

# Mamre Road upgrade

## Kerrs Road to M4 Motorway

Roads and Maritime Services | November 2017





# Executive summary

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## Background

The NSW Government has started planning for a future upgrade of Mamre Road, between Kerrs Road and the M4 Motorway, to support economic and residential growth in this area.

The Mamre Road upgrade (the proposal) is part of a plan to progressively upgrade arterial roads in western Sydney to deliver a more efficient, reliable network that meets the future needs of the community and the economy. This includes the need to support Western Sydney Airport and the Western Sydney Priority Growth Area.

A 40 metre road corridor was dedicated for the upgrade of Mamre Road as a State Arterial Road in the 1950s. However, with the proposed M12 Motorway, which will run generally parallel to Elizabeth Drive, Mamre Road is now to be designated as a Primary Arterial Road. The proposed corridor width for Mamre Road as a Primary Arterial Road is 50 metres. Options for the 50 metre corridor and access have been developed and are currently being evaluated

## Purpose of this report

This report explains the option development and evaluation process for the proposal. The report aims to:

- explain the strategic context and need for the upgrade
- present relevant issues and constraints
- document community and stakeholder involvement
- describe the corridor options development and evaluation process
- present the favoured corridor option and related design options
- outline the next steps for proposal development.

## Need for the proposal

The proposal is consistent with a number of NSW Government policies and strategic plans including:

- NSW Government State Priorities (specifically the building infrastructure priority)
- A Plan for Growing Sydney (NSW Government, 2014)
- NSW Long Term Transport Master Plan (NSW Government, 2012)
- *NSW Freight and Ports Strategy* (NSW Government, 2013)
- *NSW Road Safety Strategy 2012-2021* (Transport for NSW, 2012)

The proposal is needed to address existing congestion and forecast future demand. Forecast traffic volumes are as follows:

- 15,000 vehicles/day in 2015
- 19,000 vehicles/day in 2026
- 25,000 vehicles/day in 2036.

The existing two-lane Mamre Road currently experiences congestion and has a Level of Service (LoS)<sup>1</sup> of C at present. Modelling indicates that without future upgrade conditions would deteriorate

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<sup>1</sup> Level of Service is a qualitative assessment of the effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to manoeuvre. There are six levels of service with A indicating the best performance and F indicating the worst performance.

and the existing two-lane road would provide a LoS of C to D in 2026 and a LoS of E to F in 2036. In contrast, an upgraded four-lane divided road would improve conditions resulting in a LoS of B in 2026 and a LoS of C in 2036.

Safety is a further issue that underpins the need for the proposal. In the period July 2010 to June 2014 there were 175 crashes on the section of Mamre Road between the M4 Motorway and Kerrs Road. Of these, 87 were non-casualty crashes, 87 were injury crashes (involving injuries to 118 people) and one was a fatal crash. It is likely that without improvements, increased traffic volumes and congestion would see safety deteriorate along Mamre Road for all road users.

## Proposal objectives

The proposal objectives are to:

- meet the future transport demand associated with the Western Sydney Priority Growth Area and the Western Sydney Airport at Badgerys Creek
- reduce future road transport costs by improving corridor performance
- improve liveability and sustainability and support economic growth and productivity by providing road capacity for projected freight and general traffic volumes
- improve road safety in line with the NSW Road Safety Strategy 2012-2021
- improve quality of service, sustainability and livability by providing facilities for walking and cycling and future public transport needs
- deliver good urban design outcomes
- minimise environmental and community impacts.

## Issues and constraints

The main potential environmental issues associated with the proposal are:

- potential for direct and indirect (visual / setting) impacts on items of historic heritage, including the State Heritage Register listed 'Mamre' at the northern extent of the proposal corridor
- presence of a high density of Aboriginal sites and areas of archaeological potential in parts of the proposal corridor
- potential impacts on threatened ecological communities listed under the *Biodiversity Conservation Act 2016* (BC Act) and the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act)
- potential for direct impacts on Key Fish Habitat (associated with Kemps Creek and South Creek)
- potential impacts on existing surface flow patterns
- presence of flood affected lands
- potential for erosion and sedimentation during construction
- potential for air quality impacts during construction and operation
- construction and operational noise impacts on noise-sensitive receivers
- impacts on landscape character and moderate / high value views
- positive socio-economic effects associated with improved access to jobs and more efficient movement of freight
- negative socio-economic effects associated with property acquisition and construction related disturbance
- presence of utilities including Water NSW pipelines, overhead transmission lines, sewer pipelines and optic fibre.

## Options considered

The first step in the option development process involved determining the appropriate typical cross section for the project. Corridor widening options were then developed. This was an iterative process involving a number of inputs, including preliminary environmental investigations, property impacts, utility impacts, road design requirements, key stakeholder inputs and technical workshops including a Constructability Workshop. Following development of the corridor widening options a number of location specific design sub-options, relating to intersections and access, were developed for evaluation.

The proposal requires a 50 metre road corridor along Mamre Road. From Luddenham Road to M4 Motorway the corridor is already 50 metres wide and from the Water NSW pipelines (near Bakers Lane) to Luddenham Road there is already established industrial and residential development on the eastern side of Mamre Road which represents a major constraint to any eastern corridor widening in that area. As a result, corridor widening options were only developed for the section of Mamre Road between Kerrs Road to the Water NSW pipelines, where there is rural land or open space on both sides of Mamre Road with the potential to widen on either side.

An eastern option and a western option for widening the Mamre Road corridor between Kerrs Road to the Water NSW pipelines from 40 metres to 50 metres were developed.

Intersection sub-options were developed for the following locations:

- midblock U-turn facility between Abbots Road and Bakers Lane
- Bakers Lane
- Mandalong Close
- McIntyre Avenue.

## Options evaluation

Widening of the corridor on the western side of Mamre Road is favoured for the following reasons:

- it would be consistent with widening on the western side north of the Water NSW pipelines
- it would provide a better sequence for construction of drainage. Because the northbound carriageway would be constructed first, the downstream sections of the cross drainage structures and associated downstream channels could be constructed first, thus minimising potential flooding problems during construction
- it would not impact on a dam on the eastern side Mamre Road, about one kilometre north of Abbots Road
- the eastern and western corridor widening options would involve comparable levels of property acquisition
- there were no key environmental issues that differentiated the two corridor widening options.

The recommended option is an upgrade of Mamre Road to a four lane divided road between Kerrs Road and the M4 Motorway. It includes the following access arrangements:

- four-way intersection with traffic lights at Abbots Road with the new fourth intersection leg used as a U-turn facility
- u-turn facility with traffic lights midway between Abbots Road and Bakers Lane. The U-turn facility would use a stub for a new intersection
- four-way intersection with traffic lights at Bakers Lane. The western intersection leg would include a U-turn facility. The Southern Link Road proposed by the Department of Planning and Environment that runs parallel to and south of Bakers Lane could be aligned to connect to the proposed intersection at Bakers Lane
- four-way intersection with traffic lights at James Erskine Drive with a new fourth intersection leg on the western side to provide access to future industrial developments on the western side of Mamre Road

- T-junction with traffic lights at Erskine Park Drive
- left in, left out only T-junction at Mandalong Close
- left in, left out only T-junction at McIntyre Avenue
- T-junction with traffic lights at Luddenham Road with a U-turn arrangement via a road around the Erskine Park Rural Fire Brigade property
- four-way intersection with traffic lights at Solander Drive with a new fourth intersection leg to provide access to Department of Planning and Environment land on the western side of Mamre Road for future development
- four-way intersection with traffic lights at Banks Drive with a new fourth intersection leg to provide access to the Mamre property.

## Community and stakeholder consultation

In May 2017, Roads and Maritime released a community update announcing the start of early planning for the proposal. The update was distributed to 6,000 residents and businesses and was placed on the Roads and Maritime website.

Roads and Maritime now proposes to seek comment on the recommended corridor alignment via display of this options report and community information sessions.

## Next steps

Following public exhibition of the recommended option, Roads and Maritime will consider community submissions, make changes where necessary and then confirm the preferred option. Subject to the availability of funding, this will be followed by development of a concept design and environmental assessment.

Roads and Maritime will continue stakeholder and community consultation during the next stages of the project. The Roads and Maritime website will be periodically updated with information about the progress of the proposal.

# Contents

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<b>1</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Background .....	1
1.2	Proposal objectives .....	5
1.3	Report purpose and structure .....	5
<b>2</b>	<b>Need for the proposal .....</b>	<b>6</b>
2.1	Strategic planning context .....	6
2.2	Road network conditions .....	7
<b>3</b>	<b>Issues and constraints .....</b>	<b>9</b>
3.1	Geology and soils .....	9
3.2	Hydrology and flooding .....	9
3.3	Biodiversity .....	9
3.4	Noise and vibration .....	12
3.5	Air quality .....	12
3.6	Socio-economic and land use .....	12
3.7	Landscape character and visual amenity .....	12
3.8	Aboriginal heritage .....	13
3.9	Non-Aboriginal Heritage .....	13
3.10	Utilities .....	15
<b>4</b>	<b>Community and stakeholder engagement .....</b>	<b>16</b>
4.1	Community involvement .....	16
4.2	Government agency and council involvement .....	16
4.3	Future community and stakeholder involvement .....	16
<b>5</b>	<b>Options development .....</b>	<b>17</b>
5.1	Approach to option development .....	17
5.2	Typical cross section .....	17
5.3	Corridor widening options .....	18
5.4	Intersections and other sub-options .....	22
<b>6</b>	<b>Options evaluation .....</b>	<b>34</b>
6.1	Options evaluation process .....	34
6.2	Options evaluation outcomes .....	35
6.3	Recommended option for consultation .....	36
<b>7</b>	<b>Conclusion and next steps .....</b>	<b>44</b>
	<b>References .....</b>	<b>45</b>

## Tables

Table 3-1 Historic heritage items in the study area.....	13
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## Figures

Figure 1-1 Location of the proposal.....	2
Figure 1-2 Images of the proposal corridor .....	3
Figure 1-3 Western Sydney Employment and Priority Growth Areas.....	4
Figure 3-1 Vegetation communities and waterways .....	11
Figure 3-2 Historic heritage .....	14
Figure 5-1 Typical cross section .....	17
Figure 5-4 Corridor widening options – Map 1 .....	19
Figure 5-5 Corridor widening options – Map 2 .....	20
Figure 5-4 Corridor widening options – Map 2 .....	21
Figure 5-5 Mid-block U-turn facility Option 1 .....	23
Figure 5-6 Mid-block U-turn facility Option 2 .....	24
Figure 5-7 Mid-block U-turn facility Option 3.....	25
Figure 5-8 Bakers Lane intersection Option 1 .....	27
Figure 5-9 Bakers Lane intersection Option 2.....	28
Figure 5-10 Bakers Lane intersection Option 3.....	29
Figure 5-11 McIntyre Close intersection Option 1 .....	31
Figure 5-12 McIntyre Close intersection Option 2 .....	32
Figure 5-13 McIntyre Close intersection Option 3.....	33
Figure 6-1 Option evaluation process .....	34
Figure 6-2 Recommended option – Map 1 .....	37
Figure 6-3 Recommended option – Map 2.....	38
Figure 6-4 Recommended option – Map 3.....	39
Figure 6-5 Recommended option – Map 4.....	40
Figure 6-6 Recommended option – Map 5.....	41
Figure 6-7 Recommended option – Map 6.....	42
Figure 6-8 Recommended option – Map 7.....	43
Figure 7-1 Next steps.....	44

## Appendices

Appendix A Community Update May 2017	
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# 1 Introduction

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## 1.1 Background

The NSW Government has started planning for a future upgrade of Mamre Road, between Kerrs Road and the M4 Motorway, to support economic and residential growth in this area.

The Mamre Road Upgrade (the proposal) is part of a plan to progressively upgrade a number of major arterial roads in western Sydney to deliver a more efficient, reliable network that meets the future needs of the community and the economy. The proposal is located within the Penrith local government area and within the suburbs of Kemps Creek, Mount Vernon, Erskine Park, Orchard Hills, St Clair and St Marys.

Mamre Road (Main Road 536) is a State Road connecting Elizabeth Drive in the south to the M4 Motorway and Great Western Highway in the north. Mamre Road between Elizabeth Drive and M4 Motorway is currently a two-lane undivided road. South of the Water NSW pipelines near Bakers Lane, Mamre Road passes through a semi-rural environment. North of the pipelines, the western side of Mamre Road is largely semi-rural except for the recently re-zoned Mamre West Precinct currently under development and on the eastern side is the Western Sydney Employment Area of Erskine Park and the residential area of St Clair further north. The following roads connect with the proposal corridor:

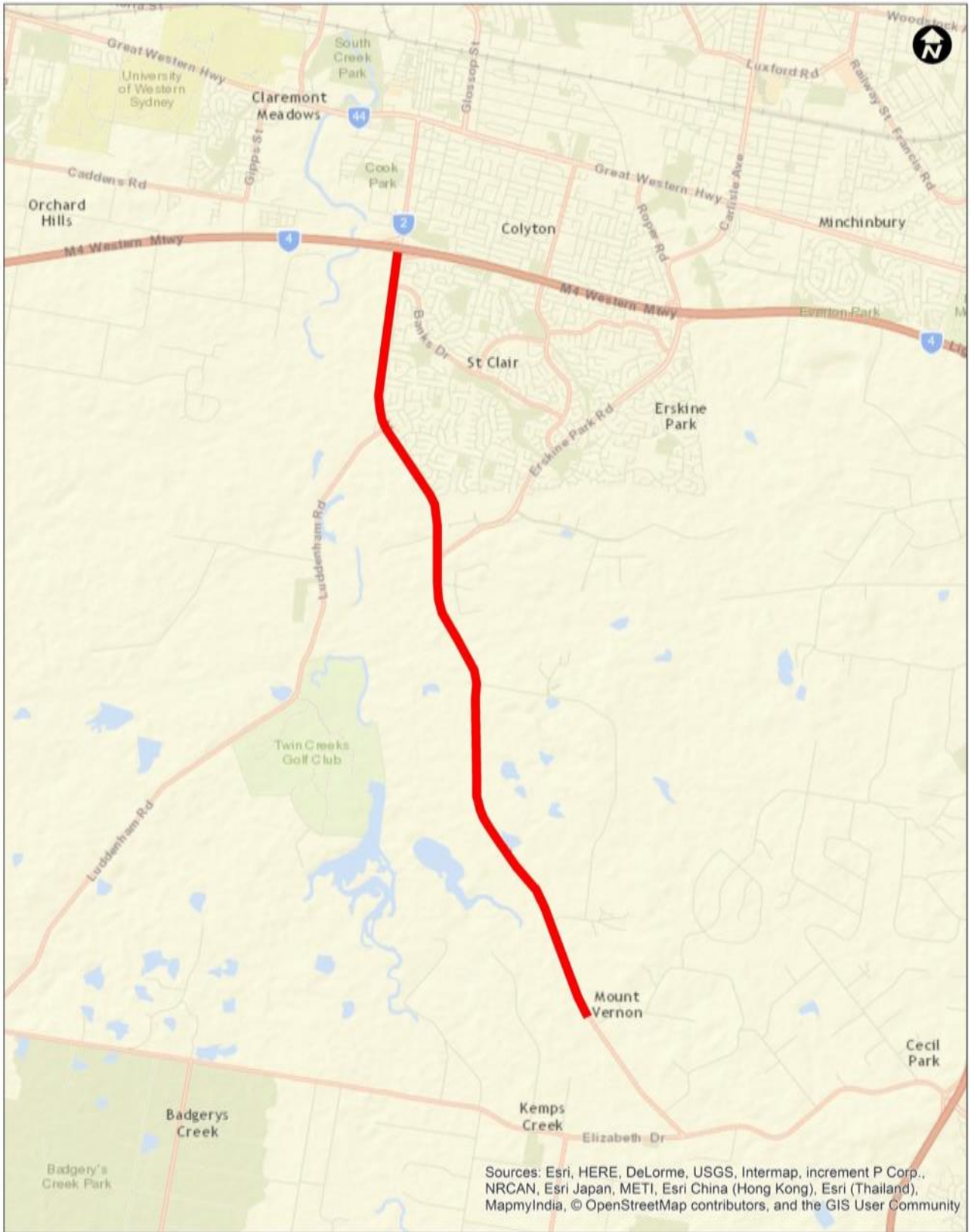
- Kerrs Road – T-intersection (no traffic lights)
- Abbots Road – T-intersection (no traffic lights)
- Bakers Lane – four-way intersection (with traffic lights except for the western leg)
- James Erskine Drive – signalised T-intersection, with a single right-turn lane from Mamre Road, northbound, into James Erskine Drive
- Erskine Park Road – T-intersection with traffic lights, with dual right-turn lanes from Mamre Road, northbound, into Erskine Park Road
- McIntyre Avenue – T-intersection (no traffic lights)
- Luddenham Road – seagull configuration intersection (no traffic lights)
- Solander Drive – T-intersection (no traffic lights)
- Banks Drive – T-intersection with traffic lights
- M4 Motorway – grade separated interchange catering for all movements.

The NSW Government is investigating opportunities for new jobs, homes and services around the planned Western Sydney Airport. The Department of Planning and Environment has identified a new Western Sydney Priority Growth Area (WSPGA), which will provide local people with better access to jobs within and around the airport, as well as infrastructure and services for local residents.

Mamre Road passes through the WSPGA, which extends from Elizabeth Drive to Luddenham Road on the western side and from Kerrs Road to the Water NSW pipelines on the eastern side. In the context of these developments, there is a need to plan for the future upgrade and widening of Mamre Road to four lanes to facilitate expected increased traffic in the area.

A 40 metre road corridor was dedicated for the upgrade of Mamre Road as a State Arterial Road in the 1950s. However, with the proposed M12 Motorway, which will run parallel to Elizabeth Drive, Mamre Road is to be designated as a Primary Arterial Road. The proposed corridor width for Mamre Road as a Primary Arterial Road is 50 metres. Options for the 50 metre corridor and access have been developed and are currently being evaluated

Figure 1-1 shows the location of the proposal, Figure 1-2 shows selected images of the proposal corridor while Figure 1-3 shows the WSPGA and Western Sydney Employment Area.



— Proposal Location



Figure 1-1 Location of the proposal



View south, central section of proposal



View south to Erskine Business Park



View south from south of Erskine Park Road



View to 'Mamre'



Entrance to "Mamre"



View north to M4 Motorway interchange

Figure 1-2 Images of the proposal corridor

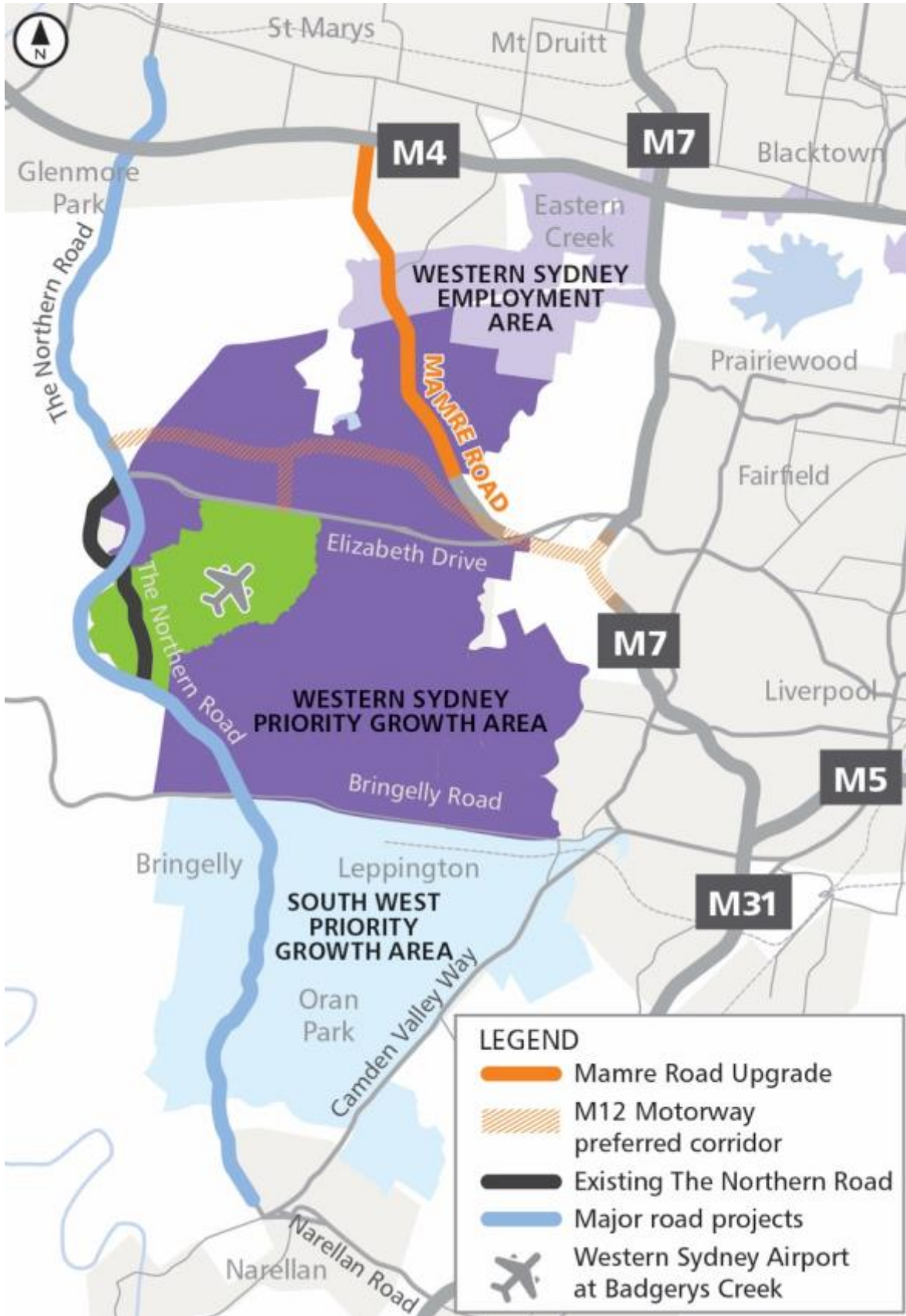


Figure 1-3 Western Sydney Employment and Priority Growth Areas

Source: Department of Planning and Environment

## 1.2 Proposal objectives

The proposal objectives are to:

- meet the future transport demand associated with the Western Sydney Priority Growth Area and the Western Sydney Airport at Badgerys Creek
- reduce future road transport costs by improving corridor performance
- improve livability and sustainability and support economic growth and productivity by providing road capacity for projected freight and general traffic volumes
- improve road safety in line with the NSW Road Safety Strategy 2012-2021
- improve quality of service, sustainability and livability by providing facilities for walking and cycling and future public transport needs
- deliver good urban design outcomes
- minimise environmental and community impacts.

## 1.3 Report purpose and structure

This report explains the option development and evaluation process for the proposal. The report aims to:

- explain the strategic context and need for the upgrade
- present relevant issues and constraints
- document community and stakeholder involvement
- describe the corridor options development and evaluation process
- present the favoured corridor option and related design options
- outline the next steps for proposal development.

## 2 Need for the proposal

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### 2.1 Strategic planning context

The following major strategic planning and policy documents provide direction and establish priorities that are relevant to the proposal.

#### 2.1.1 NSW State Priorities

The NSW Government has set State Priorities in the following five groups:

- Strong budget and economy
- Building infrastructure
- Protecting the vulnerable
- Better services
- Safer communities.

Within the building infrastructure category, the proposal would specifically contribute to the priority of improving road travel reliability by aiming to ensure that 90 per cent of peak travel on key road routes is on time.

The Premier has also set twelve priorities one of which is ensuring that key infrastructure projects are delivered on time and on budget across the State.

#### 2.1.2 A plan for growing Sydney

*A Plan for Growing Sydney* (NSW Government, 2014) sets out the NSW Government's strategy for accommodating Sydney's future population growth over the next 20 years. The plan consists of goals, directions and actions that provide a framework for strengthening the global competitiveness of Sydney and delivering strong investment and jobs growth in western Sydney.

The proposal is consistent with the Strategic Direction 1.1 Deliver Infrastructure. At a broader level, the proposal would contribute to improved connections to and between Sydney's growth centres including:

- Western Sydney Priority Growth Area
- Penrith and Blacktown urban corridor
- Western Sydney Employment Area
- A planned western Sydney airport.

#### 2.1.3 NSW Long Term Transport Master Plan

The *NSW Long Term Transport Master Plan* (NSW Government, 2012) provides a framework for delivering an integrated, modern transport system by identifying NSW's transport actions and investment priorities for the next 20 years.

Section 5.6 of the plan includes an action to identify and address pinch points as growth occurs and specifically identifies Mamre Road from St Marys to Kemps Creek as a corridor for future investigation.

The plan also includes a specific action to provide faster and more frequent transport services to major employment centres. This proposal would support this action.

The proposal is also consistent with the nominated objective of the NSW transport system to support economic growth and productivity. It would do this by contributing to a transport system that responds directly to customer needs, is more efficient, increases freight efficiency and improves the connectivity and accessibility of people to other people, opportunities, goods and services.

## 2.1.4 NSW Ports and Freight Strategy

The *NSW Freight and Ports Strategy* (NSW Government, 2013) targets specific challenges associated with the forecast doubling of the NSW freight task by 2031. Providing a network that minimises congestion will support economic growth and productivity and encourage regional development. In this context the strategy identifies the need to develop and maintain capacity for freight on the road network. The proposal provides an opportunity to respond to this need.

Mamre Road is not classified as a primary, secondary or tertiary freight route but is an approved 25/26 metre B-Double Route and provides important connections to the M4 Motorway (a primary freight route) Elizabeth Drive (a tertiary freight route) and Erskine Park Road (a tertiary freight route).

Objectives of the *NSW Freight and Ports Strategy* relevant to the proposal include:

- Delivery of a freight network that efficiently supports the projected growth of the NSW economy.
- Balancing freight needs with those of the broader community and the environment.

Actions of the strategy and task actions relevant to the proposal include:

- Action 1D - Improve productivity of the road freight network
  - Task 1D-2 Provide necessary infrastructure to support High Productivity Vehicle access
  - Task 1D-3 Improve access for High Productivity Vehicles on State and local roads
- Action 2B – Develop and maintain capacity for freight on the road network
  - Task 2B-2 Prioritise road infrastructure investments
- Action 3B – Manage congestion, noise and emission impacts of freight transport
  - Task 3B-1 Recognise costs of congestion
  - Task 3B-2 Mitigate noise from freight operations
  - Task 3B-3 Mitigate emissions from freight operations
- Action 3C – Prioritise safety of freight transport
  - Task 3C-2 Improve heavy vehicle safety.

The proposal is considered consistent with the objectives, actions and tasks referenced above. It would reduce congestion on a road with connections to primary freight and tertiary freight routes route and includes design features that would better accommodate heavy vehicles such as 26 metre and 30 metre B-doubles and which would enhance safety for all road users.

## 2.1.5 NSW Road Safety Strategy

The *NSW Road Safety Strategy 2012-2021* (Transport for NSW, 2012) establishes the direction of road safety in NSW for 10 years from 2012. It supports a targeted reduction in the annual number of fatalities and serious injuries by at least 30 per cent by the end of 2021.

The strategy places particular importance on the design of safe roads and roadsides and recognises that the ongoing development and upgrade of the NSW road network is essential to improve road safety. The proposal is consistent with this direction and provides an opportunity to improve road safety through the design development process.

## 2.2 Road network conditions

### 2.2.1 Existing traffic and forecast volumes and congestion

Traffic modelling conducted previously to assess road network requirements with the full development of Western Sydney Employment Area identified the need to upgrade Mamre Road to

four lanes between M4 Motorway and James Erskine Drive. Forecast traffic volumes are as follows:

- 15,000 vehicles/day in 2015 (for a 2-lane Mamre Road)
- 19,000 vehicles/day in 2026 (for a 2-lane Mamre Road)
- 25,000 vehicles/day in 2036 (for a 2-lane Mamre Road)

The existing 2-lane Mamre Road has a Level of Service (LoS)<sup>2</sup> of C at present. Modelling indicates that without future upgrade the existing 2-lane road would provide a LoS of C to D in 2026 and a LoS of E to F in 2036. In contrast, an upgraded 4-lane divided road would have a LoS of B in 2026 and a LoS of C in 2036.

## 2.2.2 Road safety

In the period 1 Jan 2012 to 31 Dec 2016 there were 118 crashes on the section of Mamre Road between the M4 Motorway and Kerrs Road. Of these 50 were non-casualty crashes, 67 were injury crashes (involving injuries to 98 people) and one was a fatal crash.

It is likely that without improvements, increased traffic volumes and congestion would see safety deteriorate along Mamre Road for all road users.

## 2.2.3 Link between M4 Motorway and proposed M12 Motorway

As the Western Sydney develops there will be a greater need for commercial and industrial vehicles to have better access to major motorways to and from Western Sydney Priority Growth Area and Western Sydney Employment Area. Upgrading Mamre Road would provide this link. At the northern end, the M4 Smart Motorway project will be enhancing the connection to M4 Motorway and at the southern end M12/Mamre Road interchange will be making provision for a high standard connection to M12 Motorway.

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<sup>2</sup> Level of Service is a qualitative assessment of the effect of factors such as speed, volume of traffic, geometric features, traffic interruptions, delays and freedom to manoeuvre. There are six levels of service with A indicating the best performance and F indicating the worst performance.



## 3 Issues and constraints

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A range of investigations have occurred to support the proposal design development and option evaluation processes. These include a preliminary environmental investigation, traffic modelling / analysis and preliminary utilities investigations. The following sections provide an overview of the main issues and constraints identified for the proposal.

### 3.1 Geology and soils

The soils of the study area have some potential for erosion, although soil erodibility is generally low. Most of the study area is within the Blacktown soil landscape where no appreciable erosion occurs, however there is a risk of further stream bank erosion within the South Creek soil landscape (Bannerman & Hazelton, 1990).

While most of the study area has a moderate salinity potential, a small area at the southern extent has been identified as having a high salinity potential (Kemps Creek and immediately adjacent areas).

A search (3 December 2015) of the NSW Environment Protection Authority (EPA) contaminated land record of notices and the list of NSW contaminated sites notified to EPA (as at 27 October 2015) identified no sites within the proposal corridor.

There is potential for the coal tar to be present in existing pavements (most likely as a subsurface layer). Coal tar is high in a range of chemicals of concern including total polyaromatic hydrocarbons (PAHs), phenols and benzo-a-pyrene. Between about 1973 and 1977 coal tar was commonly used as a binder instead of bitumen in asphalt mixes, particularly in the Sydney and Newcastle areas and continued to be used in roads in very small quantities up until about 1989 (Roads and Maritime Services, 2015).

Other potential sources of contamination include agricultural activities (pesticide and fuel storage). Areas of uncontrolled fill and residual spills from traffic incidents may also be present within the study area, although specific locations have not been identified as part of the current investigation.

### 3.2 Hydrology and flooding

The proposal corridor is located in the South Creek / Kemps Creek catchment, which is part of the Hawkesbury-Nepean system. Mamre Road crosses (on culverts) tributaries of these two creeks at several locations.

Parts of the proposal corridor are affected by the 20-year, 100-year and probable maximum floods (Worley Parsons, 2015). The 100 year flood would cross Mamre Road at the following locations:

- About 400 m north of Erskine Park Road
- McIntyre Avenue to Luddenham Road
- Banks Road.

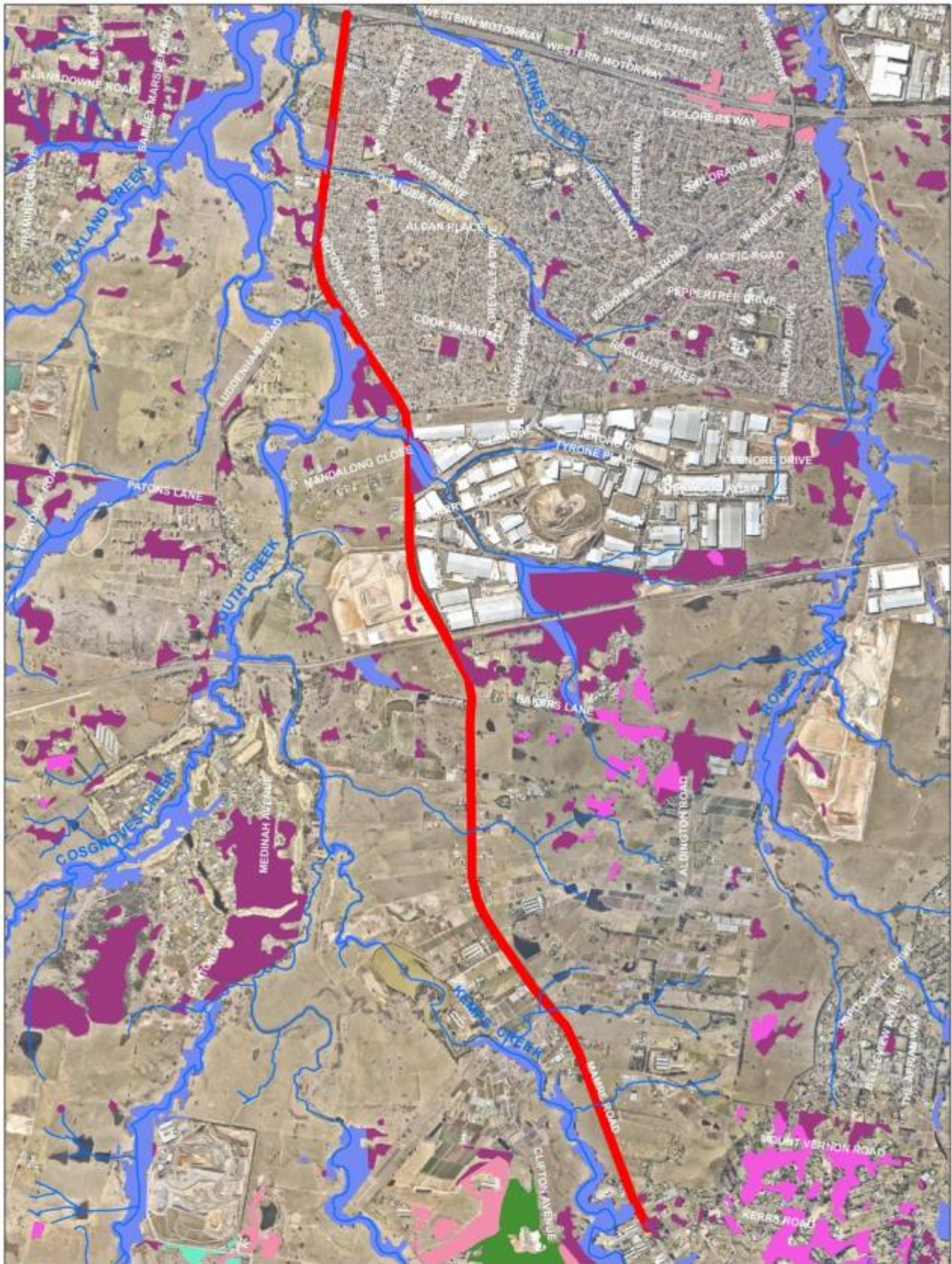
### 3.3 Biodiversity

The main biodiversity issues identified for the proposal corridor are (refer also to Figure 3-1):

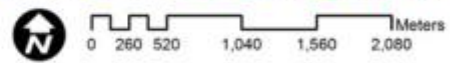
- Potential impacts on *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) threatened ecological communities (Cumberland Plain Woodland, River-flat eucalypt forest)
- Possible occurrence of BC Act and EPBC Act threatened fauna species and migratory species (or their habitats). The remnant patches of woodland within the study area would offer foraging

and breeding opportunities for woodland birds, small and medium sized mammals, arboreal mammals, small reptiles and the Cumberland Plain Land Snail (*Meridolum corneovirens*)

- Identified key fish habitat (Kemps Creek and South Creek).



Imagery: Nearmap (taken 9/9/2017)  
 Data: Office of Environment and Heritage (2013)



- Watercourses
- 10 - Shale Plains Woodland
- 103 - Shale/Gravel Transition Forest
- 11 - Alluvial Woodland
- 3 - Cooks River Castlereagh Ironbark Forest
- 6 - Castlereagh Scribbly Gum Woodland
- 9 - Shale Hills Woodland
- Proposal Location

Figure 3-1 Vegetation communities and waterways

### 3.4 Noise and vibration

The main noise sensitive receivers are large lot / rural residential dwellings (which are zoned E4 – Environmental Living, RU2 – Rural Landscape, RU4 Primary Production Small Lots) and the residential area of St Clair (zoned R2 – Low Density Residential).

Banks Public School is located within St Clair on the northern edge of the study area and is set back about 200 metres from the Mamre Road corridor. Several schools are also located off Bakers Lane in the central part of the study area, at a distance of about 300 metres from Mamre Road.

The dominant noise source in the study area is road traffic noise. Changes to the receiving environment and to noise sources are expected to occur with the development of the Western Sydney Priority Growth Area and the Western Sydney Airport.

Construction noise would be primarily a construction management issue for the proposal. Potential changes in operational road traffic noise as a result of changes in traffic volumes and/or road geometry are a consideration for the environmental assessment phase.

### 3.5 Air quality

A road upgrade within the proposal corridor could result in air quality impacts during both construction and operation. Construction air quality would be primarily a construction management issue for the proposal. Potential changes in air quality during operation as a result of changes in traffic volumes and/or road geometry are a consideration for the environmental assessment phase.

### 3.6 Socio-economic and land use

Social infrastructure within the study area includes schools within St Clair and off Bakers Lane. The nearby St Marys area provides additional services including schools, medical services, recreational facilities, places of worship, and community centres.

The following potential socio-economic benefits are anticipated as a result of improving Mamre Road:

- travel time improvements from higher travel speeds and less congestion. This would also lead to operational cost savings for business and individuals
- reducing the frequency and severity of crashes and more broadly improving road user safety
- economic benefits over the construction period.

The following potential socio-economic impacts could occur as a result of the proposal:

- disruption associated with property acquisition
- congestion and delays during construction associated with lane occupancy and road work speed limits. This would potentially affect both buses and general traffic
- residential amenity impacts such as noise and visual amenity.

### 3.7 Landscape character and visual amenity

The landscape character and visual setting within the study area is strongly influenced by the rural lands, stands of native vegetation, the road network, and the Kemps Creek and South Creek riparian corridors. The northern part of the study area sees a transition to a more urban character, first with the Erskine Park Industrial Estate and then with the suburb of St Clair.

During field investigations important views extending for some distance over the primary production lands and the Kemps Creek and South Creek corridors were noted. These views would be mainly available to road users.

Any proposal within the study area could see changes to the landscape including tree removal and the introduction of new embankments and structures (with a corresponding moderate / high level of

visual effect). This would occur within some landscapes of moderate-high visual sensitivity. Accordingly, there is the potential need for landscape character and visual impacts to be addressed as part of the design development and detailed environmental assessment process.

### 3.8 Aboriginal heritage

Much of this study area is heavily disturbed reducing the potential for Aboriginal objects to be found. Remaining archaeological potential is expected to be greatest along creek lines (Kemps Creek and South Creek). While a search of the Aboriginal Heritage Information Management System (AHIMS) identified 46 Aboriginal sites in the broader area, these known sites would not be affected by the proposal. More detailed consideration of Aboriginal cultural heritage would need to occur at the environmental assessment phase.

### 3.9 Non-Aboriginal Heritage

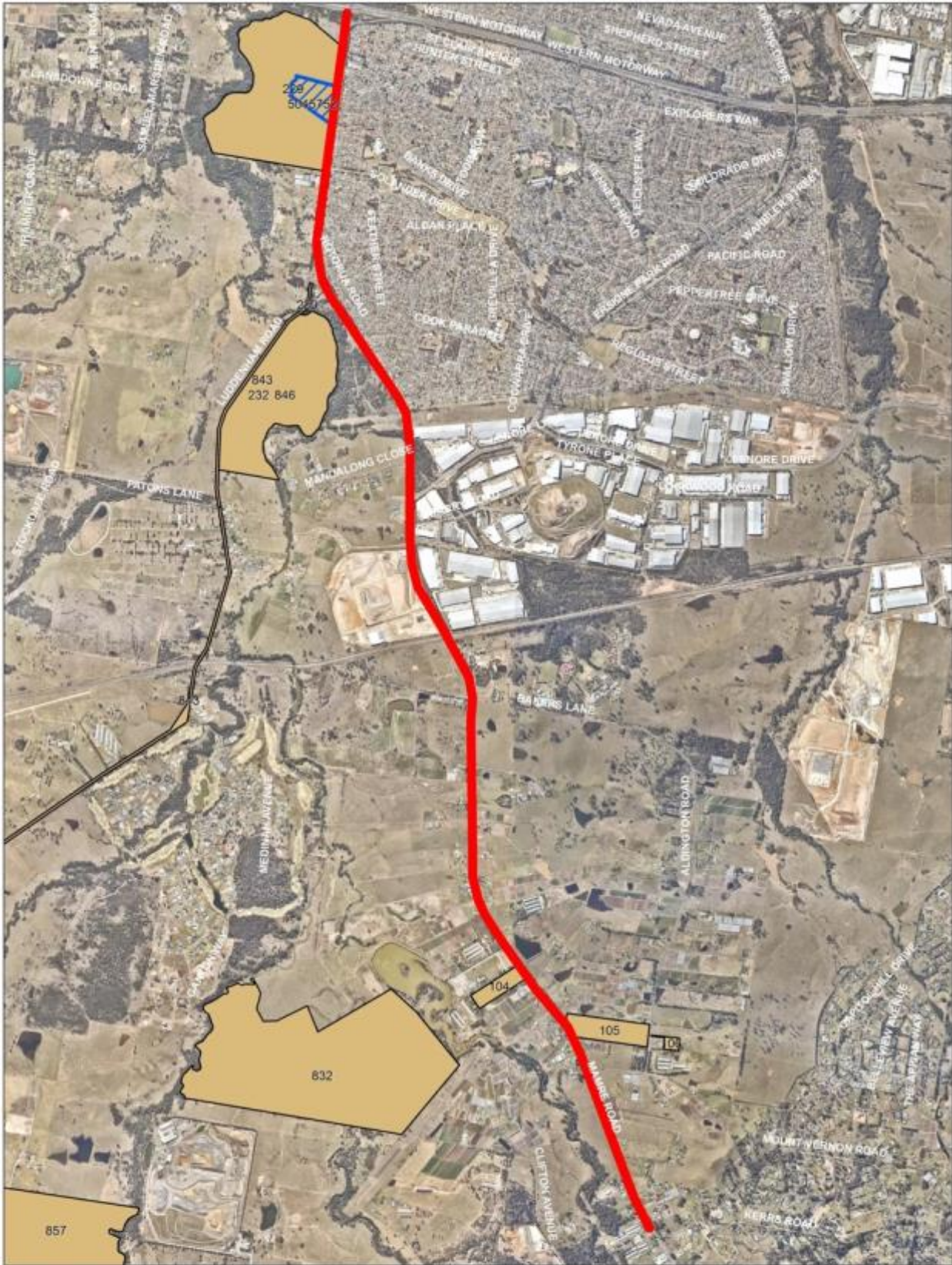
There are a number of historic heritage items within the area, some of which would be directly or indirectly affected by proposal options. Potentially affected listed items are listed below (and are shown by Figure 3-2):

Table 3-1 Historic heritage items in the study area

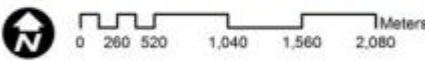
ID	Item	Listing	Significance
105	Gateposts to Colesbrook	Penrith LEP	Local
104	Bayley Park - house	Penrith LEP	Local
846	Canine Council dwelling	Penrith LEP	Local
232	Leeholme Horse Stud Rotunda	Penrith LEP Department of Planning and Environment Heritage and Conservation Register	Local
843	Luddenham Road Alignment	Penrith LEP	Local
229	Memorial Cairn	Penrith LEP	Local
5045752	Identified as 'Mamre' on the State Heritage Register Identified as 'Mamre House' on the Penrith LEP	Penrith LEP State Heritage Register Register of the National Estate (Non-statutory archive)	State

In addition to the listed heritage items identified above, two further items were identified by Roads and Maritime as follows:

- site of Erskine Park Public School (located near the Erskine Park Drive intersection) – local significance – some archaeological potential to reveal information relating to the original location and construction of the school.
- Warragamba dam and Prospect reservoir water supply pipeline – local significance.



Imagery: Nearmap (taken 9/9/2017)  
 Data: NSW Crown Copyright - Planning and Environment



- Proposal Location
- State Heritage Act
- Conservation Area - General
- Conservation Area - Landscape
- Item - General
- Item - Archaeological
- Item - Landscape

Figure 3-2 Historic heritage

## 3.10 Utilities

Investigations to identify the utilities constraints along the corridor have included:

- initial discussions with Water NSW representatives
- dial before you dig searches
- digitised information provided by utility authorities.

Potentially affected utilities include:

- Water NSW pipelines that cross under Mamre Road about 480 metres north of Bakers Lane
- Transgrid 330 kV overhead transmission lines that cross Mamre Road north of Mandalong Close
- concrete encased sewer main that crosses under Mamre north of Mandalong Close
- sewer main that crosses under Mamre Road near McIntyre Avenue
- sewer main that crosses under Mamre Road north of Solander Drive
- optic fibre along the eastern side of the road corridor from adjacent to the St Clair residential area then on the western side of the road corridor from near Banks Drive.

## 4 Community and stakeholder engagement

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### 4.1 Community involvement

#### 4.1.1 May 2017 community update

In May 2017, Roads and Maritime released a community update announcing the start of early planning for the proposal (refer to Appendix A). The update was distributed to 6,000 residents and businesses and was placed on the Roads and Maritime website.

### 4.2 Government agency and council involvement

Initial discussions have taken place with key stakeholders in the NSW Government and local governments.

### 4.3 Future community and stakeholder involvement

Roads and Maritime proposes to seek comment on the recommended corridor alignment via display of this options report and community information sessions. After considering community and stakeholder submissions Roads and Maritime will confirm the preferred option.

Further consultation will be carried out by inviting community members to provide comments on the concept design and during the environmental assessment process.

The following stakeholders have been identified as having a potential interest in the proposal. The list is not exhaustive and should be refined during the course of detailed environmental assessment.

- Penrith City Council
- NSW Planning and Environment
- Transport for NSW
- Busways
- NSW Office of Water
- Environmental Protection Authority
- Office of Environment and Heritage
- Penrith Valley Chamber of Commerce
- Deerubbin Local Aboriginal Land Council
- The local Aboriginal community
- Emergency services
- Endeavour Energy and Jemena
- Optus, Telstra, NBN Co
- Sydney Water
- Water New South Wales
- Directly and indirectly affected business around the area
- Educational facilities in nearby area
- Landowners, residents and local businesses.



## 5 Options development

### 5.1 Approach to option development

The first step in the option development process involved determining the appropriate typical cross section for the project.

Corridor widening options were then developed. This was an iterative process involving a number of inputs, including preliminary environmental investigations, property impacts, utility impacts, road design requirements, key stakeholder inputs and technical workshops including a Constructability Workshop.

Following development of the corridor widening options a number of location specific design sub-options, relating to intersections and access, were developed for evaluation.

New alignment options (wholly separate to the existing Mamre Road alignment) were not considered in detail due to cost (property acquisition and construction), the utility of the existing alignment in servicing adjacent land uses and the need to maximise the use of existing infrastructure.

A 'do nothing' option was considered. However, the 'do nothing' option does not meet the proposal objectives or address the identified need and would therefore only be preferred in circumstances where the costs and environmental impacts of proceeding were assessed as outweighing identified benefits. That was not the case and therefore the 'do nothing' option was discarded. Section 2.2 explains the traffic and transport implications of not proceeding with the proposal.

### 5.2 Typical cross section

A typical cross section was developed to be consistent with the proposal objectives and to be that suitable proposed Primary Arterial Road designation for Mamre Road. The following were also considered in the development of a typical cross section for the proposal:

- minimising the impact on properties along the corridor
- minimising impact on utilities
- ensuring that the road corridor meets all the current road standards
- maximising the opportunities for urban design outcomes along the corridor

Following a balanced consideration of the above factors a typical four lane cross section was developed for the proposal and is shown in Figure 5-1



Figure 5-1 Typical cross section

## 5.3 Corridor widening options

The proposal requires a 50 metre road corridor along Mamre Road. From Luddenham Road to M4 Motorway the corridor is already 50 metres wide and from the Water NSW pipelines (near Bakers Lane) to Luddenham Road there is already established industrial and residential development on the eastern side of Mamre Road which represents a major constraint to any eastern corridor widening option in that area. As a result, corridor widening options were only developed for the section of Mamre Road between Kerrs Road to the Water NSW pipelines, where there is rural land or open space on both sides of Mamre Road with the potential to widen on either side.

An eastern and western option for widening the Mamre Road corridor between Kerrs Road to the Water NSW pipelines from 40 metres to 50 metres were developed. Figure 5-4, Figure 5-5 and Figure 5-6 illustrate the corridor widening options.



Figure 5-2 Corridor widening options – Map 1

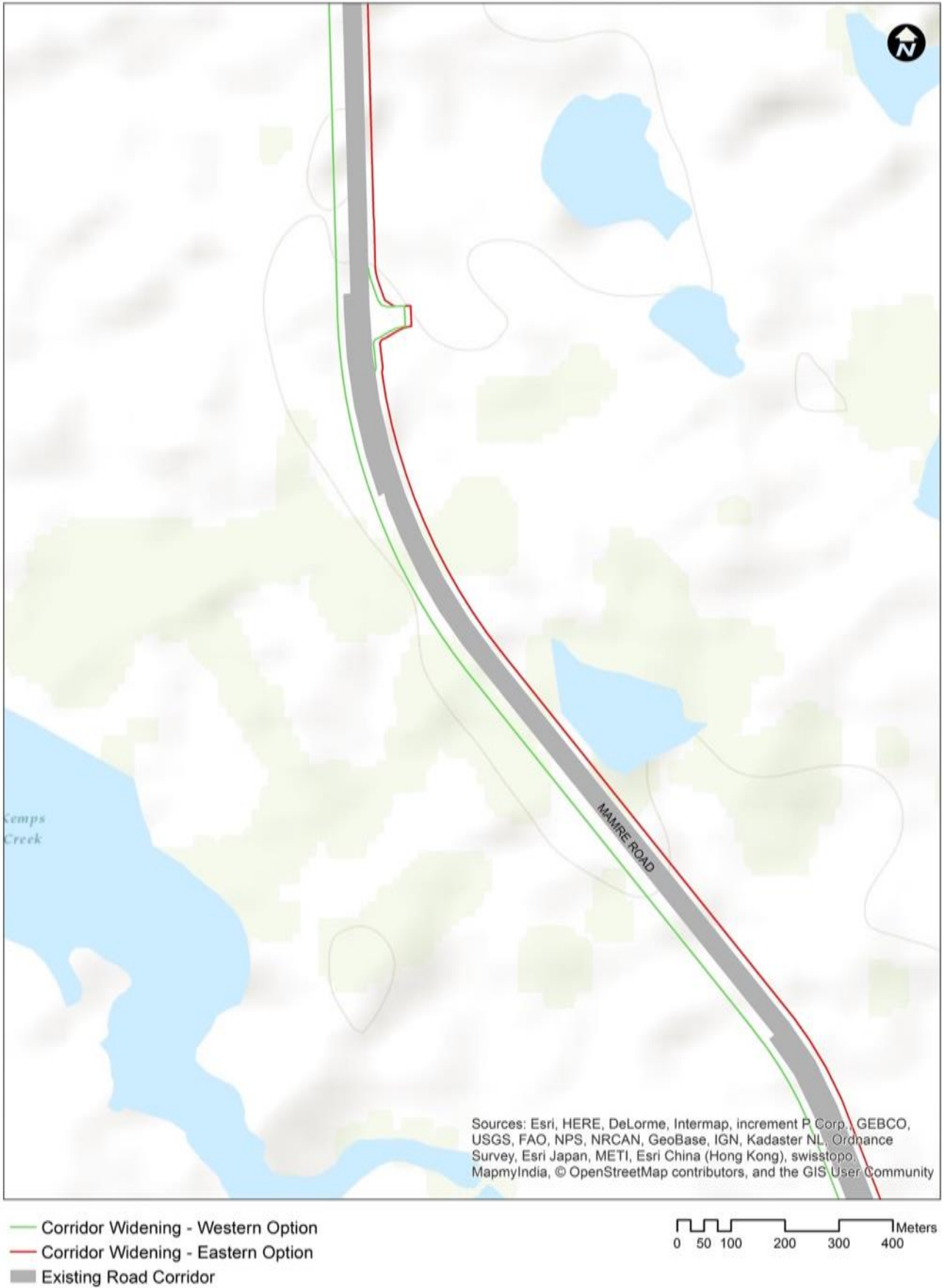


Figure 5-3 Corridor widening options – Map 2

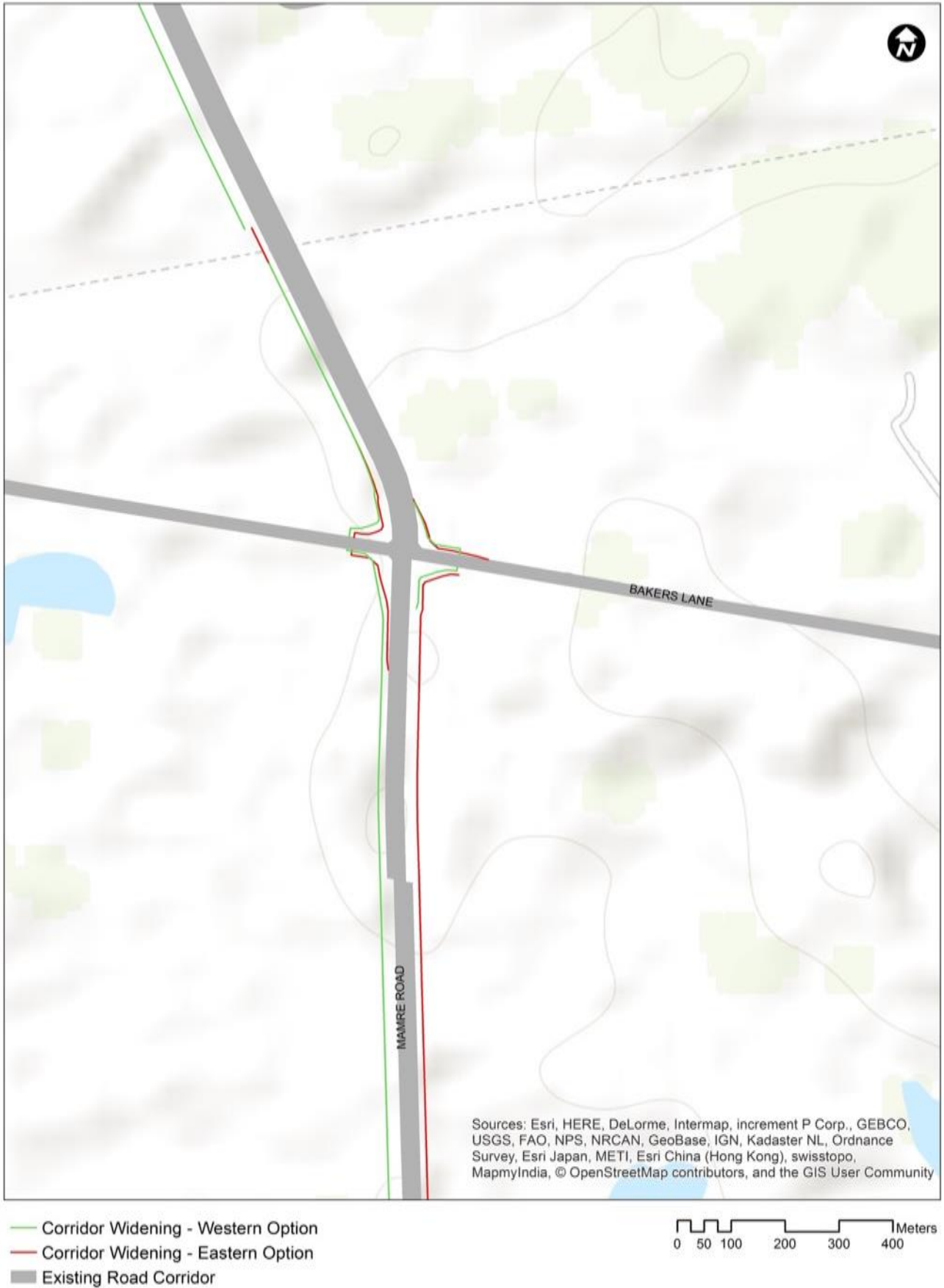


Figure 5-4 Corridor widening options – Map 2

## 5.4 Intersections and other sub-options

In developing the design for Mamre Road upgrade as a dual carriageway, close attention was given to providing safe access to and from properties in the adjoining area. Sub-options were developed for those locations where the required design was identified early and the consideration of alternatives was considered important. Intersection options were developed for the following locations:

- midblock U-turn facility between Abbots Road and Bakers Lane
- Bakers Lane
- Mandalong Close
- McIntyre Avenue.

### 5.4.1 Midblock U-turn facility between Abbots Road and Bakers Lane

To improve safety, the proposal would include the introduction of a central median and a restriction on right-turn access to and from properties along Mamre Road.

The distance between the Abbots Road and Bakers Lane intersections is about 3.1 kilometres. Providing a U-turn facility midway between these intersections would reduce the additional travel distance required for those road users needing to make U-turns to access properties adjoining Mamre Road. Three main options were considered for a midblock U-turn facility:

- Option 1 – Two ‘jug handle’ U-turn facilities, one for northbound traffic and the other for southbound traffic (refer to Figure 5-5)
- Option 2 – Use of western stub of potential future intersection between the Abbots Road and Bakers Lane (refer to Figure 5-6)
- Option 3 – U-turn facility (without traffic lights) for both directions that would use intersection stubs for a future intersection midway between Abbots Road and Bakers Lane (refer to Figure 5-7).

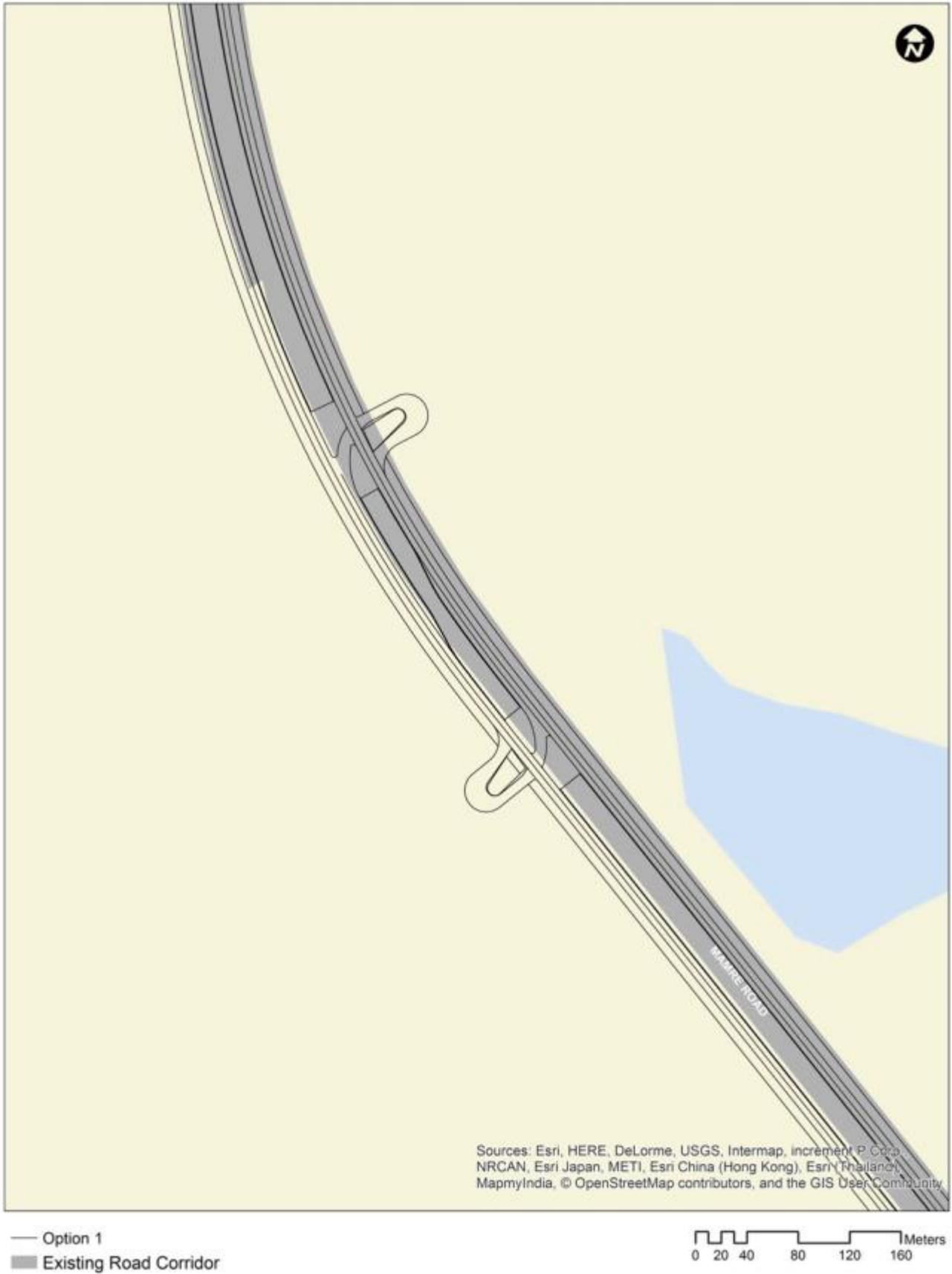


Figure 5-5 Mid-block U-turn facility Option 1

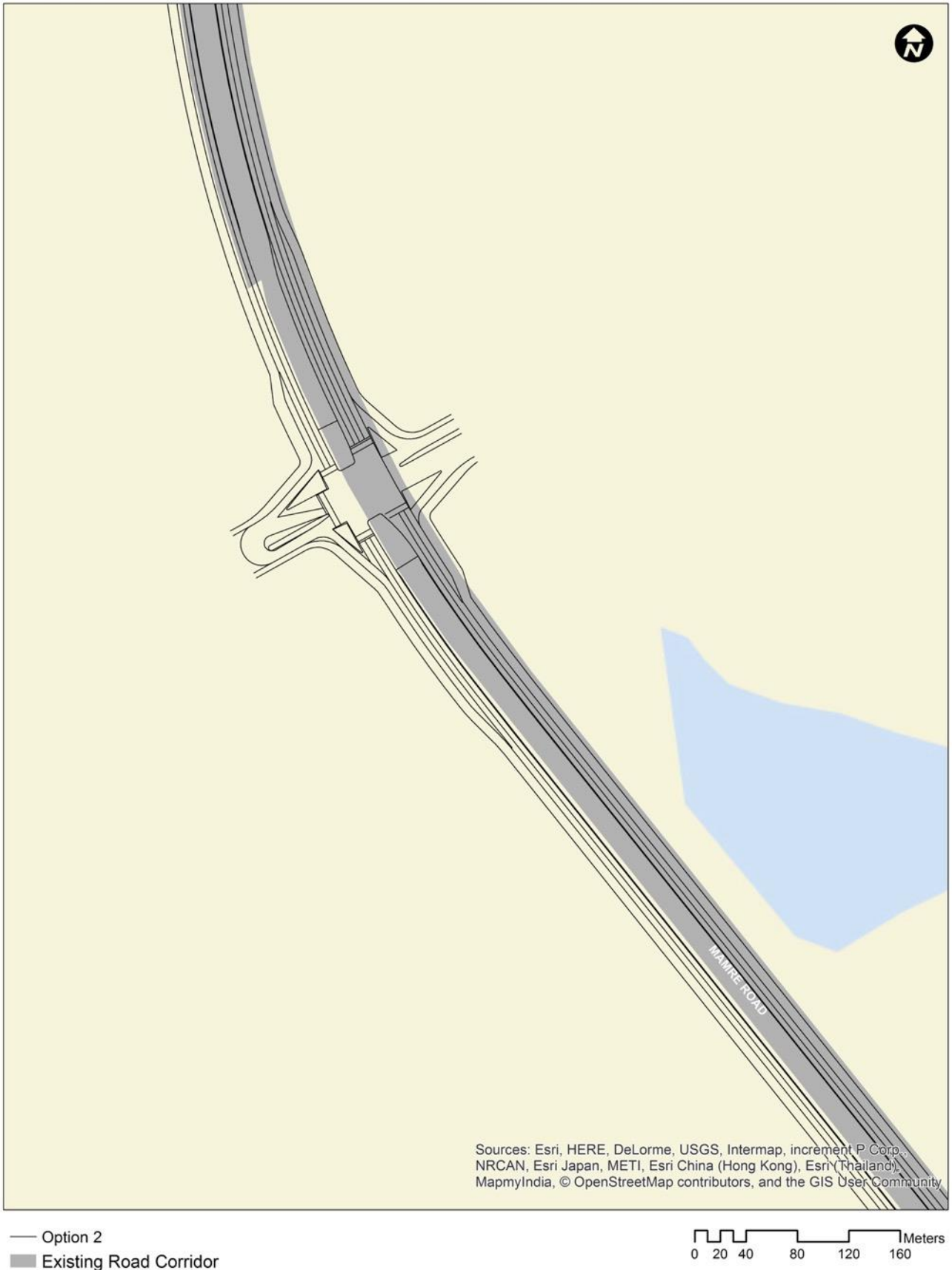


Figure 5-6 Mid-block U-turn facility Option 2



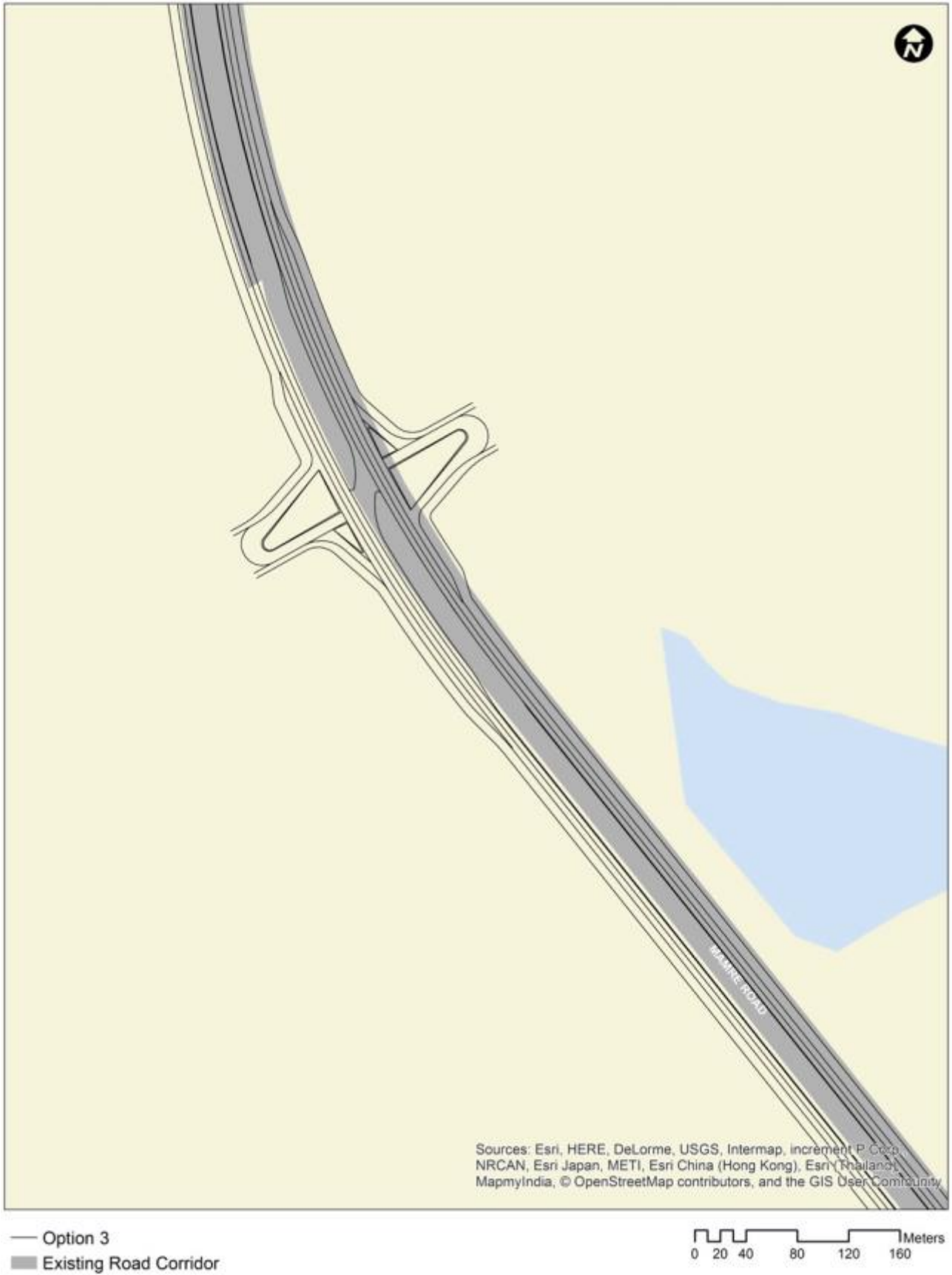


Figure 5-7 Mid-block U-turn facility Option 3

## 5.4.2 Bakers Lane

In 2014, the Department of Planning and Environment proposed a Southern Link Road, which would provide a future east-west arterial link from Wallgrove Road to Mamre Road. The Southern Link Road would run parallel to and about 40 metres south of Bakers Lane, shifting the intersection of Bakers Lane with Mamre Road to the south.

Three main options were considered for the Bakers Lane intersection:

- Option 1 – Align the intersection with the existing Bakers Lane corridor pending determination of the Southern Link Road project (Figure 5-8)
- Option 2 – Close the existing Bakers Lane intersection and provide an intersection with the proposed Southern Link Road to the south (Figure 5-9)
- Option 3 – Align the intersection with the existing Bakers Lane corridor and align the Southern Link Road to connect to this intersection (Figure 5-10).

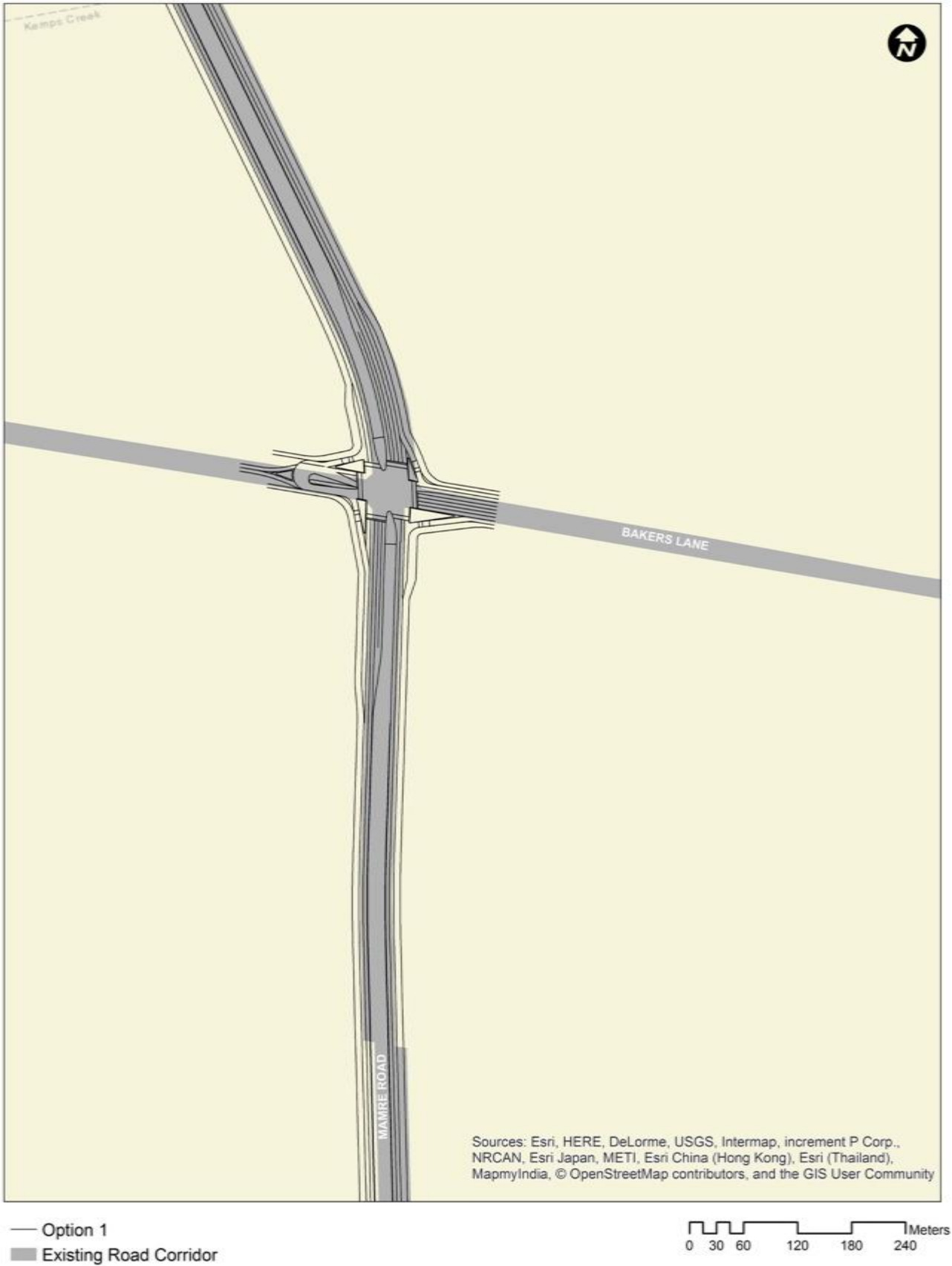
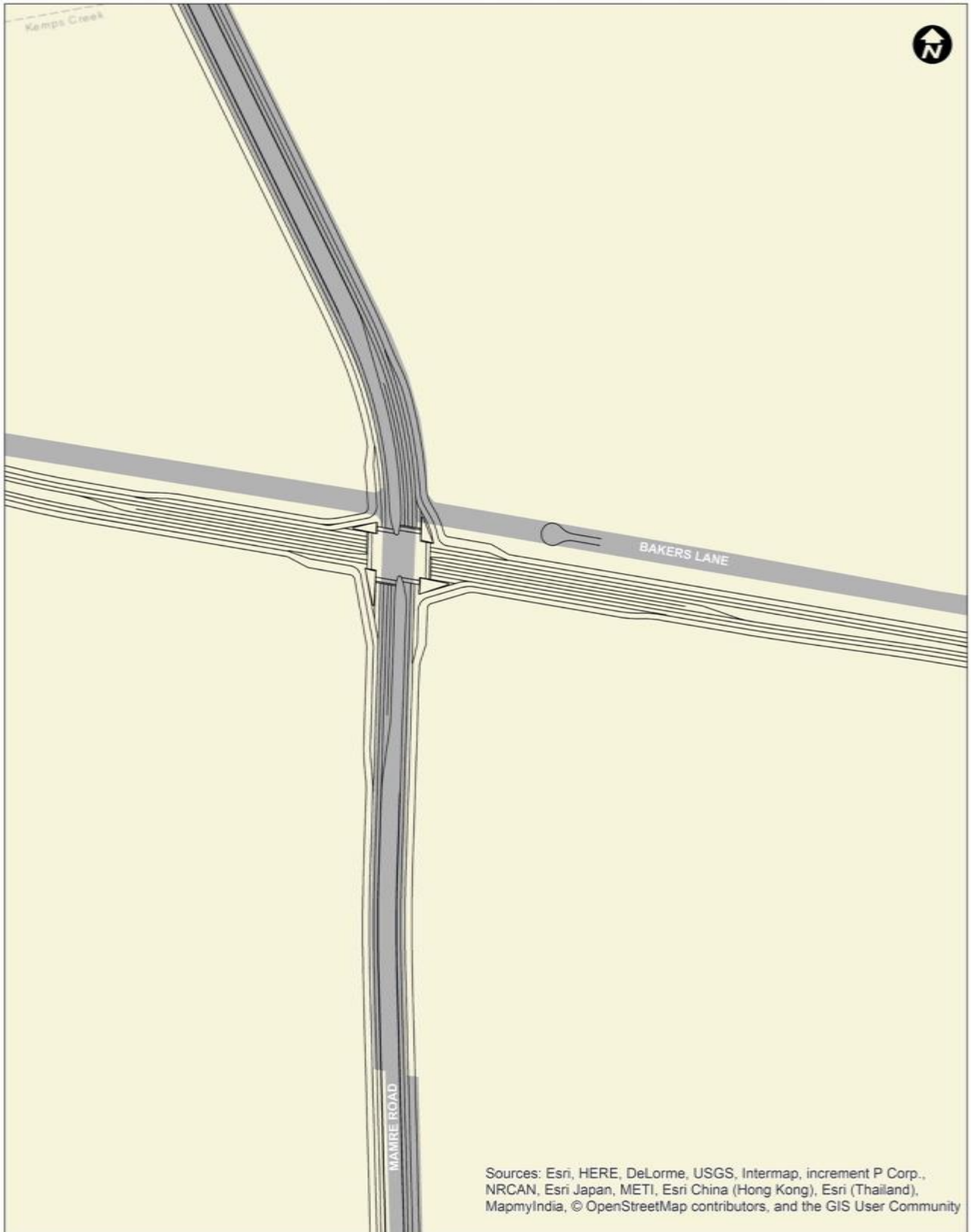


Figure 5-8 Bakers Lane intersection Option 1



— Option 2  
 ■ Existing Road Corridor

0 30 60 120 180 240 Meters

Figure 5-9 Bakers Lane intersection Option 2

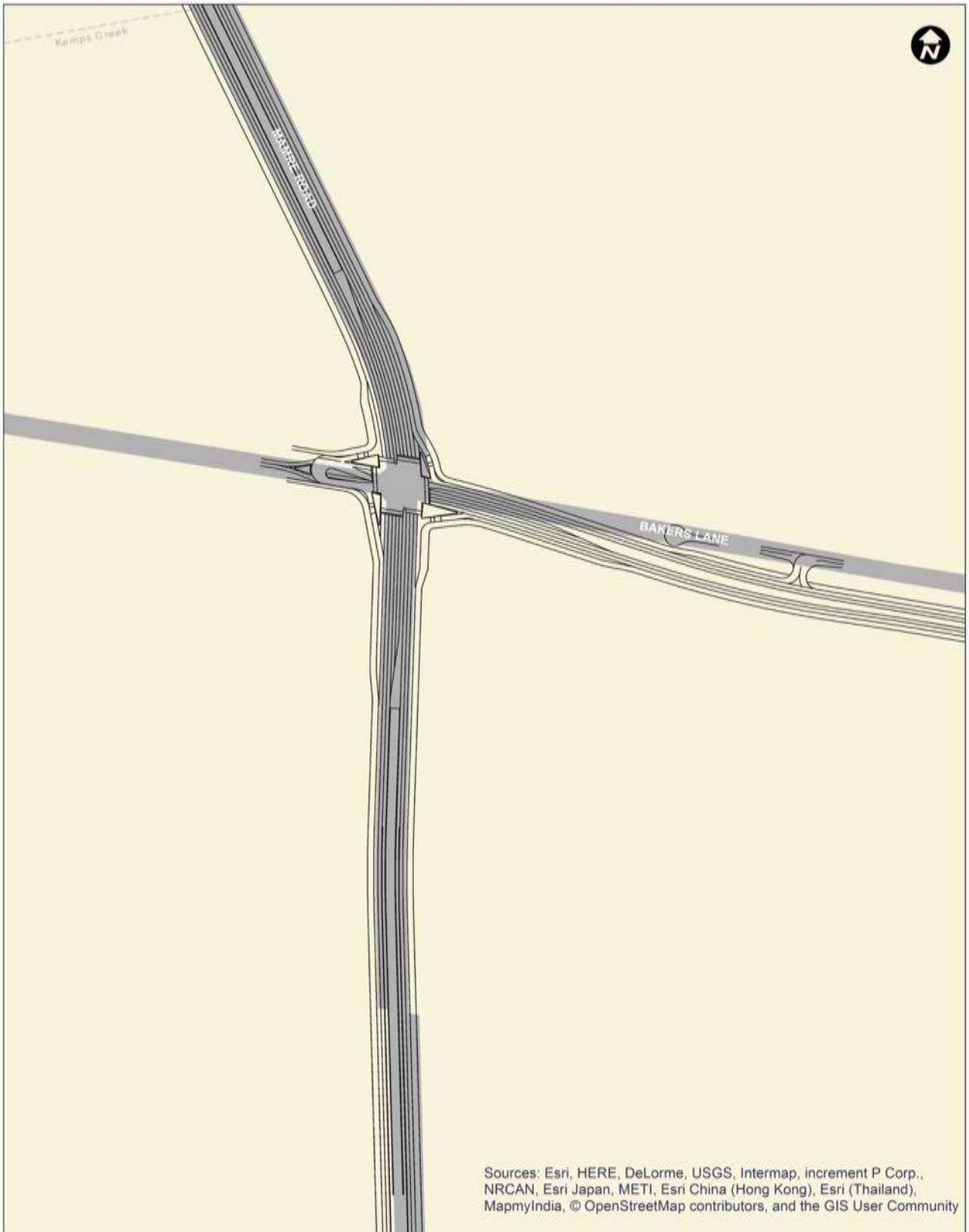


Figure 5-10 Bakers Lane intersection Option 3

### 5.4.3 Mandalong Close

The intersection of Mandalong Close with Mamre Road is a give way T-junction with turn bays allowing all turning movements. Mandalong Close currently provides access to twelve houses and a childcare centre. In 2016, Planning and Environment announced Mamre West precinct as a State Significant Development (SSD 7173). The approved Development Control Plan for this precinct includes internal road network to connect Mandalong Close to the main signalised access to the precinct at James Erskine Drive.

Two options were considered as an interim measure pending full development of Mamre West precinct for the Mandalong Close intersection:

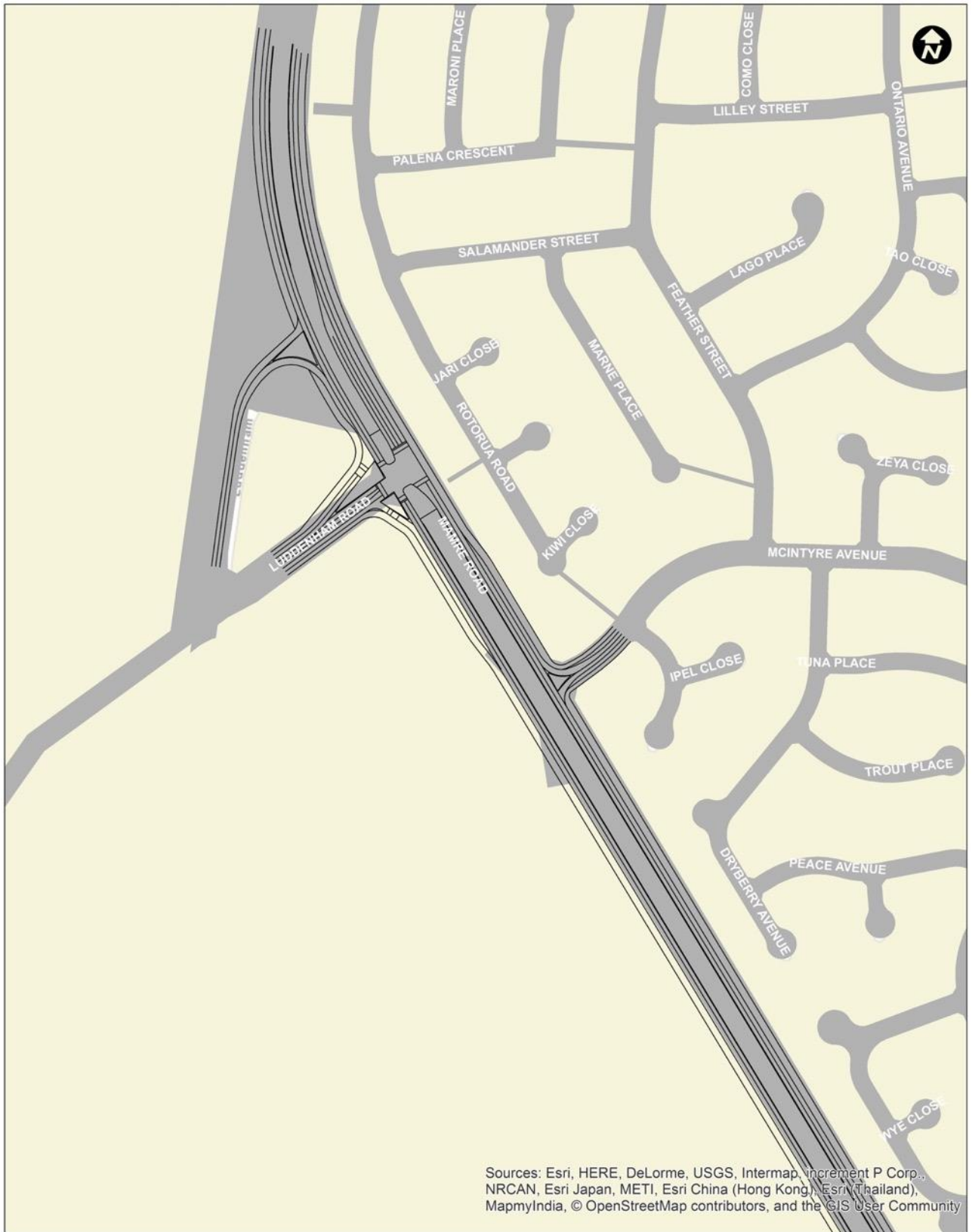
- Option 1 – Convert the intersection into left in, left out only.
- Option 2 – Add a new fourth leg at the intersection with Erskine Park Road and provide a connection to Mandalong Close via an existing lane for the childcare centre.

### 5.4.4 McIntyre Avenue

McIntyre Avenue is one of three roads that provide access to the St Clair residential area from Mamre Road. The intersection at McIntyre Avenue is about 220 metres south of the intersection at Luddenham Road, which is to be signalised. Installing traffic lights at the intersection at McIntyre Avenue is not viable due its close proximity to proposed traffic signals at Luddenham Road, as the turning lane layout of the intersections would clash and conflict.

The following three options were considered for providing access to McIntyre Avenue:

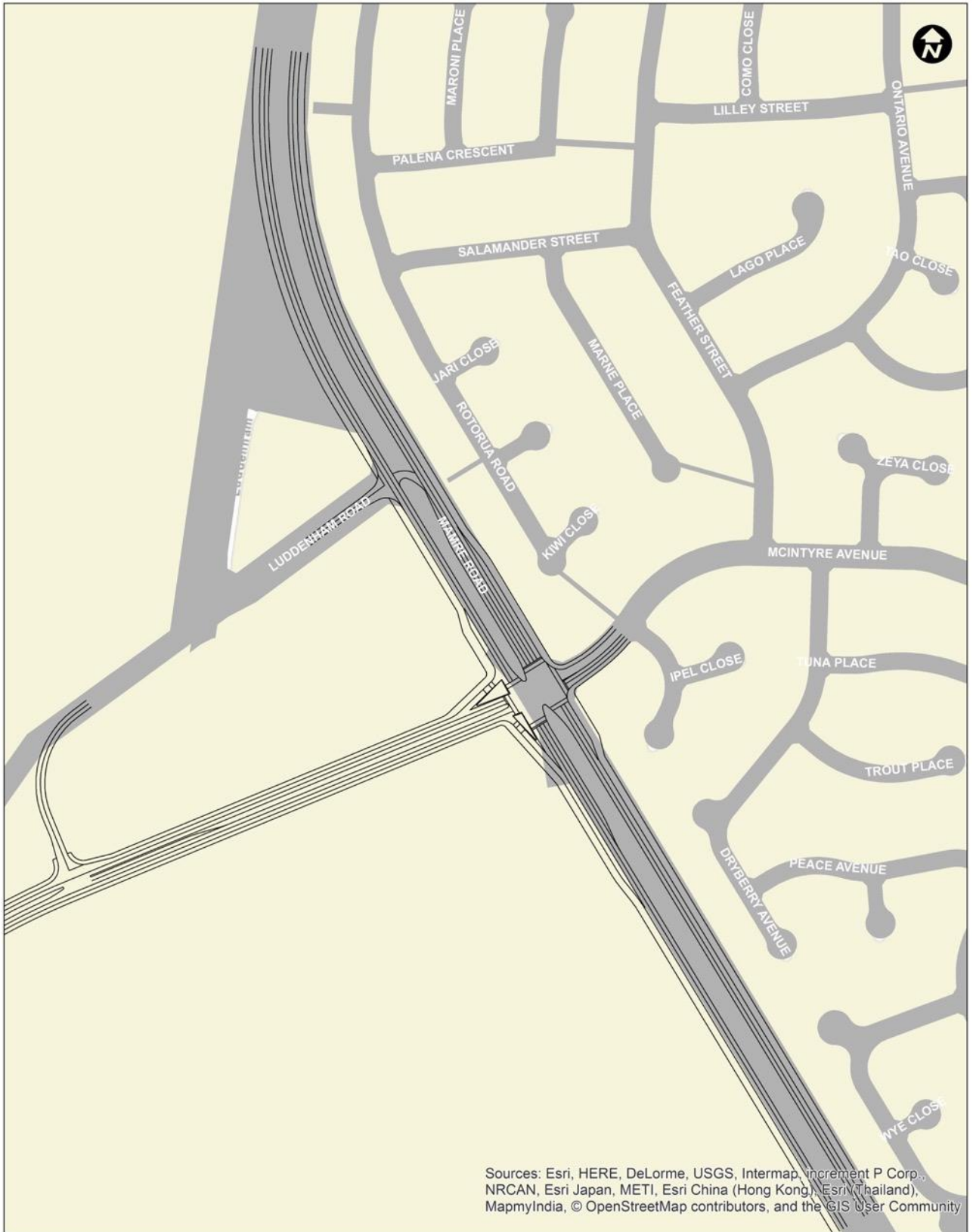
- Option 1 – Convert the intersection with McIntyre Avenue to left in, left out only (Figure 5-11)
- Option 2 – Realign Luddenham Road to intersect with McIntyre Avenue (Figure 5-12). This option would involve:
  - Realigning 800 metres of Luddenham to align it with McIntyre Avenue to achieve one signalised intersection for both roads
  - Building a long bridge across the South Creek flood plain
- Option 3 – Link McIntyre Avenue to intersection at Luddenham Road (Figure 5-13). This option would involve shifting the alignment of Mamre Road to the west to fit a north-south link road from McIntyre Avenue to Luddenham Road. The link road would be located within the road corridor along the eastern side and connect to the intersection with Luddenham Road.



— Option 1  
 ■ Existing Road Corridor

0 30 60 120 180 240 Meters

Figure 5-11 McIntyre Close intersection Option 1



— Option 2  
 ■ Existing Road Corridor

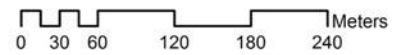
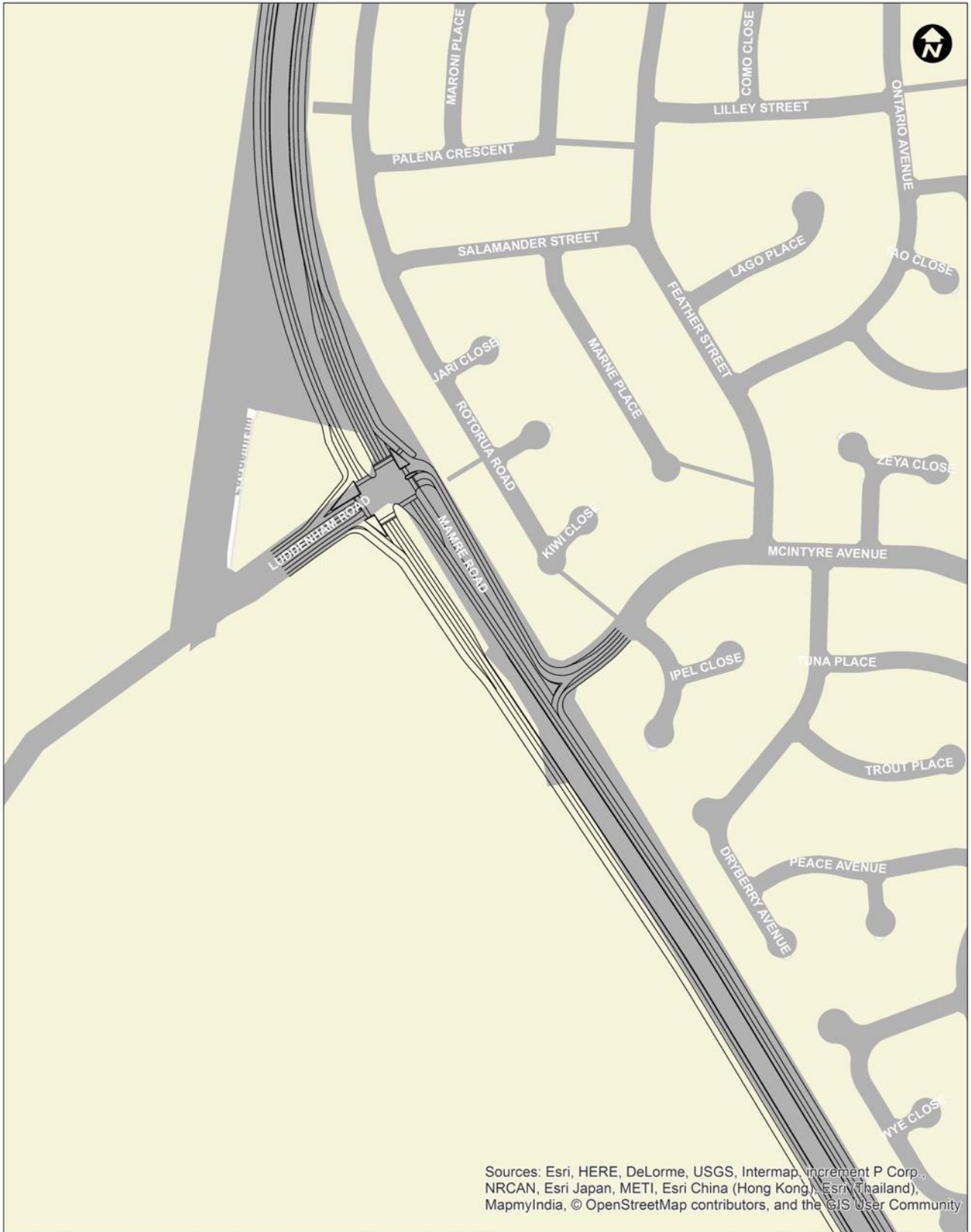


Figure 5-12 McIntyre Close intersection Option 2





— Option 3  
 ■ Existing Road Corridor

0 30 60 120 180 240 Meters

Figure 5-13 McIntyre Close intersection Option 3

## 6 Options evaluation

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### 6.1 Options evaluation process

#### 6.1.1 Overview of the process

The options evaluation process has involved several stages. The initial stages served an information gathering role and were followed by specific consideration of corridor and sub options. The various stages of the option evaluation process are illustrated by Figure 6-1 and discussed in Section 6.1.2 through Section 6.1.5.



Figure 6-1 Option evaluation process

#### 6.1.2 Preliminary environmental investigation

A preliminary environmental investigation was undertaken for the proposal corridor. The investigation used a site inspection and desktop review to identify environmental issues early to allow for consideration as part of the design process. The main findings of the investigation are reviewed in Chapter 3.

#### 6.1.3 Value Management workshop

A Value Management Workshop was held on 2 August 2016 and was attended by representatives from Roads and Maritime, Transport for NSW, the Department of Planning and Environment and Penrith City Council. The objectives of the workshop were to:

- obtain a common understanding of the project and its current position
- review the strategic design and highlight issues, concerns and potential improvements associated with various aspects of the project

- identify a way forward to address the issues and concerns, evaluate the improvements identified and ensure the design is robust as it is progressed.

## 6.1.4 Constructability workshop

A constructability workshop was held on 19 May 2017. Its purpose was to identify constructability issues and potential mitigation measures for further consideration as a result of the strategic design. At the constructability workshop a paired scoring system was used to rank each of the issues as better or worse for each corridor option.

## 6.2 Options evaluation outcomes

### 6.2.1 Corridor options

Widening of the corridor on the western side of Mamre Road is favoured for the following reasons:

- it would be consistent with widening on the western side north of the Water NSW pipelines
- it would provide a better sequence for construction of the drainage. Because the northbound carriageway would be constructed first, the downstream sections of the cross drainage structures and associated downstream channels could be constructed first thus minimising potential flooding problems during construction
- it would not impact on a dam on the eastern side Mamre Road, about one kilometre north of Abbots Road
- the eastern and western corridor widening options would involve comparable levels of property acquisition.
- there were no key environmental issues that differentiated the two corridor widening options.

### 6.2.2 Intersection and sub-options

#### ***Midblock U-turn facility between Abbots Road and Bakers Lane***

Use of western stub of potential future intersection between the Abbots Road and Bakers Lane is the recommended option (Option 2).

Option 1 was rejected because it would not be compatible with the proposed future intersection between the Abbots Road and Bakers Lane. Option 3 would have the advantage of not having to install and maintain traffic signals just for U-turn movements, however, both intersection stubs would need to be constructed for this arrangement rather than one for the recommended option. There would also be potential safety issues associated with long heavy vehicles u-turning at this location without traffic lights.

#### ***Bakers Lane***

The recommended option for Bakers Lane is a four way intersection with traffic lights at the existing Bakers Lane intersection (Option 1). The western intersection leg would be used as a U-turn facility. The Southern Link Road proposed by the Department of Planning and Environment that runs parallel to and south of Bakers Lane could be aligned to connect to the proposed intersection at Bakers Lane.

Option 2 and Option 3 were not considered further as the alignment of Southern Link Road has not yet been finalised.

#### ***Mandalong Close***

The environmental assessment for the Mamre West precinct development informed the approved Development Control Plan for this precinct. It includes an internal road network to connect

Mandalong Close to a signalised access to the precinct at Mamre Road/James Erskine Drive intersection.

Converting the Mandalong intersection into left in, left out only is the favoured option. Interim Option 2 as an interim measure was rejected as it would involve significant property acquisition and construction costs.

### **McIntyre Avenue**

The recommended option for McIntyre Avenue is a left out only T-junction (Option 1). In recommending this option it was noted right-turn to Mamre Road would be available from Solander Drive, which would have traffic lights, or from Banks Drive, which does have traffic lights. An alternative to a right turn into McIntyre Avenue could be achieved by turning left into the U-turn arrangement near Luddenham Road before turning right out of Luddenham Road and then travelling south to turn left into McIntyre Avenue.

Option 2 was rejected because it would affect two listed heritage items (Canine Council dwelling; Leeholme Horse Stud Rotunda) and would require clearing of threatened ecological communities (BC Act listed River-flat eucalypt forest).

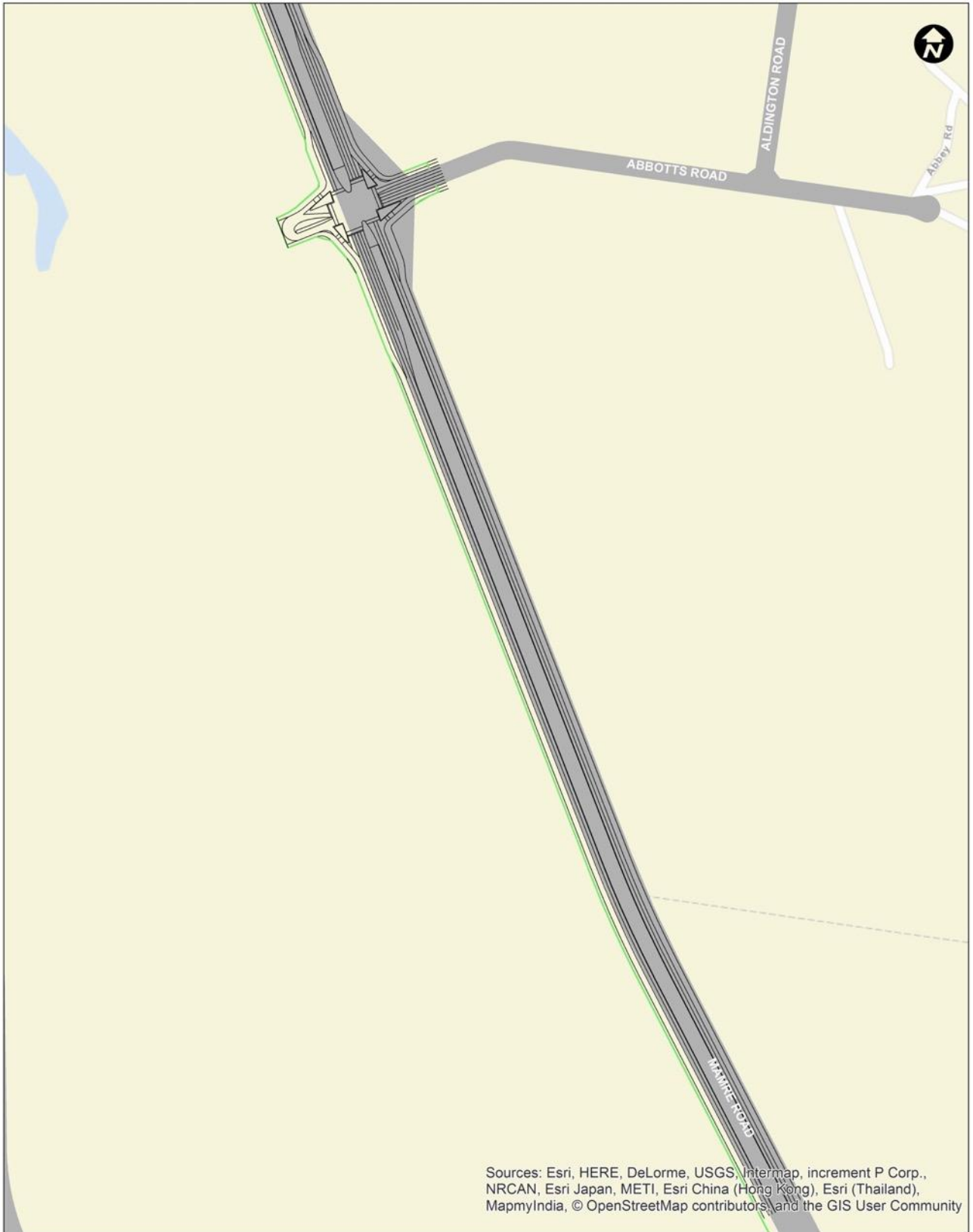
Option 3 was rejected for the following reasons:

- it would have a greater impact on Department of Planning and Environment owned land on the western side of Mamre Road, which has been set aside for environmental offsets
- the link road would have an undesirable tight 90 degree bend close to and approaching the intersection of Mamre Road and Luddenham Road
- the tight 90 degree bend around a corner property from McIntyre Avenue to the link road could have limited sight distance
- there could be potential safety issues associated with headlight glare to drivers travelling in opposing directions where the link road runs parallel to the southbound carriageway of Mamre Road.

## **6.3 Recommended option for consultation**

The recommended option is an upgrade of Mamre Road to a four lane divided road between Kerrs Road and the M4 Motorway and is illustrated by Figure 6-2 to Figure 6-6. It includes the following access arrangements:

- four-way intersection with traffic lights at Abbots Road with the new fourth intersection leg used as a U-turn facility
- u-turn facility with traffic lights midway between Abbots Road and Bakers Lane. The U-turn facility would utilise a stub for a new intersection
- four-way intersection with traffic lights at the existing location of Bakers Lane intersection. The western intersection leg would include a U-turn facility.
- four-way intersection with traffic lights at James Erskine Drive with a new fourth intersection leg on the western side to provide access to future industrial developments on the western side of Mamre Road as well as a future internal connection to Mandalong Close
- T-junction with traffic lights at Erskine Park Drive
- left in, left out only T-junction at Mandalong Close
- left in, left out only T-junction at McIntyre Avenue
- T-junction with traffic lights at Luddenham Road with a U-turn arrangement via a road around the Erskine Park Rural Fire Brigade property
- four-way intersection with traffic lights at Solander Drive with a new fourth intersection leg to provide access to Department of Planning and Environment land on the western side of Mamre Road for future development.
- four-way intersection with traffic lights at Banks Drive with a new fourth intersection leg to provide access to the Mamre House property.



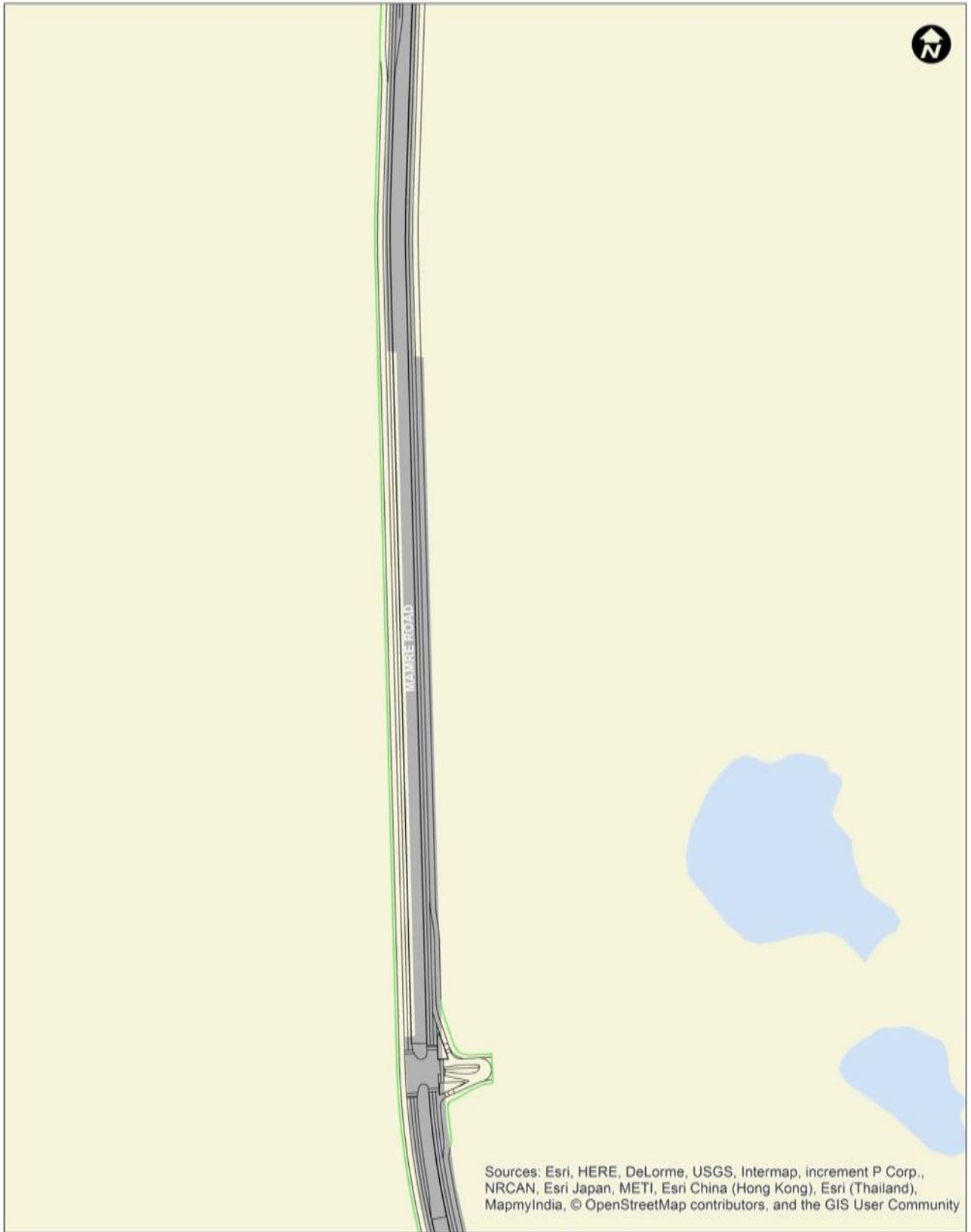
- Strategic Design (4 Lanes)
- Proposed Boundary
- Existing Road Corridor

0 40 80 160 240 320 Meters

Figure 6-2 Recommended option – Map 1



Figure 6-3 Recommended option – Map 2



- Strategic Design (4 Lanes)
- Proposed Boundary
- Existing Road Corridor



Figure 6-4 Recommended option – Map 3

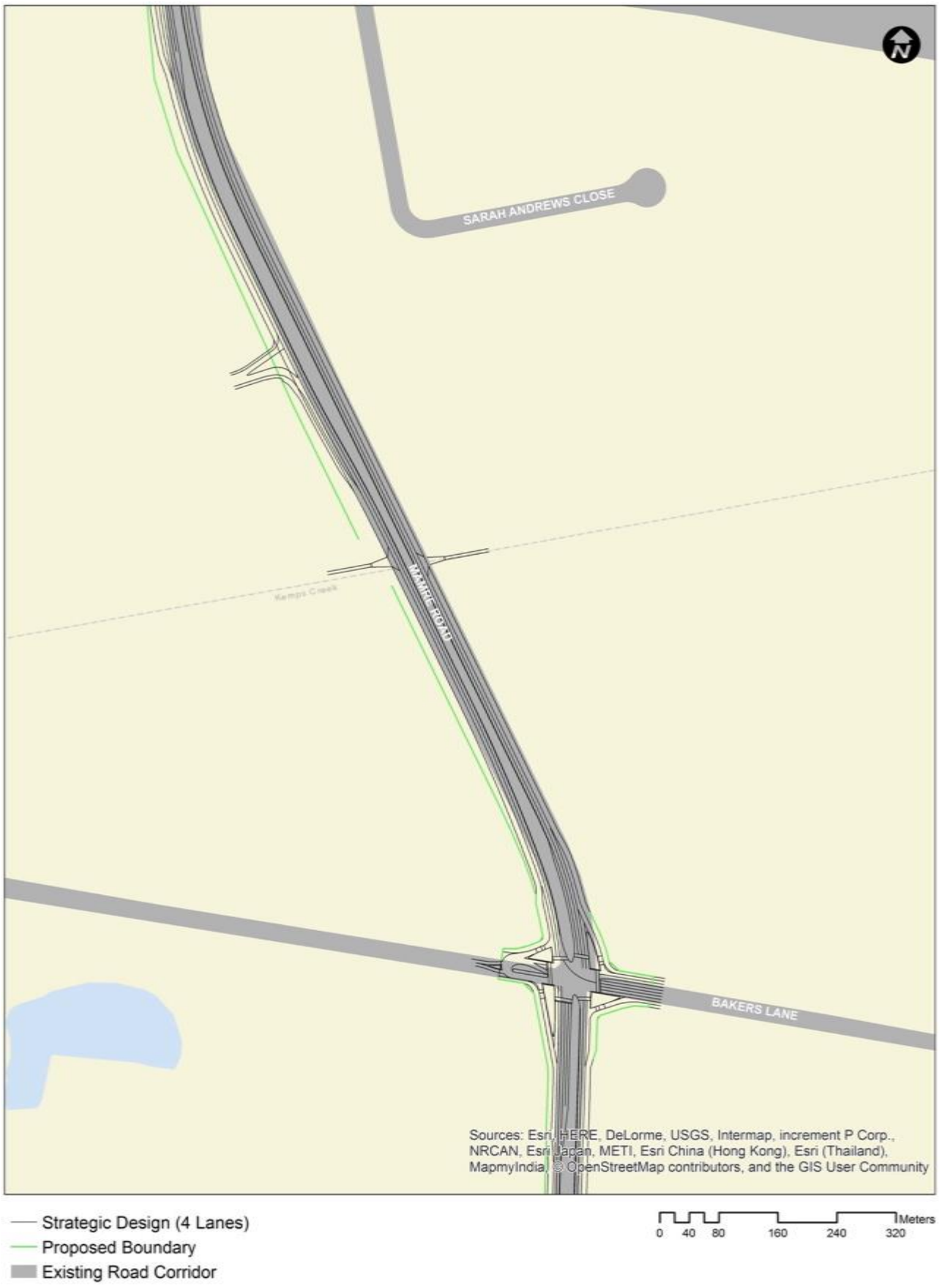


Figure 6-5 Recommended option – Map 4



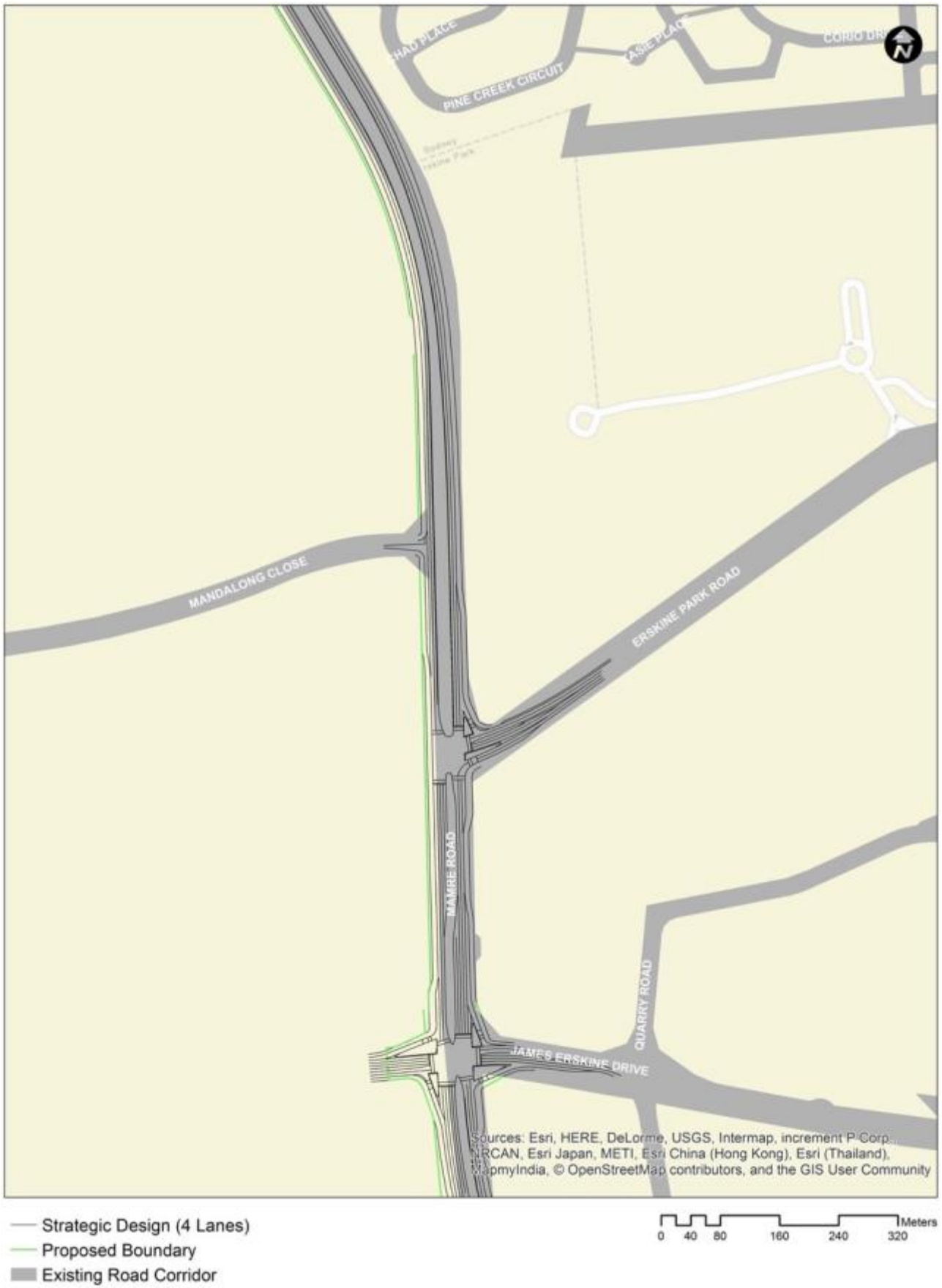


Figure 6-6 Recommended option – Map 5

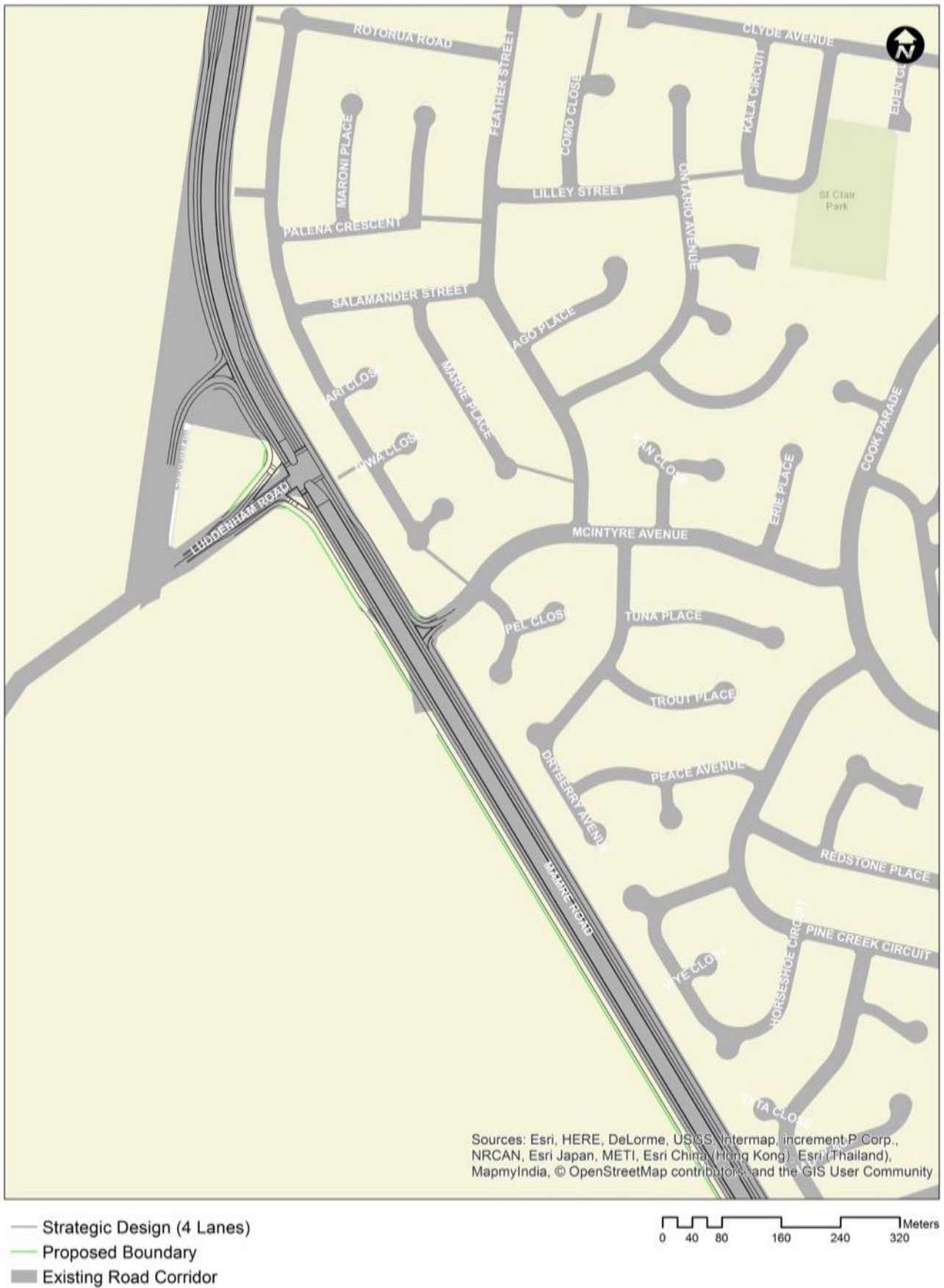


Figure 6-7 Recommended option – Map 6

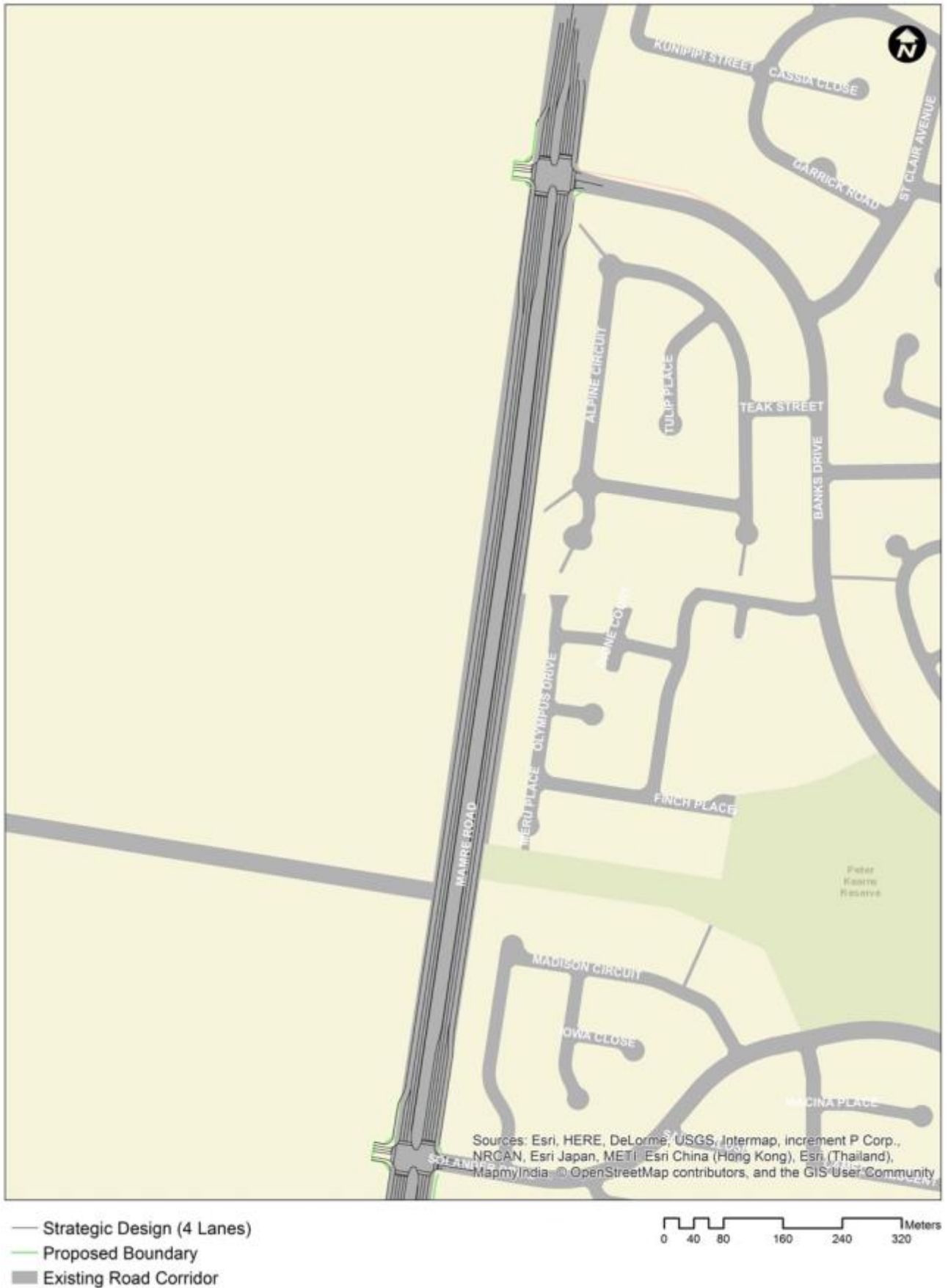


Figure 6-8 Recommended option – Map 7

# 7 Conclusion and next steps

The options evaluation process for the upgrade to Mamre Road Upgrade between Kerrs Road and M4 Motorway has considered a range of environmental, social and engineering constraints / issues. The recommended option for community consultation is described in Section 6.3 of this report

The next steps for the proposal are outlined in Figure 7-1. Following public display of the recommended option, Roads and Maritime will consider community submissions, make changes where necessary and then confirm the preferred option. This will be followed by development of a concept design and environmental assessment.



Figure 7-1 Next steps

Roads and Maritime will continue stakeholder and community consultation during the next stages of the project. The Roads and Maritime website will be periodically updated with information about the progress of the proposal.

## References

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## **Appendix A – Community Update May 2017**

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# Mamre Road Upgrade

May 2017

The NSW Government has started early planning for a future upgrade of Mamre Road, between the M4 Motorway and Kerrs Road, to support economic and residential growth in this area.

## Background

Western Sydney is Australia's third largest economy and the population is expected to grow from two million to three million people over the next 20 years. The NSW Government is planning for this growth by reserving residential and employment land for future developments.

Mamre Road is a key transport corridor passing through the Western Sydney Priority Growth Area (WSPGA) and providing connections to the Western Sydney Employment Area (see map overleaf).

## Benefits of planning now

- Preserve a road corridor for the future that would also accommodate cyclist and pedestrian access
- Deliver certainty for existing and future developments regarding future road access
- Provide for a reliable road network to support economic and residential growth in western Sydney

## What is happening now?

Roads and Maritime Services is carrying out field work and technical studies, including survey, traffic modelling and environmental and heritage investigations, to assist with project planning and development. We may require access to some private properties in order to carry out investigation works. If access to your property is needed, we will contact you directly in advance to discuss access requirements.

Mamre Road, Kemps Creek looking north



## Next steps

We will keep stakeholders informed of the project's progress during the planning phase. The community can access information on the proposed Mamre Road Upgrade through the project website, community newsletters and the project phone number and email address provided on the back page.

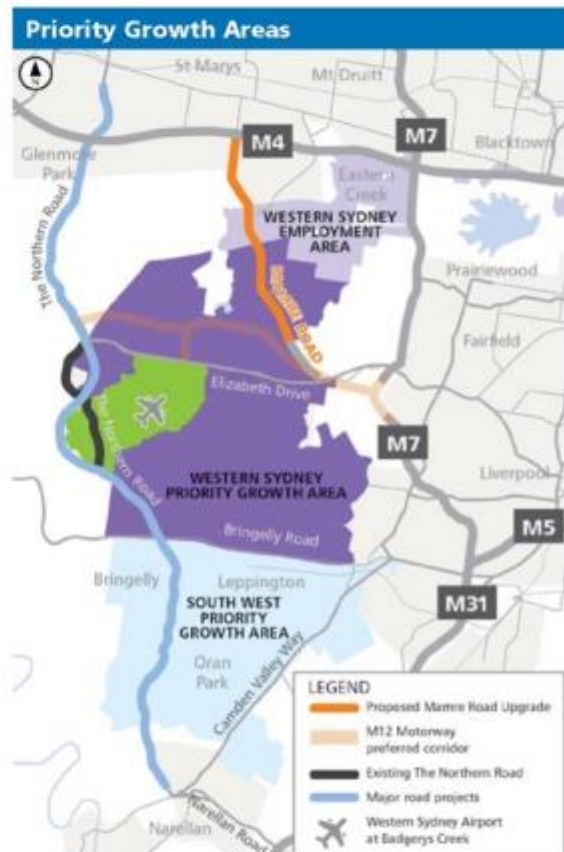


\* Subject to project approval and funding availability

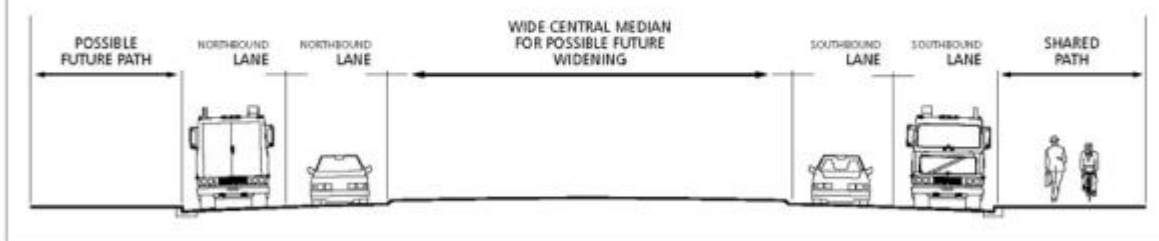
## Western Sydney Priority Growth Area

A section of Mamre Road falls within the Western Sydney Priority Growth Area (WSPGA). The WSPGA will provide local residents with better access to jobs within and around the Western Sydney Airport at Badgenys Creek, as well as infrastructure and services for local residents.

For more information on the WSPGA, visit the NSW Planning and Environment website: [planning.nsw.gov.au](http://planning.nsw.gov.au).



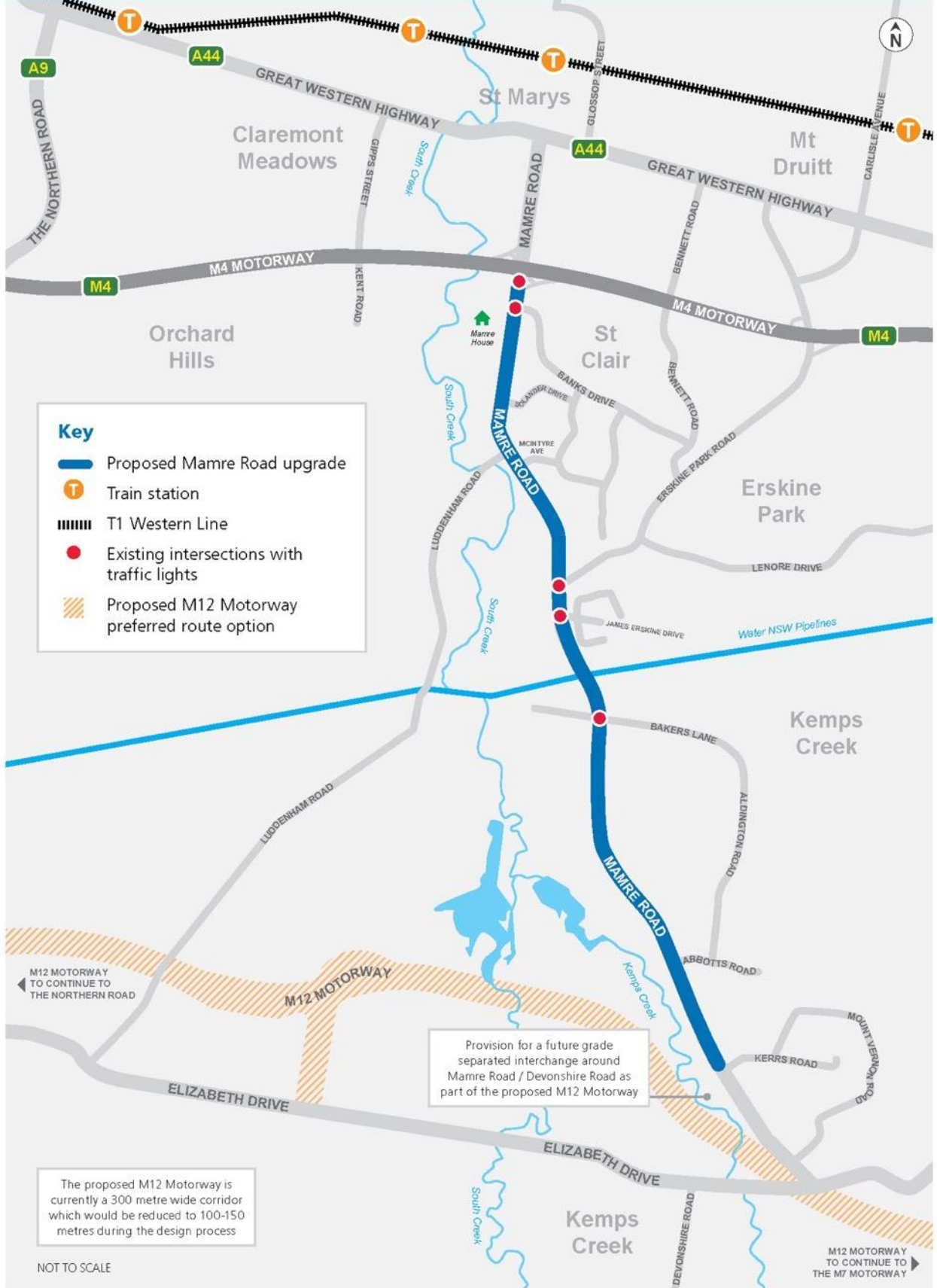
## Possible cross section of Mamre Road Upgrade



Not to scale



# Proposed Mamre Road Upgrade



## Other projects in your area

### Western Sydney Infrastructure Plan

The Australian and NSW governments are funding a 10 year, \$3.6 billion road investment program for western Sydney. The Western Sydney Infrastructure Plan will deliver major road infrastructure upgrades to support integrated transport for the region and capitalise on the economic benefits of the Western Sydney Airport at Badgerys Creek. It will also improve safety, increase road capacity and reduce congestion and travel times in the future.

Roads and Maritime is currently building around 15 kilometres of the 61 kilometres of Western Sydney Infrastructure Plan roads. This includes work on:

- Werrington Arterial Road
- Bringelly Road Upgrade Stage 1
- The Northern Road Upgrade, between The Old Northern Road, Narellan and Peter Brock Drive, Oran Park
- The Northern Road Upgrade, between Glenmore Parkway, Glenmore and Jamison Road, South Penrith.

A further 15 kilometres of roads are currently being tendered with construction work expected to start by mid-2017.



For more information check out the interactive video portal:  
[www.rms.nsw.gov.au/wsip](http://www.rms.nsw.gov.au/wsip).

## Contact us

For more information on the Mamre Road Upgrade or to provide feedback, please contact the project team:

 1800 696 564

 [mamreroadupgrade@rms.nsw.gov.au](mailto:mamreroadupgrade@rms.nsw.gov.au)

 Mamre Road Upgrade,  
Roads and Maritime Services,  
PO Box 973, Parramatta NSW 2124

 [www.rms.nsw.gov.au/mamreroad](http://www.rms.nsw.gov.au/mamreroad)



If you need help understanding this information, please contact the Translating and Interpreting Service on **131 450** and ask them to call us on **1800 696 564**.

## M12 Motorway

The M12 Motorway will provide direct access to the Western Sydney Airport at Badgerys Creek and connect to Sydney's motorway network. Following feedback from the community and in consultation with the Australian and NSW government agencies, Roads and Maritime has selected the option shown on page 3 as the preferred corridor route for the M12 Motorway.

The preliminary design and access strategy for the M12 Motorway is expected to be on display in the second half of 2017.

For more information, visit the M12 Motorway website:  
[www.rms.nsw.gov.au/m12motorway](http://www.rms.nsw.gov.au/m12motorway).



May 2017  
RMS 17.179



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[rms.nsw.gov.au](http://rms.nsw.gov.au)



[contactus@rms.nsw.gov.au](mailto:contactus@rms.nsw.gov.au)



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

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