strategy forecasts population

growth of 15% by 2036, which equates to an average rate of growth of just over 0.5% pa. The forecasts of regional travel demand have been provided from RMS, which in turn were derived from BTS. These reflect the increasing investment in public transport infrastructure and services across the city, resulting in gradual shift towards public transport for commuting to major activity centres, and during peak periods.

The strategic population forecasts represent a balance between projections of demographic / economic trends, the availability of land for development, and planning policy. The easing of growth rates in the second decade reflects a shift towards public transport, a slight shortening of trips and a moderation of development activity that can be anticipated under present statutory planning policies.

[Acceptable response by proponent.]

3.3 Road Network / Traffic Operations

In general, the assessment of road network and intersection operations has been undertaken thoroughly. All significant intersections in the relevant area were analysed for existing as well as future scenarios.

The following are specific comments on the assessment of the road network and traffic operations:

- For the proposed restriction of the left-turn movement into Fitzpatrick Avenue (East), it is considered potentially problematic for westbound vehicles travelling along Warringah Road to turn before their destination road, ie. turn at Hilmer Street, which is upstream of Fitzpatrick Ave (East). Moreover, vehicles accessing Fitzpatrick Avenue (East) from Forest Way will now be required to turn left from Forest Way into Warringah Road (opposite direction to intended destination) and then turn right into Hilmer Street from the surface lane. How will this be effectively / clearly conveyed to drivers?

The current left-turn movement from Warringah Road into Fitzpatrick Avenue East is typically low volume with many from the community using the Hilmer Street access, especially when coming from Forest Way. The left-turn access into Fitzpatrick Avenue East via Forest Way, although currently permitted, is a problematic movement as being made from the middle lane it requires vehicles to cut across the kerbside lane and therefore vehicles travelling along Warringah Road (westbound), over a short distance. This is a movement that is not commonly made by the community and most vehicles access via Hilmer Street. Feedback from the community from various information sessions, together with input from Warringah Council during the design development process also confirmed this and supported the proposed removal of the left-turn access.

The lane configuration on Forest Way at Warringah Road will also be improved as part of a proposed design refinement to be developed in the detail design stage which will improve the overall operation of the intersection. This design refinement will improve access to Hilmer Street from the Forest Way intersection by providing one left turn lane on the approach of the intersection for access directly into Warringah Road (eastbound) and onward to Hilmer Street. The overall configuration at the intersection will therefore be one left-turn lane, one right-turn bus lane, and two right-turn lanes.

[Acceptable response by proponent.]

- The modelling predicts relatively high percentages of unreleased demand, which is likely to result in 'rat running' along local street routes. While the 'rat running' occurs at present, there are no specific mitigation measures proposed to address this aside from enhancement to the capacity of the road network to cater for the increase in background traffic volumes and traffic generated by the proposed hospital.

Section 4.7 of the Traffic and Transport Technical Working Paper details the extent of 'rat running' observed to currently take place within the study area. This 'rat running' is as a result of significant congestion on the arterial road network and primarily at the Warringah Road / Forest Way and Warringah Road / Wakehurst Parkway intersections. The Stage 2 Project provides increased capacity along the Warringah Road corridor, minimising the need for vehicles to seek alternate routes via the local road network as is currently observed.

The proportion of unreleased demand is predicted to reduce from 14 per cent under the Do Minimum scenario in 2018 to 2 per cent with the Project during the AM peak period and from 12 per cent to 3 per cent during the PM peak period respectively. This indicates that the project is largely expected to mitigate the unreleased demand generated by the new hospital.

By 2028 the proportion of unreleased demand is predicted to reduce from 10 per cent and 17 per cent during the AM and PM peak periods respectively under the Do Minimum case to 5 per cent in both peak periods with the Project. These results indicate that the Project will provide clear benefits to managing congestion compared to existing and also Do Minimum scenarios.

Section 4.7 of the Traffic and Transport Technical Working Paper provides a discussion of the current extent of 'rat running' on the local road network of the precinct, illustrated in Figures 4.13 and 4.14. The potential for this to occur would increase substantially under the Do Minimum case. The extent of 'rat running' would be reduced significantly by the Project due to its ability to provide a clear benefit in managing congestion with its lower proportion of unreleased demand.

Importantly, it should be noted that the unreleased demand is not predicted to occur at the Warringah Road / Forest Way or Warringah Road / Wakehurst Parkway intersections. Rather the unreleased demand is forecast to occur at localised locations and on Warringah Road outside of the project area.

Without the Project the proportion of unreleased demand is predicted to increase to 14 per cent in the AM peak hour (2018) and to 17 per cent in the PM peak hour (2028), significantly above the proportion of unreleased demand predicted with the Project.

Based on the above findings, the assessment confirms that there are no specific measures required to address 'rat running' as a result of the Project.

[Notwithstanding the above acceptable response by the proponent, consideration should be given to conditioning regular monitoring of local streets that are likely to exhibit increases in traffic and rat-running and consult with Council in regard to temporary measures that could be implemented to manage safety and related matters.]

- Some proposed road widths are less than 3.5 m (general urban standard), which has the potential to adversely affect road safety and traffic operations – refer to Design Parameters in Table 5.4 of EIS.

Austroads Guide to Road Design Part 3: Geometric Design (Section 4.2.5) provides

guidance on the recommended lane widths for urban roads. The Guide recommends a preferred lane width of 3.5 metres, but recognises that in some cases narrower lane widths may be required including when “the road reserve or existing development form stringent controls preventing wider lanes”. The Guide indicates that general traffic lane widths of 3.3 to 3.5 metres are considered acceptable and recognises that narrower lanes (less than 3.3 metres) may also be appropriate in certain circumstances.

Travel lanes in the Project that are less than the minimum recommended width typically reflect locations of existing roads (and existing lane widths) that are not proposed to be upgraded as part of the proposed works. Increases in the width of these existing roads would have an impact on the overall project footprint and cost, both of which have needed to be minimised where possible as the project has developed.

[Notwithstanding the above acceptable response by the proponent, consideration should be given to conditioning the undertaking of independent road safety audits to manage safety and related matters.]

3.4 Parking

In general, the assessment of parking matters has been undertaken adequately as part of the previous Stage 1 and Concept Proposal assessment. The use of a kerbside parking survey as part of the previous assessment was considered appropriate to determine available on-street parking / existing utilisation and is considered to be satisfactory for the Stage 2 assessment. Off-street parking was also addressed for the adjacent Forest High School parking area.

Notwithstanding the general adequacy of the parking assessment, the following comment is provided for consideration:

- The *Submissions Report / Preferred Infrastructure Report* (for the Concept Proposal and Stage 1 of the Northern Beaches Hospital Road Connectivity and Network Enhancement Project) indicated that the parking spaces to be provided for the hospital site would be expected to reduce the need for use of local streets for parking by hospital staff and visitors. In addition, the report indicated that the effect of the proposed new shared pedestrian / cyclist overbridge (connecting the southern side of Warringah Road to the hospital site and other areas on the northern side of Warringah Road) on parking and traffic flow would be assessed as part of the Stage 2 project assessment (refer to page 3-27 of the *Stage 1 Submissions Report / Preferred Infrastructure Report*).

[There has been no assessment of these potential impacts in the Stage 2 assessment. Potential impacts to on-street parking, particularly along Hilmer Street and Bantry Bay Road, should be covered as part of the post-completion review to be undertaken in consultation with and to the satisfaction of Warringah Council.]

3.5 Public Transport Operations

In general, the assessment of public transport operations has been undertaken adequately. The existing services serving the area as well as the bus stop hubs within the area at Skyline shops and Forest Way Shopping Centre form part of the only public transport services in the area. These operate in conjunction with school buses (particularly for Forest High School) and will need to interact with any proposed buses serving the proposed NBH.

The following are specific comments relating to public transport / bus infrastructure:

- As part of the *Northern Beaches Transport Action Plan*, Transport for NSW is proposing to improve bus services and associated infrastructure in the vicinity of the proposed NBH. However, there is no indication of timing for these improvements and no commitment for them to be operational by the time the NBH opens. Moreover, there is some discussion on how bus services will be improved and meet relevant public transport plans / policies. This is implied via the road network improvements but not really specifically addressed. Similarly, the enhancement of bus services to cater to the changed land uses (specifically the NBH) seems to be left to Sydney Buses / Transport for NSW, although no indication of timing has been provided.

The timing and operations of buses have been addressed in consultation with Sydney Buses / TfNSW.

[Notwithstanding the above response by the proponent, consideration should be given to including bus operations as part of the post-completion review. This would be undertaken in consultation with and to the satisfaction of Sydney Buses / TfNSW.]

- Although the Stage 2 works are expected to result in improved bus travel times in comparison with the 'do minimal' scenario, the average travel speeds would not meet TfNSW target route speeds.

[This has not been specifically addressed. There is a need to determine that TfNSW deems the lower average travel speeds as suitable. This aspect of operations should be covered as part of the post-completion review to be undertaken in consultation with and to the satisfaction of Sydney Buses / TfNSW.]

3.6 Pedestrian / Cyclist Matters

In general, the assessment of pedestrian and cyclist matters has been adequately assessed taking into account the existing conditions, proposed plans by other parties and various constraints, eg. the scale of the Wakehurst Parkway and Warringah Road corridors and the volumes of traffic in the peak periods create an uninviting pedestrian environment with distinct north-south and east-west severances, resulting in the central core of Frenchs Forest being hard to reach for cyclists and pedestrians.

For Stage 2, this is ameliorated somewhat by the provision of an additional grade-separated crossing for pedestrians and improved signalised crossing level of service due to the grade-separated 'slot' bypass along Warringah Road.

For pedestrians, any increase in vehicles and travel times along the area's road network may have an impact on pedestrian transport, eg. longer vehicle 'green times' at congested intersections resulting in less 'green time' and consequent reduced level of service for pedestrians.

The integration of cyclist infrastructure with future plans throughout the area (especially Council's *Warringah Bike Plan*) is considered to be an important aspect for cycleway connectivity within the area and to surrounding areas.

Specific matters relating to pedestrian and cyclist infrastructure are as follows:

- It is unclear why different width / standard shared paths have been proposed, eg. 3.0 m width along Warringah Road, 2.5 m width along Wakehurst Parkway, Allambie Road, Forest Way. Were the different standards proposed based on volumes, users, or some other criteria. Please confirm the adequacy of the shared path widths based on relevant standards / guidelines.

The width of the shared paths has been determined based on anticipated future usage and also its provision within a constrained project footprint. Warringah Road has been designated by TfNSW as an active transport link and it also provides direct connectivity to the new hospital and The Forest High School. As a result, a wider 3.0 metre shared path is proposed along Warringah Road. The standard 2.5 metre minimum shared path width is proposed for all other locations. This was determined with reference to Austroads Guide to Road Design (Part 6A - Pedestrian and Cyclist paths) and in close consultation with Warringah Council during the concept design development process.

[Acceptable response by proponent.]

- There is comment on the Warringah Bike Plan proposals and how these would complement shared paths proposed at part of the Stage 2 works. However, further information is required on the status of bike plan implementation and the potential timing of future projects and how these will be incorporated into any proposals developed by the Stage 2 project, eg. what is the timeframe for Council bike plans and will this correspond with Stage 2 works. It is understood that DP&E issued supplementary SEARs for Stage 2 of the Project on this matter, which required the RMS to identify actions to be undertaken to assist in the delivery of a connected cycleway network within and adjoining the Concept Proposal area.

The development of the proposed shared path network has been carried out in close consultation with Warringah Council. The approach taken has been to provide suitable connections between Stage 1 and Stage 2 of the project together with alignment (where possible) to Council's bike plan. Council's bike plan is currently being reviewed, however, suitable infrastructure to support access to the new hospital and precinct has been identified with Council and forms part of the scope of works for both Stage 1 and Stage 2 of the Project.

[Acceptable response by proponent.]

- The shared path along the northern side of Warringah Road has no connection to the southern side of Warringah Road at Wakehurst Parkway. Shared path users are required to cross two signalised intersection legs to connect to the southern side of Warringah Road.

Section 5.1.4 (Provisions for pedestrians and cyclists) of the EIS states "Where cycleways are provided as part of a shared path network, traffic signals would be modified to incorporate bicycle lanterns". This would apply to the signalised intersection of Wakehurst Parkway/Warringah Road with signalised crossings (suitable for cyclists) provided across Wakehurst Parkway (north and south side) and across Warringah Road

(east side). There is also a new shared pedestrian / cyclist bridge proposed across Warringah Road to the west of Hilmer Street which will connect to the shared path on both sides of Warringah Road.

[Acceptable response by proponent.]

- The assessment states that bicycle signals should be considered where the shared path crosses at signalised intersections. It is unclear how this consideration would be triggered or enacted, especially for the Warringah Road crossing at Wakehurst Parkway to connect shared paths on opposite side of the road.

Section 5.1.4 (Provisions for pedestrians and cyclists) of the EIS states “Where cycleways are provided as part of a shared path network, traffic signals would be modified to incorporate bicycle lanterns”. This requirement will apply to all signalised intersections that connect to shared path facilities and this will be further developed during the detail design stage.

[Acceptable response by proponent.]

- The *Submissions Report / Preferred Infrastructure Report* (for the Concept Proposal and Stage 1 of the Northern Beaches Hospital Road Connectivity and Network Enhancement Project) indicated that the provision of a pedestrian bridge across Warringah Road near Maxwell Parade would be investigated as part of the Stage 2 project assessment (refer to page 3-27 of the *Stage 1 Submissions Report / Preferred Infrastructure Report*), noting the desirability of locating pedestrian crossings to facilitate safe access to bus stops.

[While it is acknowledged that this area is outside the project’s scope of work, there has been no assessment of this additional pedestrian overbridge in the Stage 2 assessment. Potential impacts to pedestrian connectivity across Warringah Road at the subject location could be covered as part of road safety audits to be undertaken for the project area.]

3.7 Construction Phase

The ongoing development of the construction methodology for the Stage 2 Project is proposed to be refined as detailed design progresses. However, from the information and layout of potential work sites and construction methodologies provided in the TTI, the assessment appears to cover construction impacts thoroughly.

In lieu of final detail, a general framework of principles, guidelines and parameters has been provided to assist in identifying potential assessment impacts.

A key consideration proposed during the construction period is the strict requirement to maintain peak period traffic capacity throughout the study area network and even though capacity may be reduced during the off-peak periods, the network performance would be no worse than during peak periods. This is considered to be an important principle and is suggested to be conditioned and monitored as part of CTMP.

With respect to construction vehicle routes, the TTI recommends that an updated assessment be undertaken once the preferred construction compound arrangements have been determined and preferred truck routes confirmed by the project construction team. This is considered a prudent approach as part of the CTMP development.

Two main site compound locations have been identified: one south of the Allambie Road / Aquatic Drive intersection and the other on the north-east corner of the Warringah Road / Wakehurst Parkway intersection. The two compounds would seem to operate well with a combination of suitable storage capacity and proximity to the work areas. This would facilitate better day-to-day access to materials and plant and equipment that would be in regular use as well as providing better access to emergency and spill containment products and measures in the event of an incident.

It is understood that an additional ancillary facility has been identified as a result of detailed construction planning for the Stage 1 project. This is to be potentially sited on the south-western corner of Warringah Road / Wakehurst Parkway and has not been considered as part of the Stage 2 project assessment.

For all site compound locations including the possible site on the south-western corner of Warringah Road / Wakehurst Parkway, there is generally suitable access onto the major road network to ensure heavy vehicle transport routes minimise impacts on local roads in particular. While some local roads are required to be used for access to work sites, it has been acknowledged that preparation of suitable traffic management plans (TMPs) and traffic control plans (TCPs) to appropriate standards would be undertaken.

While partial road closures would potentially be required during the course of the construction period, these are proposed to be staged so as to allow priority for traffic movements in the peak direction, and alternate diversion routes provided. Provisional times during weekdays and weekends have been suggested for any lane and road closures.

Cumulative construction impacts have been acknowledged as construction for the Northern Beaches Hospital and for Mona Vale Road Upgrade project. While some potential mitigation measures have been detailed, the assessment relies on a Project Construction Traffic Management Plan (CTMP) to further identify impacts and develop mitigation measures. It is assumed that the NBH project CTMP would be considered in the development of the CTMP for the Stage 2 works.

The general objectives for traffic management of construction activities are considered to be reasonable and adequate. These should be fully met by a CTMP to be prepared by the chosen contractor in conjunction with the proponent (RMS), Councils and other stakeholders.

The following specific construction-related comments are provided:

- For the Warringah Road Construction Compound Site, the left-in / left-out access off Warringah Road requires circuitous access routes from the east and to the west. These would need to travel via Frenchs Forest Road and Wakehurst Parkway (as shown in *Figures 7.5 and 7.6*) with 95% of exiting traffic from the subject compound needing to travel via Frenchs Forest Road (East).

Illegal turns / routes would be covered by construction vehicle routes and transport code of practice included as part of the CTMP document.

[Acceptable response by proponent.]

- The assumption that two-thirds of the 120 employees would be on-site each day as part of the Stage 2 works is considered to be too low. This would affect the traffic generation for the Stage 2 works. What is the two-thirds assumption based on and where would the other third of employees be?

The assessment assumed that all staff will be on-site and that two-thirds of staff will drive to the site, as stated in the Traffic and Transport Technical Working Paper "There are anticipated to be 120 employees on-site at each day as part of the Stage 2 works. Assuming that two thirds of staff access the compound by private vehicle (as driver) there would be a total of 160 vehicle movements (80 in / 80 out) generated."

The existing journey to work mode share data (2011 ABS Data, sourced from the BTS website) for the surrounding travel zones indicates that between 62 per cent and 85 per cent of workers drive. The Journey to Work data indicates a mode share of 62 per cent to car for the site of the new hospital. It is assumed that the remaining third of staff would car pool, catch public transport or walk/cycle to work. The assumption of a two-thirds mode share to car (as driver) is generally consistent with the journey to work data.

[Acceptable response by proponent.]

- In Table 7.5 (page 104 of the TTI), the adoption proportion of 25% for traffic per assessment period is debatable and seems incorrect. It is considered that there should be more light vehicles (LVs) during the background peak periods. What is this assumption based on?

The adopted traffic distribution across the day takes into account workers arriving and departing during the peak periods, as well as those arriving throughout the day and during the evening. It is noted that the adopted splits still concentrate vehicles accessing the site during the road network peak periods. The traffic profile for vehicles accessing the site is generally consistent with the traffic profile for vehicles on the surrounding arterial road network.

[Acceptable response by proponent.]

- In Table 7.6 (page 104 of the TTI), the construction distribution seems inaccurate. 80% of heavy vehicles (HVs) to the north-west seems high and the corresponding 0% to the south and east seems incorrect. Similarly for LVs, there is 80% to the west, which seems high. This distribution has been assumed for both the Stage 2 works as well as the NBH project construction. What is this distribution assumption based on?

The adopted distribution of the heavy and light vehicles during the construction period was based on the following considerations:

- *distribution of existing workers in the area;*
- *likely distribution of construction workers in the area;*
- *anticipated distribution of plant and material;*
- *heavy vehicle routes (and avoiding sensitive land uses for heavy vehicles);*
- *configuration of the arterial road network in the immediate vicinity of the site;*
- *existing operation of intersections providing access between the local and arterial road network;*
- *likely distribution of employee's residences in relation to the site; and*
- *configuration of access points to the site.*

Based on the above factors, it was concluded that there would likely be a bias in construction traffic accessing the site to / from the west (ie. where workers and materials are likely to be sourced from), hence the basis for the adopted rates.

Construction traffic will however only be able to travel along identified key routes and an

important element of the assessment is the estimation of the total number of heavy vehicle movements generated as a result of the Project and the ability of these routes to cater for these. The assessment clearly indicated that regardless of the general distribution of construction traffic, the road network is capable of managing this traffic, being a small proportion of the overall traffic volumes already using these roads.

[Acceptable response by proponent.]

- In the discussion on lane width reduction (Section 7.7.2 of the TTI), it is noted that the existing 3.1 m lane widths along some sections of Warringah Road are considered to be sub-standard for HVs and buses. Therefore, from a road safety viewpoint (apart from any operational capacity factors), there should not be any further lane width reductions.

Any road safety matters would be covered by road safety audits included as part of the CTMP document.

[Acceptable response by proponent.]

- In the discussion on speed limit reductions (Section 7.7.4 of the TTI), there may still be speed limit reductions required during non-peak periods based on road safety considerations, eg. travel lanes close to work areas.

Any road safety matters would be covered by road safety audits included as part of the CTMP document.

[Acceptable response by proponent.]

- In Table 7.11 and Figure 7.11 (page 115 of the TTI), any road or lane closures during the day around schools (eg. Frenchs Forest Road) may need to be lifted prior to afternoon school pick-up. Consideration should be given to amending the 3:00 pm to 2:30 pm, which would also coincide with start of the school speed zone.

The nominated road closure periods are indicative and subject to confirmation at the time of lodgement of the Road Occupancy Licence (ROL) by Roads and Maritimes' contractor to the TfNSW Transport Management Centre (TMC). In instances where a school zone exists, ROL times will be adjusted to align with school zone periods, when in operation.

[Acceptable response by proponent.]

- There is minimal discussion on the potential for rat-runs / alternative routes that vehicles may use to bypass congestion caused during the construction period, eg. when capacity is constrained by road / lane closures.

As detailed in Section 7.8 of the Traffic and Transport Technical Working Paper it is not proposed to close roads (including partial closures) during peak and inter-peak periods, including weekends.

TfNSW's TMC requires network capacity to be maintained at all key times so that there is no detrimental impact on network performance during construction. As a result there will be limited opportunities for Roads and Maritime's contractor to close or partially close lanes with there being no lane or road shoulder closures permitted during peak periods when traffic volumes are at their greatest. Based on this approach the existing traffic capacity in and through the project area will be maintained during peak periods (ie. the critical assessment scenario).

The assessment that was carried out was based on the principle that lane closures on Warringah Road will only be permitted between 10 pm and 5 am and between 8 pm and 5 am on other roads.

Road shoulder closures will only be permitted during lane closures times and between 10 am and 3 pm. The closures during the inter-peak period will not adversely impact on the operation of the road network (ie. capacity > volumes). Although the inter peak road shoulder closures will result in a reduced free flow speed for vehicles it will not adversely impact on the operation of the road network (ie. capacity > volumes).

The final approval in relation to lane and shoulder closures is also subject to the issuing of the ROL by the TfNSW TMC following application by Roads and Maritime's contractor.

Based on this and the assessment carried out, it is considered that the existing 'rat running' from through traffic in the local road network will therefore be unchanged during construction periods.

[Acceptable response by proponent.]

- Public transport impacts during the construction period have been noted in Section 7.9.1 of the TTI, however no measures have been identified to mitigate these impacts, eg. there are no mitigation measures for bus operations, with respect to loss of bus priority (including bus lanes, bus queue jumps and dedicated bus only sections of the road network), relocation of bus stops, etc. It is assumed that these would be included as part of the CTMP.

The existing bus priority measures are detailed in Section 4.9.2 of the Traffic and Transport Technical Working Paper and include the provision of the following bus jump lanes:

- Warringah Road westbound at Wakehurst Parkway;
- From Frenchs Forest Road westbound to Warringah Road westbound via Wakehurst Parkway; and
- Forest Way southbound to Warringah Road westbound.

Where possible the above bus priority measures would be maintained throughout the construction period, however, there may be short periods where these measures cannot be maintained. Some bus stops may also need to be relocated temporarily during construction. The communication of this will be managed as part of a comprehensive community consultation process and with close engagement with TfNSW and bus operators.

The details of changes to bus stops and public transport operation within the precinct during construction would be detailed in the Construction Traffic Management Plan, which would be approved by DP&E.

[Acceptable response by proponent.]

- Monitoring of operations during construction period should be considered to determine if targets and commitments with respect to road network capacities / travel speeds / congestion, etc., are being met during the construction period.

An estimate of the potential diversion to Warringah Road due to the construction of the Mona Vale Road upgrade was not known at the time of the Stage 1 report.

[It is acknowledged that this level of detail would need to be determined and detailed during preparation of the Project CTMP.]

The Transport for NSW, Transport Management Centre will outline network management conditions for the Road Occupancy Licence during construction. Conditions would include aspects such as requirements in terms of lane / shoulder closures and day of week / time of day restrictions to maintain appropriate capacity at peak / inter peak / non-peak periods.

[Acceptable response by proponent.]

4. Findings, Recommendations & Conclusion

4.1 Findings

The following findings are provided in the independent review of the proposed Project's traffic and transport assessment:

- In general, it is considered that the methodology and analysis of traffic and transport impacts has been undertaken quite rigorously and in adequate detail. Moreover, it is considered that the SEARs have generally been addressed adequately.
- The main matters of note include the following:
 - The extent of 'rat running' would be reduced significantly by the Project due to its ability to provide a clear benefit in managing congestion with its lower proportion of unreleased demand.
 - Some proposed road widths are less than 3.5 m (general urban standard), which has the potential to adversely affect road safety and traffic operations. However, it is noted that travel lanes that are less than the minimum recommended width typically reflect locations of existing roads (and existing lane widths) that are not proposed to be upgraded as part of the proposed works. Increases in the width of these existing roads would have an impact on the overall project footprint and cost, both of which have needed to be minimised where possible as the project has developed.
 - While the timing and operations of bus service improvements have been generally addressed in consultation with Sydney Buses / TfNSW, there may be a need to condition this commitment to the satisfaction of Sydney Buses / TfNSW.
 - Bus travel times along the corridor have been predicted to operate below the target average operating speed sought by TfNSW. There is a need to determine that TfNSW deems the target speeds suitable – this aspect of operations could be covered as part of the post-completion monitoring, if deemed necessary by TfNSW.
 - The provision of an additional grade-separated crossing for pedestrians, the improved signalised crossing level of service due to the grade-separated 'slot' bypass along Warringah Road as well as integration of cyclist infrastructure with future plans throughout the area (especially Council's *Warringah Bike Plan*) are considered to be important aspects for pedestrian and cycleway connectivity within the area and to surrounding areas.
 - The general objectives for traffic management of construction activities are considered to be reasonable and adequate and should be fully met by a CTMP to be prepared by the chosen contractor in conjunction with the proponent (RMS), Councils and other stakeholders.
 - A key consideration proposed during the construction period is the requirement to maintain peak period traffic capacity throughout the study area network and even though capacity may be reduced during the off-peak periods, the network performance would be no worse than during peak periods. This is considered

to be an important principle and is suggested to be conditioned and monitored as part of CTMP.

- Any road safety matters related to lane width and speed limit reductions during the construction period would be covered by road safety audits included as part of the CTMP document.
- Cumulative construction impacts have been acknowledged as construction for the Northern Beaches Hospital and for Mona Vale Road Upgrade project. While some potential mitigation measures have been detailed, the assessment relies on a Project Construction Traffic Management Plan (CTMP) to further identify impacts and develop mitigation measures.

4.2 Recommendations

Based on the areas of concern described above, a number of Conditions of Consent and/or commitments would be required by the proponent to appropriately determine final impacts and provide suitable mitigation measures.

The following Draft Conditions of Consent or commitments from the proponent are recommended:

1. Prior to Project construction, the preparation of a Construction Traffic Management Plan (CTMP) would need to be undertaken by the chosen contractor in consultation with, and to the satisfaction of relevant local councils and RMS. As well as typical matters such as construction access, haul routes, traffic impacts, pedestrian / cyclist impacts and road safety, the CTMP should specifically address impacts on affected schools, on-street parking impacts and cumulative impacts with other nearby projects. The CTMP should also include monitoring of operations to determine if targets and commitments with respect to road network capacities / travel speeds / congestion, etc., are being met during the construction period.
The CTMP would need to be either a Condition of Consent or included within the Statement of Commitments.
2. Post Project implementation, undertake a detailed traffic and transport operations review within six (6) months of the Stage 2 project completion. This review should include the entire Concept Proposal project area, ie. Stage 1 and Stage 2. The review should identify all traffic and transport-related impacts including, but not limited to, the following:
 - Major road network traffic / intersection performance.
 - Local road network performance – this should include regular weekly monitoring of local streets that are likely to exhibit increases in traffic and ‘rat-running’ and consultation with Council in regard to temporary measures that could be implemented to manage safety and related matters. Potential strategies and activation points should be identified to construct or manage traffic by RMS in conjunction with Council.
 - Any parking impacts and specifically in relation to on-street parking on the southern side of Warringah Road in the vicinity of the proposed new shared pedestrian / bicycle overbridge.
 - Pedestrian and cycle facilities including connectivity at the project area fringes with other proposed non-project facilities, eg. Warringah Bicycle

Plan proposals.

- Bus operations including average travel speeds for bus services through the project area.

The review should develop measures to mitigate any impacts identified. This should include an assessment of any measures proposed and whether there are 'downstream' impacts and/or cumulative impacts of these measures. In addition, responsibilities for the post-operations review should be detailed including (as a minimum) who would be responsible for the review assessment (eg. Warringah Council for on-street parking impacts and Bicycle Plan implementation, Sydney Buses / TfNSW for bus operation impacts), who would be responsible for implementation of any actions arising from the review, what timeframe would be agreed to and how any works would be funded.

3. Independent road safety audits are to be undertaken for all stages of further design development and at pre-opening stage. Any issues identified by the audits will need to be closed out to the satisfaction of the relevant authorities including RMS and/or Councils.

4.3 Conclusion

It is considered that the traffic and transport impact assessment has been undertaken adequately and suitably addresses the Project SEARs. While a number of matters / areas of concern were identified, it is considered that by implementing the actions detailed in the above recommendations, the Project impacts would be satisfactorily mitigated.