



Roads &
Maritime

Parramatta Road and Great North Road intersection improvement Submissions Report

March 2017

BLANK PAGE

Roads and Maritime Services

Parramatta Road and Great North Road Intersection Improvement Submissions Report

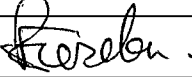
March 2017

Prepared by NGH Environmental and Roads and Maritime Services
RMS 17.276
ISBN: 978-1-925659-24-5

COPYRIGHT: The concepts and information contained in this document are the property of Roads and Maritime Services NSW (Roads and Maritime). Use or copying of this document in whole or in part without the written permission of Roads and Maritime constitutes an infringement of copyright.

Document controls

Approval and authorisation

Title	Parramatta Road and Great North Road Intersection Improvement Submissions Report
Accepted on behalf of Roads and Maritime NSW by	ROBIN FERDOUS
Signed	
Dated	10/04/17

Executive summary

The Parramatta Road corridor is a critical transport link between the Sydney and Parramatta Central Business Districts (CBD), the western suburbs and beyond to the Blue Mountains. Great North Road provides direct access to the suburbs of Five Dock, Wareemba and Abbotsford. Roads and Maritime Services NSW (Roads and Maritime) identified Parramatta Road as a Pinch Point Corridor, with improvements to key intersections anticipated to provide better travel time for the entire corridor.

As part of the NSW Government's Pinch Point Program which targets peak hour traffic hotspots and investigates ways to relieve traffic congestion, Roads and Maritime proposes to upgrade the intersection of Parramatta Road and Great North Road, Five Dock. The proposed works would provide improved capacity along Parramatta Road at the right turn into Great North Road, assist in relieving existing traffic congestion, and improve safety for road users.

Construction is expected to commence in first half of 2018 and be completed during January 2019 subject to approval and weather permitting. Most of the works would be completed as night works to minimise traffic delays locally and to the wider road network.

Roads and Maritime prepared a review of environmental factors to assess the environmental impacts of the proposed works. The review of environmental factors was publically displayed for 14 days between 6 December 2016 and 19 December 2016 at two locations. The review of environmental factors was placed on the Roads and Maritime project website and made available for download. The display locations and website link were advertised in the Inner West Courier.

In addition to the public display, a community newsletter and invitation to comment on the review of environmental factors was sent directly to 800 local residents, businesses and key stakeholders. A community information session was also held on Tuesday 13 December 2016 to give the community an opportunity to speak with the project team and ask questions.

The community and stakeholders were encouraged to provide their feedback, leave comments and make submissions via mail, email or phone contact with the project team.

One submission was received in response to the display of the review of environmental factors. The submission was from an individual in the community. The submission received supports the proposal but suggests the need for further improvements to the road signage, design and line markings.

No form letters were submitted.

An additional study was completed to assess parking impacts from the proposal. The parking study assessed the impact to parking from removal of four car parking spaces (over 40 metres including driveways) on Great North Road and one car parking space on Dolbroyd Parade to be changed to "No Stopping".

The parking study concluded that the proposal would result in the loss of four unrestricted spaces in front of residential properties on the western side of Great North Road. Equivalent parking with adequate capacity was identified within close walking distance. Additionally, the report noted one additional impact not identified within the REF. This was the loss of one unrestricted car parking space on the western side of Dolbroyd Parade. The removal of this parking space would improve safety for vehicles accessing Parramatta Road. Equivalent available parking provision was identified on Dolbroyd Avenue and Henley Marine Drive.

No additional management and mitigation measures are required as a result of the submission received or the additional study.

Contents

Executive summary	5
Contents	6
1 Introduction and background	7
1.1 The proposal.....	7
1.2 REF display	10
1.3 Purpose of the report.....	11
2 Response to issues	12
2.1 Overview of issues raised.....	12
2.2 Traffic impacts	12
3 Additional assessment	13
3.1 Parking Studies at Parramatta Road/Great North Road Intersection	13
4 Environmental management	16
4.1 Environmental management plans (or system)	16
4.2 Summary of safeguards and management measures.....	16
4.3 Licensing and approvals.....	32
5 References.....	33

Appendices

Appendix A – Parking Assessment (TDG)

1 Introduction and background

1.1 The proposal

The Parramatta Road corridor is a critical transport link between the Sydney and Parramatta Central Business Districts (CBD), the western suburbs and beyond to the Blue Mountains. Great North Road provides direct access to the suburbs of Five Dock, Wareemba and Abbotsford. Roads and Maritime Services NSW (Roads and Maritime) identified Parramatta Road as a Pinch Point Corridor, with improvements to key intersections anticipated to provide better travel time for the entire corridor.

As part of the NSW Government's Pinch Point Program which targets peak hour traffic hotspots and investigates ways to relieve traffic congestion, Roads and Maritime proposes to upgrade the intersection of Parramatta Road and Great North Road, Five Dock. Key features of the proposal would include:

- Duplicating an existing right turn bay westbound from Parramatta Road to Great North Road
- Widening of the bridge over Iron Cove Creek (also known as Dobroyd Canal)
- Widening of the north side of Parramatta Road between Great North Road and around 70 metres east of Dobroyd Parade.

The proposed works would provide improved capacity along Parramatta Road at the right turn into Great North Road, assist in relieving existing traffic congestion, and improve safety for road users.

The local context of the proposal is presented in Figure 1-1 and the key features of the proposal are presented in Figure 1-2.

Construction is expected to commence in first half of 2018 and be completed during January 2019 subject to approval and weather permitting. The majority of works would be completed as night works to minimise traffic delays locally and to the wider road network.

A more detailed description of the proposal is found in the review of environmental factors prepared by SNC-Lavalin on behalf of Ventia Boral Amey Joint Venture and Roads and Maritime in November 2016.

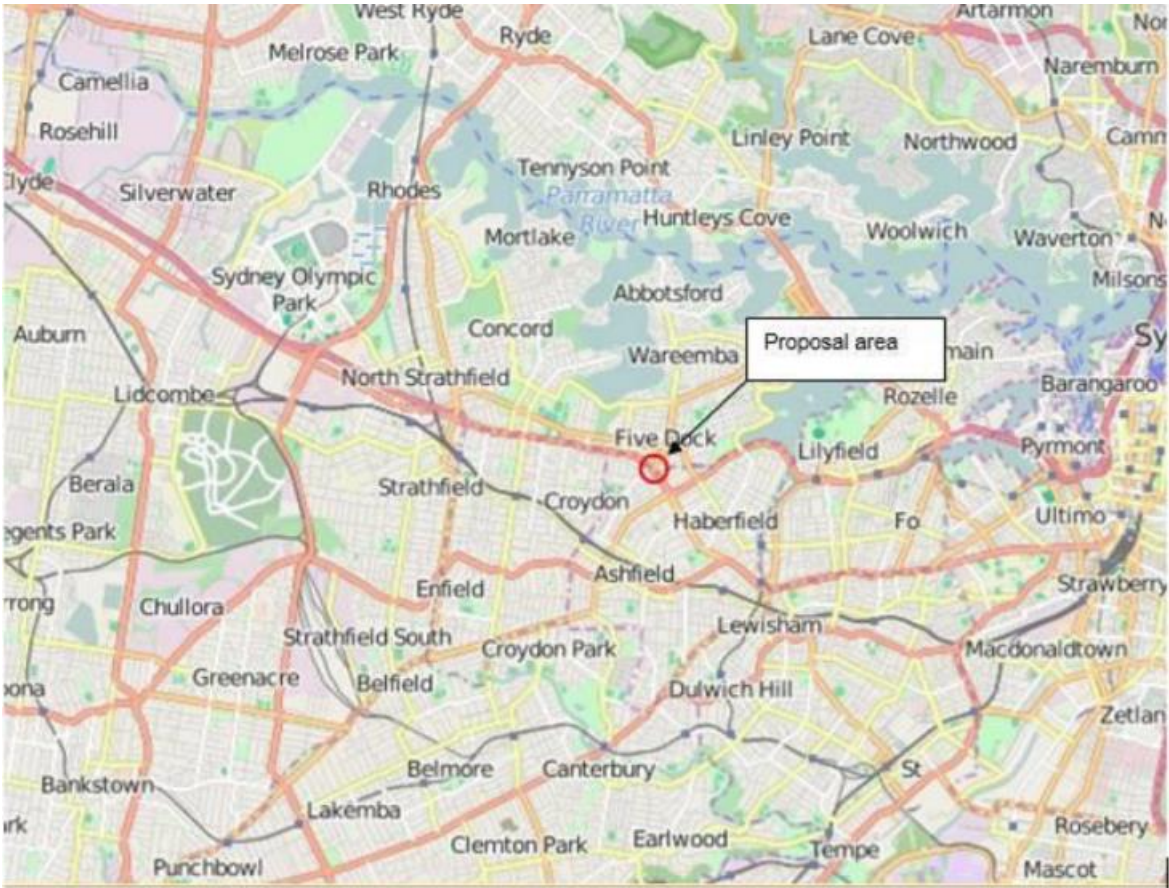


Figure 1-1 Locality map of the proposal



Figure 1-2 Design of the proposed Parramatta Road & Great North Road intersection upgrade

1.2 REF display

Roads and Maritime prepared a review of environmental factors to assess the environmental impacts of the proposed works. The review of environmental factors was publically displayed for 14 days between 6 December 2016 and 19 December 2016 at two locations, as detailed in Table 1-1. The review of environmental factors was placed on the Roads and Maritime project website and made available for download. The display locations and website link were advertised in the Inner West Courier.

Table 1-1: Display locations

Location	Address
Concord Library	60 Flavelle St, Concord NSW 2137
Five Dock Library	Level 1, 4-12 Garfield St, Five Dock 2046

In addition to the above public display, a community newsletter and invitation to comment on the review of environmental factors was sent directly to 800 local residents, businesses and key stakeholders as presented in Figure 1-3.

A community information session was also held on Tuesday 13 December 2016 to give the community an opportunity to speak with the project team and ask questions. No one attended the session.

The community and stakeholders were encouraged to provide their feedback, leave comments and make submissions via mail, email or phone contact with the project team.



Figure 1-3 Distribution of community newsletter

1.3 Purpose of the report

This submissions report relates to the review of environmental factors (REF) prepared for the Parramatta Road and Great North Road Intersection Improvement, and should be read in conjunction with that document.

The REF was placed on public display and submissions relating to the proposal and the REF were received by Roads and Maritime. This submissions report summarises the issues raised and provides responses to each issue (Chapter 2). It details investigations carried out since finalisation of the review of environmental factors (Chapter 3), and identifies new or revised environmental management measures (Chapter 4).

No project changes are proposed that would require the preparation of a preferred infrastructure report. No revisions have been made to the assessment or environmental management measures as described in the environmental impact statement.

2 Response to issues

2.1 Overview of issues raised

One submission was received in response to the display of the review of environmental factors in the form of a phone call. The submission was from an individual in the community and was received during the display period. No late submissions were received in January 2017.

The submission has been examined to understand the issues being raised. The issues raised and Roads and Maritime response to these issues forms the basis of this chapter.

The submission received supports the proposal but suggests the need for further improvements to the road signage, design and line markings.

The submission received raised two matters:

- There is not enough green time for traffic turning right from Great North Road onto Parramatta Road. This causes motorists to use the left lane to turn right and creates traffic for motorists turning left onto Parramatta Road. This causes traffic to bank up all the way back to Queens Road.
- Can more signage and line marking be installed, to clearly delineate left turn and right turn for motorists on Great North Road?

No other form of correspondence was received.

2.2 Traffic impacts

Issue Description

- There is not enough green time for traffic turning right from Great North Road onto Parramatta Road. This causes motorists to use the left lane to turn right and creates traffic for motorists turning left onto Parramatta Road. This causes traffic to bank up all the way back to Queens Road.
- Can more signage and line marking be installed, to clearly delineate left turn and right turn for motorists on Great North Road?

Response

The traffic lights on the Parramatta Road are linked to Sydney Coordinated Adaptive Traffic System (SCATS). SCATS synchronises nearby traffic signals to optimise traffic flow across the road network. It evaluates all traffic approaches on a cycle by cycle basis, and automatically distributes the green light phases in an equitable arrangement.

Given, Parramatta Road is a heavily used state road SCATS will allow more green time to traffic travelling along Parramatta Road. The amount of green time given for traffic turning right from Great North Road onto Parramatta Road would not be altered as part of this project.

Signage and line marking would be in accordance with the requirements of Australian Standard AS 1742 Part 2: Traffic Control Devices for General Use. Markings and signage are designed to convey traffic movements as clearly and concisely as possible.

3 Additional assessment

3.1 Parking Study for Parramatta Road/Great North Road Intersection

3.1.1 Summary

A parking study was undertaken in late 2016 (Appendix A) to further assess the potential car parking impacts as a result of the proposal. The proposal as described in the REF would impact 40 metres of unrestricted car parking space located on the western side of Great North Road (just north of the existing bus zone) (refer to Figure 1-2). This length would be converted to no stopping zone to provide for additional lane capacity. .

The study area for the proposal included Parramatta Road, Great North Road, and short sections of adjacent local streets including Longview St, Harrabrook Avenue, Henley Marine Drive, and Dobroyd Parade. This is shown in Figure 1-2 and Figure 3-1.

The scope of the parking study included:

- Parking inventory of all spaces within the study area
- Parking occupancy and length of stay surveys and analysis of all spaces within the study area between 6:00 am and 6:00 pm on Thursday 8 December and on Saturday 10 December 2016. The surveys were completed outside the school holiday period to get the most accurate representation
- Assessment of proposed works on parking conditions and formulation of appropriate recommendations to remedy any impact.

A summary of parking inventory, impacts and proposed alternate parking solutions of the study area is shown below in Table 3-1.

Table 3-1 Summary of parking inventory, impacts and proposed alternate parking solutions

Road name	Existing parking provision (within the study area)	Impact of the proposal on parking	Proposed alternate parking solution
Parramatta Road	<ul style="list-style-type: none"> • None, Clearway and No Stopping zone. 	None	n/a
Great North Road (within the study area)	<ul style="list-style-type: none"> • 32 unrestricted spaces • Five no stopping 6 am to 10 am and 3 pm to 7pm Monday to Friday spaces 	Loss of four car spaces due to proposed new 'No Stopping Zone' north of the existing bus zone. Reduces from 32 to 28 unrestricted car spaces.	<p>Alternate unrestricted car parking is located in Great North Road, Harrabrook Avenue and Longview Street. The average unrestricted parking occupancy was observed on:</p> <ul style="list-style-type: none"> • Great North Road to range from 60 to 73 percent • Harrabrook Avenue to range from 47 to 67 percent • Longview Street to range from 60 to 73 percent <p>The parking occupancy indicates that there is capacity to accommodate the loss of four car spaces within the study area in Great North Road, Harrabrook Avenue and Longview Street.</p>
Harrabrook Avenue	<ul style="list-style-type: none"> • 37 unrestricted 	None	n/a

Road name	Existing parking provision (within the study area)	Impact of the proposal on parking	Proposed alternate parking solution
	spaces		
Longview Street	<ul style="list-style-type: none"> • 22 unrestricted spaces 	None	n/a
Henley Marine Drive	<ul style="list-style-type: none"> • 36 unrestricted spaces • Seven 2 hours limit - 8:30 am to 6 pm Monday to Friday and 8:30 am to 12:30 pm Saturday 	None	n/a
Dobroyd Parade	<ul style="list-style-type: none"> • 35 unrestricted spaces 	Loss of one unrestricted car space on the eastern side of Dobroyd Parade near Parramatta Road	The average unrestricted parking occupancy on Dobroyd Parade was observed to range from 95 to 97 per cent. Henley Marine Drive was observed to range from 86 to 64 percent. The parking occupancy indicates that there is capacity to accommodate the loss of one car space within the study area in Dobroyd Avenue or Henley Marine Drive.
Summary	<ul style="list-style-type: none"> • Total existing car parking spaces identified = 174 	Total spaces on completion = 169	

The parking study identified 148 unrestricted car parking spaces, seven 2P spaces and five no Stopping 6 am to 10 am and 3 pm to 7 pm Monday to Friday. Based on the surrounding land use, it is believed that these spaces would cater for a number of purposes including employees working in the area, residents and their visitors, and commuters catching the bus on Great North Road.

The study observed that all commercial developments within the study area provide off-street parking spaces which are restricted to staff and patrons. Most residences can accommodate more than one car on-site. There are no loading zones within the surveyed area.

An analysis of the parking occupancy survey indicates that the overall peak parking demand for the area occurred on Thursday between 12:00pm and 12.30pm when spaces were occupied (~76% occupancy). A higher overall peak parking demand occurred on Saturday when 52 spaces were occupied (~83% occupancy) between 12.30 pm and 1.00 pm.

In evaluating the impact of the four lost car parking spaces (over 40 metres including driveways) on the western side of Great North Road, the parking study concluded that of the equivalent 37 unrestricted spaces on nearby Harrabrook Road, the maximum occupancy during the survey period was 22 cars on weekday (Thursday) and 33 on the weekend (Sunday). This indicates at least four equivalent unrestricted spaces were available to offset the four lost spaces.

Additionally, the report noted one additional impact not identified within the REF. This was the loss of one unrestricted car parking space on the western side of Dobroyd Parade. The removal of this parking space would improve safety for vehicles accessing Parramatta Road. Consequently, this

single parking space will be converted to a 'no parking' zone. The parking occupancy indicates that there is capacity to accommodate the loss of one car space within the study area in Dobroyd Avenue or Henley Marine Drive.

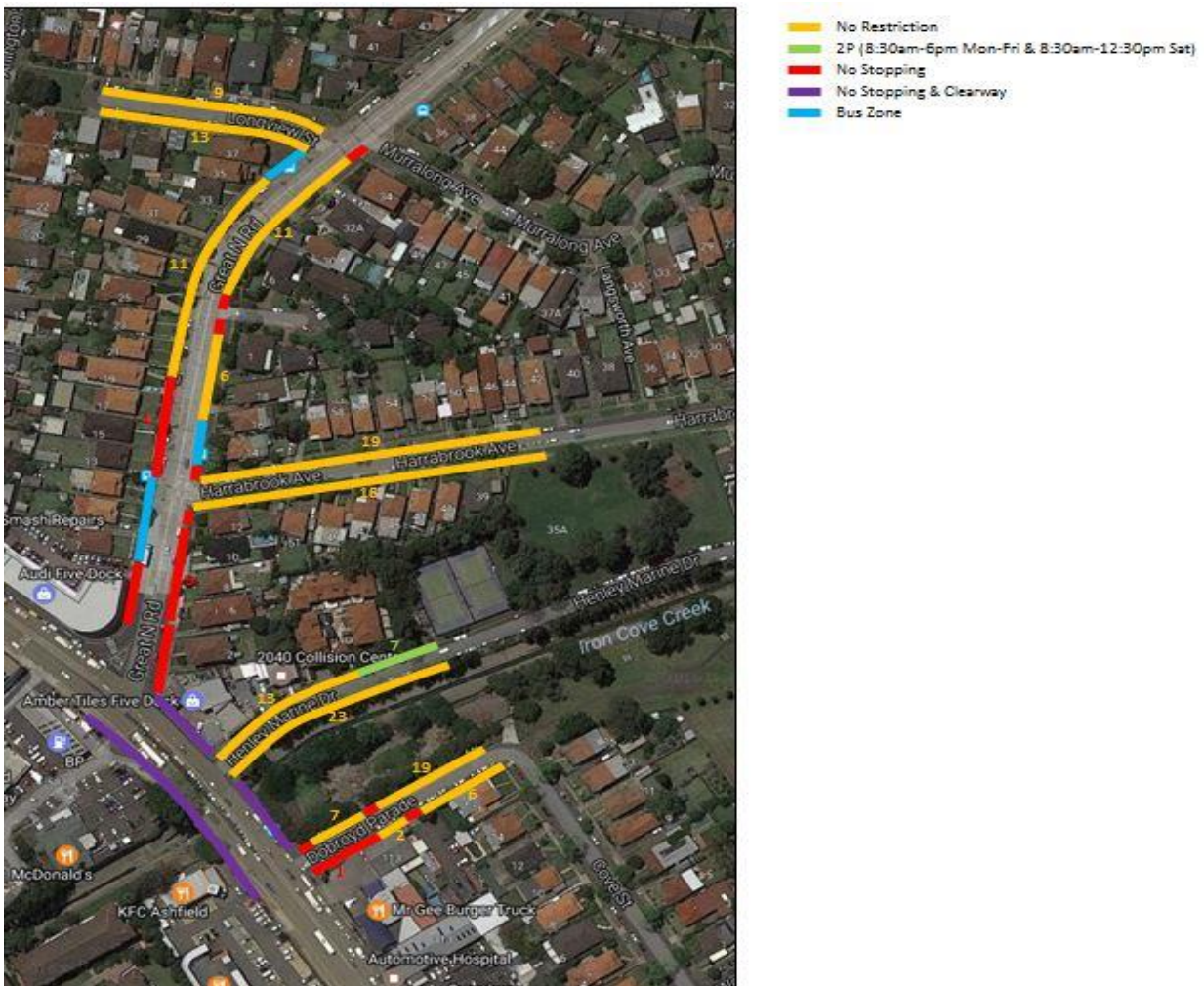


Figure 3-1 Parking inventory at completion of works

3.1.2 Additional management and mitigation measures

No additional management and mitigation measures are required for the proposal.

4 Environmental management

The REF for the Parramatta Road and Great North Road Intersection Improvement identified the framework for environmental management, including safeguards and management measures that would be adopted to avoid or reduce environmental impacts (Section 7 of the REF).

After consideration of the issues raised in the public submissions, no additional safeguard and management measures are required

Should the proposal proceed, environmental management will be guided by the framework and measures outlined below.

4.1 Environmental management plans (or system)

A number of safeguards and management measures have been identified in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the proposal. Should the proposal proceed, these management measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

A Construction Environmental Management Plan (CEMP) will be prepared to describe safeguards and management measures identified. The CEMP will provide a framework for establishing how these measures will be implemented and who would be responsible for their implementation.

The CEMP will be prepared prior to construction of the proposal and must be reviewed and certified by environment staff, Sydney Region, prior to the commencement of any on-site works. The CEMP will be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in the QA Specification G36 – Environmental Protection (Management System), QA Specification G38 – Soil and Water Management (Soil and Water Plan), QA Specification G40 – Clearing and Grubbing and QA Specification G10 - Traffic Management.

4.2 Summary of safeguards and management measures

The review of environmental factors for the Parramatta Road and Great North Road Intersection Improvement identified a range of environmental outcomes and management measures that would be required to avoid or reduce the environmental impacts.

After consideration of the issues raised in the public submission, no additional environmental management measures for the project (refer to Chapter 7 of the REF) are required. Should the project proceed, the environmental management measures in Table 4-1 will guide the subsequent phases of the Parramatta Road and Great North Road Intersection Improvement development.

Table 4-1: Summary of environmental safeguards and management measures

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
GEN1	General minimise environmental impacts during construction	<p>- A CEMP will be prepared and submitted to VBA JV environmental advisor for approval. As a minimum, the CEMP will address the following:</p> <ul style="list-style-type: none"> • Any requirements associated with statutory approvals • Details of how the project will implement the identified safeguards outlined in the REF • Issue-specific environmental management plans • Roles and responsibilities • Communication requirements • Induction and training requirements • Procedures for monitoring and evaluating environmental performance, and for corrective action • Reporting requirements and record-keeping • Procedures for emergency and incident management • Procedures for audit and review. <p>The endorsed CEMP will be implemented during the undertaking of the activity.</p>	Contractor	Pre-construction / detailed design	Core standard safeguard
GEN2	General notification	<p>- All businesses, residential properties and other key stakeholders (eg. child care facilities, schools, local councils) affected by the activity will be notified at least five days prior to commencement of the activity. The notification will include details of: the project; construction period and construction hours; contact information for project management staff; complaint and incident reporting; and how to obtain further information.</p>	Contractor	Pre-construction	Core standard safeguard
GEN3	General environmental awareness	<p>- All personnel working on site will receive training to ensure awareness of environment protection requirements to be implemented during the project. This will include up-front site induction and regular "toolbox" style briefings.</p>	Contractor	Pre-construction / construction	Core standard safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<p>Site-specific training will be provided to personnel engaged in activities or areas of higher risk. These include:</p> <ul style="list-style-type: none"> • Areas of non-Aboriginal heritage sensitivity • Threatened species habitat • Adjoining residential areas requiring particular noise and vibration management measures. 			
TT1	Traffic and transport	<p>Consultation will be undertaken with potentially affected residences prior to the commencement of and during works in accordance with the RTA's <i>Community Involvement and Communications Resource Manual</i>. Consultation will include but not limited to door knocks, newsletters or letter box drops providing information on the proposed works, working hours and a contact name and number for more information or to register complaints.</p>	Contractor	Pre-construction / construction	Core standard safeguard
TT2	Traffic and transport	<p>A Traffic Management Plan (TMP) will be prepared and implemented as part of the CEMP. The TMP will be prepared in accordance with the <i>Roads and Maritime Traffic Control at Work Sites Manual</i> and <i>QA Specification G10 Control of Traffic</i>. The TMP will include:</p> <ul style="list-style-type: none"> • Confirmation of haulage routes • Measures to maintain access to local roads and properties (as agreed with the property owner during the construction period) • Site specific traffic control measures (including signage) to manage and regulate traffic movement • Measures to maintain pedestrian and cyclist access • Requirements and methods to consult and inform the local community of impacts on the local road network • Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads. • A response plan for any construction traffic incident • Consideration of other developments that may be under construction to minimise traffic conflict and congestion that may occur due to the 	Contractor	Detailed design / Pre-construction	Core standard safeguard Section 4.8 of QA G36 Environment Protection

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<p>cumulative increase in construction vehicle traffic</p> <ul style="list-style-type: none"> Monitoring, review and amendment mechanisms. 			
TT3	Traffic transport and	Access for emergency vehicles will be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Contractor	Construction	Core standard safeguard
TT4	Traffic transport and	Access to properties will be maintained during construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the relevant local road authority.	Contractor	Construction	Additional standard safeguard
TT5	Traffic transport and	Pedestrian and cyclist access will be maintained throughout construction. Where that is not feasible or necessary, temporary alternative access arrangements will be provided following consultation with affected landowners and the local road authority.	Contractor	Construction	Additional standard safeguard
NV1	Noise vibration and	<p>A Noise and Vibration Management Plan (NVMP) will be prepared and implemented as part of the CEMP. The NVMP will generally follow the approach in the <i>Interim Construction Noise Guideline (ICNG)</i> and identify:</p> <ul style="list-style-type: none"> All potential significant noise and vibration generating activities associated with the activity A map indicating the locations of sensitive receivers including residential properties Feasible and reasonable mitigation measures to be implemented. A monitoring program to assess performance against relevant noise and vibration criteria Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures Contingency measures to be implemented in the event of non-compliance with noise and vibration criteria. 	Contractor	Detailed design / pre-construction	<p>Core standard safeguard</p> <p>Section 4.6 of QA G36 <i>Environment Protection</i></p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
NV2	Noise and vibration	<p>All sensitive receivers (eg. child care centres, local residents, schools,) likely to be affected will be notified at least five days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of:</p> <ul style="list-style-type: none"> • The project • The construction period and construction hours • Contact information for project management staff • Complaint and incident reporting • How to obtain further information. 	Contactors	Detailed design / pre-construction	Core standard safeguard
NV3	Noise and vibration	All personnel working on site are to receive a Project induction which will include requirements of the NVMP. Site-specific training will be given to personnel when working in the vicinity of sensitive receivers.	Contractor	Pre-construction / construction	Additional standard safeguard
NV4	Noise and vibration	<p>Considerations in equipment selection will include:</p> <ul style="list-style-type: none"> • Quieter and less noise emitting construction methods where feasible and reasonable • All plant and equipment to be appropriately maintained to ensure optimum running conditions 	Contractor	Pre-construction and Construction	Additional safeguard
NV5	Noise and vibration	<p>Considerations in the use and siting of plant will include:</p> <ul style="list-style-type: none"> • Simultaneous operation of noisy plant within discernible range of a sensitive receiver is to be limited/ avoided where possible. • The offset distance between noisy plant and adjacent sensitive receivers is to be maximised where practicable • Plant used intermittently to be throttled down or shut down when not in use where practicable • Noise-emitting plant to be directed away from sensitive receivers where possible. 	Contractor	Pre-construction and Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
NV6	Noise and vibration	<p>Worksites and activities will be planned to minimise noise, such as:</p> <ul style="list-style-type: none"> All reasonable and feasible noise control measures should be implemented prior to the commencement of construction works Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site Deliveries to occur during standard construction hours where feasible and reasonable. 	Contractor	Pre-construction and Construction	Additional safeguard
NV7	Noise and vibration	<p>Where reasonable and feasible, structures will be used to shield residential receivers from noise such as:</p> <ul style="list-style-type: none"> Site shed placement Temporary or mobile noise screens (where practicable) Enclosures to shield fixed noise sources such as pumps, compressors, fans etc (where practicable). 	Contractor	Pre-construction and Construction	Additional safeguard
NV8	Noise and vibration	Dilapidation surveys will be conducted where required prior to construction commencing. Survey requirements would be determined in the Noise and Vibration Management Plan.	Contractor	Pre-construction and Construction	Additional standard safeguard
NV9	Noise and vibration	<p>Site specific buffer distances shall be determined on site prior to the commencement of bored piling adjacent to the Dobroyd Canal.</p> <p>After site specific buffer distances are determined, continuous vibration monitoring of the canal structure would be conducted for the duration of the piling works.</p>	Contractor	Pre-construction and Construction	Additional safeguard
NV10	Noise and vibration	Non-tonal reversing beepers (or equivalent) should be fitted and used on all construction vehicles and mobile plant regularly used on site for periods of over two months.	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
NAH1	Non-Aboriginal heritage	<p>A Non-Aboriginal Heritage Management Plan (NAHMP) will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to avoid and mitigate impacts to Non-Aboriginal heritage:</p> <ul style="list-style-type: none"> • Identification of potential environmental risks/impacts due to the works/activities • Management measures to minimise the potential risk • Mitigation measures to avoid risk of harm and the interface with work activities on site • Implementation of mitigation measures to protect identified heritage items or areas • Identify in toolbox talks where management of non-aboriginal heritage is required such as identification of no go zones and responsibilities under the Heritage Act 1977 and any obtained permits or exemptions • A stop works procedure in the event of actual or suspected potential harm to a heritage feature/place. • Vibration management procedures would be developed and implemented where works resulting in vibration are undertaken within the vicinity of identified heritage items. 	Contactor	Detailed design / pre-construction	<p>Core standard safeguard</p> <p>Section 4.10 of QA G36 <i>Environment Protection</i></p>
NAH2	Non-Aboriginal heritage	<p>The RMS <i>Standard Management Procedure - Unexpected Heritage Items</i> will be followed in the event that any unexpected heritage items, archaeological remains or potential relics of Non-Aboriginal origin are encountered. Work will only re-commence once the requirements of that Procedure have been satisfied.</p>	Contactor	Detailed design / pre-construction	<p>Core standard safeguard</p> <p>Section 4.10 of QA G36 <i>Environment Protection</i></p>
NAH3	Non-Aboriginal heritage	<p>Specific measures relating to the Dobroyd Canal Stormwater Channel will include:</p>	Contractor	Pre-construction	Additional standard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<ul style="list-style-type: none"> Establish an exclusion zone to manage inadvertent impacts to this item during construction Consultation with Sydney Water's Heritage Advisor regarding requirements in relation to the item prior to works commencing and liaison would continue through the construction period. A vibration assessment for the canal would be conducted prior to works commencing to ensure that there is no inadvertent impact to canal fabric. 		and Construction	safeguard
NAH4	Non-Aboriginal heritage	<p>Specific measures relating to the 1930 road bridge over Iron Cove Creek will include:</p> <ul style="list-style-type: none"> Archival recording of the portion of the bridge to be removed according to <i>NSW Heritage Division standards (1998)</i>. 	Contractor	Pre-construction	Additional standard safeguard
SE1	Socio-economic	All property acquisition will be carried out in accordance with the <i>Land Acquisition Information Guide</i> (Roads and Maritime, 2012) and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i> .	Roads and Maritime project manager	Pre-construction and construction	Additional standard safeguard
UT1	Utilities	<p>Prior to the commencement of works:</p> <ul style="list-style-type: none"> The location of existing utilities and relocation details will be confirmed following consultation with the affected utility owners If the scope or location of proposed utility relocation works falls outside of the assessed proposal scope and footprint, further assessment will be undertaken. 	Contractor	Detailed design / pre-construction	Core standard safeguard
B1	Biodiversity	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal will be investigated during detailed design.	Contractor	Detailed design / pre-construction	Additional safeguard
B2	Biodiversity	No stockpiling materials and equipment and parking vehicles and machinery	Contractor	Detailed	Additional

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		within the dripline of any tree.		design / pre-construction	safeguard
B3	Biodiversity	<p>Prior to the start of any clearing a physical clearing boundary is to be demarcated and implemented:</p> <ul style="list-style-type: none"> • Identification (marking) of the clearing boundary and trees that needs to be removed eg. – use of flagging tape. • Where trees are to be retained, place an exclusion zone fencing outside the tree protection zone • Erect signs to inform personnel of the purpose of the fencing. Signs should be clearly visible and be general in nature, such as 'Exclusion zone' or 'Environmental Protection zone'. 	Contractor	Detailed design / pre-construction	Additional Safeguard
B4	Biodiversity	Declared noxious weeds (ie. <i>Asparagus aethiopicus</i>) will be managed according to the requirements stipulated by the Noxious Weeds Act 1993, and any weed removal activities will follow Guide 6 (Weed Management) in the Biodiversity Guidelines (RTA 2011).	Project Manager and Contractor	Construction	Additional standard safeguard
B5	Biodiversity	A landscape plan must be prepared, approved by council and implemented.	Contractor	During Construction	Additional standard safeguard
C1	Contaminated land	<p>A Contaminated Land Management Plan (CLMP) will be prepared and implemented as part of the CEMP for any areas of existing contaminated land or to address land contamination likely to be caused by the activity. The CLMP will be in accordance with the <i>Guideline for the Management of Contamination</i> and, as a minimum address the following matters:</p> <ul style="list-style-type: none"> • control measures to divert surface runoff away from the contaminated land • capture and management of any surface runoff contaminated by exposure to the contaminated land 	Contractor	Detailed design / Pre-construction	<p>Core standard safeguard</p> <p>Section 4.2 of QA G36 <i>Environment Protection</i></p>

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<ul style="list-style-type: none"> • further investigations required to determine the extent, concentration and type of contamination, as identified in the detailed site investigation (Phase 2) • management of the remediation and subsequent validation of the contaminated land, including any certification required • measures to ensure the safety of site personnel and local communities during construction. • measures if ASS is discovered on site 			
C2	Contaminated land	If contaminated areas are encountered during construction, appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with the Roads and Maritime Environment Manager and/or EPA.	Contractor	Detailed design / Pre-construction / construction	Core standard safeguard Section 4.2 of QA G36 <i>Environment Protection</i>
C3	Contaminated land	A site specific emergency spill plan will be developed, and include spill management measures in accordance with the Roads and Maritime <i>Code of Practice for Water Management</i> (RTA, 1999) and relevant EPA guidelines. The plan will address measures to be implemented in the event of a spill, including initial response and containment, notification of emergency services and relevant authorities (including Roads and Maritime and EPA officers).	Contractor	Detailed design / Pre-construction	Core standard safeguard Section 4.3 of QA G36 <i>Environment Protection</i>
C4	Contaminated land	Hazardous material inspection including a Part 6 Report to include asbestos is to be undertaken prior to demolition works commencing. Management measures would be developed, if necessary, commensurate to potential risk.	Contractor	Detailed design / Pre-construction	Additional standard safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		Should any potentially hazardous materials or similar be encountered during demolition then works should stop and the material in question be examined by an appropriate specialist who would identify the material and provide management measures if required.			
HAZ1	Hazards	Appropriate storage (eg. bunds, spill pallets, as appropriate) of fuels, oils, greases and any other hazardous materials associated with construction activities, including maintaining a spill kit within the construction compound to allow site personnel to respond to spills events.	Contractor	Construction	Core standard safeguard
F1	Flooding	A site specific Flood Evacuation Plan would be prepared and implemented as required as part of the CEMP. It would include the following measures: <ul style="list-style-type: none"> • Weather and flood monitoring • List equipment to be removed from the site • Responsibility and method for monitoring flood threat (e.g. flood warning information sourced from the BoM website) Detail staff training requirements and roles and responsibilities for the implementation of the Plan.	Contractor	Construction	Additional safeguard
SW1	Soil and water	A Soil and Water Management Plan (SWMP) will be prepared and implemented as part of the CEMP.	Contractor	Construction	Core standard safeguard Section 2.1 of QA G38 Soil and Water Management
SW2	Soil and water	A site specific Erosion and Sediment Control Plan(s) will be prepared and	Contractor	Construction	Core

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<p>implemented and included in the SWMP. The Plan(s) will identify detailed measures and controls to be applied to appropriate to the level of risk of erosion and sedimentation and as a minimum address the following matters:</p> <ul style="list-style-type: none"> • Direction of water flow, both off and on site • Diversion of off-site water around or through the site or details of separation of on-site and off-site water • Stabilising disturbed areas as soon as possible • The locations of other erosion and sediment control measures Staged implementation arrangements • Arrangements for managing wet weather events, including monitoring of potential high risk events (such as storms) • Specific controls and follow-up measures to be applied in the event of wet weather. • Scour protection and energy dissipaters at locations of high erosion risk • Installation of measures at work entry and exit points to minimise movement of material onto adjoining roads, such as rumble grids or wheel wash bays • Appropriate location and storage of construction materials, fuels and chemicals, including bunding where appropriate. 		n	<p>standard safeguard</p> <p>QA G38 Soil and Water Management</p>
SW3	Soil and water	A Spill Management Plan will be prepared and implemented as part of the CEMP to minimise the risk of pollution arising from spillage or contamination on the site and adjoining areas.	Contractor	Pre-Construction and Construction	Additional Standard safeguard
SW4	Soil and water	<p>The following requirements will be included in the SWMP:</p> <ul style="list-style-type: none"> • A containment system must capture all waste water/slurry • Concrete washout shall be carried out offsite or in concrete washout areas described in the SWMP • Procedures for testing, treatment and discharge of construction waste 	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<p>water must be as described in the SWMP</p> <ul style="list-style-type: none"> Liquid chemical stored on site to be within bunded containers Any liquid wastes to be disposed of to a licensed facility. 			
SW4	Soil and water	<p>Should excavation of the disturbed terrain area adjacent to Dobroyd Canal be required, soil testing would be completed to assess acid sulfate potential. If the presence of Acid Sulfate Materials is confirmed, an Acid Sulfate Materials Management Plan will be prepared in accordance with the RTA Guidelines for the Management of Acid Sulfate Materials and implemented as part of the CEMP. The plan will detail the management, handling, treatment and disposal of ASS and will be prepared in compliance with the relevant guidelines.</p>	Contractor	Pre-construction / Construction	Additional Standard safeguard
AH1	Aboriginal heritage	<p>The <i>Standard Management Procedure - Unexpected Heritage Items</i> (Roads and Maritime, 2015) will be followed in the event that an unknown or potential Aboriginal object/s, including skeletal remains, is found during construction. This applies where Roads and Maritime does not have approval to disturb the object/s or where a specific safeguard for managing the disturbance (apart from the Procedure) is not in place.</p> <p>Work will only re-commence once the requirements of that Procedure have been satisfied.</p>	Contacto	Detailed design / pre-construction	<p>Core standard safeguard</p> <p>Section 4.9 of QA G36 <i>Environment Protection</i></p>
UD1	Landscape, visual, urban design	<ul style="list-style-type: none"> Ensure all lights are directed away from residential properties. 	Contractor	Construction	Core standard safeguard
UD2	Landscape, visual, urban design	<p>The CEMP shall include measures and procedures to minimise visual impacts, including:</p> <ul style="list-style-type: none"> The worksite is to be kept clean and tidy at all times Appropriate storage of equipment, stockpile screening and arrangements 	Contractor	Pre-construction / construction	Additional standard safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<p>for the storage and removal of rubbish and waste materials</p> <ul style="list-style-type: none"> • On completion of work, all vehicles, materials and refuse relating to the works would be removed • Construction lighting to be directed away from sensitive receivers • Vegetation not to be disturbed will be demarcated. 			
WST1	Waste	<p>A Waste Management Plan will be prepared and implemented as part of the CEMP. It will provide specific guidance on measures and controls to be implemented to support minimising the amount of waste produced and appropriately handle and dispose of unavoidable waste.</p> <p>The Plan will give effect to any management measures contained in any waste assessment undertaken for the project and include, but not necessarily be limited to:</p> <ul style="list-style-type: none"> • measures to avoid and minimise waste associated with the project • classification of wastes and management options (re-use, recycle, stockpile, disposal) • statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemptions • procedures for storage, transport and disposal • monitoring, record keeping and reporting. <p>The WMP will be prepared taking into account the <i>Environmental Procedure - Management of Wastes on Roads and Maritime Services Land</i> and relevant Roads and Maritime Waste Fact Sheets.</p>	Contractor	Detailed design / pre-construction	<p>Core standard safeguard</p> <p>Section 4.2 of QA G36 <i>Environment Protection</i></p>
WST2	Waste	<p>Hierarchy of waste management would be implemented via:</p> <ul style="list-style-type: none"> • Separation of general wastes, recyclable/reusable materials, and hazardous wastes to avoid mixing with other materials/wastes. • Regular housekeeping and servicing of waste storages. • General waste and recycling receptacles will be provided onsite. 	Contractor	Construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<ul style="list-style-type: none"> Waste would be transported to an appropriately licensed waste disposal and/or recycling facility. Wastes (including green waste) would not be burnt. Potential for mulching and reuse of cleared vegetation would be balanced against presence of noxious weeds and compliance with necessary weed control measures. 			
WST3	Waste	<p>With regard to the stockpiled general solid waste material:</p> <ul style="list-style-type: none"> Where practicable, recyclable fractions of the construction and demolition waste (e.g. concrete and asphalt) would be separated for off-site disposal to an appropriately licensed recycling facility The soil fraction would be neutralised via thorough mixing with approximately two tonnes of agricultural lime The final soil pH would be validated, with a target soil pH of between 6.5 and 9 Once the soil pH has been validated, the soil fraction of the construction and demolition waste can be disposed to an appropriately licensed landfill facility as General Solid Waste. 	Contractor	Construction	Additional safeguard
WST4	Waste	A far as practicable, construction materials would be sourced within the Sydney region so as to reduce transport costs, including fuel usage.	Contractor	Pre-construction / construction	Additional safeguard
AIR1	Air	<p>The CEMP shall address potential for air pollution, including:</p> <ul style="list-style-type: none"> Identification of potential sources of air pollution (such as dust, vehicles transporting waste, plant and equipment) during construction Care during loading and unloading of materials to avoid spills and wind-blown dust Turn machinery off rather than left to idle when they are not in use Maintain vehicles to manufacturer's standards 	Project Manager and Contractor	Pre-construction	Additional safeguard

No.	Impact	Environmental safeguards	Responsibility	Timing	Standard / additional safeguard
		<ul style="list-style-type: none"> • Methods to manage works during strong winds or other adverse weather conditions • Employ measures such as watering or covering exposed areas to minimise or prevent air pollution and dust • Vehicles transporting waste or other materials are to be covered during transportation. 			
C1	Cumulative Impacts	The traffic management plan including Road Occupancy Licenses would be prepared in consultation with the Transport Management Centre taking into consideration the traffic cumulative impact of projects on the Sydney road network.	Project Manager and Contractor	Construction & pre-construction	Additional safeguard
C2	Cumulative Impacts	Undertake regular meetings with WestConnex to discuss co-ordination of the construction works and provision of respite for night works.	Project Manager and Contractor	Construction & pre-construction	Additional safeguard
C3	Cumulative Impacts	The construction environmental management plan (CEMP) would be revised to consider potential cumulative impacts from surrounding development activities as they become known.	Project Manager and Contractor	Construction & pre-construction	Additional safeguard

4.3 Licensing and approvals

As the proposal is being assessed under Part 5 of the EP&A Act, Roads and Maritime is both the proponent and determining authority. Additional licensing and approvals required for the proposal is summarised in Table 4-2.

Table 4-2: Summary of licensing and approval required

Instrument	Requirement	Timing
<i>Roads Act 1993</i>	Approval under Section 138 from the appropriate road authority prior to works on roads	Prior to works on roads
<i>Land Acquisition (Just Terms Compensation) Act 1991</i>	Compensation for land acquired for the proposal would be negotiated in accordance with the Act	Prior to land acquisition

5 References

Roads and Maritime Services 2016, Review of Environmental Factors Parramatta Road and Great North Road Intersection Improvement, Sydney.

Appendix A

Parking Assessment

Memorandum

To: Vishal Gandhi
From: Fred Gennaoui
Date: 23 January 2017
Job N^o: 14412
Subject: **Parking Studies at Parramatta Road/Great North Road Intersection**

Background

The Road & Maritime Services (RMS) is proposing major works along Parramatta Road to improve the capacity and safety of the intersection with Great North Road in accordance with the REF produced in November 2016 for this location and titled *Parramatta Road and Great North Road Intersection Upgrade - Review of Environmental Factors*.

The Proposal aims to increase the capacity of the right turn movement from Parramatta Road into Great North Road, improve safety on the approaches to the intersection and minimise environmental impact. The proposed intersection upgrade is represented in **Figure 1**.



Figure 3-1: Key features of the proposal (VBA 2016)

Figure 1: Proposed RMS Works at Intersection of Parramatta Road with Great North Road

The proposal includes the removal of around 40 metres of parking space on Great North Road to be changed to “No Stopping”.



TDG in association with Gennaoui Consulting has been commissioned to assess the impact of these works on parking in the vicinity of this intersection.

Scope of Work & Methodology

The scope of works and adopted methodology was based on the RMS requirements for a parking study report reproduced below:

A review and mapping of the current parking restriction should be undertaken to inform the parking study. The parking study should specifically identify and assess:

- *The current parking restrictions that apply, by time of day and day of week at the location, including any loading zones, bus zones etc;*
- *The number of parking spaces in each section and type (retail, commuter, staff or residential);*
- *The adjacent land use where the parking is permitted (including side streets);*
- *The length of parking that will be removed and the number of parking spaces that will be impacted in accordance with AS2890.5-1993 (width of parallel parking spaces for cars and light commercial vehicles under normal conditions = 2.3m, length of car spaces = 6.0 – 6.7m, refer AS2890.5-1993 for specifications);*
- *If the proposed clearway or removal of parking is through a residential area, identify if residences have off-street parking available;*
- *Identification of nearby public parking facilities, capacity, availability and their existing utilisation. The locations of these parking spaces will need to be presented in an aerial plan;*
- *The total number of parking spaces available and their existing utilisation along the route and the capacity of the adjacent side streets and parking areas;*
- *The duration of the stay and parking turnover of cars and of vehicles utilising loading zones by type;*
- *The need for parking directional signage for directing residents and other road users to side street parking and the potential location for these signs.*

The assessment of the proposed RMS works on nearby parking involved the following tasks:

- Inventory of land use within study area
- Parking inventory of all spaces within the study area;
- Parking occupancy and length of stay surveys and analysis of all spaces within the Study area between 6:00 am and 6:00pm on Thursday 8 December and on Saturday 10 December 2016. The surveys were carried outside the school holiday period and therefore provides a typical representation of the existing situation for weekdays and weekend.
- Assessment of proposed works on parking conditions and formulation of appropriate recommendations to remedy any impact.



Study Area

The parking study was carried out for the area illustrated **Figure 2**. It comprises the following land uses:

- Residential along Great North Road, Longview Street and Harrabrook Avenue;
- Commercial along Parramatta Road, Henley marine Drive and Dobroyd Parade.



Figure 2: Study Area and Parking Inventory

Parking Inventory

There are about 170 parking spaces within the Study Area. The current number, location, type and time restrictions of spaces available for parking are summarised in **Table 1**, detailed in **Appendix A** and also noted in **Figure 2**.

The majority of spaces have no time limit restrictions. These spaces are used for a number of purposes including employees working in the area, residents and their visitors, and commuters catching the bus in Great North Road.

There are a small number of spaces on the western side of Henley Marine Drive with 2 hours limit to cater for the adjacent Tennis Courts.

The type of drivers using the available parking spaces was determined by general observation and is also noted in **Table 1**.

All commercial developments within the study area provides off-street parking spaces which are restricted to staff and patrons. Most residences can accommodate more than one car on-site.

There are no loading zones within the surveyed area.



Location	Time Restrictions	Type of parkers	Spaces
Dobroyd Parade			
Both sides, Parramatta to Cove	No Restriction	Commuter /staff	35
Henley Marine Drive			
Westside, from ~65m from Parramatta Rd to end of Survey Area	2 hours limit - 8:30am-6pm Mon-Fri and 8:30am-12:30pm Sat	Recreational for Tennis Courts	7
Eastside, Parramatta Rd and 2 hr limit	No restriction	Employees	
Westside, Parramatta Rd and End of Survey Area	No restriction	Employees	36
Parramatta Road			
Great N Rd to Dobroyd Pde	No Stopping		
Longview Street			
Great North to end	No Restriction	Residential	22
Great North Road			
Westside, Longview to Parramatta	No Restriction	Residential & Commuters	15
Eastside, Murralong to Wangal	No Restriction		11
Eastside, Wangal and Harrabrook	No Restriction		6
Eastside, Harrabrook and Parramatta	No Stopping - 6am-10am and 3pm-7pm Mon-Fri	Visitors	5
Harrabrook Avenue			
Both sides, Great North to N ^o 45 Harrabrook	No Restriction	Residential	37
Total			174

Table 1: Parking Inventory

Parking Occupancy

The total number of vehicles parked in each type of on-street and the off-street parking space within the Study area was recorded at half-hourly intervals between 6:00 am and 6:00pm on Thursday 8 December and on Saturday 10 December 2016.

The average parking occupancy (%) of each type of available parking space on the Thursday and Saturday of survey are summarised in **Table 2** and detailed in **Appendix B**. Also included in **Table 2** and **Appendix B** are the maximum number of occupied spaces during the survey period and those occupied during the overall peak period.

The overall peak parking demand occurred on Thursday between 12:00pm and 12.30pm when spaces were occupied (~76% occupancy). A higher overall peak parking demand occurred on Saturday when 52 spaces were occupied (~83% occupancy) between 12.30pm and 1.00pm.



PARKING RESTRICTIONS	THURSDAY				SATURDAY		
	Spaces	Average	Max	Overall Peak	Average	Max	Overall Peak
Dobroyd Parade							
No Restriction	35	95%	100%	100%	83%	97%	94%
Henley Marine Drive							
2Hrs (8:30am-6pm Mon-Fri and 8:30am-12:30pm Sat)	7	36%	86%	57%	32%	57%	57%
No Restriction	36	86%	100%	97%	64%	94%	94%
Parramatta Road							
No Stopping (Clearway 6am-7pm Mon-Fri and 8am-8pm Sat-Sun)	No spaces available for parking						
Longview Street							
No Restriction	22	60%	73%	64%	73%	86%	73%
Great North Road							
No Restriction	32	60%	72%	72%	73%	97%	81%
No Stopping (6am-10am and 3pm-7pm Mon-Fri)	5	1%	20%	20%	58%	100%	40%
Harrabrook Avenue							
No Restriction	37	47%	59%	54%	64%	89%	78%
Total	174	67%	76%	76%	69%	83%	83%

Table 2: Parking Occupancy by Type of Parking Thursday and Saturday December 2016

An analysis of the occupancy survey indicates that:

- On-street 2 hours restricted spaces have higher maximum utilisation on Thursday (~86%) than on Saturday (~57%);
- Overall on-street spaces were more utilised on Saturday than on Thursday.

Parking Turnover and Length of Stay

The number plates of all vehicles parked in all on street short term and unrestricted parking spaces were recorded together with their approximate time of arrival and departure. The data collected was processed to obtain length of stay and parking turnover for each parking type of on-street spaces and of the off-street spaces. These surveys were carried out on Thursday 8 December and on Saturday 10 December between 6:00am and 6:00pm.

Length of Stay

The frequency distribution of length of stay and average length of stay of parkers in on-street spaces and in the off-street parking area are detailed in **Appendix C** and are summarised in **Table 3**.

The average and 85%tile length of stay for vehicles parking in the 2 hour limit on-street spaces exceeded the posted time limit of 120 minutes during the survey period.



STREET	SPACES	RESTRICTION	THURSDAY			SATURDAY		
			Avg	85 th le mins	Turnover Cars/sp/hr	Avg	85 th le mins	Turnover Cars/sp/hr
Dobroyd Parade	35	No Restriction	372	649	0.2	381	649	0.1
Henley Marine Dr	7	2 hours	164	410	0.1	133	410	0.1
Henley Marine Dr	36	No Restriction	450	655	0.1	397	655	0.1
Longview St	22	No Restriction	317	706	0.1	417	706	0.1
Great North Rad	32	No Restriction	309	574	0.1	256	574	0.2
Harrabrook Av	37	No Restriction	223	530	0.1	260	530	0.1
Total	174		328	606	0.1	315	622	0.1

Table 3: Length of Stay and Turnover of Vehicles

Turnover of Parking Facilities

Parking turnover rates indicate the number of cars per hour, during a specified survey period, using a particular space. The shorter the designated length of stay for the space, the greater should be the turnover rate or utilisation of the space. In theory, where parking is in great demand and is strictly controlled, “15 minutes” spaces would show turnover rates of about 4.0 cars per hour, “half-hour” of 2.0, “one hour” spaces of 1.0 or more, and “two hour” spaces of 0.5 or more. The average turnover rate over the period of the survey in vehicles/ space/hour have been calculated from the information collected and are also noted by parking type in **Table 3**. On-street parking in 2 hour time restricted spaces recorded much lower turnover rates than expected. The results of this survey are not surprising in view of the relatively high length of stay for these spaces.

Impact of Proposed Works on Parking

The proposed works would result in the permanent loss of four on-street spaces (~40m) on the western side of Great North Road, northbound from the bus zone as shown in **Figure 3**.

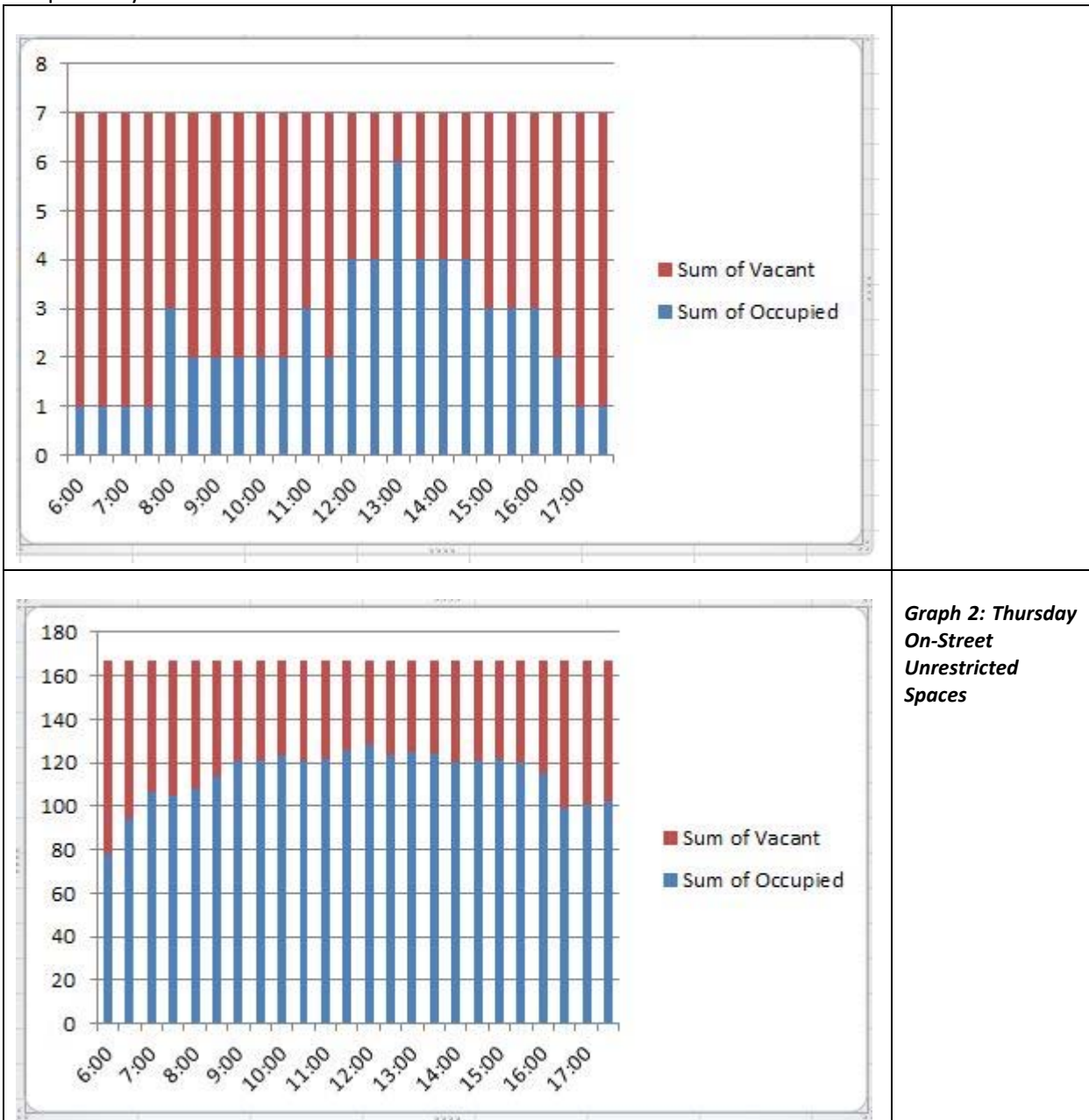


Figure 3: Parking Inventory at Completion of Works



One (1) space may also be lost on the eastern side of Dobroyd Parade near Parramatta Road. The removal of this space, not identified in the REF, would improve safety for vehicles accessing Parramatta Road.

In order to establish where cars parking in those spaces could be accommodated, a closer analysis of on-street spaces was carried out. In this regard, the number of currently occupied and vacant on-street short stay (2 hour limit) and unrestricted spaces on Thursday are displayed in **Graphs 1 and 2** respectively.



Graph 2: Thursday On-Street Unrestricted Spaces

The loss of the five (5) parking spaces could be catered for by the current vacant on-street spaces as noted in **Graph 2**, in Great North Road (at least 5 spaces) and Harrabrook Avenue (at least 15 spaces). It is pertinent to note that each residential property adjacent to these spaces have on-site parking for at least two cars.



Parking in Henley Marine Drive, Longview Street and Harrabrook Avenue is not likely to be unduly affected by the proposed RMS works. On-street parking along Parramatta Road is currently prohibited at the approaches of the intersection.

Conclusions

The proposed RMS works will have a minimal impact on on-street parking in proximity of the works; four spaces will be lost on the western side of Great North Road, and one possible space on the western side of Dobroyd Avenue.

This loss of parking could easily be catered for by vacant spaces in Great North Road and Harrabrook Avenue. There will be no need for directional signage for directing residents and other road users to side street parking.

Fred Gennaoui
Principal Consultant, TDG
Director, Gennaoui Consulting



Appendix A

Parking Inventory

APPENDIX A Parking Inventory Great North Road Study Area

Street	Between	Side	Parking Restriction	Time Restriction	Capacity
Dobroyd Parade	Parramatta Rd and Cove St	North	No Stopping		
Dobroyd Parade	Parramatta Rd and Cove St	North	No Restriction	90' Angle Parking Rear to Kerb	26
Dobroyd Parade	Parramatta Rd and Cove St	South	No Stopping		
Dobroyd Parade	Parramatta Rd and Cove St	South	No Restriction		9
Henley Marine Drive	Parramatta Rd and End of Survey Area	North	No Restriction		13
Henley Marine Drive	Parramatta Rd and End of Survey Area	North	2P	8:30am-6pm Mon-Fri & 8:30am-12:30pm Sat	7
Henley Marine Drive	Parramatta Rd and End of Survey Area	South	No Restriction		23
Parramatta Road	Great N Rd and Henley Marine Dr	North	No Stopping	Clearway 6am-7pm Mon-Fri & 8am-8pm Sat-Sun	
Parramatta Road	Henley Marine Dr and Dobroyd Parade	North	No Stopping	Clearway 6am-7pm Mon-Fri & 8am-8pm Sat-Sun	
Parramatta Road	Dobroyd Parade and Great N Rd	South	No Stopping	Clearway 6am-7pm Mon-Fri & 8am-8pm Sat-Sun	
Longview Street	Great N Rd and No Through Rd	North	No Restriction		9
Longview Street	Great N Rd and No Through Rd	South	No Restriction		13
Great N Road	Longview St and Parramatta Rd	West	Bus Zone		
Great N Road	Longview St and Parramatta Rd	West	No Restriction		15
Great N Road	Longview St and Parramatta Rd	West	No Stopping		
Great N Road	Murralong Ave and Wangal Pl	East	No Stopping		
Great N Road	Murralong Ave and Wangal Pl	East	No Restriction		11
Great N Road	Wangal Pl and Harrabrook Ave	East	No Stopping		
Great N Road	Wangal Pl and Harrabrook Ave	East	No Restriction		6
Great N Road	Wangal Pl and Harrabrook Ave	East	Bus Zone		
Great N Road	Harrabrook Ave and Parramatta Rd	East	No Stopping		
Great N Road	Harrabrook Ave and Parramatta Rd	East	No Stopping	6am-10am & 3pm-7pm Mon-Fri	5
Harrabrook Avenue	Great N Rd and 45 Harrabrook Ave	North	No Restriction		19
Harrabrook Avenue	Great N Rd and 44 Harrabrook Ave	South	No Restriction		18
				Total	174



Appendix B

Parking Occupancy

APPENDIX B

Table B1

Great North Rd Parramatta Road Intersection THURSDAY 8 December 2016

Between	Time Restriction	Supply	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	Avg	Max	Overall
Dobroyd Parade																													Peak *
Parramatta Rd and Wadim (Bill) Jegerow Reser	No Restriction	35	24	30	34	33	34	34	34	34	35	35	35	35	35	35	35	33	33	35	35	34	31	33	33	32	95%	100%	100%
Henley Marine Drive																													
Parramatta Rd and End of Survey Area	2P 8:30am-6pm Mon-Fri & 8:30am-12:30pm Sat	7	1	1	1	1	3	2	2	2	2	2	3	2	4	4	6	4	4	4	3	3	3	2	1	1	36%	86%	57%
Parramatta Rd and End of Survey Area	No Restriction	36	18	28	36	36	36	36	35	35	36	36	36	36	35	35	34	34	34	35	32	32	31	12	12	10	86%	100%	97%
Parramatta Road																													
Great North Rd and Dobroyd Parade	No Stopping Clearway 6am-7pm Mon-Fri & 8am-8pm Sat-Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Longview Street																													
Great North Rd and No Through Rd	No Restriction	22	12	12	12	11	10	10	12	12	12	12	12	14	14	14	15	16	15	12	14	14	15	15	16	16	60%	73%	64%
Great North Road																													
Londview St and Parramatta Rd	No Restriction	32	11	11	10	11	12	15	20	20	23	23	22	23	23	22	23	23	20	21	23	22	22	21	21	22	60%	72%	72%
Murralong Ave and Parramatta Rd	No Stopping 6am-10am & 3pm-7pm Mon-Fri	5	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1%	20%	20%
Harrabrook Avenue																													
Great North Rd and 45 Harrabrook Ave	No Restriction	37	13	13	14	14	16	19	20	20	17	15	17	18	20	17	18	18	18	18	18	18	16	18	19	22	47%	59%	54%
Total		174	79	95	107	106	111	116	123	123	125	123	125	128	132	127	131	128	124	125	125	123	118	101	102	103	67%	76%	76%

* Overall peak 12.00 to 12.30pm

Table B2

Great North Rd Parramatta Road Intersection SATURDAY 10 December 2016

Between	Time Restriction	Supply	6:00	6:30	7:00	7:30	8:00	8:30	9:00	9:30	10:00	10:30	11:00	11:30	12:00	12:30	13:00	13:30	14:00	14:30	15:00	15:30	16:00	16:30	17:00	17:30	Avg	Max	Overall
Dobroyd Parade																													Peak **
Parramatta Rd and Wadim (Bill) Jegerow Reser	No Restriction	35	27	28	28	29	29	29	29	32	33	33	33	34	33	33	30	31	30	31	27	23	19	24	28	28	83%	97%	94%
Henley Marine Drive																													
Parramatta Rd and End of Survey Area	2P 8:30am-6pm Mon-Fri & 8:30am-12:30pm Sat	7	0	0	0	0	3	4	4	4	3	4	2	3	4	4	4	3	3	3	3	2	1	0	0	0	32%	57%	57%
Parramatta Rd and End of Survey Area	No Restriction	36	10	10	10	19	33	33	33	34	33	33	33	32	33	34	33	33	32	32	8	9	8	5	5	5	64%	94%	94%
Parramatta Road																													
Great N Rd and Dobroyd Parade	No Stopping Clearway 6am-7pm Mon-Fri & 8am-8pm Sat-Sun	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Longview Street																													
Great N Rd and No Through Rd	No Restriction	22	13	13	13	15	15	14	15	15	17	19	14	14	14	16	17	17	17	17	19	19	19	18	18	18	73%	86%	73%
Great N Road																													
Londview St and Parramatta Rd	No Restriction	32	12	12	15	16	19	19	18	18	18	19	22	24	26	26	27	26	30	30	30	31	31	30	30	31	73%	97%	81%
Murralong Ave and Parramatta Rd	No Stopping 6am-10am & 3pm-7pm Mon-Fri	5	1	1	1	2	3	3	3	3	3	4	4	3	4	2	1	1	2	3	4	5	5	3	4	4	58%	100%	40%
Harrabrook Avenue																													
Great N Rd and 45 Harrabrook Ave	No Restriction	37	16	16	16	17	17	17	18	19	20	24	22	22	26	29	26	26	28	28	28	33	32	29	30	30	64%	89%	78%
Total		174	79	80	83	98	119	119	120	125	127	136	130	132	140	144	138	137	142	144	119	122	115	109	115	116	69%	83%	83%

** Overall peak 12.30 to 1.00pm



Appendix C

Length of Stay and Turnover

APPENDIX C
Length of Stay Survey
Table C1

Great North Road Study Area
Thursday 8 December 2016

Street	Spaces	Restriction	Length of Stay																		Total	Avg	85% mns	Turnover			
			15mns	30mns	45mns	60mns	75mns	90mns	105mns	120mns	135mns	150mns	165mns	180mns	4hrs	5hrs	6hrs	7hrs	8hrs	9hrs					10hrs	11hrs	12hrs
																											Cars/space/h
Dobroyd Parade	35	No Restriction	1	1	1	1	0	2	9	4	0	1	4	1	3	3	1	0	2	7	13	2	9	65	372	649	0.15
Henley Marine Drive	7	2P	1	3	0	0	1	0	2	0	0	0	0	1	1	0	0	1	0	0	0	1	0	11	164	410	0.13
Henley Marine Drive	36	No Restriction	1	0	0	1	2	0	2	0	2	0	0	0	4	2	1	6	2	1	10	8	7	49	450	655	0.11
Longview Street	22	No Restriction	0	0	2	1	3	0	2	1	1	2	2	1	1	1	1	1	1	5	0	0	5	30	317	706	0.11
Great N Road	32	No Restriction	0	3	2	6	1	3	0	1	1	1	0	2	3	3	0	1	3	7	2	2	4	45	309	574	0.12
Great N Road	5	No Stopping 6am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Harrabrook Avenue	37	No Restriction	1	6	3	8	3	1	3	3	2	1	1	4	3	3	0	2	1	4	3	0	4	56	223	530	0.13
Total	174		4	13	8	17	10	6	18	9	6	5	7	9	15	12	3	11	9	24	28	13	29	256	328	606	0.12

APPENDIX C
Length of Stay Survey
Table C2

Saturday 10 December 2016

Street	Spaces	Restriction	Length of Stay																		Total	Avg	85% mns	Turnover			
			15mns	30mns	45mns	60mns	75mns	90mns	105mns	120mns	135mns	150mns	165mns	180mns	4hrs	5hrs	6hrs	7hrs	8hrs	9hrs					10hrs	11hrs	12hrs
																											Cars/space/h
Dobroyd Parade	35	No Restriction	2	0	1	4	1	6	1	0	0	0	1	1	5	1	3	2	3	7	6	0	11	55	381	649	0.13
Henley Marine Drive	7	2P	0	1	1	1	0	0	2	2	1	0	0	1	2	1	0	0	0	0	0	0	0	12	133	410	0.14
Henley Marine Drive	36	No Restriction	0	2	2	0	0	1	0	1	0	0	1	0	2	0	0	15	8	3	1	1	4	41	397	655	0.09
Longview Street	22	No Restriction	0	0	2	0	3	0	0	1	0	0	0	0	3	2	3	1	2	0	0	3	8	28	417	706	0.11
Great N Road	32	No Restriction	1	2	8	3	13	2	2	1	1	1	2	1	3	2	3	3	4	3	2	6	3	66	256	574	0.17
Great N Road	5	No Stopping 6am	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.00
Harrabrook Avenue	37	No Restriction	1	2	6	6	2	1	5	2	1	3	1	2	7	6	4	5	1	3	0	2	6	66	260	530	0.15
Total	174		4	7	20	14	19	10	10	7	3	4	5	5	22	12	13	26	18	16	9	12	32	268	315	622	0.13



rms.nsw.gov.au



contactus@rms.nsw.gov.au



Customer feedback
Roads and Maritime
Locked Bag 928,
North Sydney NSW 2059