URBANHORIZON

Lane Cove Bushfire Accessibility

Final Report

Department of Planning

March 2011

Urbanhorizon Pty Ltd
Level 14, 109 Pitt Street, Sydney NSW 2000
tel +61 9232 8065 **fax** +61 9232 8087 philipbrogan@urbanhorizon.com.au
ABN 40 116 237 364

Lane Cove Bushfire Accessibility

Prepared by

Urbanhorizon Pty Ltd
Suite 1404, 109 Pitt Street, Sydney NSW 2000
tel +61 2 9232 8065 **fax** +61 2 9232 8087 **email** philipbrogan@urbanhorizon.com.au
Web www.urbahorizon.com.au
ABN 40 116 237 364

March 2011

2011 p 002

Document Information

Document Lane Cove Bushfire Accessibility - Final Report

Ref 2011 p 002

Date 9 March 2011

Prepared by Philip Brogan

Reviewed by

Document History

Amendment	Amendment Date	Particulars	Approval	
			Name	Signature
	23 February 2011	Draft Report	P Brogan	
	26 February 2011	Minor edits	P Brogan	
	4 March 2011	Draft Final Report	P Brogan	
	9 March 2011	Final Report (change RFS vegetation ref. Page 13)	P Brogan	

TABLE OF CONTENTS

Executive Summary

This report details the findings of a review of the existing road infrastructure in the Lane Cove North precinct (study area) for its ability to cater for vehicular movement during a bushfire given planned increases in density provided for in the Lane Cove LEP 2010. The study area is bounded by Centennial Avenue, Mowbray Road West, Willandra Street and Batten Reserve. See aerial plan on page 9. The residential properties north of Gordon Crescent and Kullah Parade are designated as bus fire prone land 'buffer area' in LCC's June 2010 Bush Fire Prone Land map. Batten Reserve is classed as 'high risk' on the same map.

The investigation concludes as follows:

- The existing road widths and some turning areas do not comply with RFS *Planning for Bushfire Protection, 2006.*

- Notwithstanding the above, existing widths and turning areas are considered sufficient to accommodate small and medium rigid truck fire fighting vehicles and associated equipment safely and without conflict, however, options for amelioration include:

    - Ensure the parking needs of higher density development are met entirely within the confines of the development sites and restrict on-street parking to one side of nominated streets (See **Section 3.3.1**)
    - Provide a roll back mountable kerb along the Batten Reserve side of Gordon Crescent and Kullah Parade and at other appropriate locations to facilitate RFS vehicle access and operations during a fire event.
    - Impose a set back requirement on new higher density development to enable road widths and turning areas to be increased over time in Gordon Crescent, Kullah Parade, Pinaroo Place, Merinda Street and Willandra Street.
    - Undertake works to increase road widths and turning areas funded through contributions from new higher density development in the precinct.

- The perimeter roads (Gordon Crescent and Kullah Parade) have kerb to kerb carriageways widths of 7.3 metres. All other local roads within the precinct have the same carriageway widths. These widths are about 700mm less than the 8 metre minimum specified by the RFS, however, safe access can be provided by one or more of the options referred to above.

- The roundabout at the intersection of Elizabeth Parade and Gordon Crescent and the cul-de-sac at the end of Pinaroo Place have an outer radii of about 8.0 metres, sufficient to allow a small rigid vehicle to turn in a single movement but below the 12 metre minimum specified by the RFS. Providing no parking signage is placed in the cul-de-sac head to prevent any on-street parking, both

locations are considered adequate to accommodate small and medium RFS vehicle access.

- The perimeter roads are linked to the internal road system at multiple points at intervals no greater than 500 metres.
- Pinaroo Place is a dead end but is less than 200m in length.

- Maximum grades across the study area are well within the suggested RFS limits.

- The 1,200 – 1,500 potential precinct dwellings could generate between 4,800 and 6,000 trips per average weekday across the study area at full development. This is not considered a threat to RFS access and operation during a fire event, however, the increased volume of traffic and parking in the precinct may increase delays in the event of an evacuation. It is recommended that the parking needs of higher density development be met entirely within the confines of the development sites to minimise constraints to RFS operations during a fire event.

- The RFS should be involved in developing an updated Displan for the area along with Council's Emergency Management Committee.

- Council's request for "a comprehensive traffic study" would best be integrated with the update of their Displan, which can then take into consideration: the take up rate of the precinct's development (expected to be about 10-20 years); emergency scenario planning; changes in government policy and Council's Section 94 Plan. Any supplementary traffic investigation will need to be undertaken in a manner that does not delay development application assessment and approval in the precinct.

1.0 Introduction

Urbanhorizon Pty Ltd has been commissioned by the Department of Planning (DoP) to review the existing road infrastructure in the Lane cove North precinct (study area) for its ability to cater for vehicular movement during a bushfire given planned increases in density provided for in the Lane Cove LEP 2010.

1.1 Scope

The purpose of the transport and access investigations is as follows:

- Consult with the relevant officers from DoP, Rural Fire Service (RFS) and Lane Cove Council (LCC) on access, bushfire and development issues in the study area.
- Visit the site, make observations and comment on the suitability of the current road network to cater for vehicular movement during a bushfire given planned increases in density provided for in the Lane Cove LEP 2010.
- Recommend appropriate vehicular access changes or emergency access requirements.
- Document the findings of the investigation in a draft report for submission to the DoP.

1.2 Report Overview

The report comprises four sections as follows:

Executive Summary
1.0 Introduction
2.0 Existing Road Network
3.0 Operational Assessment
4.0 Conclusions

Bibliography
Glossary

Appendix A – Photographs
Appendix B – Fire fighting Vehicle Characteristics
Appendix C – Bush Fire Prone Land

2.0 Existing Road Network

A summary of the road network within the study area is provided below.

2.1 The Study Area

The study area is bounded by Centennial Avenue, Mowbray Road West, Willandra Street and Batten Reserve. That section of Centennial Avenue between Mowbray Road West and Epping Road is a regional road under the care and control of Lane Cove Council. Mowbray Road West is also a regional road. All other roads within the study area are local roads under Lane Cove Council's car and control. See **Figure 2.1** overleaf.

2.2 The Road Network

All the local roads within the study area are paved and have kerb to kerb carriageway widths of 7.3 metres. A roundabout controls the intersection at Elizabeth Parade and Gordon Crescent and has an outer radius of 8.0 metres. The cul-de-sac in Pinaroo Place has an 8.0 metre outer radius.

Gordon Crescent and Kullah Parade are both perimeter roads as defined in the RFS *Planning for Bushfire Protection, 2006*. A perimeter road is the preferred option to separate bushland from urban areas. No on-street parking is permitted along the southern or Batten Reserve side of Gordon Crescent and Kullah Parade. No standing signs are located along the southern side of these roads. During peak periods (7am-9am) signs prevent right turns from Mowbray Road West into Willandra Street, Kullah Parade, Mindarie Street and Girraween Avenue.

Girraween Avenue has a grade of about 1:20 or 5%. All other roads are generally free of slope or have gentle grades towards the south (Batten Reserve).

Land within the study area is primarily used for detached residential dwellings.

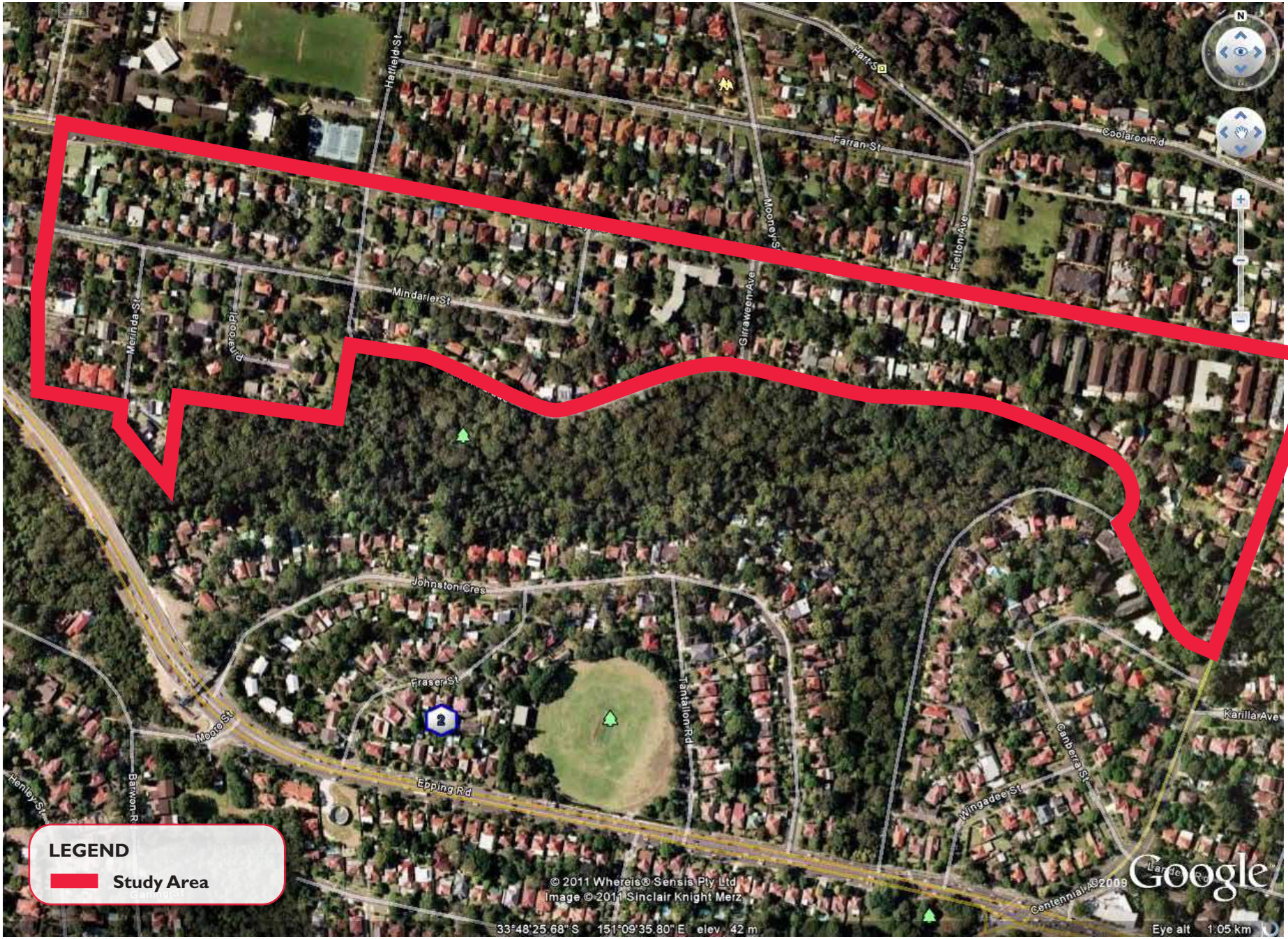


Figure 2.1—Lane Cove Precinct

URBANHORIZON Level 14, 109 Pitt Street, Sydney NSW 2000, **tel:** 02 9232 8065 **fax:** 02 9232 8087 **email:** philipbrogan@urbanhorizon.com.au

3.0 Operational Assessment

This section summarises the extent to which the study area satisfies the RFS requirements as documented within *Planning for Bushfire Protection, 2006*.

3.1 RFS Requirements

The key RFS requirements are summarised as follows:

- Road should provide sufficient width to allow fire fighting vehicle crews to work with fire fighting equipment about the vehicle.
- The minimum single lane width of a public road that is not a perimeter road is 3.5m where the curve radius is greater than 100m and 4.5m where the curve radius is less than 40m.
- The minimum two way width of a public road that is not a perimeter road is 6.5m where the curve radius is greater than 100m and 8.0m where the curve radius is less than 40m.
- Two way urban permitter roads should have a kerb to kerb carriageway width of 8.0 metres.
- Public and private access roads and fire trails should have a 6 metre inner turn radius and a 12 metre outer radius.
- The permitter road should be linked to the internal road system at an interval no greater than 500 metres.
- Ideally all roads should be through roads but if unavoidable, dead ends should be no more than 200m in length, have a 12 metre outer radius turning circle and be clearly sign posted as dead ends.
- Curves of non perimeter roads should have a minimum inner radius of 6 metres.
- Maximum grades for sealed roads is 15 degrees and an average of not more than 10 degrees.
- Road surfaces and bridges should be able to carry loaded fire fighting vehicles at 15 tonnes.
- Public roads between 6.5 and 8 metres in width are No Parking along one side.
- Parking bays are a minimum of 2.6 metres wide from kerb to edge of road pavement.
- Public roads directly interfacing the bush fire hazard vegetation provide roll top kerbing to the hazard side of the road.
- A minimum vertical clearance of 4 metres to any overhanging obstructions, including tree branches.
- Road cross fall of not more than 10 degrees.

3.2 Consultation

3.2.1 Department of Planning

Feedback was obtained from DoP officers in February 2011. In summary the key issues raised are those listed below:

- An assessment is required of the road network and precinct generally to accommodate fire fighting vehicles and equipment during a fire event.

- The likely future traffic generation to and from the precinct is a secondary consideration compared to that described above.

3.2.2 Rural Fire Service

Feedback was obtained from RFS officers in February 2011. In summary the key issues raised are those listed below:

- Acknowledgment that the RFS is not an approval authority and the manner in which any infrastructure deficiencies are managed is at the discretion of Council and the DoP.
- Acknowledgment that *Planning for Bushfire Protection, 2006* does not provide detail about how to manage traffic access in the event of a fire event.
- Noted that the situation in the precinct was not as constrained as other locations in Sydney where multiple points of access and two way traffic flow where not available.

3.2.3 Lane Cove Council

Council was consulted in the preparation and sign off of the consultant brief. Council was then consulted by phone and email with some of their recommendations included in the Draft Final report.

3.3 Bushfire Access Assessment

The study area was visited on Sunday 20 February 2011 and the views expressed by stakeholders taken into consideration as part of the assessment. The outcomes of the assessment have been reported under the following five categories:

1. Road widths.
2. Road turning radii.
3. On-Street parking.
4. Public transport access.
5. Traffic generation.

Australian Standard AS/N252890.1:2004 and AS 2890.2-2002 specify the following design vehicle characteristics and dimensions:

- Car - 5.2m x 1.94m (B99 – only 1% of cars are longer)
- Small Rigid Truck - 6.4m x 2.3m
- Medium Rigid Truck – 8.8m x 2.5m (RFS design vehicle)
- Heavy Rigid Truck – 12.5m x 2.5m
- Articulated vehicle – 19.0m x 2.5m

The RFS design fire fighting vehicle is a medium rigid truck.

Appendix B lists the dimensions of vehicles used by NSW Fire and Rescue and RFS. NSW Fire and Rescue are often first on a scene at either a structure or bush fire. Most of the NSW Fire and Rescue vehicles are pumpers that carry comparatively smaller amounts of water on board, between 1800 and 2000 litres. They need to connect to a hydrant and pump water from a mains supply. This is also the case for most RFS vehicles although the heavy appliance Category 1 RFS vehicles have tank capacities greater than those of their NSW Fire and Rescue counterparts (max 4,000 litres).

Discussions with both NSW Fire and Rescue and RFS personnel reaffirm that in the case of the study area the vehicle most likely to be used in the event of a bushfire would be the Category 7 Light Appliance 6 person crew cab (6.1m long, 2.1m wide and 2.7m high). These are small rigid trucks that offer greater manoeuvrability and operational flexibility to RFS officers. In circumstances where mains pressure falls or is cut, bulk water tankers are driven to the fire event, these are slightly larger vehicles with lengths slightly less than 8 metres, but still within the range of the medium rigid design vehicle. These tankers do not exceed 2.5m in width.

The *Planning for Bushfire Protection, 2006* document would appear to be directed to "residential subdivisions associated with single dwelling houses through dual occupancy and multi-unit development may be permissible." (p. 15). In the event larger RFS vehicles and equipment need to be used in the precinct during a fire event, one or more of the options outlined below may need to be actioned.

3.3.1 Road Widths

The perimeter roads (Gordon Crescent and Kullah Parade) have kerb to kerb carriageways widths of 7.3 metres. All other local roads within the precinct have the same carriageway widths. These widths are about 700mm less than the 8 metre minimum specified by the RFS. Under a situation where cars are parked on both sides of the carriageway, a 2.3 metre wide gap would remain to provide one way movement. This would be inadequate in a bushfire event situation. The options to address this include the following:

- Ensure the parking needs of higher density development are met entirely within the confines of the development sites and restrict on-street parking to one side of nominated streets (See **Section 3.3.1**).
- Provide a roll back mountable kerb along the Batten Reserve side of Gordon Crescent and Kullah Parade and at other appropriate locations to facilitate RFS vehicle access and operations during a fire event.
- Impose a set back requirement on new higher density development to enable road widths and turning areas to be increased over time.
- Undertake works to increase road widths and turning areas funded through contributions from new higher density development in the precinct.

On-street car parking could be restricted to one side only of the following carriageways:

- Gordon Crescent (retain no parking restriction which applies to Batten Reserve side of road)
- Kullah Parade (retain no parking restriction which applies to Batten Reserve side of road).
- Pinaroo Place (restrict on-street parking to one side of road).
- Merinda Street (restrict on-street parking to one side of road).
- Willandra Street (restrict on-street parking to one side of that section of Willandra Street south of Mindarie Street).

Allowing parking along the Batten Reserve side of Gordon Crescent and Kullah Parade is not considered an option as it would adversely impact the ability of RFS crews to access and fight fires in the Reserve.

Appendix 2 of *Planning for Bushfire Protection, 2006* outlines the approach to determining Asset Protection Zones (setbacks) for residential and rural-residential subdivisions. The determination is a function of slope, fire intensity, vegetation types and other factors. In relation to Batten Reserve, fire risk and RFS accessibility and operations would be improved by:

- Removing lower limbs of trees abutting the southern side of Gordon Crescent and Kullah Parade up to a height of 4 metres above the ground.
- Reducing the tree canopy cover in Batten Reserve to between 15 and 30%.
- Mowing the understorey of Batten Reserve along the southern side of Gordon Crescent and Kullah Parade.

3.3.2 Road Turning Radii

The roundabout at the intersection of Elizabeth Parade and Gordon Crescent and the cul-de-sac at the end of Pinaroo Place both have an outer radii of 8.0 metres. A small rigid vehicle has a minimum turn radius of 7.1 metres. A medium rigid vehicle has a minimum turn radius of 10 metres. The 8.0 metres is sufficient to allow a small rigid vehicle to turn in a single movement but is below the 12 metre minimum specified by the RFS. Providing no parking signage is placed in the cul-de-sac head to prevent any on-street parking, both locations are considered adequate to accommodate small and medium RFS vehicle access. The use of heavy rigid fire fighting vehicles will necessitate expansion of the roundabout and cul-de-sac head.

3.3.3 On-Street Parking

On street parking is not permitted along the southern or Batten Reserve side of Gordon Crescent and Kullah Parade. This should continue and could be extended as suggested in **3.3.1** above.

3.3.4 Public Transport Access

Buses use Mowbray Road West but do not use any of the local roads in the study area. No changes are suggested in this regard.

3.3.5 Traffic Generation

The High Density R4 zoning in the 2009 LEP provides for 12 metre high buildings at a 2.1:1 FSR. This translates to a dwelling potential of about 1,550 dwellings across the entire study area. Total dwelling yield at full development would be between 1,200 and 1,500 having taken into account existing dwellings in the study area. The RTA Guide to Traffic Generating Developments, 2002 suggests that each dwelling could generate about 4 trips per average weekday. At this rate between 4,800 and 6,000 trips per day could be generated across the study area at full development. In my opinion, the dwelling yields achievable under the 2009 LEP will be constrained by RFS setback and other risk management requirements such that average daily generation will be closer to 4,800 veh/day.

During a fire event Police, SES and RTA officers are empowered to close roads and regulate traffic flow (Displan, 2007). The Displan does not elaborate on how traffic dispersal and traffic control should be managed. The increase in traffic activity resulting from the greater precinct resident population may pose challenges for traffic control and dispersal during a fire event. The time taken to evacuate motorists from the precinct during a fire event is likely to be greater under a higher density residential situation than under the current low density situation by virtue of the increased vehicle generation.

RTA and Council officers are empowered under the Displan to close roads and regulate motor vehicle access into the precinct during a fire event. Motor vehicle egress from the precinct during a fire event can also be managed, prevented or controlled by RTA and Council officers. However, RFS vehicle access and RFS operations need not be constrained if the parking needs of higher density development are accommodated on site. Moreover, the precinct has multiple points of entry and exit to Mowbray Road West which will assist in traffic dispersal and management during an event.

Fire fighting operations could be assisted where residential properties are required to maintain rain water tanks within the confines of their properties for RFS and other agency use in fire events.

4.0 Conclusions

The investigation concludes as follows:

- Some existing road carriageway widths and turning areas do not meet the RFS requirements outlined in the *Planning for Bushfire Protection, 2006.* The existing widths and turning areas are considered sufficient to accommodate small and medium rigid truck fire fighting vehicles and associated equipment safely and without conflict, however, options for amelioration include:

    - Ensure the parking needs of higher density development are met entirely within the confines of the development sites and restrict on-street parking to one side of nominated streets (See **Section 3.3.1**)
    - Provide a roll back mountable kerb along the Batten Reserve side of Gordon Crescent and Kullah Parade and at other appropriate locations to facilitate RFS vehicle access and operations during a fire event.
    - Impose a set back requirement on new higher density development to enable road widths and turning areas to be increased over time in Gordon Crescent, Kullah Parade, Pinaroo Place, Merinda Street and Willandra Street.
    - Undertake works to increase road widths and turning areas funded through contributions from new higher density development in the precinct.

- The perimeter roads (Gordon Crescent and Kullah Parade) have kerb to kerb carriageways widths of 7.3 metres. All other local roads within the precinct have the same carriageway widths. These widths are about 700mm less than the 8 metre minimum specified by the RFS, however, safe access can be provided by one or more of the options referred to above.

- The roundabout at the intersection of Elizabeth Parade and Gordon Crescent and the cul-de-sac at the end of Pinaroo Place have an outer radii of about 8.0 metres, sufficient to allow a small rigid vehicle to turn in a single movement but below the 12 metre minimum specified by the RFS. Providing no parking signage is placed in the cul-de-sac head to prevent any on-street parking, both locations are considered adequate to accommodate small and medium RFS vehicle access.

- The perimeter roads are linked to the internal road system at multiple points at intervals no greater than 500 metres.

- Pinaroo Place is a dead end but is less than 200m in length.

- Maximum grades across the study area are well within the suggested RFS limits.

- The 1,200 –1,500 potential precinct dwellings could generate between 4,800 and 6,000 trips per average weekday across the study area at full development. This is not considered a threat to RFS access and operation during a fire event, however, the increased volume of traffic and parking in the precinct may increase delays in the event of an evacuation. It is recommended that the parking needs of higher density development be met entirely within the confines of the development sites to minimise constraints to RFS operations during a fire event.

- The RFS should be involved in developing an updated Displan for the area along with Council's Emergency Management Committee.

- Council's request for "a comprehensive traffic study" would best be integrated with the update of their Displan, which can then take into consideration: the take up rate of the precinct's development (expected to be about 10-20 years); emergency scenario planning; changes in government policy and Council's Section 94 Plan. Any supplementary traffic investigation will need to be undertaken in a manner that does not delay development application assessment and approval in the precinct.

Bibliography

Roads and Traffic Authority (2002), Guide to Traffic Generating Developments, Sydney, Australia.

SJB Planning (2008) Assessment of Viability of Planning Controls for North Lane Cove Precinct.

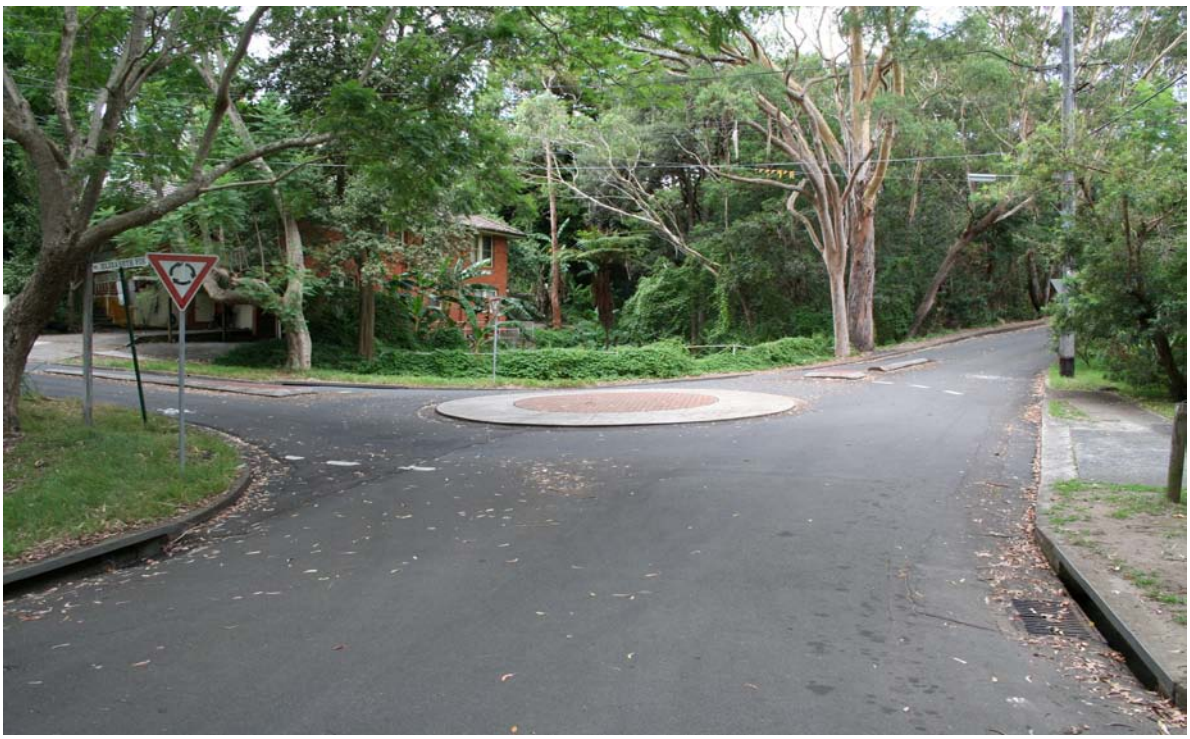
Rural Fire Service (2006) Planning for Bushfire Protection.

Willoughby / Lane cove Local Disaster Plan (Displan), 5 March 2007.

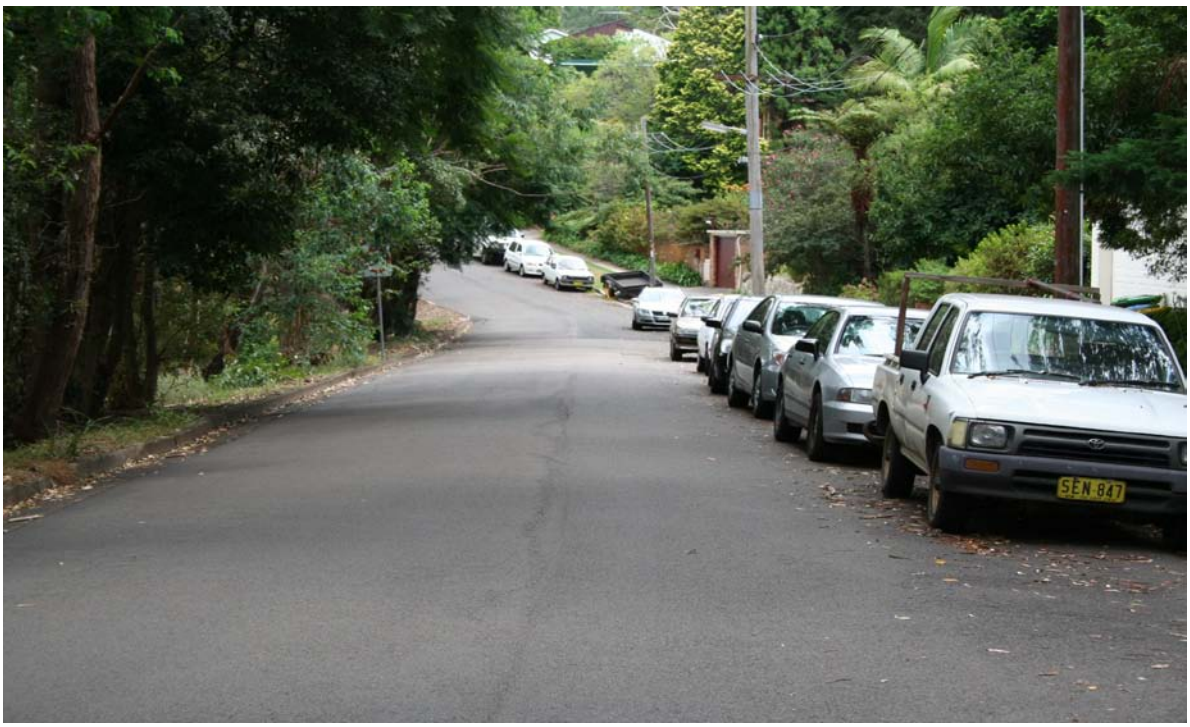
Glossary

AADT	Average Annual Daily Traffic
DCP	Development Control Plan
DoP	Department of Planning
DS	Degree of Saturation
EPA	Environmental Planning & Assessment Act, 1979
JTW	Journey to Work
LCC	Lane Cove Council
LoS	Level of Service
LGA	Local Government Area
RFS	NSW Rural Fire Service
RTA	Roads and Traffic Authority
SES	State Emergency Services
VKT	Vehicle Kilometres Travelled
VPD	Vehicles per day
VPH	Vehicles per hour

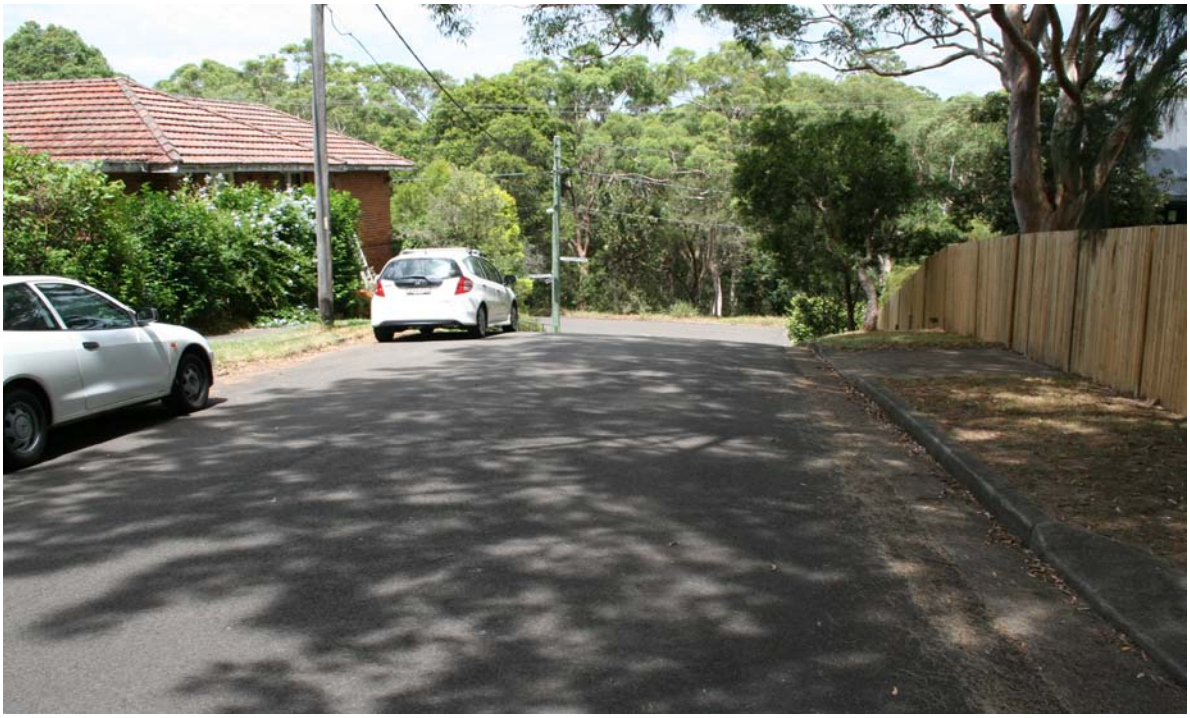
Appendix A – Photographs



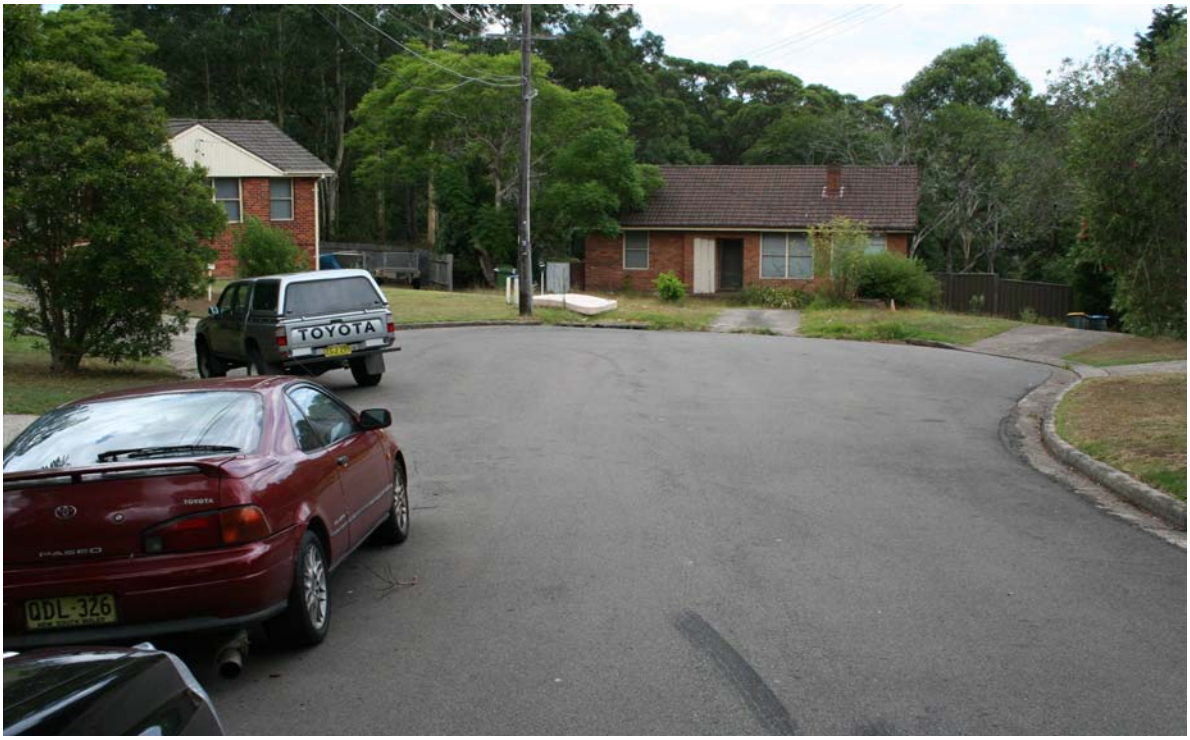
Photograph A1 – Roundabout at the intersection of Elizabeth Parade and Gordon Crescent, February 2011.



Photograph A2 – Looking west along Gordon Crescent, February 2011.



Photograph A3 – Looking south along Girraween Avenue towards Kullah Parade and Batten Reserve, February 2011.



Photograph A4 – the cul-de-sac in Pinaroo Place, February 2011.

Appendix B – Fire Fighting Vehicle Characteristics

Rural Fire Service Vehicles:

- Category 9 Ultra Light Tanker (5.3m long, 1.8m wide and 2.12m high).
- Category 1 Heavy Appliance 6 person crew cab (7.8m long, 2.47m wide and 3.2m high).
- Category 1 Heavy Appliance 3 person single cab (7.8m long, 2.47m wide and 3.2m high).
- Category 2 Medium Appliance 6 person crew cab (7.6m long, 2.47m wide and 3.05m high).
- Category 11 Town Appliance 6 person crew cab (7.4m long, 2.45m wide and 2.9m high).
- Category 7 Light Appliance 6 persons crew cab (6.1m long, 2.1m wide and 2.7m high).
- Category 7 Light Appliance 3 person single cab (5.25m long, 2.1m wide and 2.7m high).

NSW Fire and Rescue Vehicles:

- Pumper Class 3 Varley Commander (8.04m long, 2.5m wide and 3.2m high).
- Pumper Class 4 Varley Commander (7.87m long, 2.5m wide and 3.05m high).
- Pumper Class 5 Varley Commander (7.87m long, 2.5m wide and 3.05m high).
- Tanker Class 1 4x4 (7.8m long, 2.5m wide and 3.1m high).
- Pumper Class 4 Scania P94D (7.75m long, 2.5m wide and 3.02m high).
- Pumper Class 2 Isuzu FTR800 (7.6m long, 2.5m wide and 3.1m high).

Appendix C – Bush Fire Prone Land

THEMES:

Bush Fire Prone Land

- Buffer Area 100m High Risk / 30m Low Risk
- High Risk
- Low Risk

THE COUNCIL of THE MUNICIPALITY of LANE COVE 1895

Bush Fire Prone Land - Rural Fires and Environmental Assessment Legislation Amendment Act 2002

Date: 11/06/10

Scale: 1:8000

THE INFORMATION CONTAINED ON THIS MAP WAS PROVIDED BY THE RURAL FIRE SERVICES NSW. ITS ACCURACY CANNOT BE GUARANTEED BY COUNCIL. DETAILED ENQUIRIES SHOULD BE MADE WITH RFS NSW BEFORE RELYING ON THE INFORMATION.