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<b>Subject</b>	TNR6 Adams Road intersection - Options Analysis	<b>Project Name</b>	The Northern Road upgrade
<b>Attention</b>	██████████	<b>Project No.</b>	██████████
<b>From</b>	██████████		
<b>Date</b>	██████████		

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## 1. Background and need for change

Roads and Maritime Services (Roads and Maritime) propose to upgrade 16 km of The Northern Road between Mersey Road, Bringelly and Glenmore Parkway, Glenmore Park (the project).

To meet the requirements of both the Commonwealth and State planning approval processes for the proposed upgrade, Roads and Maritime prepared a single document acting as both the NSW Environmental Impact Statement (EIS) and the Commonwealth Draft EIS for the project.

With approval from the Commonwealth Department of the Environment and Energy (Commonwealth DoEE), the EIS / Draft EIS was exhibited by the NSW Department of Planning and Environment (NSW DPE) from Wednesday 21 June 2017 until Wednesday 2 August 2017.

Subsequent to this, Roads and Maritime prepared a submissions and preferred infrastructure report (SPIR) to meet requirements of Division 5.2 (formerly Part 5.1) of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and to respond to issues raised in submissions received during the exhibition of the EIS, as well as describe and assess proposed changes and design refinements to the project. Similarly, Roads and Maritime also prepared a Final EIS to satisfy requirements under Part 8 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Key features of the project as identified in the SPIR and Final EIS are summarised below:

- A six-lane divided road between Mersey Road, Bringelly and Bradley Street, Glenmore Park (two general traffic lanes and a kerbside bus lane in each direction to be delivered when demand requires). The wide central median would allow for an additional travel lane in each direction in the future, if required
- An eight-lane divided road between Bradley Street, Glenmore Park and about 100 m south of Glenmore Parkway, Glenmore Park (three general traffic lanes and a kerbside bus lane in each direction separated by a median to be delivered when demand requires)
- About eight kilometres of new road between Mersey Road, Bringelly and just south of the existing Elizabeth Drive, Luddenham, to realign the section of The Northern Road that currently bisects the Western Sydney Airport site and to bypasses Luddenham
- About eight kilometres of upgraded and widened road between the existing Elizabeth Drive, Luddenham and about 100 m south of Glenmore Parkway, Glenmore Park
- Closure of the existing The Northern Road through the Western Sydney Airport site

- Tie-in works with the following projects:
  - The Northern Road Upgrade, between Peter Brock Drive, Oran Park and Mersey Road, Bringelly (to the south)
  - The Northern Road Upgrade, between Glenmore Parkway, Glenmore Park and Jamison Road, South Penrith (to the north).
- New intersections including:
  - a traffic light intersection connecting the existing The Northern Road at the southern boundary of the Western Sydney Airport, incorporating a dedicated u-turn facility on the western side
  - a traffic light intersection for service vehicles accessing the Western Sydney Airport, incorporating 160 m of new road connecting to the planned airport boundary
  - a traffic light intersection connecting the realigned The Northern Road with the existing The Northern Road (west of the new alignment) south of Luddenham
  - a 'give way' controlled intersection (that is, no traffic lights) connecting the realigned The Northern Road with Eaton Road (east of the new alignment, left in, left out only)
  - a four-way traffic light intersection formed from the realigned Elizabeth Drive, the realigned The Northern Road and the existing The Northern Road, north of Luddenham
  - a traffic light intersection at the Defence Establishment Orchard Hills entrance, incorporating a u-turn facility.
- New traffic lights at four existing intersections:
  - Littlefields Road, Luddenham
  - Kings Hill Road, Mulgoa
  - Chain-O-Ponds Road, Mulgoa
  - Bradley Street, Glenmore Park incorporating a u-turn facility.
- Modified intersection arrangements at:
  - Dwyer Road, Bringelly (left in, left out only)
  - Existing Elizabeth Drive, Luddenham (access removed)
  - Gates Road, Luddenham (left in only)
  - Longview Road, Luddenham (left in, left out only)
  - Grover Crescent south, Mulgoa (access removed)
  - Grover Crescent north, Mulgoa (left in, left out only).
- Dedicated u-turn facilities at:
  - the existing The Northern Road at Luddenham, south-west of Elizabeth Drive
  - the existing Elizabeth Drive, Luddenham around 800 m east of The Northern Road
  - Chain-O-Ponds Road, Mulgoa
- Twin bridges over Adams Road, Luddenham
- Local road changes and upgrades, including:
  - closure of Vicar Park Lane, east of the realigned The Northern Road, Luddenham
  - Eaton Road cul-de-sac, west of the realigned The Northern Road, Luddenham
  - Eaton Road cul-de-sac, east of the realigned The Northern Road, Luddenham
  - Elizabeth Drive cul-de-sac, about 300 m east of The Northern Road with a connection to the realigned Elizabeth Drive, Luddenham
  - Extension of Littlefields Road, east of The Northern Road, Mulgoa
  - a new roundabout on the Littlefields Road extension, Mulgoa
  - a new service road between the Littlefields Road roundabout and Gates Road, including

- a ‘give way’ controlled intersection (that is, no traffic lights) at Gates Road, Luddenham
- extension of Vineyard Road, Mulgoa between Longview Road and Kings Hill Road
- a new roundabout on the Vineyard Road extension at Kings Hill Road, Mulgoa.
- A new shared path on the western side of The Northern Road and footpaths on the eastern side of The Northern Road where required
- The upgrading of drainage infrastructure
- Operational ancillary facilities including:
  - heavy vehicle inspection bays for southbound traffic, adjacent to Longview Road, Mulgoa
  - an incident response facility on the south-western corner of the proposed four-way traffic light intersection at Elizabeth Drive, Luddenham to be implemented for the operation of the Western Sydney Airport and the proposed M12 Motorway.
- Roadside furniture and lighting as required
- The relocation of utilities and services
- Changes to property access along The Northern Road (generally left in, left out only)
- Establishment and use of temporary ancillary facilities and access tracks during construction
- Property adjustments as required
- Clearance of unexploded ordinance (UXO) within the Defence Establishment Orchard Hills as required.

The Final Business Case review of the project by Infrastructure NSW has resulted in a number of ‘critical’ recommendations which need to be addressed prior to final funding approval.

A key recommendation was to reconsider all of the recommendations of the recent Value Engineering Study (April 2017) prior to finalising the detailed design and Final Business Case and implement those initiatives that are considered feasible.

The Value Engineering Study which reviewed the project identified the need for removing the Adams Road Bridge and replacing it with an at grade intersection. The outcomes of the Value Engineering Study were presented and subsequently agree with Roads and Maritime Sydney Development Committee.

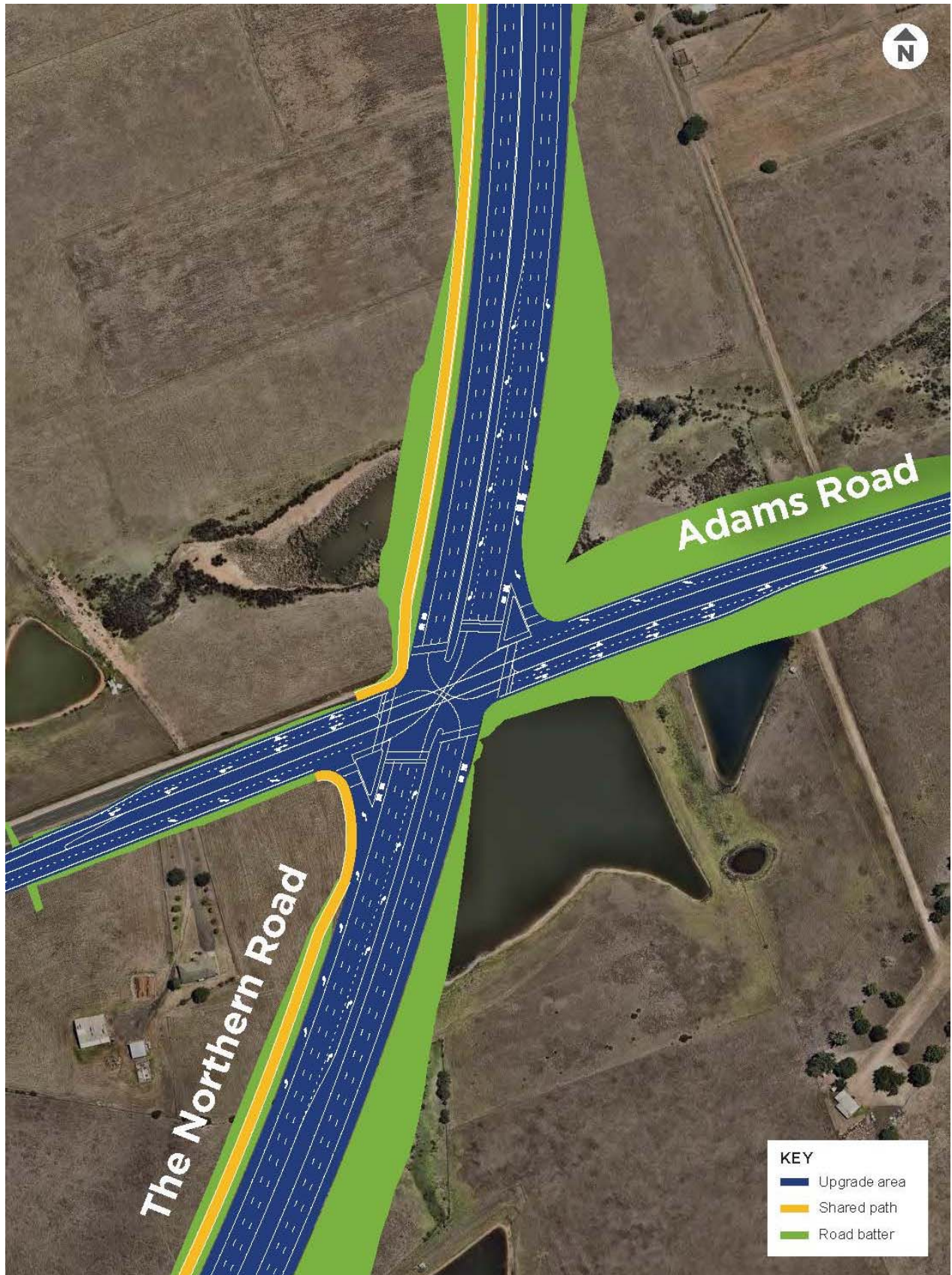
## 2. Purpose of this report

Detailed design has identified the opportunity to replace the proposed twin bridges over Adams Road with an at-grade intersection solution. Three options are being considered:

- Option 1 – a signalised intersection
- Option 2 – a left in/left out intersection (both sides)
- Option 3 – a left in/left out turn for Adams Road on the eastern side into The Northern Road and provision of a cul-de-sac on the western end of Adams Road.

The three options are shown on Figure 2-1 through Figure 2-6. For the purposes of a consistent comparison, a nominal assessment buffer has been applied to each intersection option.

The purpose of this report is to provide a comparative analysis of the options order to identify the suitability of the preferred option.



**Figure 2-1 Option 1 – Signalised intersection**



Figure 2-2 Option 2 – a left in/left out intersection (both sides)



**Figure 2-3 Option 3 – a left in/left out turn for Adams Road on the eastern side into The Northern Road and provision of a cul-de-sac on the western end of Adams Road**

### **3. Key issues and constraints**

A range of environmental, socio-economic and community issues and constraints have been considered for the intersection options. The consideration of these issues is based on the detailed assessments and community consultation that has been carried out for the Northern Road EIS / Draft EIS and subsequent SPIR and Final EIS. The existing environment relative to key issues are described below and then used as the basis of the comparative analysis provided in Table 4-1.

#### **3.1.1 Community and consultation**

Prior to and during preparation of the SPIR and Final EIS, consultation was carried out with the community, Federal, State and local government agencies, special interest groups and relevant industry stakeholders that have specific interest in the project. The purpose of community consultation has been to:

- Inform community members and stakeholders about the EIS / Draft EIS and concept design for The Northern Road upgrade between Mersey Road and Glenmore Parkway
- Seek comments and submissions from the community and stakeholders
- Continue to build a database of community members and stakeholders for Roads and Maritime to engage with through the development and delivery of the project.

To date, there has been no specific consultation regarding options for the Adams Road intersection. Roads and Maritime have committed to work with the community to ensure they are informed about the project and have opportunities to provide feedback to the project team.

Throughout development of the EIS / Draft EIS, key community issues related to the design of the project generally included:

- Concerns about property acquisition
- Impacts to businesses and property
- Traffic impacts such as travel times
- Construction related impacts
- Environmental concerns, specifically impacts from noise.

Likely community concerns regarding the options at Adams Road are considered throughout the options analysis provided in Table 4-1. Consultation with the community and stakeholders will be integral to the process of seeking approval for any modification to the project under Part 5.1 of the EP&A Act.

#### **3.1.2 Traffic, transport and functionality**

Adams Road is a rural collector road managed by Liverpool City Council. It is a two-lane undivided carriageway that runs between Elizabeth Drive and The Northern Road. The road is signposted at 70 km/h and is eight metres wide with unsealed shoulders. Adams Road provides access to a number of rural properties as well as some residential properties at the southern end near The Northern Road.

As a local road, Adams Road primarily serves an access function, carrying about 1,400 vehicles a day.

Traffic volumes on Adams Road derived from traffic surveys undertaken in 2014 and 2015 show that 134 vehicles use Adams Road in the AM peak and 161 vehicles in the PM peak.

A recent The Northern Road simulation traffic model based on optimised traffic signal settings at Adams Road (similar to Option 1 – a signalised intersection) was developed using Sidra forecast 2041 traffic volumes as shown in Table 3-1.

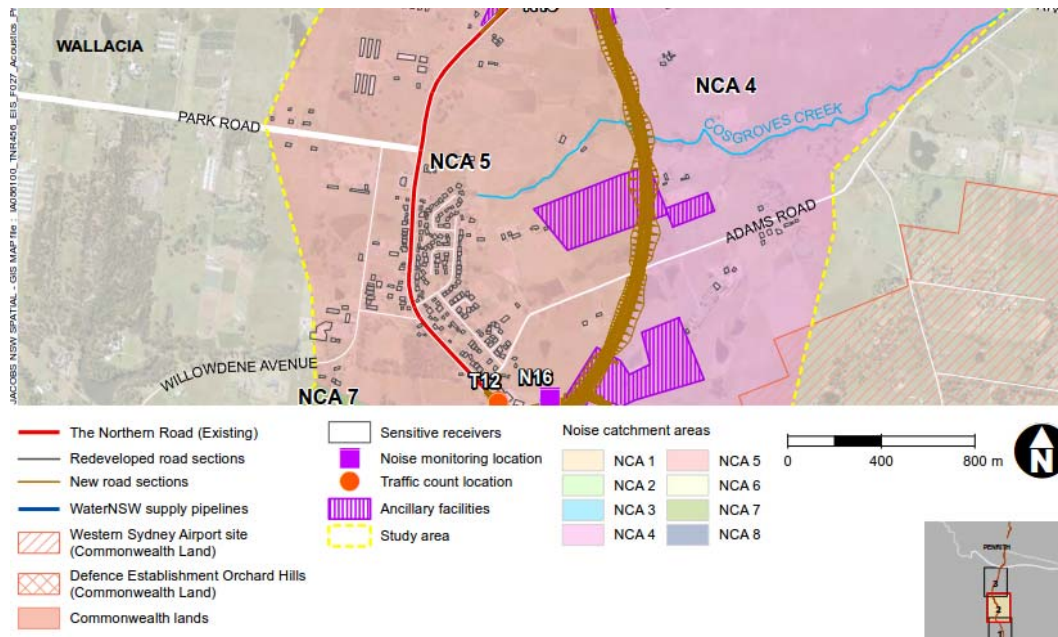
**Table 3-1 Forecast 2041 traffic volumes (vehicles/hr) based on an optimised traffic signal option with all movements for Adams Road**

Approach	Direction	2041 AM		2041 PM	
		Car	Truck	Car	Truck
Adams Road, east	Left	217	30	189	9
	Through	17	7	55	11
	Right	19	4	28	3
The Northern Road, north	Left	1	0	1	0
	Through	939	104	976	93
	Right	6	2	27	2
Adams Road, west	Left	106	0	40	1
	Through	57	7	28	2
	Right	5	0	9	0
The Northern Road, South	Left	0	1	1	0
	Through	961	49	1307	69
	Right	73	7	111	3

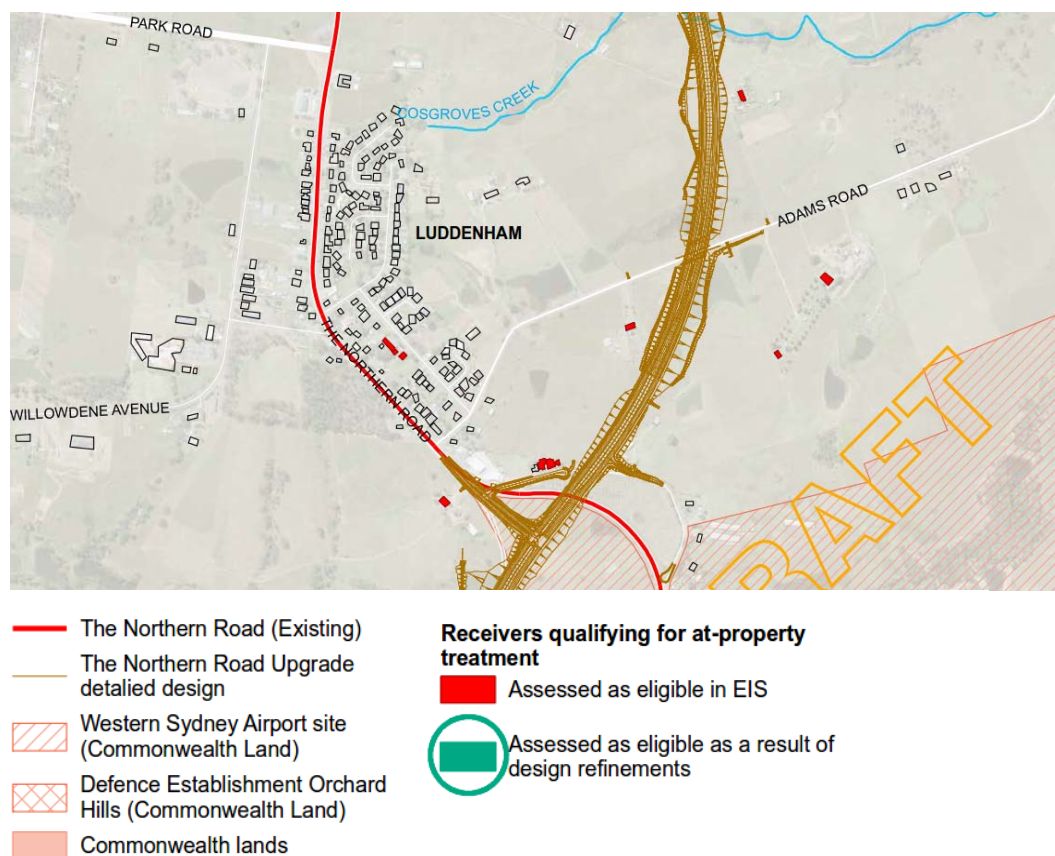
### 3.1.3 Noise and Vibration

The site is located within Noise Catchment Area (NCA) 4. A small number of rural residences are located to the north and south of the intersection near the proposed alignment at this location.

### TNR6 Adams Road intersection - Options Analysis



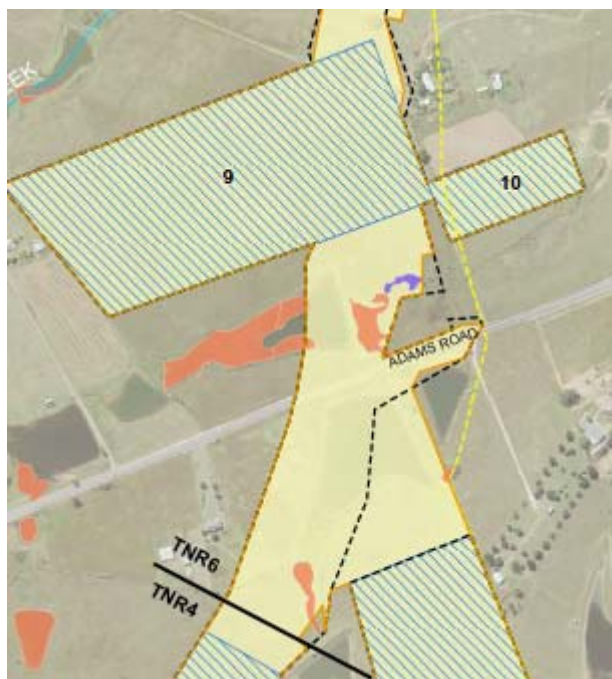
The SPIR / Final EIS identified receivers were qualified for consideration of noise mitigation as a result of the project. Of those 78 eligible receivers, several are located in proximity to Adams Road, as shown below.



### 3.1.4 Biodiversity

A number of plant community types and vegetation are located to the north of the intersection, including:

- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
- Forest Red Gum – Rough-barked apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion
- *Phragmites Australis* and *Typha orientalis* coastal freshwater wetlands of the Sydney Basin Bioregion.



River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

The SPIR / Final EIS did not identify any key fish habitat in proximity to Adams Road. Artificial dams, which are either first or second order streams, and are not considered key fish habitat and threatened species would be unlikely to be present within these dams.

### **3.1.5 Socio-economic and land use**

The proposed intersection is located in the Liverpool Local Government Area (LGA) and is zoned primary production. The town of Luddenham is located to the west of the proposed intersection. There are no businesses within the footprint of the intersection or immediately adjacent to the intersection.

A number of farm dams are located within the properties at this location. The introduction of an at-grade intersection would impact one additional dam, located in the south east corner of the intersection.

A nominal five metre construction buffer has been applied to each intersection option (see Figures 2-1 to 2-3) to compare the overall land take of each option and the number of properties that would be partially impacted by each option. The intersection options would require the following areas for construction:

- Option 1 – 12.58 ha (impact to 10 properties)
- Option 2 – 10.87 ha (impact to 9 properties)
- Option 3 – 10.80 ha (impact to 9 properties).

### **3.1.6 Hydrology and Flooding**

The proposed intersection is located within the Cosgroves Creek catchment.

The existing flooding behaviour of this catchment was described in the SPIR and Final EIS as follows:

Depths of ponding exceed 1 m in the various farms dams, flow in the various drainage lines between each water storage is generally relatively shallow for events up to 100 year ARI. There are also no existing dwellings that are presently impacted by flooding for events up to the PMF. High hazard flooding is generally confined to the farm dams and the incised reaches of the drainage system which are typically located downstream of the project corridor for events up to 100 year ARI.

A number of farm dams are located within the properties at this location. The introduction of an at-grade intersection would impact one additional dam, located in the south east corner of the intersection.

### **3.1.7 Soils, water and contamination**

The proposed intersection is located in an area identified in the SPIR and Final EIS as containing erosional and residual soils. It is located in an area of moderate to high soil salinity potential.

Cosgroves Creek is located north of the proposed intersection. This was identified as a sensitive receiving waterway in the EIS, with water quality controls to be optimised for the project in relation to identified sensitive receiving waterways.

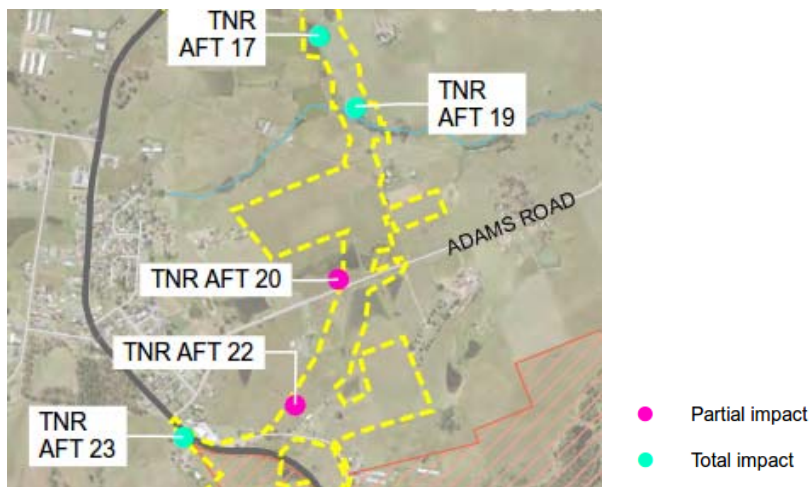
An area containing dumped tyres located to the south of the proposed intersection were identified in the SPIR and Final EIS as an area of environmental interest in relation to potential contamination. However, the assessment determined these to be of low exposure likelihood in relation to the project with contamination (if present) likely to be localised.

An asbestos walkover survey conducted by WSP Australia (WSP) in July 2017 identified areas within TNR Stage 6 alignment, which present a potential contamination risk including areas of asbestos (See **Attachment A**). None of the identified areas of potential asbestos were in proximity to Adams Road.

In general, the materials observed in the walkover in proximity to Adams Road were relatively inert (bricks, concrete, building rubble) and unlikely in themselves to present a significant health or environmental concern, however, these materials may be an indication of the presence of asbestos materials, particularly where subsurface fill material was observed or suspected.

### 3.1.8 Aboriginal heritage

One Aboriginal heritage site (TNR AFT 20) was identified in the SPIR and Final EIS at the location of the proposed intersection. It was assessed as being of moderate Aboriginal archaeological significance. The project as assessed to date (ie twin bridges over Adams Road at this location) identified partial impact to this item as a result of the project.



### 3.1.9 Non-Aboriginal heritage

There are no known non-Aboriginal heritage items identified in the SPIR and Final EIS at the location of the proposed intersection.

### 3.1.10 Landscape character and visual impacts

The area of the proposed section of the road was identified in the SPIR and Final EIS as Landscape Character Zone (LCZ) 4: Cosgroves Creek.

A viewpoint from Adams Road looking west towards the proposed intersection was assessed in the SPIR and Final EIS (viewpoint 6). The sensitivity of this viewpoint was assessed as high as it is situated in a rural environment on the outskirts of Luddenham where viewers would be sensitive to change. It is characterised by the rural landscape outlook, including a series of cascading farm dams along Cosgrove Creek.

## 4. Options analysis

To determine a preferred option, a multi-criteria analysis was used similar to that applied in the assessment of options for the project as outlined in the EIS. Table 4-1 summarises the outcomes of the assessment against the assessment criteria.

Table 4-1 Assessment of Adams Road intersection at grade options

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
<b>1 Support airport construction</b>						
Realignment of The Northern Road around the Western Sydney Airport site to allow construction and facilitation of a Western Sydney Airport at Badgerys Creek.	1A project delivery The length of the option (directly related to length of construction period)	10%	3 (0.03)	3 (0.03)	3 (0.03)	This is not applicable to any of the design options.
	1B Staging of construction Ability to stage construction to support the early development of a Western Sydney Airport at Badgerys Creek while still facilitating traffic flow along The Northern Road	10%	3 (0.03)	3 (0.03)	3 (0.03)	All options are located and can be constructed off The Northern Road mainline, leading to fewer traffic impacts and less traffic management.
			6 (0.06)	6 (0.06)	6 (0.06)	

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
<b>2 Land-use integration</b>						
<p>Development and demand – support the Western Sydney Airport, and land use change and residential growth; balancing functional, social, and environmental and value for money considerations</p> <p>Improve transport connections to the Western Sydney Airport site and surrounding developments including the SWPA.</p> <p>Realignment of The Northern Road around the Western Sydney Airport site to allow construction and facilitation of a Western Sydney Airport at Badgerys Creek.</p>	<p>2A Current development</p> <p>Impacts on current land use</p>	<b>6%</b>	3 (0.18)	4 (0.24)	4 (0.24)	<p>Option 1 would impact a larger area than the other options.</p> <p>Options 2 and 3 would impact similar land size</p>
	<p>2B Future development</p> <p>The opportunities to support the development of the WSPA and SWPA</p>	<b>6%</b>	3 (0.18)	3 (0.18)	3 (0.18)	<p>All options would form part of the overall upgrade of The Northern Road and support the development of the WSPA and SWPA.</p>
	<p>2C Airport connectivity</p> <p>The opportunities to provide road connections to the Western Sydney Airport site during construction and operation of an airport.</p>	<b>3%</b>	5 (0.15)	3 (0.09)	3 (0.09)	<p>All options would form part of the overall upgrade of The Northern Road and provide road connections to the Western Sydney Airport site during construction and operation of the airport. Option 1 would provide the greatest connectivity allowing all turning movements.</p>
			<b>11</b> <b>(0.51)</b>	<b>10</b> <b>(0.51)</b>	<b>10</b> <b>(0.51)</b>	<p><b>Option 1 scores the highest due to the greater opportunity to provide connectivity to the Western Sydney Airport.</b></p>

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
<b>3 Community</b>						
<p>Development and demand – support the Western Sydney Airport, and land use change and residential growth; balancing functional, social, and environmental and value for money considerations.</p> <p>Improve transport connections to the Western Sydney Airport site and surrounding developments including the SWPA.</p> <p>Customer focus – provide meaningful engagement with customers and stakeholders throughout the program life.</p>	<p>3A Property acquisition</p> <p>The number and size of private properties requiring total and partial acquisition.</p>	<b>7%</b>	3 (0.21)	4 (0.28)	4 (0.28)	Option 1 would impact one less property than the other options.
	<p>3B Impact on existing businesses</p> <p>Connectivity and access to existing businesses in Luddenham</p>	<b>4%</b>	5 (0.20)	3 (0.12)	3 (0.12)	Option 1 provides the greatest connectivity to Luddenham with all turning movements allowed.
	<p>3C Community preference</p> <p>Feedback from community consultation</p>	<b>4%</b>	5 (0.20)	3 (0.12)	3 (0.12)	Expected outcome, subject to community consultation.
			<b>13 (0.61)</b>	<b>10 (0.52)</b>	<b>10 (0.52)</b>	<b>Option 1 scores highest due to providing access to businesses in Luddenham. Consultation required to confirm community preferences.</b>

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
<b>4 Environment</b>						
Minimise environmental impacts	4A Traffic Impacts on traffic and access	3%	5 (0.15)	4 (0.12)	3 (0.09)	<p>Option 1 would provide the greatest level of access for Adams Road on both sides of The Northern Road and allow for right turns to be made to and from The Northern Road</p> <p>Option 2 would provide limited access to Adams Road on both eastern and western sides of The Northern Road. Traffic turning right to or from Adams Road would be required to travel further south to the intersection of The Northern Road and Old Northern Road, or further north to the intersection of Elizabeth Drive and The Northern Road.</p> <p>Option 3 would offer fewer access opportunities, with all traffic travelling to Adams Road west of the Northern Road required to travel further south to the intersection of The Northern Road and Old Northern Road.</p> <p>Both options 2 and 3 would preclude any crossing of The Northern Road at Adams Road for pedestrians and cyclists. Under Option 1, a staged pedestrian crossing would be provided on both northern and southern legs of the signalised intersection.</p>

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
	4B Noise and Vibration	3%	3 (0.09)	4 (0.12)	4 (0.12)	Operation of option 1 is likely to be slightly louder than the other options due to the nature of breaking and accelerating associated with signalised intersections.
	4C Biodiversity	3%	3 (0.09)	3 (0.09)	3 (0.09)	Options score the same as biodiversity assessments have not identified any sensitivities in the location of the intersection.
	4D Socio-economic	3%	5 (0.15)	3 (0.09)	4 (0.12)	All options score the same for construction impacts on amenity, local businesses, agriculture and employment. Option 1 scores highest overall due to preferred safety for pedestrians and cyclists associated with signalled crossing. Acquisition scored in 3A Access and connectivity scored in 4A
	4E EIS non-key issues (Flooding, soils, heritage)	3%	3 (0.09)	3 (0.09)	3 (0.09)	All options score the same as it is assumed that relevant criteria as outlined in the SPIR and Final EIS would be met for flooding, air quality and GHG. All options also perform the same for heritage impacts due to being restricted to the operational boundary and road reserves.

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
			19 (0.57)	17 (0.51)	17 (0.51)	<b>Option 1 performs best overall. Primarily due to better performance of traffic and active transport access.</b>
<b>5 Functionality</b>						
<p>Cater for future traffic demand to improve the flow of traffic to provide reliable journeys.</p> <p>Integrated network – provide road improvements to support and integrate with the broader transport network</p> <p>Connectivity to airport – provide a resilient connection to the Western Sydney Airport site for freight and people</p> <p>Cater for future traffic demand to improve the flow of traffic to provide reliable journeys.</p> <p>Connectivity to airport – provide a resilient connection to the Western Sydney Airport site for freight and people</p>	<p>5A Maintain arterial road function</p> <p>The ability to maintain a speed limit of 80 km/h, provide a safe road environment and length of road</p>	7%	3 (0.21)	4 (0.28)	4 (0.28)	<p>All options are designed to achieve an 80 km/h posted speed on the mainline of The Northern Road. During consultation, the community has indicated a preference for fewer intersections. Fewer connections means fewer decision points and potential conflict points, and provide for a safer road environment, with improved legibility for motorists.</p> <p>In addition to these impacts on the arterial road network, the provision for all movements at this intersection would undermine the local road function of Adams Road in the surrounding road hierarchy by allowing for vehicles travelling from Elizabeth Drive east to The Northern Road south via Adams Road rather than the arterial road network.</p> <p>Option 1 provides greater active transport provisions and safety.</p>
	<p>5B Future motorways connection</p> <p>The opportunities, costs and complexity of connections with</p>	7%	3 (0.21)	3 (0.21)	3 (0.21)	<p>All options would contribute to the overall upgrade of The Northern Road and would not affect its design in terms of accommodating the proposed M12</p>

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
Cater for future traffic demand to improve the flow of traffic to provide reliable journeys.	the proposed M12 Motorway, Outer Sydney Orbital (OSO) and Elizabeth Drive					Motorway, Outer Sydney Orbital and Elizabeth Drive connections with The Northern Road.
	5C Operation The maximum and average grade of road and other design parameters	6%	3 (0.18)	3 (0.18)	3 (0.18)	All options are designed to meet Roads and Maritime road design criteria and Austroads standards.
			9 (0.60)	10 (0.67)	10 (0.67)	<b>Options 2 and 3 score highest due to their ability to restrict traffic on Adams Road.</b>
<b>6 Relative cost/constructability</b>						
Development and demand – support the Western Sydney Airport, and land use change and residential growth; balancing functional, social, and environmental and value for money considerations	6A Cost/constructability	15%	4	5	5	While all options would perform similarly in the context of the overall construction cost of the TNR upgrade, Option 1 is likely to cost the most due to the requirement for infrastructure supporting the signals. Option 3 would cost the least due to less concrete required for slip lanes and intersection turning movements.
			4 (0.60)	5 (0.75)	5 (0.75)	<b>Options 2 and 3 performs best from a cost perspective.</b>



Memorandum

TNR6 Adams Road intersection - Options Analysis

WSIP/Project objective/Project assessment criteria	Assessment criteria	Weighting	Option 1	Option 2	Option 3	Commentary/Justification
TOTALS			62 (2.95)	58 (3.56)	61 (3.56)	

## 5. Preferred option

The TNR6 Adams Road intersection - Options Analysis provided above shows that:

- Option 1 scores highest overall unweighted due to:
  - 2C Airport connectivity – a signalised intersection would provide the greater opportunity to provide connectivity to the Western Sydney Airport due to allowing all turning movements
  - 3B Impact on existing businesses - Option 1 provides the greatest connectivity to Luddenham with all turning movements allowed
  - 3C Community preference, subject to community and stakeholder consultation
  - 4A Impacts on traffic and access - Option 1 would provide the greatest level of access for Adams Road and increased safety for pedestrian and cyclists
  - 4D Socio economic - Option 1 scores highest overall due to preferred safety for pedestrians and cyclists associated with signalled crossing.
- Option 2 and 3 score highest overall weighted due to:
  - Better maintaining arterial road function
  - Performing best from a cost perspective.