4.0 Statutory Requirements

The EP&A Act and EP&A Regulation provide the statutory framework for assessment of the proposal which is to be assessed under Part 5 of the EP&A Act with the RTA being the determining authority. The EP&A Act is supplemented by a number of Environmental Planning Instruments (EPIs) and policies including:

- State Environmental Planning Policies (SEPPs).
- Regional Environmental Plans (REPs).
- Local Environmental Plans.
- Other Planning Policies and Guidance Statements.

Relevant EPIs made under the EP&A Act that apply to the proposal are described in the following sections.

4.1 Approval Process

4.1.1 Blacktown Local Environmental Plan 1988

The proposal traverses land within the Blacktown LGA, where the development of land is regulated by environmental planning controls administered by Blacktown Council. The primary local environment planning instrument controlling development at the subject site is the Blacktown Local Environment Plan 1988 (LEP 1988).

Land use zoning

The land use zoning of the subject site under LEP 1988 is shown as Figure 5.

The land use zoning of the site is comprised of the following:

- Special Uses 5(b) – Arterial Road and Arterial Road Widening
- Special Uses 5 (c) – Local Road and Local Road Widening.

Land adjoining Schofields Road is zoned a combination of:

- Special Uses 5(a) Drainage
- Special Uses 5(a) Cemetery and Crematorium
- Residential 2(a) (Residential “A”)
- Rural 1(a) (Rural “A”)
- Open Spaces 6(a) Public Recreation.

The proposed development is defined as a ‘public utility undertaking’ under LEP 1988. In all zones identified, public utility undertakings are permissible with development consent.
4.1.2 Approval Process

Clause 11C (1) of the State Environment Planning Policy No.4 – Development Without Consent and Miscellaneous Exempt and Complying Development (SEPP4) states:

“If, in the absence of this clause, development for the purpose of a classified road or proposed classified road may be carried out only with development consent, that development may be carried out without that consent”.

As the objective of the proposal is to upgrade Schofields Road, which is a classified road (within the meaning of the Roads Act 1993), Clause 11C of SEPP 4 applies to the proposed works area. Therefore, consent will not be required from Blacktown Council for the proposed works and RTA would be the determining authority under Part 5 of the EP&A Act.

As the determining authority, the RTA is required to assess the impacts of the proposal on the environment, in accordance with Section 111 of the EP&A Act “to take account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity”.

This REF has been prepared to address the requirements of Section 111 of the EP&A Act and Clause 228 of the EP&A Regulation.

4.2 State and Regional Environmental Planning Policies

State Environmental Planning Policy (Sydney Region Growth Centres) 2006

The subject site is located on the southern boundary of the North West Growth Centre between Windsor Road and Tallawong Road. The proposed road upgrade is being funded from contributions from the release of the Second Pond Creek Area development but the works are identified in the Growth Centres Infrastructure Strategies.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006 (SEPP 2006) provides the initial environmental planning instrument component of the Metropolitan Strategy for the release of land for urban and employment development within the growth centres. Aims of the policy listed in section 2 of SEPP 2006 include:

- “to co-ordinate the release of land for residential, employment and other urban development in the North West and South West growth centres of the Sydney region,
- to provide for the orderly and economic provision infrastructure in and to those growth centres,
- to provide land use and development controls that will contribute to the conservation of biodiversity”.

Part 3 of the Policy applies to land within a growth centre that is zoned under SEPP 2006. The ‘Sydney Region Growth Centres Zoning Map – North West Growth Centre’ was checked and land within the vicinity of and including the proposal site is not yet zoned as any of the noted zones under the SEPP. Zones identified on the Zoning Map include Environment Conservation, Public Recreation – Local and Public Recreation – Regional. Therefore the provisions of Part 3 do not apply to the proposal.

Part 4 details the general development controls within the growth centres, with section 16 detailing matters for consideration which consent authorities should take into account before granting consent. Due to the provisions of SEPP 4, the proposal does not require consent, however, the matters for consideration are addressed below.
### Table 1  Part 4 of SEPP (Sydney Region Growth Centres) 2006 Matters for Consideration

<table>
<thead>
<tr>
<th>Matter for consideration</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Whether the proposed development will preclude the future urban and employment land uses identified in the relevant growth centre structure plan,</td>
<td>The proposed development will facilitate the future urban and employment land uses in the growth centres structures plan by providing the necessary road infrastructure to support projected population growth in the area.</td>
</tr>
<tr>
<td>b) Whether the extent of the investment in, and the operational and economic life of, the proposed development will result in the effective alienation of the land from those future land uses,</td>
<td>The proposed development will result in a permanent improvement to road infrastructure which will effectively integrate with future land uses.</td>
</tr>
<tr>
<td>c) Whether the proposed development will result in further fragmentation of land holdings,</td>
<td>The proposed development will not result in any further fragmentation of land holdings.</td>
</tr>
<tr>
<td>d) Whether the proposed development is incompatible with desired land uses in any draft environmental planning instrument that proposes to include provisions in Schedule 1 with respect to the land,</td>
<td>The proposed development is consistent with the objectives of the North West Growth Centre and is shown on the Growth Centres Structure Plan as one of the proposed improvements to regional transport infrastructure in the Growth Centre.</td>
</tr>
<tr>
<td>e) Whether the proposed development is consistent with the precinct planning strategies and principles set out in any publicly exhibited document that is relevant to the development,</td>
<td>The proposed development is consistent with the objectives of the North West Growth Centre and is shown on the Growth Centres Structure Plan as one of the proposed improvements to regional transport infrastructure in the Growth Centre.</td>
</tr>
<tr>
<td>f) Whether the proposed development will hinder the orderly and co-ordinated provision of infrastructure that is planned for the growth centre,</td>
<td>The proposed development will facilitate the orderly and co-ordinated provision of infrastructure that is planned for the growth centre.</td>
</tr>
<tr>
<td>g) In the case of transitional land – whether (in addition) the proposed development will protect areas of aboriginal heritage, ecological diversity or biological diversity as well as protecting the scenic amenity of the land.</td>
<td>Not applicable as the proposed development is not on transitional land.</td>
</tr>
</tbody>
</table>
4.3 Other Relevant Legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection Biodiversity Conservation Act 1999 (EPBC Act) governs the Commonwealth environmental assessment process and provides protection for matters of National Environmental Significance (NES), which include:

- Nationally threatened species and ecological communities
- Australia’s World heritage properties
- Ramsar wetlands of international importance
- Migratory species listed under the EPBC Act (species protected under international agreements)
- Commonwealth marine areas
- Nuclear actions, including uranium mining
- National heritage.

Potential impacts associated with the development of the proposal have been assessed against these matters of NES, and no negative adverse impacts have been identified. Referral under Section 68 of the EPBC Act is therefore not necessary. Formal consideration of matters of NES and also Commonwealth land are detailed in Section 13.0 of this report.

National Parks and Wildlife Act 1974

Specialist studies carried out during the preparation of this REF have concluded that no known sites of archaeological interest or sensitivity exist along the proposal route. The National Parks and Wildlife Act 1974 (NPW Act) provides the primary basis for the legal protection and management of Aboriginal sites within NSW and also the protection of native terrestrial fauna and some flora species. The proposal is not expected to impact on landholdings protected by this Act, or that may be gazetted in the near future by this Act.

Should any archaeological sites or relics be uncovered during construction, approval would be required from the Director-General of the Department of Environment and Climate Change (DECC - Parks Services Division) under Section 87 (1) of the NPW Act to excavate archaeological sites and relics. Under Section 90 (2) of this Act, approval from the Director-General would also be required for a ‘Consent to Destroy’ permit for any identified archaeological sites or remains found during construction.

Threatened Species Conservation Act 1995

The Threatened Species Conservation Act 1995 (TSC Act) is administered by the DECC and serves to protect threatened species, communities and critical habitat listed as endangered, vulnerable or extinct in NSW. A Species Impact Statement must be prepared if it is determined under Part 5 of the EP&A Act (the Eight Part Test) that there is likely to be a significant impact on any threatened species, populations or ecological communities.

There are no works associated with the proposal that are expected to impact endangered and vulnerable species, endangered populations, and endangered and vulnerable ecological communities listed under the TSC Act.

Heritage Act 1977

The Heritage Act 1977 is administered by the NSW Heritage Office and provides for the protection and conservation of non-Aboriginal heritage in NSW. A key component of the Heritage Act 1977 is the requirement for approval prior to the excavation or disturbance of non-Aboriginal relics or artefacts.
No items of non-Aboriginal heritage are likely to be affected as a result of this proposal and therefore requirements under Section 140 are unlikely to apply.

**Protection of the Environment Operations Act 1997**

The DECC is the responsible agency for the administration of the *Protection of the Environment Operations Act 1997* (POEO Act) in relation to air, noise, water, pollution and waste management. The proposal would not be classified as a ‘scheduled activity’ under this Act and as such an Environment Protection License would not be required. Landcom is cognisant of the requirements of this Act and ensures environmental impacts are adequately managed through its Environmental Management System and the implementation of Environmental Management Plans.

Ancillary activities such as batch plants or crushers would have their own relevant mobile licences and would not be able to operate on site until these have been sighted for currency and applicability.
5.0 Consultation

5.1 Community involvement

This REF will be exhibited at the offices of Blacktown City Council and the Riverstone branch of the Blacktown City Library for a period of at least 14 days. In addition the REF will be advertised in a local Blacktown newspaper and will be shown to the NSW State Emergency Services and local bus service operators, as well as the NSW Ministry of Transport.

Any submissions received during the exhibition period will be considered in finalising the proposal. Residents have also been informed of the intention to upgrade and widen Schofield’s Road through a letter box drop in January 2007 as documented in section 5.2 below.

5.2 Property owners

Residents along Schofields Road between Windsor and Hambledon Roads were informed on Wednesday 17 January 2007 via a letter delivered by hand to mailboxes, that Landcom were investigating the widening and upgrading of Schofields Road.

The letter informed residents that non invasive investigations would be undertaken and that specialist consultants may ask for access to their property. The letter also informed residents that a formal Environmental Assessment would be prepared and placed on public exhibition during 2007. Contact information was provided for one of the project team members. A copy of the letter is attached in Appendix B.

Maunsell received one telephone call from a property owner requesting information on which side widening would occur. At that stage, studies were still being undertaken to determine the best location and subsequent widening requirements for the road.

5.2.1 Castlebrook Crematorium and Lawn Cemetery

Castlebrook Crematorium and Lawn Cemetery is owned by InvoCare Pty Ltd. Maunsell and Landcom met with InvoCare on the 22 September 2006 and provided an outline of the proposal with a focus on the potential need to acquire a parcel of land fronting Schofields Road.

Commentary on the option to proceed with widening to the south of Schofields Road into the cemetery area is provided in section 7.3.

5.2.2 Allam Homes

Allam Homes is developing part of the of the Second Ponds Creek release area, which has a frontage on Schofields Road between Second Ponds Creek and Ridge Road. Maunsell and Landcom met with Allam Homes on 19 July 2006 to discuss the proposal and temporary roundabout at the intersection of Ridge Road and Schofields Road. Further liaison has been undertaken to consider levels within the adjacent development and Schofields Road.

5.2.3 Blacktown City Council

Blacktown City Council owns the shale quarry and adjacent property to the east on the northern side of Schofields Road. Potential impacts on the shale quarry were discussed with Blacktown City Council at meetings held on the 20 March and 5 July 2006.
5.2.4 Integral Energy
Integral Energy purchased the land on the corner of Schofields Road and Cudgegong Road for a new switching station. Maunsell has been liaising with Integral Energy in relation to the installation of high voltage power cables under Schofields Road, and as such Integral Energy are aware of the project and potential implications for their site.

5.3 Government agencies and stakeholder consultation
5.3.1 Stakeholder workshops
Six stakeholder workshops were held between December 2005 and August 2006 in the formulation and agreement of the road user requirements and design criteria. A summary of these workshops is provided below.

Relevant government agencies were contacted by telephone and email with the opportunity to comment on the proposal. Table 2 lists the government agencies that were invited to comment on the proposal for this REF.

Table 2 Summary of stakeholder workshops

<table>
<thead>
<tr>
<th>Workshop and attendees</th>
<th>Issues Discussed</th>
</tr>
</thead>
</table>
| **Workshop 1** 15 December 2005 | 1. Background & study purpose  
2. A vision for Schofields Road  
3. User requirements and characteristics  
   - Design implications  
4. Agreement on road characteristics:  
   - Number and type of lanes, Public transport, Speed, Access Parking, Land uses, Flood evacuation |
| **Workshop 2** 19 January 2006 | 1. Workshop 1 recap  
2. Status of Investigations  
   - Maunsell, NSW Roads and Traffic Authority, Growth Centres Commission  
3. User Requirements / Cross Section  
   - Agreed items from Workshop 1, Outstanding items from Workshop, Resolution of outstanding items |
| **Workshop 3** 9 February 2006 | 1. Workshop 2 Recap  
2. Status of Investigations  
   - Presentation of section sketches and plans for discussion that have been prepared based on the previous workshop ideas/discussions. Growth Centres Commission feedback on Jim Higgs report.  
3. User Requirements / Cross Section / Intersections  
   - Resolution and agreement of outstanding items on mid block cross section. Discussion of intersections. |
The agreed outcomes of the workshops were documented in a Design Brief Report, which was issued on the 18 April 2006 to the NSW Roads and Traffic Authority, Growth Centre Commission and Blacktown City Council.

Other consultation with government and other stakeholders is documented in the following sections.

5.3.2 Baulkham Hills Shire Council

Baulkham Hills Shire Council's Local Government Area extends from the eastern side of Windsor Road and is not directly affected by the proposal.

5.3.3 Blacktown City Council

In addition to the workshops documented in Table 2 above, Maunsell and Landcom met with Blacktown City Council during 2005 / 2006 as listed in Table 3.

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendees</th>
<th>Issues discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 November 2005</td>
<td>Blacktown City Council, Maunsell</td>
<td>Introductory meeting to provide background to project.</td>
</tr>
</tbody>
</table>
Maunsell issued preliminary concept design plans to Blacktown City Council on 29 August 2006. Comments on the proposal were received on 13 September 2006 and are attached in Appendix C.

A summary of the issues and how these are addressed is provided below.

<table>
<thead>
<tr>
<th>Issue raised</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>The concept design submitted is supported.</td>
<td>Noted.</td>
</tr>
<tr>
<td>The close proximity of two signalised intersections at the Allam development and Tallawong Road is not supported.</td>
<td>The proposal shows the realignment of Tallawong Road to create a single four way signalised intersection.</td>
</tr>
<tr>
<td>The road width for SPC access road and Cudgegong Road are insufficient to provide two lane approach to the traffic signals.</td>
<td>Provision has been made for additional lanes, which are shown on the concept plans.</td>
</tr>
<tr>
<td>The treatment of access to the quarry site needs to be considered.</td>
<td>Noted.</td>
</tr>
<tr>
<td>Batters shown on the northern side at CH 2360 are shown at 1 in 2. If these batters are to be turfed, they need to be minimum 1 in 5 for maintenance.</td>
<td>The batter arrangement near the existing CH 2360 has been changed. There section of cut that is shown at 1 in 4, however this can be flattened to 1 in 5 with a minor property adjustment if required.</td>
</tr>
<tr>
<td>Where left slip turns are to be provided, a dedicated inlet lane should be provided on approach to gain benefit from the slip lane.</td>
<td>Noted.</td>
</tr>
</tbody>
</table>
5.3.4 Growth Centres Commission

Maunsell and Landcom met with Growth Centres Commission from 2005 - 2007 as documented in Table 5.

Table 5 Consultation with Growth Centre Commission

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendees</th>
<th>Issues Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 November 2005</td>
<td>Growth Centres Commission, Maunsell</td>
<td>Introductory meeting to provide background to project.</td>
</tr>
<tr>
<td>21 December 2005</td>
<td>Department of Planning, Maunsell, Growth Centres Commission, Maunsell</td>
<td>Working session between workshop 1 and 2 to move forward.</td>
</tr>
<tr>
<td>24 February 2006</td>
<td>Growth Centres Commission, Maunsell, Annand Alcock Urban Design</td>
<td>Working session between workshop 2 and 3 to move forward.</td>
</tr>
<tr>
<td>27 September 2006</td>
<td>Growth Centres Commission, RTA, Maunsell</td>
<td>Form of Environmental Assessment.</td>
</tr>
<tr>
<td>23 April 2007</td>
<td>Growth Centres Commission, Maunsell, Landcom</td>
<td>Cross section and speed limit.</td>
</tr>
</tbody>
</table>

Maunsell issued preliminary concept design plans to the Growth Centres Commission on the 29 August 2006. No comments on the proposal were received.

5.3.5 Road and Traffic Authority

Maunsell and Landcom met with the NSW Roads and Traffic Authority during 2005 - 2007 as documented in Table 6.

Table 6 Consultation with the NSW Roads and Traffic Authority

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendees</th>
<th>Issues Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 October 2005</td>
<td>RTA, Maunsell</td>
<td>Introductory meeting to provide background to project.</td>
</tr>
<tr>
<td>22 February 2006</td>
<td>RTA, Maunsell, Annand Alcock Urban design</td>
<td>Working session between workshop 1 and 2 to move forward.</td>
</tr>
<tr>
<td>20 March 2006</td>
<td>RTA, Maunsell</td>
<td>Presentation of preliminary cross sections for discussion and comment</td>
</tr>
<tr>
<td>19 April 2006</td>
<td>RTA, Maunsell</td>
<td>Discussion of alignment and property acquisition issues.</td>
</tr>
<tr>
<td>5 July 2006</td>
<td>RTA, Maunsell</td>
<td>Discussion of alignment and property acquisition issues.</td>
</tr>
<tr>
<td>22 November 2006</td>
<td>RTA, Maunsell</td>
<td>Finalisation of Environmental Assessment form, scope and methodology.</td>
</tr>
</tbody>
</table>

Maunsell issued preliminary concept design plans to the NSW Roads and Traffic Authority on the 29 August 2006. Comments on the proposal were received on 12 September 2006 and are attached in Appendix D.
A summary of the issues and how these are addressed is provided in Table 7.

Table 7  RTA comments on proposal (preliminary concept)

<table>
<thead>
<tr>
<th>Issue raised</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Offset &quot;T&quot; configuration at Tallawong and Ridge Road is not supported.</td>
<td>The proposal shows the realignment of Tallawong Road to create a single four way signalised intersection.</td>
</tr>
<tr>
<td>The difference in levels between the east and westbound carriageways make potential widening to six lanes difficult.</td>
<td>The difference in levels between the east and eastbound carriageways has been kept to a minimum.</td>
</tr>
</tbody>
</table>

5.3.6  Rouse Hill Infrastructure Corporation

The Rouse Hill Infrastructure Consortium Pty Ltd (RHIC) is a private company formed in 1989 to facilitate and procure the delivery of trunk water based infrastructure works in the Rouse Hill Development Area. Maunsell met with RHIC during 2006 as described in Table 8.

Table 8  Consultation with Rouse Hill Infrastructure Corporation

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendees</th>
<th>Issues Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 February 2006</td>
<td>Rouse Hill Infrastructure Corporation, Maunsell</td>
<td>Trunk Drainage, Second Ponds Creek, Flooding</td>
</tr>
<tr>
<td>4 August 2006</td>
<td>Rouse Hill Infrastructure Corporation, Maunsell</td>
<td>Flood levels around Second Ponds Creek</td>
</tr>
<tr>
<td>19 June 2006</td>
<td>Rouse Hill Infrastructure Corporation, Maunsell</td>
<td>Detention and water quality</td>
</tr>
</tbody>
</table>

5.3.7  Integral Energy

Integral Energy will be installing two 132 kV duct banks under Schofields Road between Cudgegong switching station and Windsor Road. This is a separate proposal not covered by this REF. To enable planning and integration, Maunsell have maintained open communication with Integral Energy during the proposals development. Meetings held with Integral Energy are documented in Table 9.

Table 9  Consultation with Integral Energy

<table>
<thead>
<tr>
<th>Date</th>
<th>Attendees</th>
<th>Issues Discussed</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 July 2006</td>
<td>Integral Energy, Maunsell, Landcom</td>
<td>Introductory meeting regarding integration of 132 kV underground duct banks within project corridor.</td>
</tr>
<tr>
<td>31 January 2007</td>
<td>Integral Energy, Maunsell, Landcom</td>
<td>Update on project progress.</td>
</tr>
<tr>
<td>12 March 2007</td>
<td>Integral Energy, Maunsell, Landcom</td>
<td>Update of project progress and presentation of preliminary concept and location of 132 kV duct banks.</td>
</tr>
<tr>
<td>14 May 2007</td>
<td>Integral Energy, Maunsell, Landcom, Brown Consulting</td>
<td>Update of project progress and presentation of concept and location of 132 kV duct banks.</td>
</tr>
</tbody>
</table>
Maunsell wrote to Integral Energy on the 18 December 2006 providing a project update and issuing preliminary plans to enable planning on cable locations. Updated plans have been supplied to Integral Energy as the design of the proposal has progressed.
6.0 Strategic stage

6.1 Planning and environmental background

6.1.1 Metropolitan Strategy

The Metropolitan Strategy is a framework to secure Sydney’s future by promoting and managing growth. The strategy predicts Sydney development scenarios for the next 25 years and identifies planning strategies to achieve desirable outcomes. As a continuation of the Metropolitan Strategy, more detailed regional and local planning strategies are being developed.

The NSW Government’s plans for Sydney’s Growth Centres were exhibited in December 2004, and the *Growth Centres State Environmental Planning Policy* gazetted 18 months later. This SEPP is intended as a tool which will enable the NSW Government to coordinate and manage the release of land within the north west and south west growth centres. The Structure Plan for the North West Growth Centre is illustrated in Figure 6.

**Figure 6  Structure Plan for the North West Growth Centre**

![Structure Plan for the North West Growth Centre](image)

Source: Department of Planning, NSW Government’s Metropolitan Strategy, 2005

The first precincts in the north west will be Alex Avenue (7000 lots), Area 20 (1500 lots), Colebee (1000 lots), North Kellyville (4500 lots), Riverstone (8500 lots) and Riverstone West (500 lots).

Precinct planning will commence immediately in Alex Avenue, North Kellyville, Riverstone, Oran Park and Turner Road and will commence in Riverstone West and Area 20 in 2007/2008. Colebee and Edmondson Park have already been rezoned. Progressively, planning will commence in the remaining precincts.

The north west structure plan applies urban structure planning principles which include the following:

- Better public transport with frequent buses that link into the rail system.
- A range of land uses to provide the right mix of houses, jobs, open and recreational space and green spaces.
• Easy access to major town centres with a full range of shops, recreational facilities and services along with smaller village centres and neighbourhood shops.
• Jobs available locally and within the region, reducing the demand for transport services into the CBD and cutting travel times.
• Streets and suburbs planned so that residents can walk to shops for their daily needs.
• A wide range of housing choices to provide for different needs and different incomes. ‘Traditional’ houses on their own block of land will be available along with smaller, lower maintenance homes, units and terraces for older people and young singles or couples.
• Conservation land, in and around the development sites, will help to protect the region’s biodiversity and provide clean air for Western Sydney as well as provide open space for recreation.

The Growth Centres Commission (GCC) will coordinate the orderly rollout of land release and infrastructure identified as capable of urban development. The key tasks of the GCC are to:

• develop land use and infrastructure plans
• manage funding and infrastructure delivery
• recommend to Government the orderly sequencing of land release to co-ordinate the rollout infrastructure and to prevent speculation
• achieve coordination between small land holders.

The GCC will work with local councils to develop Growth Centre Plans which will be included in Local Environmental Plans (LEPs).

6.1.2 Shaping Our Cities/Shaping Western Sydney

Shaping Our Cities is the current metropolitan planning strategy for the Greater Metropolitan Region of Sydney, Newcastle, Wollongong and the Central Coast. The strategy aims to manage continued population growth and its associated affects, in an environmentally and socially sustainable way. It seeks to create a compact, vibrant and socially inclusive city, which is supported by a transport system that is both economically efficient and environmentally sustainable. It also seeks to ensure an adequate supply of new housing in a range of locations.

Shaping Our Cities has a companion document, Shaping Western Sydney, which sets specific directions for land use and transport planning in western Sydney. Shaping Western Sydney again embraces the transport planning goals of reducing the growth in car use and increasing public transport use, while encouraging public transport-supportive development. The strategy also emphasises the need for continued delivery of quality and affordable new housing in areas where good public transport can be provided. Principles contained within these strategies have been incorporated into the development of the proposal.

6.1.3 Action for Transport 2010

Action for Transport 2010 outlines the Government’s plans for transport over the next decade. The plan, released in 1998, responds to similar challenges identified in Action for Air and Shaping Our Cities. The need to contain the growth in car use in order to protect air quality is highlighted. A range of policies and proposals are outlined, including:

• the development of the Western Sydney Transitway Network
• a number of major new rail lines such as the Epping-Chatswood Rail Link
• increased priority for buses and freight on the road network
• key expansions and upgrades for the road network
• a significant expansion of regional cycling facilities.

Importantly, the plan also features a strong commitment to improve the integration of transport planning in the planning and development process. Action for Transport 2010 also includes a commitment to reducing car dependency, through the provision of integrated transport solutions. In the case of the proposal, opportunities include the possibility of incorporating priority or dedicated bus lanes or off-road cycle ways into new or upgraded road development. Impacts of the proposal on air quality have been addressed in Section 9.2.

6.2 Need for the proposal

6.2.1 Strategic Need

Over 20 years ago the New Rouse Hill was identified as the regional centre to serve northwest Sydney. The Rouse Hill development will include a town centre, up to 1800 homes and 34 hectares of parks and open space and community facilities.

Schofields Road forms part of a strategic link to the north-west growth centre plans. It provides an important road corridor connecting Windsor Road to Railway Terrace and linking Area 20, Riverstone East, Riverstone, Schofields and Alex Avenue precincts. With increasing high traffic volumes, this section of Schofields Road is experiencing congestion, safety and access issues.

Change in land use has seen Schofields Road change from a semi-rural road to a major arterial road within the last 10 years. The increasing use of this road as an arterial route, compounded with the traffic generated from newly developing suburbs along the route, has reduced the efficiency and traffic safety of the road.

Sections of Schofields Road are experiencing high traffic growth per annum as a result of increasing residential development. Current traffic volumes along the two-lane section of Schofields Road are in excess of 11,000 vehicles per day. Traffic volumes on Schofields Road between the Tallawong and Windsor Road are forecast to increase between now and 2011 as a result of increased residential development.

The upgrade of this section would link current and planned upgrade sections and form a continuous high standard arterial road for western Sydney. The upgrade is required to provide an efficient, safe and reliable option for motorists, cyclists, commercial freight operators, and road based public transport. The proposal would be consistent with the planning strategies detailed in section 6.1 above, providing part of the integrated transport planning outcome for the region. Without the upgrade this section of Schofields Road would experience high levels of congestion, which would have flow-on effects for other sections of the road network.

6.2.2 Safety

The existing configuration of Schofield’s Road presents as a safety concern. It is currently only a single lane carriageway which is insufficient to support the traffic volumes. This traffic congestion may encourage drivers to accept smaller gaps in traffic. This can lead to intersection crashes where drivers misjudge space.

No dedicated pedestrian or cyclist facilities currently exist. Pedestrian and cyclists therefore currently have no choice but to use Schofields Road unprotected.
6.2.3 Socio-economic

Schofields Road Upgrade is one of many improvements to regional transport infrastructure in the North West Growth Centre and is shown on the Growth Centres Structure Plan as one of two east-west mixed use employment corridors.

Development within the Growth Centre will result in a significant increase in traffic volumes. Accordingly upgrading of Schofields Road is required to improve the socio-economic conditions for local residents and for those who use Schofields Road as a connector.
7.0 Concept stage

7.1 Proposal objectives
The objectives of the proposal are:

- to increase traffic capacity along Schofields Road
- to reduce travel times along Schofields Road
- to improve safety for all road users
- to cater for traffic safety for all road users
- to cater for traffic volumes to the year 2020 and facilitate traffic flow between precincts in the north west growth centre
- to provide shared pedestrian/cyclist access
- to promote economic development.

7.2 Options considered
A number of alignment options have been considered in the development of the concept design for the proposal, based on the agreed 41m typical cross section.

Engineering design for the proposal has evolved over two key stages. Stage 1 preliminary engineering was undertaken by Cardno (NSW) Pty Ltd and involved the development of several alignments. Stage 2 engineering was undertaken by Brown Consulting and built on the work already undertaken by Cardno, with refinements to reduce the need for property acquisition along the northern side of the corridor and maintain the road footprint within the LEP 1988 and road widening corridor as far as possible.

In general, option development has been based on minimising:

- the extent of property acquisition
- acquisition outside the area zoned for road widening
- the number of lots requiring acquisition
- environmental impacts.

7.2.1 Do nothing option
The "do nothing" option involved retention of the existing Schofields Road alignment. Since problems of road safety, traffic efficiency, inconvenience and potentially adverse residential amenity impact were major factors influencing the need for a road upgrade, the "do nothing" option was not regarded as an acceptable solution and was discarded from further consideration.

7.2.2 Horizontal alignment
Both the existing road boundary and road widening zoning boundary vary significantly in width along the proposal length and the impacts on property acquisition for road widening vary accordingly. For assessment the horizontal alignment has been divided into three sections which are:

- Section 1 Old Windsor Road to CH 1400 (Cemetery)
- Section 2 CH 1400 (Cemetery) to Cudgegong Road
- Section 3 Cudgegong to Tallawong.
East of chainage 1400 (Section 1), the road widening and cadastral boundaries narrow to approximately 32m. Within section 2, east of chainage 1600 the road widening boundary also narrows.

These changes in boundary width create pinch points for the horizontal alignment. In any case, particularly east of chainage 1400 acquisition outside the road widening zone is required.

Option development has considered combinations of alignment to the north, south and over the existing centreline of Schofields Road alignment. An overview of the advantages and disadvantages of options considered is provided below.

7.2.3 Vertical alignment
In general the vertical alignment has been optimised to tie into existing ground levels as far as possible, while meeting the requirements of the RTA Road Design Guide.

The critical constraint to vertical alignment is immunity from the 100 year Annual Recurrence Interval (ARI) flood event, which requires lifting the alignment above Second Ponds Creek. This also raises road levels approaching Second Ponds Creek. The existing road does not meet the current flood immunity requirements.

7.2.4 Intersection analysis
Maunsell modelled the proposed intersection using SIDRA software to determine the number of lanes required at:

- Intersection 1 - Schofields Road with Hambledon Road (three arm junction)
- Intersection 2 - Schofields Road with Tallawong Road and Ridge Road (four arm junction)
- Intersection 3 - Schofields Road with Cudgegong Road (three arm junction)
- Intersection 4 - Schofields Road with The Ponds Boulevard (three arm junction).

Each of the junctions includes a bus priority lane along Schofields Road. Each cycle includes a bus jump phase although this would only be called when a bus approaches the stop line. The SIDRA analysis is therefore considered to be conservative as the bus jump phase will not occur every cycle.

Overall, the analysis confirms that the junctions modelled are sufficient to accommodate the forecast development of the Northwest Growth Centre region.

Tallawong Road and Ridge Road
Tallawong and Ridge Road intersections with Schofields Road are within close proximity. The RTA advised at a project meeting on 30 July 2007 that the use of staggered tee intersections at Tallawong Road and Ridge Roads was not acceptable.

The RTA prefers a four way intersection which would necessitate realignment of either of Ridge Road or Tallawong Road. Due to development planning being well advanced on the southern (Ridge Road) side, Tallawong Road would need to be realigned to provide the four way intersection with Schofields Road.

A potential solution could be the acquisition of two parcels of land on the eastern side of Tallawong Road. Access to the redundant section of Tallawong Road would be provided by a short service road with turning circle. The new intersection would be signal controlled and pedestrian and cycle facilities would be included in the traffic signals. Tallawong Road realignment is not part of this proposal, the
design of which will be resolved during GCC’s precinct planning. In the interim Tallawong Road would need to be restricted to left in- left out.

**Cudgegong Road**

A left in, left out arrangement is proposed for Cudgegong Road. This arrangement is preferred by the RTA in this instance. Traffic intending to turn right can access Schofield Road via Macquarie Road to Tallawong Road.

**The Ponds Boulevard**

The Ponds Boulevard is a proposed new road to provide access to The Ponds development. This intersection will be controlled by traffic signals and would include pedestrian and cyclist crossing facilities.

### 7.2.5 Bus Priority

Schofields Road has been designated in the primary road plan for the North West Growth Centre area as a transit boulevard with an emphasis on easy access to public transport. The concept design has been developed to provide for additional road space for buses on approach and departure to intersections.

These lanes can be used as turning lanes until such times as bus priority measures are required along Schofield Road. Consequently, traffic islands have been added to the intersection layouts to provide more conventional channelisation.

These islands have the advantage of providing shorter pedestrian walk phase times and somewhere for signal post location. These can be removed and special long overhead mast arms installed when exclusive bus lane facilities are required.

### 7.3 Summary of option performance

**Vertical Alignment**

An option to provide a pedestrian/bicycle passage under Second Ponds Creek Bridge was investigated. This option would involve lifting Schofields Road to provide a 2.4m underpass above the 2 year (ARI) flood event. This option was investigated because a regional bicycle route is planned along Second Ponds Creek, crossing Schofields Road. The finished levels required to achieve this option are higher than the 100 year ARI flood level.

An alternative option was investigated to only provide flood immunity from the 100 year ARI event. This option would also allow for bridge deck thickness and freeboard above the 100 year ARI level. The finished levels required for this option are lower than that required for the cyclist underpass option.

Considering the impact of the road footprint on approach to Second Ponds Creek, the visual impact and volume of material required to provide an underpass for cyclists / pedestrians, the latter options is preferred. Movements for cyclists/pedestrians across Schofields Road could be provided in the future using a structure over the road. Preliminary estimates have shown a bridge option, or at grade crossing to be of lower cost than an underpass. The pedestrian/ cyclist bridge is not part of this proposal.
Horizontal Alignment
Assessment of options A, B and C within Sections 1, 2 and 3 are detailed in Tables 10, 11 & 12.

Table 10  Section 1 Old Windsor Road to CH 1400 (Cemetery)

<table>
<thead>
<tr>
<th>Alignment</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 1A Centreline of existing alignment</td>
<td>• On the northern side of Schofields Road the widening is mainly within the LEP 1988 zoning for road widening.</td>
<td>• Requires partial acquisition of quarry property, adjacent lots east and west of the quarry and part of the cemetery. • Requires substantial engineering works to construct road within quarry. • Removes remnant strip of low value Cumberland Plain Woodland (EEC). • Difficult to stage and manage traffic during construction.</td>
</tr>
<tr>
<td>Option 1B North of existing alignment</td>
<td>• Preserves remnant strip of low value Cumberland Plain Woodland (EEC) within cemetery land.</td>
<td>• As for Option 1A.</td>
</tr>
<tr>
<td>Option 1C South of existing alignment (Preferred alignment)</td>
<td>• Avoids need for substantial engineering works within quarry. • Partial acquisition of one property only (cemetry). • Enables use of existing road while southern carriageway is under construction.</td>
<td>• Large amount of acquisition within cemetery land required. • Removes remnant strip of low value Cumberland Plain Woodland (EEC). • Doesn’t utilise LEP 1988 road widening zoning within the quarry.</td>
</tr>
</tbody>
</table>
### Table 11  Section 2 CH 1400 (Cemetery) to Cudgegong Road

<table>
<thead>
<tr>
<th>Alignment</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Option 2A Centreline of existing alignment | • Nil | • Partial acquisition of 12 properties required on northern side.  
• Acquisition also required on southern side.  
• Difficult to stage and manage traffic during construction.  
• Widening is outside LEP 1988 road widening zoning on northern side. |
| Option 2B North of existing alignment | • Nil | • As for Option 2A. |
| Option 2C South of existing alignment **(Preferred Alignment)** | • Minimises number and extent of properties requiring partial acquisition on northern side.  
• All widening within LEP road widening zoning.  
• Enables use of existing road while southern carriageway is under construction. | • Most acquisition is within The Ponds development. |

### Table 12  Section 3 Cudgegong to Tallawong

<table>
<thead>
<tr>
<th>Alignment</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
</table>
| Option 3A Centreline of existing alignment | • Nil | • Partial acquisition of seven lots required on Northern side and two lots on south side – acquisition required on both sides.  
• Removes remnant strip of low value Cumberland Plain Woodland (EEC).  
• Widening is outside LEP 1988 road widening zoning on northern side. |
| Option 3B North of existing alignment | • Minimises impact on a strip of low value Cumberland Plain Woodland (EEC) | • Partial acquisition of seven lots required on northern side and two lots on south side – acquisition required on both sides.  
• Widening is outside LEP 1988 road widening zoning on northern side. |
| Option 3C South of existing alignment **(preferred alignment)** | • Minimises extent of acquisition on northern side (5 lots northern side)  
• Utilises full extent of southern of road widening zoning. | • Removes remnant strip of low value Cumberland Plain Woodland (EEC). |
An alignment to the south of the existing road (Option1C-2C-3C) is preferred. This alignment is located as close to the southern road widening zoning boundary as possible. The potential impacts and mitigation measures are discussed in Sections 9 and 10.

The preferred alignment has the following key attributes:

- enables the southern carriageway to be constructed while traffic utilises the existing road
- enables the existing pavement to be used as an access road to northern properties if only the southern carriageway is constructed and operational in the short term
- maximises the utilisation of the road widening zoning
- minimises the number of properties requiring acquisition
- minimises the extent of acquisition on the northern side, where it is required
- enables Integral Energy to construct their underground 132 kV duct banks within the existing road corridor in the short term, while locating them within the northern carriageway in the long term.
8.0 Design Considerations

8.1 Existing road

Schofields Road exists as undivided rural road, providing one lane in each direction of travel. The alignment traverses Second Ponds Creek to the east of Cudgegong Road and is below the 100 year ARI flood level. The posted speed limit of Schofields Road is 80 km/hr.

The existing alignment has a crest to the east adjacent to the Castlebrook Lawn Crematorium / shale quarry and a low point crossing Second Ponds creek. Other characterises of the proposal route subject to this REF include:

- A sealed undivided road with lane widths generally between 3.0 m to 3.5 m wide and no consistent shoulder, there is no kerb.
- There is no formal provision for pedestrian or cyclists.
- Second Ponds Creek runs north south through the proposal, Schofields Road currently crosses the creek with culverts.
- Unsignalised intersections at Cudgegong and Tallawong Roads.
- A signalised intersection at Old Windsor Road, currently under reconstruction as part of the Rouse Hill Regional Centre development.
- Rural residential is characteristic on the northern side of Schofields Road, with Blacktown Quarry to the east the exception.
- Castlebrook Lawn Cemetery and Crematorium is located to the east, on the southern side of Schofields Road.
- “The Ponds” Second Ponds Creek development incorporating Landcom and Allam Holmes developments adjoins the southern boundary, west of Castlebrook Lawn Cemetery.
- Overhead power and telecommunication is located on both or alternating sides of the road along the proposal length.
- Areas of remanent Cumberland Plain Woodland are located on both sides of Schofields Road.

8.2 Existing and forecast traffic flows

Existing Traffic (2005)

Peak hour classified intersection traffic counts were carried out at various locations along Schofields Road by the RTA in September 2005. The average AM peak and PM peak traffic counts are summarised in Table 13.

<table>
<thead>
<tr>
<th>Location</th>
<th>Direction</th>
<th>AM (8am to 9am)</th>
<th>PM (5pm to 6pm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schofields Road between Tallawong Road and Hambledon Road</td>
<td>Eastbound</td>
<td>610</td>
<td>420</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>550</td>
<td>570</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1,160</td>
<td>990</td>
</tr>
<tr>
<td>Schofields Road west of Windsor Road</td>
<td>Eastbound</td>
<td>540</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td>Westbound</td>
<td>520</td>
<td>620</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1,060</td>
<td>980</td>
</tr>
</tbody>
</table>

Source: RTA Classified Traffic Counts, Sep 2005

Assuming the peak hour represents approximately 10 percent of the daily flow, the two way average daily mid-block flow for Schofields Road in 2005 is approximately 11,000 vehicles/day.
**Forecast Traffic (2008)**

Forecast traffic flows on Schofields Road in 2008 (opening year) were determined by factoring the 2005 base traffic by 2.5 percent per annum to account for background growth in the area, plus a proportion of traffic associated with the Rouse Hill Regional Centre (RHRC) development that will use Schofields Road. RHRC is due to be completed in late 2007 with 127,000 square metres of Gross Leasable Floor Area and 1,050 dwellings.

The calculation of average daily mid-block flow for Schofields Road in 2008 is illustrated in Table 14.

**Table 14 Calculated 2008 Average Daily Traffic**

<table>
<thead>
<tr>
<th>Components of 2008 Daily Flow</th>
<th>Two way Average Daily Mid-block flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005 Traffic Flow</td>
<td>11,000 vehicles/day</td>
</tr>
<tr>
<td>Background growth of 2.5% p.a. (2005 to 2008)</td>
<td>900 vehicles/day</td>
</tr>
<tr>
<td>Rouse Hill Regional Centre traffic to/from Schofields Road</td>
<td>13,800 vehicles/day</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25,700 vehicles/day</strong></td>
</tr>
</tbody>
</table>

Source: Maunsell, 2007

Therefore, the average two way daily mid-block flow for Schofields Road in 2008 will be approximately 25,700 vehicles/day. This level of traffic assumes no induced traffic from other routes resulting from the increased capacity of Schofields Road.

**Forecast Traffic (2018)**

Year 2016 traffic forecasts have been prepared by the NSW RTA’s Operations and Services Sydney Region using their EMME/2 strategic traffic model. Forecasted mid block PM peak traffic volumes for 2016 (assuming the completion of the Rouse Hill Regional Centre and approximately 50,000 lots released in the North West Sector) are:

- 2,000 vehicles/hr eastbound
- 1,500 vehicles/hr westbound.

Assuming the peak hour represents approximately 10% of the daily flow, the two way average daily mid-block flow for Schofields Road in 2016 will be approximately 35,000 vehicles/day.

To allow for additional regional growth (additional development in the North West Sector) beyond 2016, a 4% p.a. growth has been applied to the 2016 traffic to obtain forecast traffic flows for 2018. Therefore, the average daily mid-block flow for Schofields Road in 2018 will be approximately 38,000 vehicles/day as shown in Table 15.

**Table 15 Calculated 2018 Average Daily Traffic**

<table>
<thead>
<tr>
<th>Year</th>
<th>Two way Average Daily Mid-block flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>35,000 vehicles/day</td>
</tr>
<tr>
<td>2018</td>
<td>38,000 vehicles/day</td>
</tr>
</tbody>
</table>

Source: Maunsell, 2007
8.3 Urban and landscape design

Existing character of surrounding landscape
The site is located at the beginning of a broad valley surrounded by low undulating hills extensively modified by semi-rural and residential development. The surrounding area contains the following distinct landscape character types.

- Naturally regenerated vegetation, with open understorey layer typical of Cumberland Plain Woodland Character.
- Low-density rural residential properties with large land holdings to the north side, along Schofields Road. Scattered plantings within the gardens provide vegetation screening in some directions. There are minimal plantings to the frontages of these properties where they interface with Schofields Road. Informal stands of roadside trees provide a visual buffer between the present road corridor and the houses.
- Open and slightly undulating agricultural property.

8.4 Road design parameters

Typical cross sections
During stakeholder Workshop 5 on Thursday 23 March 2006 (as detailed in Section 5), a preferred cross section was agreed. Key stakeholders in attendance were Growth Centres Commission, the RTA, Landcom and Blacktown City Council.

A Design Brief Report, documenting key agreed criteria and cross sections was issued on the 18 April 2006 to the RTA, Growth Centers Commission and Blacktown City Council. The preferred cross section provides for:

- a 41m cross section at typical mid block locations
- a 48m cross section at intersections which includes turn lanes/bus priority lanes (41m plus two 3.5m lanes).

In the short to medium term (10 to 15 years) the road will comprise 4 traffic lanes with turn lanes at intersections as required. In the long term six lanes may be required.

The agreed cross sections as shown in Figure 4, plans are provided in Appendix A.

Features
The RTA Road Design Guide has been used for the development of this concept design. Carriageway. Key features of the carriageway area are:

- design speed is 80 km/hr
- speed zoning (sign posted speed)of 60 km/hr
- maximum grade 6%
- minimum grade 0.5%
- minimum horizontal curve is 260 m
- clear zone distance is 5 m
- lane widths of 3.5 m
- flood immunity from the 100 year Annual Recurrence (ARI) Interval flood event.
Median
The central median is 12.8m wide at the mid block providing a boulevard style road. A central row of mature trees will be planted in the median. The maximum median slope is 10 horizontal to 1 vertical. The median will be turfed to enable pedestrians to use this space. At intersections, right turn lanes reduce the width of the median and mature trees would not be provided due to inadequate clear zone.

Shared path and landscaped zone
A 5.1m wide strip on both sides of the road provides for a 2.5m wide shared path and landscaping.

Earthworks
Fill batters, where required at the edge of the 5.1 m strip, are proposed at 4 to 1. However the actual treatment where there is a change in levels will be determined by agreement with the land owner. A note ‘property adjustment required’ on the drawings shows these locations where such agreement is necessary. A batter with a grade of 4 to 1 negates the need for safety barriers. Cut batters are shown with a grade of at 2 to 1 to minimise property acquisition.

Bridges over Second Pond Creek
Separate structures will be provided for the east and west bound carriageways over Second Ponds Creek. The bridges would span Second Ponds Creek and the energy dissipation outlet structure from Basin 40 (main basin in Second Ponds Creek, adjacent to Schofields Road). The bridge would have three spans and the total length of each bridge would be 40m. There would be a 10m space between the bridges to allow light penetration to the riparian zone below.

The bridge cross section proposes two 3.5m lanes and a 2.5m shared path in each direction. Bridge railing would be provided along the kerb line and pedestrians and cyclists using the shared cycleway would be protected by a 1,300 mm high fence at the edge of structure.

The soffit of the proposed structures would sit above the 100 year ARI flood event level, with a 300mm allowance for freeboard.

The substructure of the bridge would include piled abutments. It is not anticipated that piles would be located in the actual stream. Construction of the substructure would require some stream training work, which would be restricted to the area between the bridges.

Culverts
No requirements for culverts have been identified at this stage. Second Ponds Creek is the low point and it is proposed that a bridge will be constructed over it as discussed in section 8.4.3.

Noise walls and retaining walls
Retaining walls will be provided where a property owner prefers this solution. Retaining wall may also be proposed between chainage 1160 and chainage 1300 and chainage 30 to chainage 30.

Road drainage
A concept pavement drainage design was developed for the proposal using the Rational Method and Blacktown Council rainfall intensities for the 10 year ARI storm event. Storm water kerb inlet pits were positioned at approximately 30m centres to ensure gutter flow widths onto the road do not exceed 1.5m.

East of Tallawong Road to the cemetery/shale quarry crest the proposal drains towards Second Ponds Creek. This 6.2 hectare area is the main proposal catchment and would discharge into Second Ponds creek following treatment by gross pollutant traps.
East of the cemetery/shale quarry crest the proposal drains towards Old Windsor Road intersection, where it is proposed to connect the pavement drainage system to the existing pipe drainage system.

The increased peak flows generated by the increased impervious surface of the proposal (compared to the existing conditions) was accounted for in the Second Ponds Creek Trunk Drainage Strategy Development Report as instructed by the RHIC and therefore no detention system will be required.

8.5 Traffic Assessment

A Traffic Intersection Modelling Report was commissioned to support the REF by providing traffic engineering advice in developing a concept plan for the intersections along Schofields Road. The assessment assumes full development in the North West Sector and includes all traffic movements associated with the Rouse Hill Regional Centre (RHRC) as well as Second Ponds Creek and proposed development to the north of Schofields Road.

A copy of this Traffic Intersection Modelling Report is attached as Appendix E and the analysis confirms that the junctions modelled are sufficient to accommodate the forecast development of the Northwest Growth Centre Region.

8.6 Construction activities

8.6.1 Work methodology – brief description of the construction process

The following construction activities would be involved in the proposal.

- Site establishment and preliminary works, including
  - commencement of pre-construction mitigation measures as outlined in the Construction Environmental Management Plan (CEMP) such as installation of erosion, sediment and water quality control
  - establishment of stockpile and compound sites
  - relocation and/or adjustment of all affected utilities.
- Clearing and grubbing of vegetation within areas of direct impact.
- Stripping, stockpiling and management of topsoil.
- Bulk earthworks including the construction of site accesses.
- Installation of drainage works and structures.
- Construction of bridges over Second Ponds Creek.
- Geotechnical stabilisation works.
- Road foundation and pavement works.
- Signposting, line marking and installation of other road furniture.
- Topsoil rehabilitation and revegetation.
- Finishing works.

Construction activities would be refined at the detailed design stage of the proposal. All construction process, including scheduling and overall timing works would be determined by the contractor in accordance with the RTA’s approval.

8.6.2 Construction staging

Subject to funding allocation, Schofields Road is likely to be constructed in stages. An indicative construction staging sequence is provided in the following sections.
Stage 1 Southern Carriageway Windsor Road - The Ponds Boulevard
This section of the southern carriageway would be built off line. Traffic, pedestrians and cyclists would continue to use the existing road. Approximately half the cross section would be built, enabling the planting of mature trees in the centre of the (ultimate) median.

Once constructed the southern carriageway would be tied into the existing intersection at Windsor Road intersection to take both east and westbound traffic between Second Ponds Boulevard and Windsor Road. Pedestrians and cyclists would use the new share path on the southern side of the proposal. A temporary tie into the existing Schofields Road would be provided west of Second Ponds Boulevard.

The existing Schofields Road would become a two way service road providing access to existing residential properties on the northern side. The existing Schofields Road would be terminated west of the quarry and east of Second Ponds Boulevard, where access to the service road would be provided.

Stage 2 Southern Carriageway – The Ponds Boulevard to Tallawong Road
Stage 2 would also be built off line. Once constructed, traffic would be diverted onto the new carriageway. At this stage all through traffic would be using the new southern carriageway from Old Windsor Road to Ridge/Tallawong Road. A temporary tie in would be provided at the western extent of the proposal.

The existing Schofields Road would become a two way service road providing access to existing residential properties on the northern side. The existing Schofields Road would be terminated west of the quarry and east of Tallawong road, where access to the service road would be provided.

Stage 3 Northern Carriageway – Old Windsor Road to Tallawong Road
The northern carriageway would be constructed offline to complete the ultimate cross section beginning from Windsor Road towards Tallawong Road. Access to properties on the northern side would be maintained during construction, if at this time land to the north had not yet been released as part of the Growth Centres Development.

8.6.3 Bridge construction
Two new bridges are proposed over Second Ponds Creek. Both the structures would be built in stage 2 for efficiency. The southern bridge would be constructed first and traffic diverted as discussed above. The existing culvert would be removed and the northern structure constructed to form part of the service road, until the northern carriageway is constructed in Stage 3.

Foundations
Bridges are proposed to be founded on bored piles. Cranes may need to operate from hard stand area prepared on the creek banks.

Superstructure
The superstructure would be precast concrete girders. The girders would be manufactured off site. Cranes would be used to place the girders. The deck and parapets would then be constructed. Approaches would be constructed during the bridge construction.

8.6.4 Workforce and working Hours
Proposed construction working hours are:

- Monday to Friday: 7am to 6pm
- Saturday: 8am to 1pm
- no construction work is to be carried out on Sundays or Public Holidays.

The workforce would comprise approximately 50 personnel. For safety reasons and also to minimise impact on road users at peak times, it is anticipated that a small amount of night work may need to occur. Should these works be required, any night time work would follow procedures contained within the RTAs *Environmental Noise Management Manual* and its *Roadworks Outside of Normal Working Hours* policy contained within.

A free call contact name and number would be established for the construction period to deal with and community queries or complaints. The community would also be notified in advance of particular elements of the construction should this be required, such as lane closures. Advertisements would be placed in local newspapers or specific residents could be notified through targeted letter box drops.

The contractor and Principal for the works are yet to be determined.

**8.6.5 Plant and equipment to be used**

It is anticipated that standard construction machinery and equipment would be required for the proposed works. Typical equipment and machinery would include but not be limited to:

- Earthmoving: excavators, bulldozers, loaders, backhoes, on-and-off highway trucks, water cart.
- Pavement construction: excavators, dozers, graders, concrete pumps and agitators, rollers, trucks, pavement machine.
- Fitting and finishing: line-marking machine, graders, bobcats, loaders and trucks.

**8.6.6 Source of quarried materials such as road base**

Select pavement materials will be sourced from a suitable off site source, determined by the contractor at the time of construction tender.

**8.6.7 Earthworks**

Preliminary earthwork volumes have been calculated as follows:

- 10,650 m$^3$ for stripping of topsoil (assumed 100 mm of topsoil)
- 74,820 m$^3$ of cut
- 37,578 m$^3$ of fill (7000 m$^3$ would need to be imported, excluding pavement layers)
- 37,242 m$^3$ would be disposed of on other sites for fill
- 5,000 m$^3$ allowance for unsuitable material.

The existing culvert over Second Ponds Creek would be replaced and two parallel bridges would be constructed. There is limited space for embankments within the proposed property line. Property adjustments or retaining walls will be negotiated with individual property owners. Retaining walls may be utilised in the following locations:

- between chainage 1160 and 1300 (140 m long)
- between chainage -30 and 30 (60 m long).
8.6.8 Stockpiling considerations
The main stockpile compound site would be established in accordance with guidance contained in RTA QA Specification R44. The stockpile and compound site would be located in the property to be purchased for the realignment of Tallawong Road in order to prevent material from entering local drainage lines, and also to allow easy vehicular access.

8.6.9 Site facilities and work compounds
Site facilities
The main compound site would provide full site services including:

- office and meeting room for site personnel
- reception and general administration area
- amenity and first aid facilities
- storage areas for light equipment and tools
- materials and fuel storage areas
- communication facilities and parking areas.

8.7 Utilities
A desktop search for utility and service infrastructure within the study area has been undertaken using the ‘Dial Before You Dig’ telephone service. Major utility and service infrastructure identified in the study area are discussed below.

Gas
Agility operate a buried 160mm diameter 300 kPa high pressure gas main along the southern side of Schofields Road between Windsor Road approximately half way to Cudgegong Road (Chainage 1160) where it terminates.

Water
Sydney Water has the following infrastructure within the study area:

- Twin buried 750 mm DICL water mains on the western side of Windsor Road, passing under the intersection of Windsor Road and Schofields Road.
- A buried 100 mm diameter CICL /AC main is located on the northern side of Schofield Road from Hambledon Road to Tallawong Road.
- A buried 200 mm diameter DICL water main is located on the northern side of Schofields Road between Hambledon Road and Cudgegong Road. The main continues along the western side of Cudgegong Road.
- A 50 mm diameter PVC private water main runs along the northern side of Schofields Road between Cudgegong Road and chainage 2000.
- A 50 mm diameter PVC private water main runs also north along Tallawong Road from the 200mm DICL main.
- A sewer main runs approximately northeast / southwest on the eastern bank of Second Ponds Creek.
Communications
Overhead Optus cables are installed between Windsor Road and approximately chainage 780. The overhead cable is on the southern side except between approximately chainage 1450 and 1650 where the cable is located on the northern side of the road.

West of chainage 780, the Optus cables are underground on the southern side of Schofields Road and continue to Cudgegong Road. The cable follows Cudgegong Road on the western side.

A main Telstra cable is located on the western side of Windsor Road. From this cable, an overhead main runs down the northern side of Schofield Road past Tallawong Road.

Power
Overhead 11 kV power is installed on the southern side of Schofields Road for the length of the study area. The power cable briefly crosses to the northern side of Schofield Road between approximately chainage 1450 and 1650.

Overhead 11 kV power extends to the north along Tallawong Road. Overhead 132 kV power crosses the study area in a northwest / southeast direction near Second Ponds Creek.

Street Lighting
Street lights are attached the poles that support the 11 kV power. Alignment is discussed above.

Culverts
Schofields Road currently crosses Second Ponds Creek utilising three pipes. These pipes will be replaced with a new bridge structure as discussed in this proposal.

8.8 Future services
All services will require relocation due to the change of levels and widening of Schofield Road. In addition, new services as described in the following sections

Water
A 450 mm water main is to be laid along the northern side of Schofields Road. The timing of this installation has not been determined.

Power
Integral Energy are planning to install 132 kV cables from a new substation located on the north eastern corner of Cudgegong and Schofield Roads.

- Two underground circuits comprising three cables for each circuit between the new substation and the Rouse Hill Regional Centre to be installed in the next 12 months, referred to as the eastern circuits.
- Three cables from the new substation to the west along Schofields Road to be installed in the future, referred to as the western circuits.
- One cable from the new sub station south to Second Ponds Creek development across Schofields Road to be installed in the future.

The two new eastern circuits will be each encased in a 0.9 m wide duct bank. The spacing between duct banks needs to be 2.0 m. The cables will preferably be located under the new northern carriageway as to not interfere with the landscaping proposed in the median. Maunsell has liaised with
Integral Energy during the development of this proposal to integrate Integral Energy’s requirements where possible.

Each new circuit will require a pulling pit approximately 8 m by 3 m in plan area and these would be spaced at approximately 800 m centres. For the eastern circuit, the first pit would be located near the new Cudgegong Road substation.

The installation of new 132 HV underground power is not part of this proposal. Integral Energy will be undertaking their own environmental assessment as part of seeking approval for those works.

8.9 Property acquisition

The RTA’s *Land Acquisition Policy* outlines procedures and guidelines for the transfer of land between the RTA and affected property owners. The policy sets out procedures for partial acquisition and also special conditions applying to total acquisition and compulsory acquisition. The proposal would result mainly in property acquisition inside and outside the road widening boundary of the following land.

Property affected by acquisition is detailed in Table 16 and Table 17.

### Table 16 Property affected by acquisition on northern side

<table>
<thead>
<tr>
<th>Property</th>
<th>Lot / DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>65 Schofields Road, Schofields</td>
<td>Lot 24 DP 27220</td>
</tr>
<tr>
<td>67 Schofields Road, Schofields</td>
<td>Lot 23 DP 27220</td>
</tr>
<tr>
<td>69 Schofields Road, Rouse Hill</td>
<td>Lot 22 DP 27220</td>
</tr>
<tr>
<td>71 Schofields Road, Rouse Hill</td>
<td>Lot 21 DP 27220</td>
</tr>
<tr>
<td>73 Schofields Road, Rouse Hill</td>
<td>Lot 20 DP 27220</td>
</tr>
<tr>
<td>75 Schofields Road, Rouse Hill</td>
<td>Lot 19 DP 27220</td>
</tr>
<tr>
<td>77 Schofields Road, Rouse Hill</td>
<td>Lot 18 DP 27220</td>
</tr>
<tr>
<td>79 Schofields Road, Rouse Hill</td>
<td>Lot 17 DP 27220</td>
</tr>
<tr>
<td>81 Schofields Road, Rouse Hill</td>
<td>Lot 16 DP 27220</td>
</tr>
<tr>
<td>99 Schofields Road, Rouse Hill</td>
<td>Lot 7 DP 27220</td>
</tr>
<tr>
<td>101 Schofields Road, Rouse Hill</td>
<td>Lot 6 DP 27220</td>
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<tr>
<td>103 Schofields Road, Rouse Hill</td>
<td>Lot 5 DP 27220</td>
</tr>
<tr>
<td>105 Schofields Road, Rouse Hill</td>
<td>Lot 4 DP 27220</td>
</tr>
<tr>
<td>Land corner of Schofields &amp; Windsor Roads</td>
<td>Lot 1 DP 1001478</td>
</tr>
<tr>
<td>Quarry</td>
<td>Lot A DP 379470</td>
</tr>
</tbody>
</table>

### Table 17 Properties affected by acquisition on southern side

<table>
<thead>
<tr>
<th>Property</th>
<th>Lot / DP</th>
</tr>
</thead>
<tbody>
<tr>
<td>86 Schofields Road, Schofields</td>
<td>Lot 5 DP 214959</td>
</tr>
<tr>
<td>88 Schofields Road, Schofields</td>
<td>Lot 6 DP 214959</td>
</tr>
<tr>
<td>90-94 Schofields Road, Schofields</td>
<td>Lot 1 DP 124210</td>
</tr>
<tr>
<td>The Ponds development</td>
<td>Lot 15 DP 1088121</td>
</tr>
<tr>
<td>712 Windsor Road, Kellyville Crematorium</td>
<td>Lot 2 DP 129670 &amp;</td>
</tr>
</tbody>
</table>
8.10 **Additional fill material**
No additional fill material, except for select pavement zones, is required.

8.11 **Issues to be further addressed in detailed design**
There are a number of issues that have not been fully resolved in the preliminary concept design phase and would be considered during the detailed design phase. These issues include, but are not limited to:

- detailed drainage design which will be addressed in consultation with the RTA
- conduct a detailed survey to provide accurate ground levels for the networks utilities traversed by the proposal, in order to avoid any damage to the utility’s provider assets
- conduct detailed geotechnical survey to establish ground conditions, including salinity
- development of pavement design, such as pavement drainage, subsoil drainage
- detailed design of earthworks and retaining structures, where necessary
- detailed design of shared path geometry, if path alignment is to be curved
- development of comprehensive information, advisory and directional signage strategy.