



Transport
Roads & Maritime
Services

CAMPBELLTOWN ROAD UPGRADE

Camden Valley Way – Brooks Road Submissions Report

MAY 2014

Roads and Maritime Services

Campbelltown Road upgrade from Camden Valley Way to Brooks Road

Submissions report

May 2014

This report has been prepared for Roads and Maritime Services in accordance with the terms and conditions of appointment for Review of Environmental Factors, dated 16 January 2012. Hyder Consulting Pty Ltd (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

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Executive summary

Overview of the proposed Campbelltown Road upgrade

Roads and Maritime Services (Roads and Maritime) proposes to upgrade 5.4 kilometres of Campbelltown Road between Camden Valley Way, Casula and Brooks Road, Denham Court.

The proposed upgrade would cater for an anticipated increase in traffic and residential and commercial activity in the area as a result of the development of the South West Growth Centre (SWGC), as well as changes to the wider area and existing land uses. Campbelltown Road is one of the main arterial transport corridors in the SWGC.

Roads and Maritime documented and assessed the proposal in a Review of Environmental Factors (REF). The proposal described in the REF would involve:

- Widening Campbelltown Road to six lanes between Camden Valley Way and Beech Road (three lanes each way), and four lanes from Beech Road to Denham Court Road (two lanes each way). The wider median south of Beech Road would facilitate a future six-lane road design, if required.
- Providing a central median
- Upgrading existing (and providing additional) intersections along the route
- Providing a shared pathway for bicycles and pedestrians
- Building new bridges over Maxwells Creek and the Hume Motorway (formerly known as Hume Highway)
- Upgrading culverts
- Realigning an 85-metre section of Maxwells Creek.

Public display of the REF

Between 11 April and 5 July 2013, Roads and Maritime placed the REF on public display at Narellan Library, Narellan Motor Registry, Ingleburn Greg Percival Library and Campbelltown HJ Daley Library.

To further inform the public about the proposal, Roads and Maritime:

- Held a number of community information sessions
- Placed a newspaper advertisement in the *Macarthur Advertiser*
- Placed the REF on its website for reading and download
- Informed the community and stakeholders of the display of the REF via a community update, newspaper advertisements and the project website
- Held four staffed displays during April and May 2013, where members of the project team were present to answer any questions and to receive comments on the proposal from the community and stakeholders. The project team also attended two separate community meetings run by community groups and local councils.

Submissions received

Roads and Maritime invited the public to comment in writing on the proposal during the exhibition period. It also accepted late submissions for inclusion in this submissions report until 22 October 2013.

Roads and Maritime received 76 written submissions from the community, government agencies and local councils. The submissions received included issues concerning:

- The proposal justification

- Alternatives and options considered
- The statutory and planning framework, and consultation that was carried out
- Potential impacts on:
 - Biodiversity
 - Aboriginal and non-Aboriginal heritage
 - Hydrology and water quality
 - Traffic, transport and access
 - Noise
 - Air quality
 - Landscape character and visual amenity
 - Land use and socio-economic aspects.

Design refinements to the original proposal

Since the display of the REF, Roads and Maritime has revised the concept design of the proposal to reflect submissions received from the community, additional value engineering, and the outcomes of supplementary environmental assessments.

There have been three key revisions to the concept design:

- The road corridor south of Zouch Road has been narrowed to accommodate a four-lane road with a narrower median to minimise impacts on property
- A two-lane roundabout has been provided at the intersection of Denham Court Road, Campbelltown Road and Dickson Road to allow greater access to local roads and improve traffic flow
- A right-turn bay has been provided from the northbound carriageway of Campbelltown Road to improve access to Blomfield Road.

Purpose of this report

This report documents the following aspects that have occurred since display of the REF:

- Issues raised in submissions, and responses to these submissions (Chapter 2)
- Additional assessments by Roads and Maritime (Chapter 3)
- Design refinements made to the proposal by Roads and Maritime and the environmental assessment of impacts resulting from the refinements (Chapter 4)
- The revised environmental management measures to be implemented to mitigate the impacts of the proposal (Chapter 5).

Next steps

The proposal as described in the REF, including refinements as documented in this submissions report, meets the project's safety and improved capacity objectives, while minimising environmental impacts and considering community issues.

Roads and Maritime is seeking project determination for the final concept design as reported in this submissions report.

Should the project be approved, Roads and Maritime would carry out detailed design, in consultation with relevant government agencies and stakeholders, and proceed to a staged construction program, subject to funding.

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Appendix C	Heritage Appendix Supplementary Statement of Heritage Impact (Artefact Heritage 2013c) Landscape Heritage Assessment (Taylor Brammer Landscape Architects 2013) Heritage Gates Landscape Plan (HBO+EMTB Urban and Landscape Design 2013b)
Appendix D	Urban Design Appendix Zouch Road to Brooks Road Supplementary Visual Impact Assessment (HBO+EMTB Urban and Landscape Design 2013a) Photomontages package (HBO+EMTB Urban and Landscape Design 2013c)
Appendix E	Supplementary Land Use and Socio-Economic Impact Assessment (Hyder Consulting 2014), including a Business Impact Assessment (Hill PDA 2013)

Terms and acronyms used in this report

Term/acronym	Description
ANZECC	Australia and New Zealand Environment and Conservation Council
ARI	Average recurrence interval
CEMP	Construction environmental management plan
CHAR	Cultural heritage assessment report
CRSC	Campbelltown Road site complex
DEC	Former NSW Department of Environment and Conservation (now OEH)
DECC	Former NSW Department of Environment and Climate Change (now OEH)
DECCW	Former NSW Department of Environment, Climate Change and Water (now OEH)
DoP	Former NSW Department of Planning
DoE	Commonwealth Department of the Environment
DP	Deposited plan
DPI	NSW Department of Primary Industries
P&E	Planning and Environment (formerly NSW Department of Planning & Infrastructure – DP&I)
DUAP	Former NSW Department of Urban Affairs and Planning
EMME	Equilibrium Model/Multimodal Equilibrium. A strategic traffic forecasting model maintained by Roads and Maritime Services
ENV	Existing native vegetation
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW). Provides the legislative framework for land use planning and development assessment in NSW
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth). Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process.
ESD	Ecologically Sustainable Development. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends, are maintained and the total quality of life, now and in the future, can be increased.
GCRF	Growth Centres Road Framework
ha	Hectare(s)
IHO	Interim Heritage Order
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i>
km	Kilometre(s)
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act
LGA	Local government area
LoS	Level of Service. A qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers
NB	Northbound

Term/acronym	Description
NWGC	North West Growth Centre
OEH	NSW Office of Environment and Heritage
PACHCI	RMS Procedure for Aboriginal Cultural Heritage Consultation and Investigation
PEMP	Project Environmental Management Plan
REF	Review of environmental factors
RTA	Former New South Wales Roads and Traffic Authority (now Roads and Maritime Services)
SB	Southbound
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEWPaC	Former Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now DoE)
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
SIDRA	Intersection modelling software used in traffic forecasting
SWGC	South West Growth Centre
SWMP	Soil and Water Management Plan
SWRL	South West Rail Link
TMAP	Traffic management and accessibility plan
TMP	Traffic management plan
TfNSW	Transport for New South Wales
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)
Veh/h	Vehicles per hour
V/C	Volume capacity ratio

1 Introduction and background

1.1 Purpose of this report

In 2013, Roads and Maritime Services (Roads and Maritime) prepared a Review of Environmental Factors (REF) to assess the environmental impacts of a proposed upgrade of Campbelltown Road from Camden Valley Way to Brooks Road (the proposal). This submissions report relates to, and should be read in conjunction with the REF.

The REF was placed on public display (refer Section 1.5 of this report), and submissions relating to the proposal and the REF were received by Roads and Maritime.

This submissions report describes:

- Issues raised in submissions, and responses to these submissions (Chapter 2)
- Additional assessments by Roads and Maritime (Chapter 3) including:
 - Supplementary Traffic Assessment (AECOM 2014, Appendix B)
 - Peer-review of the original and supplementary traffic and transport studies (GTA Consultants 2013, Appendix B)
 - Supplementary Statement of Heritage Impact (Artefact Heritage 2013c, Appendix C)
 - Landscape Heritage Assessment (Taylor Brammer Landscape Architects 2013, Appendix C)
 - Zouch Road to Brooks Road Supplementary Visual Impact Assessment (HBO+EMTB Urban and Landscape Design 2013a, Appendix D)
 - Supplementary Land Use and Socio-Economic Impact Assessment (Hyder Consulting 2014, Appendix E), including a Business Impact Assessment (Hill PDA 2013).
- Design refinements made to the proposal by Roads and Maritime and the environmental assessment of impacts resulting from the refinements (Chapter 4)
- The revised environmental management measures to be implemented to mitigate the impacts of the proposal (Chapter 5).

1.2 The proposal

Roads and Maritime proposes to upgrade 5.4 kilometres of Campbelltown Road between Camden Valley Way, Casula and Brooks Road, Denham Court to service development in metropolitan Sydney's South West Growth Centre (SWGC) and changes to surrounding areas.

The original proposal described in the REF would involve:

- Widening Campbelltown Road to six lanes between Camden Valley Way and Beech Road (three lanes each way), and four lanes from Beech Road to Brooks Road (two lanes each way)
- The wider median south of Beech Road would facilitate a future six-lane road design, if required
- Providing a central median
- Upgrading existing (and providing additional) intersections along the route
- Providing a shared path for bicycles and pedestrians
- Building new bridges over Maxwells Creek and the Hume Motorway (formerly known as Hume Highway)
- Upgrading culverts

- Realigning an 85-metre section of Maxwells Creek.

The full project scope and description as originally proposed can be found at Section 3 of the REF. Since the REF was displayed, the concept design of the proposal has been revised. More detail is provided in Chapter 4 of this report.

1.3 Staging and funding

The start of the proposal, and construction timeframes, would depend on funding. If the project is approved, Roads and Maritime would invite tenders for detailed design. Following this and subject to funding, construction tenders would then be invited, most likely in stages. The timing of construction has not been confirmed.

Indicative project staging and what each stage entails can be viewed in Section 3.3.1 and Figure 3-41 of the REF. Construction staging would be reviewed during detailed design and is subject to change.

The first stage of construction would be carried out by UrbanGrowth as part of the Edmondson Park South precinct development

The proposal is expected to be funded by a mix of government and developer funding.

1.4 Regional and local context

Figure 1.1 presents the location of the proposal. More detailed figures are included in Appendix A.

Throughout this document, the following terms are used to describe Campbelltown Road and the surrounding land:

- Northbound carriageway – the carriageway directing traffic towards Liverpool from Campbelltown in a general north-easterly direction
- Southbound carriageway – the carriageway directing traffic towards Campbelltown from Liverpool in a general south-westerly direction
- Land to the north/west of Campbelltown Road – the land that is next to the northbound carriageway that generally falls within the Liverpool Local Government Area (LGA).
- Land to the south/east of Campbelltown Road – the land that is next to the southbound carriageway of Campbelltown Road that generally falls within the Campbelltown LGA.

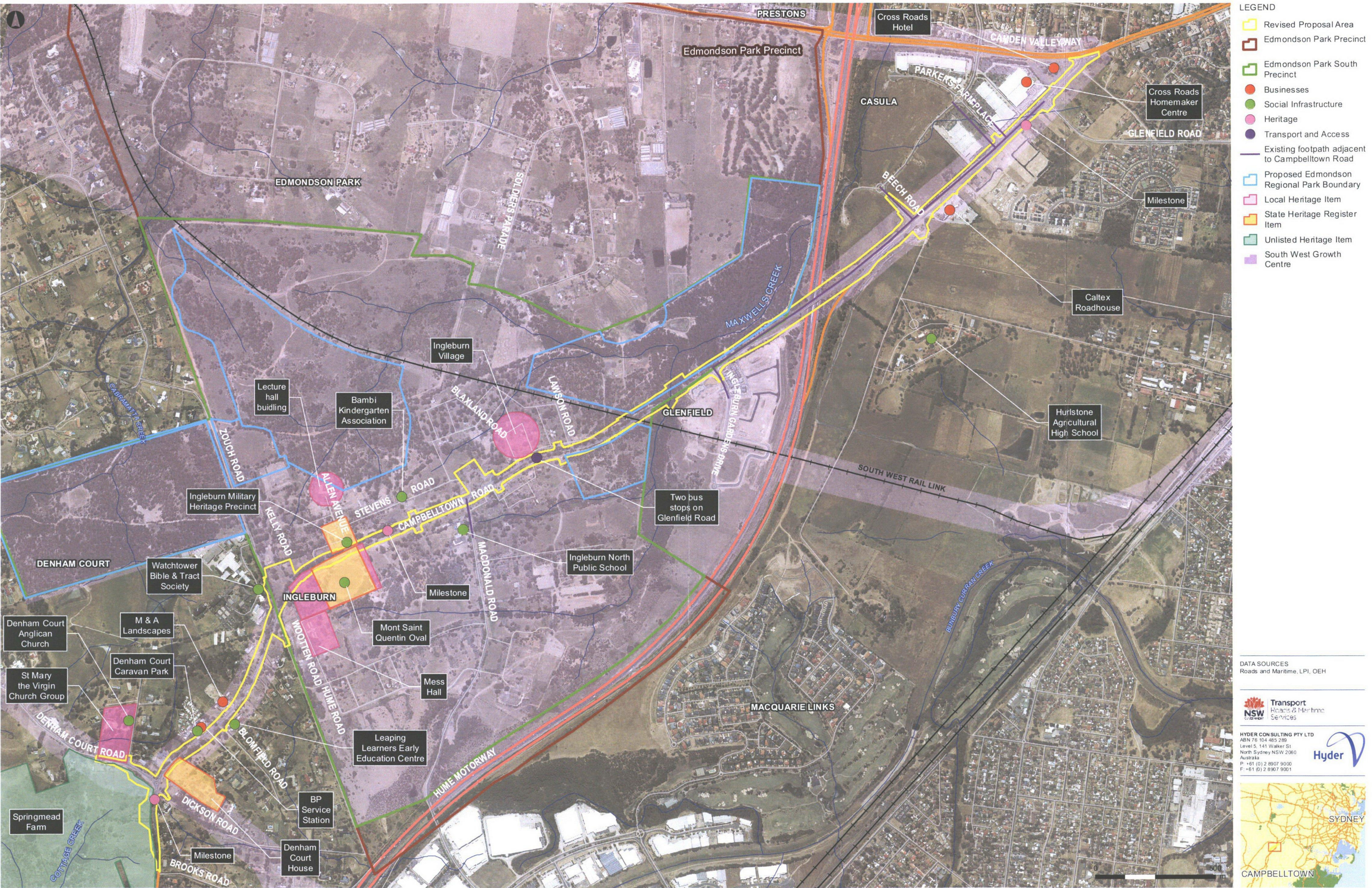


Figure 1-1: Map showing local and regional context of the proposal

1.5 REF display

Roads and Maritime exhibited the REF between 11 April 2013 and 5 July 2013 at four locations, as detailed in Table 1.1, and conducted consultation activities as detailed in Table 1.2.

To increase public awareness of the proposal, Roads and Maritime placed the REF on its website and made it available for download. The exhibition locations and website link were advertised in the *Macarthur Advertiser* on 27 March 2013.

Table 1.1: Display locations

Location	Address
Narellan Library	Corner of Queen and Elyard streets, Narellan Monday and Wednesday from 9.30am – 8pm Tuesday, Thursday and Friday from 9.30am – 5pm Saturday from 9am – 3pm
Narellan Motor Registry	Shop G1, Narellan Town Centre 326 Camden Valley Way, Narellan Monday to Friday from 8.30am – 5pm Saturday from 8.30am – 12pm
Ingleburn Greg Percival Library	Corner of Oxford and Cumberland roads, Ingleburn Monday and Friday from 9.30am – 8.30pm Tuesday to Thursday from 9.30am – 5pm Saturday from 9am – 12pm
Campbelltown HJ Daley Library	1 Hurley Street, Campbelltown Monday to Friday from 9.30am – 8.30pm Saturday from 9am – 4pm Sunday from 10.30am – 4pm

Table 1.2: Consultation activities

Timeline	Consultation activity
14 March 2012	Project website, email address and phone line went live
25 May 2012	Consultation letter to Liverpool City Council in accordance with ISEPP Clauses 13 and 15
28 May 2012	Consultation letter sent to EPA and OEH
7 June 2012	Letter sent to Liverpool City Council and Campbelltown City Council in accordance with ISEPP Clause 13 and Clause 15
15 June 2012	Meeting with Liverpool City Council about the proposal
4 October 2012	Consultation letter sent to NSW P&E in accordance with Clause 18A of the Growth Centre SEPP
8 October 2012	Project team met with OEH
19 November 2012	Project team met with NSW P&E
7 December 2012	Project team met with OEH Heritage Branch
16 January 2013	Advertisement in <i>Koori Mail</i> for involvement in Aboriginal heritage consultation
February 2013	A letter distributed to residents along Campbelltown Road to advise of the proposal and invite them to register interest for proposal updates (12 responses were received)
6 February 2013	Closing date for registration of interest in involvement in Aboriginal heritage consultation

Timeline	Consultation activity
7 February 2013	Consultation letter sent to Campbelltown City Council in accordance with ISEPP Clause 14
14 February 2013	Project team met with OEH and NSW P&E
21 February 2013	Project team met with OEH Heritage Branch
22 February 2013	Consultation letter sent to Liverpool City Council in accordance with ISEPP Clause 14
22 February 2013	Aboriginal Focus Group meeting held
27 February 2013	Project team met with DoE (formerly SEWPaC), P&E and OEH
4 March 2013	Project team met with OEH Heritage Branch to present proposal options and received verbal in-principle agreement with the approach adopted
22 March 2013	Project team met with the owner of Denham Court House, and a resident of Campbelltown Road, Denham Court to discuss their concerns about potential impacts of the proposal (these stakeholders had responded to the February letter)
27 March 2013	Advertisements announcing the display of the REF and concept design were placed in local newspapers
11 April 2013	The REF was placed on display and the website was updated
11 and 13 April 2013	Community sessions were held as advertised. A small number of community members attended the first session at Narellan Town Centre; no community members attended the second session in Ingleburn
21 April 2013	Community update brochures were distributed
2 May 2013	Additional community update brochures were hand delivered to residents of Blomfield Road and Campbelltown Road in Denham Court, after feedback that they had not been received
	A community session was held at Leppington Progress Hall (5 residents of Blomfield Road, Denham Court attended)
4 May 2013	A community information session was held at Crossroads Homemaker Centre, Casula (about 20 community members attended, mostly from Denham Court and Glenfield)
10 May 2013	Due to community requests, Roads and Maritime extended the submissions process in response to feedback received, and called and emailed each person who had enquired about the proposal to inform them of the time extension
10 May 2013	Four media enquiries were received about the consultation process of the proposal
16 May 2013	The project team met with the Member for Campbelltown to discuss the project and media interest
20 May 2013	The project team attended a community information session about the proposal hosted by Scenic Hills Association
21 May 2013	The project team met with the Member for Camden to discuss the proposal and media interest
24 May 2013	The project team distributed a Letter to Residents and Questions and Answers fact sheet to Denham Court residents to address the key issues raised in feedback Roads and Maritime updated the project website with

Timeline	Consultation activity
	additional information
29 May 2013	The project team and Campbelltown City Council met with the Minister for Roads and Ports The submissions period was extended to 28 June
5 June 2013	The extension to the REF exhibition period was advertised in the <i>Macarthur Advertiser</i>
24 June 2013	The project team attended a community information session at Ingleburn Community Hall hosted by Campbelltown City Council
25 June 2013	The project team briefed Liverpool City councillors
28 June 2013	The submissions period was extended for an additional week Roads and Maritime updated the project website with information from the community information session held 24 June, and announced the extended closing date for submissions
5 July 2013	Closing date for submissions
7 August 2013	The project team briefed Heritage Council about an Interim Heritage Order (refer Section 1.6 of this report)
7 August 2013	The project team discussed traffic modelling for the proposal with Scenic Hills Association
22 October 2013	Final date for accepting late submissions
23 October 2013	The project team met with OEH Heritage Branch about an Interim Heritage Order (refer to Section 1.6 of this report)
4 December 2013	The project team presented to Heritage Council about an Interim Heritage Order (refer to Section 1.6 of this report)

As documented in Table 1.2, and in response to community concerns, Roads and Maritime:

- Extended the consultation and submissions period for the REF to 5 July 2013, resulting in a total display period of 12 weeks
- Consulted with and notified community members and groups about the submissions process
- Committed to ensuring that the submissions report would be made available to those who provided submissions, and would be published on the project website
- Frequently updated the project website to:
 - Thank the community for their ongoing interest in the proposal, and for including Roads and Maritime in the community meeting
 - Show links to the Edmondson Park Master Plan, Department of Planning and Infrastructure Edmondson Park approvals and the South West Growth Centre Structure Plan
 - Provide a Letter to Residents (24 May 2013) addressing their concerns
 - Provide information about traffic modelling processes, as requested at the community meeting on 24 June 2013
 - Provide the posters presented at the meeting on 24 June 2013. Topics included Big Picture Planning; Road Project Development Process; Zouch Road to Denham Court Road Alignment; Blomfield Road Access; Zouch Road to Denham Court Local Access; Heritage; Edmondson Park Development; and Other Issues, Staging and Next Steps.

1.6 Interim Heritage Order, Campbelltown Road

In June 2013, the Scenic Hills Association requested that the Heritage Council of NSW consider an Interim Heritage Order (IHO) for Campbelltown Road between the Crossroads at Casula and Raby Road, St Andrews. The request also included Denham Court Road. However, this road is not being considered for upgrade by Roads and Maritime due to its classification as a regional road and being under the care and control of local government.

On 7 August 2013, Roads and Maritime presented to the Heritage Council of NSW. The meeting resolved "That the Heritage Council of NSW:

1. Request Roads and Maritime Services (RMS) carry out a detailed heritage study of Campbelltown Road in the context of surviving colonial roads to inform option choice and design development; and
2. Defer consideration of the item's level of significance and determination of the need for IHO at this time, pending further consultation with RMS."

Roads and Maritime subsequently commissioned supplementary heritage studies and made changes to the proposed design to reduce heritage and property impacts. These additional studies are appended to this report (Appendix C) and summarised in Sections 3.4 and 3.5 of this report.

After these studies were completed, Roads and Maritime presented to the Heritage Council of NSW on 4 December 2013. The outcomes of the meeting were:

- "1. A wider study of the Great South Road, as one of the significant early roads in NSW, is required and resolved to commission a study; and
2. Resolved not to recommend an IHO be made at this time."

The minutes of this meeting were adopted on 5 February 2014.

2 Response to issues

Roads and Maritime received 76 submissions, including a form letter submission with 78 signatories and a petition with 240 signatories. There were seven submissions from government agencies, 10 from organisations and 60 from individuals.

Table 2.1 lists each respondent and their allocated submission number (All respondents will be notified directly of their submission number). The table also indicates where the issues from each submission are addressed in this chapter.

Subsequent sections in this chapter provide an overview of the key issues, and address each issue in turn.

Table 2.1: Respondents

Respondent	Submission no.	Section number where issues are addressed
Vista at Panorama, Glenfield	1	2.12
Individual submission	2	2.15.6
Individual submission	3	2.2.1, 2.4.1, 2.6, 2.11.6, 2.14
Individual submission	4	2.11.6, 2.11.8
Individual submission	5	2.11.6, 2.11.8
Individual submission	6	2.3.2, 2.4.1, 2.4.2, 2.6, 2.9.3, 2.11.2, 2.11.6, 2.11.7, 2.15.8, 2.16
Individual submission	7	2.2.1, 2.4.1
Individual submission	8	2.2.1, 2.4.1
Individual submission	9	2.11.6
Individual submission	10	2.2.1, 2.3.2, 2.4.1, 2.6, 2.9.5, 2.11.4, 2.11.6, 2.11.7, 2.11.8, 2.13, 2.15.2, 2.15.3, 2.15.5, 2.15.6, 2.15.7, 2.16
Individual submission	11	2.9.5, 2.11.8
Individual submission	12	2.11.6, 2.11.8
Individual submission	13	2.6
Individual submission	14	2.2.1, 2.2.2, 2.11.4, 2.11.6, 2.11.8
BP service station	15	2.11.6, 2.11.8, 2.15.5
Individual submission	16	2.6, 2.11.6
Individual submission	17	2.6, 2.11.6, 2.11.8, 2.15.5, 2.15.6, 2.15.7
Individual submission	18	2.3.1, 2.11.2, 2.16
Individual	19	2.4.1, 2.4.2, 2.6, 2.11.2, 2.11.3, 2.12, 2.16

Respondent	Submission no.	Section number where issues are addressed
submission		
Bambi Kindergarten Association Inc	20	2.14, 2.15.3
Individual submission	21	2.3.2
Individual submission	22	2.6
Individual submission	23	2.2.1, 2.5, 2.6, 2.9.3, 2.15.7
Scenic Hills Association	24	2.2.1, 2.2.2, 2.3.1, 2.3.2, 2.5, 2.6, 2.7.2, 2.9.1, 2.9.2, 2.9.3, 2.9.5, 2.9.6, 2.11.1, 2.11.2, 2.13, 2.14, 2.15.3, 2.15.8, 2.16
Individual submission	25	2.2.1, 2.2.2, 2.5, 2.6, 2.9.2, 2.9.3, 2.9.4, 2.9.5, 2.11.1, 2.11.4, 2.11.6, 2.11.8, 2.15.3, 2.15.6, 2.15.7, 2.15.8
Individual submission	26	2.11.6
Individual submission	27	2.11.6
Individual submission	28	2.2.1, 2.3.2, 2.9.3, 2.11.6, 2.11.8
Individual submission	29	2.16
Individual submission	30	2.11.6, 2.16
Individual submission	31	2.12, 2.16
NSW Office of Environment and Heritage	32	2.2.2, 2.7.1, 2.7.2, 2.7.3, 2.11.2, 2.14
NSW Office of Environment and Heritage (OEH Heritage Branch)	33	2.9.1
Heritage Council of NSW	34	2.8, 2.9.1, 2.9.2, 2.9.3, 2.9.4, 2.9.6, 2.14
Individual submission	35	2.15.3
Commonwealth Defence Support and Reform Group – Northern NSW	36	2.15.4
Individual submission	37	2.3.2, 2.6, 2.9.3, 2.11.5, 2.11.8, 2.12, 2.15.1, 2.15.3, 2.15.4, 2.15.6
Campbelltown and Airds Historical Society Inc	38	2.7.3, 2.9.2, 2.9.4, 2.9.5,
Individual submission	39	2.11.6, 2.11.7, 2.15.3
Denham Court Association	40	2.2.1, 2.4.2, 2.6, 2.11.1, 2.15.7, 2.15.8

Respondent	Submission no.	Section number where issues are addressed
Individual submission	41	2.2.1, 2.2.2, 2.3.2, 2.4.1, 2.6, 2.7.2, 2.9.3, 2.9.4, 2.9.5, 2.11.1, 2.11.6, 2.11.8, 2.13, 2.14, 2.15.2, 2.15.3, 2.15.6, 2.15.7, 2.15.8
Individual submission	42	2.2.1, 2.4.1, 2.11.6, 2.15.2, 2.15.3
Individual submission	43	2.15.6
Individual submission	44	2.15.7
Individual submission	45	2.2.1, 2.2.2, 2.7.2, 2.9.2, 2.11.8, 2.13, 2.15.3, 2.15.6, 2.15.8
NSW Planning and Environment	46	2.7.1, 2.7.3
Individual submission	47	2.2.1, 2.6, 2.9.3, 2.9.5, 2.15.3
UrbanGrowth NSW	48	2.14
Individual submission	49	2.2.1, 2.4.1, 2.4.2, 2.6, 2.9.3, 2.11.1, 2.11.5, 2.11.6, 2.11.7, 2.14
Individual submission	50	2.2.1, 2.5, 2.6, 2.11.8, 2.15.3
Individual submission	51	2.3.2, 2.10, 2.11.6, 2.11.8, 2.13, 2.14, 2.15.3, 2.15.4, 2.15.5, 2.15.6
Individual submission	52	2.2.1, 2.3.2, 2.6, 2.11.3, 2.11.6
Individual submission	53	2.2.1, 2.3.2, 2.6, 2.9.3, 2.15.7
National Trust of Australia	54	2.9.3
Individual submission	55	2.11.6, 2.15.5, 2.15.6
Individual submission	56	2.11.6
Campbelltown City Council	57	2.2.1, 2.2.2, 2.3.1, 2.3.2, 2.4.1, 2.6, 2.9.3, 2.9.4, 2.9.5, 2.11.1, 2.11.6, 2.11.7, 2.16
Individual submission	58	2.2.1, 2.3.1, 2.4.1, 2.6, 2.10, 2.15.3, 2.16
Individual submission	59	2.7.3, 2.9.2, 2.9.3, 2.9.4, 2.15.3
Individual submission	60	2.2.1, 2.6, 2.7.3, 2.9.3, 2.11.6, 2.11.7, 2.13, 2.15.7, 2.16
Individual submission	61	2.7.3, 2.11.8
Individual submission	62	2.3.2, 2.15.3
Individual submission	63	2.3.2
Individual submission	64	2.2.1, 2.3.2, 2.4.1, 2.9.2, 2.11.7, 2.15.7
Liverpool City Council	65	2.4.2, 2.7.3, 2.9.1, 2.9.4, 2.10, 2.11.6, 2.11.8, 2.12, 2.14, 2.15.4, 2.15.5, 2.15.6, 2.16
Individual submission	66	2.2.1, 2.6, 2.7.3, 2.9.2, 2.9.3, 2.11.1, 2.11.6, 2.11.8, 2.13, 2.15.3, 2.15.6, 2.15.8

Respondent	Submission no.	Section number where issues are addressed
Individual submission	67	2.2.1, 2.6, 2.7.2, 2.7.3, 2.9.2, 2.9.3, 2.11.1, 2.11.6, 2.11.8, 2.13, 2.14, 2.15.2, 2.15.3, 2.15.6, 2.15.7, 2.15.8
Carmelite Nuns, Varroville	68	2.2.1, 2.4.1, 2.4.2, 2.7.2, 2.8, 2.9.1, 2.11.1, 2.11.5, 2.15.3, 2.15.8
Individual submission	69	2.2.1, 2.3.1, 2.6, 2.9.3, 2.15.3
Individual submission	70	2.2.1, 2.3.1, 2.6, 2.15.8
Petition (240 signatories)	71	2.11.5, 2.11.6, 2.11.7, 2.11.9, 2.15.3, 2.15.5, 2.16
Watchtower Bible and Tract Society of Australia	72	2.11.6, 2.15.5, 2.16
Individual submission	73	2.11.9
Individual submission	74	2.15.6
Individual submission	75	2.9.3
Form letter, various (78 signatories)	76	2.2.1, 2.2.2, 2.4.1, 2.5, 2.6, 2.9.1, 2.9.3, 2.11.1, 2.11.7, 2.11.8, 2.13, 2.15.3, 2.15.6, 2.15.7, 2.15.8, 2.16

2.1 Overview of issues raised

Roads and Maritime has examined each submission to understand the issues raised. The issues have been extracted and collated, and responses to the issues have been provided. Where similar issues have been raised in different submissions, only one response has been provided.

In relation to the overall proposal:

- About 71 per cent of submissions objected to the proposal
- About seven per cent provided positive comments on the proposal, including Liverpool City Council and Commonwealth Defence Support and Reform Group, Northern NSW
- About 22 per cent of submissions did not offer a position on the proposal.

2.1.1 Government agency and stakeholder submissions

Submissions were received from the following agencies and stakeholders:

- NSW Office of Environment and Heritage (OEH)
- NSW Office of Environment and Heritage, Heritage Branch (OEH Heritage Branch)
- Commonwealth Defence Support and Reform Group, Northern NSW
- NSW Department of Planning and Environment (P&E)
- UrbanGrowth NSW (UrbanGrowth)
- Campbelltown City Council
- Liverpool City Council.

The main issues raised in the OEH submission included:

- The avoidance, minimisation and offsetting of ecological impacts on the proposed Regional Park within the Edmondson Park precinct, and maintenance of ecological connectivity
- Compliance with the Biodiversity Certification of Sydney's Growth Centres
- Additional consultation around safeguards and mitigation measures, particularly with regards to landscape design at the interface between the proposal and the proposed Edmondson Regional Park.

The main issues raised by OEH Heritage Branch included:

- A request for additional consultation with the Heritage Council of NSW
- Concern about the alignment of the proposal and the impact on curtilage at Denham Court House (which is listed on the State Heritage Register (SHR))
- Impacts of the proposal on the heritage gates within the Ingleburn Military Heritage Precinct and Mont St Quentin Oval (which are listed on the SHR).

The Commonwealth Defence Support and Reform Group, Northern NSW did not raise any issues, but noted its support for measures to improve general road safety and meet future traffic demands. The submission recommended that UrbanGrowth be consulted separately as owner of the former Ingleburn Army Camp and that Department of Finance be consulted in relation to the Defence landholdings at Moorebank Avenue, which form the site selected for an Intermodal Terminal facility.

P&E provided feedback to Roads and Maritime about the Biodiversity Certification of the Growth Centres and issues around vegetation clearing. P&E also noted that some comments previously provided for the Ecological Assessment had not been addressed.

UrbanGrowth requested more detail around the landscaping associated with the proposal and provided some photomontages and recommendations in relation to landscape design for consideration.

The main issues raised by Campbelltown City Council included:

- A questioning of the strategic need for the proposal (as it was not included in the 1970s *Three Cities Plan (Campbelltown-Camden-Appin)*), and the justification for widening the road past Macdonald Road
- Concerns about potential traffic impacts, traffic modelling, intersections with local roads and access, and impacts on local roads
- Concerns about potential heritage impacts, including impacts on Denham Court House curtilage and impacts on the heritage gates in the Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- The consultation process, and requests for additional consultation
- Alternative transport modes that could be encouraged by the proposal
- Construction staging.

Liverpool City Council offered support for the proposal but raised a number of issues, including:

- The need to clarify the strategic need for the proposal
- Construction matters, including staging and haul roads
- Potential reclassification of Denham Court Road
- Impacts on biodiversity, including vegetation clearing
- Mitigation of potential heritage impacts
- Intersections with local roads and access
- Mitigation of potential noise impacts

- Landscape design considerations, including street lighting
- Property impacts, including impacts on Council land
- Hydrology and drainage impacts, as well as safeguards and management measures.

2.1.2 Community submissions

The submissions from the public (individuals and organisations), including a form letter and a petition, raised a number of issues, including:

- The strategic need for the proposal and options considered
- The consultation process, which was seen to be inadequate by some members of the public in terms of timeframes and transparency
- The potential impact of the proposal on non-Aboriginal heritage items, including the Ingleburn Military Heritage Precinct and Mont St Quentin Oval, Denham Court House estate and Campbelltown Road itself, as well as the level of assessment in relation to this in the REF
- Traffic, transport and access, particularly in relation to Zouch Road, Blomfield Road and Denham Court Road
- The need to clarify aspects of the concept design, such as the construction process, and how the proposal would fit under the SWRL overbridge
- The need to clarify aspects of the statutory approvals process for the proposal, such as why an EIS was not required
- Land-use and socio-economic impacts, including land acquisition, impacts on land values, and potential impacts on businesses and residences
- Noise impacts and mitigation measures, particularly around the Vista at Panorama development, Glenfield
- Potential impacts of the proposal on local air quality.

Each issue is described and addressed in the following sections.

2.2 Proposal justification

2.2.1 Strategic need

Respondents and submission numbers

Campbelltown City Council, Carmelite Nuns of Varroville, Scenic Hills Association, Denham Court Association, 3, 7, 8, 10, 14, 23, 25, 28, 41, 42, 45, 47, 49, 50, 52, 53, 58, 60, 64, 66, 67, 69, 70, 76

Issue description

The submissions raised the following issues:

- Who requires the Campbelltown Road upgrade? There is a lack of demonstrated interagency collaboration/consultation on the proposal
- What is the real reason for the proposal? What is the big picture? The proposal should be justified with more certainty around potential future growth and the timing of planned developments in the SWGC
- Looking at other roads in the area, Campbelltown Road does not need to be upgraded because:
 - Any increase in traffic along Campbelltown Road would be due to Roads and Maritime's failure to build adequate roads elsewhere, as well as to compensate for the anticipated failure of the northern end of Camden Valley Way. Roads and Maritime should fix bottlenecks and/or failures in

- other major roads such as the Hume Motorway and Camden Valley Way rather than upgrade Campbelltown Road
- Denham Court Road would not be upgraded beyond that adjoining East Leppington
- There is already sufficient access to local roads; Camden Valley Way, Soldiers Parade (formerly known as Croatia Avenue), the Hume Motorway, Williamson Road and Macdonald Road provide adequate access services for the Edmondson Park precinct
- Brooks Road is not suitable for opening onto the Hume Motorway
- Campbelltown City Council noted that the need for the proposal is highly predicated on the fact that Denham Court Road would be upgraded as part of the East Leppington development at the western end of Denham Court Road. Without an upgrade of Denham Court Road, there would be a dramatically reduced need to upgrade Campbelltown Road, ie the traffic modelling assumed that Denham Court Road would also be upgraded to four lanes from Camden Valley Way to Campbelltown Road
- The Hume Motorway was expanded to discourage traffic on Campbelltown Road, but now Roads and Maritime is encouraging traffic on Campbelltown Road
- What is the development plan for the suburb of Denham Court and the Central Hills Lands (commonly referred to as the Scenic Hills area)?
- The proposal does not adhere to the principles of ecologically sustainable development.

Response

The strategic need for the proposal has been thoroughly investigated and documented.

Stakeholders involved in planning the Campbelltown Road upgrade

The NSW Government established the North West Growth Centre (NWGC) and SWGC in 2005 to sustainably prepare for and manage Sydney's growth over the next 20 to 30 years by streamlining the supply of greenfield land for urban development and coordinating the delivery of infrastructure through P&E. Planning and Infrastructure coordinates and oversees the development of the growth centres, as well as planning for infrastructure in accordance with these plans.

The NSW government agency UrbanGrowth drives investment in NSW and seeks to provide greater housing choice and affordability. UrbanGrowth is developing the Edmondson Park precinct using former Defence land in order to cater for future growth anticipated in the region. The SWGC precinct land releases would provide new homes on a scale equivalent to fitting 80 per cent of the current population of Canberra into 20 per cent of its land area (TfNSW 2012).

Roads and Maritime is supporting this development by planning, providing and maintaining the road network to improve the movement of people and goods by various transport modes (Roads and Maritime 2013). There would be a number of new local roads built within the Edmondson Park precinct by UrbanGrowth in accordance with the conditions of a Part 3A approval under the NSW Environmental Planning and Assessment Act 1979 (EP&A Act) for development of the precinct. These new local roads would facilitate the movement of people in and around this precinct; however, in order to facilitate their movement in and around the wider Sydney road network, it would be essential to upgrade Campbelltown Road (which is classified as a principal arterial road, refer to Table 2.2) to a minimum four-lane configuration in the short-medium term.

There is demonstrated interagency collaboration/consultation on the proposal, as shown in Figure 2.1.

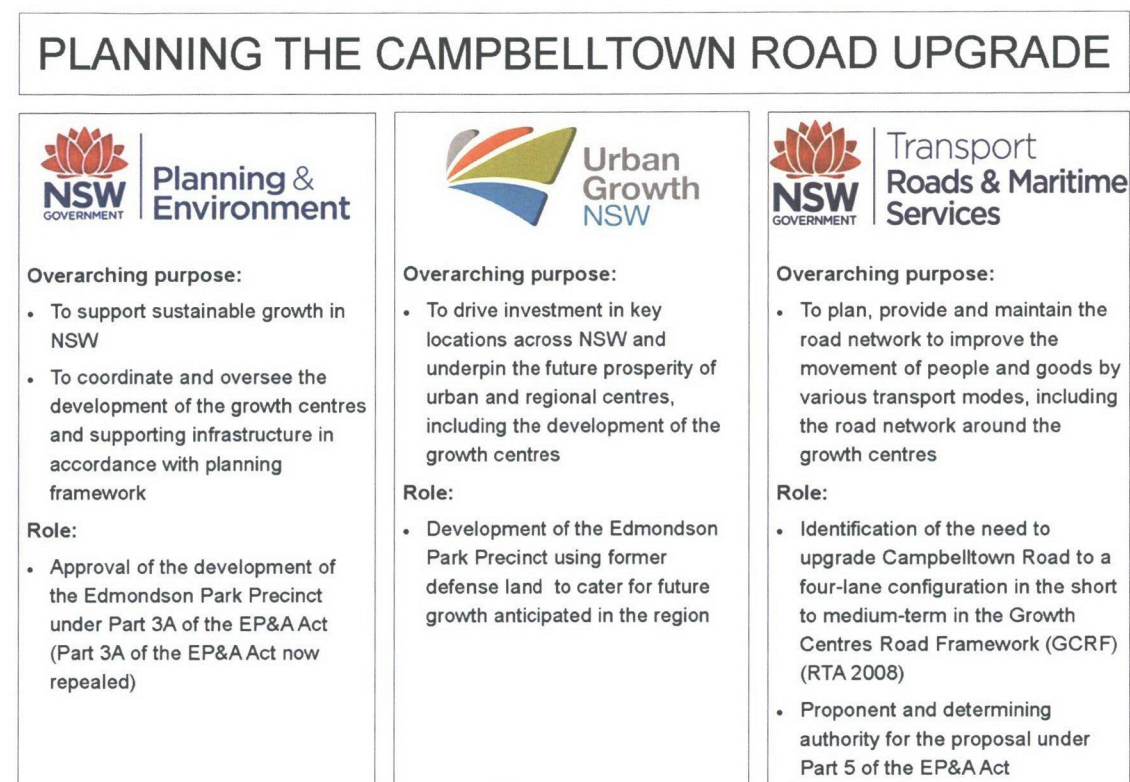


Figure 2.1: Key stakeholders involved in planning the Campbelltown Road upgrade

The coordination between government agencies is also reflected in the bigger plans for the area, as shown on [the P&E website](#) (as of May 2014). For example:

- The Campbelltown Road upgrade corridor has been shown on the *Campbelltown (Urban Area) Local Environment Plan 2002* for over a decade. This plan is the current planning instrument for the Campbelltown LGA
- The proposal is consistent with, and supports, NSW planning strategies, including NSW 2012, the State Infrastructure Strategy and the Long Term Transport Master Plan, as described in Section 2.1 of the REF
- The upgrade corridor has also been confirmed and identified on the *Edmondson Park South Development Control Plan 2012* and by the Planning Assessment Commission in 2011.

The development of these plans is discussed in more detail in Section 2.2.2 of this report.

What is the reason for the proposal?

Roads and Maritime's Growth Centres Road Framework (GCRF) presents a road hierarchy to guide appropriate development of the major road network in the NWGC and SWGC. The GCRF addresses issues such as traffic demand, design standards, road character, and integration of arterial roads with local roads (RTA 2008). As outlined in the REF (Section 2.1.1), Campbelltown Road is classified as a principal arterial road in the GCRF, and Roads and Maritime has designed the proposed upgrade to cater for predicted growth in traffic.

Table 2.2 provides a summary of the characteristics of a principal arterial road in

relation to other types of roads within the GCRF.

Table 2.2: Summary of road types within the GCRF

Road type	Functions and attributes	Examples
Motorways	<ul style="list-style-type: none"> • Provide high speed transportation at up to 110 km/h • Grade-separated intersections (interchanges) and access control 	Hume Motorway
Principal arterials	<ul style="list-style-type: none"> • Connect with motorways, with posted speeds of 80 km/h and 70 km/h • Largely dedicated to a transport function, although often with pedestrian access and commercial frontage near towns or centres • Higher degree of access control with rationalised intersections and occasional grade separations 	Campbelltown Road, Camden Valley Way
Transit boulevards	<ul style="list-style-type: none"> • Connect with principal arterials, with posted speeds of 60 km/h and 50 km/h • Provide a mix of transport and land service functions • Public transport corridors strongly associated with residential and commercial activities 	Soldiers Parade
Sub arterial	<ul style="list-style-type: none"> • Connect with transit boulevards, with a posted speed of 50 km/h • Service a community role, but still have a significant transport function 	Denham Court Road
Local road	<ul style="list-style-type: none"> • Connect with sub-arterials • Primarily provide a land service function and provide low-speed access to housing and employment areas 	Church Road

Source: RTA (2008)

Figure 2.2 shows the road types within the GCRF in relation to the nearby Edmondson Park precinct. As shown, Campbelltown Road, when upgraded, would have the attributes of a principal arterial road, but with certain constraints, such as:

- The restricted width of the corridor in some places – such as next to the Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- The need for a reduced speed limit at the entrance to the Edmondson Park Town Centre
- The value of the landscape character of the road south of Zouch Road.

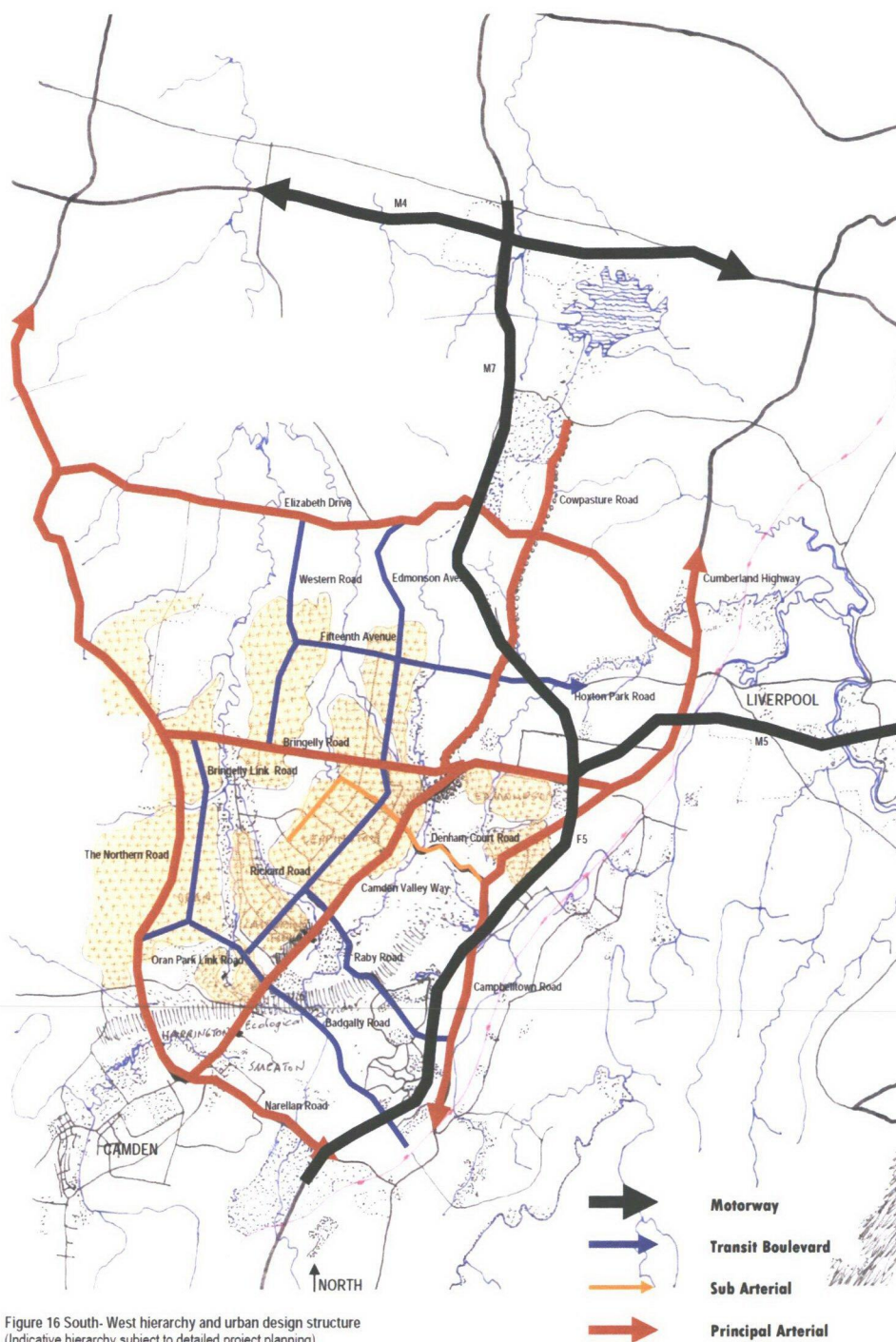


Figure 2.2: The Growth Centre Road Framework in relation to the proposal area and Edmondson Park precinct

As a principal arterial road, Campbelltown Road would play a major role in accommodating traffic to and from Casula, Liverpool Central Business District (CBD) and Campbelltown CBD, including traffic generated by the Edmondson Park precinct and traffic associated with the SWGC. The South West Rail Link (SWRL) is expected to attract a number of additional trips and would increase localised pressure on Campbelltown Road as it becomes an important link to Edmondson Park Station. This is despite the SWRL resulting in an overall reduction of traffic across the wider network. Extra road network capacity and new public transport services would be needed to efficiently move people within and out of the sub-region.

The Supplementary Traffic Assessment (AECOM 2014) has addressed the strategic need for the Campbelltown Road upgrade in regards to land uses along the corridor, population and employment growth, and mid-block (ie the mid-point taken between two intersections) capacity. The Supplementary Traffic Assessment has utilised growth data obtained from the P&E for planned developments in the SWGC. A summary of the strategic need for the proposal is presented in Section 3.2.1 of this report.

The analysis of future land use changes in the surrounding area, including the development of the Edmondson Park precinct, indicates that population and employment growth in the SWGC and surrounding areas would create congestion on Campbelltown Road if the proposal does not take place (the 'do nothing' option is assessed in Section 2.4.3 of the REF).

The need for the proposal in the context of road upgrades in the area

The proposal is required to address increases in traffic in the road network due to the development of the SWGC, and particularly, the Edmondson Park precinct. The Supplementary Traffic Assessment included an analysis of forecast origin and destination movements of vehicles travelling along Campbelltown Road in both 2026 and 2036 (A summary is presented in Section 3.2.1 of this report). The analysis highlights the increased demand by drivers to use Campbelltown Road to access local roads within the Edmondson Park precinct and Denham Court Road.

Surrounding roads such as Camden Valley Way are also being upgraded to provide additional capacity. Therefore, despite the increased capacity of surrounding roads within the network, including Camden Valley Way, the Hume Motorway, and Macdonald Road, new residents of the Edmondson Park precinct would be using Campbelltown Road as part of the wider road network.

It is unlikely that the proposal would increase traffic along Campbelltown Road by diverting traffic away from a more direct route. Campbelltown Road has always played an integral role in the road network of South West Sydney. This would continue to be the case and the GCRF identifies it as a principal arterial road (refer Table 2.2 and Figure 2.2, above). It is unlikely that vehicles would transfer to Campbelltown Road from a more direct route due to capacity upgrades being provided on alternative roads.

The Supplementary Traffic Assessment (Section 3.2 and Appendix B of this report) included an assessment of mid-block volumes and capacity for 2026, assuming that Campbelltown Road is not upgraded and other work in the area are completed as planned. The results are summarised in Section 3.2.1. The assessment forecast that, without an upgrade of Campbelltown Road, future traffic volumes would result in exceedances in road capacity during the AM and PM peak hour.

Need for the proposal in the context of a possible future upgrade of Denham Court Road

An upgrade of Denham Court Road beyond the East Leppington development was not considered in the traffic modelling for Campbelltown Road as the modelling only considers approved (confirmed and funded for construction) road projects. Furthermore, the origin and destination profiles indicate that there is no single entry or exit point along Campbelltown Road. Vehicles enter and exit at a variety of points, including the Hume Motorway, Denham Court Road, Macdonald Road, Campbelltown Road (south of Brooks Road), and Camden Valley Way to the north.

Therefore, the need for the proposal is not predicated on an assumed upgrade of Denham Court Road.

Need for the proposal in relation to access to local roads

Predicted traffic volumes would also create difficulties associated with local road access due to the limited provisions of dedicated turning lanes and opportunities to cross the road during times of congestion. Therefore, while the proposal includes a median, it also includes dedicated turning lanes to facilitate safe right-turn movements at:

- Glenfield Road
- Parkers Farm Place
- Beech Road
- Ingleburn Gardens Drive
- East Town Centre Road
- Soldiers Parade
- Macdonald Road
- Blomfield Road (from the northbound carriageway only)
- Denham Court Road and Dickson Road (dual-lane roundabout).

Access to local roads is addressed further in Section 2.11.7 of this report.

Need for the proposal in relation to the Hume Motorway/M5 upgrade

Discouraging traffic along Campbelltown Road was not a driver of the Hume Motorway upgrade proposal. The Hume Motorway corridor is the main route for road freight, commercial and passenger vehicles between Port Botany/Sydney Airport to south-west Sydney, and beyond to interstate. In recent years, traffic levels and the high number of heavy vehicles on the Hume Motorway has meant that the corridor is operating at or near capacity, including outside peak hours. This congestion impacts Sydney's economic productivity and competitiveness, particularly with regard to moving passengers and freight in and around Port Botany and Sydney's international and domestic airports.

Currently, there are no proposals to change the way Brooks Road presently links with the Hume Motorway.

The development plan for Denham Court and the Central Hills Lands

Denham Court and the Central Hills Lands do not factor into SWGC planning as they are outside the designated boundaries. These areas are still governed by the local environmental plans of the local councils (*Campbelltown (Urban Area) LEP 2002* and *Liverpool LEP 2008*).

If and when Campbelltown City Council or Liverpool City Council propose to amend or revise these LEPs, the proposal would be subject to a 'gateway' planning process, whereby the relevant council would consult with agency and community stakeholders. For more information, visit [the P&E website](#).

Need for the proposal and consideration of the principles of ecologically sustainable development (ESD)

An assessment of the proposal against the principles of ESD was included in Section 8.2 of the REF. It was found that the proposal adheres to the principles of ESD.

2.2.2 Strategic plans and policies

Respondents and submission numbers

Scenic Hills Association, Campbelltown City Council, OEH, 14, 25, 41, 45, 76

Issue description

The submissions raised the following issues:

- The proposal is not consistent with key election promises by the NSW Government
- The proposal should comply with a key objective in NSW 2021: A Plan to Make NSW No. 1, namely, "to strengthen local environment and communities"
- There is a lack of community understanding of the planning justification for the proposal (at local and State levels), particularly about plans for the SWGC
- The proposal is inconsistent with the South West Sub Regional Strategy (draft) (NSW DoP 2007) which includes the following objective: "protect the cultural and heritage elements of the subregion"
- The proposal was not recommended in the Three Cities Plan (State Planning Authority of NSW 1973)
- Section 2.1.1 of the REF should consider the Edmondson Regional Park Statement of Interim Management Intent (Manidis Roberts 2012).

Response

The proposed upgrade is consistent with strategic documents prepared by the NSW government as shown in Figure 2.3.

In addition, planning for the proposal started before the last NSW election, held in 2011, as shown in the section below on SWGC plans, and is therefore not relevant to promises made at that election.

Consistency with NSW 2021: A Plan to Make NSW No. 1

The proposal responds to NSW 2021: A Plan to Make NSW No. 1 (refer Section 2.1.1 of the REF). It is most relevant to the transport goals in this document. It is also consistent with the goal 'to strengthen local environment and communities' by ensuring that Campbelltown Road is able to accommodate the proposed population and employment growth in the area, while avoiding significant impact on biodiversity values, heritage values, community safety or local road accessibility.

Planning justification for the proposal as regards the SWGC

The strategic planning justification for the proposal is provided in Section 2.1.1 of the REF. Some additional detail is provided in the proposal timeline (refer to Figure 2.3).

In summary, the NSW government is planning for the future by identifying centres for future population growth (Figure 2.4). The SWGC is expected to house around 300,000 additional residents in around 110,000 dwellings. The upgrade of Campbelltown Road would be critical to ensure the smooth functioning of area's road network.

Development of the Campbelltown Road upgrade proposal

2002	<i>Campbelltown (Urban Area) Local Environmental Plan</i> was released, identifying the proposed road corridor for a future upgrade of Campbelltown Road
2005	The NSW Government established the North West and South West Growth Centres
2006	The <i>State Environmental Planning Policy (Sydney Regional Growth Centres)</i> and subordinate documents including regulations, mapping and structure plans were drafted, publicly exhibited and came into effect GHD were commissioned by RTA (now Roads and Maritime) to undertake the <i>Campbelltown Road/Appin Road Route Strategy</i>
2007	The NSW Government decided to proceed with planning of Edmondson Park, allowing for 6000 new dwellings, as well as local shops, services and employment The draft <i>South West Subregional Strategy</i> was released by Department of Planning (now P&E), recognising plans to upgrade Campbelltown Road
2008	The <i>Growth Centre Road Framework</i> was released by the RTA (now Roads and Maritime), presenting a road hierarchy to guide appropriate development of the major road network in those areas and address issues such as traffic demand, design standards, road character, and integration of arterial roads with local roads. Campbelltown Road was identified as a principal arterial road The amending Local Environmental Plan for Edmondson Park was finalised, a collaborative effort between the Growth Centres Commission, Liverpool City Council and Campbelltown City Council
2009	The second edition of the South West Growth Centre Structure Plan was released
2010	RTA (now Roads and Maritime) completed a Campbelltown Road Route Strategy Review to re-assess the recommendations made in the Campbelltown Road/Appin Road Route Strategy (GHD 2006), finding that improvements to this section of the corridor would be necessary in light of the future development of the Edmondson Park precinct
2011	Edmondson Park South was listed as a State Significant site, under the <i>State Environmental Planning Policy (Major Development) 2005</i> The third edition of the South West Growth Centre Structure Plan was released The Planning Assessment Commission granted concept approval for a proposal from Landcom (now UrbanGrowth NSW) to develop residential and mixed use development on the Edmondson Park South site Work on the concept design for the Campbelltown Road upgrade commenced; Hyder Consulting were commissioned to prepare a REF
2013	The concept design and REF for the Campbelltown Road upgrade were completed and publicly exhibited

Figure 2.3: Timeline showing planning for the proposal to upgrade Campbelltown Road



Figure 2.4: Planned population growth centres (DoP 2009)

Within the SWGC, the Edmondson Park precinct is anticipated to cater for 6000 new dwellings (P&E 2014). Leppington Major Centre is also planned to be a key focal point for the community (Figure 2.5).

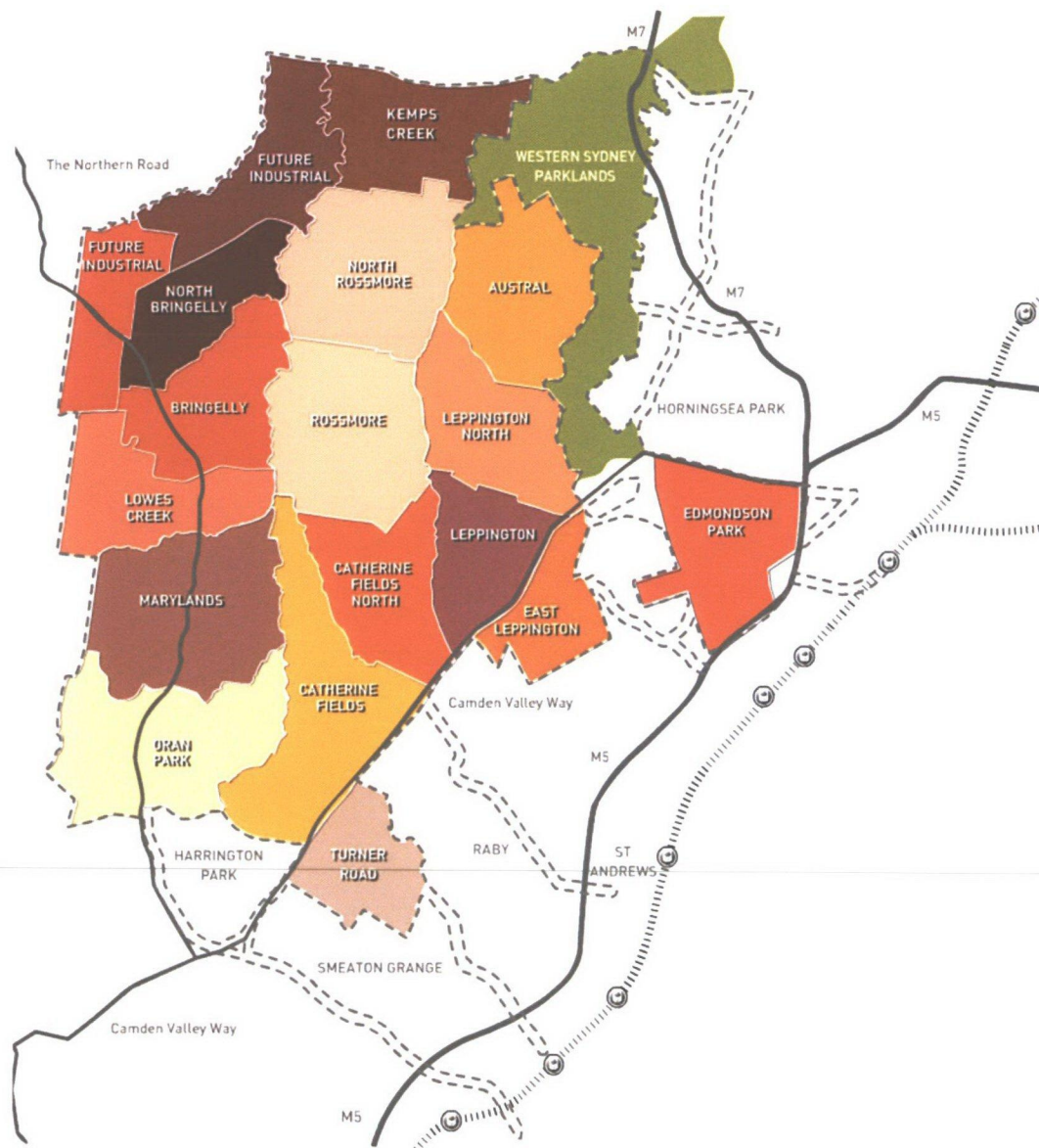


Figure 2.5: The SWGC precincts showing Edmondson Park precinct next to the proposal area and East Leppington nearby (DoP 2009)

As shown on Figure 2.6, the SWRL will provide new stations at Edmondson Park and Leppington. Campbelltown Road would be one of two main roads connecting Edmondson Park train station to the wider existing and future local road network. A network of arterial and local roads is needed to distribute traffic and provide alternative routes. Increasing population and traffic in the area would create congestion on Campbelltown Road if it were not upgraded.

The concept plan for the Edmondson Park South precinct is shown in Figure 2.7. It shows the importance of Campbelltown Road within the precinct.

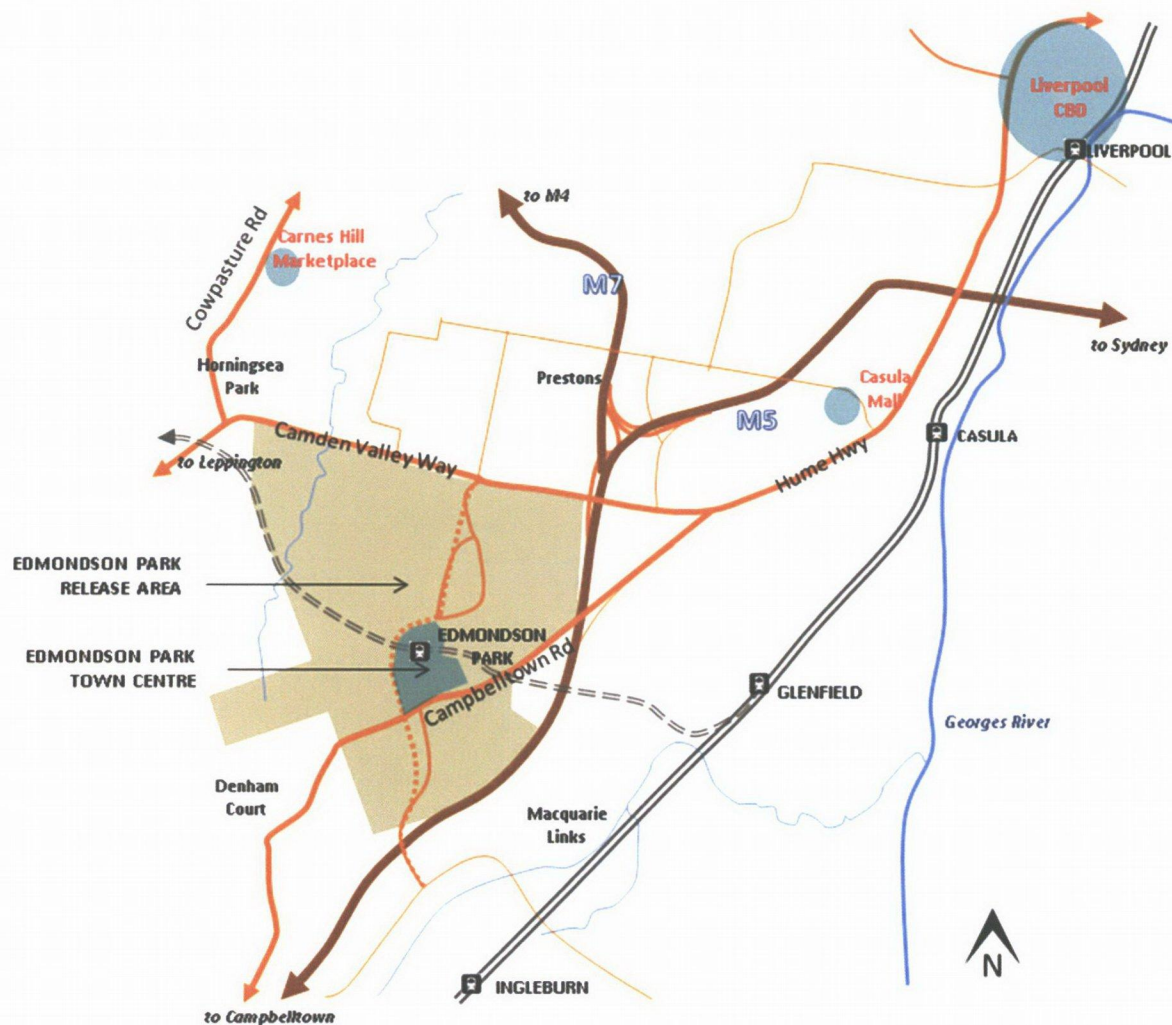


Figure 2.6: Edmondson Park precinct showing the SWRL and planned railway station at Edmondson Park (UrbanGrowth 2011)

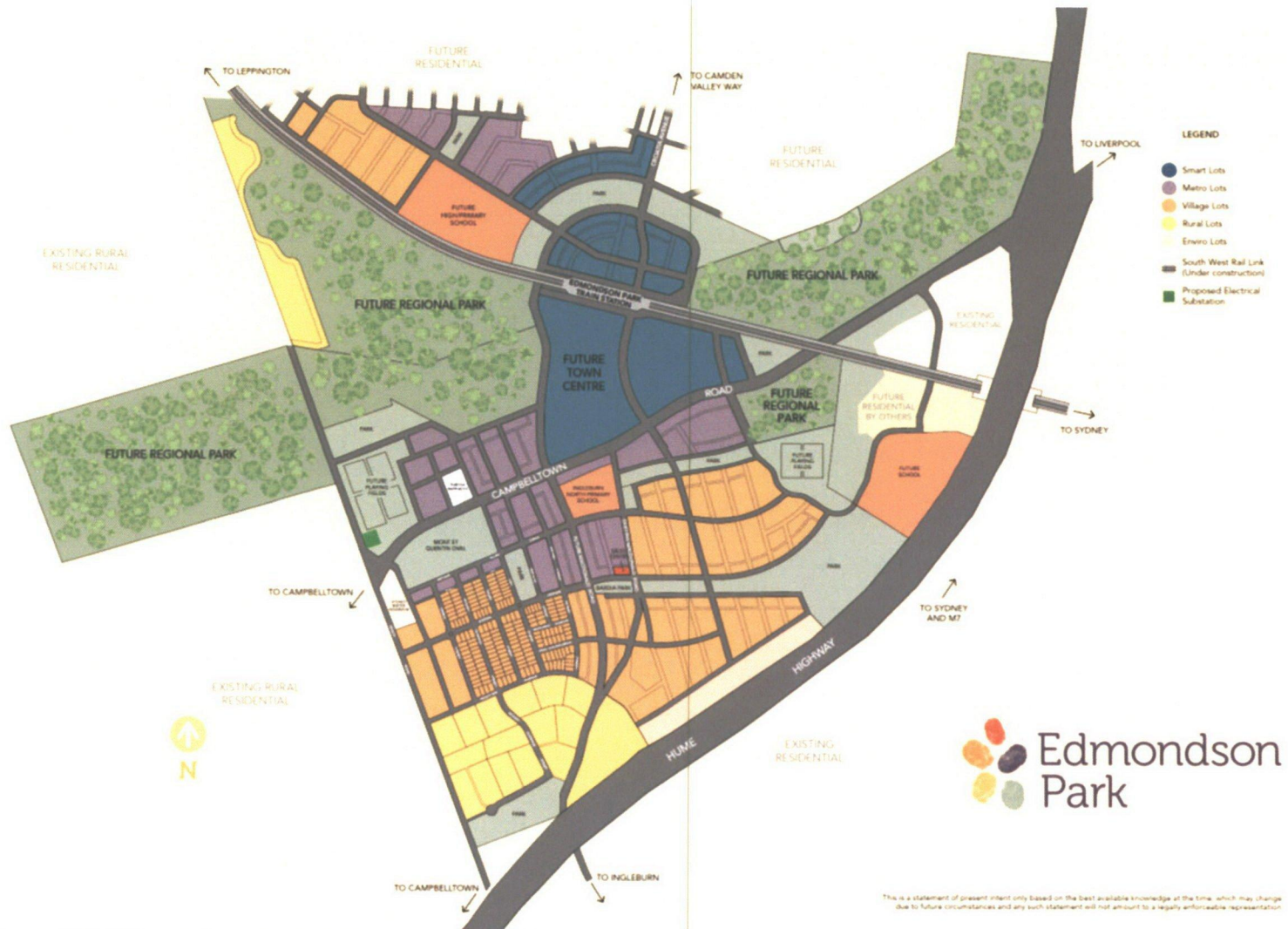


Figure 2.7: Edmondson Park South precinct concept plan (UrbanGrowth 2011)

Consistency with the South West Sub Regional Strategy (draft) (DoP 2007)

The proposal responds to key elements of the draft South West Sub Regional Strategy (DoP 2007):

- SW D1.2.1...“implement plans to extend and upgrade the road network in the SWGC, to support the forecast 100,000 dwellings, including upgrades/extensions to...Campbelltown Road...”
- SW D2.4.3 "...projects to remove 'pinch points' at places on the network that experience high levels of congestion, including Campbelltown Road..."

The proposal is also consistent with, and takes into account, the need to protect the cultural and heritage elements of the subregion. This is explored in detail in sections 6.2 and 6.3 of the REF. Section 2.14 and the landscape concept plan (Figures 3.10 and 3.11) of this report provide further detail on cultural and heritage protection.

The Three Cities Plan (State Planning Authority 1973)

The Three Cities Plan was prepared in 1973 by the State Planning Authority of NSW. It outlined a plan for the three new cities on the south-western fringe of Sydney centred on the existing towns of Campbelltown, Camden and Appin. Most of the development that has since eventuated was located in Campbelltown, and the development of cities at Appin and Camden did not occur on the scale that was predicted. The Three Cities Plan has been superseded by a number of strategies, including those discussed above and therefore is no longer directly relevant to planning the future road network in south-western Sydney.

Edmondson Regional Park Statement of Interim Management Intent

In 2005, the NSW Government identified an area of about 150 hectares of the Edmondson Park release area to be retained and managed as a regional park, as defined by the *National Parks and Wildlife Act 1974*. This portion of the site is now referred to as the proposed Edmondson Regional Park, and is managed in accordance with the Edmondson Park Conservation Agreement.

This Statement of Interim Management Intent was commissioned by Landcom (now UrbanGrowth). It has been developed as part of a broader plan of management to provide strategic direction for the management, transfer of ownership, and future maintenance of the park. It was prepared in consultation with the Department of Environment and Conservation (now OEH), the Commonwealth Department of Defence, Liverpool City Council and Campbelltown City Council.

Key values that are outlined in the Edmondson Regional Park Statement of Management Intent that are relevant to the proposal include:

- Exceptional natural environment outcomes
- Exceptional heritage outcomes
- Exceptional urban/natural interface outcomes.

The relationship between these values and the proposal are described below.

- Potential impacts on the natural environment of the proposed Edmondson Regional Park would be minimised through the avoidance, mitigation and compensation approach adopted by Roads and Maritime (Chapter 5 of this report includes details of proposed safeguards and management measures).
- Aboriginal cultural heritage associated with the proposed Edmondson Regional Park would be largely unaffected by the proposed upgrade; and mitigation in the form of salvage excavation would be sufficient to manage impacts on the two Aboriginal sites within the larger site complex that would

be directly impacted by the proposal (refer to sections 6.2.4 and 6.2.5 of the REF).

- In terms of urban/natural interface outcomes, the proposal would provide linkages between the proposed shared path along Campbelltown Road and the network of paths within the proposed Edmondson Regional Park. In addition, the proposed landscape concept plan would aim to minimise the visual impacts of the proposal on the proposed Edmondson Regional Park.

2.3 Alternatives and modifications considered

2.3.1 Alternative upgrades and modes of transport

Respondents and submission numbers

Scenic Hills Association, Campbelltown City Council, 18, 58, 69, 70

Issue description

The submissions proposed a range of alternatives that were different from those proposed in the REF, including:

- Retaining Campbelltown Road as a tourist drive south to Raby Road; this would retain the existing configuration and alignment of the road within its rural setting, retain existing trees lining the road, and take advantage of the views
- Extending Macdonald Road through to Cowpasture Road
- Making Soldiers Parade more capable of carrying traffic
- Diverting or forcibly diverting traffic to the Hume Motorway and Camden Valley Way (one submission suggested that an example of traffic being forcibly diverted is the Sydney Cross City Tunnel)
- Facilitating greater use of public transport (including buses) instead of building the proposed upgrade.

Response

Roads and Maritime has considered each of these alternatives in detail. Its findings are summarised below.

Retaining Campbelltown Road as a tourist drive

Campbelltown Road does not meet the eligibility criteria to be designated as a tourist drive. According to the Tourist Attraction Signposting Assessment Committee, there must be a demonstration that the touring route has:

- Attractions and experiences
- A management structure
- Sound financial backing
- A route marketing strategy.

Although Campbelltown Road demonstrates scenic and heritage value, the attractions and experiences along the Campbelltown Road corridor do not currently fit the criteria that would typically justify designation as a tourist drive.

Extending Macdonald Road through to Cowpasture Road

Extending Macdonald Road along the SWRL to Cowpasture Road would have a number of disadvantages:

- There is currently no defined road corridor to enable such an extension

- The financial, social and environmental cost of maintaining the existing Campbelltown Road as well as a new road would be much greater than the cost of upgrading the existing Campbelltown Road, which is within an existing road corridor
- A large amount of green space would need to be used to create a road corridor through this area, which is densely vegetated in places. Clearing additional native vegetation would result in a loss of potential ecological habitat (including additional impacts on non-certified land, protected areas for endangered species and ecological communities as identified in Section 6.1 of the REF). Clearing additional green space would also result in a loss of potential public open space.

Making Soldiers Parade more capable of carrying traffic

Irrespective of the configuration of Soldiers Parade, Campbelltown Road (as a principal arterial road linking Liverpool and Campbelltown) would continue to play a more strategic role in the traffic network, providing important access to adjacent local roads, and local businesses. The Edmondson Park local road network, including Soldiers Parade, would be upgraded as part of the approved precinct development.

In addition, diverting traffic through the Edmondson Park precinct (off Campbelltown Road) would have adverse access and amenity outcomes within the precinct.

Diverting or forcibly diverting traffic onto other roads

Forcibly diverting traffic is not an outcome that is likely to meet with the acceptance of the broader community.

This option presupposes that there is adequate capacity elsewhere in the network to cater for the additional traffic volumes. This is unlikely to be the case and it would be reasonable to expect that upgrades would be required on roads that are accommodating the diversion(s).

Alternative transport modes

Alternative modes of transport were assessed in Section 2.4 of the REF. The assessment concluded that alternative modes of transport in this historically rural area are being introduced through other projects, including the SWRL, which includes the establishment of Edmondson Park railway station. The provision of a dedicated bus lane along Campbelltown Road was also considered during the options evaluation process. This would require an increase in the width of the road by a further seven metres, requiring additional vegetation removal and acquisition of land, with associated environmental and social impacts.

The Edmondson Park South Transport Management and Accessibility Plan (TMAP) identifies a bus route (to come into effect sometime before 2016). It would connect Ingleburn Station with Liverpool Station via Edmondson Park south using Macdonald Road and Campbelltown Road. This bus route was also identified in the overall South West Bus Servicing Plan (Maunsell Australia 2009). This route would be redirected with the opening of the SWRL (TfNSW 2013).

The increased public transport use that is being facilitated in the area has been taken into account in traffic projections and will not negate the need for an upgrade of Campbelltown Road (The need for additional capacity on the road network is identified in Section 2.1.1 of this report). The level of public transport provision that would be required to avoid the need for the proposed upgrade is likely to be well beyond what could be realistically implemented in this type of urban environment.

2.3.2 Modifications to the proposed upgrade

Respondents and submission numbers

Campbelltown City Council, Scenic Hills Association, 6, 10, 21, 28, 37, 41, 51, 52, 53, 62, 63, 64, 67

Issue description

The submissions suggested a range of options for modifying the proposal, including:

- Widening Campbelltown Road to three lanes and using the middle lane as a turning lane (like on Cumberland Road), with widening to four lanes if and when required
- Upgrading Campbelltown Road to four lanes south of Macdonald Road, with a narrow median as opposed to an ultimate six-lane configuration, because widening to six lanes past Macdonald Road is not justified, and not endorsed by SWGC planners
- Not upgrading Campbelltown Road past Macdonald Road as there is a reduced need (or no need) to because there are no plans to develop land between Raby Road and St Andrews Road
- Considering Williamson Road as an alternative route to Campbelltown Road
- Ending the proposal further north (or south) than Brooks Road. Various alternative southern limits were suggested, including:
 - Macdonald Road
 - Zouch Road
 - Williamson Road
- Providing right-turn movements for the Leaping Learners Early Education Centre
- Including a fourth arm to the Blomfield Road intersection (a local service road) (and possibly providing traffic signals at the intersection) to connect to the retail business site at 479 Campbelltown Road, the BP Service Station, Denham Court Caravan Park, M&A Landscapes, and the two rural-residential lots in between
- Providing a local service road along the southbound carriageway parallel to a reduced width Campbelltown Road to link to Blomfield Road instead of a wide landscaped median and shared path.

Response

Widening Campbelltown Road to three lanes and using the middle lane as a turning lane

Roads and Maritime considers traffic forecasts so that they can proactively plan safe and efficient traffic flow ahead of predicted growth, rather than reacting when traffic increases.

Cumberland Road is a regional road (the equivalent of a sub-arterial road; refer Table 2.2), with significantly lower volumes of traffic than predicted for Campbelltown Road. On a principal arterial road (like Campbelltown Road), the proposed option would result in inefficient and potentially hazardous traffic flow, as vehicles wait for a break in the traffic to turn into a local road.

Therefore, this option would not significantly improve traffic flow or access to local roads under the proposed traffic scenario.

Upgrading Campbelltown Road to four lanes south of Macdonald Road and encouraging traffic to use Williamson Road as an alternative route

In response to community submissions on the REF, Roads and Maritime reassessed the need to widen Campbelltown Road (in its ultimate configuration) to six lanes south of Macdonald Road. This assessment was done in two parts: Macdonald Road to Zouch Road and Zouch Road to Brooks Road.

Macdonald Road to Zouch Road

Although there are no plans to further develop the land between Raby Road and St Andrews Road, the realigned Macdonald Road will be part of the Edmondson Park South precinct, and has been designated as a sub-arterial road under the GCRF (refer to Section 2.2.1 of this report for further information about sub-arterial roads and the GCRF). As such, it is anticipated that the realigned Macdonald Road will play an integral role in facilitating travel from Edmondson Park South precinct either north towards Liverpool or south towards Campbelltown, with vehicles travelling both northbound and southbound along Campbelltown Road. This is illustrated in figures 1.1 and 2.7 of this report.

As part of the Supplementary Traffic Assessment (AECOM 2014), an options assessment was carried out for 2036 in which traffic uses Williamson Road via Macdonald Road as an alternative route to Campbelltown Road. The objective of the assessment was to determine if providing an alternative route would reduce congestion on Campbelltown Road and remove the potential need for a future upgrade to six lanes between Macdonald Road and Zouch Road.

The outcome of this assessment was that the proposed Williamson Road scenario would have a minimal effect with respect to inducing traffic away from Campbelltown Road to Williamson Road and Macdonald Road. Therefore, it was not considered appropriate to limit the ultimate configuration to a four-lane road between Macdonald Road and Zouch Road. (More detail is provided in Section 3.2.1.)

Zouch Road to Brooks Road

The need to make provision for an ultimate widening to a six-lane road between Zouch Road and Brooks Road was reassessed in terms of mid-block capacity. The findings are presented in Section 3.2.1. It was found that it would be possible to retain acceptable mid-block capacity performance in 2036 without upgrading Campbelltown Road to three lanes in each direction south of Zouch Road.

In response to this community issue, Roads and Maritime has modified the proposal to include a four-lane upgrade with narrow median south of Zouch Road to Brooks Road. The revised proposal is detailed in Chapter 4 of this report.

SWGC support for the proposal for six lanes south/west of Macdonald Road

The State Environmental Planning Policy (Infrastructure) 2007 is the mechanism used to determine the approval pathway for the proposal. This was identified in Section 4.5 of the REF. It allows the proposed works to be carried out without development consent, and is thereby subject to assessment under Part 5 of the EP&A Act. The proponent and determining authority for the proposal is Roads and Maritime. It is the responsibility of Roads and Maritime to plan, provide and maintain the State road network, as illustrated in Figure 2.1, above. The proposal has been developed by Roads and Maritime in accordance with the various policies and plans developed by and in consultation with P&E, as outlined in Figure 2.3, above. Endorsement from P&E is not required for this proposal.

Ending the upgrade at Macdonald Road, Zouch Road or Williamson Road

The proposal would extend to Brooks Road, transitioning to the existing alignment south of the intersection with Denham Court Road. There is no proposed widening past Denham Court Road as the upgrade needs to tie in with the existing alignment at Brooks Road to achieve a safe, smooth transition. If the proposal ended at Macdonald Road or Zouch Road, it would not cater for projected traffic identified in Table 3.3 (Section 3.2.1 of this report) south to Williamson Road.

Blomfield Road intersection

In response to community submissions on the REF, Roads and Maritime considered additional options to allow right-turn movements at Blomfield Road:

- Allowing right-turn movements from the northbound carriageway of Campbelltown Road into Blomfield Road (and the Leaping Learners Early Education Centre) via a dedicated right-turn lane
- Allowing right-turn movements from Blomfield Road (and the Leaping Learners Early Education Centre) to the northbound carriageway of Campbelltown Road via a break in the median or a roundabout
- Providing a service road connecting Blomfield Road with either Zouch Road or Dickson Road.

Roads and Maritime found that allowing right-turn movements from the northbound carriageway of Campbelltown Road into Blomfield Road could be safely accommodated in the median, and this option was therefore adopted. This design change is detailed in Chapter 4 and presented in Figure 4.8. Under this design change, direct access to Blomfield Road and the Leaping Learners Early Education Centre would be possible by a right-turn lane into Blomfield Road.

Allowing right-turn movements from Blomfield Road (and the Leaping Learners Early Education Centre) to the northbound carriageway of Campbelltown Road would require an increased design footprint. This would increase land acquisition. Roads and Maritime has revised the concept design to accommodate a two-lane roundabout at the intersection of Denham Court Road, Campbelltown Road and Dickson Road. This would facilitate a quick turnaround from the southbound carriageway of Campbelltown Road to provide access to the northbound carriageway of Campbelltown Road from Blomfield Road and Leaping Learners Early Education Centre. This design change is discussed further in Section 4.2 of this report.

Roads and Maritime considered the full range of options suggested by the community for providing improved access to Blomfield Road via a service road. It found that:

- There would be little advantage in providing a one-way service road connecting Blomfield Road with either Zouch Road or Dickson Road. An additional 8.5-metre-wide property acquisition would be required to provide a one-way service road, but seeing that property owners already have direct access to Campbelltown Road and the properties are large enough to allow vehicles to exit in a forward direction, provision of a service road was not considered justified
- A two-way service road between Blomfield Road and Dickson Road would require an additional 12-metre-wide strip to be acquired. This would have substantial additional impact on the curtilage of Denham Court House. It would also require substantial acquisition from the property on the northern corner of Dickson Road to provide adequate separation between the intersection of the service road and the intersection of Campbelltown Road
- A two-way service road between Zouch Road and Blomfield Road would require

the total acquisition of the property on the south-eastern corner of Zouch Road and the Leaping Learners Early Education Centre. A two-way service road would give drivers the opportunity to turn around and travel north, but the proposed roundabout at Denham Court Road (as described in Section 4.2 of this report) would provide this facility and has been adopted.

Providing shared access at BP service station via a service road or signals

Roads and Maritime considered the full range of options suggested by the community for providing improved access to local roads and private properties (including businesses) south of Zouch Road. Placing another four way intersection at Blomfield Road (possibly including traffic signals) so close to the roundabout at the intersection of Campbelltown Road and Denham Court Road would inhibit traffic flow and is not required given the low traffic volumes generated by the BP Service Station, Denham Court Caravan Park, M&A Landscapes and the two rural-residential lots in question (2013b, Appendix B). A new roundabout would need to be quite large, because of the need to accommodate heavy vehicles as Campbelltown Road is classified as a principal arterial road and B-double route. Therefore, the roundabout option would result in substantial property acquisition impacts.

In order to provide access to the BP service station, M&A Landscapes and Denham Court Caravan Park via a service road or signals, Roads and Maritime would need to acquire a substantial amount of additional land from other property owners. As part of its duty under Part 5 of the EP&A Act, Roads and Maritime needs to consider the socio-economic impacts of any proposed land acquisition and any other impacts on all affected properties. It is considered that the impact on other owners (who would incur substantial acquisition effects) for the purposes of improving access for others, and financial cost would not be justified, given the low traffic volumes that would make use of a service road or signals at this location..

The *Roads Act 1993* permits Roads and Maritime to carry out work for service roads in certain circumstances, such as providing access to residences that would be otherwise landlocked. In this case, the proposal would maintain access to all properties. Notwithstanding this, under Part 4 of the EP&A Act, landowners are able to develop a privately funded service road to service their properties. An application to do so would be determined by Liverpool City Council.

2.4 Description of the proposal

2.4.1 Scope of the proposal

Submission numbers

Campbelltown City Council, Carmelite Nuns of Varroville, 3, 6, 7, 8, 10, 19, 41, 42, 49, 58, 64, 76

Issue description

The submissions raised the following issues:

- The word 'upgrade' has been incorrectly used to describe the proposal, which is an extension/widening
- The upgrade would turn Campbelltown Road into a highway or motorway
- Would Brooks Road remain closed to the Hume Motorway under the proposal, and would any other proposals to open the Hume Motorway exist, including extension of Dickson Road to the Hume Motorway?

- The scope of widening needs to be clarified, particularly:
 - Would Campbelltown Road be widened to four lanes between Glenfield Road and the Hume Motorway overbridge?
 - Would the road be widened from the Crossroads to Denham Court Road or the SWRL Bridge to Denham Court Road?
 - Why is only minor widening proposed at the Denham Court Road intersection and no widening proposed south of Denham Court Road?
- Would the proposal include a safety zone?
- The proposal would not fit under the SWRL overbridge.

Response

Why the term 'upgrade' is used to describe the proposal

Roads and Maritime uses the term 'upgrade' to describe work that includes improvements in line with current design standards/materials or increasing road capacity. In addition to increasing the capacity (widening) of the road surface, the proposal includes upgrading drainage structures, intersections, pedestrian facilities and other features. The proposal would not extend Campbelltown Road. Therefore, 'upgrade' is deemed the most appropriate term to describe the proposal.

Campbelltown Road is a principal arterial road, and would not be a motorway

Campbelltown Road is classified as a principal arterial road. A principal arterial road is a main or trunk road within the State road network that predominantly carries through traffic between regions. It does not fit the definition of a highway or motorway, which provides high-speed transportation at up to 110 kilometres per hour and features interchanges and controlled access. The characteristics of a principal arterial road are described in Section 2.2.1.

Hume Motorway connections at Brooks Road and Dickson Road

There are no plans to enable additional access to the Hume Motorway from Brooks Road, Dickson Road or any other road as part of this proposal.

The scope of the widening

The REF proposal to widen Campbelltown Road has been modified following community feedback as follows:

- Between Camden Valley Way and the Hume Motorway overbridge – generally six lanes with a narrow median
- From Hume Motorway to Zouch Road - four lanes with provision for possible future widening to six lanes within a wide median
- From Zouch Road to Brooks Road – four lanes with no provision for widening to six lanes; however, there is a road corridor dedicated for possible road widening if required in the future, in accordance with the *Campbelltown (Urban Area) LEP 2002*.

To minimise land acquisition requirements and cultural heritage impacts on Denham Court House, minor widening is proposed at the southern extent of the proposal around Denham Court House. This is discussed further in Section 2.9.3. No widening is proposed south of Denham Court Road, for the upgrade to tie-in with the existing road at Brooks Road.

Safety zones

Safety zones are areas for trams and buses to safely drop large numbers of

passengers in areas other than the edge of the carriageway (an example is a wide median down the middle of an arterial road that can be accessed by trams).

Safety zones are not used in NSW (Clause 9.4 Roads and Maritime Supplement to AS1742.10), and the proposal would not incorporate a safety zone. However, it would incorporate clear zones. A clear zone is the roadside area next to the road which is required to be clear of any non-frangible roadside hazards (ie trees, poles, drains, culverts, steep embankments). The clear zone would be verified during detailed design and would be consistent with Roads and Maritime Supplement to Section 6 of the Austroads Guide to Road Design.

South West Rail Link overbridge

Roads and Maritime has been in liaison with the designers of the SWRL overbridge to ensure that the width of the proposed carriageways would be safely accommodated underneath the SWRL overbridge and that a minimum clearance of 5.4 metres would be maintained between the underside of the bridge and both the existing road surface and the proposed road surface on Campbelltown Road.

2.4.2 Construction of the proposal

Respondents and submission numbers

Denham Court Association, Carmelite Nuns of Varroville, Liverpool City Council, 6, 19, 49

Issue description

The submissions raised the following issues:

- Timelines for construction
- At what stage is this proposal in terms of project planning and design?
- Liverpool City Council submitted that the staging of the proposal should minimise environmental and traffic impacts, including expected traffic congestion from the urbanisation of the SWGC
- Liverpool City Council submitted that detailed design should identify haul routes, subject to Council approval
- Campbelltown City Council submitted that the staging of work should be examined to provide a sufficient period to establish mature replacement trees prior to removal of existing trees.

Response

Construction timeframes

The start of construction would depend on funding. The construction period would be about two years for each stage. Indicative project staging and what each stage entails can be viewed in Section 3.3.1 and Figure 3-41 of the REF. Construction staging would be reviewed during detailed design and is subject to change.

The first stage of construction would be carried out by UrbanGrowth as part of the Edmondson Park South precinct development.

Stage of project planning

The proposal is currently at the 'environmental assessment' stage, as indicated in Figure 2.8.



Figure 2.8: The road project planning process

Staging of work

Staging allows for environmental and traffic impacts associated with construction to be localised to a smaller work area. Environmental and traffic impacts, including traffic congestion from development of Edmondson Park and the SWGC, would be key considerations during pre-construction planning to ensure minimal disruption to road users and local residents.

Haul routes

Roads and Maritime proposes to use Campbelltown Road as the main haul route in order to minimise impacts on local roads. Construction methods would be developed further during detailed design and Campbelltown and Liverpool City Councils would be consulted as a stakeholder where relevant throughout the proposal.

Tree replacement

Opportunities for the establishment of replacement trees prior to the removal of existing trees would be investigated during detailed design and implemented where feasible.

2.5 Statutory and planning framework

Respondent and submission numbers

Scenic Hills Association, 23, 25, 50, 76

Issue description

The submissions raised the following issues:

- The decisions around this proposal are entirely made by Roads and Maritime
- An environmental impact statement (EIS) should be required
- Environmental and social impacts of the proposal have not been considered, and environmental impacts are not clear – particularly with regards to environmental impacts on Denham Court House – because there would be additional widening that would take place in the future that has not been assessed in the REF
- The proposal should be signed off by a full sitting of Campbelltown City Council.

Response

Decision making

Roads and Maritime provides the management and delivery of safe, efficient and high quality services and infrastructure to the community and businesses of NSW. Customer focus is an important strategic aspiration. In this regard Roads and Maritime has consulted with agencies and the community about the Campbelltown Road upgrade proposal, and has listened to community feedback and considered and included refinements to the proposal wherever feasible. This report provides a description of the design refinements which would be implemented for the proposal.

As the proposal is for road and road infrastructure facilities and is to be carried out by Roads and Maritime, under the EP&A Act, Roads and Maritime is responsible for assessing impacts of the proposal and making a determination. Campbelltown Road is zoned SP2 – Roads Infrastructure, for which a road upgrade is a permissible activity not requiring Council consent, in accordance with the *Liverpool LEP 2008* and *Campbelltown (Urban Area) LEP 2002*, and Clause 94 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP).

Is an EIS required?

A REF was prepared in accordance with Part 5 of the EP&A Act. The purpose of the REF is to help Roads and Maritime meet the statutory requirement to take into account all matters affecting or likely to affect the environment due to the proposal. It helps to establish whether or not the activity is likely to significantly affect the environment and whether an EIS needs to be prepared for approval to be sought from the Minister for Planning and Environment. This includes consideration of the factors specified in the guideline document: *Is an EIS required?* (DUAP 1999).

The REF and associated studies found that the proposal is unlikely to have a significant impact on the environment, and therefore an EIS is not required (Section 8.3 of the REF).

Assessment of environmental and social impacts

The proposal was assessed in the REF in terms of the full extent of widening that Roads and Maritime proposes along Campbelltown Road. This widening would occur between Camden Valley Way and Brooks Road, as indicated in the description of the proposal (Chapter 3 of the REF and Section 1.2 of this report).

The REF assessed a four-lane upgrade (with a wider median to facilitate possible future widening to six lanes). An additional assessment would be required if the four lanes were to be widened to six lanes. As part of concept design refinements, the wider median to facilitate this future widening south of Zouch Road has been removed as part of the refined concept design and the cross-section reduced. (Refer to Chapter 4 for more detail.)

The REF examined and took into account to the fullest extent possible all environmental impacts. A number of detailed technical reports were carried out to support this assessment and to help identify safeguards and management measures to mitigate these impacts.

Involvement of Campbelltown City and Liverpool City councils

The proposal does not require development consent from the local councils. This is because:

- Clause 94 of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) (which aims to facilitate the effective delivery of infrastructure across the State) permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by, or on behalf of, a public authority without consent
- Campbelltown Road is zoned SP2 – Roads Infrastructure in the *Liverpool LEP 2008* and *Campbelltown (Urban Area) LEP 2002*. Under this zoning, a road upgrade is a permissible activity not requiring council consent.

Nevertheless, Roads and Maritime has consulted with both Campbelltown and Liverpool City councils. Part 2 Division 1 of ISEPP outlines particular circumstances where consultation with councils and other public authorities is required. These circumstances include where council-managed infrastructure would be affected or where local heritage items would be affected. As identified in Section 5.4 of the REF, the proposal triggers clauses 13, 14 and 15 of ISEPP. Roads and Maritime has consulted with Campbelltown and Liverpool City councils as per the requirements of these clauses with regards to stormwater, road and footpath excavation, local heritage items and flood-labile land.

In addition, Campbelltown and Liverpool City councils have been identified as key stakeholders and have been consulted during the proposal development and preparation of the REF. Details of this consultation can be found in section 5.4.1 of the REF. Both councils have participated in the submission process and would continue to be consulted as stakeholders where relevant throughout the approval, detailed design and construction phases.

2.6 Stakeholder and community consultation

Respondents and submission numbers

Scenic Hills Association, Denham Court Association, Campbelltown City Council, 3, 6, 10, 13, 16, 17, 19, 22, 23, 25, 37, 41, 47, 49, 50, 52, 53, 58, 60, 66, 67, 69, 70, 76

Issue description

The submissions raised the following issues:

- The consultation process has not been transparent or fully engaging of the community (including potentially affected landowners), during the development of the proposal and exhibition of the REF and concept design
- The Community Update newsletter did not include clear maps and correct and adequate detail with regards to widening impacts and was not distributed before the start of the community information sessions
- Extensions to the submissions period were requested
- The third consultation session was poorly organised and executed
- Roads and Maritime did not hold any make-up community information sessions in Denham Court
- The consultation process put too much pressure on the community in requesting them to read large reports and did not accommodate the needs of senior citizens
- There was inadequate time to review the new information about the traffic model and its assumptions prior to the submission date
- Consultation has not adequately dealt with the overwhelming community dissent
- Submissions should be confidential
- Campbelltown City Council submitted that Roads and Maritime should start the REF process again and carry out more consultation, earlier
- Some local residents expressed disappointment at not being consulted earlier and some requested further consultation before a final decision is made
- Field surveys were carried out under misleading and deceptive circumstances that could be described as trespassing at one residence in Blomfield Road.

Response

Consultation process

Roads and Maritime has carried out extensive consultation and followed a consultation process in line with the requirements specified in the *Community Engagement and Communications Resources Manual* (Roads and Maritime 2011), and all statutory requirements under Part 5 of the EP&A Act and ISEPP. The consultation process has involved using a wide range of activities to provide information about the proposal to the community and stakeholders (including potentially affected landowners) to obtain input and feedback. Details of the consultation activities are provided in Chapter 5 of the REF and Section 1.5 of this report.

Community consultation for the proposal began on 14 March 2012 when the project website, email address and phone line went live. Throughout the process, Roads and Maritime used a range of consultation tools to reach the community. Consultation continued on the preferred option to allow community issues to be considered. Roads and Maritime would continue to provide opportunities for the community to participate during detailed design of the proposal.

Throughout the consultation process, community expectations and concerns have been addressed in project planning and design to the greatest extent practicable. Ultimately, the refinement of the preferred option takes into account transport needs, heritage impacts, environmental impacts and engineering and cost constraints, as well as community feedback.

Community Update

Roads and Maritime acknowledges the issues with the distribution of the Community Update (April 2013), as well as community concerns about information that it did not contain. Roads and Maritime distributed a subsequent Letter to Residents and Questions and Answers fact sheet on 24 May 2013 and made them available online.

In addition, in response to community submissions on the REF and subsequent design changes, supplementary studies were carried out to clarify and update assessments of the impacts of the proposal. These supplementary studies are described in Chapter 3 of this report and presented in the appendices. The impacts that were further investigated include:

- Local roads and traffic impacts (Sections 3.1 to 3.3 of this report)
- Non-Aboriginal heritage (Section 3.4 of this report)
- Landscape heritage (Section 3.5 of this report)
- Landscape character and Visual impacts (Section 3.6 of this report)
- Socio-economic and business impacts (Section 3.7 of this report).

Extension of submissions period

The submissions period to the REF was extended to 60 days.

Third consultation session

Noted.

Make-up community sessions

Roads and Maritime has endeavoured to satisfy all requests for further information or clarification, in a transparent and responsive manner. The project team also attended additional community meetings hosted by Denham Court Association and Campbelltown City Council (in addition to the four sessions run by Roads and Maritime), as detailed in Section 1.5. Information to address the concerns raised by the community at these meetings was included in the Letter to Residents and Questions and Answers fact sheet, which was distributed on 24 May 2013.

At the 24 June 2013 community information session run by Campbelltown City Council, Roads and Maritime presented a number of posters in response to key issues raised by the community. These were then uploaded to the project website. The posters covered the following topics:

- Big picture planning
- Road project development process
- Zouch Road to Denham Court Road alignment
- Blomfield Road access
- Zouch Road to Denham Court local access
- Heritage
- Edmondson Park development
- Other issues, staging and next steps.

Roads and Maritime was asked to provide some additional information about traffic modelling and the assumptions which informed the traffic modelling for the proposal. These were all uploaded to the [Campbelltown Road upgrade website](#).

Accommodation of senior citizens and adequacy of consultation process

The consultation process outlined here and in Section 1.5 of this report was extensive, and provided many opportunities for senior citizens to gain information and provide input.

A fundamental objective of the community information sessions was to consult with community members who are unable to access the full documentation that is available online, or who have further questions, and to respond to specific questions in a timely and personal manner.

The project team responded via email or phone to correspondence that was received from the community during the REF display period. The team also held one-on-one meetings with stakeholders who were unable to attend community information sessions or wished to further discuss the proposal. Furthermore, both the REF and this submissions report comply with the Web Content Accessibility Guidelines 2.0.

Review of new information about the traffic model

The community had adequate time to review the new information about the traffic model and its assumptions prior to the submission date. As outlined above, Roads and Maritime provided some additional information about traffic modelling and the assumptions that informed the traffic modelling for the proposal. These were all uploaded to the Campbelltown Road upgrade website on 27 June 2013. Roads and Maritime accepted late submissions until 22 October 2013, and any late submissions received until this date related to the new information supplied about the traffic model have been considered in this submissions report.

The information supplied on 27 June 2013 was intended for clarification purposes only. This information was consistent with what was provided in the REF and the original traffic study (AECOM 2013).

During the preparation of the submissions report, a peer review, supplementary assessment and peer review of the supplementary assessment were carried out. The revised model and associated information are presented in this report (refer to Sections 3.1 to 3.3 and Appendix B for further detail).

Confidentiality of submissions

All submissions to Roads and Maritime are confidential and are collected for the sole purpose of helping to assess the proposal. In this submissions report, individual private submissions have been assigned a number and this is the only differentiating factor between the submissions; no names or addresses are stated. Names have been given for government or organisation submissions. Further information on privacy relating to submissions can be found in the Executive Summary of the REF.

Request to restart the REF process

Campbelltown City Council submitted that Roads and Maritime should restart the REF process.

Roads and Maritime developed and displayed the REF in accordance with Part 5 of the EP&A Act. All aspects of the environment were assessed to the fullest extent possible and Roads and Maritime considered community issues raised during the

preparation of the REF. Furthermore, this report responds to issues raised by the community during public display of the REF and presents the design refinements which have been adopted to reflect the consideration of community concerns. The assessment process was comprehensive, and a restart of the process is not considered necessary.

For this submissions report, a number of supplementary technical reports were prepared to address issues that were raised during consultation with stakeholders and the community. The submissions report and all associated supplementary assessments will be considered as part of the approval process under Part 5 of the EP&A Act. If the proposal is determined, all proposed safeguards and management measures would be carried through to detailed design and construction.

Requests for earlier or further consultation

As noted in Chapter 1, the consultation process began in March 2012, and the REF was placed on display in April 2013. Further consultation has been carried out since that time. Therefore, Roads and Maritime considers that consultation occurred well in advance of the REF display period. In addition, potentially affected residents were consulted as part of the REF display, and the proposal has been refined in response to issues raised during this consultation process.

If the proposal is given approval to proceed, affected land owners would be consulted during detailed design, and the project would be refined further in response to issues raised by the community. The wider community would also be kept informed as the project progresses.

Field surveys

All field inspections on private property were carried out in accordance with the *Roads Act 1993*, which permits Roads and Maritime to enter properties for the purposes of carrying out investigations. Notifications were sent to landowners in February 2012 advising that access to private properties along and near the road alignment would be required at various times from February 2012.

2.7 Biodiversity

2.7.1 Growth Centres Biodiversity Certification and Edmondson Park Conservation Agreement

Respondents

OEH, P&E

Issue description

The submissions raised the following issues:

- The proposal should incorporate avoidance, minimisation and offset of impacts on the proposed Edmondson Regional Park
- The proposal should comply with the biodiversity certification of the Growth Centres SEPP under the *Threatened Species Conservation Act 1995* (TSC Act) and the Edmondson Park Conservation Agreement under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- The proposed offset strategy should be approved by P&E, OEH and DoE (Department of the Environment, formerly SEWPaC) before the project is determined and ongoing consultation amongst these parties is supported by OEH

- OEH requested inclusion throughout detailed design, construction planning and construction to help manage impacts and ensure best-practice outcomes for the Cumberland Plain Woodland vegetation, and conservation of this endangered ecological community within the proposed Edmondson Regional Park.

Response

Edmondson Park Conservation Agreement and offset strategy

As identified in Chapter 4.4 of the REF, under the Edmondson Park Conservation Agreement the State of NSW agreed to implement a Biodiversity Conservation Plan, which would include establishment of a Regional Park, sympathetic management of open space that contains Cumberland Plain Woodland, and provision of a suitable offset package for unavoidable impacts. Under the Conservation Agreement, 79 hectares of Cumberland Plain Woodland is required to be retained in the proposed Edmondson Regional Park.

Roads and Maritime is committed to implementing a hierarchy of 'avoid, minimise/manage and offset' for impacts on biodiversity. During development of the proposal, impacts on biodiversity were avoided and minimised as much as possible. There would be a 1.14 hectare impact on the proposed Edmondson Regional Park as a result of the proposal. It is proposed that this would be offset by a 1.14 hectare addition to the north-eastern portion of the proposed Edmondson Regional Park. The proposed offset area includes areas of Cumberland Plain Woodland and would maintain the minimum 79 hectares of Cumberland Plain Woodland that must be retained and protected under the terms of the Conservation Agreement. The proposed offset area is currently owned by Roads and Maritime.

Roads and Maritime notes the requirements of the biodiversity certification of the Growth Centres SEPP and these are discussed in the REF. The Ecological Assessment for the REF (sections 4.3 and 5.6.1) included assessments of significance in accordance with Section 5A of the EP&A Act for impacts in non-certified areas. An assessment of the consistency of the proposal and offset strategy with the Biodiversity Certification Order found that the offset would maintain the minimum area of Existing Native Vegetation (ENV) specified in the relevant biodiversity measures of the Biodiversity Certification.

The variation to the Edmondson Park Conservation Agreement to facilitate the Campbelltown Road upgrade has been signed by the relevant Commonwealth and State ministers. To comply with the varied agreement, the new area to be incorporated into the proposed Edmondson Regional Park (as shown in Figure 2.9) would be transferred to P&E or OEH before Roads and Maritime starts clearing of vegetation for the Campbelltown Road upgrade within the previously proposed Edmondson Regional Park boundary. This is shown in Map 3 of the Edmondson Park Conservation Agreement.

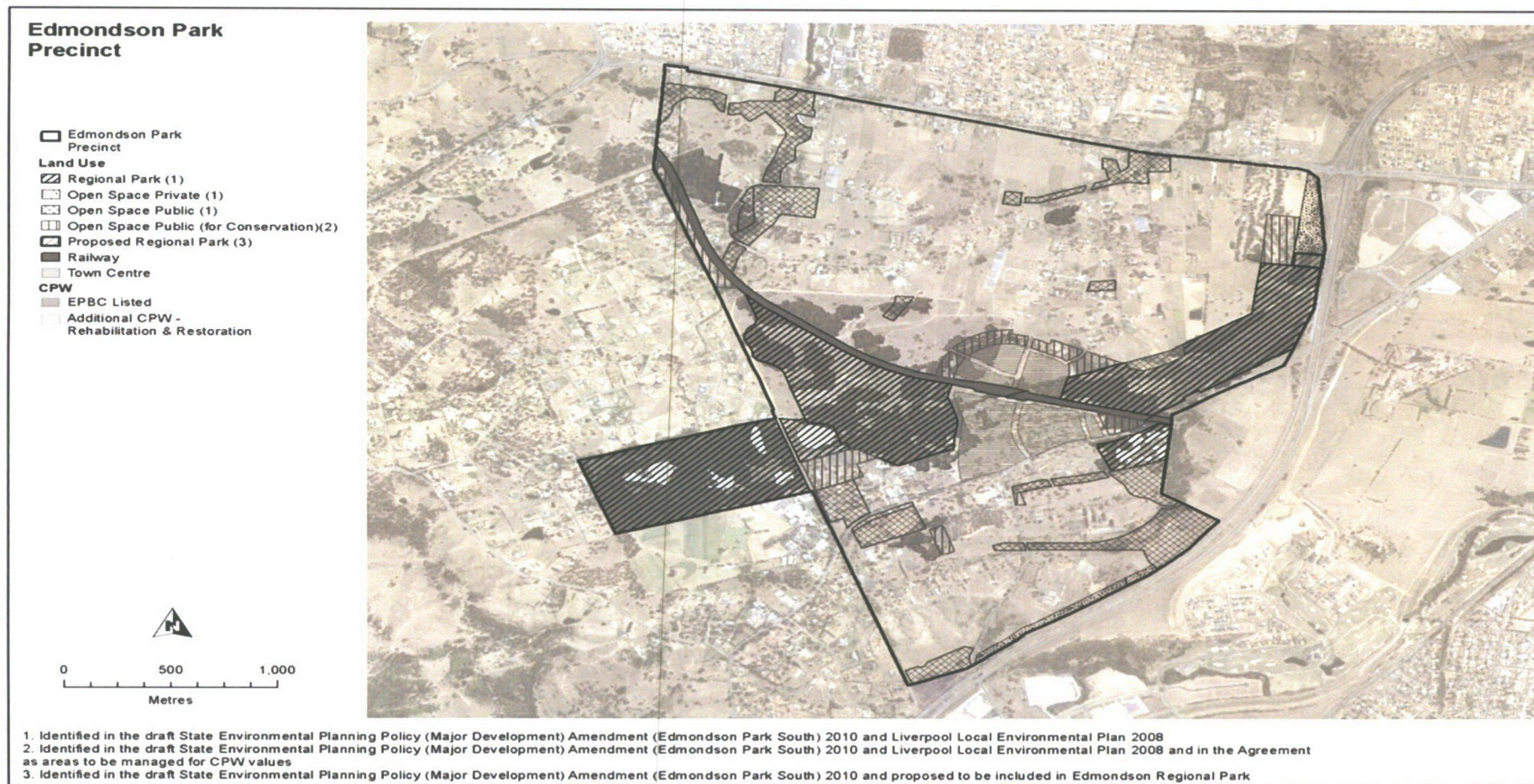


Figure 2.9: Land use and EPBC listed Cumberland Plain Woodland in the Edmondson Park precinct (Source: Annex A of the Variation agreement to the Edmondson Park Precinct Conservation Agreement made under the EPBC Act)

Ongoing consultation with OEH

Roads and Maritime would continue to consult with OEH (as a stakeholder), where relevant, throughout the project with regards to the implementation of management measures during detailed design, pre-construction and construction.

2.7.2 Connectivity

Respondents and submission numbers

OEH, Carmelite Nuns of Varroville, Scenic Hills Association, 41, 45, 67

Issue description

The respondents raised the following issues:

- The area should be reserved as a wildlife corridor linked to the Western Sydney Parklands
- The proposal would impact on ecological connectivity, particularly between Maxwells Creek south and north precincts
- Impacts of the proposal on ecological connectivity would irreversibly impact fauna; this would add to cumulative impacts of development within the area (Edmondson Park precinct, the SWRL and Edmondson Park railway station), leading to a decline in wildlife numbers and local species extinction, and negatively impact Australia's biodiversity targets.

Response

Reservation as a wildlife corridor

It is not considered viable to reserve the land occupied by Campbelltown Road as a wildlife corridor due to the established nature of Campbelltown Road its current form, as well as the development of the Edmondson Park precinct and surrounding SWGC immediately adjacent to Campbelltown Road. The reservation of land for conservation purposes is the responsibility of relevant local, state and commonwealth government agencies.

Impact on ecological connectivity

Ecological studies for the REF indicate that intact native vegetation of the study area is limited to riparian vegetation associated with Maxwells Creek and adjoining remnant woodland in the non-certified areas. This vegetation does not directly link with any larger areas of habitat, as vegetation has been almost entirely cleared from the surrounding locality. However, this vegetation is connected to small areas of vegetation to the north of the study area, a patch adjoining Tree Valley Golf Club in Edmondson Park, and a patch adjoining Soldiers Parade in Edmondson Park. Scattered trees in the Soldiers Parade patch provide some connectivity to a larger patch adjoining the western side of Zouch Road, north of the study area, although the sparseness of trees may limit the movement of cover-dependent species.

The proposed bridge construction and creek realignment (which form part of the proposal) are unlikely to impact on the existing habitat connectivity values of Maxwells Creek, which are currently fragmented by Campbelltown Road. While there is likely to be a temporary loss in habitat connectivity during construction and creek realignment, the long-term outcome would improve connectivity along Maxwells Creek by replacing the existing three-cell box culvert with a wider two-span bridge

that would enhance fauna connectivity and provide light under the structure.

Cumulative impact on ecological connectivity

The planned development of the SWGC in biodiversity-certified areas, including the Edmondson Park precinct, will modify connectivity within the surrounding environment. Impacts of the development of the Edmondson Park precinct are to be offset by the proposed Edmondson Regional Park, established in accordance with the Edmondson Park Precinct Biodiversity Conservation Agreement made under the EPBC Act.

As outlined in Section 2.7.1, the proposal includes an offset strategy to mitigate impacts to the proposed Edmondson Regional Park. The proposed offset area for the Campbelltown Road upgrade includes areas of Cumberland Plain Woodland and would maintain the minimum 79 hectares of Cumberland Plain Woodland that must be retained and protected under the terms of the Edmondson Park Precinct Biodiversity Conservation Agreement.

This lack of habitat connectivity across the study area is compounded by substantial barriers to fauna movement, including linear infrastructure such as the Hume Motorway, large industrial developments and large urban residential areas. Construction of the SWRL in the study area has also fragmented riparian vegetation associated with Maxwells Creek.

Widening Campbelltown Road where it transects remnant woodland would increase the gap between existing patches of habitat on either side of the proposal, but would not substantially increase the extent of habitat fragmentation. The majority of fauna species recorded within the study are highly mobile bird species and are unlikely to be adversely impacted by barrier effects associated with the proposed road widening.

Species that may be adversely affected include smaller, slow-moving species recorded in the study area such as reptiles and amphibians and the endangered Cumberland Plain Land Snail. The widening of Campbelltown Road is unlikely to create a greater barrier to movement of these animals than presently exists.

The Ecological Assessment of the proposal included a detailed assessment of impacts on all threatened species, populations and communities recorded or considered to have a high to moderate likelihood of occurrence in the non-certified areas within the study area. It was found that the proposal would be unlikely to have a significant impact on any threatened fauna species such that a viable local population of that species would be placed at risk of extinction.

The Ecological Assessment is found in Chapter 6 and Appendix K of the REF.

2.7.3 Vegetation clearing

Respondents and submission numbers

OEH, Liverpool City Council, Campbelltown and Airs Historical Society, P&E, 59, 60, 61, 66, 67

Issue description

The submissions raised the following issues:

- Concerns about the clearing of vegetation, particularly the loss of roadside trees,

Cumberland Plain Woodland and associated ecological impacts such as flora and fauna impacts and biodiversity impacts

- Extant vegetation should be retained where possible, particularly within the median strip, until removal is required for future widening
- Liverpool City Council submitted that a condition of project approval should be that clearing of vegetation be approved in accordance with the Biodiversity Certification prior to removal
- Roads and Maritime should strengthen the environmental safeguards around vegetation clearing (item 19 of Table 7-89) which commits Roads and Maritime to not clearing ENV and EPBC Cumberland Plain Woodland until offsets are secured in accordance with the offset strategy agreed by DoE, OEH and P&E
- Vegetation rehabilitation plans should meet OEH requirements as per the EPBC Act. All work should ensure best-practice soil erosion and sediment control procedures so as not to impact on aquatic habitat and alluvial vegetation
- The REF and associated technical reports were inconsistent in their reference to the amount of ENV and EPBC Cumberland Plain Woodland to be cleared. Roads and Maritime should check all documentation to ensure accurate records
- P&E noted that comments made on the draft Ecological Assessment (Appendix K of the REF) were not addressed in the exhibited document.
- OEH requested a review of the riparian plan prepared as part of the Landscape Plan for areas impacted by the realignment of Maxwells Creek and by bridge construction
- OEH requested a review of the landscape plan prepared by Roads and Maritime to ensure commitment to revegetation, planting establishment and ongoing maintenance, in order to ensure minimal expansion of the edge effect into areas of native vegetation

Response

Vegetation clearing, including roadside trees and Cumberland Plain Woodland

During development of the concept design, Roads and Maritime adopted the following approach:

- Avoid areas of high biodiversity value wherever possible
- Mitigate actions and safeguard values identified for retention by prescribing appropriate controls
- Compensate for, or offset, the removal of biodiversity values.

This approach is consistent with OEH principles for the use of biodiversity offsets in NSW (DEC 2006) to provide biodiversity benefits. Vegetation communities likely to be impacted within the proposal area, in both certified and non-certified areas, that require approval prior to removal, are listed in Table 6-32 and shown in Figure 6-51i-iv of the REF.

Some of the roadside vegetation (including large Eucalypts between the Ingleburn Military Heritage Precinct and Zouch Road, as well as within the frontage of Denham Court House) would need to be removed to facilitate the proposed upgrade of Campbelltown Road. The trees along Campbelltown Road near the Ingleburn Military Heritage Precinct are plantings associated with the former barracks, as well as the natural regrowth of native vegetation (Taylor Brammer Landscape Architects 2013). During the preparation of the REF, an Arboricultural Assessment (Footprint Green 2013) investigated the Safe Useful Life Expectancy of these trees and their health. The assessment found that the Safe Useful Life Expectancy for many of these trees is five years or less due to poor health. Consequently, many of these trees would

require eventual removal regardless of the impact of the proposal.

The Ecological Assessment for the REF (Appendix K) identified that these roadside trees constitute poor condition Cumberland Plain Woodland and are substantially fragmented with low native species diversity and high occurrence of exotic species. The Ecological Assessment also noted that these areas of poor condition Cumberland Plain Woodland identified outside of the SWGC are not considered to provide potential habitat for threatened species, given that the understorey consists of *Olea* subsp. *cuspidate* (African Olive) and exotic grass species. Furthermore, the Ecological Assessment noted that the roadside vegetation to be removed is subject to edge effects, with disturbed soils, dead and dying trees and large patches of weedy exotic species.

Chapter 5 of this report presents proposed safeguards and management measures (updated from the REF) that would be implemented to minimise impacts on flora and fauna within the proposal area. Key safeguards include:

- During construction, vegetation clearing would be restricted to those areas assessed for removal
- Vegetation to be retained would be fenced for the duration of work with highly visible temporary fencing to ensure that clearing does not extend beyond the area necessary. Site plans would clearly identify areas to be retained (ie clearing boundaries and no-go zones); these plans would be included in site inductions
- If additional vegetation is to be removed, the proposed variation of scope would be referred to Roads and Maritime's Environment Manager, Sydney Region to determine if additional impact assessment is required
- A biodiversity offset strategy has been proposed to compensate for vegetation clearing. The new area to be incorporated into the proposed Edmondson Regional Park (refer to Figure 2.9) would be transferred to P&E or OEH before Roads and Maritime starts clearing of vegetation for the proposal within the proposed Edmondson Regional Park boundary. This is described further in Section 2.7.1.

Retention of extant vegetation in the median

It would not be feasible to maintain extant vegetation in the median because this would not comply with appropriate safety and sightline standards. Instead, medians with a width greater than four metres would be landscaped with native grasses. The exception is adjacent to the Edmondson Park precinct, where there would be trees planted in the median as identified in Section 2.14 of this report.

Offset area

The proposed offset area would be managed according to a Biodiversity Management Plan for the area, to be prepared in consultation with OEH, P&E and DoE. Erosion and sediment control during construction would be undertaken in accordance with the Blue Book (Landcom 2004) and Environmental Work Method Statements would be prepared to prevent impact on aquatic habitat and alluvial vegetation.

Comments by P&E on the draft Ecological Assessment

The figures presented in the REF and the final Ecological Assessment for clearing of ENV and EPBC Cumberland Plain Woodland are correct. All comments from P&E have been incorporated into the final documents.

Ongoing consultation with OEH

The proposal is consistent with the conditions of the Biodiversity Certification and the

proposed biodiversity offset area and management plan would result in an improved environmental outcome. OEH has provided in-principle agreement for the project, and Roads and Maritime would continue to consult OEH to ensure that the proposal is delivered in accordance with the Biodiversity Certification. The proposed biodiversity offset area would be secured and the Biodiversity Management Plan approved before vegetation is cleared for the proposal.

Roads and Maritime would continue to consult OEH, where relevant, throughout the development of the proposal. This would include consultation with regard to the landscape plan and riparian plan.

2.8 Aboriginal heritage

Respondents

Carmelite Nuns of Varroville, Heritage Council of NSW

Issue description

The submissions raised the following issues:

- General concern about potential impacts on Aboriginal heritage
- How the site complex would be protected and what mitigation measures would be implemented.

Response

General concern about impacts on Aboriginal heritage

The Aboriginal archaeological survey and Cultural Heritage Assessment Report (CHAR) were completed in accordance with the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI, Roads and Maritime 2011), and also applicable OEH regulations, including the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) (Code of Practice), and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). The Aboriginal Heritage Assessment can be found in Section 6.2 and Appendix G of the REF.

A Native Title search was conducted on 23 January 2012 by Artefact Heritage. The Aboriginal Heritage Information Management System database was searched on 23 January 2012 (and again on 22 January 2013) for sites within a six-kilometre by four-kilometre section of the study area, with a buffer of 50 metres. Previous Aboriginal archaeological survey reports within and next to the study area were reviewed during the desktop investigations.

All ground exposures were examined for stone artefacts, shell or other traces of Aboriginal occupation. Old growth trees were examined for signs of cultural scarring or marking. Photographs were taken of the landform units, vegetation communities, objects of interest and levels of disturbance.

A methodology for salvage excavations was prepared in consultation with the Aboriginal stakeholder groups at an Aboriginal Focus Group meeting on 22 February 2013. In accordance with Stage 3 of the PACHCI a CHAR was prepared to accompany the future Aboriginal Heritage Impact Permit application to OEH; it was informed by further consultation (Section 6.2 and Appendix G of the REF).

Protection of the site complex, and mitigation measures

The majority of the site complex (CRSC1) identified in the CHAR that falls within the boundaries of the study area would not be impacted by the proposal. As significance of the site has been assessed, subsurface testing under the OEH Code of Practice was not required.

A range of mitigation measures would be implemented to mitigate impacts on this site complex. These are listed in Section 5.2 of this report.

2.9 Non-Aboriginal heritage

2.9.1 Non-Aboriginal Heritage Assessment and Statement of Heritage Impact

Respondents and submission numbers

OEH (Heritage Branch), Carmelite Nuns of Varroville, Scenic Hills Association, Heritage Council of NSW, Liverpool City Council, 76

Issue description

The submissions raised the following issues:

- General concerns about impacts on non-Aboriginal heritage
- Concerns regarding the scope and outcomes of the Non-Aboriginal Heritage assessment because:
 - It did not assess the additional widening that would take place in the future on Campbelltown Road (outside of the current proposal) and Denham Court Road (outside of the Campbelltown Road limit of work)
 - It makes incorrect heritage classifications from its assessments of non-State Heritage Register listed heritage
 - The proposal does not take into account the advice in the Heritage Assessment that impact on items on the SHR should be avoided
 - The proposal would destroy heritage items
 - Roads and Maritime should further consider potential impacts on the heritage values of the area, including: Denham Court House, Campbelltown Road itself, milestones, Ingleburn Military Heritage Precinct and Mont St Quentin Oval, and vegetation (including roadside gum trees)
- The proposal should retain the trees, historic buildings and milestones associated with the current alignment in their original positions, as well as remnants of Cumberland Plain Woodland
- Mitigation measures recommended include:
 - A generic excavation permit is required under sections 139-146 of the *Heritage Act 1977* for all sections of the road corridor where there is potential for archaeological relics. This application should be supported by an archaeological assessment, discussion of whether test pits and monitoring and appointment of an excavation director are required, staff induction training (to recognise unexpected finds), archival recording prior to start of work, and recording of relics found etc. If relics are potentially state-significant, an excavation permit is required. If relics are potentially locally-significant, an exception to an excavation permit is required
 - A photographic archival record must be made in accordance with current Heritage Branch, OEH guidelines, of any archaeological 'finds'. Copies of this record should be provided to the Heritage Council and to Campbelltown and Liverpool City councils

- Liverpool City Council requested that a suitably qualified heritage architect should complete a condition assessment for all heritage places that could be impacted by the proposed project, prior to the start of work. The heritage architect should complete monitoring during construction and guide any rectification work necessary to mitigate any damage
- If the proposal proceeds, Roads and Maritime should be requested to prepare the documentation required to support the de-listing and re-listing of a reduced SHR curtilage at the former Ingleburn Defence Site and Denham Court House
- Recommendations on pages vi-viii of the original Statement of Heritage Impact (SoHI) are all required as minimum consent conditions
- All site staff should receive training in archaeological resources likely to exist along a c.1817 colonial road corridor with an unchanged alignment during site preparation and construction; this will help them to recognise 'unexpected finds'
- OEH Heritage Branch requested a copy of the Heritage Impact Statement and that the proposal documents be referred to the Heritage Council of NSW for comment.

Response

Impacts on Non-Aboriginal Heritage

Concerns regarding impacts on Non-Aboriginal heritage are noted. These are fully documented in the REF and in this report.

Scope and outcomes of the Non-Aboriginal Heritage Assessment

The Non-Aboriginal Heritage Assessment and Statement of Heritage Impact (SOHI) that was prepared by Artefact Heritage (2013b) considered the entire scope of work for the Campbelltown Road upgrade, from Camden Valley Way to Brooks Road, as defined in Chapter 3 of the REF. It was carried out in accordance with the principles and guidelines of the Burra Charter, the *Heritage Manual* (NSW Heritage Office 1996) and *Assessing Heritage Significance* (NSW Heritage Office 2001). Details of this assessment are outlined in Section 6.3 of the REF, while the full assessment is included as Appendix M of the REF.

The assessment identified that the proposal would impact five listed non-Aboriginal heritage items, including:

- Denham Court House and Chapel ('Denham Court') (State Heritage Register, *Campbelltown (Urban Area) LEP 2002*).
- Part of the former Ingleburn Defence Site, including the Military Heritage Precinct and Mont St Quentin Oval (*Campbelltown (Urban Area) LEP 2002*, *Liverpool LEP 2008* and State Heritage Register (now listed)).
- Three heritage listed milestones (*Campbelltown (Urban Area) LEP 2002*).

The assessment also identified suitable safeguards and management measures for these impacts. The safeguards listed in Section 6.3.4 of the REF have been superseded by the final list of proposed safeguards and management measures, presented in Chapter 5 of this report.

Consultation with Campbelltown City Council and Liverpool City Council has been carried out in accordance with ISEPP Clause 14. The assessment concluded that with the implementation of the proposed safeguards and management measures, the proposal would not significantly impact the value of any heritage items. Consultation

with OEH Heritage Branch as well as the Heritage Council of NSW has been carried out, and a Section 60 application would be made to the Heritage Council of NSW and a permit obtained before any impacts occur.

In response to community submissions on the REF, Roads and Maritime undertook design refinements of the proposal and commissioned Artefact Heritage to complete a Supplementary SoHI to the original report to:

- Discuss and assess design changes made since the original SoHI and changes to potential impacts on Denham Court House, Campbelltown Road itself, the milestones and Ingleburn Military Heritage Precinct and Mont St Quentin Oval. Further detail on this assessment is provided in sections 2.9.2–2.9.6 of this report
- Discuss changes in the statutory listing of the Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- Address the Interim Heritage Order request made to the Heritage Council about Campbelltown Road and the subsequent request for a detailed heritage assessment of Campbelltown Road.

The Supplementary SoHI (Appendix C, Artefact Heritage 2013c) supports the heritage classifications that were reported in the original SoHI and, in particular, the assessment of non-SHR listed heritage, including Campbelltown Road. The Supplementary SoHI concluded that Campbelltown Road was of Local Significance. This was verified by the Landscape Heritage Assessment carried out by Taylor Brammer Landscape Architects (2013). Further information is provided in sections 2.9.2 and 2.9.7 of this report.

Retention of trees, historic buildings, milestones and remnants of Cumberland Plain Woodland Forest

Roads and Maritime has endeavoured to retain the trees, historic buildings and milestones associated with this alignment as much as possible. The Supplementary SoHI found that:

- No historic buildings would be significantly affected by the proposal. This was confirmed through the noise and vibration assessment, which found that construction of the proposal is unlikely to result in structural damage to heritage structures (Section 6.7 of the REF).
- The milestones had previously been removed from their original location and were replaced in the 1980s by the former Roads and Traffic Authority (now Roads and Maritime) and Campbelltown City Council. Therefore, relocating them to maintain the original distances but to accommodate a widened carriageway would not affect their value
- All efforts have been made to retain extant vegetation along the alignment where feasible. The revised concept design has been able to further reduce impacts on extant vegetation, reducing impacts on the landscape character of the study area, as discussed further in Section 2.14. However, it is not safe to maintain all of the trees in their original position. Some trees are too close to the edge of the road, and pose a hazard to motorists; they should be consistent with minimum clear zones outlined in the Roads and Maritime Supplement to Section 6 of the Austroads Guide to Road Design (Roads and Maritime 2011), which requires a minimum safety distance from the face of kerb.

Mitigation measures

The mitigation measures presented in pages vi-viii of the original SoHI (Artefact Heritage 2013b) and Supplementary SoHI (Artefact Heritage 2013c, Appendix C) have been included in the updated summary of safeguards and management measures presented in Section 5.2 of this report.

The Supplementary SoHI assessed the section of Campbelltown Road within the study area as having low archaeological potential. This was based on an archaeological assessment carried out by Australian Museum Business Services in 2010 that stated that while there was some limited potential for archaeological evidence of early road construction to be present beneath the modern road surface, remains of this type were unlikely to provide answers to significant research questions. Based on this, it was concluded that the proposed impacts on the road were acceptable. Campbelltown Road is not listed on any heritage registers. It has been assessed as being of Local Significance and having low research potential. No excavation or exemption permit under the *Heritage Act 1977* is required for the proposal.

Where retention of vegetation is not possible, trees would be replanted in accordance with the Landscape and Urban Design Strategy, which considers the heritage and ecological values within the study area. However, no trees would be retained within the median, for safety and sight distance reasons (with the exception of the section of the road adjacent to Edmondson Park). Further information about compensatory tree planting for the proposal is provided in Section 2.14.

As outlined in Section 6.3.4 of the REF, archival recording of the existing curtilage, trees, fence and gate at Denham Court would be carried out before the start of construction. Archival recording of the former Ingleburn Defence site elements that would be impacted by the proposal would also be carried out before the start of construction, as well as archival recording of any unexpected archaeological 'finds'. Copies of this record would be provided to the Heritage Council of NSW, Campbelltown City Council and Liverpool City Council.

As outlined in sections 6.3.4 and 6.7.5 of the REF, a condition survey would be carried out before the start of construction by a qualified heritage architect. Vibration impacts would be minimised near Bardia Barracks, an element of the Ingleburn Military Heritage Precinct, and Mont St Quentin Oval. This was the only heritage place that was identified as being potentially impacted by construction. As identified in the REF, condition surveys would be carried out for any building where construction machinery would be operated within 15 metres. This would be followed up with monitoring during construction.

If the proposal proceeds, Roads and Maritime would prepare the documentation required to support the de-listing and re-listing of SHR curtilages at the Ingleburn Military Heritage Precinct and Mont St Quentin Oval and Denham Court House.

As outlined in Section 6.3.4 of the REF, in accordance with the Non-Aboriginal Heritage Management Plan (part of the Construction Environmental Management Plan - CEMP) that would be prepared prior to construction, all site personnel would complete a non-Aboriginal heritage induction prior to starting work. Aspects such as location of heritage items, their significance, responsibilities under the *Heritage Act 1977* and any relevant permits would be discussed.

Consultation with OEH Heritage Branch and Heritage Council of NSW

A number of meetings have been held with OEH Heritage Branch and the Heritage Council of NSW throughout the development of the concept design and the REF (refer to Table 1-2 for more information). The proposal documents were referred to the Heritage Council, which prepared a submission commenting on the REF.

2.9.2 Campbelltown Road

Respondents and submission numbers

Scenic Hills Association, Campbelltown and Airds Historical Society, Heritage Council of NSW, 25, 45, 59, 64, 66, 67

Issue description

The submissions raised the following issues:

- Campbelltown Road should be added to the Section 170 register, that there should be State listing of the Ingleburn Military Heritage Precinct and Mont St Quentin Oval, and that there should be an Interim Heritage Listing of Campbelltown Road from the Crossroads at Casula to Raby Road
- The heritage significance of Campbelltown Road should be assessed in more detail, particularly with regard to social significance, archaeological research potential or rarity and identification of significant features (alignment, physical remains such as culverts, milestones, drains, etc)
- The proposal would compromise heritage values associated with Campbelltown Road, which are significant, from Camden Valley Way to Raby Road, including its milestones, its junctions at Denham Court Road and the Cross Roads, and the gum trees that line it and form an archway over the road.

Response

Additional listings

In June 2013, the Scenic Hills Association requested that the Heritage Council of NSW consider an IHO for Campbelltown Road between the Crossroads at Casula and Raby Road, St Andrews. This is discussed in detail in Section 1.6. On 4 December 2013, the Heritage Council of NSW resolved that an IHO would not be made at this time, but that a wider study of the Great South Road was required.

During detailed design, Roads and Maritime would consider including Campbelltown Road (or a portion thereof) on its s170 Heritage and Conservation Register.

Any future listing of Ingleburn Military Heritage Precinct and Mont St Quentin Oval are outside the scope of this proposal.

Assessment of heritage significance of Campbelltown Road

In response to community submissions on the REF, Roads and Maritime commissioned the following additional heritage studies:

- Heritage Landscape Assessment (Taylor Brammer Landscape Architects 2013) to assess the heritage significance of Campbelltown Road and surrounding heritage items as a whole
- Supplementary SoHI (Artefact Heritage 2013c, Appendix C) to respond to design changes and issues raised in submissions.

Both reports concluded that:

- Campbelltown Road has Local Significance. This is consistent with the original SoHI (Artefact Heritage 2013b, 2013c).
- Campbelltown Road satisfies several of the potential criteria for heritage listing at a local level, as outlined in Section 3.4.

These assessments are discussed in detail in Section 3.4 and 3.5 of this report.

Potential impacts on Campbelltown Road heritage values

Further information about the Supplementary SoHI, and safeguards and management measures relating to Campbelltown Road's heritage values, are presented in Section 3.4 and Appendix C.

2.9.3 Denham Court House

Respondents and submission numbers

OEH Heritage Branch, Scenic Hills Association, Heritage Council of NSW, National Trust of Australia, Campbelltown City Council, 6, 23, 25, 28, 37, 41, 47, 49, 53, 59, 60, 66, 67, 69, 75, 76

Issue description

The submissions raised the following issues:

- The investigation of options was not adequate:
 - Only one option has been presented
 - The 'do nothing' option was not considered for the road alignment next to the Denham Court House estate
 - The option to move the alignment of Campbelltown Road north was ruled out due to cost
- The proposal should accommodate four lanes next to Denham Court House with a conventional median strip. If further widening is required, the respondents suggested that land could be acquired in the future on the northern/western side of the road
- Various concerns and suggestions regarding impacts to Denham Court House, including its curtilage. Submissions stated:
 - Heritage Council and others would prefer that impacts on the curtilage of Denham Court House were avoided, particularly because it is on the State Heritage List
 - The proposal should avoid Denham Court House by widening to the north/west, where less large, built up residences exist. The road could be straightened to use the eastern side past Bardia Barracks.
 - Widening to the north/west to avoid Denham Court House, resulting in acquisition of a different set of properties, is not considered a viable alternative.
 - Opposition to the removal of 37 metres of curtilage – the land helps interpret Denham Court House as a major early colonial farm and the remaining estate land is a rarity in modern south-western Sydney
 - Opposition to the removal of 11 mature gum trees that are over 100 years old. These trees provide a boundary/security/privacy function
 - There has already been land resumed from Denham Court House estate for a national highway. The proposal should not include further resumption of the estate
 - The reasoning (in the REF) that Denham Court House was once bigger so now it is okay to reduce it is not appropriate and we should be maximising the land remaining
- Roads and Maritime should engage the owners of Denham Court House and local historians to validate the significance of the impact on Denham Court House.

Response

The investigation of options was not adequate

Roads and Maritime has explored options to avoid impacting the curtilage of Denham Court House. These options were described in Section 2.4.3 of the REF. Doing nothing at this location would not achieve the objectives of the proposal, as outlined in Section 2.4.3 of the REF. Widening to four lanes with a conventional median strip adjacent to Denham Court House is discussed further in Section 2.3.2 of this report.

Shifting the road alignment north at this location would also not achieve the proposal objectives, as this road alignment would reduce the storage capacity of the left turn slip lane and would result in traffic congestion at the Campbelltown Road intersection with Denham Court Road. To prevent this congestion, the Church Road/Denham Court Road intersection to the north would need to be realigned to increase distance from the Campbelltown Road intersection. This would impact the curtilage of the St Mary the Virgin Church Group. It would also require substantial property acquisition along the northern side of Campbelltown Road, affecting a number of private properties, including two businesses (one of which, Denham Court Caravan Park, is occupied by permanent residents) and one property that would need to be totally acquired and residents relocated. Part of the existing corridor would not be utilised, but would be orphaned between the new design and the properties on the southern side of Campbelltown Road.

In short, widening to the north/west to avoid Denham Court House would require the acquisition of a different set of properties, and is not considered a equitable alternative.

Impacts on Denham Court House, including its curtilage

The proposal would involve the removal of the current fence and entrance gate of the property, and a number of established eucalypts. The April 2013 SoHI stated that while it would be preferable for the trees to be retained, their removal was considered to be an acceptable impact if necessary (Artefact Heritage 2013b). In addition, an Arboricultural Assessment (Footprint Green 2013) assessed that the Safe Useful Life Expectancy of each of these trees is five years or less due to poor health. Consequently, these trees would require removal regardless of the impact of the proposal, possibly prior to any construction for this stage of the proposal.

In response to community submissions on the REF, Roads and Maritime undertook a series of additional investigations and made a number of further design refinements to the concept design. The modifications to the proposed design have reduced the impact of the proposal on Denham Court House. The proposal would impact the curtilage of Denham Court House by a maximum of about 16.2 metres, with about 9.2 metres to be returned to Denham Court House following the completion of construction (in consultation with OEH Heritage Branch and landowners). These design refinements are described in more detail in relation to Denham Court House in Section 4.2.2.

The implications of these design refinements were assessed in the Supplementary SoHI and have been summarised in Section 3.4.1 of this report. Additional safeguards and mitigations have also been proposed, and these are outlined in Section 3.4.2 of this report. The Supplementary SoHI concluded that while the reduction of the curtilage of Denham Court House is not ideal, the proposed impacts on the curtilage would be appropriately mitigated.

As Denham Court House is listed on the State Heritage Register, a Section 60 application would be made to the Heritage Council of NSW and a permit obtained before any impacts are made within the item's curtilage.

Additional consultation on Denham Court House

As indicated in Table 1.2, the project team met with the owners of Denham Court House on 22 March 2013 to discuss their concerns about potential impacts of the proposal. In addition, Roads and Maritime has carried out extensive consultation with agency stakeholders and the broader community. This consultation is also outlined in Table 1.2. Roads and Maritime would continue to consult with the owner of Denham Court House during detailed design and construction to refine and implement the safeguards and management measures proposed (presented in Table 5.1).

The significance assessment has been carried out in accordance with the principles and guidelines of the Burra Charter, the *Heritage Manual* (NSW Heritage Office 1996) and *Assessing Heritage Significance* (NSW Heritage Office 2001). A qualified heritage consultant was used to assess the heritage significance and potential impacts on Denham Court House.

2.9.4 Ingleburn Military Heritage Precinct and Mont St Quentin Oval

Respondents and submission numbers

Campbelltown and Airs Historical Society, Liverpool City Council, Campbelltown City Council, OEH (Heritage Branch), Heritage Council of NSW, 25, 41, 59

Issue description

The submissions raised the following issues:

- Concerns regarding the proximity of the proposal to the Ingleburn Military Heritage Precinct and Mont St Quentin Oval. Submissions stated the following:
 - Campbelltown City Council is concerned about loss of curtilage in front of Mont St Quentin Oval and the Bardia Barracks site
 - The proposal should be sited away from the Ingleburn Military Heritage Precinct and Mont St Quentin Oval, conserving the gates, memorials and areas next to Campbelltown Road in the Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- Concerns regarding the relocation of the heritage gates. Submissions stated the following:
 - OEH noted that the proposal requires approval for relocation of heritage gates in the Ingleburn Military Heritage Precinct and Mont St Quentin Oval.
 - Liverpool City Council would like the relocated hospital gates to be reinstated on the proposed shared path as recommended in the original SoHI
- A section 60 application for construction within the SHR curtilage of the former Ingleburn Defence Site should be supported by an archaeological assessment of the potential for relics along this section of Campbelltown Road, and discussion whether archaeological monitoring, test pits and appointment of an excavation director are required
- The proposal should incorporate replanting of the same species of trees, in the same configuration and general locations relative to that boundary through the former Ingleburn Defence Site.

Response

Proximity of the proposal to Ingleburn Military Heritage Precinct and Mont St Quentin Oval

It is not feasible to realign the upgrade away from the Ingleburn Military Heritage Precinct and Mont St Quentin Oval, for the reasons identified in Section 2.4 of the REF:

- It would not be consistent with the *Edmondson Park South Development Control Plan 2012* (P&E 2012) that has been developed for the SWGC
- It would introduce a number of new impacts on areas not currently impacted by a road corridor, such as traffic noise and increased vegetation removal
- It would require considerable property acquisition.

The Supplementary SoHI (Appendix C of this report) has verified that the proposal would not have any significant impact on the heritage value of these items, provided that the proposed safeguards and management measures are implemented, as the relationship between the Mont St Quentin Oval associated gates and Bardia Barracks would be maintained.

Relocation of heritage gates

The approval of the Heritage Council of NSW is required for any major work. It would be necessary to make a Section 60 application to the Heritage Council for any impacts on the State Listed item, including the relocation of heritage gates at Mont St Quentin Oval. The safeguards and management measures presented in Section 6.3.4 of the REF (now superseded by the final list of safeguards and management measures proposed, which is presented in Chapter 5 of this report) address the potential impacts of the proposal on the State Listed Ingleburn Military Heritage Precinct and Mont St Quentin Oval.

As outlined in the REF, the configuration of the shared path and both sets of entry gates to St Mont Quentin Oval would be further considered during detailed design in consultation with the Heritage Council and OEH (Heritage Branch). Some additional assessment of the options for reconfiguration of the entry gates was completed as part of the Supplementary SoHI (Appendix C). A summary of the options is presented in Section 3.4.1.

Section 60 application for construction within the curtilage of the former Ingleburn Defence Site

The specific scope of any additional archaeological assessments as part of a Section 60 application would be determined in further consultation with the Heritage Council of NSW.

Replanting of the same species of trees

The proposal would involve the removal of trees along both sides of Campbelltown Road, where it passes through the former Ingleburn Defence Site. These trees would be replaced with the same species (and where safe, feasible and reasonable, in the same configuration and general locations) to maintain the landscape. A Section 60 permit would be obtained prior to starting this work.

2.9.5 Milestones

Respondents and submission numbers

Campbelltown City Council, Scenic Hills Association, Campbelltown and Airs

Issue description

The submissions raised the following issue:

- The relocation of the milestones would affect their heritage significance. This is an unacceptable impact.

Response

Relocation of milestones

As discussed in section 6.2.4 of the REF, the milestones are not in their original positions. During the 1980s, the former Roads and Traffic Authority (now Roads and Maritime) together with Campbelltown City Council recovered the milestones from storage and returned them to their current location.

During construction, Roads and Maritime would protect and preserve the milestones, which would be relocated at the appropriate distance, and landscaped. Consultation has occurred with the NSW Heritage Office and heritage experts and advisors to ensure historic integrity is maintained.

2.9.6 St Mary the Virgin Church and Cemetery Group

Respondents

Heritage Council of NSW, Scenic Hills Association

Issue description

The submissions raised the following issues:

- St Mary the Virgin Church and Cemetery Group is of greater than local heritage significance, and should be treated as State significant in terms of conditions of consent about archaeological potential
- Proposed impacts on St Mary the Virgin Church and Cemetery Group are unacceptable.

Response

Heritage significance

St Mary the Virgin Church is listed on the *Liverpool LEP 2008* as an item of local heritage significance. It is not listed as an item of State significance. The significance assessment for the heritage item, as outlined on the State Heritage Inventory and in Table 6-44 of the REF, describes the church and grounds as meeting the threshold for listing at a local level based on its historical, associative and aesthetic significance, its ability to contribute to research, and its rarity.

Impacts

The heritage assessment for the REF (Table 6-45) determined that impacts on the St Mary the Virgin Church and Cemetery Group are not likely to be significant. The proposal area includes a small strip of land (about five metres wide) along the western side of the item's heritage curtilage and a minor section at the corner of Denham Court Road and Church Road. Any impacts would be limited to a small area

on the western boundary of the property, around 140 metres from the main church/cemetery complex. This area is mostly cleared, with a few immature eucalyptus trees, and impacts within this area would not involve significant impacts on the views or setting of the church.

The item would not be affected by vibration impacts during construction as all structures on the site are located over 100 metres from the construction footprint (Section 6.7.4 of the REF).

If any trees are removed as part of the proposal, replacement trees of a similar species would be planted along the southern boundary of the item's curtilage following completion of construction, and in consultation with the landowner.

2.10 Hydrology and water quality

Respondents and submission numbers

Liverpool City Council, 51, 58

Issue description

The submissions raised the following issues:

- The REF did not include a flood analysis for Cabramatta Creek. The flood impact assessment should assess the impact of the proposal on flood levels, flows and velocities
- Liverpool City Council requested that:
 - The proposal should maintain or improve pre-existing flood regime and water quality
 - The proposal should not result in increased flows downstream of the road crossing of Maxwells Creek
 - The proposed work could potentially impact on overland flow paths and private properties. Overland flow/flood assessment should be carried out and appropriate mitigation provided to ensure no private property is adversely affected
 - The proposal should include appropriate flood mitigation and erosion protection work to mitigate any impacts on private property
 - During detailed design, the flood impact assessment and water quality reports should be submitted to Liverpool City Council for review, as well as a detailed flood modelling report
 - The proposal should incorporate culverts designed in accordance with AS5100 – Bridge Design.
- The proposal should incorporate a road surface that is designed to cater for all stormwater from the subject land. This water should pass under or over the Blomfield Road alignment and enter the new crossing culvert west of Blomfield Road
- Liverpool City Council noted that no arrangements have been made for the ongoing maintenance of new drainage crossings and roadside channels. Council views these as a major cost burden should Council be expected to maintain these structures. While at this stage, Liverpool City Council does not accept the ongoing maintenance of these structures, the following requirements are provided to enable these issues to be properly addressed during the design stage:
 - A plan should be submitted for Council acceptance showing all assets that are to become Council's maintenance responsibility

- Road boundaries should be adjusted to ensure that all public assets are fully contained within dedicated public roads
- Appropriate access should be provided for cleaning and maintaining drainage channels
- Batter slopes should be treated with mass plantings to eliminate the need for intensive maintenance
- All drainage channels should be designed to fully accommodate 100-year ARI flood flows from the upstream catchments to prevent property inundation
- Any proposal to discharge large quantities of stormwater into local creek systems would result in increased velocities and subsequent erosion, so appropriate measures should be carried out to mitigate adverse impacts on creek erosion and flooding
- Where drainage is being directed through natural watercourses and/or existing trunk drainage, the watercourses and trunk drainage should be upgraded to receive such waters
- Prior to the start of any work on private property, Council would require evidence of agreement and approval by the property owner for the work
- Construction would generate additional pollutants, and appropriate water quality treatment facilities should be incorporated in detailed design. A maintenance management plan should be prepared and costed should maintenance becomes Council's responsibility.

Response

Flood impact assessment

An assessment of the drainage requirements and flooding impacts of the proposal was prepared by Lyall and Associates (2013). A copy of the report is available in Appendix J of the REF.

The hydrology and drainage assessment for the REF outlines a strategy to maintain and improve the present flood regime for the proposal area, considering flood levels, flows and velocities. The assessment included consideration of Cabramatta, Maxwell and Cottage Creeks. The flood assessment was carried out to determine the flooding impacts in relation to the proposal. Investigations in both LGAs (Major Development SEPP Edmondson Park South Flood Planning) found that flood-prone land was specific only to the area around Maxwells Creek. Therefore, the flood assessment has focused on this area.

The REF also determined that the realignment of Maxwells Creek would have a minor impact on flow depths and velocities both upstream and downstream of the road corridor. On this basis, the potential impact on stream stability is considered to be negligible. The hydrology and drainage strategy and additional information can be viewed in section 6.4 of the REF.

Mitigation measures have been incorporated into the proposal to ensure avoidance of impacts on water quality (refer Section 6.4 of the REF). Further development of the mitigation measures would occur through refinements to the proposal during detailed design.

Liverpool City Council requirements

The flooding and drainage assessment by Lyall and Associates (2013) found that the proposed twin bridges would reduce peak 100-year average recurrence interval (ARI)

flood levels immediately downstream (north) of Campbelltown Road within the proposed Edmondson Regional Park by about 700 millimetres, and would not impact on any developed areas. Appropriate energy dissipation and scour protection measures would be incorporated into the design of each outlet of the road surface drainage system.

The proposed twin bridges at Maxwells Creek would also reduce the peak 100-year ARI flood level on the southern (upstream) side of the road corridor and establish a 300-millimetre freeboard to the crest level of the earth embankment running alongside Maxwells Creek. This would prevent the breakout of flow that presently occurs toward the east.

Section 6.4 of the REF includes an assessment of the potential flooding impacts on properties and recommends design measures to avoid or minimise flooding impact, which would be further developed in detailed design.

Roads and Maritime would carry out further investigations during detailed design to ensure appropriate treatments are implemented to avoid or minimise flooding impacts to ensure waterways can receive any increased peak flows as a result of the proposal. The REF includes a safeguard that identifies that appropriate mitigation measures for any flood impacts on property would be developed during detailed design in consultation with affected landowners. Written agreement to carry out work on private property would be obtained by Roads and Maritime prior to the start of work.

A flood study would be prepared during detailed design for each stage and would be provided to Council. The study would also consider the timing of future drainage improvements and flood mitigation measures provided by the development of the surrounding land catchments.

Waterway crossings including bridges would be designed in accordance with AS5100- Bridge design. Relevant bridge design standards and safety considerations would form part of the detailed design scope.

Between Zouch Road and Denham Court Road, current design road levels put the widened road in cut along the upslope (eastern) side of the road corridor. It would be difficult to control and direct runoff along the upslope side of the road towards upgraded cross drainage structures, given the presence of several access driveways which would need to be maintained as part of the road upgrade.

Road surface that caters for all stormwater from the subject land

The flooding and drainage assessment prepared by Lyall & Associates recommended that existing cross-drainage structures be removed, with runoff from the upslope catchments introduced into the new road surface drainage system along the length of road corridor between Zouch Road and Denham Court Road. A series of catch drains would be required along the top of the cut batter, with inlet pits provided as required to manage flows and to suit new driveway access locations. It is recommended that combined runoff generated on both upslope catchments and the new carriageways be discharged on the western side of the road corridor.

Maintenance of drainage crossings

The REF outlined that batters and retaining walls would be designed to accommodate access for maintenance. Drainage channels would also be designed to accommodate access for maintenance (and cleaning).

This would be in accordance with relevant standards and specifications, and would be progressed during detailed design.

Details of assets to be transferred to Liverpool City Council would be finalised during detailed design and provided for Council discussion/acceptance, inclusive of public assets within dedicated road corridors and access for maintenance.

2.11 Traffic, transport and access

2.11.1 Traffic modelling

Respondents and submission numbers

Campbelltown City Council, Carmelite Nuns of Varroville, Denham Court Association, Scenic Hills Association, 25, 41, 49, 66, 67, 76

Issue description

The submissions raised the following issues:

- Campbelltown City Council requested that Roads and Maritime review the traffic modelling informing the proposal to confirm predicted volumes; and the traffic modelling should be peer reviewed and assumptions tested
- The proposal is not consistent with recent changes in the area and to Campbelltown Road. Campbelltown Road is closed to access (without detour) from the south to discourage traffic in the Central Hills Lands, along Campbelltown Road. Traffic on Campbelltown Road is actually declining; there are no current traffic concerns in the area. The traffic has not increased on an annual basis from 1996–2005. The submission requested clarification on the source and interpretation of data on traffic volumes in Section 3.3 (Appendix B of the REF, pages 28-29).

The traffic data used in the modelling was:

- Taken from an invalid database.
- Collected at an inappropriate location that does not reflect the traffic on the area of Campbelltown Road to be upgraded and may/may not make allowances for pedestrians who may walk to the railway at Edmondson Park rather than use vehicles
- Collected during a period of increased traffic along Campbelltown Road due to diversions around roadwork in the area
- Heavily influenced by extensive traffic delays on Camden Valley Way between Cowpasture Road and the Crossroads due to roadwork. Even with this inflated traffic, the modelling suggests that intersections along Campbelltown Road performed satisfactorily
- The traffic modelling methods:
 - The variables and assumptions were not made clear
 - The 'do nothing' option and expansion of Soldiers Parade were not assessed
 - The proximity of the train station was not taken into account
 - It indicated that a four-lane capacity road would appear to perform satisfactorily through to the year 2036, which does not support the proposed upgrade. Even Camden Valley Way is only four lanes wide.
- The proposal would result in a bottleneck at the Brooks Road intersection
- The proposal would increase traffic on Campbelltown Road by diverting traffic away from a more direct route, and would increase traffic moving north–south along Campbelltown Road.

Response

Peer review of modelling

In response to community submissions on the REF, Roads and Maritime (with the concurrence of Campbelltown City Council) commissioned GTA Consultants to carry out a Traffic and Transport Peer Review (GTA Consultants 2013a). The full report is available in Appendix B and a summary is presented in Section 3.1.

In response to the Traffic and Transport Peer Review, Roads and Maritime subsequently commissioned AECOM to carry out a Supplementary Traffic Assessment (AECOM 2014). The full report is available in Appendix B, and a summary is presented in Section 3.2 of this report).

A Supplementary Traffic and Transport Peer Review (GTA Consultants 2013b) reviewed the Supplementary Traffic Assessment. The full report is available in Appendix B and is summarised in Section 3.3 of this report.

Current and future traffic trends

Campbelltown Road is not closed to access from the south; Brooks Road is closed to access from the Hume Motorway. Campbelltown Road remains an important principal arterial road between Liverpool and Campbelltown.

As outlined in Section 2.2.1, the purpose of the proposal is to cater for the planned future growth in the areas surrounding Campbelltown Road including the development of the Edmondson Park precinct and operation of the Edmondson Park railway station, and to prevent congestion or traffic issues arising in the future. The proposal has been identified as necessary to cater for predicted traffic numbers in 2016 and beyond to 2036.

In summary, the proposal is required to cater for future traffic volumes, which are forecast to be much higher than today's traffic volumes due to the development of the SWGC, particularly the Edmondson Park precinct.

Traffic data used in modelling

Traffic data used in the traffic and transport modelling assessment as part of the REF was collected at survey points within the alignment of the proposed road upgrade and reflect the length of Campbelltown Road to be upgraded. The data collected at these survey sites form a representative 'database' from which to base the assessment of existing corridor conditions on Campbelltown Road as they adequately reflect the prevailing traffic conditions at the time of the assessment.

Roads and Maritime provided available traffic count data gathered at a number of locations across Campbelltown Road, Hume Motorway and Camden Valley Way for the purposes of the traffic and transport assessment. In the Supplementary Traffic Assessment (AECOM 2014, Appendix B), an analysis was carried out to determine if the traffic count data used would have been impacted by the timing of construction upgrades in the surrounding road network and, if so, in what capacity they had been affected. A summary of this analysis is included in Section 3.2.1.

In conclusion, the analysis of available traffic volumes gathered between March 2010 and August 2013 indicates that the 2011 traffic counts used in the traffic and transport modelling included in the REF are representative of traffic volumes on the corridor and were not adversely impacted by construction upgrade work on the Hume Motorway or Camden Valley Way.

Traffic modelling methods

Responses to specific queries with regards to traffic modelling are as follows:

- Roads and Maritime was asked to provide some additional information about traffic modelling and the assumptions that informed the traffic modelling for the proposal. These were all uploaded to the [Campbelltown Road upgrade website](#)
- The Supplementary Traffic Assessment (AECOM 2014, Appendix B, Chapter 2) clearly outlines the assumptions and variables considered in the traffic modelling in the REF. These are summarised in Section 3.2.1
- The 'do nothing' option was considered in Section 2.4 of the REF
- Increasing the capacity of Soldiers Parade was explored in Section 2.3.1 of this report. The consideration of a reduced widening south of Macdonald Road was considered and adopted
- The supplementary traffic modelling that was carried out to inform this design refinement is summarised in Section 3.2.1.

Bottleneck at the Brooks Road intersection

Mid-block analysis (AECOM 2014, Appendix B) indicates that there is a low likelihood of a potential bottleneck occurring at Brooks Road as a result of the proposal. About one third of the traffic travelling along Campbelltown Road leaves or joins at Denham Court Road. Therefore there is less traffic on Campbelltown Road south of the intersection with Denham Court Road. The potential for a bottleneck to occur was raised as a concern in feedback as it is at this point where the upgrade finishes and the Campbelltown Road corridor returns to one lane in each direction. The proposed merge is no different to that provided on other parts of the road network which are used frequently by drivers.

The proposal would increase traffic on Campbelltown Road

Campbelltown Road has always played an integral role in the road network of south-western Sydney. This would continue to be so in future years and the GCRF identifies it as a principal arterial road as outlined in Section 2.2.1. The proposal would not increase traffic along Campbelltown Road by diverting traffic away from a 'more direct' route. Despite the increased capacity of surrounding roads within the network, including Camden Valley Way, the Hume Motorway, Williamson Road and Macdonald Road, new residents of Edmondson Park precinct and the wider SWGC would be using Campbelltown Road as an important part of the road network.

As outlined in Section 2.2.2, the proposal would address increases in traffic that would be experienced in the road network as a consequence of the development of the SWGC, particularly the Edmondson Park precinct. The traffic modelling that was carried out assigns trips dynamically within the model to the route or combination of connecting roads that provides the overall shortest travel time between the origin and the destination. The origin and destination profiles are presented in the Supplementary Traffic Assessment (AECOM 2014, Appendix B) and described in Section 3.2.1. Campbelltown Road provides the most direct route for most trips.

2.11.2 Shared path

Respondent and submission numbers

OEH, Scenic Hills Association, 6, 18, 19

Issue description

The submissions raised the following issues:

- The 'existing bike lane along the northern side of the road' is poorly maintained, with little signage and occasional pinch points (it is really a breakdown lane for cars) and there are very limited facilities on the southern side of the road
- The proposal should include:
 - Pedestrian facilities to cross the road at Parkers Farm Place
 - Access from the Vista Estate to the nearest bus stop at Glenfield Road
- Provisions for greater signage for cyclists at Brooks Road
- The proposed off-road shared path should be bi-directional and possess links (with appropriate signage) to:
 - The M7 bike path
 - The Glenfield to Liverpool bike path
 - The Camden Valley Way cycleway
 - Cowpasture Road
 - Pathway connections (east and west) across the open space network of Edmondson Park, including the proposal Edmondson Regional Park and public open space network
- OEH requested consultation with regards to pedestrian and cycle connectivity between Edmondson Regional Park precincts
- The provision of pedestrian and cycle tracks should not impact on heritage values.

Response

Existing facilities

Section 2.2.3 of the REF states that: "there are limited pedestrian facilities along this section of Campbelltown Road, due to its largely rural character and the high speed of traffic on the road... Shoulders and verges provide an informal means for pedestrians and cyclists to travel along Campbelltown Road... For cyclists, a marked on-road cycle lane is provided within the road shoulder between Ingleburn Gardens Drive and Denham Court Road."

Proposed pedestrian crossings

Pedestrian crossings would be included on all approaches at intersections of Campbelltown Road with the realigned Macdonald Road, Soldiers Parade and East Town Centre Road, providing connectivity between land uses to the east and west of Campbelltown Road.

Pedestrians wishing to access the nearest bus stop at Glenfield Road may do so using the existing road network within the Vista Estate and existing facilities on Glenfield Road. These roads are outside the scope of this project.

Signage for cyclists

Specific signage would be determined during detailed design.

Proposed off-road shared path

The proposed off-road shared path would be bi-directional and include links to all other bike paths in the area, including:

- The M7 bike path, via Brooks Road (and, by extension, the Glenfield to Liverpool bike path)
- The Camden Valley Way cycleway (and, by extension, Cowpasture Road)
- Pathway connections (east and west) across the open space network of Edmondson Park, including the proposed Edmondson Regional Park and the public open space network.

Consultation with OEH

Roads and Maritime would continue to consult with OEH in subsequent stages of the proposal.

Heritage impacts

The configuration of the shared path in relation to the two sets of entrance gates at Mont St Quentin Oval would be determined during detailed design, and is discussed further in Section 3.4.1 of this report. Minimising any potential impacts on heritage values would be a key determinant of the final design of the shared path in this section.

2.11.3 Speed limits

Submission numbers

19, 52

Issue description

The submissions raised the following issues:

- Roads and Maritime should reconsider the number of proposed speed limit changes (four) along the subject section of Campbelltown Road
- The proposal should include provisions for the speed limit to be reduced between Glenfield Road and the Hume Motorway to 60 kilometres per hour.

Response

The identification of speed limits in the REF was based on the future land use around Campbelltown Road.

For example, the narrower available corridor through the proposed Edmondson Park Town Centre – and the resultant reduction in carriageway width – meant that clear zones had to be reduced. This, coupled with the likelihood of high pedestrian volumes and closer-spaced intersections, suggested that a lower speed limit of 70 kilometres per hour would be more appropriate.

Proposed speed limits would be reviewed during detailed design.

2.11.4 Traffic lights

Submission numbers

10, 14, 25

Issue description

The submissions raised the following issues:

- The proposal should incorporate more traffic lights
- The proposal should incorporate fewer traffic lights and instead should incorporate other pedestrian-friendly solutions to crossing the road as opposed to traffic lights, such as pedestrian underpasses or overpasses, or traffic lights at mid-block pedestrian crossings.

Response

The proposal would incorporate traffic lights to ensure efficient traffic flow along Campbelltown Road, while providing safe access to side streets for motorists, pedestrians and cyclists. Roads and Maritime have specific criteria to determine the necessity for traffic lights. These criteria have been applied to the proposal in accordance with the Roads and Maritime document *Traffic Signal Design* (RTA 2008).

The minimum pedestrian traffic for which mid-block pedestrian signals is warranted is 150 pedestrians per hour for each of four one-hour periods per day (Roads and Maritime Traffic Signal Design – Section 2 Clause 2.3(c)). The Traffic and Transport Modelling Assessment (Appendix B of the REF) included an estimated existing pedestrian volume of 10 to 20 people per hour (AECOM 2013). This indicates that there are not enough pedestrians to warrant traffic lights at mid-block pedestrian crossings.

2.11.5 Heavy vehicles

Respondents and submission number(s)

Carmelite Nuns of Varroville, 37, 49, 71

Issue description

The submissions raised the following issues:

- Has the proposal taken into account the opening of the Southern Sydney Freight Line and its impact on heavy vehicle traffic flows on Campbelltown Road, Camden Valley Way and the Hume Motorway?
- The finding that heavy vehicles comprise 10 per cent of existing traffic volumes was questioned, given that the modelling did not extend the entire length of the road
- How significant is Campbelltown Road as a freight route, and do plans exist to make it one?
- Campbelltown Road should not be designated as a B-double route because it is closed to northbound traffic at Raby Road and is no longer a through road for traffic travelling from Campbelltown to Sydney
- How does the proposal address increases in truck traffic and what mitigation measures are proposed to minimise negative safety, noise and other impacts?
- Would appropriate weight restrictions be given to trucks considering the current condition of local roads?

Response

Southern Sydney Freight Line and heavy vehicle volumes

The Southern Sydney Freight Line has not been specifically included in the assessment of the corridor as it is considered somewhat remote from the proposal area. Freight movements are considered by the strategic traffic forecasting model maintained by Roads and Maritime that formed the basis for the Traffic and Transport Assessment (AECOM 2013).

Ten per cent of heavy vehicles have been assumed to occur across the corridor, with fluctuations at each intersection. Based on the 2011 intersection count surveys, a range of one per cent to 46.2 per cent was adopted for intersections. This is broken

down into individual intersection movements and is presented in full in Appendix C of the Supplementary Traffic Assessment (included in Appendix B of this report).

The role of Campbelltown Road as a freight route

Campbelltown Road is not closed to northbound traffic at Raby Road.

Campbelltown Road is an existing designated principal arterial road and a B-double route. It serves as a through road for traffic travelling from Campbelltown to Liverpool and further towards Sydney.

The proposal is expected to result in improved safety and efficiency for freight vehicles along Campbelltown Road. With the addition of a second lane in each direction between Denham Court Road and Ingleburn Gardens Drive, other vehicles and road users would be able to pass larger trucks more easily and safely.

Measures to mitigate impacts of increases in truck traffic

A discussion of noise mitigation measures is provided in Section 6.7 of the REF and is included in Section 2.12 of this report.

Campbelltown Road, as an existing B-double route, has no vehicle weight restrictions and none are proposed. All other surrounding roads are local roads under council control and subject to any restrictions that councils might apply.

Impacts of truck traffic on local roads

There is potential for the proposal to increase traffic volumes on local roads. These local roads are likely to remain as local/collector roads in the road hierarchy, under the care and control of Liverpool City Council or Campbelltown City Council. As such, a safeguard has been included in Chapter 5 which states that Roads and Maritime would carry out further traffic assessment during preconstruction to consider potential impacts on local roads during construction, once more detail of construction has been refined (such as proposed haulage routes). This additional assessment would consider whether any additional safeguards or management measures are required, such as traffic calming devices.

Roads and Maritime would continue to consult with Liverpool City Council and Campbelltown City Council.

The proposal does not include local road upgrades beyond the 'tie-in' (connection) to Campbelltown Road.

2.11.6 Intersections

Respondents and submission number(s)

Liverpool City Council, BP service station, Campbelltown City Council, Watchtower Bible and Tract Society, 3, 4, 5, 6, 9, 10, 12, 14, 16, 17, 25, 26, 27, 28, 30, 39, 41, 42, 49, 51, 52, 55, 56, 60, 66, 67, 71, 72

Issue description

The submissions raised the following issues:

- Liverpool City Council suggested that the proposal incorporate an interim access arrangement for Edmondson Park Town Centre between Lawson Road and the East Town Centre Road intersection

- The no right-turn access to and from the southbound carriageway of Campbelltown Road and Zouch Road would not be appropriate to service the level of traffic entering and leaving the Watchtower Bible and Tract Society Headquarters, or for providing access to the residential area of Denham Court. Ideas include:
 - A right-turn bay
 - A roundabout (or dual-lane roundabout)
 - Traffic lights
- Liverpool City Council submitted that the proposed configuration of the intersection of Campbelltown Road and Zouch Road should incorporate access arrangements for the land zoned for public open space
- The intersection of Blomfield Road and Campbelltown Road should provide better access to and from Blomfield Road and the northbound carriageway of Campbelltown Road (including for rigid heavy vehicles) through:
 - A break in the median
 - A roundabout
 - Traffic lights
 - A turnaround bay
 - Access via easements at Dickson Road/Keating Place
- The intersection of Campbelltown Road and Denham Court Road should address additional traffic volumes and improve safety for motorists and pedestrians. Ideas suggested include:
 - A roundabout
 - A shorter right-hand turning bay
 - A dual-lane roundabout (although it was also noted that provision of a roundabout at this intersection would be dangerous because cars would use it to double-back)
- The proposal would result in a bottleneck at the Denham Court Road intersection
- The two right-hand lanes merging into one on Denham Court Road heading north-west towards Camden Valley Way should be reconsidered because it is dangerous and would encourage additional traffic onto Denham Court Road
- The proposal should not reduce the accessibility of residences on Dickson Road
- The Dickson Road turnaround facility should cater for 19-metre semi-trailers and 25-metre B-Doubles and provide for vehicles to get back onto the northbound carriageway.

Response

In response to community submissions on the REF, Roads and Maritime commissioned AECOM to carry out a Supplementary Traffic Assessment (refer to Section 3.2.1). This report considered the implications of intersection turning restrictions on individual route choice patterns and tested potential design changes and scenarios with appropriate modelling tools for Blomfield Road, Zouch Road and Denham Court Road. As a result, there have been some amendments to the proposed intersection arrangements:

- Blomfield Road would include a right-turn in arrangement, with a break in the median to allow access to Blomfield Road from the northbound carriageway of Campbelltown Road
- The intersection of Denham Court Road/Campbelltown Road/Dickson Road would feature a dual-lane roundabout to allow ease of turnaround at this location.

These amendments to the proposal would improve the accessibility of local roads and residences for all vehicles, including heavy rigid vehicles.

All other proposed intersections described in the REF remain unchanged.

Investigations carried out as part of the Supplementary Traffic Impact Assessment into Zouch Road, Blomfield Road and Denham Court Road are summarised in Section 3.2.1 of this report.

Lawson Road

Lawson Road is a local road and therefore the responsibility of Liverpool City Council.

East Town Centre Road is part of the Edmondson Park precinct to be constructed by UrbanGrowth to an agreed road layout. Therefore, it would be the responsibility of Liverpool City Council and UrbanGrowth to determine whether an interim access arrangement would be required, and to implement this accordingly.

Roads and Maritime would continue to work with these stakeholders to ensure that the road network operates effectively during both construction and operation of the proposal.

Blomfield Road

While there may be drainage or utility easements across properties in Blomfield Road that link to Dickson Road and Keating Place, these present substantial topographical and utilities constraints, and cannot also be used as public roads. Land would have to be acquired from landowners and consent obtained from Campbelltown City Council to build a link between the two roads.

With the proposed two-lane roundabout at the intersection of Denham Court Road, Campbelltown Road and Dickson Road, as well as the dedicated right-turn bay from the northbound carriageway of Campbelltown Road to Blomfield Road, access to and egress from Blomfield Road is assessed to be adequate.

Zouch Road

The land zoned public open space that features an electricity substation with frontage to Zouch Road and Campbelltown Road is next to the proposal area. Maintenance access arrangements during construction and operation of the proposal would be refined during detailed design in consultation with Liverpool City Council.

Denham Court Road

The purpose of providing the proposed roundabout is to allow vehicles to double-back. The roundabout would be of sufficient size to allow drivers entering the roundabout from Denham Court Road to discern whether drivers are making a U-turn or turning right into Denham Court Road.

Also, as it would be a two-lane roundabout, vehicles turning left from Denham Court Road would be turning into the outer lane, whereas vehicles making a U-turn would be in the inner lane. The proposal provides for relatively safe and legal U-turns, whereas if traffic signals were provided instead of a roundabout, there would be a risk that drivers would make illegal U-turns at the traffic signals.

With regards to the two right-hand lanes merging into one on Denham Court Road heading north-west towards Camden Valley Way, the second lane would be there primarily to provide additional width for heavy vehicles making turns. At this roundabout, only one lane would be available for traffic turning right from the

southbound carriageway of Campbelltown Road into Denham Court Road. There would be only one lane entering the roundabout at Dickson Road. The additional lane would facilitate a small amount of traffic safely turning left from the northbound carriageway of Campbelltown Road onto Denham Court Road while other vehicles are exiting the roundabout onto Denham Court Road in the right-hand lane. The merge length provided would be adequate for the design speed and the treatment is not considered dangerous.

Dickson Road

The two-lane roundabout now proposed for the intersection of Campbelltown Road, Denham Court Road and Dickson Road would accommodate 19-metre semi-trailers and 25-metre B-doubles and provide for them to turn around to re-enter the northbound carriageway of Campbelltown Road. Dickson Road would be realigned slightly to improve accessibility for residents.

2.11.7 Local roads

Respondents and submission numbers

Campbelltown City Council, 6, 10, 39, 49, 60, 64, 71, 76

Issue description

The submissions raised the following issues:

- Campbelltown City Council requested that the REF should consider the wider impacts on the immediate and surrounding road network and review the cost-benefit and environmental heritage impacts of the proposal
- Residents of Denham Court should be able to complete right-turn movements from local roads (and driveways) that intersect Campbelltown Road
- Not allowing right turns into and out of Zouch Road would significantly increase traffic down Springmead Drive, Cubitt Drive and Culverston Avenue to and from the Watchtower Society Headquarters (hundreds of traffic movements per day)
- The local roads were not designed to handle heavy vehicles and traffic numbers diverting from Campbelltown Road. There is a safety concern that children ride their bikes in these streets as there is no footpath
- Consideration could be made for a left- and right-hand turn into Springmead Drive between 6am–10am Monday to Friday
- The proposal should incorporate traffic calming measures for Springmead Drive to address potential use of the road as a short-cut
- The proposal should incorporate the cost of widening Springmead Road, Cubitt Drive and Culverston Avenue to cope with heavy traffic movements and the ongoing cost of maintaining these roads, unless the Zouch Road intersection is changed to allow for right turns in and out
- The proposal may result in Springmead Drive – Cubitt Drive – Culverston Avenue – Zouch Road becoming a short-cut to Edmondson Park railway station and a thoroughfare for the Edmondson Park precinct
- The proposal is not close enough to the new railway station at Edmondson Park
- The traffic on Macdonald Road has been underestimated – there has been no consideration given to existing traffic flows
- The proposed location of the realigned Macdonald Road is not good, and it would be a busy and dangerous road.

Response

Wider impacts on the immediate and surrounding network (including impacts on Denham Court residents)

The proposal would result in changes to permitted intersection turning movements on several local roads within the proposal area. Right-turn movements from private properties and some side streets would no longer be possible due to the installation of a central median. The forecast traffic along Campbelltown Road would reduce the safety of right-turn movements on many of the local roads and driveways along Campbelltown Road. (Right-turn restrictions are used to improve road safety and optimise traffic flow in many places across the State road network).

Alternative access and egress routes for vehicles turning right onto Campbelltown Road would be required for the intersections of Campbelltown Road with:

- Zouch Road (north)
- Zouch Road (south)
- Blomfield Road
- Properties facing Campbelltown Road, including the BP service station and Denham Court Caravan Park shared driveway.

The Supplementary Traffic Assessment (AECOM 2014, Appendix B) investigated local area route impacts that would occur as a result of the proposal, taking into account modifications to the concept design that were made since the display of the REF. The results are summarised in Section 3.2.1 of this report. As shown in Table 3.5 of this report, changes to traffic movements as a result of the proposed central median would have a small impact on local roads relative to the number of vehicles that use Campbelltown Road.

Costs (in terms of impacts) and benefits of the proposal are addressed at length in the REF and this submissions report. A formal economic cost-benefit analysis would be undertaken by Roads and Maritime after planning approval, but before funding is allocated for construction of the project.

Heritage impacts were addressed in the REF. A number of supplementary environmental assessments have also been undertaken since the display of the REF, including a landscape heritage assessment (Taylor Brammer Landscape Architects 2013), which is summarised in Section 3.5.

Potential traffic volume increases (including from the Watchtower Bible and Tract Society Headquarters) on Springmead Drive, Culverston Avenue and Cubitt Drive and management measures

Right turn access into Zouch Road (north) would be removed as part of Stage 4 of the proposal (Zouch Road to Brooks Road). Following completion of Stage 4, the preferred (and most direct) route for vehicles accessing Zouch Road (north) from the northbound carriageway of Campbelltown Road would be via Macdonald Road and the Edmondson Park precinct road network (to be developed by UrbanGrowth). The planned Edmondson Park precinct road network is expected to be operational prior to the construction of Stage 4 of the proposal. Therefore, potential traffic impacts on Springmead Drive, Culverston Avenue and Cubitt Drive (including traffic generated by the Watchtower Bible and Tract Society Headquarters) are anticipated to be small.

There is however the potential for traffic volumes to increase on some local roads. These local roads are likely to continue to perform a local/collector road function, under the care and control of Liverpool City Council or Campbelltown City Council.

As such, the measures recommended in submissions on the use of traffic calming measures and restricted access hours would be referred to Liverpool City Council for consideration.

A safeguard has been added (Section 5.2 of this report) which states that Roads and Maritime would carry out further traffic assessment prior to construction to consider potential impacts to local roads during construction and operation, once more detail of construction has been refined (such as proposed haulage routes). This additional assessment would consider whether any additional management measures are required, such as traffic calming devices, and inform further consultation with Liverpool City Council and Campbelltown City Council. No upgrades to local roads are planned as part of this proposal.

Potential heavy vehicle traffic impacts on Springmead Drive, Culverston Avenue and Cubitt Drive and management measures

The proposal would not alter the permissibility of heavy vehicles travelling local roads surrounding Campbelltown Road. The designation of routes for restricted access vehicles is the responsibility of local councils for all local and regional roads, in accordance with the Roads and Maritime *Route Assessment Guideline for Restricted Access Vehicles* (RTA 2002).

Access to Edmondson Park precinct and railway station via Springmead Drive, Culverston Avenue and Cubitt Drive

It is unlikely that vehicles travelling to or from the Edmondson Park precinct and railway station would short-cut through local roads within Denham Court. The realigned Macdonald Road would provide direct access to the railway station. The railway station could also be accessed through the planned Edmondson Park precinct road network via Zouch Road (north). It is not likely that local roads in Denham Court such as Springmead Drive, Cubitt Drive and Culverston Avenue would be adversely affected by vehicles accessing Edmondson Park precinct and railway station.

The proposal does not include the development of the Edmondson Park precinct (for which UrbanGrowth is the proponent) or railway station (for which Transport for NSW is the proponent), though these are related projects. The upgrade of Campbelltown Road coupled with the establishment of the Edmondson Park precinct road network would improve direct access to the Edmondson Park precinct and railway station, which may have a positive influence in attracting vehicles away from local roads within Denham Court.

Proximity of proposed upgrade to Edmondson Park precinct and railway station

Campbelltown Road is a principal arterial road. The Edmondson Park precinct has been designed to be accessible from Campbelltown Road, including the new Edmondson Park railway station constructed as part of the SWRL. The configuration of the internal network of roads within the precinct is outside the scope of the Campbelltown Road upgrade.

Forecast traffic on Macdonald Road

Forecast traffic volume data for the future realigned Macdonald Road was taken from the Edmondson Park South Transport Management and Accessibility Plan (AECOM 2010). This approach was peer reviewed by GTA Consultants (2013b, Appendix B3) and is considered appropriate. More information about traffic data used in the traffic modelling is presented in Section 3.2 of this report.

Realignment of Macdonald Road

Macdonald Road is being realigned by UrbanGrowth as part of the development of the Edmondson Park precinct. The proposal includes provision of a new intersection 'stub' to link the realigned Macdonald Road with Campbelltown Road. Macdonald Road would provide the main access for the Edmondson Park railway station.

Roads and Maritime has consulted with UrbanGrowth on the most feasible alignment/configuration of Macdonald Road. The proposed location for the realignment of Macdonald Road was selected by Roads and Maritime and UrbanGrowth for two main reasons:

- Primarily, this alignment offers the safest option for vehicles as the road alignment straightens where it intersects Campbelltown Road, improving visibility
- Secondly, this alignment removes the road from the front entrance to Ingleburn North Primary School, increasing the safety of the access and the informal pick-up/drop-off area in front of the school (refer Section 2.15.2 of this report).

2.11.8 Access

Respondents and submission numbers

Liverpool City Council, BP service station, 4, 5, 10, 11, 12, 14, 17, 25, 28, 37, 41, 45, 50, 51, 61, 66, 67, 76

Issue description

The submissions raised the following issues:

- The proposed access arrangements at Denham Court Road, Zouch Road and Blomfield Road should consider the impacts of the proposal in terms of ability to respond to emergencies, such as bushfire. Increased development would result in increased bushfire risk
- Under the proposal, changes to access for residents along Campbelltown Road are unclear and may be unsafe
- The proposal should accommodate safe access to properties with entry gates along Campbelltown Road that include opportunities for cars to slow down, exit Campbelltown Road and wait at the gate to be admitted to the property
- Liverpool City Council and others noted that under the proposal, altered driveways should comply with the relevant Australian Standards and Council standard drawings
- Under the proposal, access to houses in Blomfield Road would be taken away
- Under the proposal, access to homes in Sovereign Circuit, Glenfield would be taken away
- The BP service station should be accessible from both sides of the road. This should include arrangements for 19-metre semi-trailers and 25-metre B-doubles, as well as pedestrians
- The proposal should accommodate access to and from Denham Court Caravan Park and the northbound and southbound carriageways
- The proposal should allow right-turn entry and exit to and from Campbelltown Road and Ingleburn Military Heritage Precinct by tourist coaches and heavy military vehicles.

Response

Emergency response

One of the key drivers for the upgrade is safety. As outlined in the REF, the proposal would improve safety by installing traffic lights at intersections, constructing turning lanes at intersections, and providing a median to separate traffic travelling in opposite directions. The design of the upgrade would be in accordance with relevant standards and guidelines for emergency access, such as those outlined in *Austroads Guide to Traffic Management: Part 9 Traffic Operations*. During detailed design, Roads and Maritime would undertake consultation with emergency service providers and other relevant agency stakeholders to ensure that the emergency access requirements are met.

The extent to which local traffic would be impacted by the central median and changes to right-turn movements out of Zouch Road, Blomfield Road, and Denham Court Road was investigated as part of the Supplementary Traffic Assessment and was found to be comparatively small with respect to the overall project (Section 2.11.7 and Section 3 of this report) (AECOM 2014).

Access to properties on Campbelltown Road

There was an extensive options analysis carried out for the proposal. The preferred option was selected for the purposes of the REF, using a number of key criteria such as improving driver safety and access for both local and through traffic. The preferred option was then revised to take into consideration community feedback received during the exhibition of the REF; these revisions would further minimise impacts on private properties along Campbelltown Road.

If private property access to the road network were affected, Roads and Maritime would fund and carry out work to reinstate this access (for example, by modifying driveways and gates). These adjustments would take place before or during road construction. If necessary, Roads and Maritime would prepare a plan detailing property adjustments for consideration by the landowner, as part of the acquisition process (refer Section 2.15.6).

Any work to reinstate access to the road network as a result of the proposal would be compliant with the relevant Australian Standards and Council drawings.

Sovereign Circuit, Glenfield

Access to homes in Sovereign Circuit would be maintained via Glenfield Road as per existing access arrangements in the Panorama Vista Estate.

Blomfield Road

Access to homes in Blomfield Road would not be taken away by the proposed upgrade. The REF detailed left in/left out only arrangements at Blomfield Road. The access arrangements for Blomfield Road have since been revised in response to community submissions on the REF. As a result, residents would also be able to turn right into Blomfield Road from the northbound carriageway of Campbelltown Road, as outlined in Section 2.11.6.

BP service station and Denham Court Caravan Park

Denham Court Caravan Park and the BP service station would be accessible via a left in/left out arrangement; vehicles from the southbound carriageway of Campbelltown Road could use the proposed dual-lane roundabout at Denham Court Road to turn around to access the left in arrangement from Campbelltown Road, adding 0.9 kilometres to the journey. Light vehicles exiting the Caravan Park/BP service station could travel north/west via Zouch Road and local roads to access the intersection of Macdonald Road with Campbelltown Road, which facilitates a right-

hand turn towards the southbound carriageway of Campbelltown Road. This total egress route length would be about 2.6 kilometres. Accessibility arrangements for heavy vehicles would be investigated further prior to the construction of each stage.

Following community feedback during the exhibition of the REF, Roads and Maritime investigated the option of providing right-turn access to the southbound carriageway of Campbelltown Road to service the BP service station, Denham Court Caravan Park and M&A Landscapes. This option would require Roads and Maritime to acquire land from other property owners, particularly if this right-turn access to the southbound carriageway were designed to accommodate heavy vehicles. Roads and Maritime considers that the impact on other owners – who would incur substantial acquisition effects – for the purpose of improving access for other owners, is not justifiable.

Ingleburn Military Heritage Precinct

Tourist coaches and heavy military vehicles would be able to access the Ingleburn Military Heritage Precinct from the southbound lane of Campbelltown Road by utilising the proposed dual-lane roundabout at Denham Court Road. It is not feasible to provide a right-turn facility at this location, because adding a right-turn lane sufficient to accommodate heavy vehicles and coaches would increase the carriageway width at this location, which would impact on the Bardia Barracks heritage gates and Mont St Quentin Oval heritage gates. Patrons of the Ingleburn Military Heritage Precinct would be able to use the road networks within Edmondson Park precinct for access.

2.11.9 Cumulative traffic impacts

Submission numbers

71, 73

Issue description

The submissions raised the following issues:

- If construction of the proposal begins before the Camden Valley Way upgrade is completed, there would be substantial traffic impacts during peak hour
- There would be cumulative traffic impacts on local roads as a result of the proposal, the development of East Leppington precinct development, and the widening of Denham Court Road and Ingleburn Road.

Response

Camden Valley Way upgrade

It is possible that construction of one or more of the stages of the Camden Valley Way upgrade would coincide with construction of one or more stages of the Campbelltown Road upgrade. Roads and Maritime would adopt a coordinated approach to minimise the cumulative impacts of construction work in the region. This would be a key consideration of the traffic management plan that would be completed for the Campbelltown Road upgrade prior to the start of construction.

Cumulative impacts on local roads

The REF found that the construction of the proposal, particularly construction of the central median and changes to right-turn movements in and out of local roads, would have a comparatively small impact on local traffic (refer Section 2.11.7 of this report).

Roads and Maritime would continue to work with all relevant stakeholders to ensure the road network as a whole continues to operate effectively during construction and operation of the proposal.

Roads and Maritime would repair any damage to local roads resulting from construction traffic.

During operation, the condition of local roads is the responsibility of local councils. As such, it would be the responsibility of Liverpool City Council (to the north/west of Campbelltown Road) and Campbelltown City Council (to the south/east of Campbelltown Road) to address any required improvement or maintenance work to address cumulative impacts of development in the surrounding area on local roads.

2.12 Noise

Respondents and submission numbers

Liverpool City Council, 1, 19, 31, 37

Issue description

The submissions raised the following issues:

- Liverpool City Council and others queried what measures are proposed to mitigate the expected noise impacts of construction and increased traffic at properties on Campbelltown Road. Detailed design and conditions of project approval should incorporate noise mitigation measures
- The proposal would increase traffic along Campbelltown Road near the Vista at Panorama estate, Glenfield (off Glenfield Road); Roads and Maritime should investigate and the proposal should incorporate concrete barriers (noise walls) along Campbelltown Road or the perimeter of the estate to reduce impacts.

Response

Noise mitigation measures

As presented in Section 6.7.5 of the REF, a construction noise and vibration management plan would be developed by the construction contractor prior to the start of construction in accordance with the Environment Protection Authority's (EPA) *Interim Construction Noise Guideline* (DECCW 2009). This would be prepared as part of the CEMP and would detail the mitigation, monitoring and community liaison measures to be carried out during construction. Further details about what the construction noise and vibration management plan would include are provided in Section 5.2 of this report.

During detailed design, further investigation of noise mitigation options would be carried out for the receivers currently affected by acute noise levels to identify feasible and reasonable measures to be implemented (refer Section 6.7 of the REF). Options include a quiet road surface (such as stone mastic asphalt), noise barriers (including a wall, mound or a combination of a wall and mound) and at-property treatment (which is the responsibility of the developer in the case of new residential estates). The design of any potential noise barriers would take into consideration the Roads and Maritime *Noise Wall Design Guidelines* (RTA 2007). Developers would be responsible for any noise treatment required within the Edmondson Park precinct during the operation of the Campbelltown Road upgrade.

Noise mitigation for Vista at Panorama estate

The REF identified an option that would be considered as part of the noise mitigation strategy for the proposal as being upgrading of the existing noise barrier along Campbelltown Road near Vista at Panorama, Glenfield, if reasonable and feasible. The noise mitigation strategy for the proposal would be determined following further investigations during detailed design.

2.13 Air quality

Respondents and submission numbers

Scenic Hills Association, 10, 41, 45, 51, 60, 66, 67, 76

Issue description

The submissions raised the following issues:

- The air quality assessment in the REF is inadequate because:
 - It focussed only on a section of Campbelltown Road and did not assess the potential impacts associated with the future upgrade of Campbelltown Road further south of Denham Court Road
 - It did not identify The Leaping Learners Early Education Centre as a sensitive receiver
 - It did not assess the impact of increased car use over time, or cumulative impacts on the air shed
 - It did not include an environmental health impact assessment
 - It relied on general statements and not tangible mitigation measures to address potential air quality impacts
- The proposal would:
 - Have unacceptable impacts on the air quality at Leaping Learners Early Education Centre
 - Decrease air quality in the area, particularly by producing high levels of ozone, which would result in adverse impacts on respiratory health. This is not in keeping with the NSW Sustainability Initiatives
 - Result in insurmountable greenhouse gas emissions, particularly by requiring detours and additional travel time to access local streets and driveways, resulting in increased emissions.

Response

Scope and adequacy of the air quality assessment for the REF

The air quality assessment for the REF considered the entire scope of work for the Campbelltown Road upgrade, from Camden Valley Way to Brooks Road.

Sensitive receivers were identified along Campbelltown Road as those land uses immediately adjacent to the proposal area that may be sensitive to changes in air quality. The Leaping Learners Early Education Centre was not identified in the REF as a sensitive receiver. This was an oversight and Roads and Maritime acknowledge that Leaping Learners Early Education Centre is a sensitive receiver. Potential impacts on this sensitive receiver can be extrapolated from the impact assessment in Section 6.8.3 of the REF and the response below.

The air quality assessment for the REF acknowledges increases in traffic that would occur on Campbelltown Road. It also identifies a number of ways that potential

increases in emissions as a result of increased traffic would be offset. These are:

- Improving travel efficiency by increasing the carrying capacity of Campbelltown Road to cater for the forecast traffic growth in the area (including less stop-start operation of motor vehicles).
- Improving connections to public transport facilities in the area, including the planned Edmondson Park railway station
- Improving pedestrian and cyclist facilities through construction of the proposed shared path along the northbound carriageway.

The REF also identified that the 'vehicle fleet' of road users in future years would have a lower percentage of older, more inefficient vehicles and would further offset emissions associated with increased traffic volumes. This is independent of specific future improvements in emissions technology, rather it suggests an 'improvement in the average emission performance of vehicles with newer, more efficient vehicles replacing older less efficient vehicles. This is an acceptable assumption used in the technical assessment of air quality impacts for road upgrades such as the Roads and Maritime *M5 West Widening Environmental Assessment* (Manidis Roberts 2010) and Roads and Maritime *Foxground and Berry bypass – Technical paper Air quality* (PAE Holmes 2012).

Cumulative impacts on the air shed were considered in Section 6.13 of the REF, which indicated that there would be potential cumulative increases in air pollution in the area.

The relevant EPA quality assessment standards (Table 6-78 of the REF) are largely based on potential impacts to human health. As there is a very low potential for any of these criteria to be exceeded (see discussion below), a separate environmental health impact assessment was not considered appropriate.

The REF includes specific mitigation measures to address potential construction air quality impacts. No air quality mitigation measures are proposed for the operational phase, given the low potential for exceedances of air quality criteria to occur (see discussions below).

Impacts on air quality during operation

The potential for air quality at sensitive receptors, including the Leaping Learners Early Education Centre as a result of the proposal is low. It has been demonstrated in recent quantitative assessments such as *Foxground and Berry bypass – Technical paper: Air quality* (PAE Holmes 2012) that local air quality impacts as a result of emissions from road upgrade projects at closest receptors are generally well below relevant EPA air quality assessment standards. For example, for the Foxground and Berry Bypass, predicted maximum ground level concentrations at closest receptors in forecast years due to emissions from the project amounted to generally less than 10 per cent of the EPA criteria for carbon monoxide, oxides of nitrogen and particulate matter (PAE Holmes 2012).

It is acknowledged that emissions from vehicles on Campbelltown Road may make a small contribution to overall ozone levels in the area. Rather than being emitted directly from motor vehicles, ozone results from chemical reactions with pollutants which take some time to occur. Ozone concentrations close to roadways are low because fresh emissions of nitric oxide titrate take the place of any ozone that may be present (PAE Holmes 2012). It is unclear which sustainability initiatives are being

referred to in the submission; however Roads and Maritime consider that, in the context of increasing urbanisation in western Sydney, this project assists in the management of air quality through the facilitation of efficient traffic movement in the area.

In terms of greenhouse gas emissions, the proposal is catering for forecast increases in traffic that would occur as a result of the planned developments in its immediate vicinity. The proposal is not anticipated to result in a discernible increase in greenhouse gas emissions, but would be upgrading the road to safely cater for future increases in traffic. The turnaround distances required to access some of the local roads would have a minimal impact on greenhouse gas emissions due to the small number of vehicles involved (refer Section 2.11).

2.14 Landscape character and visual impacts

Respondents and submission numbers

OEH, Liverpool City Council, UrbanGrowth, Bambi Kindergarten Association Inc, Scenic Hills Association, Heritage Council of NSW, 3, 41, 49, 51, 67

Issue description

The submissions raised the following issues:

- The REF (and associated technical reports) do not adequately address the impact of the proposal on landscape character and visual amenity, particularly because it does not consider impacts of changes to road levels and does not address the new road context through the town centre
- The proposal to widen (with a wide median) would reduce the visual amenity associated with the Central Hills Lands and change the nature of the area (as occurred with the Camden Valley Way upgrade) by:
 - Destroying or compromising built and natural heritage, including established Critically Endangered Cumberland Plain Woodland and associated fauna habitat
 - Reducing land lots to less than the zoned size, which would lead to high density living
 - Dividing the community of Denham Court in two
 - Providing for the forecast growth in traffic, which would ruin the amenity
- The proposal should:
 - Retain the large trees lining the road
 - Protect and maintain the historic and natural values of Denham Court and the Central Hills Lands
- Conditions of consent should include reducing corridor width, replanting roadside trees, redesigning road verges, barriers, fencing and planting or landscape treatment to retain or reinstate the rural sense of Campbelltown Road
- The approval of the proposal should provide flexibility to enhance landscape outcomes at the detailed design stage
- The proposal should avoid impacts on Macdonald Road and the associated archway of trees
- UrbanGrowth, OEH and Liverpool City Council recommended that the proposal incorporate a range of measures near the proposed Edmondson Park precinct, including:
 - Batter slopes planted out to minimise maintenance requirements. Planting and stabilisation techniques for batter slopes along the proposal should ensure successful revegetation of the verges abutting the road corridor and

- open spaces
- A planting strategy to mitigate impacts of large-scale vegetation removal. The strategy should include replacement trees that are the same species and planted in a location that corresponds spatially with those removed
- Planting within the median to achieve similar character and mitigate visual impact
- Street lighting to current industry standards that reinforces the boulevard character and makes use of Smart Poles. Lighting and Smart Poles should be located opposite each other to provide symmetry and coherence
- An at-grade (level) relationship between the residential lots within the Edmondson Park precinct and Campbelltown Road frontage
- Early procurement and planting of mature trees. This may require an early work contract separate to the detailed road design
- Structured planting in the verge and central median between the SWRL overbridge and Zouch Road at 10-metre centres. The proposal should incorporate mass planting between the SWRL overbridge and Zouch Road with a maximum height of 700 millimetres
- Landcom's Street Tree Design Guidelines into detailed design
- Treatment of secondary entry points into the town centre, including at the corners, ends of medians and possible the road thresholds
- OEH requested input into final materials selection, finishes and detailed designs of the retaining walls near the proposed Edmondson Regional Park and landscape plan during detailed design.

Response

Supplementary Visual Impact Assessment and revised concept design

In response to community submissions on the REF, Roads and Maritime commissioned HBO+EMTB Urban and Landscape Design to carry out a Supplementary Visual Impact Assessment based on the amended concept design from Zouch Road to Brooks Road (2013a, Appendix D)...

The Supplementary Visual Impact Assessment assessed the potential visual impacts associated with the large cut-and-fill batters that would be required around the Denham Court Road/Campbelltown Road/Dickson Road roundabout as moderate–high.

As a result of community feedback, the concept design has been revised to further reduce the corridor width around key built and natural heritage values (as outlined in Chapter 4 of this report). In addition, an Urban and Landscape Concept Design Strategy has been prepared to illustrate how mitigations have been included in the concept design, such as replacement tree planting and use of wire rope barriers. Section 3.6 describes how the revised proposal, Urban and Landscape Concept Design and Strategy (and additionally proposed mitigation measures) would impact various viewpoints between Zouch Road and Brooks Road, and help retain landscape character values.

The proposed changes to the concept design (and the additional detail that has been developed in terms of urban design and landscaping) would minimise the potential visual impacts of the proposal. By narrowing the proposed road corridor, and considering additional mitigation measures as detailed in Section 3.6, Roads and Maritime has reduced potential impacts on built and natural heritage values. Minimising the road corridor would also reduce the divisive impact of the road on the landscape. As a result, no further conditions of approval would be necessary in order to address potential landscape character and visual amenity impacts.

Urban design of the proposal and its relationship to Edmondson Park precinct

The trees lining the road in Precinct 7 (next to Macdonald Road) in the original Landscape Character and Visual Impact Assessment (JPW 2013) would be removed to accommodate a wider carriageway. Due to the scale of the proposal, this impact is unavoidable. To mitigate this impact, compensatory trees would be planted on public property prior to construction, where feasible and reasonable, to ensure that landscape work is in place prior to roadwork, and a certain level of amenity is retained. This would be included in the landscape strategy prepared during detailed design. An early work contract may be required to complete this landscape work.

Other mitigation measures to be considered during detailed design include:

- Planting and stabilising batter slopes along the proposal to ensure successful revegetation of the verges and open spaces next to the road corridor. This would minimise maintenance requirements. This measure would be considered in consultation with Liverpool and Campbelltown City Councils, which would be ultimately responsible for maintenance
- Incorporating species in the planting strategy consistent with the Cumberland Plain Woodlands remnant bushland. The location for tree planting would be determined during detailed design. The planting strategy would principally include replacing vegetation that is removed, subject to the constraints of clear zone requirements, adjacent land uses, and reaching agreements with landowners
- Planting in the median, including trees (adjacent to the Edmondson Park precinct only), subject to road safety considerations (consistent with the GCRF, in accordance with the Roads and Maritime Road Design Guide and Austroads Standards)
- Providing lighting only at interchanges, cross-overs and merges. This would be designed to provide 'flag' standard lighting levels in accordance with AS/ NZS 1158 Public Lighting Code. During detailed design, a lighting assessment would be carried out and a lighting strategy and lighting design developed to minimise light spill and contain lighting within the corridor. The lighting assessment would include a headlight glare assessment. The need for any additional street lighting would be reviewed during the post-construction road safety audit
- Continuing to consult with OEH as a stakeholder where relevant throughout the project
- Considering Landcom's (now UrbanGrowth) Street Tree Design Guidelines during detailed design, along with the Roads and Maritime Landscape Guideline (RTA 2008), and any relevant council standards
- Incorporating linkages to surrounding land uses where practical, including the Edmondson Park precinct. This would be done in the landscape plan.

Smart Poles

Smart poles are generally used in more urban landscapes than that which is envisaged for the upgraded Campbelltown Road.

Edmondson Park

It is anticipated that no residential lots within the Edmondson Park precinct would have direct access to Campbelltown Road. UrbanGrowth has committed to regrading the adjoining land so there would be no level difference between the upgraded Campbelltown Road and the adjoining land within the precinct.

It is noted that the road and landscape design principles for the proposal do not provide for tree planting in the median, in order to provide safe sight distances along the upgraded road. The exception would be adjacent to the Edmondson Park precinct (between the SWRL overbridge and Zouch Road), where the proposal would

be constructed in accordance with Edmondson Park South concept design. This would include formal tree planting in the verge and central median to clearly identify the entry into the planned Edmondson Park Town Centre.

Illustrations of the revised concept design next to the Edmondson Park precinct and the proposed Edmondson Regional Park are shown in figures 2.10 and 2.11.



Figure 2.10: Photomontage of the revised concept design next to Edmondson Park precinct (HBO+EMTB Urban and Landscape Design 2013c)



Figure 2.11: Photomontage of the concept design next to the proposed Edmondson Regional Park (HBO+EMTB 2013b)

2.15 Land use and socio-economic impacts

2.15.1 Social impact assessment

Submission number

37

Issue description

The submission raised the following issue:

- The REF did not adequately consider social and quality of life impacts on existing residents of Campbelltown Road. A detailed social impact assessment informed by extensive community consultation should be prepared at concept design stage, or before detailed design.

Response

The REF addressed social impacts of the proposal in accordance with the *Environmental Assessment Procedure for Project Review of Environmental Factors* (Roads and Maritime 2012) and subordinate guidance notes, templates and checklists. Section 6.11 of the REF (land use and socio-economic impacts) considered aspects of the proposal such as potential impacts on surrounding land uses, changes to property and local roads access, and impacts on amenity of adjacent road users.

Roads and Maritime also commissioned a Supplementary Land Use and Socio-Economic Impact Assessment to assess the design refinements to the concept design that were made in response to community submissions on the REF (Appendix E of this report). The methods and outcomes of this report are summarised in Section 3.7.1.

2.15.2 Safety

Submission numbers

10, 41, 42, 67

Issue description

The submissions stated that the proposal would adversely affect safety at the following locations:

- Around school areas
- Within Blomfield Road, including Leaping Learners Education Centre and driveways
- Dickson Road, due to the proposed U-turn facility, which would increase traffic and reduce safety for children.

Response

General safety benefits of the proposal

As identified in Section 2.3 of the REF, the primary objective of the proposal is to create a safe and efficient Campbelltown Road between Camden Valley Way and

Brooks Road. In particular, this includes improving driver safety and access for both local and through traffic, and improving safety for cyclists and pedestrians by providing an off-road shared path.

The Traffic and Transport Study to support the REF (AECOM 2013) found that the proposal would have the following benefits in terms of safety:

- The number of head-on crashes and likelihood of intersection crashes would be reduced with the provision of a divided carriageway and traffic lights at intersections along Campbelltown Road, as well as the provision of deceleration/slip lanes, which would improve safety for motorists
- The proposed road design would improve safety and efficiency for freight travelling on Campbelltown Road by providing a road environment and capacity improvements that cater for the anticipated future increase in traffic volumes
- The risk of congestion and oversaturation on the road network would be minimised by the increased road capacity
- The provision of deceleration/slip lanes, a roundabout and various means of safely turning around would help residents gain safe access to and from Campbelltown Road
- The safety of pedestrians and cyclists travelling along the corridor would be improved due to the provision of additional capacity, a shared path along the northbound carriageway, and traffic lights at intersections to facilitate potential pedestrian and cycle movements associated with Edmondson Park Town Centre and railway station.

The proposal would be designed to Austroads Guide to Road Design and would be reviewed through a Stage 2 Road Safety Audit as part of the concept design approval process.

The following sections address the site-specific statements in the submissions about safety.

Ingleburn North Public School

The realignment of Macdonald Road is part of the previously approved UrbanGrowth development of the Edmondson Park precinct. The realignment would improve safety around Ingleburn North Public School by relocating traffic away from the entrance to the school, where pick up/drop off commonly occurs. The existing road would become a cul-de-sac in front of the entrance to the school, improving safety in this area for pick up/drop off. There would be no direct access to Campbelltown Road.

Blomfield Road

The intersection of Blomfield and Campbelltown Roads would be designed in accordance with relevant Australian standards and guidelines, including those related to safety. The arrangement would facilitate left in/left out movements, as well as a right-hand turning lane from the northbound carriageway of Campbelltown Road. Not allowing right-hand turns out of Blomfield Road would improve safety, given the traffic predictions for Campbelltown Road (refer to Section 2.11.1).

The changes to the concept design proposed in response to community submissions on the REF (refer to Chapter 4) would reduce the proposal footprint at the Blomfield Road intersection. This would reduce the area needing to be acquired from the Leaping Learners Early Education Centre from 2295 square metres to 1635 square metres. The setback of the childcare facility from the upgraded Campbelltown Road would be about 15 metres, as opposed to 11 metres (shown in the concept design in the REF).

The proposal is not expected to result in any reduction in safety at Leaping Learners.

There would be no impacts on driveways in Blomfield Road as a result of the proposal.

Dickson Road

The revised concept design would replace the Dickson Road turnaround facility proposed in the REF with a dual-lane roundabout at the Denham Court Road/Campbelltown Road/Dickson Road intersection.

The purpose of providing the roundabout is to allow drivers to safely and efficiently 'double back'. The roundabout would be large enough for drivers entering the roundabout from Dickson Road to discern where drivers already on the roundabout are travelling, and provide two lanes to accommodate safe, legal U-turns on Campbelltown Road. If traffic signals were provided instead of a roundabout, there would be a risk that drivers would make illegal U-turns at the traffic signals.

In addition, the dual-lane roundabout, as opposed to the previously proposed turnaround facility within Dickson Road, would reduce non-local traffic entering Dickson Road, offering a safer solution for vehicles, pedestrians and cyclists in Dickson Road.

2.15.3 Local amenity

Respondents and submission numbers

Bambi Kindergarten Association Inc, Carmelite Nuns of Varroville, Scenic Hills Association, 10, 62, 25, 35, 37, 39, 41, 42, 45, 47, 50, 51, 58, 59, 62, 66, 67, 69, 71, 76

Issue description

The submissions raised the following issues:

- The proposal would negatively affect the peacefulness and space associated with the rural lifestyle of residents in the area, particularly by:
 - Constructing the central median along the length of the proposal, which would create lengthy detours for local residents needing to access their property or street, increasing fuel costs for residents and particularly affecting amenity at properties near the roundabout at Denham Court Road/Campbelltown Road/Dickson Road
 - Bringing the road too close to houses
 - Leaving residents of Denham Court sandwiched between the Hume Motorway and Campbelltown Road
 - Benefitting those travelling through the area, not those who live there (ie patronage of the railway station by people from outside of the area would increase, reducing the provision of services afforded to locals)
 - Having a detrimental impact on the elderly of Denham Court
- There would be impacts on Bambi Kindergarten:
 - Large trees lining the road offer privacy and a noise buffer for the kindergarten
 - Visual impacts and proposed treatments along the roadside are unclear
 - Acoustic screens and/or large embankments would reduce the scale and prominence of the childcare centre for passersby
 - The proposal would bring the childcare centre closer to the road; a greater

separation of the childcare centre from the road should remain to maintain an appropriate environment for the facility.

Response

Impacts on rural lifestyle of residents in the area

As identified in the REF, south of the Hume Motorway overbridge, Campbelltown Road is a two-lane road in a predominantly rural setting. Particularly south of Zouch Road, Campbelltown Road is surrounded by large residential properties of about one to two hectares. Several submissions identified concerns about impacts of the proposal on the peacefulness and space associated with the rural lifestyle experienced by residents in this area.

Although residents in the area embrace Campbelltown Road as being relatively rural, this road has always been identified as an important component of the road network. This was identified in the Landscape Heritage Assessment (Taylor Brammer Landscape Architects 2013). Section 2.2.2 of this report more specifically identifies Campbelltown Road as a principal arterial road under the Roads and Maritime GCRF (RTA 2008). It is not feasible to maintain it in its existing configuration because of the important link that it forms between major urban centres (new and established).

The central median that is proposed along the length of the proposal and subsequent changes to access arrangements for local roads and adjacent properties would not result in lengthy detours for local residents. These potential detours were assessed in the Supplementary Traffic Assessment (AECOM 2014) and found to be relatively minor. This is explored further in Section 2.11.7. The proposed access arrangements would not result in a substantial loss of amenity to properties near the roundabout at Denham Court Road/Campbelltown Road/Dickson Road because of the size of properties (one to two hectares) and distances between residences and the proposed carriageway. The impact on fuel use by residents would be minor.

The proposal would only require partial acquisitions, as identified in Section 4.1.2 of this report (Table 4.2). This means that the effect of the proposal on the remaining portion of the property (including bringing the road closer to residences) has been assessed in accordance with the Roads and Maritime *Land Acquisition Policy* and the *Land Acquisition (Just Terms Compensation) Act 1991* as being minor and not warranting full acquisition. As outlined in Section 4.1.2 of this report, the revised concept design results in a smaller proposal area, and thus reduced acquisition requirements (8.95 hectares across 52 properties as opposed to 11.53 across 66 properties as assessed in the REF). This means that impacts on the amenity of residents living near Campbelltown Road would be less than what was detailed in the REF.

As outlined in the Supplementary Land Use and Socio-Economic Assessment (Hyder Consulting 2014, Appendix E of this report), the potential operational impacts of the proposal (ie noise, visual and traffic) on adjacent residential properties would be minor, and suitably mitigated. During construction, there would be some moderate impacts on local amenity, but these would be short-term and staged.

The upgrade of Campbelltown Road would occur along its historical alignment. Roads and Maritime has not identified any properties along Campbelltown Road between Camden Valley Way and Brooks Road that are near both Campbelltown Road and the Hume Motorway, or any other major road, as a result of the proposal.

The proposal would ensure that residents on Campbelltown Road are not inconvenienced by the additional traffic created by patrons of the new Edmondson Park railway station.

In summary, the proposal has been designed to minimise impacts on the rural lifestyle that is embraced by residents south of Zouch Road. This is shown in Figure 2.12.

In the context of the bigger changes to the area that are happening as a result of the development of the Edmondson Park precinct (and other planned developments in the SWGC), the potential impacts on local amenity as a result of the upgrade of Campbelltown Road, including impacts on elderly residents, are considered to be minor.



Figure 2.12: Photomontage of proposed upgrade between Zouch Road and Blomfield Road (looking south) (HBO+EMTB Urban and Landscape Design 2013c)

Impacts on Bambi Kindergarten

The value of the trees lining Campbelltown Road outside Bambi Kindergarten is acknowledged. However, trees do not provide noise attenuation benefits, and the removal of these trees would not impact on road noise experienced at the kindergarten.

Impacts to the trees lining Campbelltown Road at this location would be minimised or avoided where possible. Where trees are removed, the same species would be replanted along roadsides following the completion of works.

As outlined in the Supplementary Land Use and Socio-Economic Assessment (Hyder Consulting 2014, Appendix E), the Bambi Kindergarten has submitted a development application for the establishment of new premises within the Edmondson Park precinct and is expected to have vacated the existing premises prior to the construction of the proposal.

2.15.4 Land use impacts

Respondents and submission numbers

Commonwealth Defence Support and Reform Group – Northern NSW, Liverpool City Council, 37, 51

Issue description

The submissions raised the following issues:

- The proposal would render the Leaping Learners Early Education Centre less suitable for a childcare centre due to its size, reduced access, and proximity to the road, contravening the development provisions for the childcare centre
- There was no consideration of the potential for future subdivisions and development on properties along Campbelltown Road and potential for additional and separate road easements. In particular, Leaping Learners is currently preparing an application to expand, but this would likely no longer be acceptable given impacts of the proposal on access and site layout
- Liverpool City Council noted that use of Council land during construction would require written consent from Council and be subject to Council conditions. Detailed design should identify land to be temporarily occupied for the purpose of access, storage, site accommodation, stockpiles, or other construction purposes
- The Commonwealth Defence Support and Reform Group (Northern NSW) noted that it would be appropriate for Roads and Maritime to consult with Department of Finance, which is coordinating the development of the Moorebank Intermodal Terminal facility on Defence landholdings along Moorebank Avenue, and UrbanGrowth, which is the impacted landowner at the former Ingleburn Army Camp.

Response

Leaping Learners Early Education Centre

Roads and Maritime has revised the concept design in response to community submissions on the REF. The revisions include a reduction in the land to be acquired from the Leaping Learners (from 2295 square metres to 1635 square metres).

As a result, impacts on access to the childcare centre and car park arrangements would be reduced. One of the driveways would no longer meet safety standards in its current location; an alternative access arrangement for the site would be determined in consultation with the landowner during detailed design.

It should be noted that Leaping Learners was developed in 2007, several years after the upgrade corridor for Campbelltown Road was published (in the *Campbelltown (Urban Area) LEP 2002*).

Roads and Maritime and the landowner would need to discuss the implications of the road upgrade on the development provisions for the childcare centre with Campbelltown City Council, so that an acceptable solution to any planning issues can be determined.

Future development

The impetus for the proposal stems from the need to accommodate increased traffic volumes from planned developments in the SWGC.

Roads and Maritime has considered the potential impacts of the proposal on current and planned future uses of adjacent land. The proposal considers known developments and would consider others as information becomes available. In particular, the proposal has been developed in full consideration of the SWGC, inclusive of planned (approved) developments along Campbelltown Road.

The cumulative impacts of the proposal in terms of other developments in the area are presented in Section 6.13 of the REF.

Council land

The location of land to be temporarily occupied for access, storage, site compounds, stockpiles or other construction purposes would be confirmed in detailed design. Roads and Maritime would consult both Liverpool City Council and Campbelltown City Council about requirements for the use of Council land during construction and would adhere to consent processes.

Moorebank Intermodal Terminal

Roads and Maritime and TfNSW representatives are liaising with the Moorebank Intermodal Terminal proponents to determine any infrastructure upgrade requirements that would be required to support the Terminal. It was determined that project-specific consultation with the Commonwealth Defence Support and Reform Group (Northern NSW) would not be necessary given the distance from the proposal area (about 10 kilometres).

2.15.5 Impacts on local businesses

Respondents and submission numbers

BP service station, Watchtower Bible and Tract Society, Liverpool City Council, 10, 17, 51, 55, 71

Issue description

The submissions stated that the proposal would result in the following negative impacts on local businesses:

- Impacts on access arrangements and loss of road frontage/setback for the

Leaping Learners Early Education Centre, BP service station, Denham Court Caravan Park and M&A Landscapes

- Impacts on property improvements such as the price board and two underground diesel tanks at the BP service station, structures at the Denham Court Caravan Park and M&A Landscapes, and phone tower at the Watchtower Bible and Tract Society Headquarters potentially resulting in safety issues for pedestrians and motorists
- Loss of business for the BP service station during construction of the proposal, which should be compensated due to loss of business
- Impacts on Denham Court Caravan Park during construction of the proposal.

Response

Impacts on access arrangements and loss of road frontage

There are a number of businesses located next to Campbelltown Road within the proposal area. Property acquisitions have the potential to affect access arrangements and road frontage, particularly south of Zouch Road. Businesses with main road frontage are affected by changes in traffic, access arrangements and passing traffic.

Roads and Maritime commissioned Hill PDA to carry out a Business Impact Assessment for the Campbelltown Road upgrade (Hill PDA 2013, Appendix B of the Supplementary Land Use and Socio-Economic Impact Assessment). The methods and findings of the Business Impact Assessment are summarised in Section 3.7.1. The assessment concluded that:

- The growth in trade over the next five years due to additional northbound traffic created by the growth of the SWGC would potentially generate more business than business which is potentially lost due to the removal of right-turn movements for southbound motorists at the BP service station (subject to this stage of the proposal being constructed within this timeframe)
- The only other business likely to experience some potential adverse impact is M&A Landscapes, which is partially a destination outlet for some shoppers and partially a wholesale business to other businesses and contractors. This business would benefit from the development of the SWGC and the strong demand generated from home building
- The impacts on other businesses would be less as these businesses do not greatly rely on passing trade.

In terms of impacts on amenity as a result of the loss of setback from Campbelltown Road at the Leaping Learners Early Education Centre, the noise assessment undertaken for the REF (Wilkinson Murray 2013) concluded that there would be some audible increases in noise levels during operation of the upgrade at this facility, due to its proximity to the upgrade. As identified in the REF, mitigation measures would be employed to address operational noise impacts at this facility as per the *Road Noise Policy* (EPA 2011) requirements as well as the *Roads and Maritime Environmental Road Noise Management Manual* (RTA 2001). Feasible and reasonable mitigation measures would be determined during detailed design.

Impacts on property improvements

The proposal would result in some impacts on property improvements (elements of the development like phone towers and price boards) at some of the local businesses along Campbelltown Road. These would be dealt with through property adjustment in the same way as impacts on residential properties (refer to Section 2.15.6).

The proposal would not have any impacts on the underground storage tanks at the BP service station. Property impacts surrounding the tanks would be investigated further during detailed design, due to the moderate risk of encountering contaminated material, as identified in the Stage 1 – Preliminary Contamination Assessment Report (Hyder Consulting 2013, Appendix N of the REF).

Investigations have not identified any potential safety issues resulting from the structures at Denham Court Caravan Park and M&A Landscapes being too close to the proposed road upgrade. The distance between the carriageway and the nearest structure at Denham Court Caravan Park is 22 metres in the revised concept design (the concept design presented in the REF would have resulted in a distance of 17 metres). The distance between the closest structure at M&A Landscapes and the proposed road alignment is seven metres in the revised concept design (the concept design presented in the REF would have resulted in a distance of three metres). The proximity of these structures to the upgraded road is considered acceptable and would not pose any safety issues for pedestrians and motorists.

Construction impacts on the BP service station and Denham Court Caravan Park

The *Roads Act 1993* only provides for Roads and Maritime to acquire land required for road purposes (called 'directly affected' land). While Roads and Maritime does not provide financial compensation for construction, it does its best to reduce impacts and would continue to consult with and inform business owners throughout the construction process.

The staged approach to construction of the proposal would help to minimise traffic impacts during construction. It would prioritise the upgrade of the section of road that would provide access to the proposed Edmondson Park railway station and Town Centre.

Current road capacity would be maintained during peak periods, where possible, with speed reductions through the site for the duration of the work. Roads and Maritime would provide temporary signage during construction to inform southbound traffic of alternative access to the businesses on the other side of the road.

During Stage 4 of construction, there would be some visual impacts on residents of Denham Court Caravan Park, due to the close proximity of the construction work. Increases in dust may also occur during this stage. Wilkinson Murray (2013) indicated that construction noise criteria would be exceeded during site clearing, earthwork and paving, and road infrastructure installation of Stage 4 of the proposal at this facility. It is anticipated that these noise, dust and visual impacts would be short-term, and would not result in major disruptions or disturbances to the facility, or reductions in level of service provided.

2.15.6 Property impacts

Respondents and submission numbers

Liverpool City Council, 2, 10, 17, 25, 37, 41, 43, 45, 51, 55, 66, 67, 74, 76

Issue description

The submissions raised the following issues:

- The proposed acquisitions would result in the following negative property impacts:
 - Impacts on septic systems on unsewered land; Denham Court was wrongly noted as being a sewer area. The proposal would impact landowner capacity to manage sewage on site by reducing the area available for the current use of on-site sewage management systems and interfering with existing systems
 - Acquisition of land for relocation of milestones. Landowner still has to pay land taxes, even though the land is unusable
 - Loss of frontage of homes along Campbelltown Road, including Denham Court House and homes near the proposed roundabout at Denham Court Road/Campbelltown Road/Dickson Road
- If Dickson Road is used as a turnaround, landowners in Dickson Road would like the option to sell the whole property to Roads and Maritime
- The proposal would force residents to relocate
- Questions were raised about the process of acquisition, why affected residents have not been informed or consulted about the proposal, and how Roads and Maritime would compensate landowners for acquired land, including any improvements within the acquired land
- Roads and Maritime should consult with affected property owners prior to finalisation of detailed design with respect to property adjustments.

Response

Impacts on properties, including on-site sewage management systems and other property improvements

The revised concept design would require less property acquisition than was outlined in the REF. The Supplementary Land Use and Socio-Economic Impact Assessment (Hyder Consulting 2014, Appendix E of this report) provides an update on the proposed acquisitions (refer also to Table 4.2 in this report). In addition, a preliminary assessment of potential impacts on on-site sewage management systems using Campbelltown City Council and Liverpool City Council property records did not identify any properties where the proposed partial acquisition would encroach on or impede the operation of an on-site sewage management system (as outlined in Table 4.2). Further details are outlined in the Supplementary Land Use and Socio-Economic Impact Assessment (Appendix E).

Any potential impacts to on-site sewage systems as a result of the proposal would be confirmed during detailed design. If impacts are identified they would be discussed with landowners and suitable mitigation measures identified.

If part of a property is acquired, Roads and Maritime would adjust property entrance arrangements (driveways). These adjustments would take place before or during roadwork. In addition, Roads and Maritime would relocate fencing and, where appropriate, reinstate access to the road network. Fencing along the new property boundary would be relocated or, if required, built new to a standard similar to the existing fence on the property. If required, Roads and Maritime would prepare a plan detailing property adjustments for consideration by the landowner. If this plan is acceptable it may form part of the contract for sale, if the land is subject to partial acquisition.

Acquisition of land for relocation of milestones

Milestones would be placed in the road corridor and maintained by Council. The

portion of land that would be acquired for the upgrade, including any land acquired for the relocation of the milestones, would be rezoned to SP2 (Infrastructure), and owned by Roads and Maritime. The previous owner would no longer need to pay land tax on this portion of land. There would be no zoning change for the remainder of the land within the partially acquired property.

Loss of property frontages/large acquisitions

The upgrade corridor for Campbelltown Road has been published since 2002 on the *Campbelltown (Urban Area) LEP 2002* and *Liverpool LEP 2008*. All of the partial acquisitions around the proposed roundabout at Campbelltown Road / Denham Court Road / Dickson Road, as well as the partial acquisition at the Denham Court House estate, are within the road corridor defined in this LEP (refer to Figure 3.3 of this report).

In response to community submissions on the REF, Roads and Maritime has revised the concept design and further reduced the acquisition area from 11.53 hectares across 63 properties (in the REF) to 8.95 hectares across 52 properties (refer to Table 4.2 and Figure 4.6). Landowners would be suitably compensated through the Roads and Maritime land acquisition process, in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.

Acquisition process

To upgrade roads, build new roads or maintain existing roads, Roads and Maritime often needs to acquire private land. A clear process has been established for NSW property owners. Project staff and dedicated property experts are available to give property owners an understanding of what to expect if their property is affected by land acquisition. The process is outlined in the Roads and Maritime Land Acquisition Information Guide (Roads and Maritime 2012), which is available on the [Campbelltown Road upgrade website](#).

The REF outlines preliminary acquisition requirements based on the concept design for the proposal (refer to Section 3.6 of the REF). During detailed design, the exact area to be acquired would be finalised and property impacts would become evident. At this point, Roads and Maritime would notify affected property owners by letter (ie before the start of the land purchasing process). The letter would include a plan showing the proposed new property boundary (ie the new road boundary that would result from the purchase of the required land). This plan would also include the dimensions and area of the required part of the property.

All property acquisitions would be carried out in accordance with the *Land Acquisition (Just Terms) Compensation Act 1991* and *Roads Act 1993*.

The acquisition process is governed by the *Land Acquisition (Just Terms Compensation) Act 1991*. This process aims to make the acquisition less intrusive and the outcome as liveable as possible. Division 3 of Part 4 of the Act, in particular section 55, covers the matters that are considered when assessing payment.

If Roads and Maritime only needs a part of a lot or a property to build or upgrade a road, the amount to be paid for partial acquisition is generally assessed using a 'before and after' method. This method requires two valuations to be carried out. The first valuation is of the total property, as unaffected by the road proposal, known as the 'before valuation'. The second valuation, known as the 'after valuation', which would be carried out at the same date, is of the remaining land as if the new road has been completed and is in use. The difference between the 'before' and 'after'

valuations is the basis for the payment for the property to be purchased.

As per the *Land Acquisition (Just Terms Compensation) Act 1991* and *Roads Act 1993*, Roads and Maritime is not required to acquire more property than is necessary for the roadwork; however, landowners are able to request owner initiated acquisition in certain circumstances (refer to the Roads and Maritime land acquisition information guide, Roads and Maritime 2012). This can be discussed with Roads and Maritime once the acquisition requirements for the proposal have been confirmed during detailed design.

Potentially affected residents have been consulted as part of the REF consultation process and have had the opportunity to view the full REF through the exhibition period and provide feedback to Roads and Maritime (refer to Section 1.5 of this report). Roads and Maritime has considered all submissions carefully, and has refined the proposal in response to issues raised during this consultation process. If the proposal is given approval to proceed, affected landowners would be further consulted during the detailed design phase. The community would also be kept informed as the project progresses.

2.15.7 Land values

Respondents and submission numbers

Denham Court Association, 10, 17, 23, 25, 41, 44, 53, 60, 64, 67, 76

Issue description

The submissions raised the following issues:

- The rates and property values in this area are high to protect the scenic amenity; the property owners have paid a lot of money for it
- There is presently a relationship between declining land values as advised by the Valuer-General and the proposal
- The potential socio-economic impacts – including impacts on amenity, property and land use – would reduce property values at:
 - The suburb of Denham Court, rendering properties unsalable
 - BP service station
 - Denham Court Caravan Park
 - Properties on Blomfield Road.

Response

Rates and property values

Rates are informed by the Valuer-General's assessment of land values. The Valuer-General is an independent government agency that provides new land values to councils every three to four years for rating. Valuations carried out by Land and Property Information on behalf of the Valuer-General for rating and taxing purposes are made under the *Valuation of Land Act 1916*. These values refer to the value of the land only; they do not include the value of a home or other improvements. The land value does not generally reflect the full sale price that could be obtained for the property. Property sales are the most important factor considered when determining land values. When comparing property sales to the land being valued, valuers consider factors such as:

- Property market conditions as at 1 July in the year of valuation

- Most valuable use of the land
- Location of the land
- Constraints on use such as zoning and heritage restrictions
- Land size, shape and land features such as slope and soil type
- Nearby development and infrastructure
- Views.

Since there are a number of factors that influence property values, it is not clear that there would be any impact on property values due to the proposal. The proposal would increase connectivity and reduce travel times to regional hubs, which are generally beneficial to businesses and property values.

Property impacts are expected to be largely limited to minimal strip acquisition. Roads and Maritime would acquire land in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* where the property would be directly impacted. Property that would not be directly impacted would not be purchased. On occasion, and in accordance with Roads and Maritime policy, Roads and Maritime may purchase the total property even if only part of it would be required for the proposal. This typically occurs when the effect of the proposal on the remaining land is considered so major that it warrants total purchase. This would be considered on a case-by-case basis. Where partial acquisition is undertaken, the valuation of the property would be determined in consideration of the impact on the value of the remaining portion of land. This consideration would include the earning capacity of the land.

If landowners and lessees are not satisfied with the land value recorded on the Notice of Valuation, they can have their land value reviewed by lodging an objection. For more information, refer to the [NSW government land and property information website](#).

Socio-economic impacts of the proposal affecting property values

As described above, since there are a number of factors that influence property values, it is not clear that there would be any impact on property values due to the proposal, including the suburb of Denham Court, BP Service Station, Denham Court Caravan Park and properties on Blomfield Road. The proposal would increase connectivity and reduce travel times to regional hubs, which are generally beneficial to businesses and property values.

The acquisition process is governed by the *Land Acquisition (Just Terms Compensation) Act 1991*. Division 3 of Part 4 of the Act, in particular Section 55, covers the matters that are considered when assessing payment. A primary matter listed for consideration in this Act is market value, which is defined as the amount that would have been paid for the land if it had been sold at that time by a willing but not anxious seller to a willing but not anxious buyer. This disregards any increase or decrease in value caused by the road proposal, or changes to amenity. A definition is found in Section 56 of the *Land Acquisition (Just Terms Compensation) Act 1991*. Therefore any potential socio-economic impacts of the proposal would not affect the value of land for the purposes of acquisition. More information is available in the *Roads and Maritime Land Acquisitions Guide* (Roads and Maritime 2013), which is available on the [Campbelltown Road upgrade website](#).

2.15.8 Zoning

Respondents and submission numbers

Denham Court Association, Scenic Hills Association, Carmelite Nuns of Varroville, 6, 25, 41, 45, 66, 67, 70, 76

Issue description

The submissions raised the following issues:

- Campbelltown City Council and others queried how the proposal would affect the one hectare minimum zoning requirement in the area
- The proposal is not consistent with, and puts at risk, the zoning of the Central Hills Lands (referred to by submitters as Scenic Hills Protection Area) and would compromise this zoning by damaging associated heritage – Denham Court House, St Mary the Virgin Church and Campbelltown Road alignment from the Crossroads to Denham Court – thereby allowing for future development
- The proposal indicates that the NSW Government has plans to change the Central Hills Lands (referred to as Scenic Hills Protection Area) zoning.

Response

The Supplementary Land Use and Socio-Economic Impact Assessment found that there would not be a significant impact on the Central Hills Lands or other environmental protection zoning in the area as a result of the proposal. A summary of the findings is presented in Section 3.7.1 of this report.

Land Rezoning in relation to Central Hills Lands is a matter for Campbelltown City Council, Liverpool City Council and/or the relevant planning authority and is not related to the road upgrade process. At the recent public meeting of the Scenic Hills Association, the Campbelltown City Council representative confirmed that properties that are affected by partial acquisition would not be rezoned, and that there are no plans to allow future development in this area.

2.16 Other concerns raised beyond the scope of the proposal

Some submissions raised issues outside the scope of this proposal. These are listed below.

Respondents and submission numbers

Watchtower Bible and Tract Society, Scenic Hills Association, Campbelltown City Council, Liverpool City Council, 6, 10, 18, 19, 29, 30, 31, 58, 60, 71, 76

Issue description

The submissions raised the following issues:

- The community wants input into the broader plan for Denham Court and the 'Scenic Hills' area
- The road network at Edmondson Park should be 'cobwebbed' to make it easier to enter and exit the new station
- The development of Leppington and Edmondson Park would lead to additional traffic along Springmead Drive, Cubitt Drive and Culverston Avenue, which are already in poor condition as a result of heavy truck movements servicing current

developments

- The proposal should include widening and realigning Denham Court Road, and full acquisition of 1 Dickson Road
- Instead of upgrading Denham Court Road, Roads and Maritime should find an alternative way to link Edmondson Park and Camden Valley Way
- Denham Court Road should be reclassified as a State Road
- The proposal should make provisions for cycling along Denham Court Road to access the new Leppington Town Centre
- There is no justification for extending this six-lane road widening along Denham Court Road and south to the Hume Motorway to support the SWGC because of the recent upgrades of the Hume Motorway and Camden Valley Way
- The proposal should accommodate a temporary on-ramp to the Hume Motorway or a direct feed to the Hume Motorway, such as by upgrading Brooks Road
- If Roads and Maritime were prepared to upgrade the existing farm track, which exits to Church Street, to provide an alternative entry/exit to the watchtower society, this would improve property access
- The residents in the Vista at Panorama Glenfield Estate are currently affected by increased commercial land uses in the area and general traffic increases, including increases in traffic along Beech Road and truck braking noises as vehicles use compression braking to access Uncle Leo's Roadhouse
- The double-glazing supplied to residences at the Vista at Panorama Glenfield Estate is not an acceptable solution to address existing traffic noise on Campbelltown Road. The current noise treatment (wooden fence) at the Vista Estate is inadequate
- The non-compliant barrier at the entrance to the freeway from Brooks Road should be fixed by Roads and Maritime
- Campbelltown Road is sometimes used for 'drag racing'
- Liverpool City Council should consider traffic counts to provide a base line point of reference to measure current traffic flow from Springmead Drive at Denham Court Road through Cubitt Drive, Culverston Avenue and Zouch Road.

Response

The above issues have been considered and are considered outside the scope of the proposal for the following reasons:

- Feedback on the wider SWGC and Edmondson Park development plans – While these matters relate to general development in the area, they do not directly relate to the proposal or its scope and objectives as defined in the REF. These issues will be forwarded to UrbanGrowth and P&E, which are better placed to respond to these submissions. The strategic need for the proposal, and how it relates to strategic plans and policies, are discussed in Sections 2.2 and 3.2.1 of this report
- Feedback on other potential road/bike path upgrades – While these matters relate to the road network surrounding the proposal area, they do not directly relate to the proposal described in the REF. Alternatives and modifications considered following public exhibition of the REF are discussed in Section 2.3 and subsequent design changes detailed in Chapter 4 of this report
- Feedback on current road noise, barriers or misuse – While these matters relate to the existing condition of Campbelltown Road, they do not directly relate to the proposal described in the REF. Existing road infrastructure and road noise were adequately assessed in the REF (refer to sections 2.2 and 6.7 of the REF)
- Feedback on current noise treatment issues within Vista Estate, Glenfield – These barriers were provided by the developer. Mirvac would be best placed to respond to these concerns and will be notified of the release of the Submissions

Report. Section 2.12 of this report addresses relevant noise issues raised during the public exhibition of the REF

- Suggestion for Liverpool City Council to do traffic counts on local roads – This feedback does not directly relate to the proposal assessed in the REF. Liverpool City Council is best placed to respond to this feedback and will be notified of the release of the Submissions Report.

3 Additional assessments

As a result of public consultation and the submissions received through the REF display period, Roads and Maritime commissioned a number of additional studies to inform responses to stakeholders. This chapter describes the additional assessments and supplementary investigations carried out since the exhibition of the REF.

3.1 Peer Review of REF Traffic and Transport Assessment

3.1.1 Summary

In response to community concerns, Roads and Maritime commissioned GTA Consultants to independently review the traffic and transport modelling elements of the Traffic and Transport Assessment for the REF (AECOM 2013), mainly focussing on the SIDRA analysis (SIDRA is software used for intersection modelling). The purpose of GTA Consultants' report was to give Roads and Maritime a level of confidence that the assessment carried out for the REF followed standard traffic engineering and transport modelling industry practices, and that the recommendations and outcomes of the report are feasible in traffic and transport terms.

The full report is presented in Appendix B. The main findings of the peer review are as follows:

- The mid-block capacity assessment was considered to be accurate
- Minimal data were provided in terms of future year traffic volumes, and this was unable to be verified
- The SIDRA models include a number of inconsistencies ranging from input data and Peak Flow Factor values, heavy vehicle percentages and cycle times
- The linking of intersections and impacts of upstream and downstream conditions should be taken into consideration, particularly the proposed closely spaced intersections either side of Macdonald Road.

3.1.2 Additional management and mitigation measures

GTA Consultants recommended that the inconsistencies that were identified in the peer review be verified and updated prior to the traffic model being adopted for further use.

3.2 Supplementary Traffic Assessment

3.2.1 Summary

Roads and Maritime commissioned a Supplementary Traffic Assessment (AECOM 2014) in response to community submissions on the REF, subsequent revisions to the concept design (detailed in Chapter 4) and the findings of the Traffic and Transport Peer Review (GTA Consultants 2013a) (detailed in Section 3.1, above). In order to address these issues, the report includes:

- An overview in non-technical language of the modelling methodology as outlined in the REF
- Responses to the issues identified by GTA consultants in the peer review
- Responses to the community feedback received during the exhibition of the REF
- An overview of the need and requirement to upgrade Campbelltown Road in the context of future population and employment in the region
- A discussion of potential impacts associated with local streets/accesses as a

- result of the installation of a central median
- An appraisal of various alternative intersection configurations that have been considered as a result of community feedback at the intersections of Campbelltown Road with Denham Court Road and Blomfield Road, as well as the potential use of Williamson Road as an alternative route to Campbelltown Road.

Further explanation of traffic modelling completed for the REF

In the Supplementary Traffic Assessment, AECOM clarified the assumptions and methods used in the traffic modelling carried out for the purposes of the REF. Traffic volumes identified in the REF were based on traffic surveys collected in 2011, as well as the Roads and Maritime EMME model and Edmondson Park South Transport Management and Accessibility Plan (TMAP), which was approved by Roads and Maritime and P&E.

The EMME model is strategic transport forecasting software, which enables traffic modelling and forecasting of road schemes with wide-reaching impacts. The model takes into consideration projected regional, residential and employment growth forecasts for the SWGC precinct and wider Sydney Metropolitan area.

A TMAP is a comprehensive assessment of the transport impacts of a major development proposal. It forms the basis of the identification of a package of appropriate transport measures for the proposal which help manage the demand for travel to and from the development.

To assess the impact of the proposal on Campbelltown Road, future year modelling for years 2026 and 2036 was carried out at the intersection of the following local roads with Campbelltown Road using the intersection modelling software SIDRA:

- Glenfield Road
- Beech Road
- Ingleburn Gardens Drive
- East Town Centre Road (new)
- Soldiers Parade (new)
- Macdonald Road (realigned)
- Denham Court Road.

Traffic volumes for future years were gathered from either the Roads and Maritime EMME strategic forecasting model or the Edmondson Park South TMAP report (AECOM 2010).

The EMME model flows were used to determine the future AM and PM peak hour performance of the intersections of the following local roads with Campbelltown Road:

- Glenfield Road
- Beech Road
- Ingleburn Gardens Drive
- Denham Court Road.

As the EMME traffic flows are provided in two -hour profiles for the AM and PM peak, a conversion ratio of 0.55 was applied to determine the single one -hour volume. The exception to this was at the intersection of Ingleburn Gardens Drive with Campbelltown Road where a ratio of 0.5 was used.

Traffic volume data from the Edmondson Park South TMAP report was applied to the intersections of the following local roads with Campbelltown Road:

- East Town Centre Road (new)
- Soldiers Parade (new)
- Macdonald Road (realigned).

Traffic data

Roads and Maritime provided available traffic count data gathered at a number of locations across Campbelltown Road, Hume Motorway and Camden Valley Way for the purposes of the traffic and transport assessment. In the Supplementary Traffic Study (AECOM 2014, Appendix B), an analysis was carried out to determine if these volumes would have been impacted by the timing of construction upgrades in the surrounding road network and, if so, in what capacity they would have been affected.

The Supplementary Traffic Assessment investigated whether traffic data used in the modelling was influenced by construction work on surrounding roads (compared to traffic volumes gathered between March 2010 and August 2013). A summary of the findings is presented in this section. Construction of the Camden Valley Way upgrade began in September 2012 and is ongoing. Construction of the Hume Motorway upgrade occurred in stages:

- Stages 1 and 2 began in 2009
- Stage 3 began in September 2010
- All stages were open to traffic in March 2012.

Two sites contained multiple data points of comparison between March 2010 and August 2013. These were:

- At the intersection of Denham Court Road and Campbelltown Road, where traffic survey counts were available for March 2010, October 2011 and August 2013
- At the intersection of Macdonald Road and Campbelltown Road, where traffic survey counts were available for October 2011 and August 2013.

Traffic volumes gathered between March 2010 and August 2013 indicate that the 2011 traffic counts used in the traffic and transport modelling for the REF are representative of traffic volumes on the corridor and were not adversely impacted by the upgrade work on the Hume Motorway or Camden Valley Way. For example, volumes on Campbelltown Road were about 200 vehicles higher in 2010 than in 2011 at the intersection of Denham Court Road with Campbelltown Road. The 2013 data at this location shows an increase of only 100 vehicles. This could be attributable to development in the SWGC and Macarthur Region. Based on this data, it can be seen that the surrounding construction did not impact Campbelltown Road during the time when traffic surveys were carried out (2011) as traffic volumes fell during this period, despite the upgrade to Hume Motorway being carried out at this time. This indicates that the models used in the traffic and transport study to inform the REF are robust and accurately reflect existing conditions on Campbelltown Road.

The traffic volumes gathered between March 2010 and August 2013 discussed above do not constitute a data set size that is statistically significant enough to highlight long-term average trends on the corridor. Despite this, the provided traffic count information does support that the traffic volumes used in the creation of the base (2011) models are consistent with traffic patterns on the corridor.

The resultant growth on the corridor between 2011 and 2013 was 10 per cent at the intersection of Campbelltown Road and Denham Court Road and five per cent at the intersection of Campbelltown Road and Macdonald Road (across the entire period).

This increase in traffic volumes is due to residential and employment growth in the SWGC and Macarthur Region.

Strategic need to upgrade Campbelltown Road

The need for the Campbelltown Road upgrade is being driven by the anticipated growth in population and employment in the SWGC, in particular, the Edmondson Park precinct. A logical network of roads is needed to distribute traffic and provide alternative routes.

Edmondson Park precinct as a whole is anticipated to cater for 6000 new dwellings. A concept plan for Edmondson Park South (the part of the precinct to be built on both sides of Campbelltown Road, largely on former Defence land, identified in figures 1.1 and 2.7) was approved by P&E under Part 3A of the EP&A Act in 2011. The concept precinct plan is for a mixed-use residential, commercial and retail development, with a dwelling yield of 3200 and up to 45,000 square metres of retail/commercial floor space within the new Edmondson Park Town Centre (presented in Figure 2.6). When fully developed, Edmondson Park South is expected to generate up to 5000 trips during the peak periods, as identified in the original Traffic and Transport Assessment (AECOM 2013) for the REF.

Edmondson Park precinct would be accessed from Campbelltown Road via three new intersections with traffic lights: East Town Centre Drive, Soldiers Parade and the realigned Macdonald Road, south of the Hume Motorway. A new railway station is currently being constructed in Edmondson Park South as part of the SWRL, and Campbelltown Road is one of two main roads connecting the proposed Edmondson Park train station and the future local road network.

Analysis of future origin and destination movements for the Edmondson Park South precinct indicates that in 2026, 59 per cent of trips associated with the precinct are expected to be northbound along Campbelltown Road. A further five per cent would be southbound along Campbelltown Road. Nine per cent would be southbound via Macdonald Road and 27 per cent would be via Soldiers Parade and Camden Valley Way.

The forecast population and employment growth from 2006 to 2036 for the SWGC as a whole are presented in tables 3.1 and 3.2. Given that the Edmondson Park South precinct is currently being developed, with a new railway station and bus interchange due to be operational in 2015 (12 months earlier than originally planned), and residential lots are currently being sold and constructed, the immediately adjacent section of Campbelltown Road would be upgraded as a priority in Stage 1 of the Campbelltown Road upgrade. Stage 1 is expected to be completed by UrbanGrowth.

Table 3.1: Population growth forecast 2006–2036

LGAs	2006	2016	2026	2036
Camden	59,940	96,320	172,310	249,770
Campbelltown	147,440	167,480	201,570	233,760
Liverpool	170,920	201,990	259,340	324,440
Wollondilly	41,220	48,270	57,460	66,890

Source: 2009 BTS population forecasts, cited in AECOM (2014)

Table 3.2: Employment growth forecast 2006–2036

LGA	2006	2016	2026	2036
Camden	17,320	24,250	34,850	44,980
Campbelltown	45,930	54,340	64,960	75,080
Liverpool	59,160	72,500	89,130	103,520
Wollondilly	10,920	11,970	13,480	14,880

Source: 2009 BTS population forecasts, cited in AECOM (2014)

In order to justify the proposal to upgrade Campbelltown Road, Roads and Maritime undertook an assessment of mid-block volumes and capacity for 2026, assuming that Campbelltown Road is not upgraded and other roadwork in the area is completed as planned (AECOM 2014). In Table 3.3, a volume capacity ratio (V/C) of greater than 1.0 indicates that the roadway's existing lanes cannot support the projected demand. This is shown in bold in Table 3.3. Only the section between Zouch Road and Brooks Road would have a capacity of less than 1:0 in 2026, although it would be close to capacity at 0.97.

Table 3.3: Forecast mid-block capacity of Campbelltown Road if the proposal does not proceed

Section	AM peak hour (veh/h)		PM peak hour (veh/h)	
	Peak direction flow (NB)	Volume capacity ratio (V/C)	Peak direction flow (SB)	Volume capacity ratio (V/C)
	2026 – No upgrade		2026 – No upgrade	
Between Hume Motorway Onramp and Macdonald Road	1588	1.32	1217	1.01
Between Macdonald Road and Zouch Road	1602	1.34	1350	1.13
Between Zouch Road and Brooks Road	1280	1.07	1166	0.97
	2036 – No upgrade		2036 – No upgrade	
Between Hume Motorway Onramp and Macdonald Road	1722	1.44	1272	1.06
Between Macdonald Road and Zouch Road	1761	1.47	1450	1.21
Between Zouch Road and Brooks Road	1366	1.14	1262	1.05

Note: NB refers to northbound traffic (northbound carriageway) and SB refers to southbound traffic (southbound carriageway).

Source: Roads and Maritime (2013), cited in AECOM (2014, Appendix B)

Table 3.3 indicates that without providing for any upgrade of Campbelltown Road, the impact of land use changes and expected population and employment growth would result in the southern section of the corridor exceeding capacity in 2026 and 2036 in the AM and PM peak hour. The exception to this would be the 2026 PM peak hour between Zouch Road and Brooks Road, which is forecast to be nearly at capacity.

Origin and destination profiles

The traffic modelling carried out assigns trips dynamically within the model to the route or combination of connecting roads that provides the overall shortest travel time between the origin and the destination, much like a driver would assess the quickest

route to their destination considering all possible options within a network. The route that provides the overall shortest travel time would vary, depending on the saturation level of roads within the model, as a result of other trip assignments.

Analysis of future origin and destination movements of vehicles travelling along Campbelltown Road was carried out for 2026 and 2036 to provide an indication of future trip patterns on the Campbelltown Road corridor. The origin and destination profiles are presented in the Supplementary Traffic Assessment (AECOM 2014, Appendix B). Figures 3.1 and 3.2 show the origin and destination distributions for the 2036 AM and PM peaks.

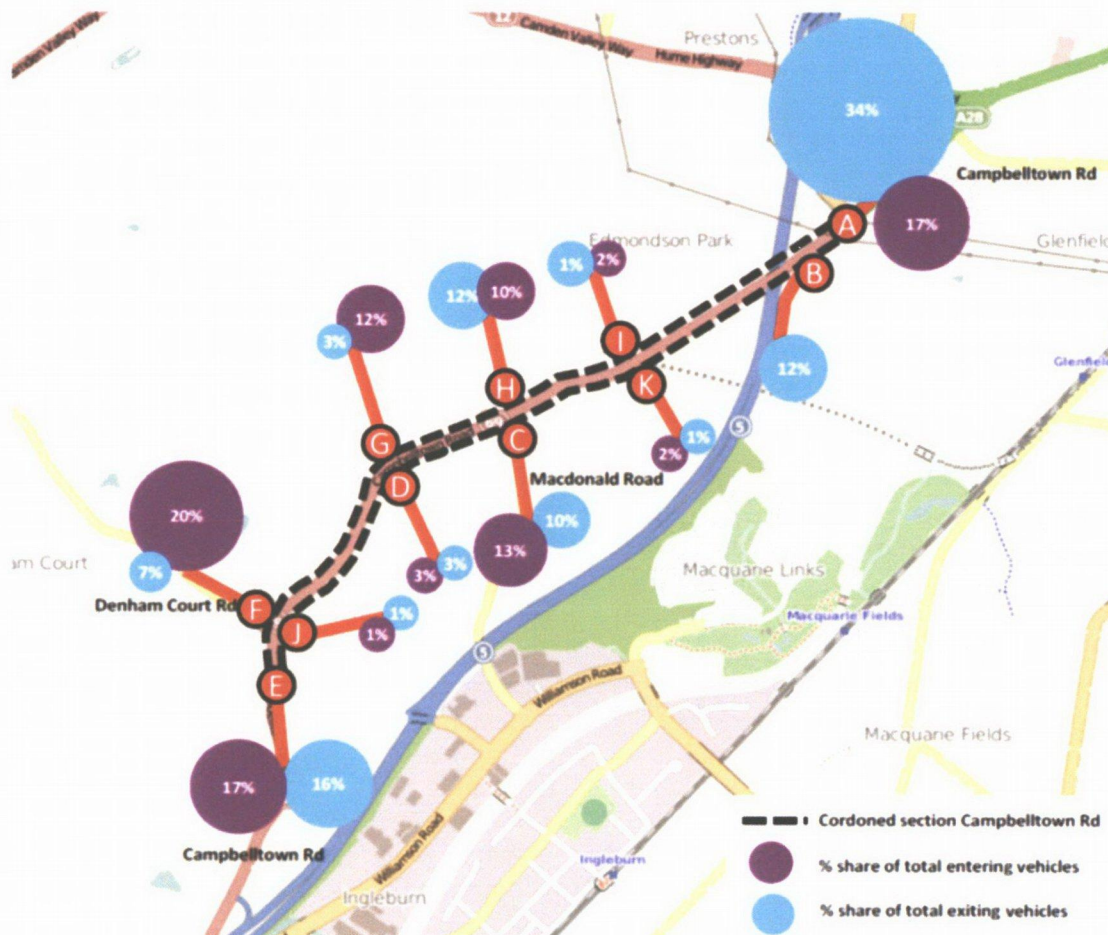


Figure 3.1: Origin and destination distributions 2036 AM peak (Source: AECOM 2014)



Figure 3.2: Origin and destination distributions 2036 PM peak (Source: AECOM 2014)

These profiles highlight the demand for vehicles to use Denham Court Road and the local roads within the Edmondson Park precinct. This demand is central to the portion of the road corridor being upgraded: Campbelltown Road provides the most direct route to access the majority of these locations.

Reduced carriageway width between Macdonald Road and Zouch Road

As part of the Supplementary Traffic Study (AECOM 2014, Appendix B), an options assessment was carried out for 2036 in which traffic uses Williamson Road via Macdonald Road as an alternative route to Campbelltown Road. This scenario was investigated to determine if providing an alternative route would reduce congestion on Campbelltown Road by a measurable amount, removing the potential need for a future upgrade to six lanes between Macdonald Road and Zouch Road.

Under this scenario, Campbelltown Road would be upgraded to six lanes (three lanes each way) between the Hume Motorway and Macdonald Road and four lanes (two lanes each way) from Macdonald Road to Brooks Road.

In addition, the Supplementary Traffic Assessment (AECOM 2014, Appendix B) undertook an assessment of the traffic impacts at the following intersections:

- Campbelltown Road/Zouch Road
- Campbelltown Road/Denham Court Road
- Campbelltown Road/Blomfield Road
- Campbelltown Road/Macdonald Road

- Campbelltown Road/Williamson Road
- Williamson Road/Macdonald Road
- Williamson Road/Brooks Road.

The mid-block volume and intersection analysis both demonstrated that the proposed Williamson Road scenario would have a minimal effect with respect to inducing traffic away from Campbelltown Road to Williamson Road and Macdonald Road. This is discussed in greater detail in Section 7.2 of the Supplementary Traffic Assessment (AECOM 2014, Appendix B). Therefore, it was not considered possible to reduce the ultimate design to a four-lane road between Macdonald Road and Zouch Road.

Reduction of carriageway width between Zouch Road and Brooks Road

Between Zouch Road and Brooks Road, the need to provide for an ultimate widening to a six-lane road between Zouch Road and Brooks Road was re-assessed in terms of mid-block capacity (Table 3.4).

Table 3.4: Forecast mid-block capacity of Campbelltown Road upgrade if the proposal proceeds as described in Chapter 4 (two lanes in each direction)

Section	AM peak hour (veh/h)		PM peak hour (veh/h)	
	Peak direction flow (NB)	Volume capacity ratio (V/C)	Peak direction flow (NB)	Volume capacity ratio (V/C)
	2026 – Two lanes		2026 – Two lanes	
Between Zouch Road and Brooks Road	1696	0.71	1166	0.71
	2036 – Two lanes		2036 – Two lanes	
Between Zouch Road and Brooks Road	1907	0.79	1262	0.83

Source: Roads and Maritime EMME Model (2013), cited in AECOM (2014)

As indicated in Table 3.4, according to the projected volumes, it is possible to retain acceptable mid-block capacity performance in 2036 without upgrading Campbelltown Road to three lanes in each direction south of Zouch Road. However, several sections of the study corridor would be close to capacity with a two-lane road in 2036.

Zouch Road intersection arrangements

Modelling results indicate that under the proposed left in/left out configuration, the intersection of Campbelltown Road and Zouch Road would operate at level of service (LoS) F in the 2036 AM peak and LoS E in the 2036 PM peak hour. (Level of service is a six-point scale (A-F) measuring the extent of delay experienced at the intersection, with A being the best and F the worst).

This level of service would be due to the increase in traffic volumes on Campbelltown Road as a result of population and employment growth in areas surrounding the corridor. The increase in traffic would reduce the available gap for motorists exiting Zouch Road, resulting in longer average delays; however, it is noted that this would not be the only way for motorists to access Campbelltown Road, and alternative access could be obtained through Macdonald Road and the new road network within the Edmondson Park precinct. The performance of this intersection would be reassessed in the future when congestion increases.

Blomfield Road intersection arrangements

Of the four intersections investigated in the Supplementary Traffic Assessment that would be impacted by the installation of the proposed central median, Blomfield Road/ Campbelltown Road currently records the highest right-turn volumes (AECOM 2014).

Three different intersection treatments were assessed in the Supplementary Traffic Assessment (AECOM 2014, Appendix B) to determine the suitability of allowing right-hand turns from the perspective of intersection performance:

- Priority treatment (all movements)
- Priority treatment (right-turn in only)
- Roundabout or intersection with traffic lights.

Right turns at the intersection of Blomfield Road/ Campbelltown Road are currently well serviced by a single lane approach, priority T-intersection. Modelling analysis shows that the intersection currently performs at LoS B in the AM peak and LoS A in the PM peak.

For the 2026 scenario year, the intersection was tested as a two-lane approach priority seagull intersection with a 50-metre right-turn bay. It was shown that increased through volumes along Campbelltown Road would inhibit opportunities for right-turn movements out of Blomfield Road, and the intersection consequently would not perform to acceptable levels (it would be at LoS E, which indicates that the intersection is operating at capacity and requires another control mode).

An alternative priority configuration was analysed in which only the right-turn movement into Blomfield Road was permitted. Modelling results indicate that this configuration would operate satisfactorily in the 2036 AM peak and until some point between 2026 and 2036 in the PM peak when it would reach LoS E. The reason for the low level of service (LoS E) would not be due to the right-turn vehicles entering Blomfield Road but the left-turn vehicles exiting Blomfield Road. Providing a dedicated right-turn lane from the northbound carriageway of Campbelltown Road to Blomfield Road would provide adequate access and acceptable intersection operation with LoS B. Detailed analysis results are shown in Table 5.2 of the Supplementary Traffic Assessment (AECOM 2014).

A roundabout or intersection with traffic lights was shown to result in increased property acquisition requirements and unacceptable queue lengths in the 2036 PM peak (an intersection with traffic lights would have cars queuing up to 191.8 metres). Therefore, these options were not considered further.

Denham Court Road intersection arrangements

The intersection of Denham Court Road and Campbelltown Road has been analysed as a dual-lane roundabout, to model performance under both 2026 and 2036 AM and PM peak travel demand. Existing intersection performance is at LoS A, with an average delay per vehicle of less than eight seconds in both the AM and PM peak periods. Modelling shows that a dual-lane roundabout is sufficient to serve the intersection under expected 2026 and 2036 future demands. In 2026, the LoS falls to B; in 2036 it falls further to a LoS C. The intersection with traffic lights option, as demonstrated in the Campbelltown Road upgrade REF (March 2013), provides LoS statistics no worse than C in 2026 for the AM and PM peak and D in the 2036 AM and PM peak periods. The performance of this intersection would be reassessed in the future when congestion increases.

It has been assumed that no additional traffic would be generated on Dickson Road as there is no future development proposed. Dickson Road is currently a no through road providing access to two dwellings.

Modelling analysis indicates that a two-lane roundabout has the potential to accommodate the projected 2026 and 2036 AM and PM peak forecast flows at the intersection of Denham Court Road/Campbelltown Road. This is based on the assumption of a notional 30 vehicles on Dickson Road. However, this arrangement would require conversion into traffic signals if Campbelltown Road were to be upgraded to three lanes in each direction south of Macdonald Road (which does not form part of the current proposal).

Impacts on local roads

The Supplementary Traffic Impact Assessment examined the impacts of the proposal on local area routes. Table 3.5 provides a summary of the local streets that would be impacted by the proposed installation of the central median and resultant changes to traffic movements, alternative routes, the total approximate distance of these routes and projected demand for these alternative routes. This table takes into consideration the modifications to the proposal outlined in Chapter 4. Projected demands are based on existing surveyed intersection turning counts with the exception of the access to Denham Court Caravan Park, which is based on the Roads and Maritime *Guide to Traffic Generating Developments* (2013).

Table 3.5: Impacts of the proposal on local area routes

Affected local street	Explanation	Alternative route	Distance (km)	Est peak demand (vehicles)	
				AM	PM
Zouch Road (north)	To Zouch Road north	Turn right at Macdonald Road, use local streets to access Zouch Road (no additional distance, simply turn off Campbelltown Road earlier).	1.1	14	22
	To Campbelltown Road southbound	Use local streets to access Macdonald Road, turn right onto Campbelltown Road, travel south.	1.8	13	6
Zouch Road (south)	To Zouch Road south	Turn right at Macdonald Road, use local streets to access Zouch Road.	1.8	8	6
	To Campbelltown Road northbound	Use local streets to access Macdonald Road, turn right onto Campbelltown Road, travel north (no additional distance, just turn onto Campbelltown Road later). The new road layout for the Edmondson Park precinct would support this movement and is expected to be in place before Zouch Road becomes left in/left	1.0	3	0

Affected local street	Explanation	Alternative route	Distance (km)	Est peak demand (vehicles)	
				AM	PM
		out.			
Blomfield Road	To Campbelltown Road northbound	Use Denham Court Road/ Campbelltown Road/ Dickson Road roundabout to U-turn.	0.9	20	9
Local roads and private property (including businesses) south of Zouch Road	To local roads or private property (including businesses)	Use Denham Court Road/ Campbelltown Road/ Dickson Road roundabout to U-turn.	0.9	1	14
	To Campbelltown Road (south)	Turn left onto Zouch Road, use local streets to access Macdonald Road, rejoin Campbelltown Road, travel south.	2.7	5	5

Source: AECOM (2014)

As shown in Table 3.5, the proposed installation of the central median would have a small impact on local roads due to changes to traffic movements, relative to the number of vehicles that use Campbelltown Road.

Response to Traffic and Transport Assessment Peer Review

The Supplementary Traffic Assessment (AECOM 2014) also responds to the abovementioned comments in the Traffic and Transport Peer Review (GTA Consultants 2013a, refer to Section 3.1, above). These responses are summarised as follows:

- Future year traffic volumes were developed in accordance with the Roads and Maritime strategic model (EMME). This is a calibrated and robust model from which to base modelling analysis and turning movement calculations
- SIDRA model inconsistencies have been corrected and the revised modelling results are presented in Appendix A of the Supplementary Traffic Assessment
- The revised SIDRA modelling has taken into consideration the closely spaced nature of the intersections along the study corridor with respect to signal coordination and cycle time optimisation. The recommended cycle times are in accordance with the Roads and Maritime *Traffic Modelling Guidelines* (2013).

3.2.2 Additional management and mitigation measures

The Supplementary Traffic Assessment (AECOM 2014) does not advocate any management and mitigation measures additional to those identified in the REF.

3.3 Supplementary Traffic Assessment Peer Review

3.3.1 Summary

Following the completion of the Supplementary Traffic Assessment (AECOM 2014) (as outlined in Section 3.2 above), GTA Consultants examined the amendments made to the SIDRA modelling to support the Campbelltown Road upgrade. GTA Consultants concluded that the SIDRA models have been satisfactorily coded to best

industry practices and are considered suitable for use in the development of the proposal. This report is included in Appendix B of this report.

3.3.2 Additional management and mitigation measures

The Supplementary Traffic Assessment Peer Review (GTA Consultants 2013a) does not advocate any management and mitigation measures additional to those identified in the REF.

3.4 Supplementary Statement of Heritage Impact (SoHI)

3.4.1 Summary

Roads and Maritime commissioned a Supplementary SoHI as a result of a number of changes to the concept design of the proposed upgrade, and legislative changes. This Supplementary SoHI discussed and assessed design and legislative changes that have occurred since the finalisation of the original SoHI. It also addressed the findings of the independent Heritage Landscape Assessment for Campbelltown Road (Taylor Brammer Landscape Architects, Appendix C), as requested by the NSW Heritage Council in response to the IHO nomination of Campbelltown Road (refer to Section 1.6 of this report).

The full report can be found in Appendix C of this report and a summary of the key findings is provided below.

Denham Court House

The Supplementary SoHI noted that the relationship of Denham Court House with Campbelltown Road has altered substantially over time. The original access to the property was off an earlier alignment of Dickson Road that has since been consumed by subdivision. Therefore, the entrance to the property off Campbelltown Road is not original in alignment or fabric, and it does not substantially contribute to the heritage significance of the property. As the current curtilage of the item is reduced from the original size of the estate, it is not considered that the size of the current lot makes a significant contribution to the heritage significance of the item.

The outcome of revising the concept design (Chapter 4 of this report) is that the proposed road alignment would encroach into the curtilage by a maximum of about 16.2 metres. Up to about seven metres of this would be included in the road corridor, while about 9.2 metres would include road batters and would be returned to Denham Court House after construction (in consultation with OEH Heritage Branch and landowners). Although this would impact on the Denham Court property boundary along Campbelltown Road, a substantial amount of lawn between the road and the homestead complex would be retained, and views toward Campbelltown Road from the rear of Denham Court House would not be significantly affected due to the screening vegetation to the north-west of the house.

The proposed widening is well within the road upgrade corridor identified in the *Campbelltown (Urban Area) LEP 2002*, as shown in Figure 3.3, in green.

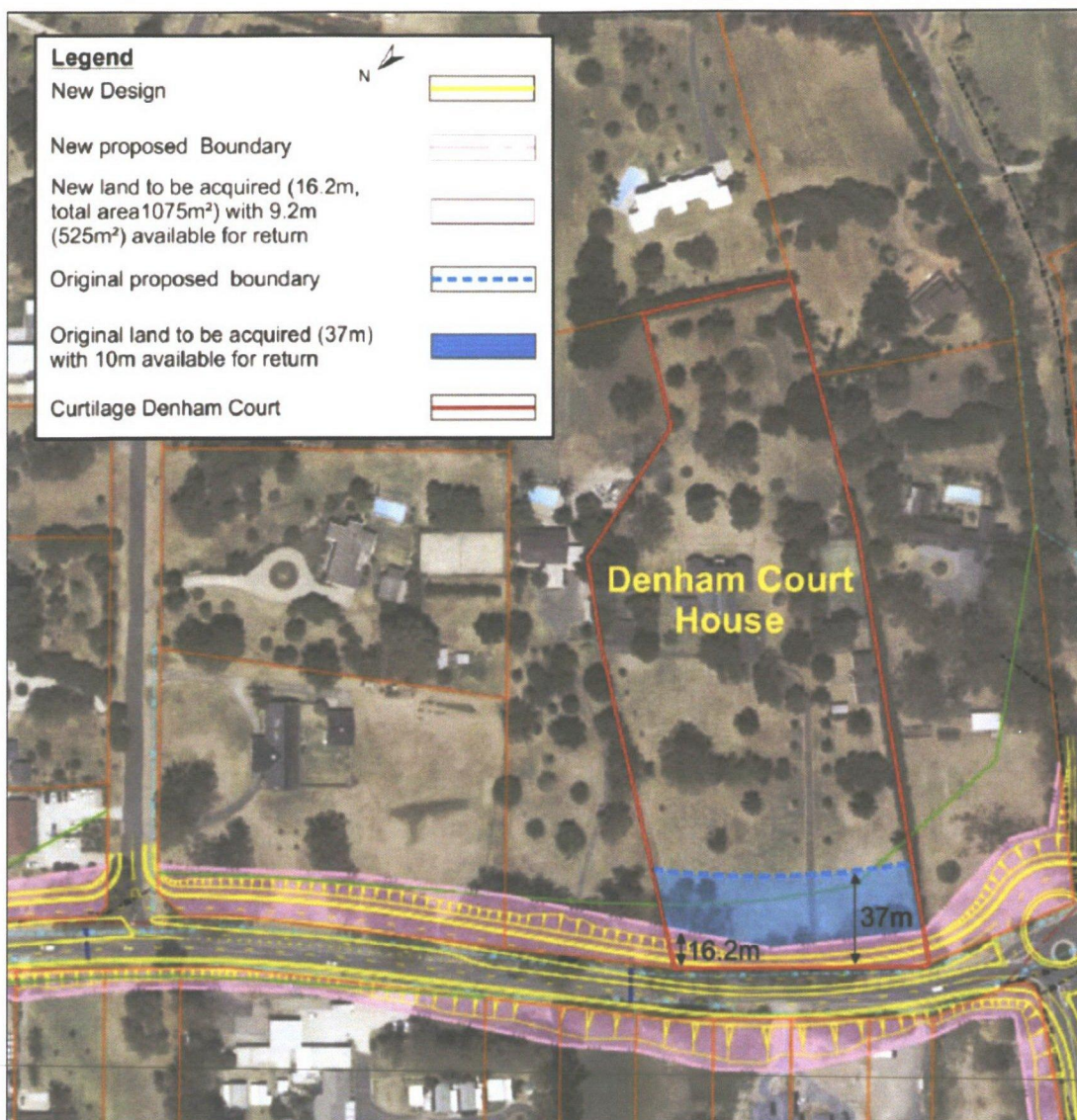


Figure 3.3: Denham Court House on Campbelltown Road. The road upgrade corridor identified in the *Campbelltown (Urban Area) LEP 2002* is indicated in green

Ingleburn Military Heritage Precinct and Mont St Quentin Oval

As the Ingleburn Military Heritage Precinct and Mont St Quentin Oval are now listed together on the SHR, the approval of the Heritage Council of NSW is required for any major work. It would be necessary to make a Section 60 application to the Heritage Council and obtain a permit prior to any impacts on the items, including the removal of trees along both sides of Campbelltown Road at this location.

The proposal would not directly impact the original walls and sentry boxes of the entrance to Bardia Barracks. The Noise and Vibration Assessment for the REF (Wilkinson Murray 2013) concluded that vibration from construction work is not anticipated to affect the wall, but recommended that a building condition survey be carried out prior to any construction work, and that vibration monitoring be carried out during the first phases of the use of construction machinery.

Mont St Quentin Oval entry gates

The proposal would require the relocation of the existing hospital gates. These gates were relocated from the site of the former military hospital in 1997 and are not original to the complex. The gates do have some significance for their role in

commemorating the hospital, but their current location does not make an important contribution to their significance. If the gates were located elsewhere within the Ingleburn Military Heritage Precinct or Mont St Quentin Oval heritage curtilage, the modified design would not have a significant impact on their heritage value.

Further assessment was carried out in terms of the safeguards and management measures associated with the alteration of the configuration of the heritage gates at the entry to Mont St Quentin Oval (refer to Table 6.45 of the REF). Two options have been proposed and assessed in the Supplementary SoHI. These options are labelled Option A and Option B, and a summary of the assessment is provided below.

Option A (figures 3.4 and 3.5) would allow the existing barracks gates and existing oval gates to be retained in situ. The existing hospital gates would be relocated, with the proposed shared pathway located to the south and the proposed road to the north. If this option were used, the existing entry gates would no longer fulfil their original function, and be visibly removed from their original context on the edge of the oval.

Option B (figures 3.6 and 3.7) would require the relocation of both the existing hospital gates and the existing oval gates further south, allowing the existing oval gates to continue to be used as an entrance to the oval. This option would also allow for a connecting pathway to the existing hospital gates opposite the Bardia Barracks entry.

The removal and relocation of heritage fabric within an SHR area would require a Section 60 permit. As outlined in the REF, further consideration of the configuration of the shared path and both sets of entry gates to St Mont Quentin Oval would be carried out in detailed design. The preferred option would be determined during detailed design in consultation with OEH (Heritage Branch).

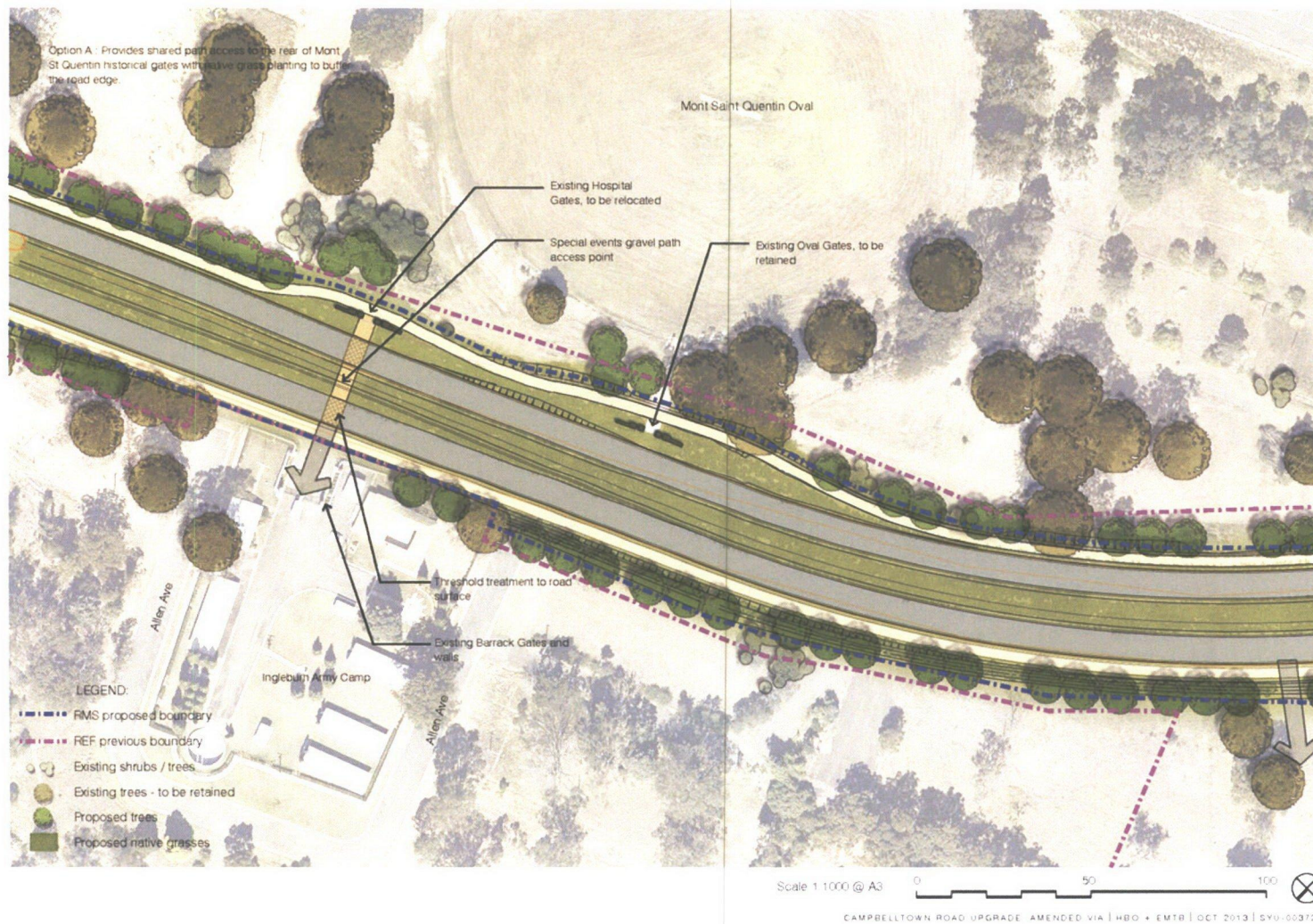


Figure 3.4: Landscape plan of Option A showing retention of the original gates with the proposed shared path located behind (HBO+EMTB Urban and Landscape Design 2013b)



Military Precinct Gates - Option A

Figure 3.5: Photomontage of Option A showing retention of the original gates with the proposed shared path located behind (HBO+EMTB Urban and Landscape Design 2013c)

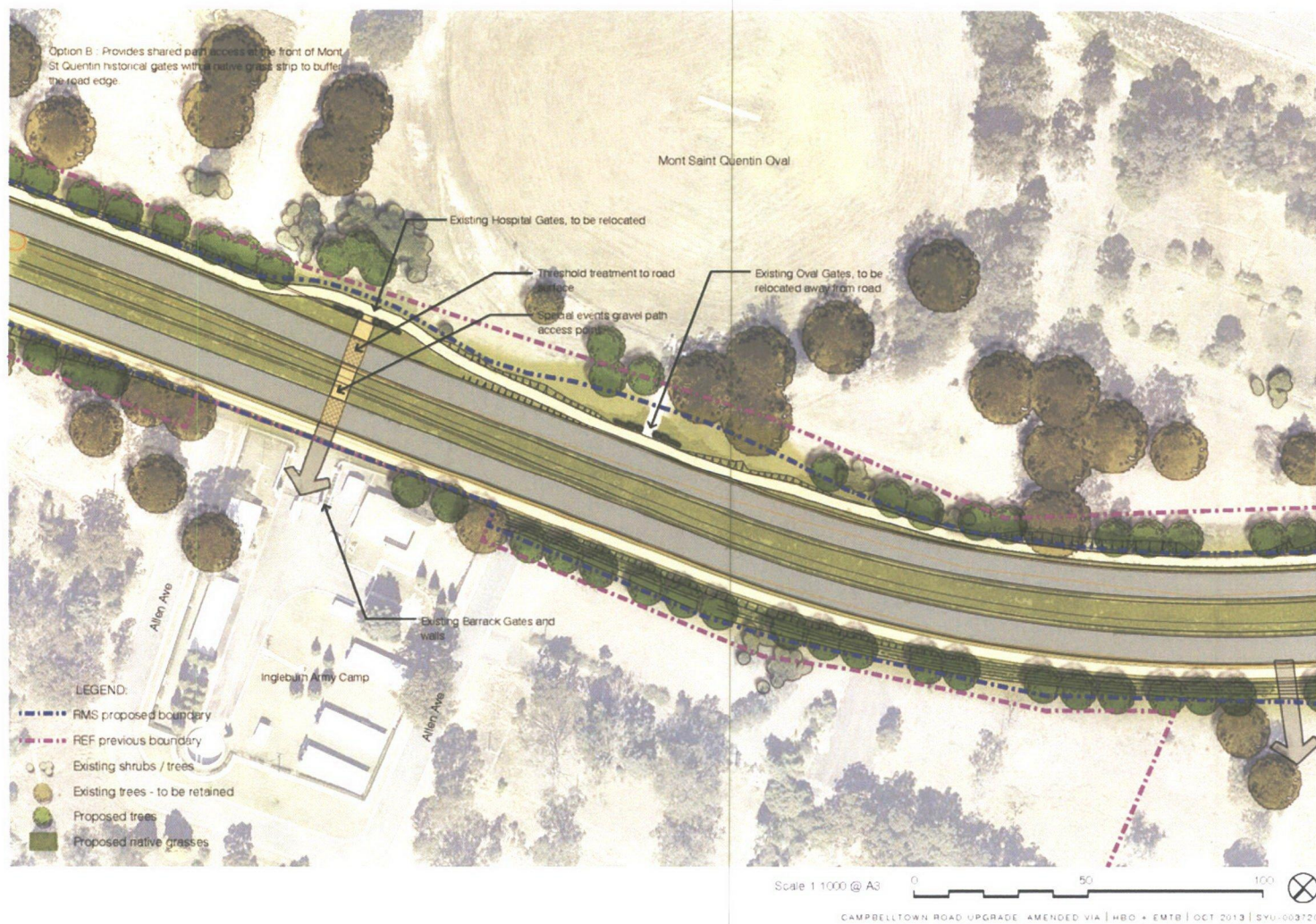


Figure 3.6: Landscape plan of Option B showing relocation of the original gates with the proposed shared path located in front (HBO+EMTB Urban and Landscape Design 2013b)



Military Precinct Gates - Option B

Figure 3.7: Photomontage of Option B showing relocation of original gates with the proposed shared path located in front (HBO+EMTB Urban and Landscape Design 2013c)

Campbelltown Road

In response to the request to consider an IHO for Campbelltown Road (Section 1.6), comparative analysis of early roads in Sydney and surrounding areas was carried out. It considered the heritage significance of Parramatta Road, Windsor Road, The Great Western Road and The Great Northern Road. This comparative analysis provided a framework within which to examine the heritage significance of Campbelltown Road.

Based on this comparative analysis, and on the fulfilment of the NSW heritage assessment criteria, Campbelltown Road was found to be of Local Significance. It has therefore been recommended that amendments to the alignment of the road be kept to a minimum, and landscaping decisions aim to maintain the connection between the road and its rural history. In keeping with these findings, on 4 December 2013 the NSW Heritage Council resolved that an IHO for Campbelltown Road would not be made at this time. Section 1.6 provides further details.

Table 3.6 summarises the comparative heritage assessment that was carried out to determine which aspects of Campbelltown Road are of heritage significance, in response to the IHO request for Campbelltown Road. A range of questions was applied in both the Heritage Landscape Assessment and the Supplementary SoHI to ascertain the relative importance of Campbelltown Road – either to the whole of NSW or to the local area (NSW Heritage Office 2009). The only difference in these two assessments was the significance apportioned to the associative heritage aspects of Campbelltown Road. The Supplementary SoHI indicated that Campbelltown Road holds no associative significance, while the Landscape Heritage Assessment indicated Local Significance in this category. This is detailed further in Section 3.5 and in Table 3.6, below.

Table 3.6: Comparative heritage assessment of Campbelltown Road (Artefact Heritage 2013c; Taylor Brammer Landscape Architects (2013)

Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
Criterion A: Historic significance – (Evolution)	<i>An item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area)</i>	The early colonial roads were highly significant to the developing colony, allowed for the expansion of settlement, facilitated trade, and linked settlements and people. Their significance lies in their relationship to the people who constructed them, settled alongside them and relied on them for their livelihood up to the present day. For example, sections of the former Great Western Road demonstrate exceptional historical significance as largely intact examples of a significant transport route constructed by convict labour between the 1820s and 1840s. The road has direct links to archaeological sites associated with convict bridge and road building gangs. The construction of the Great Western Road opened up the interior of the colony to agricultural and pastoral production and European settlement	Like the Great Western Road, the alignment of Campbelltown Road has changed little since its creation in the early 19th century, and it is of historical significance as one of the earliest main roads in NSW to have retained its alignment with little modification. Along with other early main roads in the region, Campbelltown Road has the ability to demonstrate patterns of early land use and transportation networks. Campbelltown Road was an important link to farmlands to the west and south of Parramatta, and facilitated the expansion of settlement into these areas. Campbelltown Road is also significant due to its relationship with historic properties in the area including the Ingleburn Military Precinct and Denham Court House	Yes – Local
Criterion B: Associative significance – (Association)	<i>An item has strong or special association with the life or works of a person, or group of persons, or</i>	Early colonial roads of NSW are associated with numerous persons and events of historical significance. Various Governors and surveyors were instrumental in their construction and settlement patterns were dictated by their location. Windsor Road is associated with the Battle of Vinegar Hill.	Campbelltown Road was surveyed in 1817 by Deputy Surveyor General, James Meehan, a former convict who was appointed acting Surveyor-General by Governor Macquarie. Meehan made several contributions to the mapping of the colony, most notably a map of Sydney drawn in	No (Artefact Heritage 2013c) Yes – Local (Taylor Brammer

Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
	<i>importance in NSW's cultural or natural history (or the cultural or natural history of the local area)</i>	The majority of the early roads were constructed under Governor Macquarie, as part of his vision for an orderly colony. The early roads were associated with surveyors such as James Meehan and George Evans, and road builders such as William Cox	1807, and he surveyed the townships of Richmond, Castlereagh, Windsor, Pitt Town, Wilberforce, Liverpool and Bathurst in New South Wales, as well as Hobart Town in Van Diemen's Land (ADB 1967). The road is also associated with builder Captain Richard Brooks, a prominent settler who built and was buried at Denham Court, and other landowners that relied on the road for the transport of goods. James Meehan was one of the foremost surveyor's during the Macquarie period. He was involved the construction of many of the early roads in the colony. His connection with Campbelltown Road is therefore limited. Campbelltown Road is also associated with the Australian Defence Force in the use of the road for the purposes of the development of Ingleburn Military Heritage Precinct with access gained for the army camp from both Liverpool and Campbelltown. There is an important relationship between the Bardia Barracks entry gates, Campbelltown Road and the Mont St Quentin Oval that is still (relatively) intact and allows interpretation of the former Army Camp and related historic activities	Landscape Architects 2013)



Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
Criterion C: Aesthetic significance – (Scenic qualities/ creative accomplishments)	<i>An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area)</i>	Roads contribute to understanding of the aesthetic character of the numerous individual historic places located along it. There are strong visual connections between most of the colonial roads and historic homesteads, inns and vestigial sections of their rural settings. Bypassed sections of the Old Northern Road, Great Western Road and Old Windsor Road retain much of their character as rural two-lane roads with unformed edges and verges that follow the undulations of the original landforms. Some abandoned or bypassed sections of these early roads may maintain a 'country lane' aesthetic, with links to views that have remained only slightly altered since their construction	In the case of Campbelltown Road numerous country estates were established along the alignment, including Denham Court and Robin Hood Farm. Many of these early estate houses are listed on the SHR and S.170 registers. Like many of these early road alignments, Campbelltown Road passes through a landscape that has maintained much of its rural character. Native roadside trees reflect the pastoral landscape pattern of the 19th century and later roadside plantings contribute to the historical significance of places including the former Ingleburn Military Camp. Campbelltown Road is an example of an early alignment that continues to be part of a wider landscape embodying scenic qualities that continue to be associated with the rural character of the area. Campbelltown Road therefore reaches the Local Significance threshold for this criterion	Yes – Local
Criterion D: Social significance – (Contemporary community esteem)	<i>An item has a strong or special association with a particular community or cultural group in NSW for social,</i>	Many of the early road alignments have strong links to current community interest groups. This is shown by the level of interest in the preservation of vistas, heritage buildings and heritage listings	Campbelltown Road does have the interest of local community groups in preserving the road, its relationship with the historic properties that front it, and the rural views from it. There is a strong community of interest that identifies with and values the Campbelltown Road. The IHO request	Yes – Local

Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
	<i>cultural or spiritual reasons (or the cultural or natural history of the local area)</i>		(Section 1.6 of this report) is testament to the strength of connection that members of the local community have with the road and the landscape through which it passes. Various elements of the road and its corridor are held in esteem by the local community, including the plantings associated with the former Ingleburn Army Camp. Campbelltown Road therefore meets the Local Significance threshold under this criterion	
Criterion E: Technical/ research significance – (Archaeological, educational, research potential and scientific values)	<i>An item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area)</i>	Early road alignments tend to be heavily modified to meet the demands of advancing road-building and transport technologies. Roads are therefore structures that are regularly altered; their meanings and historical importance tend to change as time passes. Modifications can affect the heritage significance of early road alignments through the removal of early fabric, alignments, vistas and the alteration of historical relationships to property boundaries and pathways. Roads that have not been substantially widened or improved may have the potential to retain archaeology associated with the early colonial period. The Great North Road and the Great West Road, for example, retain	Campbelltown Road does not meet the Local Significance threshold for this criterion. Although the original alignment of the road has been largely preserved with little modification, early fabric is unlikely to survive. Campbelltown Road does not constitute a substantial archaeological resource and has little scientific or educational potential. The research potential of the road is therefore considered to be low and the road does not meet the Local Significance threshold under this criterion	No

Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
		substantial evidence of convict road building, culverts, causeways, cuttings, convict stockade and retaining walls		
Criterion F: Rarity	<i>An item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area)</i>	Many early road alignments would not be considered to be rare or endangered, although they may contain elements that when assessed in isolation do meet this criterion. Elements of the Great Western Road for example including the convict built Victoria Pass, early stone culverts and retaining walls are all considered to be significant heritage items in their own right, but also contribute to the overall significance of the road itself	Campbelltown Road would be considered to be rare in its local context in that its alignment has remained largely unmodified unlike other roads in the area including Cowpasture Road and Camden Valley Way that have undergone substantial modification. It also retains its relationships with original pastoral landscapes that provide opportunity for interpretation of the character of colonial landscapes. Campbelltown Road meets the Local Significance threshold for this criterion	Yes - Local
Criterion G: Representative-ness	<i>An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural)</i>	Many of these colonial road alignments demonstrate characteristics that are representative of early colonial roads that have remained in use until the present day. Although most have been modified to reflect their changing uses, many retain good examples of original fabric and can demonstrate early road building and surveying techniques	Campbelltown Road does demonstrate the principal characteristics of a Macquarie era road in Sydney and surrounding areas including the preservation of original alignment, links to historical properties or landscapes and the retention of original fabric in the form of milestones. The Heritage Landscape Assessment of Campbelltown Road by Taylor Brammer Landscape Architects (2013, 68-69) demonstrates that the roadside vegetation has significance as remnant Cumberland Woodland and Alluvial Woodland	Yes - Local

Criteria	Explanation	Comparative roads	Campbelltown Road	Significant?
	<i>history of the local area)</i>		landscapes that are becoming less prevalent with the urban development of the Cumberland Plain	

Source: Artefact Heritage (2013c); Taylor Brammer Landscape Architects (2013)

The Supplementary SoHI found that the proposed alignment of Campbelltown Road would generally follow the existing road alignment, maintaining the ability of the road to demonstrate historic patterns of land use, transport and regional development. However, the proposed widening of the road, the removal of the roadside trees, and the addition of possible features such as traffic lights, would impact on the rural nature of the road, and its aesthetic significance. This would also be compounded by associated changes to the surrounding landscape through planned urban development.

In spite of these considerations, the Supplementary SoHI concluded that Campbelltown Road's significance lies largely in:

- Its alignment, which would not be substantially altered by the proposal
- Its relationship to the surrounding landscape and historic properties, which would not be significantly affected by the proposal, as the road would be kept at a similar grade and generally on the same alignment.

Furthermore, the Supplementary SoHI concluded that the ability of Campbelltown Road to demonstrate rarity, representativeness, social or historic significance would not be affected by the proposal.

3.4.2 Additional management and mitigation measures

The following management and mitigation measures identified in the Supplementary SoHI are refinements of, or additional to, the safeguards and mitigation measures proposed in the original SoHI and REF.

Denham Court House

The mitigation strategy for Denham Court House is illustrated in Figure 3.8. Specific additional mitigation measures are as follows:

- The proposal would include the planting of two rows of replacement Eucalyptus trees within the Denham Court House property. The first row would be beside the four-lane road corridor, and the second beside the possible 'future' road corridor boundary for a six-lane road (as identified in the *Campbelltown (Urban Area) LEP 2002*). While this means that the first row of trees may be ultimately sacrificial should any future road widening occur, this approach would ensure there is a continuous corridor of trees both in the interim and following any future widening
- It is recommended that these trees be planted in the near future to allow them to become established prior to removal of the existing Eucalypts
- As these plantings would be on private property, this would require consultation with, and agreement from, the property owners
- This mitigation strategy would maintain the visual relationship between Campbelltown Road and Denham Court House and between the house and its lawn and garden surroundings. It would also preserve the 19th century pastoral aesthetic of the area
- About 9.2 metres of land fronting Campbelltown Road, acquired from the estate for construction of the proposal, would be returned to the estate as landscaped batters following construction, in consultation with the owner.



Figure 3.8: Photomontage showing proposed mitigation strategy for Denham Court House (HBO+EMTB Urban and Landscape Design 2013c)

Ingleburn Military Precinct and Mont St Quentin Oval

The additional mitigation measures for Ingleburn Military Heritage Precinct and Mont St Quentin Oval are as follows:

- The Ingleburn Military Heritage Precinct and Mont St Quentin Oval are listed on the SHR. Therefore, a Section 60 application would be made to the Heritage Council and a permit obtained for any impacts on the item. Care would be taken to avoid impacts where possible
- Design Option B (relocation of the original gates with the proposed shared path located in front) would be investigated during detailed design as the preferred option for the original entrance gates to the Mont St Quentin Oval. This investigation would be carried out in consultation with OEH (Heritage Branch).

Campbelltown Road

The additional mitigation measures for Campbelltown Road are as follows:

- The proposal would retain the relationship of the road with its immediate landscape setting as much as feasible and reasonable, including the form and alignment of the road
- The proposal would retain the physical and visual relationship of the road with heritage-listed properties fronting it as much as feasible and reasonable, including Denham Court House and its plantings, and Ingleburn Military Heritage Precinct and Mont St Quentin Oval and plantings
- The proposal would retain the natural vegetation patterns of the Cumberland Woodland and Alluvial Woodland landscape where feasible and reasonable, for their scientific value as remnant natural vegetation on the Cumberland Plain that is becoming increasingly rare (Taylor Brammer Landscape Architects 2013:71).

3.5 Landscape Heritage Assessment

3.5.1 Summary

In response to a request by the Heritage Council during the exhibition of the REF, and a request for an IHO on Campbelltown Road, Roads and Maritime commissioned Taylor Brammer Landscape Architects to prepare a Landscape Heritage Assessment of Campbelltown Road, in addition to the Supplementary SoHI by Artefact Heritage (2013c, refer to Section 3.4, above). The report identifies and assesses the heritage significance of Campbelltown Road between Camden Valley Way and Brooks Road, with consideration given to its relationship with the surrounding landscape and, where required, provides appropriate heritage conservation recommendations. The full report can be found in Appendix C and a summary is provided below.

The heritage significance of Campbelltown Road has been assessed in accordance with the Heritage Office's *Assessing Heritage Significance* (Department of Planning 2001). Campbelltown Road was identified as having Local Significance. It noted that the components of Campbelltown Road that contribute to its overall significance are:

- Trees along the road at the former Ingleburn Army Camp
- The three milestones
- Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- Denham Court House
- Alignment of the road
- General roadside trees
- Pastoral landscape south of Denham Court Road
- Cross Roads at Casula.

The statement of heritage significance provided for Campbelltown Road is as follows:

Campbelltown Road is representative of the early main roads in the Cumberland Plain that were established in the Macquarie era. It is a rare surviving section of Colonial era road that has retained much of its original alignment and still enables interpretation of the cultural landscape from the first half of the nineteenth century. The road retains characteristics expressive of the historic rural character of the Cumberland Plain due to the remnant roadside trees both within the road reservation and in the surrounding landscape. Later roadside plantings around the Ingleburn Military Heritage Precinct are important evidence of significant 20th century activities. Campbelltown Road is associated with the Australian Defence Force in the use of the road for the purposes of the development of Ingleburn Army Camp with access gained for the army camp from both Liverpool and Campbelltown.

Campbelltown Road is assessed as having heritage significance at a local level.

(Taylor Brammer Landscape Architects 2013:61)

3.5.2 Additional management and mitigation measures

Roads and Maritime would consider the inclusion of Campbelltown Road (or a portion thereof) on its s170 Heritage and Conservation Register.

3.6 Zouch Road to Brooks Road Supplementary Visual Impact Assessment

3.6.1 Summary

Based on amendments to the concept design for the proposed upgrade, Roads and Maritime commissioned HBO+EMTB Urban and Landscape Design to prepare the Zouch Road to Brooks Road Supplementary Visual Impact Assessment (2013a). The assessment updates the Landscape Character and Visual Impact Assessment (JPW 2013) and urban design concept originally prepared in the REF based on an amended design for the section of Campbelltown Road from Zouch Road to Brooks Road. The full report can be found in Appendix D and a summary is provided below.

Both the original Landscape Character and Visual Impact Assessment (JPW 2013) and the Zouch Road to Brooks Road Supplementary Visual Impact Assessment (HBO+EMTB Urban and Landscape Design 2013a) utilised the landscape visual impacts rating table from the Roads and Maritime document 'EIA-N04 Guidelines for landscape character and visual impact assessment' (Roads and Maritime 2011). This matrix considers sensitivity and magnitude, as shown in Figure 3.9.

Sensitivity refers to how sensitive the character of the setting is to the proposed change.

Magnitude refers to the level of intrusion of the proposal within the existing landscape due to factors such as scale and extent of earthwork required to build the proposal.

		Magnitude					
		High	High to Moderate	Moderate	Moderate to Low	Low	Negligible
Sensitivity	High	High Impact	High Impact	Moderate-high	Moderate-high	Moderate	Negligible
	High to Moderate	High Impact	Moderate-high	Moderate-high	Moderate	Moderate	Negligible
	Moderate	Moderate-high	Moderate-high	Moderate	Moderate	Moderate-low	Negligible
	Moderate to Low	Moderate-high	Moderate	Moderate	Moderate-low	Moderate-low	Negligible
	Low	Moderate	Moderate	Moderate-low	Moderate-low	Low Impact	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible	Negligible

Figure 3.9: Landscape visual impacts rating table (RMS 2011)

The supplementary assessment found that the amended concept design would not change the impact of the proposal on landscape character in terms of:

- Sensitivity (moderate) – there would be a level of modification of the landscape within the two-lane road and rural development
- Magnitude (moderate to high) – the proposal would significantly increase the road footprint, impact on the landscape, remove existing large trees, reduce curtilage of properties and introduce extensive batters.

The visual impacts would be highest where the existing corridor includes substantial screening landscape and adjoining land uses are either residential or have a heritage significance.

3.6.2 Additional management and mitigation measures

The following management and mitigation measures identified in the Supplementary Visual Assessment are refined or in addition to the safeguards and mitigation measures proposed in the original Landscape Character and Visual Impact Assessment (JPW 2013, Appendix C of the REF) and the REF for the section of Campbelltown Road between Zouch Road and Brooks Road:

- Replacement tree planting would be carried out in the verge and within the LEP road reservation/private property to replace screening treed landscape. This would be done in consultation with the landowner
- Medians would be planted where the median is wider than four metres. Medians would be planted with native grasses only due to sightline and safety requirements
- Wire rope barriers would be used to maximise the retention of existing trees where feasible and reasonable
- At Denham Court House, a landscape strategy would be prepared that includes replacement tree planting of appropriate advanced stock on both publicly owned and private land (in consultation with the landowner) to enable long-term replacement of screening treed landscape. This strategy would incorporate a staged approach, including pre-construction planting within private properties to ensure that landscape is in place prior to start of roadwork, ensuring a certain level of amenity. Advanced planting would need to be appropriate to a road corridor landscape that is: low maintenance, contextually appropriate and indigenous species.

An Urban and Landscape Concept Design and Strategy has been prepared to illustrate how the above safeguards and mitigation measures, as well as those outlined in the REF, have been included in the concept design. It is visually

presented in figures 3.10 and 3.11 and fully detailed, including indicative planting palettes in Chapter 4 of the Zouch Road to Brooks Road Supplementary Visual Impact Assessment (HBO+EMTB Urban and Landscape Design 2013a) (Appendix D). Photomontages have been used throughout this report to illustrate this strategy, which would be further refined during detailed design.

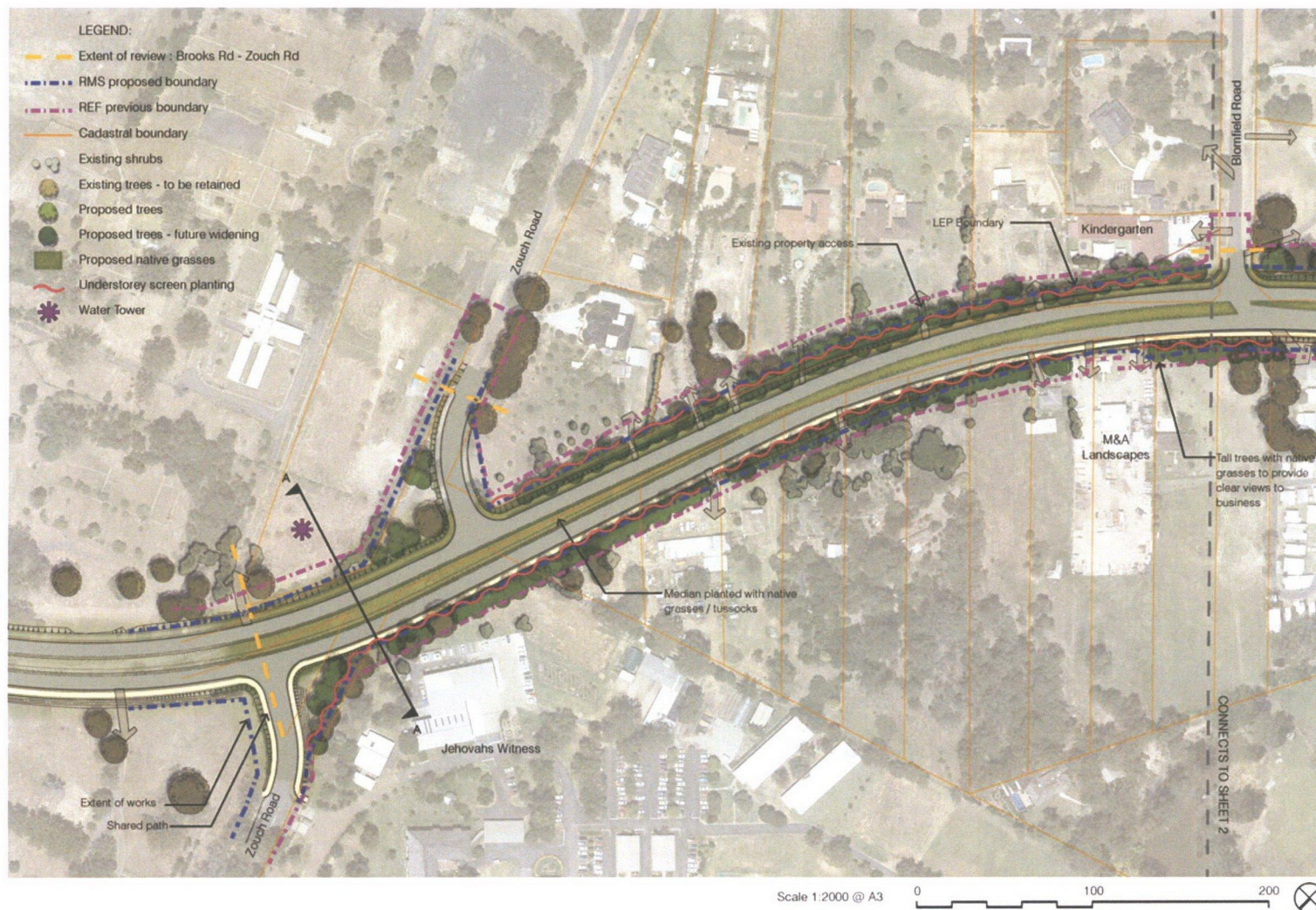


Figure 3.10: Campbelltown Road upgrade landscape concept plan: Part 1 of 2 (HBO+EMTB Urban and Landscape Design 2013a)

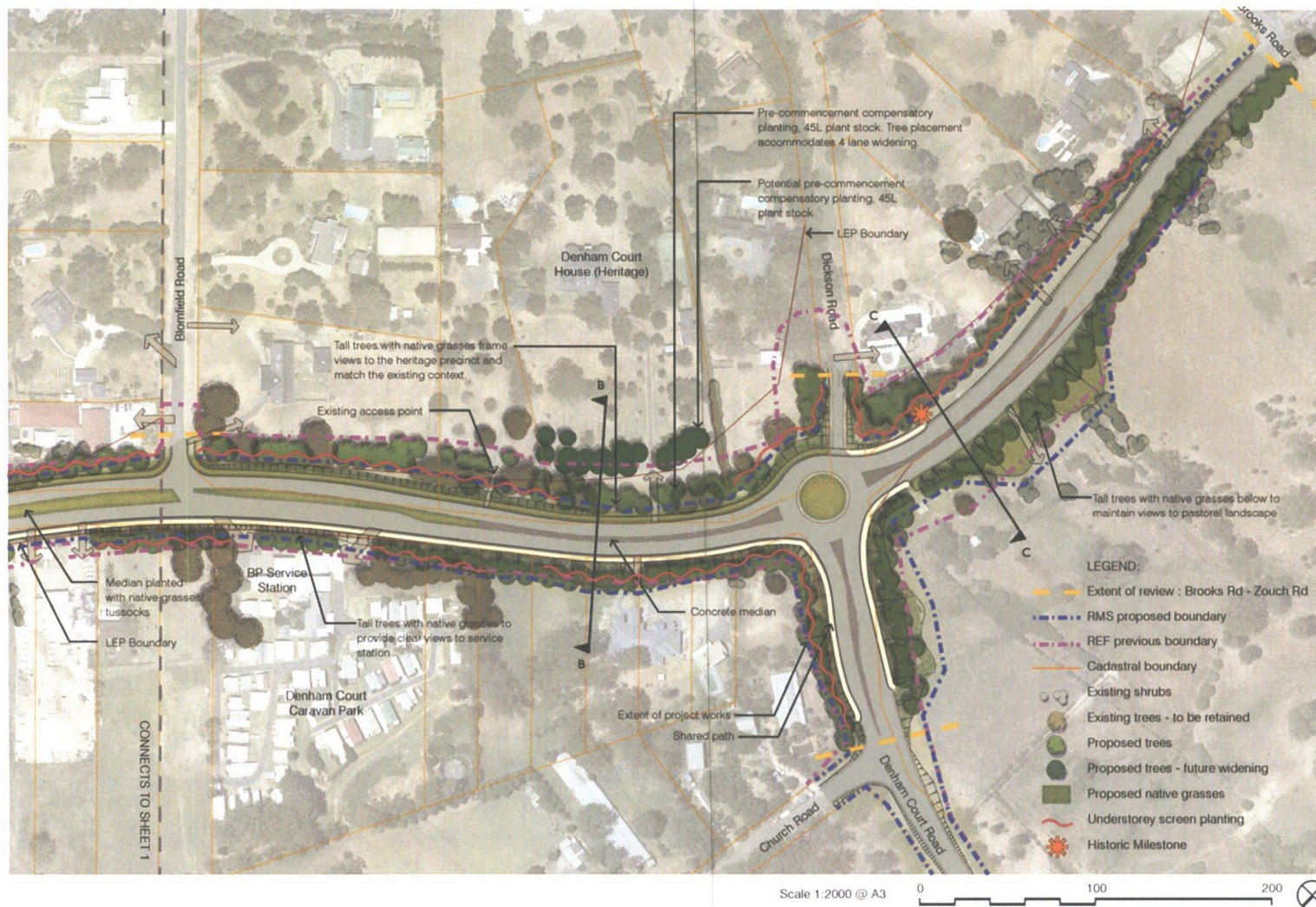


Figure 3.11: Campbelltown Road upgrade landscape concept plan: Part 2 of 2 (HBO+EMTB Urban and Landscape Design 2013a)

3.7 Supplementary Land Use and Socio-Economic Impact Assessment

3.7.1 Summary

During the public exhibition of the REF, a number of submissions from the community raised additional concerns with regards to the socio-economic impact of the proposal. In response to these concerns, and to changes in the design, Roads and Maritime commissioned Hyder Consulting to prepare a Supplementary Land Use and Socio-Economic Impact Assessment of the proposal to inform the submissions report (2014). The full report can be found in Appendix E and a summary is provided here. The assessment was completed in accordance with *Environmental Impacts Assessment Practice Note – Socio-economic Assessment* (Roads and Maritime 2013).

The Supplementary Land Use and Socio-Economic Impact Assessment focussed on potential impacts on:

- Community values, including safety
- Local businesses
- Land use and zoning
- Local amenity
- Employment and income
- Property and land values
- Social infrastructure
- Access and connectivity.

Impact on local businesses

Roads and Maritime commissioned Hill PDA (2013) to prepare a Business Impact Assessment to inform the Supplementary Land Use and Socio-Economic Assessment. It describes and qualifies the potential economic impacts of the proposal on existing businesses along the alignment.

The Business Impact Assessment (2013) noted that businesses likely to be affected are those relying on providing a convenience role and/or capturing passing trade. The land use appraisal identified the BP service station as the only business that could experience adverse impact from the road widening. The Business Impact Assessment outlined that the service station is a highway-based retail outlet relying almost exclusively on passing trade. It also competes with other service stations and its success is reliant on it providing convenience for its customers. Therefore, changes that create access restrictions or result in a loss of parking spaces, visual exposure or other factors could undermine the level of convenience provided by the business and, in turn, lead to the redirection of customers to competing outlets.

The Business Impact Assessment estimated that up to 37.3 per cent of the BP service station's trade is derived from southbound motorists (Hill PDA 2013). This is the maximum loss of passing vehicles that the BP service station could potentially experience. To help mitigate this potential loss of trade, the proposal includes:

- A roundabout at the intersection of Denham Court Road/Dickson Road/Campbelltown Road, which would facilitate U-turns from the southbound carriageway
- Temporary signage to inform motorists of alternative access arrangements
- A dedicated right-turn lane for northbound traffic along Campbelltown Road to turn into Blomfield Road.

The BP service station has two access points: site access 1 (the southern entrance) and site access 2 (the northern entrance). Being 100 metres to the south of Blomfield Road, site access 1 is the safer exit for vehicles to turn left out onto Campbelltown Road and then move across into the right-turn lane at Blomfield Road, although there may also be an opportunity to exit from site access 2. This measure would reduce the inconvenience considerably for southbound traffic, saving distance and driving time for motorists having to turn around as far back as Macdonald Road. It is anticipated that this manoeuvre would only be possible for light vehicles. This would be confirmed during detailed design.

This potential loss, would constitute an immediate 'point in time' impact – the difference between 'do nothing' and the proposed upgrade. It is important to acknowledge that the purpose of the roadwork is to meet growth in demand for road use. It is anticipated that traffic along Campbelltown Road would increase by around 60 per cent over the next five years and more than double over the next 10 years. Assuming the same percentage of passing motorists stop at the BP service station in the future as at present, then a 60 per cent increase in trade (in constant dollars) could be expected over the next five years. Therefore, the growth in trade over the next five years due to additional northbound traffic would possibly generate more business (trade and retail sales) than business which is potentially lost due to the removal of right-turn movements for southbound motorists (subject to this stage of the proposal being constructed).

The impacts on other businesses would be less since these businesses do not greatly rely on passing trade compared to the BP service station. The only other business likely to experience some potential adverse impact is M&A Landscapes. This business is partially a destination outlet for some shoppers and partially a wholesale business to other businesses and contractors. Generally, it is estimated that 16 per cent of the turnover of hardware and gardening stores is wholesale trade related, which is not reliant on passing trade and visual exposure. This business would benefit from the development of the SWGC and the strong demand generated from home building and landscaping.

The review of potential land use and socio-economic impacts has verified the findings of the original land use and socio-economic assessment in the REF. There would be some construction impacts, including noise, amenity and dust. Safety would also be a key consideration for Roads and Maritime and the construction contractor during construction. The proposal would also result in some land use and socio-economic impacts during operation, including loss of connectivity between local roads, and changes to amenity and rural lifestyle associated with the area.

After recommended management and mitigation measures are considered, all of the identified potential impacts have been identified as being of low or negligible significance. In addition, the proposal would result in a number of beneficial land use and socio-economic impacts, including:

- Improved operational safety
- Improved efficiency of regional traffic flow
- Improved pedestrian and cyclist facilities and connectivity with the surrounding network.

Zoning impacts – Scenic Hills

The 'Scenic Hills' is an informal name given to the land that is identified in the *Campbelltown Local Environmental Plan – District 8 (Central Hills Lands)* (Campbelltown City Council 2008). This plan aims to ensure that the Central Hills

Lands District (shown in Figure 3.12 in a regional context and Figure 3.13 in relation to the proposal area) 'retains the rural character that was envisaged for it during the planning that preceded the urbanisation of that City', (Campbelltown City Council 2008). The Central Hills Land comprises about 2131 hectares. Generally speaking, land zoned as Zoning 7(d1) (Environmental Protection (Scenic)) within the Central Hills is agricultural land, and subdivision is not permitted unless each allotment to be created by the subdivision has an area of not less than 100 hectares. The proposal to upgrade Campbelltown Road, to the north-east of the Central Hills Lands, would result in acquisition of about 1.244 hectares from one property zoned 7(d1) (Environmental Protection (Scenic)). This is visually presented in Figure 4.6 of this report. The acquired land would be rezoned SP2 (Infrastructure) and the remaining land on the affected property would remain within the Central Hills Land zoning. It would be possible to hand back much of this acquired land after construction is completed, as the land would predominantly accommodate landscaped 4:1 batters. Aside from this, the proposal would not have any direct physical impact on the Central Hills Lands, and particularly, that which is zoned for Environmental Protection.

Zoning impacts – other areas

In terms of land outside of the Central Hills Lands, about 1.2 hectares of the proposal area is considered to be within the '7(d5) Environmental Protection 1 Ha Minimum' zoning, on the southern side of Campbelltown Road south of Zouch Road (figures 3.12 and 3.13).








Of the properties within this zoning, only three properties to be partially acquired would be reduced to less than one hectare in size. The proposal would not result in changes to zoning of these properties, even with reduction in property area (Figure 4.2). One of these is non-residential (the site of the Leaping Learners Early Education Centre). For the other two properties, opportunities to minimise the amount of land to be acquired would be further investigated during detailed design, and opportunities to return land after construction would be investigated post-construction.

Zoning impacts – heritage

Impacts on specific items of Non-Aboriginal heritage, as well as the heritage values of the landscape as a whole, are discussed in sections 2.9, 3.4 and 3.5 of this report. It was found that these impacts are acceptable, and that the heritage values of relevant items and the landscape of Campbelltown Road as a whole would be retained under the proposal.

The Central Hills Lands that fall within the Environmental Protection (Scenic) area are not listed as a heritage item on any local, State or national register, and are instead provided for in the *Campbelltown Local Environmental Plan – District 8 (Central Hills Lands)*. Therefore, impacts on heritage values would not compromise the zoning of the Central Hills Lands and Environmental Protection 1 Ha Minimum.

There would also be no zoning changes under the *Liverpool LEP 2008* or *Campbelltown LEP 2002* as a result of the proposal.

-  Revised Proposal Area
- Land use (Campbelltown LEP – District 8 (Central Hills Lands))
-  5(a) Special Uses (Water Supply)
-  5(c) Special Uses (Proposed Local Roads & Widening)
-  5(d) Special Uses (Railway)
-  5(g) Botanic Gardens
-  6(c) Open Space (Regional)
-  7(d1) Environmental Protection 100ha min (Scenic)

HYDER LTD

Hyder

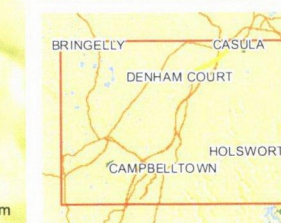


Figure 3-12: Campbelltown District 8 (Central Hills Land 2012)

Figure 3-13: Existing land use zones within and surrounding the proposal area

3.7.2 Additional management and mitigation measures

In addition to the safeguards and mitigation measures proposed in the REF, the following measures are proposed as a result of the Supplementary Land Use and Socio-Economic Impact Assessment:

- Temporary signage would be provided during construction to inform traffic of alternative access arrangements for local roads, properties and businesses on the other side of Campbelltown Road
- The air quality and noise management plans in the CEMP would consider key times during the day when construction in the immediate vicinity of the Leaping Learners Early Education Centre and Ingleburn North Public School could be avoided, such as 'nap time' and outdoor play time, where feasible.

4 Changes to the proposal

In response to community feedback on the REF, Roads and Maritime has reviewed the concept design of the proposed Campbelltown Road upgrade. The revised design and proposal area are presented in Figure 4.1 i–iv, which also includes the REF proposal area for comparison. Specific details and environmental assessment of changes to the proposal are provided in sections 4.1–4.7.



LEGEND

- Revised Proposal Area
- REF Proposal Area
- Revised Concept Design
- Shared Path
- Edmondson Park Precinct

*Shared path to be built on the northbound carriageway only.

DATA SOURCES
Roads and Maritime, LPI, OEH

NSW
Transport
Roads & Maritime
Services

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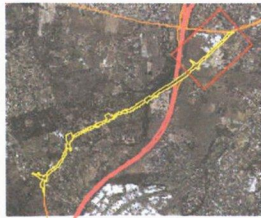
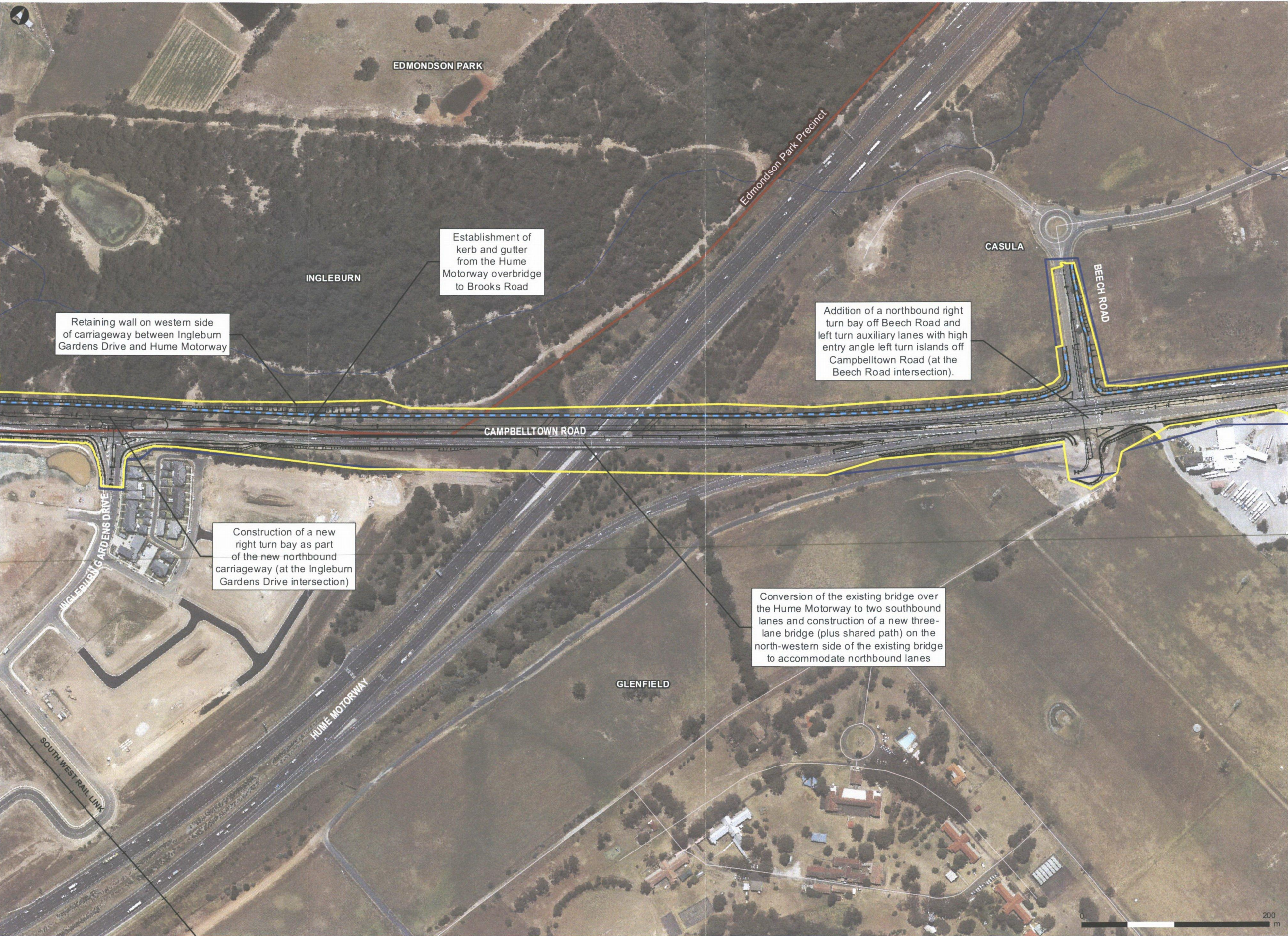


Figure 4-1i: Campbelltown Road upgrade - Camden Valley Way to Beech Road



- LEGEND
- Revised Proposal Area
 - REF Proposal Area
 - Revised Concept Design
 - Shared Path
 - Edmondson Park Precinct

*Shared path to be built on the northbound carriageway only.

DATA SOURCES
Roads and Maritime, LPI, OEH

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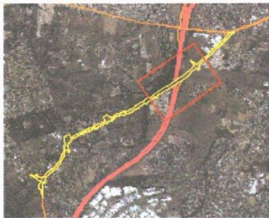


Figure 4-1ii: Campbelltown Road upgrade - Beech Road to Ingleburn Gardens Drive



LEGEND

- Revised Proposal Area
- REF Proposal Area
- Compound Sites
- Revised Concept Design
- Shared Path
- Intersections redeveloped as part of the Edmondson Park development and will no longer be accessible from Campbelltown Road
- Edmondson Park Precinct

*Shared path to be built on the northbound carriageway only.

DATA SOURCES
Roads and Maritime, LPI, OEH

NSW Transport
Roads & Maritime
Services

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Hyder



Figure 4-1iii: Campbelltown Road upgrade - Ingleburn Gardens Drive to Zouch Road



- LEGEND
- Revised Proposal Area
 - REF Proposal Area
 - Compound Sites
 - Revised Concept Design
 - Shared Path
 - Edmondson Park Precinct

*Shared path to be built on the northbound carriageway only.

DATA SOURCES
Roads and Maritime, LPI, OEH

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Figure 4-1iv: Campbelltown Road upgrade - Zouch Road to Brooks Road

4.1 Reduced cross-section south of Zouch Road

4.1.1 Description

As identified in the REF, the concept design has opted for a variable cross-section for the proposed upgrade of Campbelltown Road, which responds to a number of constraints in the corridor. These constraints include:

- Denham Court House
- Ingleburn Military Heritage Precinct and Mont St Quentin Oval
- Non-certified areas of native vegetation and the proposed Edmondson Regional Park
- The physical constraint of fitting beneath the SWRL overbridge.

Following community feedback received during the exhibition of the REF, the need to provide capacity for possible future widening within the road corridor between Zouch Road and Brooks Road was re-assessed in terms of mid-block capacity (as discussed in Section 2.3 of this report). It was determined that widening to four lanes south of Zouch Road would maintain an acceptable level of service to 2036. As a result, Roads and Maritime was able to reduce the carriageway requirements of the concept design south Zouch Road, and further reduce the median. The resultant reduction in the proposal footprint is shown in Figure 4.1 i–iv.

The concept design presented in the REF comprised a road corridor 44.3 to 56.4 metres wide. The revised concept design comprises a corridor width of 41.3 to 53.1 metres. The minimum corridor width as described in the REF is compared to the revised concept design for different sections of the proposal in Table 4.1 and indicative revised cross-sections are presented in figures 4.2–4.5.

Table 4.1: Minimum corridor widths for Campbelltown Road upgrade

Proposal section	Minimum corridor width (m)	
	REF concept design	Revised concept design
Camden Valley Way to Ingleburn Gardens Drive	35.8	35.8
Ingleburn Gardens Drive to Zouch Road	38.8	38.8
Zouch Road to Brooks Road	44.4	41.3

Source: Hyder Consulting (2013)

Campbelltown Road Upgrade Submissions Report



LEGEND
Revised Proposal Area

DATA SOURCES
Roads and Maritime, LPI, OEH

NSW
Transport
Roads & Maritime
Services

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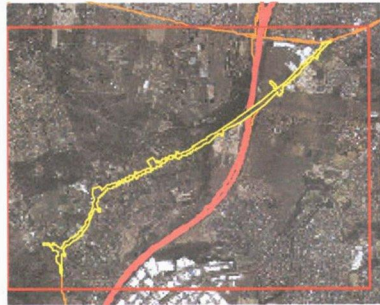
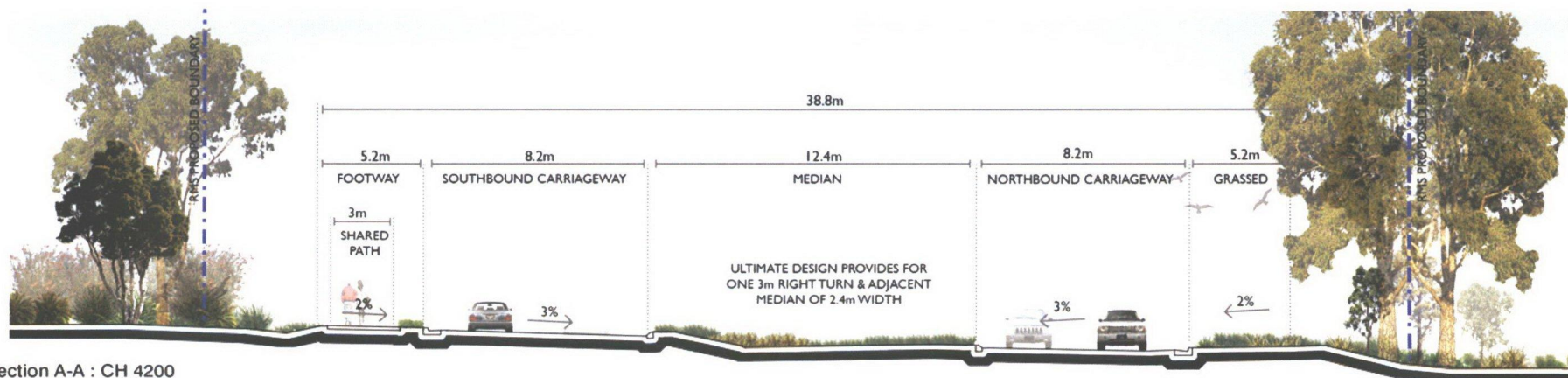
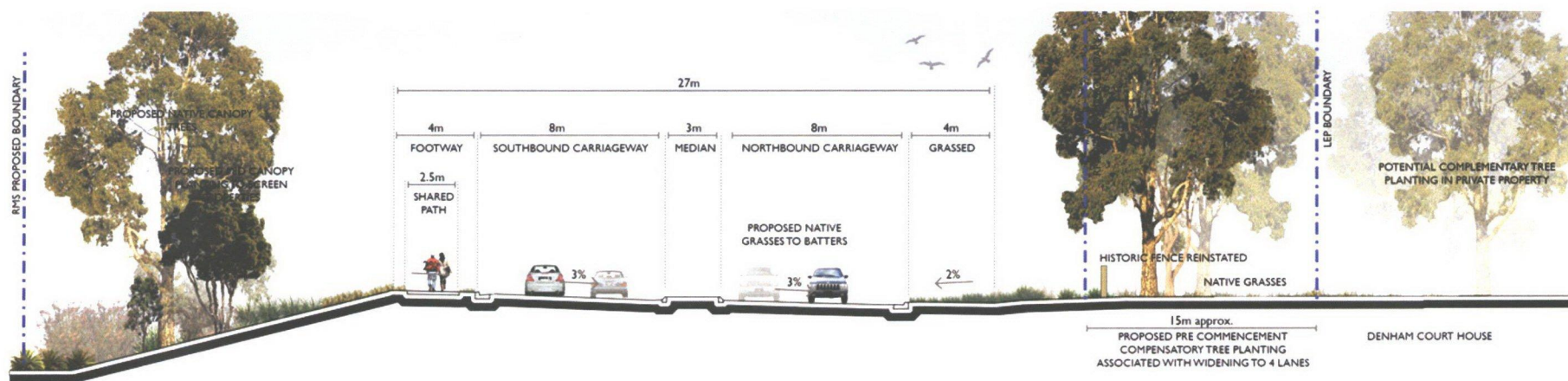


Figure 4-2: Indicative cross sections of proposed upgrade



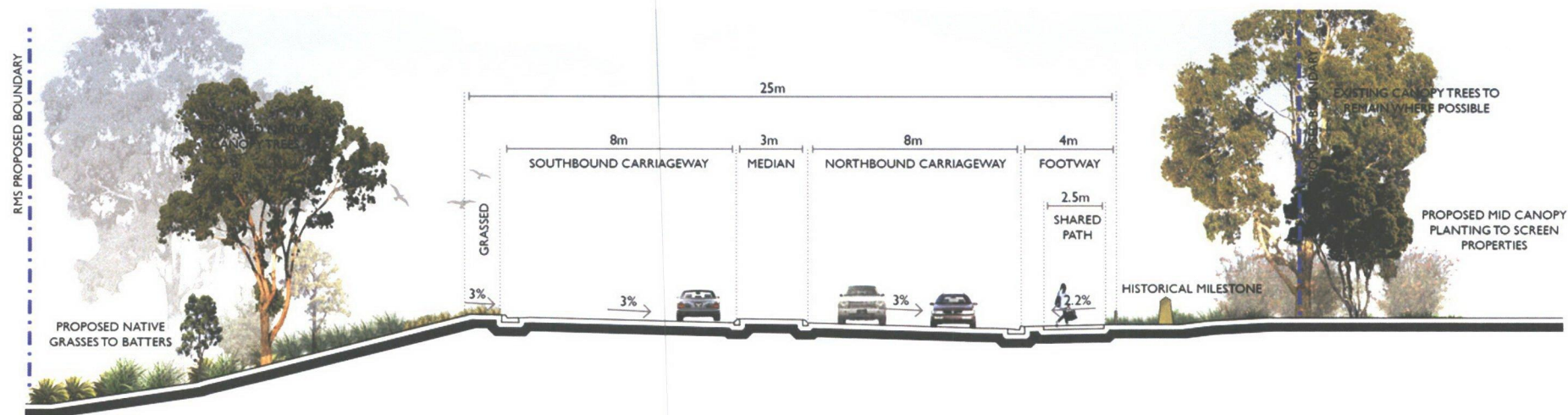
Section A-A : CH 4200

Figure 4.3: Typical cross-section at Zouch Road intersection (HBO+EMTB Urban and Landscape Design 2013a)



Section B-B : CH 4980

Figure 4.4: Proposed cross-section at Denham Court House with new planting and shared pathway on the north-western side of the road only (HBO+EMTB Urban and Landscape Design 2013a)



4.1.2 Environmental assessment

The reduced cross-section of the design south of Zouch Road is substantially consistent with the original description of the proposal in the REF and would result in a lower impact than the design that was assessed in the REF due to a smaller footprint. The proposed reduction in cross-section would be acceptable from a traffic, transport and access perspective, as identified in Section 2.2.1.

Potential impacts and management measures would not be substantially different in terms of:

- Biodiversity (Section 6.1 and Appendix K of the REF)
- Aboriginal heritage (Section 6.2 and Appendix G of the REF)
- Hydrology and water quality (Section 6.4 and Appendix J of the REF)
- Topography, geology and soils (Section 6.5 and Appendix N of the REF)
- Air quality (Section 6.8 of the REF)
- Climate change and greenhouse gas emissions (Section 6.9 of the REF)
- Resource use and waste management (Section 6.12 of the REF).

The reduced cross-section would reduce impacts of the proposal in terms of non-Aboriginal heritage, noise and vibration, landscape character and visual impacts, and land use and socio-economic impacts. Each of these is discussed below.

Non-Aboriginal heritage

In reducing the cross-section of the proposal south of Zouch Road, the proposal would impact the curtilage of Denham Court House by a maximum of about 16.2 metres instead of 27 metres. Up to seven metres of this would be included within the road corridor and about 9.2 metres would include road batters and would be returned to Denham Court House following the completion of the work (in consultation with OEH Heritage Branch and landowners). The road would be set back from the nearest building by about 97 metres as compared to 80 metres under the concept design assessed in the REF, as shown in Figure 3.3 of this report (HBO+EMTB Urban and Landscape Design 2013c).

The Supplementary SoHI assessed impacts of the revised concept design on Denham Court House and concluded that while the reduction of the curtilage of Denham Court House would not be ideal, the proposed impacts on the curtilage would be appropriately mitigated. As the relationship of Denham Court House with Campbelltown Road has altered over time (with the original entrance to the property being off Dickson Road) and the original estate boundary has significantly lessened over time, the boundary of the estate no longer contributes substantially to the overall heritage significance of the property.

Noise and vibration

Since the revised concept design would reduce the proximity of the road to adjacent sensitive receivers, there may be reduced noise and vibration impacts during both construction and operation.

A detailed assessment of noise and vibration impacts would be carried out during detailed design to verify potential noise impacts and confirm any necessary treatment options.

Landscape character and visual impacts

The Zouch Road to Brooks Road Supplementary Visual Impact Assessment reassessed the proposal in light of the revised concept design and concluded that the

impact on landscape character remains unchanged from the original assessment, regardless of the reduction in footprint (HBO+EMTB Urban and Landscape Design 2013a). The visual impacts of the proposal between Zouch Road and Brooks Road were considered in a viewpoint analysis; it was found that the impacts would decrease as a result of the reduced carriageway width. These findings are discussed in detail in Section 3.6 of this report.

Land use and socio-economic impacts

As a result of the reduced carriageway of the revised concept design, there would be less direct land use impacts and property acquisitions. Table 4.2 and Figure 4.6 indicate that the acquisition area has been reduced from the 11.53 hectares across 63 properties displayed in the REF to about 8.95 hectares across 52 properties.

Table 4.2: Revised details of potential acquisitions

Ref No.	Lot & DP	Current ownership	Full or partial acquisition?	Area in REF (ha)	Revised area (ha)	Zone	Zone change?	Sewer impact
3	202/1090110	Private	Partial	0.002	0.002	B5	No	Sewer main – no on-site system recorded.
4	203/1090110	Private	Partial	0.0885	0.0885	B5	No	Sewer main – no on-site system recorded.
5	204/1090110	Private	Partial	0.229	0.23	IN3	No	Sewer main – no on-site system recorded.
6	200/1090110	Private	Partial	0.086	0.355	IN3	No	Sewer main – no on-site system recorded.
7	1/270152	Private	Partial	0.407	0	SP2	No	No record found on Council mapping system.
9	1/122424	Private	Partial	0.031	0.026	2(b)	No	Sewer main – no on-site system recorded.
10	B/346530	Private	Partial	0.0415	0.0135	2(b)	No	Sewer main – no on-site system recorded.
11	98/270660	Private	Partial	0.013	0	2(b)	No	Sewer main – no on-site system recorded.
12	221/1057477	Private	Partial	0.039	0	2(b)	No	Sewer main – no on-site system recorded.
15	3/1149933	Private	Partial	0.007	0	2(b)	No	Sewer main – no on-site system recorded.
16	113/270660	Private	Partial	0.014	0	2(b)	No	Sewer main – no on-site system recorded.
17	112/270660	Private	Partial	0.014	0	2(b)	No	Sewer main – no on-site system recorded.
18	40/706911	Private	Partial	0.022	0	2(b)	No	Sewer main – no on-site system recorded.
19	8/656960	Private	Partial	0.0105	0	2(b)	No	No record of property found on Council mapping system.
20	1/128111	Private	Partial	0.0245	0	2(b)	No	No record of property found on

Ref No.	Lot & DP	Current ownership	Full or partial acquisition?	Area in REF (ha)	Revised area (ha)	Zone	Zone change?	Sewer impact
								Council mapping system.
21	1/456324	Private	Partial	0.0435	0.031	2(b)	No	No record of property found on Council mapping system.
22	1/241558	Private	Partial	0.016	0.007	2(b)	No	No record of property found on Council mapping system.
23	A/374928	Private	Partial	0.011	0.004	2(b)	No	No record of property found on Council mapping system.
24	3/241558	Private	Partial	0.012	0.0035	2(b)	No	No record of property found on Council mapping system.
25	101/603715	Private	Partial	0.012	0.0015	2(b)	No	Sewer main – no on-site system recorded.
26	4/241558	Private	Partial	0.000002	0	2(b)	No	No record of property found on Council mapping system.
29	1/801456	Public	Partial	0.0055	0.0055	E1	No	Sewer main – no on-site system recorded.
30	3/831152	Public	Partial	2.15	1.63	E1, SP2, RE1	No	Sewer main – no on-site system recorded.
31	1/831152	Public	Partial	0.1225	0.1225	B4	No	Sewer main – no on-site system recorded.
32	2/831152	Public	Partial	1.06	1.06	B4, SP2, R1, RE1	No	No on-site system recorded.
33	1/1144667	Public	Partial	0.001	0.001	SP2	No	No record of property found on Council mapping system.
34	2/1144667	Public	Partial	1.3455	1.3455	R1, SP2, RE1	No	No record of property found on Council mapping system.
35	3/246213	Public	Partial	1.261	0.0315	E1, R1	No	No on-site system recorded.
36	1/270621	Private	Partial	0.263	0.237	6(c)	No	No on-site system.
37	1/286233	Private	Partial	0.0005	0	2(c)	No	Sewer main – no impact.
39	2/1111318	Private	Partial	0.2565	0.204	RU2	No	Aerated system - commercial in nature – to be further investigated

Ref No.	Lot & DP	Current ownership	Full or partial acquisition?	Area in REF (ha)	Revised area (ha)	Zone	Zone change?	Sewer impact
								during detailed design with further consultation with landowner.
40	37/B/1443	Private	Partial	0.1975	0.179	RU2	No	No on-site system recorded.
41	36/B/1443	Private	Partial	0.11	0.112	RU2	No	No on-site system recorded.
42	35/B/1443	Private	Partial	0.0845	0.094	RU2	No	No on-site system recorded.
43	34/B/1443	Private	Partial	0.071	0.088	RU2	No	Septic tank and absorption bed – to be further investigated during detailed design with further consultation with landowner.
44	33/B/1443	Private	Partial	0.0615	0.076	RU2	No	Septic tank and absorption bed – to be further investigated during detailed design with further consultation with landowner.
45	32/B/1443	Private	Partial	0.0545	0.062	RU2	No	Septic tank and absorption bed – to be further investigated during detailed design with further consultation with landowner.
46	31/B/1443	Private	Partial	0.0535	0.053	RU2	No	Aerated system – commercial in nature – to be further investigated during detailed design with further consultation with landowner.
47	30/B/1443	Private	Partial	0.044	0.04	RU2	No	Aerated system – commercial in nature – to be further investigated during detailed design with further consultation with landowner.
48	29/B/1443	Private	Partial	0.0355	0.0335	RU2	No	Aerated system – commercial in nature – to be further investigated during detailed design with further consultation with landowner.
49	28/B/1443	Private	Partial	0.0255	0.035	RU2	No	Aerated system – to be further

Ref No.	Lot & DP	Current ownership	Full or partial acquisition?	Area in REF (ha)	Revised area (ha)	Zone	Zone change?	Sewer impact
								investigated during detailed design with further consultation with landowner.
50	27/B/1443	Private	Partial	0.019	0.0245	RU2	No	Aerated system – to be further investigated during detailed design with further consultation with landowner.
51	1/630181	Private	Partial	0.0705	0.141	RU2	No	Sub surface system – commercial in nature – to be further investigated during detailed design with further consultation with landowner.
52	21/B/1443	Private	Partial	0.0055	0.0435	RU2	No	No on-site system recorded.
53	20/B/1443	Private	Partial	0.0045	0.0505	RU2	No	No on-site system recorded.
54	19/B/1443	Private	Partial	0.009	0.061	RU2	No	Aerated system – to be further investigated during detailed design with further consultation with landowner.
55	18/B/1443	Private	Partial	0.0065	0.053	RU2	No	No on-site system recorded.
56	17/B/1443	Private	Partial	0.001	0.0275	RU2	No	No on-site system recorded.
57	1/1021783	Private	Partial	0.01	0.1305	RU2	No	Septic tank and absorption bed – to be further investigated during detailed design with further consultation with landowner.
58	404/714884	Private	Partial	0.2265	0.1685	7(d5)	No	Septic tank and absorption trench system – no potential impact.
59	392/564854	Private	Partial	0.231	0.1075	7(d5)	No	Septic tank and absorption trench system – no potential impact.
60	74/775926	Private	Partial	0.213	0.118	7(d5)	No	Septic tank and absorption trench system – no potential impact.

Ref No.	Lot & DP	Current ownership	Full or partial acquisition?	Area in REF (ha)	Revised area (ha)	Zone	Zone change?	Sewer impact
61	16/259492	Private	Partial	0.4205	0.274	7(d5)	No	Septic tank and absorption trench system – no potential impact.
62	101/602622	Private	Partial	0.2295	0.1635	7(d5)	No	Aerated wastewater treatment – no potential impact.
63	10/778532	Private	Partial	0.0995	0.058	7(d5)	No	Septic tank and absorption trench – no potential impact.
64	20/718716	Private	Partial	0.069	0.028	7(d5)	No	Septic tank and absorption trench – no potential impact.
65	21/718716	Private	Partial	0.0005	0.002	7(d5)	No	Unknown system – no potential impact.
66	1/883247	Private	Partial	0.074	0.074	7(d5)	No	Aerated wastewater treatment – no potential impact.
67	23/585290	Private	Partial	1.2385	1.244	District 8	No	Unknown system – no potential impact.
90	115/260767	Private	Partial	0.0006	0	7(d5)	No	Aerated wastewater treatment – no potential impact.
91	102/260767	Private	Partial	0.045	0	7(d5)	No	Aerated wastewater treatment – no potential impact.
92	101/260767	Private	Partial	0.0665	0	7(d5)	No	Septic tank and absorption trench – no potential impact.
93	56/1114607	Private	Partial	0.163	0.0085	7(d5)	No	Aerated wastewater treatment – no potential impact.



Figure 4-6: Potential acquisitions for the proposed Campbelltown Road upgrade

4.1.3 Revised management and mitigation measures

The reduced corridor width would reduce the impacts of the proposal. Furthermore, additional safeguards and management measures have been proposed to further reduce impacts of the proposal. The final measures proposed are detailed in Section 5.2 of this report.

4.2 Provision of a two-lane roundabout at the intersection of Denham Court Road/ Campbelltown Road/ Dickson Road

4.2.1 Description

In response to community submissions on the REF, and as part of the revised concept design, a two-lane roundabout would replace the proposed intersection at Denham Court Road and Dickson Road. This would improve access to the northbound carriageway from Blomfield Road, and improve access to Denham Court Caravan Park, the BP service station and nearby local businesses from the southbound carriageway. There would no longer be widening into Dickson Road to accommodate a turnaround bay. The proposed intersection arrangement is shown in Figure 4.7.

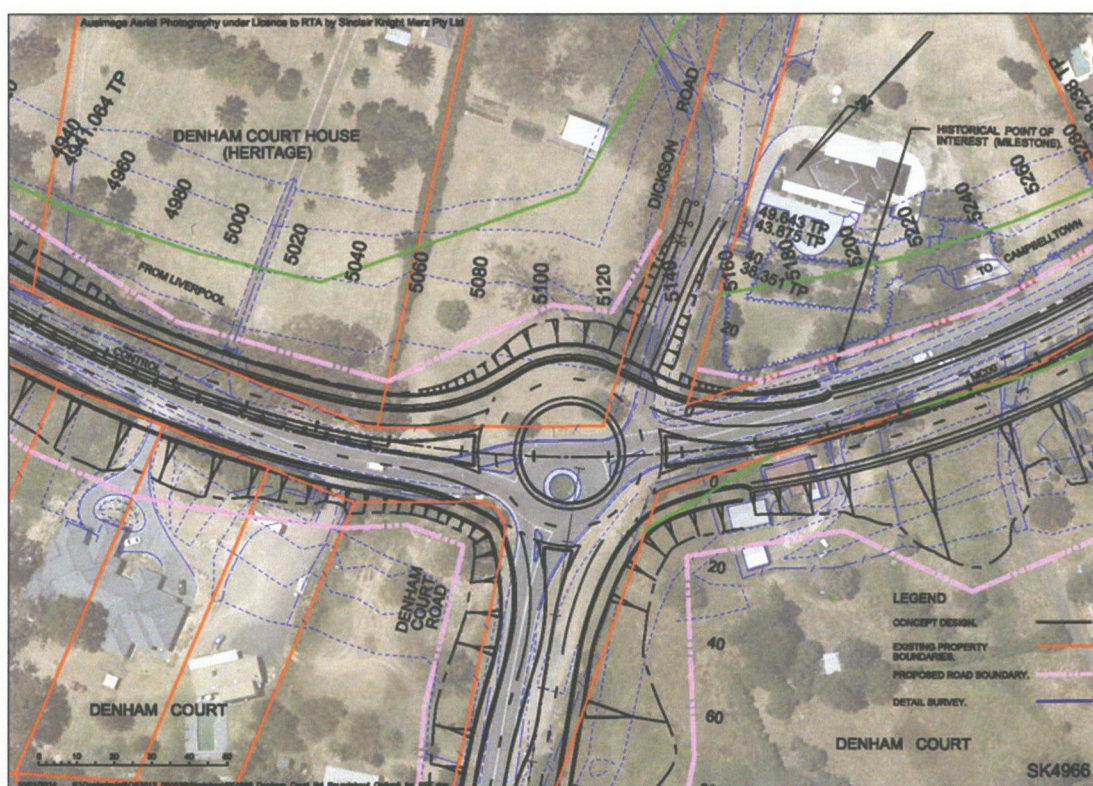


Figure 4.7: Proposed intersection upgrade – Denham Court Road and Dickson Road

4.2.2 Environmental assessment

The change to the proposed intersection arrangement at Denham Court Road/ Campbelltown Road/ Dickson Road is substantially consistent with the original description of the proposal in the REF and would result in less potential impacts than the design that was assessed in the REF. The proposed change would be acceptable from a traffic, transport and access perspective, as identified in Section 3.2.1, as traffic would be adequately catered for.

Potential impacts and management measures would not be substantially different in terms of:

- Biodiversity (Section 6.1 and Appendix K of the REF)
- Aboriginal heritage (Section 6.2 and Appendix G of the REF)
- Non-Aboriginal heritage (Section 6.3 and Appendix M)
- Hydrology and water quality (Section 6.4 and Appendix J of the REF)
- Topography, geology and soils (Section 6.5 and Appendix N of the REF)
- Air quality (Section 6.8 of the REF)
- Climate change and greenhouse gas emissions (Section 6.9 of the REF)
- Resource use and waste management (Section 6.12 of the REF).

The reduced footprint of the intersection of Denham Court Road/ Campbelltown Road and Dickson Road would reduce impacts in terms of noise and vibration, landscape character and visual impacts, and land use and socio-economic impacts. Each of these is discussed briefly below.

Noise and vibration

The revised concept design would alter the distance between the road and adjacent sensitive receivers in between Zouch Road and Denham Court Road, particularly on the north-eastern corner of the proposed roundabout. This would result in less potential noise and vibration impacts than was outlined in the REF.

Landscape character and visual impacts

The Zouch Road to Brooks Road Supplementary Visual Impact Assessment reassessed the proposal in light of the revised concept design and concluded that the impact on landscape character remains unchanged from the original assessment regardless of the footprint (HBO+EMBT 2013). The visual impacts between Zouch Road and Brooks Road were considered in a viewpoint analysis; it was found that the impacts would decrease as a result of the reduced carriageway width. These findings are discussed in detail in Section 3.6 of this report.

Land use and socio-economic impacts

As part of the revised design, 4:1 batters connecting the road surface to the contour of the surrounding land would be constructed, to minimise visual impacts. This would result in larger property acquisitions near the roundabout. Table 4.2 and Figure 4.6 of this report indicate that the acquisition area would increase from the 389 square metres displayed in the REF to 1117 square metres for properties on Dickson Road.

In addition, a larger area of 1305 square metres would need to be acquired from the property to the north-east of the roundabout, as opposed to 10 square metres which was originally proposed. The acquired area used to construct these batters would be suitable for landscaping and potentially suitable to return to the landowner following completion of construction. This would be confirmed post-construction, in consultation with the landowner.

Landowners would be compensated for acquisitions through the land acquisition process prescribed under the *Land Acquisition (Just Terms Compensation) Act 1991*, which is discussed further in Section 2.15.6.

4.2.3 Revised management and mitigation measures

Re-use or return of batters to landowners following construction of the proposal would be considered post-construction, in consultation with the relevant landowner.

4.3 Provision of a right-turn bay from the northbound carriageway of Campbelltown Road at the intersection of Blomfield Road/Campbelltown Road

4.3.1 Description

As part of the revised concept design, a right turn into Blomfield Road from the northbound carriageway of Campbelltown Road would be provided through a dedicated right-turn bay. The proposed intersection is shown in Figure 4.8.

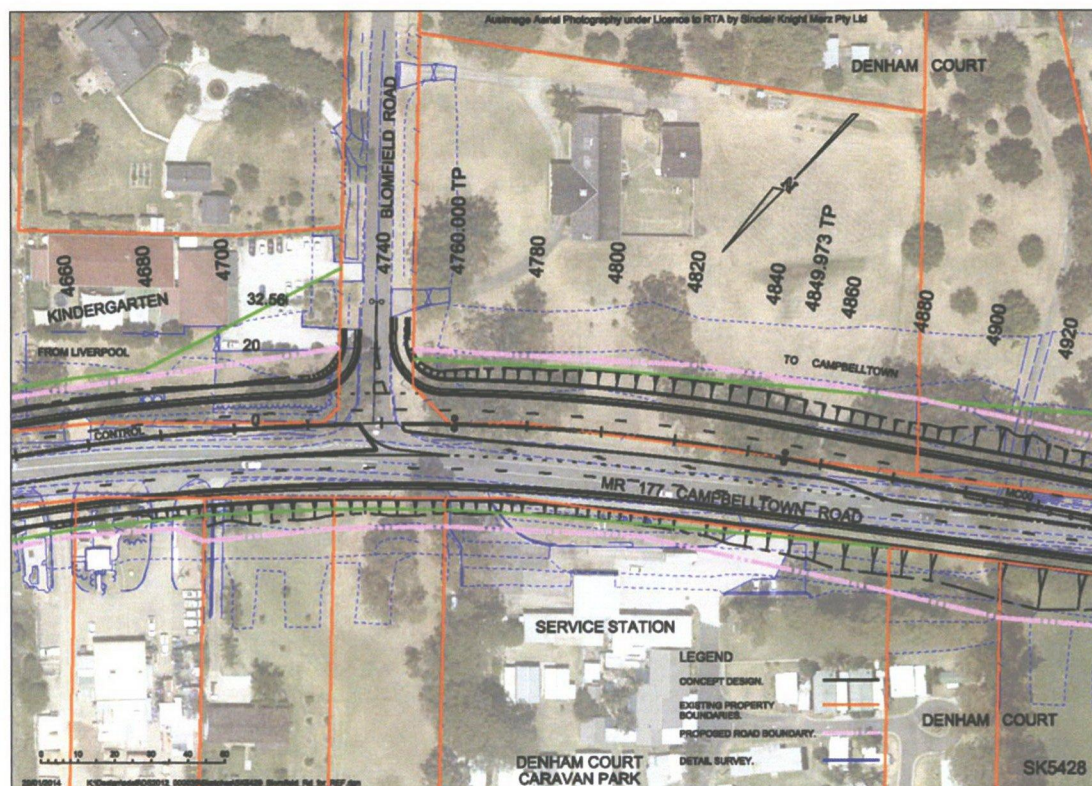


Figure 4.8: Proposed intersection upgrade – Blomfield Road

4.3.2 Environmental assessment

The changed intersection arrangement at Blomfield Road is substantially consistent with the original description of the proposal in the REF and would improve the accessibility of Blomfield Road, adequately catering for forecast traffic, without creating any additional impacts. The proposed change would be acceptable from a traffic, transport and access perspective, as identified in Section 3.2.1 of this report.

Potential impacts and management measures would not be substantially different in terms of:

- Biodiversity (Section 6.1 and Appendix K of the REF)
- Aboriginal heritage (Section 6.2 and Appendix G of the REF)
- Non-Aboriginal heritage (Section 6.3 and Appendix M)
- Hydrology and water quality (Section 6.4 and Appendix J of the REF)
- Topography, geology and soils (Section 6.5 and Appendix N of the REF)
- Noise and vibration Section 6.7 of the REF and Appendix L)
- Air quality (Section 6.8 of the REF)
- Climate change and greenhouse gas emissions (Section 6.9 of the REF)

- Resource use and waste management (Section 6.12 of the REF)
- Landscape character and visual amenity (Section 6.10 of the REF and Appendix C).

The improved accessibility to Blomfield Road would minimise negative impacts on local residents along this road as well as employees and patrons of the Leaping Learners Early Learning Centre. At the same time, the proposal area at this intersection would be reduced, thereby minimising property acquisition.

4.3.3 Revised management and mitigation measures

There are no additional management and mitigation measures proposed.

4.4 Detailed design

There are aspects of the proposal that would be refined as part of the detailed design stage. This is a normal step, and occurs as more detailed information comes to hand. Many of these aspects have been identified in the REF and through submissions. Main aspects include heavy vehicles (such as impacts on traffic on local roads, haulage routes and other traffic considerations), drainage structures, utilities, design of the twin bridges, landscaping, and confirmation of compound and stockpile areas.

As identified in the REF, should any additional areas and activities be required outside of the current proposal description to accommodate design refinements, the Roads and Maritime Senior Environmental Officer would be contacted to confirm consistency with the REF and Submissions Report, or whether additional assessment is required.

Any required management and mitigation measures would be determined during detailed design and would inform ongoing consultation with key stakeholders, such as Liverpool City Council and Campbelltown City Council, as required.

5 Environmental management

The REF for the Campbelltown Road upgrade identified the framework for environmental management, including safeguards and mitigation measures that would be adopted to avoid or reduce adverse environmental impacts, including social impacts, that could arise as a result of the proposal (Section 7 of the REF).

Since the display of the REF, Roads and Maritime has considered the issues raised in public submissions, amended the proposal, and revised the safeguards and mitigation measures. These revisions are detailed in chapters 3 and 4 of this report, specifically relating to heritage (sections 3.4.2 and 3.5.2), visual impacts (Section 3.6.2), land use and socio-economic impacts (Section 3.7.2).

Should the proposal proceed, these environmental safeguards and mitigation measures would be incorporated into the detailed design and applied during the construction and operation of the proposal.

5.1 Environmental management plans (or system)

A CEMP would be prepared to describe the environmental safeguards and mitigation measures to be implemented during construction. These plans would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The plans would be prepared prior to construction of the proposal and must be reviewed by Roads and Maritime environment staff, Sydney Region, prior to the start of any on-site work. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements.

The CEMP and PEMP would be developed in accordance with the specifications in:

- QA Specification G36 – *Environmental Protection (Management System)*
- QA Specification G38 – *Soil and Water Management (Soil and Water Plan)*
- QA Specification G40 – *Clearing and Grubbing.*

5.2 Updated safeguards and mitigation measures

Environmental safeguards outlined in this document would be incorporated into the detailed design of the proposal and during its construction and operation, should it proceed. These safeguards would minimise any potential adverse impacts arising from the proposed work on the surrounding environment. Table 5.1 lists the safeguards and mitigation measures, and updates and supersedes those presented in the REF. Red text indicates an insertion and a strikethrough indicates a deletion from text in the REF.

Table 5.1: Updated environmental safeguards

No.	Impact	Environmental safeguards	Responsibility	Timing
1	General	<ul style="list-style-type: none"> All environmental safeguards must be incorporated within the following documents: <ul style="list-style-type: none"> Project Environmental Management Plan Detailed design staged documents Contract specifications for the proposal Contractor's Environmental Management Plan. 	Project manager	Pre-construction
2	General	<ul style="list-style-type: none"> A risk assessment has been carried out on the proposal in accordance with the Roads and Maritime Project Pack and PMS Audit Pack and OSD risk assessment procedures to determine an audit and inspection program for the works. The recommendations of the risk assessment are to be implemented A review of the risk assessment must be undertaken after the initial audit or inspection to evaluate the level of risk chosen for the project is appropriate Any works resulting from the proposal and as covered by the REF may be subject to environmental audit(s) and/or inspection(s) at any time during their duration. 	Project manager and regional environmental staff	<p>Pre-construction</p> <p>After first audit</p>
3	General	<ul style="list-style-type: none"> The environmental contract specifications, QA <i>Specification G36 – Environmental Protection (Management System)</i>, QA <i>Specification G38 – Soil and Water Management (Soil and Water Plan)</i> and the QA <i>Specification G40 – Clearing and Grubbing</i>, must be forwarded to the Roads and Maritime Regional Environmental Officer-Manager (Sydney Region) for review at least 10 working days prior to the tender stage 	Project manager	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> A contractual hold point must be maintained until the CEMP is reviewed by the Roads and Maritime Regional Environmental Officer Manager (Sydney Region). 		
4	General	<ul style="list-style-type: none"> The Roads and Maritime Project Manager must notify the Roads and Maritime Regional Environmental Officer Manager (Sydney Region) at least 5 days prior to work commencing. 	Project manager	Pre-construction
5	General	<ul style="list-style-type: none"> All businesses and residences likely to be affected by the proposed works must be notified at least 5 working days prior to the commencement of the proposed activities. 	Project manager	Pre-construction
6	General	<ul style="list-style-type: none"> Environmental awareness training must be provided, by the contractor, to all field personnel and subcontractors. 	Contractor	Pre-construction and during construction as required.
7	Impacts on threatened species	<ul style="list-style-type: none"> A Flora and Fauna Management Plan would be prepared in accordance with Roads and Maritime <i>Biodiversity Guidelines</i> (RTA 2011) as part of the CEMP. The plan would include but not be limited to the following: <ul style="list-style-type: none"> - A map which clearly shows vegetation clearing boundaries and no-go zones. Any removal or replanting of trees would be completed in accordance with the Flora and Fauna Management Plan for the proposal - A site walk with the Roads and Maritime Environmental Officer to confirm clearing boundaries prior to the commencement of work - A procedure for a suitably qualified ecologist to undertake pre-clearing surveys immediately prior to 	Roads and Maritime and construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>vegetation removal. Target species would include: <i>Pimelea spicata</i>, <i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>, Cumberland Plain Land Snail and threatened microbats</p> <ul style="list-style-type: none"> - Incorporate mManagement measures identified as a result of the pre-clearing survey report, which would and nominate actions to respond to the recommendations made - A procedure for clearing potential habitat, including hollow-bearing trees, in accordance with Roads and Maritime Specification G40. An experienced, licenced wildlife carer or ecologist would be present to supervise vegetation clearing in potential habitat and capture then relocate fauna if required. Fauna handling and vegetation removal would be in accordance with the Roads and Maritime <i>Biodiversity Guidelines</i> (RTA 2011) - An experienced, licensed wildlife carer or ecologist would be notified/on call to supervise the remainder of vegetation clearing and capture then relocate fauna if required. Fauna handling would be in accordance with the Roads and Maritime <i>Biodiversity Guidelines 2011 – Guide 9</i> (RTA 2011) - Protocols to prevent introduction or spread of pathogens (eg chytrid fungus and <i>Phytophthora</i>) should be implemented in accordance with Roads and Maritime <i>Biodiversity Guidelines 2011 – Guide 7</i> (RTA 2011) • Provision of education to all personnel taking part in construction activities with regards to the importance of clearing limits, land uses (eg non-certified areas, 		



No.	Impact	Environmental safeguards	Responsibility	Timing
		proposed Edmondson Regional Park) and threatened species populations and communities, and their legislative responsibilities for the same.		
8	Impacts on threatened species	<ul style="list-style-type: none"> If unexpected threatened flora or fauna are discovered, works would stop immediately and the <i>Unexpected Threatened Species Find Procedure</i> in the <i>Roads and Maritime Biodiversity Guideline</i> (RTA 2011) implemented. 	Roads and Maritime and construction contractor	Construction
9	Impacts on Cumberland Plain Land Snail	<ul style="list-style-type: none"> A relocation plan for the Cumberland Plain Land Snail would be prepared as part of the Flora and Fauna Management Plan. This plan would be developed in consultation with OEH and would consider salvaging snails from habitat within the proposal area and relocation to suitable habitat that would not be affected by the proposal. 	Roads and Maritime	Detailed design and pre-construction
10	Impacts on Cumberland Plain Land Snail	<ul style="list-style-type: none"> A license application to OEH for Cumberland Plain Land Snail relocation under Section 91 would be undertaken prior to works and requirements incorporated into the <i>Flora and Fauna</i> management plan. 	Roads and Maritime	Pre-construction
11	Impacts to Impacts on native vegetation	<ul style="list-style-type: none"> The extent of vegetation removal (including riparian) would be minimised where possible. 	Roads and Maritime and construction contractor	Detailed design and construction
12	Impacts to Impacts on native vegetation	<ul style="list-style-type: none"> Vegetation that is to be retained would be fenced for the duration of work with highly visible temporary fencing to ensure that clearing does not extend beyond the area necessary. 	Construction contractor	Pre-construction and construction
13	Impacts to Impacts on riparian areas	<ul style="list-style-type: none"> A riparian plan would be prepared as part of the Landscape Plan for areas impacted as a result of the 	Roads and Maritime and construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>creek realignment and bridge construction. The plan would be prepared in consultation with a qualified ecologist and would include but not be limited to the following measures:</p> <ul style="list-style-type: none"> - Riparian areas disturbed by the proposal would be rehabilitated as soon as practicable - Where vegetation would be planted to rehabilitate the newly aligned creek, only native species indigenous to the region would be used - Vegetation regeneration/weed removal would be undertaken in areas within and adjacent to the proposed construction areas until the areas that are being rehabilitated have become established - Rehabilitated riparian areas would be maintained for a minimum period of two years after final planting. 		
14	Impacts on the aquatic environment	<ul style="list-style-type: none"> • Creek bank stabilisation would be installed prior to and during the creek realignment works in order to minimise bank erosion, topsoil loss and sedimentation of the waterway. 	Roads and Maritime and construction contractor	Detailed design and construction
15	Impacts on the aquatic environment	<ul style="list-style-type: none"> • Should fish passage needs to be temporarily blocked for construction purposes, a permit under Part 7 of the FM Act would be sought. 	Roads and Maritime and construction contractor	Pre-construction and construction
16	Impacts on the aquatic environment	<ul style="list-style-type: none"> • Creek diversion would be scheduled during periods of predicted low flow to minimise impacts. 	Roads and Maritime and construction contractor	Construction
17	Impacts on the aquatic environment	<ul style="list-style-type: none"> • Notification to DPI (Fisheries) of reclamation/dredging works would be undertaken prior to construction. 	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		Consideration would be given to any response within 28 days of notification.		
18	Weeds and pathogens	<ul style="list-style-type: none"> • Actions for weed management would be developed as part of the Vegetation Management Plan in accordance with the requirements of Roads and Maritime <i>Specifications G36</i> and <i>G40</i>. The plan would include, but not be limited to: <ul style="list-style-type: none"> - Identification of the type and location of weeds of concern (including noxious weeds) within the proposal area - Identification of sensitive receivers (such as native vegetation and waterways) within or next to the proposal area - Actions to prevent the spread of weeds and fungi, including hygiene procedures for equipment, footwear and clothing - Actions to manage and dispose of weeds (including Declared noxious weeds), which would be in accordance with requirements of the <i>Noxious Weeds Act 1993</i> and Roads and Maritime <i>Biodiversity Guidelines – Guide 6</i> (Weed Management) (RTA 2011) - A monitoring program to measure the success of weed management until the site has been established and stabilised - Communication strategies to improve contractor awareness of weeds and weed management. 	Roads and Maritime and construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
19	Weeds and pathogens	<ul style="list-style-type: none"> Any application of herbicide for weed management would be undertaken in accordance with the requirements of the <i>Pesticides Act 1999</i> and a herbicide that is appropriate to the sensitivity of the area would be used. Approval by Consultation with the Roads and Maritime Regional Environmental Officer Manager (Sydney Region) would be obtained carried out prior to use. 	Construction contractor	Pre-construction and construction
20	Offsets	<ul style="list-style-type: none"> The new area to be incorporated into the proposed Edmondson Regional Park (as shown in Figure 2.9) would be transferred to P&E or OEH before Roads and Maritime commences clearing of vegetation resulting from the Campbelltown Road upgrade within the previously proposed Edmondson Regional Park boundary, as depicted in Map 3 of the Edmondson Park Conservation Agreement. A biodiversity offset strategy has been developed to compensate for loss of ENV within the non-certified areas, loss of EPBC Cumberland Plain Woodland within the proposed Edmondson Regional Park and the reduction in the land area of the proposed Edmondson Regional Park. These offsets satisfy the terms of the agreements (biodiversity certification and conservation agreement) and requirements under the EPBC Act and Growth Centres and Major Development SEPPs as well as conditions of the existing land zoning. The offset strategy has been prepared in consultation with OEH, P&E and DoE and would be in place prior to construction. 	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
21	Impacts to known Aboriginal heritage sites	<ul style="list-style-type: none"> An Aboriginal Heritage Management Plan would be prepared prior to commencement of works and included in the CEMP. This plan would include but not be limited to the following: <ul style="list-style-type: none"> The location of all Aboriginal sites within and adjacent to proposal area. These would be marked on relevant site plans An environmental risk assessment to determine potential risks for discrete work elements or activities likely to affect Aboriginal heritage items Specific mitigation measures to avoid risk of harm or protect Aboriginal heritage The definition of cclearly defined boundaries for site CRSC1, including a map representing areas that would need to be protected as no-go zones The identification of f Aboriginal heritage sites are within 25 metres of the proposal area, these would be identified on construction plans. E and exclusion fencing and signage would be placed at the boundary of the proposal area at this location in order to prevent indirect or inadvertent impacts to the site A stop work procedure to be used in the event of actual or suspected potential harm to a heritage feature/place An Aboriginal heritage induction program, which would take place prior to work starting. The program would make wworkers would be made aware of the location of sites and their responsibilities under the <i>National Parks</i> 	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<i>and Wildlife Act 1974 and any relevant permits during an Aboriginal heritage induction prior to works commencing.</i>		
22	Impacts to on known Aboriginal heritage sites	<ul style="list-style-type: none"> An area-based Aboriginal Heritage Impact Permit (AHIP) would be obtained prior to construction, and any salvage would be undertaken in accordance with the proposed salvage methodology and any conditions of approval (if granted). 	Roads and Maritime	Pre-construction
23	Possible disturbance to unknown Aboriginal heritage due to construction activities	<ul style="list-style-type: none"> In the event of an unexpected find of an Aboriginal heritage item (or suspected item), work would cease in the affected area and the Roads and Maritime Regional Environmental Officer and the Roads and Maritime Senior Environmental Specialist (Aboriginal heritage), would be contacted for advice on how to proceed. The Roads and Maritime <i>Unexpected Archaeological Finds Procedure</i> (Roads and Maritime 2011) would be implemented. 	Roads and Maritime and construction contractor	Construction
24	Impacts on nNon-Aboriginal heritage impacts	<ul style="list-style-type: none"> A Non-Aboriginal Heritage Management Plan would be prepared prior to commencement of works and included in the CEMP. This plan would include but not be limited to the following: <ul style="list-style-type: none"> - Sensitive areas mapped which clearly identifies all known non-Aboriginal heritage items (including curtilages) and exclusions zones - Mitigation measures to avoid risk of harm including dilapidation surveys (including measures outlined in Noise and Vibration Management Plan) - Fencing to control access to exclusion zones during 	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>construction</p> <ul style="list-style-type: none"> - A non-Aboriginal heritage induction to all site personnel prior to commencing works. The program would cover aAspects such as the location of heritage items, their significance, responsibilities under the <i>Heritage Act 1977</i> and any relevant permits would be discussed. 		
25	Impacts to on Denham Court House	<ul style="list-style-type: none"> • Impacts to-on curtilage of Denham Court House would be minimised where possible. About 9.2 metres of land fronting Campbelltown Road, acquired from the estate for construction of the proposal, would be returned to the estate as landscaped batters following construction, in consultation with the landowner. 	Roads and Maritime and construction contractor	Detailed design and construction
26	Impacts to on Denham Court House	<ul style="list-style-type: none"> • Archival recording of existing curtilage, trees, fence and gate would be carried out prior to starting work. Copies of this record would be provided to the NSW Heritage Council, Campbelltown City Council and Liverpool City Council. 	Roads and Maritime	Pre-construction
27	Impacts to on Denham Court House	<ul style="list-style-type: none"> • The fence and gate would be relocated outside of the area of impact and replacement trees of the same or similar would be replanted along the fence in the same number and configuration. • A landscape strategy would be prepared for Denham Court House as part of the Non-Aboriginal Heritage Management Plan. It would be prepared by a qualified heritage consultant and in consultation with OEH (Heritage Branch). It would include: <ul style="list-style-type: none"> - Replacement tree planting of advanced stock along the proposed new fence line of the four-lane road as well as 	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>along the possible 'future' road corridor boundary (as identified in the <i>Campbelltown (Urban Area) LEP 2002</i>). The trees would be planted as soon as possible to allow them to become established prior to the removal of the current trees, in consultation with the landowner. The advanced trees to be planted would be appropriate to a road corridor landscape, ie low maintenance, contextually appropriate and comprising indigenous species</p> <ul style="list-style-type: none"> - The landscape strategy would also include a relocation plan for the fence and gate to Denham Court • After the landscape strategy has been prepared, and prior to construction starting, the fence and gate of Denham Court House would be relocated outside of the area of impact and replacement trees of the same species (if possible) would be replanted along the fence in the same number and configuration, as per the requirements of the landscape strategy. — This landscape strategy would be prepared as part of the Non-Aboriginal Heritage Management Plan by a qualified heritage consultant and in consultation with OEH (Heritage Branch). 		
28	Impacts to on Denham Court House	<ul style="list-style-type: none"> • Works would be undertaken in accordance with a Section 60 permit which would be obtained from NSW Heritage Council prior to works commencing at this location. 	Roads and Maritime and construction contractor	Pre-construction and construction
29	Impacts to on St Mary the Virgin Church and	<ul style="list-style-type: none"> • If any trees are removed as part of the proposal, replacement trees of a similar species would be planted along the southern boundary of the item's curtilage 	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	Cemetery Group	following completion of works in consultation with the landowner.		
30	Impacts to on three milestones	<ul style="list-style-type: none"> A relocation plan for the affected milestones would be prepared as part of the Non-Aboriginal Heritage Management Plan by a qualified heritage consultant. This—The relocation plan would include the following measures: <ul style="list-style-type: none"> The milestones would be repositioned beside the upgraded road, each at its original distance along the road, as indicated in the Non-Aboriginal Heritage Assessment and Statement of Heritage Impacts (Artefact Heritage 2013b) Methods to prevent damage during movement, and options for storage before reinstatement (including measures to prevent the milestones or their provenance details being lost) Options for landscaping and heritage interpretation near the milestones once they are reinstated would be considered. 	Roads and Maritime and construction contractor	Pre-construction and construction
31	Impacts to on former Ingleburn Defence Site	<ul style="list-style-type: none"> Archival recording of the former Ingleburn Defence Site elements, including the Ingleburn Military Heritage Precinct and Mont St Quentin Oval (which would be impacted by the proposal in their existing context) would be undertaken prior to works commencing and provided to Liverpool City Council, Campbelltown City Council and the Commonwealth Department of Defence. 	Roads and Maritime	Pre-construction
32	Impacts to on former	<ul style="list-style-type: none"> Prior to commencement of works, an exception under 	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	Ingleburn Defence Site	Section 139 of the <i>NSW Heritage Act 1977</i> would be obtained for impacts to on identified relics within the proposal area.		
33	Impacts to on former Ingleburn Defence Site-Ingleburn Military Heritage Precinct	<ul style="list-style-type: none"> A condition survey would be undertaken before the start of work by a qualified contractor to minimise vibration impacts in the vicinity of Bardia Barracks (refer to noise and vibration safeguards Section 6.7.5 of the REF). This would be followed up with monitoring during construction, and guidance of any rectification works if necessary to mitigate any damage. 	Construction contractor	Pre-construction and construction
34	Impacts to on former Ingleburn Defence Site-Ingleburn Military Heritage Precinct and Mont St Quentin Oval	<ul style="list-style-type: none"> A fenced exclusion zone would be established around the original fabric of the entrance to Bardia Barracks and the entrance gates to the oval, in order to prevent incidental impacts during construction. If necessary, insulating material would be used to further protect the fabric from accidental damage. 	Construction contractor	Pre-construction
35	Impacts to on former Ingleburn Defence Site-the Ingleburn Military Heritage Precinct	<ul style="list-style-type: none"> Further consideration of the configuration of the path and both sets of entry gates to Mont St Quentin Oval would be undertaken in detailed design (as per the Non-Aboriginal Heritage Assessment and Statement of Heritage Impacts (Artefact Heritage 2013b)). Design Option B would be investigated during detailed design as the preferred option. 	Roads and Maritime	Detailed design
36	Impacts to on former Ingleburn Defence Site-Ingleburn Military Heritage Precinct	<ul style="list-style-type: none"> Impacts to on the trees on either—both sides of Campbelltown Road in the vicinity of the former Ingleburn Defence Site road would be minimised or avoided where possible. Where trees are removed, similar the same species would be replanted along roadsides following the 	Roads and Maritime and construction contractor	Detailed design and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		completion of works.		
37	Impacts to on former Ingleburn Defence Site-Ingleburn Military Heritage Precinct	<ul style="list-style-type: none"> If the draft SHR listing for the Ingleburn Military Heritage Precinct and Mont Saint Quentin Oval is finalised prior to the commencement of works, a A Section 60 permit would be obtained from the NSW Heritage Council prior to commencement of works at this location. 	Roads and Maritime	Pre-construction
38	Impacts to on the heritage values of Campbelltown Road	<ul style="list-style-type: none"> Design of the proposal would reference principles outlined in the Supplementary SoH (Artefact Heritage 2013), including: <ul style="list-style-type: none"> The proposal would retain the relationship of the road with its immediate landscape setting where possible, including the form and alignment of the road The proposal would retain the physical and visual relationship of the road with heritage-listed properties fronting it where possible, including Denham Court House and its plantings, and Ingleburn Military Heritage Precinct and Mont St Quentin Oval and plantings The proposal would retain the natural vegetation patterns of the Cumberland Woodland and Alluvial Woodland landscape where possible. 	Roads and Maritime	Detailed design
41	Impacts to on the heritage values of Campbelltown Road	<ul style="list-style-type: none"> Roads and Maritime would consider the inclusion of Campbelltown Road (or a portion thereof) on its s170 Heritage and Conservation Register. 	Roads and Maritime	Detailed design
42	Impacts to on SHR listed items	<ul style="list-style-type: none"> Roads and Maritime would prepare the documentation required to support the de-listing and re-listing of a reduced SHR curtilage at the Ingleburn Military Heritage Precinct and Mont St Quentin Oval, and Denham Court 	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		House.		
43	Impacts to on unanticipated non-Aboriginal heritage items	<ul style="list-style-type: none"> If unexpected non-Aboriginal archaeological remains or potential relics are uncovered during the works construction, all works would cease in the vicinity of the material/find, and the Roads and Maritime <i>Unexpected Archaeological Finds Procedure</i> (RTA 2011) would be followed. 	Roads and Maritime and construction contractor	Construction
44	Impacts to on water quality	<ul style="list-style-type: none"> During detailed design an Erosion and Sedimentation Management Report is to be prepared. The report is to include: <ul style="list-style-type: none"> - Proposed staging plans for the project to ensure appropriate erosion and sediment control measures are possible - Mapping of tThe likely runoff from each road sub-catchment and direction of off-site and on -site water flow - DiversionPlans for the diversion of off-site water around or through the site - Mapping of the Thedirection of runoff and drainage points during each stage of construction - The locations and sizing of sediment basins/sumps - Appropriate scour protection for all drainage outlets, bridge abutments and the creek diversion and realignment - Requirements for erosion and sediment controls during construction according to the Landcom publication: 	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		<i>Managing Urban Stormwater – Soils and Construction</i> (Landcom and EPA 2004).		
45	Impacts to on water quality	<ul style="list-style-type: none"> A soil conservationist from the Roads and Maritime Erosion, Sedimentation and Soil Conservation Consultancy Services Panel Register is to be engaged to review the Erosion and Sedimentation Management Report. 	Roads and Maritime	Detailed design
46	Impacts to on water quality	<ul style="list-style-type: none"> A Soil and Water Management Plan (SWMP) would be prepared as part of the CEMP in accordance with the requirements of Roads and Maritime contract specification G38 prior to the commencement of construction. The SWMP would also address—include measures in the following guidelines: <ul style="list-style-type: none"> - The Roads and Maritime Code of Practice for Water Management (RTA 1999) - The Roads and Maritime Erosion and Sedimentation Management Procedure (RTA 2008) - The Blue Book – Managing Urban Stormwater: Soils and Construction, Volume 1 and 2d (Landcom and EPA 2004) - Roads and Maritime Technical Guidelines – Temporary Stormwater Drainage for Road Construction (Roads and Maritime 2011). 	Construction contractor	Pre-construction
47	Impacts to on water quality	<ul style="list-style-type: none"> The SWMP would include and address the following: <ul style="list-style-type: none"> - The identification of catchment areas and the direction of on-site and off-site water flow 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> - The likely run-off from each road sub-catchment - SeparationThe separation of on-site and off-site water - The direction of run-off and drainage points during each stage of construction - The locations and sizing of sediment traps such as sumps or basins - The locations of other erosion and sediment control measures (eg rock check dams, swales, scour protection and sediment fences) - The staging plans, location, sizing and details of creek alignment and realignment controls for scour protection and bank and bed stabilisation, including those used during construction and long term during operation - The Locationand staging of scour protection - A Primary Progressive site-specific Erosion and Sedimentation Control Plans. Progressive site-specific Erosion and Sedimentation Control Plans would then be prepared prior to each stage of construction and The ESCP is to be updated at least fortnightly - A Process for monitoring and preparing for wet weather • The SWMP is towould be reviewed by a soil conservationist and would be updated to address the recommendations • Provision of an inspection and maintenance schedule for ongoing maintenance of temporary and permanent erosion and sedimentation controls. 		

No.	Impact	Environmental safeguards	Responsibility	Timing
48	Impacts to on water quality	<ul style="list-style-type: none"> The Erosion and Sedimentation Control Plans would A include and show a rain event plan to is-to-be-included and shown on the ESCP which outlines the controls to be implemented in preparation for a rain event. 	Construction contractor	Pre-construction and construction
49	Impacts to on water quality	<ul style="list-style-type: none"> Measures would be put in place to make sure any debris material from the construction of the bridges over Maxwells Creek is captured prior to reaching the waterway. 	Construction contractor	Construction
50	Impacts to on water quality	<ul style="list-style-type: none"> Progressive re-vegetation and mulching stabilisation of the proposal area would be undertaken as each section of work is completed. 	Construction contractor	Construction
51	Construction Impacts to on drainage lines and flow paths causing scouring	<ul style="list-style-type: none"> Restoration of the natural creek geomorphology would be undertaken to reduce velocity and scour during high flow events and ensure natural bed forms, such as an alternating sequence of pools, riffles and runs. 	Construction contractor	Construction
52	Construction Impacts to on drainage lines and flow paths causing scouring	<ul style="list-style-type: none"> Channel bank and bed stabilisation measures would be maintained until riparian vegetation is completely re-established. 	Construction contractor	Construction
53	Spills	<ul style="list-style-type: none"> Emergency wet and dry spill kits would be kept on site at all times. All staff would be made aware of the location of the spill kits and trained in its to use them. 	Construction contractor	Construction
54	Spills	<ul style="list-style-type: none"> All refuelling of vehicles and equipment on site would be undertaken on an impermeable surface, within a bunded area located at least 40 metres away from water bodies and surface water drains. 	Construction contractor	Construction
55	Spills	<ul style="list-style-type: none"> Any fuel, oils or other liquids stored on site would be 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		stored in an appropriately sized impervious bunded area away from water bodies.		
56	Flooding due to increases in peak flow velocities	<ul style="list-style-type: none"> During detailed design, further flood modelling would be carried out (in consultation with the Environment Manager (Sydney Region)) to confirm impacts on surrounding land uses and appropriate mitigation measures developed (if required). It would include a detailed afflux assessment, consideration of drainage requirements and the potential effect of climate change on the proposal would be undertaken during detailed design to confirm impacts to surrounding land uses. 	Roads and Maritime	Detailed design
57	Soils and water quality	<ul style="list-style-type: none"> Environmental Work Method Statements would be prepared for high-risk activities such as: <ul style="list-style-type: none"> - Clearing and grubbing - Earthworks - Creek realignment works Works around the bridge and culverts - Drainage works - Utilities works - Bridge and culvert construction works. 	Construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
58	Soils and water quality	<ul style="list-style-type: none"> • Environmental Work Method Statements EWMS must would include the following: <ul style="list-style-type: none"> - A dDescription of the works/activities including machinery - An oOutline of the sequence of the work/activities, including interfaces with other construction activities - The lidentification of potential environmental risks/impacts due to the works/activities and associated with-wet weather events - The Eevaluation of methods to eliminate/reduce the environmental risk - Mitigation measures to reduce environmental risk - Any safeguards resulting from consultation with public authorities and other stakeholders, where appropriate - A map indicating the locations of sensitive locations (such as threatened species), likely potential environmental impacts, and work areas - The lidentification of work area and exclusion areas - Operational and monitoring measures to eliminate/reduce environmental impact - A process for assessing and reporting the performance of the implemented environmental control measures - A process for resolving environmental issues or conflicts and reporting outcomes - Associated Erosion and Sedimentation Control Plans 	Construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		ESCP updated to cater for activity.		
59	Soils and water quality	<ul style="list-style-type: none"> Control measures would be implemented at egress points to minimise dirt and mud tracking. 	Construction contractor	Construction
60	Soils and water quality	<ul style="list-style-type: none"> All stockpiles would be designed, established, operated and decommissioned in accordance with Roads and Maritime Stockpile Site Management Procedures Guideline (RTA 2011a). Stockpile sites would be located: <ul style="list-style-type: none"> - At least 50 metres from the nearest waterway - In an area of low ecological and heritage conservation significance - At least 100 metres distance from residential dwellings and other land uses that may be sensitive to noise - On relatively level ground - Outside the 1 in 10-year ARI floodplain. 	Construction contractor	Construction
61	Soils and water quality	<ul style="list-style-type: none"> Topsoil would be stockpiled separately for possible reuse for the landscaping and rehabilitation works. 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
62	Soils and water quality	<ul style="list-style-type: none"> An accredited soil conservationist from the Roads and Maritime Erosion, Sedimentation and Soil Conservation Consultancy Services Panel would be engaged to regularly inspect works throughout the construction phase. 	Construction contractor	Construction
63	Soils and water quality	<ul style="list-style-type: none"> Any material transported onto pavementroad surfaces would be swept and removed at the end of each working day and prior to rainfall. 	Construction contractor	Construction
64	Waterway crossings (design)	<ul style="list-style-type: none"> Waterway crossings, including bridges, would be designed in accordance with AS5100 – Bridge Design. Relevant bridge design standards would form part of the detailed design scope. 	Roads and Maritime	Detailed design
65	Contamination	<ul style="list-style-type: none"> A Stage 2 – Detailed sSite investigation in accordance with NSW EPA guidelines would be prepared and would include preparation of a sampling, analysis and quality plan in accordance with the draft Roads and Maritime Guideline for the Management of Contamination (2013)Contaminated Land Management Guidelines (RTA 2005) and the Phase 1 report (Appendix N of the REF). 	Roads and Maritime	Pre-construction
66	Contamination	<ul style="list-style-type: none"> Following the Stage 2 – Detailed sSite investigation, a Contaminated Land Management Plan would be prepared in accordance with the <i>Contaminated Land Act 1997</i> and relevant OEH Gguidelines as part of the CEMP. It and would include: <ul style="list-style-type: none"> - Occupational health and safety measures - Contamination management measures - Incident reporting in accordance with the Roads and 	Roads and Maritime and construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>Maritime Environmental Incident Management Procedure</p> <ul style="list-style-type: none"> - Unexpected finds procedure - RIdentification of rehabilitation requirements, classification, transport and disposal requirements of any contaminated land within the construction footprint • In the event that indications of contamination are encountered (known and unexpected, such as odorous or visually contaminated materials), work in the area would cease until an contamination assessment can be prepared using by a qualified consultant to advise on the need for remediation or other action, as deemed appropriate. 		
67	Impacts to on local roads	<ul style="list-style-type: none"> • Roads and Maritime would carry out further traffic assessment during pre-construction to consider potential impacts on local roads during construction and operation, once more detail of construction has been refined (such as proposed haulage routes). This additional assessment would consider whether any additional safeguards or management measures are required, such as traffic calming devices. Further consultation with Liverpool City Council and Campbelltown City Council would occur. 	Roads and Maritime and local councils	Pre-construction
68	Construction traffic impacts	<ul style="list-style-type: none"> • A Traffic Management Plan (TMP) would be prepared as part of the CEMP. The TMP would be prepared in accordance with the Roads and Maritime <i>Traffic Control at Worksites</i> (RTA 2010), Australian standards AS1742 (Manual of uniform traffic control devices set) and the Roads and Maritime <i>Worksite Manual Specification G10</i>. 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>The TMP would be submitted in stages to reflect the progress of work and would outline:</p> <ul style="list-style-type: none"> - Traffic controls s-provided to manage and regulate traffic movements during construction, including minimising traffic switching - Measures to maintain the continuous, safe and efficient movement of traffic for both the public and construction workers - Identification of hHaulage routes and, ensuring impacts teon local routes are minimised - Determine tTemporary speed restrictions to ensure a safe driving environment around work zones - Provide aAccess to local roads and properties, including the use of temporary turn-around bays - Measures to maintain pedestrian and cycling sts access throughout construction - Provision of appropriate wWarning and advisory signposting - Include rRequirements and methods to consult and inform the local community of impacts on the local road network and traffic • The TMP would consider other developments that may also be under construction to minimise traffic conflict and congestion that may occur due to the cumulative increase in construction vehicle traffic. 		
69	Property a Access	<ul style="list-style-type: none"> • Property access would be maintained at all times (or 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		arrangements made for temporary disruptions), including at pre-schools, places of worship and all commercial premises.		
70	Property access	<ul style="list-style-type: none"> Residents who would be more frequently or heavily affected residents would be contacted for on specific issues like driveway access or other issues that arise through construction. 	Construction contractor	Construction
71	Temporary impact on bus services	<ul style="list-style-type: none"> Access to bus stops and safe stopping locations would be maintained during construction in consultation with bus operators Ongoing updates on locations and access to bus stops would be provided to the community during construction period to ensure that disruption is minimised. 	Roads and Maritime and construction contractor	Construction
72	Construction noise	<ul style="list-style-type: none"> A Construction Noise and Vibration Management Plan would be prepared as part of the CEMP. It would conform to in accordance with OEH and EPA's <i>Interim Construction Noise Guideline</i> (DECCW 2009) would be prepared as part of the CEMP. This plan would detail the mitigation, monitoring and community liaison measures and would include but not be limited to: <ul style="list-style-type: none"> - Identification of potentially affected properties and residences (including a detailed map) - A map indicating the locations of likely potential impacts - A risk assessment to determine the potential risk for activities likely to affect residents - Mitigation measures to reduce excessive noise during construction activities including those associated with 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		truck movements, for example localised plywood barriers (at least 10 kg/m ²) to provide shielding - A process for assessing the performance of the implemented mitigation measures - A process for identifying management measures for highly noise-affected receivers including consultation with affected residences - A process for resolving issues and complaints.		
73	Construction noise	<ul style="list-style-type: none"> Where practical, equipment would be selected to minimise noise emissions. Equipment would be fitted with appropriate noise control equipment and be in good working order. 	Construction contractor	Construction
74	Construction noise	<ul style="list-style-type: none"> Where practical, the layout and positioning of noise-producing plant and activities on each work site would be optimised to minimise noise emission levels Equipment would be turned off when not in use. 	Construction contractor	Construction
75	Construction noise	<ul style="list-style-type: none"> Works would be carried out during standard working hours (ie 7am – 6pm Monday to Friday, 8am – 1pm Saturdays). Any work that is performed outside standard working normal-work hours or on a Sunday or public holiday is towould minimise noise impacts in accordance with Roads and Maritime's <i>Environmental Noise Management Manual Practice Note 7 – Roadworks Outside of Normal Working Hours</i> (RTA 2001) and the <i>Interim Construction Noise Guidelines</i> (DECC 2009). 	Construction contractor	Construction
76	Construction noise	<ul style="list-style-type: none"> The contractor would review their Construction Noise and Vibration Management Plan GNVMP in response to 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		complaints and amend it where practical throughout the construction phase. This would include consideration of respite periods.		
77	Vibration	<ul style="list-style-type: none"> Where vibration is found to exceed project criteria, management measures would be implemented to control vibration. In terms of human comfort criteria, measures would include modifications of construction methods and respite periods. For potential structural damage impacts, modification of construction methods or equipment would be necessary. 	Construction contractor	Construction
78	Vibration	<ul style="list-style-type: none"> The Construction Noise and Vibration Management Plan CNVMP would include an assessment of the structures such as buildings that need building condition surveys – particularly heritage items, including the gates to the Ingleburn Military Heritage Precinct. 	Construction contractor	Pre-construction
79	Operational noise	<ul style="list-style-type: none"> During the detailed design stage of the proposal, further investigations of all feasible and reasonable mitigation options for operational noise would be undertaken for affected receivers in accordance with the <i>Road Noise Policy</i> (DECCW 2011) and Roads and Maritime's <i>Environmental Noise Management Manual Practice Note 4</i> (RTA 2001). 	Roads and Maritime	Detailed design
80	Operational noise	<ul style="list-style-type: none"> Where practicable, any mitigation measures provided to control operational noise impacts shall—would be implemented as early as practicable to also provide a benefit during some of the construction phase. 	Construction contractor	Construction
81	Air quality and dust	<ul style="list-style-type: none"> An Air Quality Management plan would be prepared as part of the CEMP. The plan would include but not be 	Construction contractor	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>limited to the following:</p> <ul style="list-style-type: none"> - A procedure for monitoring dust on site and weather conditions - The Identification of dust -generating activities and associated mitigation measures - Limits on the area that can be opened up or distributed at any one time - Compliance with Roads and Maritime's <i>Stockpile Site Management Guidelines</i> (RTA 2011) - Progressive stabilisation plans. 		
82	Dust	<ul style="list-style-type: none"> • Measures such as covering loads that may produce dust or odour and water spraying unsealed access roads and open areas during conditions conducive to dust generation would be used to minimise or prevent air pollution and dust. 	Construction contractor	Construction
75	Dust	<ul style="list-style-type: none"> • Vehicles transporting waste or other materials that may produce odours or dust are to be covered during transportation. 	Construction contractor	Construction
83	Exhaust emissions	<ul style="list-style-type: none"> • Construction equipment (including all internal combustion engines) would be properly maintained and running efficiently to ensure exhaust emissions are minimised, where practicable, and comply with the <i>Protection of Environment Operations Act 1997</i>. 	Construction contractor	Construction
84	Exhaust emissions	<ul style="list-style-type: none"> • Machinery would not be kept idle turned off when not in use. 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
78	Improving energy efficiency and sustainability	• Machinery onsite would be running efficiently to ensure optimal performance, minimise down time and improve fuel efficiency.	Construction contractor	Construction
84	Climate change and greenhouse gas	• Detailed design would take into consideration the potential effect of climate change on the proposal, including drainage requirements.	Roads and Maritime	Detailed design
85	Climate change and greenhouse gas	• The energy efficiency and related carbon emissions would be considered in the selection of vehicle and plant equipment.	Construction contractor	Pre-construction and construction
84	Climate change and greenhouse gas	• Equipment would be serviced frequently to ensure they are operating efficiently.	Construction contractor	Construction
86	Landscape character and visual impacts	• If cut-off drains or swales are required as a permanent fixture, their location, size and treatment would be finalised during detailed design so that they blend into the landform and landscape character.	Roads and Maritime	Detailed design
87	Precinct 5: Vegetation clearance and erection of 8 m high batter as part of bridge duplication	<ul style="list-style-type: none"> • During construction, the use of fill through this zone would be minimised • Trees would be retained where possible as screening. 	Roads and Maritime and construction contractor	Detailed design and construction
88	Precinct 6: Vegetation clearanceclearing	<ul style="list-style-type: none"> • Replacement tree planting would be undertaken in the verge, within the <i>Campbelltown Urban Area LEP 2002</i> road reservation and private property to replace screening trees, in consultation with land owners. This The following would be investigated further during detailed design.: —Vegetation screening along the boundary fence. 	Roads and Maritime	Detailed design

No.	Impact	Environmental safeguards	Responsibility	Timing
		- Dense tree planting along the boundary of designated open space areas.		
89	Precinct 7: Vegetation removal and widening	<ul style="list-style-type: none"> Tree and shrub planting would be established early, particularly in areas closest to existing buildings, such as at the Watch Tower Bible and Tract Society property where possible Use of designated open space areas at Mont St Quentin Oval and near the intersection of Zouch Road – to increase the density of tree planting along the road corridor – would be investigated during detailed design. 	Roads and Maritime and construction contractor	Detailed design and construction
90	Precinct 8: Road corridor widening and increased cut and fill batters	<ul style="list-style-type: none"> Tree and shrub planting would be established early, where possible The heritage post-and-rail fence would be salvaged for relocation and reconstruction along the new boundary as detailed in the Non-Aboriginal Heritage Assessment and Statement of Heritage Impact (Artefact Heritage 2013b), Appendix M of the REF Subtle landmark planting along Denham Court Road, at the intersection, would be investigated during detailed design. 	Roads and Maritime and construction contractor	Detailed design and construction
91	Vegetation clearance	<ul style="list-style-type: none"> Revegetation ofThe cut/fill batters would be undertakenrevegetated with local species of trees, shrubs and groundcovers in accordance with the Landscape Concept Plan (HBO+EMTB 2013a) Medians would be planted with native grasses where median width is greater than four metres, in accordance with sightline and safety requirements, including those specified within the GCRF 	Roads and Maritime and construction contractor	Detailed design and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> Where feasible, a wire rope barrier would be employed to maximise retention of existing trees. 		
92	Retaining walls	<ul style="list-style-type: none"> Visually recessive materials, textures and colours would be used for retaining walls to reduce their visual dominance and blend with the surrounding landscape of Screen planting would be used to reduce the visual dominance of retaining walls, where possible. 	Roads and Maritime	Detailed design
93	Impacts on landscape character and visual amenity Landscape character and visual impacts	<ul style="list-style-type: none"> The landscape and urban design strategy for the proposal would be finalised during detailed design in consideration of the design principles and objectives as described in Section 3.2 of the REF and Appendix C of the REF. Mitigation measures that would be considered further during detailed design include: <ul style="list-style-type: none"> Planting out and stabilising batter slopes along the proposal to ensure successful revegetation of the verges and open spaces next to the road corridor to minimise maintenance requirements. This would be considered in consultation with Liverpool City Council and Campbelltown City Council Incorporation of species in the planting strategy consistent with the Cumberland Plains Woodlands remnant bushland. The planting strategy would principally include replacing all of the vegetation that is removed, subject to the constraints of clear zone requirements, adjacent land uses, and agreements being reached with landowners A lighting assessment and a lighting strategy to minimise light spill and contain lighting within the corridor. The lighting assessment would include a 	Roads and Maritime	Detailed design and post-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<p>headlight glare assessment. Lighting would be provided at interchanges, crossovers and merges. This would be designed to provide 'flag' standard lighting levels in accordance with <i>AS/NZS 1158 Public Lighting Code</i>. The need for any additional street lighting would be reviewed during the post-construction road safety audit</p> <ul style="list-style-type: none"> - UrbanGrowth's Street Tree Design Guidelines would be considered along with Roads and Maritime's <i>Landscape Guideline</i> (RTA 2008) and any applicable Council standards - Where possible, the landscape design would incorporate links to the surrounding land uses, including the Edmondson Park precinct. 		
94	Impacts on landscape character and visual amenity	<ul style="list-style-type: none"> • Bridge design and integration with the existing one bridge would follow <i>Bridge Aesthetics – Design Guidelines to Improve the Appearance of Bridges in NSW</i> (RTA, 2003). 	Roads and Maritime	Detailed design
95	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> • A complaints-handling procedure and register would be included in the CEMP. 	Construction contractor	Pre-construction and construction
96	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> • Access would be maintained wherever possible. Prior to any temporary unavoidable disruption to access, consultation would be undertaken with the affected property owner. 	Construction contractor	Pre-construction and construction
97	Impacts on businesses and the	<ul style="list-style-type: none"> • Safe access to bus stops would be maintained at all times and bus companies would be advised prior to any 	Construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
	community during construction	changes to traffic conditions.		
98	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> Cyclist and pedestrian access would be maintained although may need to be altered during construction to ensure safety. 	Construction contractor	Construction
99	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> Residents would be informed prior to any interruptions to utility services that may be experienced as a result of utilities relocation. 	Construction contractor	Pre-construction and construction
100	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> Road users, pedestrians and cyclists would be informed of changed conditions, including likely disruptions to access during construction. 	Construction contractor	Pre-construction and construction
101	Impacts on businesses and the community during construction	<ul style="list-style-type: none"> Community consultation would be undertaken in accordance with Roads and Maritime's <i>Community Involvement Practice Notes and Resource Manual</i> (2012). 	Construction contractor	Pre-construction and construction
102	Impacts on businesses during construction	<ul style="list-style-type: none"> Temporary signage would be provided during construction to inform southbound traffic on Campbelltown Road of alternative access to the businesses on the opposite side of the road. 	Roads and Maritime and Construction contractor	Construction
103	Impacts on childcare/educated facilities during construction	<ul style="list-style-type: none"> To minimise dust and noise impacts, working hours would consider key times during the day when construction in the immediate vicinity of the Leaping Learners Early Education Centre and Ingleburn North Public School could be avoided, such as 'nap time' and outdoor play time. 	Construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
104	Impacts to on property owners due to land acquisition for construction	<ul style="list-style-type: none"> Property acquisition would be managed in accordance with the provisions of Roads and Maritime's <i>Land Acquisition Policy</i> and the <i>Land Acquisition (Just Terms Compensation) Act 1991</i>. 	Roads and Maritime	Pre-construction
	Impacts to on property owners due to land acquisition for construction	<ul style="list-style-type: none"> Following construction of the proposal, the reuse or return of batters to landowners would be considered, in consultation with relevant landowners. 	Roads and Maritime	Post-construction
105	Increases in production of waste materials	<ul style="list-style-type: none"> A Resource and Waste Management Plan (RWPM) would be developed prepared as part a component of the CEMP. It would include: <ul style="list-style-type: none"> The type and volume of all waste materials Destinations for each resource/waste type either for on-site reuse or recycling, off-site reuse or recycling, or disposal at a licensed waste facility Quantity and classification of excavated material generated as a result of the proposal Disposal strategies for each type of material Details of how waste would be stored and treated on site Identification of all non-recyclable waste Identification of strategies to 'avoid', 'reduce', 're-use', and 'recycle' waste materials Identification of available recycling facilities on and off site Identification of suitable methods and routes to transport waste 	Construction contractor	Pre-construction and construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		<ul style="list-style-type: none"> - Procedures and disposal arrangements for unsuitable excavated material or contaminated material - Site clean-up procedures/strategy for each stage. 		
106	Increases in production of waste materials	<ul style="list-style-type: none"> • Waste management measures developed in accordance with the waste hierarchy established under the WARR Act for the proposal would be included in the CEMP • Training in waste management principles would be included in site inductions • Types of waste collected, amounts, date/time and details of disposal shall be recorded in a waste register. 	Construction contractor	Pre-construction and construction
107	Sourcing of recycled materials	<ul style="list-style-type: none"> • Roads and Maritime contractors would be required to propose recycled-content materials where they are cost- and performance competitive. 	Construction contractor	Construction
108	Waste disposal	<ul style="list-style-type: none"> • Solid and liquid wastes, as well as fuels, lubricants and chemical containers, would be disposed of in accordance with OEH requirements • Suitable waste disposal locations would be identified and used to dispose of litter and other wastes on-site. Suitable containers would be provided for waste collection • Material identified for recycling shall-would be stockpiled in an adequately bunded area in accordance with Roads and Maritime's <i>Stockpile Site Management Guidelines</i> (RTA 2011) • Fuel and chemical storage areas would be appropriately 	Construction contractor	Construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		sized and located , and imperviously banded.		
109	Procurement	<ul style="list-style-type: none"> Procurement would endeavour to use materials and products with a recycled content and low carbon footprint where it is cost and performance-effective to do so. 	Construction contractor	Pre-construction and construction
110	Waste management	<ul style="list-style-type: none"> All wastes would be managed in accordance with the <i>Protection of the Environment Operations Act 1997</i>. 	Construction contractor	Construction
111	Waste management	<ul style="list-style-type: none"> A dedicated concrete washout facility would be provided during construction so that runoff from the washing of concrete machinery and equipment could be collected and disposed of at an appropriate licensed waste facility. 	Construction contractor	Construction
112	Cumulative impacts during construction	<ul style="list-style-type: none"> Work would be staged to avoid-and minimise impacts along the entire length where possible at any one time. 	Contractor	Construction
113	Cumulative impacts during construction	<ul style="list-style-type: none"> Cumulative impacts would be incorporated into considered in the management plans for traffic, noise and vibration, and air quality management plans as required. 	Contractor	Pre-construction and construction
114	Cumulative impacts during construction	<ul style="list-style-type: none"> Cumulative impact management measures within the CEMP would be reviewed in response to any complaints received. 	Contractor	Construction
115	Maintenance of new assets	<ul style="list-style-type: none"> Batters and retaining walls would be designed to accommodate access for maintenance (and cleaning). This would be in accordance with relevant standards and specifications, and would be progressed during detailed design. 	Roads and Maritime	Detailed design
116	Maintenance of new assets	<ul style="list-style-type: none"> Details of assets to be transferred to Campbelltown and Liverpool City councils would be finalised during detailed 	Roads and Maritime	Pre-construction

No.	Impact	Environmental safeguards	Responsibility	Timing
		design, in consultation with these councils. All new public assets would be included within dedicated road corridors.		



5.3 Licensing and approvals

Table 5.2 lists all of the relevant licences, permits, notifications and/or approvals needed to construct and operate the proposal in addition to planning approval under the EP&A Act

Table 5.2: Summary of licensing and approvals required.

Requirement	Timing
In accordance with Section 199 of the <i>Fisheries Management Act 1994</i> , Roads and Maritime would have to give the Minister written notice and consider any matters raised by the Minister in order to carry out any dredging and reclamation activities within a waterway.	This would be obtained prior to any dredging and reclamation being undertaken.
It is likely that the proposal would temporarily cause a barrier to fish passage during the construction of culverts and Maxwells Creek bridge; accordingly, a permit to block fish passage would be required under Section 220(1) of the Act.	This would be obtained prior to disruption to fish passage should Maxwells Creek be determined 'Key Fish Habitat' by Department of Primary Industries (Fisheries).
Notification would be given to the Minister and any matters raised by the Minister would be considered within 28 days after the giving of the notice.	
The proposal would impact upon two Aboriginal heritage sites and one site complex. An Aboriginal Heritage Impact Permit = under Section 90 of the <i>National Parks and Wildlife Act 1974</i> would be required for disturbance to known Aboriginal heritage sites as identified in Section 6.2 of the REF.	An Aboriginal Heritage Impact Permit would be obtained prior to any construction works that may impact the identified sites.
A Section 60 application would be required due to impacts on the curtilage of Denham Court House, and Ingleburn Military Heritage Precinct and Mont St Quentin Oval prior to commencement of construction.	This would be undertaken prior to commencement of works on or near Denham Court House and/or the Ingleburn Military Heritage Precinct and Mont St Quentin Oval.
An exemption permit under Section 139 of the <i>Heritage Act 1977</i> would be required prior to start of work at the former Ingleburn Defence Site.	This would be carried out prior to the start of work on or near the former Ingleburn Defence Site.
The proposal would be a scheduled activity under the <i>Protection of the Environment Operations Act 1997</i> . An environment protection licence would be required under Section 48 of this Act to authorise the carrying out of scheduled development work. For the purposes of	This would be required prior to undertaking the proposed work. Each period of 12 months (commencing from the issue of a licence) is a licence fee period for a licence. The administrative fee for any licence fee period of a licence must be paid not later than 60

Requirement	Timing
Section 48, any activity that is declared by this Part to be a scheduled activity is taken to be an activity for which a licence is required for the premises at which it is carried out (the activity is 'premises-based').	days after the beginning of that licence fee period.
Relocation of the threatened Cumberland Plain Land Snail would require a licence issued under Section 91 of the <i>Threatened Species Conservation Act 1995</i> . National Parks and Wildlife Service has prepared the <i>Policy for the Translocation of Threatened Fauna in NSW</i> (National Parks and Wildlife Service 2001) which guides the planning and implementation of translocation programs for threatened fauna in NSW and the relocation plan would be developed in accordance with this guideline.	A relocation licence would be obtained prior to relocation of the Cumberland Plain Land Snail.

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