

Elizabeth Drive West

Urban Design, Landscape Character and Visual Impact Assessment

Concept Design
60641411
September 2023

Quality information

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Revision history

Issue	Issue date	Details	Name	Position
A	18.03.2022	Draft for review	Adam Jeffery	Principal Landscape Architect
B	27.04.2022	Final	Adam Jeffery	Principal Landscape Architect
C	24.08.2022	Final, updated UD chapter, updated LCVIA	Gabi Parke	Principal Landscape Architect
D	09.09.2022	Final Report for REF Issue	Gabi Parke	Principal Landscape Architect
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F	14.11.2022	Final Report for REF Issue	Gabi Parke	Principal Landscape Architect
G	20.01.2023	Final Report for REF Issue	Gabi Parke	Principal Landscape Architect
H	08.09.2023	Final Report for REF Issue	Frank Ciancio	Associate Director - Urbanism + Planning

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Introduction

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1. Introduction

The upgrade of Elizabeth Drive would support greenfield development between the M7 Motorway and The Northern Road.

A strategic design has been completed for Elizabeth Drive from The Northern Road to the M7 Motorway (the Elizabeth Drive Upgrade). This stage has involved concept design and environmental assessment under the EP&A Act, including the preparation of a Review of Environmental Factors (REF).

While the Elizabeth Drive Upgrade comprises two proposals - Elizabeth Drive West (the Proposal) and Elizabeth Drive East (refer Figure 1) - the urban design approach for Elizabeth Drive has been considered as a single project to ensure a continuous whole of corridor design response. The urban design strategy and principles are also complementary with those outlined in the M12 Motorway Place, Design and Landscape Plan (Transport for NSW, 2022) which runs parallel, to provide compatibility in the final environmental and design and outcomes.

The Proposal (the Elizabeth Drive West Upgrade) would involve the upgrade of approximately 3.6 kilometres of Elizabeth Drive from The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek. The Proposal would connect with a portion of Elizabeth Drive which is being upgraded by the M12 project.

The major design features of the Proposal include:

- Upgrade of Elizabeth Drive from a two-lane rural road, to a four-lane road (two lanes in each direction) with provision of a central median to allow for future upgrade to six lanes
- A new bridge over Cosgroves Creek to carry eastbound and westbound traffic
- Upgrades to two intersections along Elizabeth Drive: Luddenham Road and Adams Road
- Active transport provision along the full corridor with the inclusion of shared paths along both sides of Elizabeth Drive corridor
- Inclusion of public transport infrastructure with bus priority at intersection and bus stops facilities
- New stormwater drainage infrastructure
- Property acquisitions and adjustments on both sides of Elizabeth Drive and some side roads
- Relocation/adjustment of existing utilities.

1.1 Proposal objectives

The Elizabeth Drive Upgrade project objectives are to:

- provide a defined and preserved corridor to accommodate future growth and maintenance needs
- maintain primary function of a movement corridor east-west
- support important north-south routes (e.g. M12 Motorway, M7 Motorway and future road network connections in the Aerotropolis area)
- improve road safety for all road users
- provide cycleway, bus, and vehicle access with connections to:

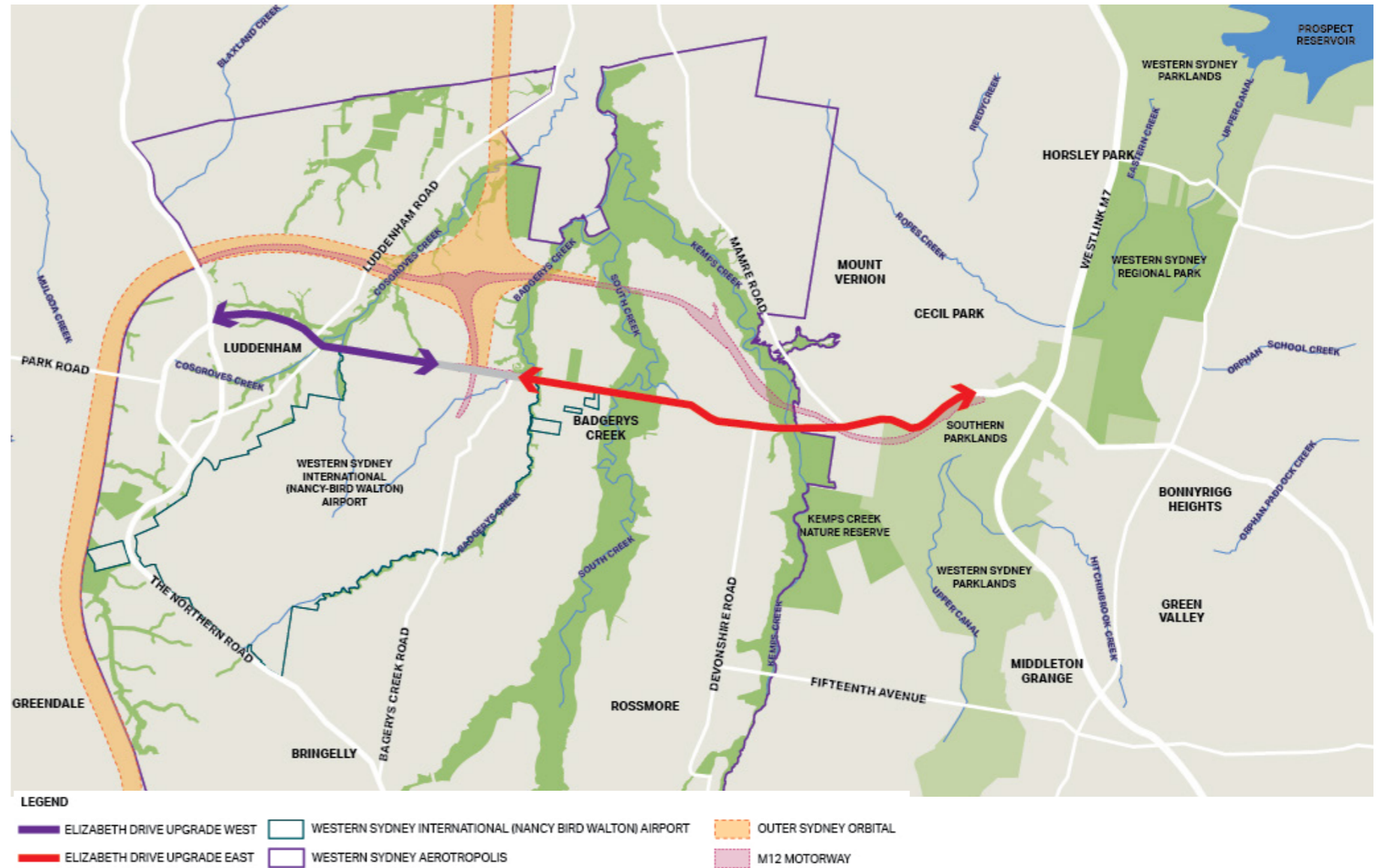


Figure 1: The Elizabeth Drive Upgrade, divided into Elizabeth Drive West (the Proposal) and Elizabeth Drive East

- the Western Sydney International (Nancy-Bird Walton) Airport (WSA) business & technology park
- Western Sydney Aerotropolis
- centres identified in the Western Parkland City
- Western Sydney Parklands
- provide an efficient, resilient freight network
- contribute to the desired future character and connectivity of the Western Parkland City and Western Sydney Parklands.

1.2 Proposal background

Elizabeth Drive is a major east-west road corridor between Sydney’s Liverpool region and the suburbs of Western Sydney. It is situated in the Liverpool City Council, Fairfield and Penrith City Council Local Government Areas and runs through the suburbs of Luddenham, Badgerys Creek, Kemps Creek, Cecil Park and Cecil Hills. The existing condition along Elizabeth Drive is predominantly a 2-lane undivided semi-rural road, generally with no footpaths, no median, and a speed limit of 60-80 kilometres/hour.

Other east-west alternatives to Elizabeth Drive are limited to the M4 Motorway to the north and Bringelly Road to the south. Lower-order roads include Hoxton Park Road / Fifteenth Avenue and Luddenham Road / Mamre Road / Lenore Drive. The introduction of the M12 Motorway would also create an additional east-west motorway link in the area.

The need to upgrade Elizabeth Drive has been driven by planned future growth in Sydney’s South West Growth Area. This includes the development of WSA, industrial and commercial precincts associated with the Western Sydney Aerotropolis, and adjoining land releases for residential precincts and employment zones. This projected growth has necessitated the upgrade of Elizabeth Drive to increase capacity, improve access, reliability, and safety as a major arterial road within the region’s future transport network.

Transport for NSW (Transport) has also recognised the requirement to provide pedestrian, cycling, and bus stop infrastructure along Elizabeth Drive as there is currently minimal infrastructure for supporting these customer groups.

The failure to upgrade Elizabeth Drive would place pressure on the surrounding transport infrastructure and result in increased congestion, travel times, and reliability issues in accessing WSA. These failures would not support the substantial planned regional residential, commercial, and industrial development proposed within the Western Sydney Aerotropolis and broader Western Parkland City, which requires strong movement corridor connections to local road networks. Lack of adequate transport connectivity would also undermine and impede the socio-economic growth of the region.

Planned and designed as a single road corridor, Elizabeth Drive Upgrade has been divided into two packages for delivery - east and west. Elizabeth Drive Upgrade West, the subject of this Proposal, has a distance of about 3.6 kilometres and extends from The Northern Road to the Airport Access Road.

1.2.1 Proposal footprint and study area

The Proposal footprint shows the extent of changes due to the Proposal. For the purposes of this assessment, the study area is the extent of the landscape surrounding the Proposal footprint assessed for landscape character and visual impact. It comprises a one kilometre wide corridor of land offset 500 metres either side of the centre line of the Proposal (refer Figure 2).

1.3 Purpose of this report

The purpose of this Urban Design, Landscape Character and Visual Impact Assessment (UD&LCVIA) report is to:

1. Develop and present an integrated engineering and urban design outcome in accordance with *Beyond the Pavement - Urban design policy procedures and design principles* (Transport for NSW, 2020) that:
 - fits sensitively into the built and natural environments through which it passes and contributes positively to the character and function of the area
 - contributes to the safety, accessibility and connectivity of people within the region and communities
 - mitigates to the best of its ability any negative landscape or visual impacts that may be imposed on the community and the natural environment
 - considers the outcomes of the landscape character and visual impact assessment so they are iteratively fed into the concept design development process.

2. Carry out a succinct landscape character and visual impact assessment, the results of which are iteratively fed back into the urban design and concept development process as well as fulfilling the environmental impact assessment requirements. Remaining impacts on landscape character and views due to the Proposal not addressed during the concept design process in response to initial report findings are addressed with mitigation measures.
3. To develop concept urban design drawings and report for the Proposal (including but not limited to input on the concept drawings for the overall proposal and detailed for bridges, walls, other structures and landscape works).

Good urban design means a safe, robust design and a diverse, sustainable landscape outcomes while deterring graffiti and vandalism. Intricate, complex design solutions and domestic scale approaches are not appropriate.

The design must undertake urban design collaboratively with Transport. It must be considered early in the concept design phase, integrated into proposals at the initiation phase, and continued through the Proposals’ development, implementation, and finalisation phases.

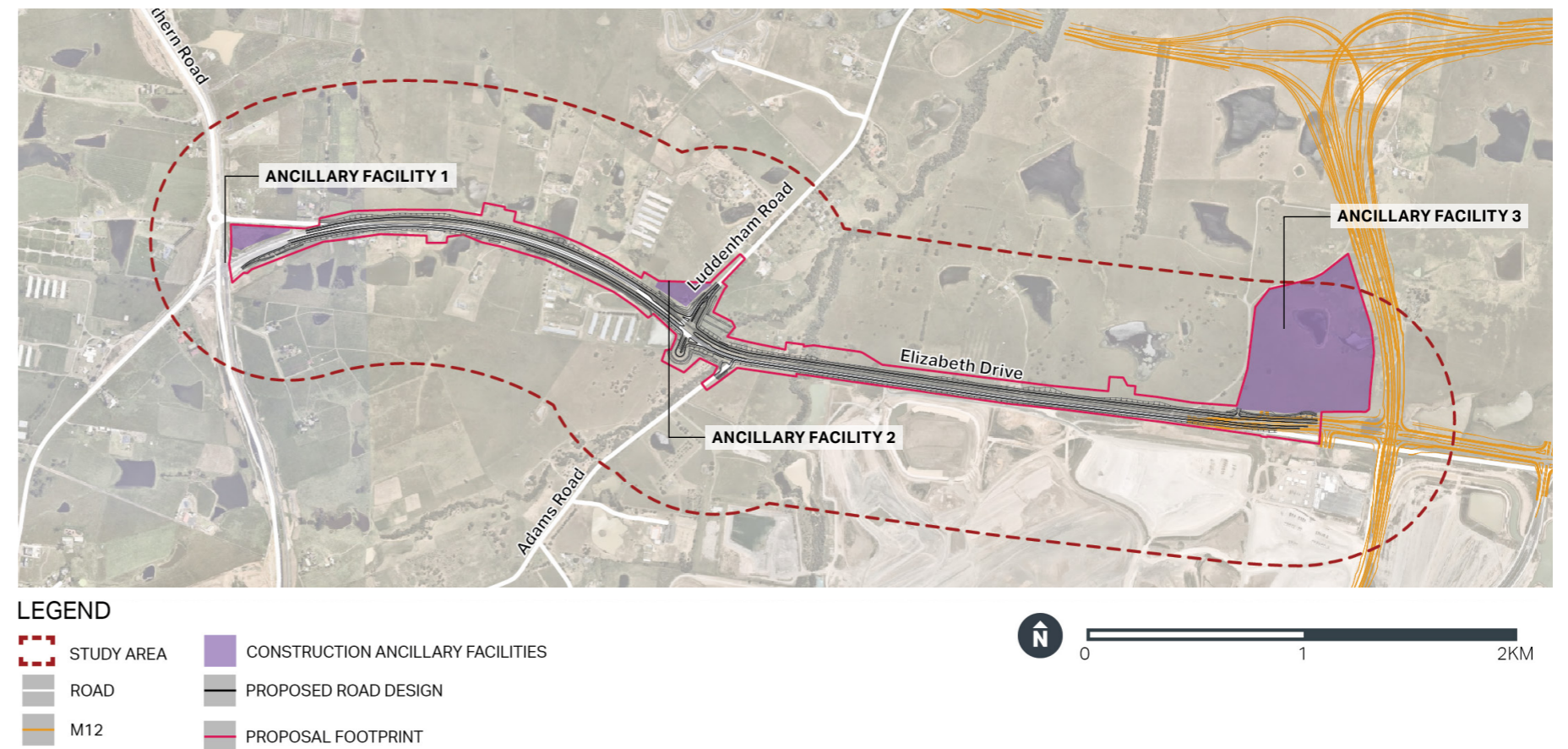


Figure 2: The Proposal footprint and study area

1.4 Description of the Proposal

1.4.1 Operational features

Transport proposes to upgrade about 3.6 kilometres of Elizabeth Drive from The Northern Road at Luddenham to near Badgerys Creek Road at Badgerys Creek where it would connect with the future M12 Motorway. The Proposal would be carried out within the Penrith Local Government Area (LGA) and the Liverpool LGA.

The major features of the Proposal (subject to detailed design) would include (refer Figure 3, Figure 4, Figure 5 and Figure 6):

- Upgrade of Elizabeth Drive from a two-lane rural road, to a four-lane road (two lanes in each direction) with provision of a central median to allow for future upgrade to six lanes
- A new bridge over Cosgroves Creek to carry eastbound and westbound traffic
- Upgrades to two intersections along Elizabeth Drive: Luddenham Road and Adams Road
- Active transport provision along the full corridor with the inclusion of shared paths along both sides of Elizabeth Drive corridor
- Inclusion of public transport infrastructure with bus priority at intersection and bus stops facilities
- New stormwater drainage infrastructure
- Property acquisitions and adjustments on both sides of Elizabeth Drive and some side roads
- Relocation/adjustment of existing utilities.

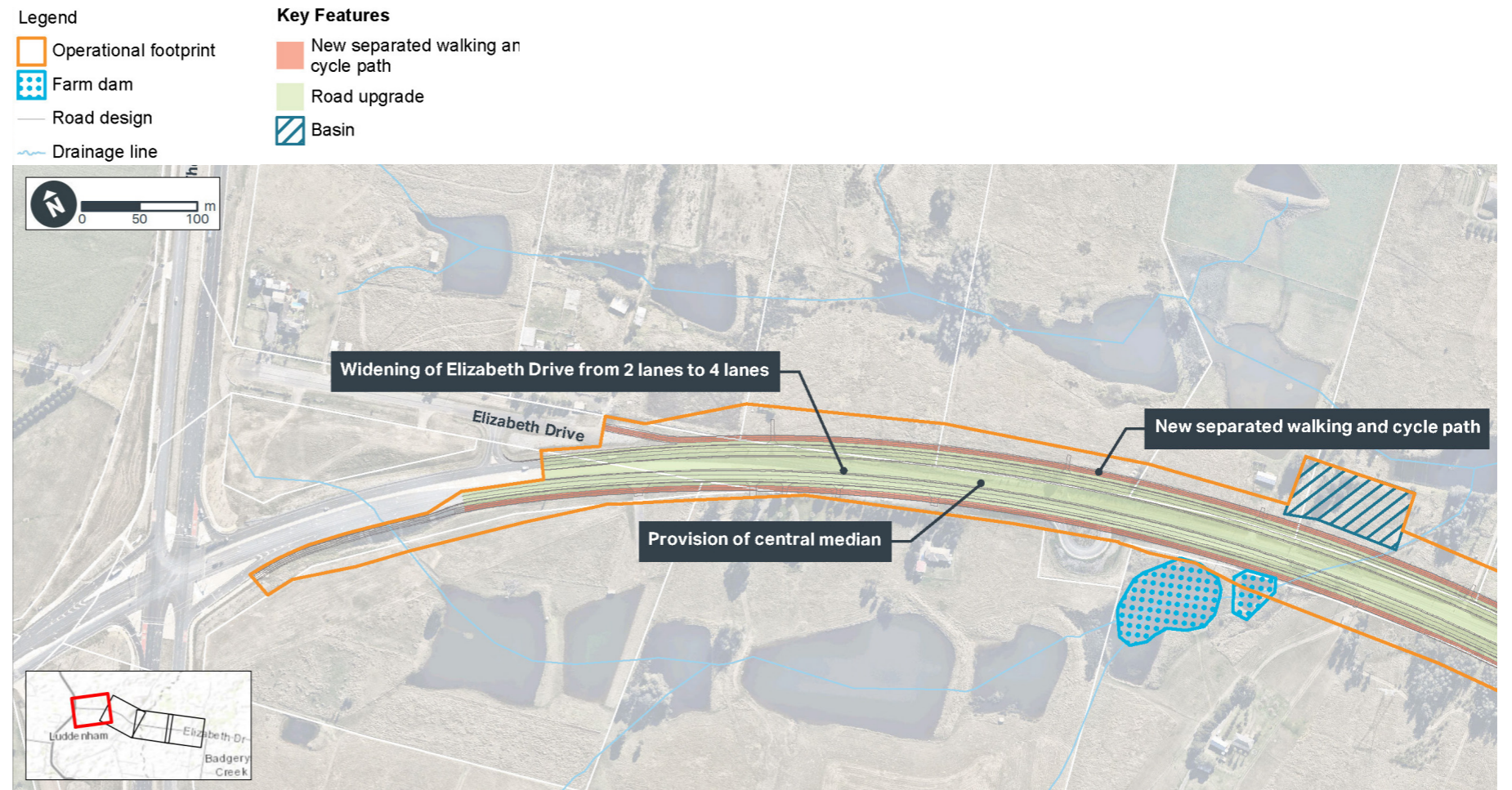


Figure 3: Key elements of the Proposal (map 1)

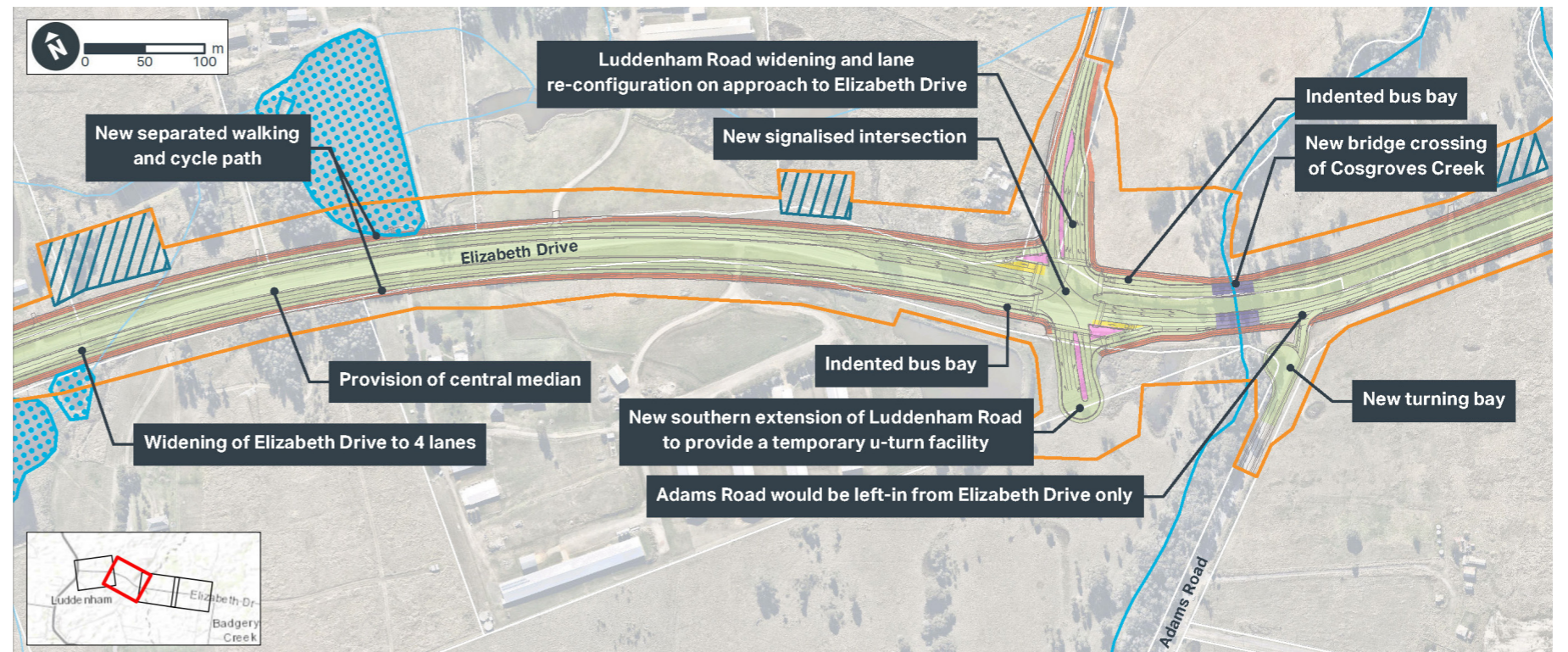


Figure 4: Key elements of the Proposal (map 2)

1.4.2 Construction

The construction footprint (i.e. area of land required for construction of the Proposal) is shown in Figure 2. Subject to detailed design and construction planning, construction of the proposal is anticipated to take about 48 months to complete.

Construction ancillary facilities

The following three temporary construction ancillary facilities would be established to support construction of the proposal:

- The Northern Road (construction ancillary facility 1) - located at the north-eastern corner of the Elizabeth Drive and The Northern Road intersection
- Luddenham Road (construction ancillary facility 2) - located at the north-western corner of the Elizabeth Drive and Luddenham Road intersection
- M12 Motorway tie in (construction ancillary facility 3) - located west of Badgerys Creek Road on the northern side of Elizabeth Drive. Subject to detailed design and construction planning, it is anticipated that the site offices at this construction ancillary facility would operate as the main site office during construction of the proposal.

Construction ancillary facilities 1 and 2 would be located on private land acquired or leased by Transport. Construction ancillary facility 3 would be located on land used to support construction of the M12 Motorway.

Each construction ancillary facility may include the following:

- establishment of site office/s, amenities, and temporary infrastructure, such as fencing and car parking areas
- laydown and storage areas, and delivery of plant, equipment and materials
- secure and bunded storage areas for re-fuelling and chemical storage
- concrete batching plant
- material crushing
- stockpiling areas and spoil management (topsoil, excavated natural material, contaminated material). Stockpile locations would be determined during subsequent design stages using the criteria set out in the Stockpile Management Guideline (RTA, 2015).

Further details of these construction activities are provided in the REF.

Each construction ancillary facility would be securely fenced with temporary fencing, and signage would be erected advising the public of access restrictions. Upon completion of construction, the temporary construction ancillary facilities, including work areas and stockpiles, would be removed and the sites would be cleared of all rubbish and materials. The sites would then be reinstated or handed over in agreement with the landowner.

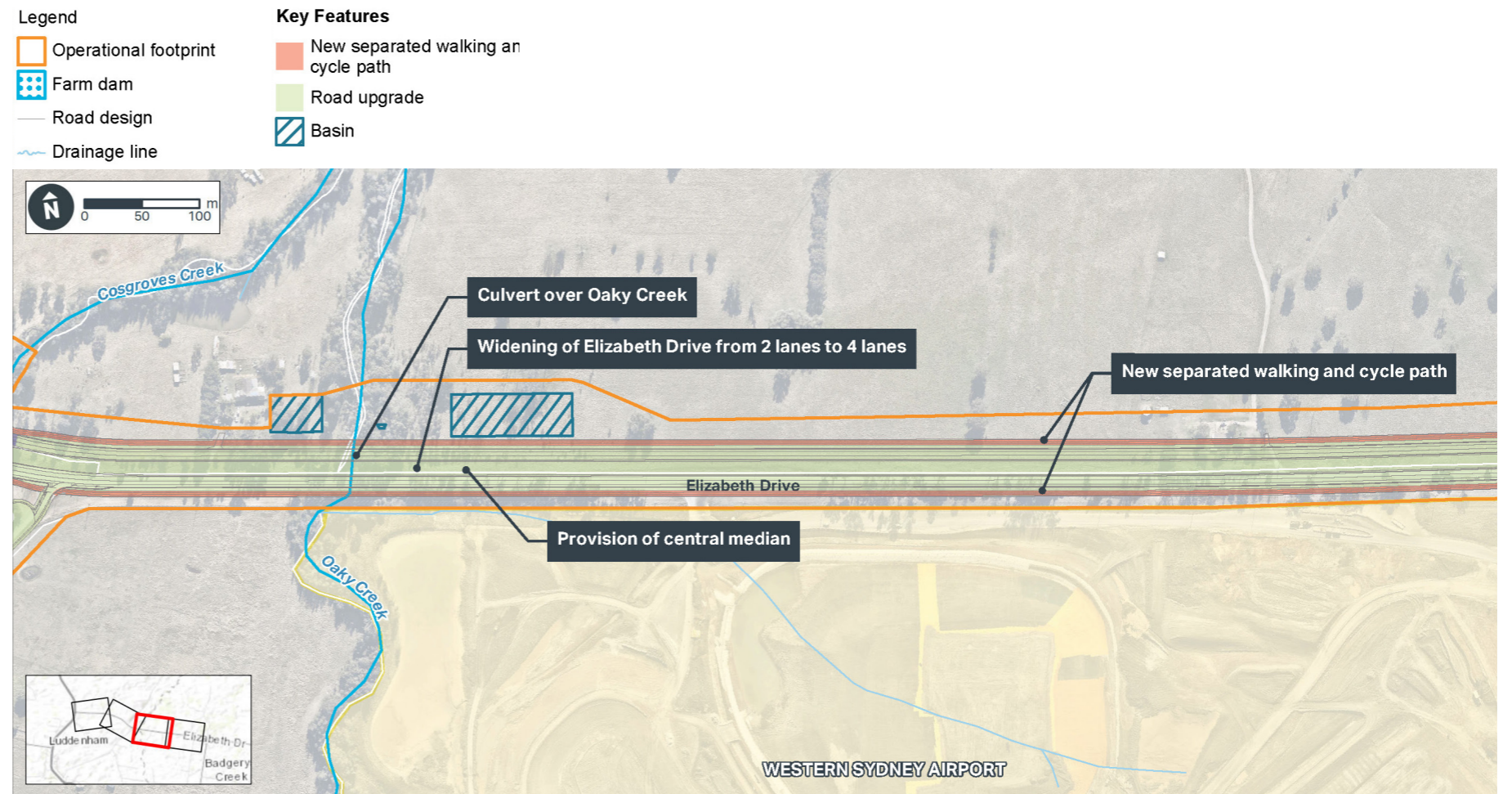


Figure 5: Key elements of the Proposal (map 3)

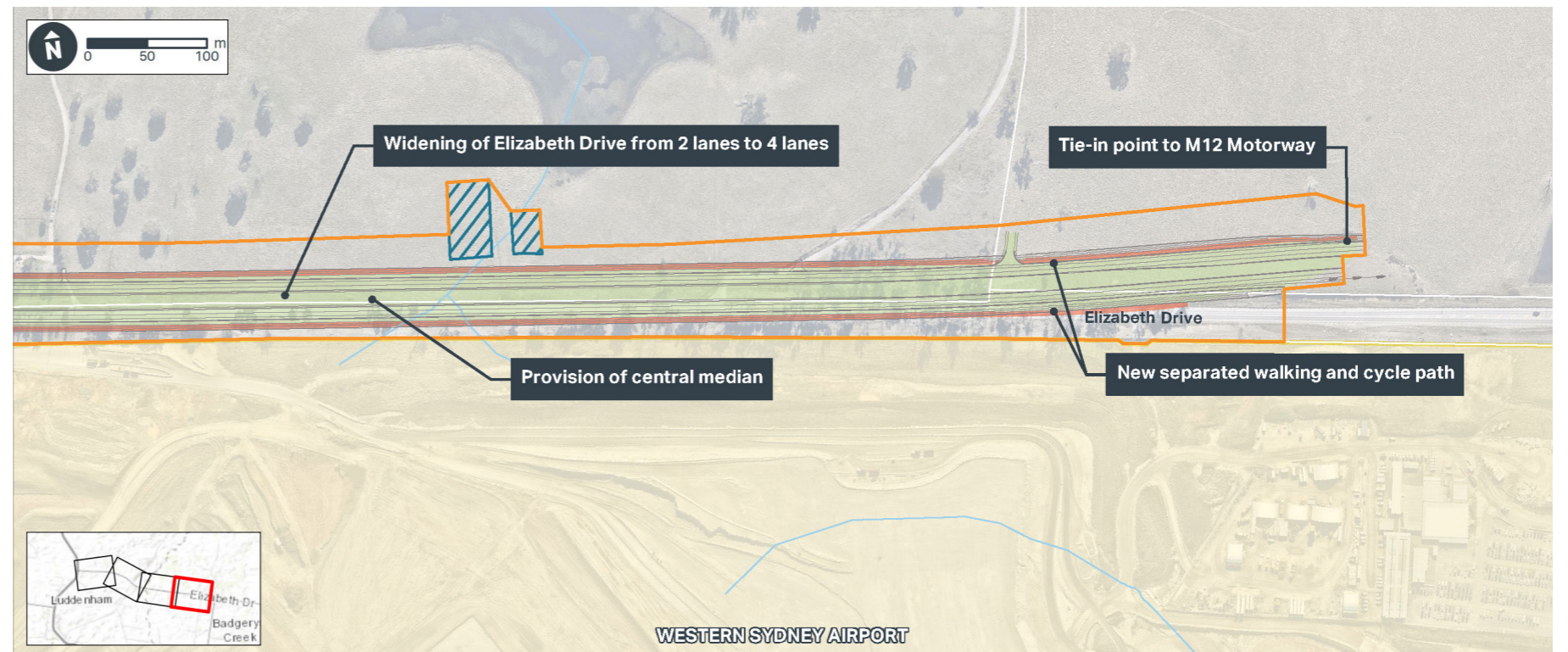


Figure 6: Key elements of the Proposal (map 4)

Construction works

Construction of the proposal would involve the following general activities:

- site establishment including set up of construction ancillary facilities and installation of environmental protection controls, including around creek areas
- utility adjustments, relocations and replacements, where required
- demolition of existing buildings/structures
- property adjustments (e.g. adjustments to fencing, property accesses)
- vegetation removal
- earthworks and drainage work
- adjustments to existing farm dams within the Construction footprint, including pumping out and re-shaping where required
- Cosgroves Creek bridge work, including installation of temporary diversion (if required) and temporary creek crossing, construction of new bridge structures and demolition/removal of the existing bridge
- Elizabeth Drive Upgrade main roadwork, including intersections with local roads and walking and cycling infrastructure
- landscaping and finishing work.

1.5 Methodology

This UD&LCVIA report has been undertaken in accordance with *Beyond The Pavement* and the Transport for NSW *Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment EIA-N04 (2020)*.

The development of the urban design concept and the assessment of impact on landscape character and views involved:

1. **Contextual analysis** - An analysis of the regional and local context through which the road passes. Refer [Section 1.5.1](#).
2. **Urban design vision, objectives and strategy** - The development of urban design principles that align with the overall vision based on policy documents, supporting design reference documents and guidelines, and planning objectives for the area. The principles would be delivered through a set of clear and achievable objectives that would guide the overall concept design for the Proposal.
3. **Urban design concept** – The preparation of an illustrative urban design concept that reflects the urban design strategy, developed in collaboration with the concept design team.
4. **Landscape character impact assessment** - An evaluation of the existing landscape character within the study area to inform the early stages of the urban design process, and to assess the anticipated landscape impacts as a result of the final design outcome. Refer [Section 1.5.2](#).

5. **Visual impact assessment** - An evaluation of the existing views and visual amenity within the study area to identify and assess possible impacts on the community as a consequence of the proposed works. Refer [Section 1.5.3](#).
6. **Mitigation** – Design outcomes and mitigation measures to avoid, reduce or mitigate adverse impacts developed in collaboration with the Proposal team. Refer [Section 1.5.4](#).

1.5.1 Contextual analysis

The contextual analysis includes a broad description of the landscape within which the Proposal is located including planning and policy documents, site setting, topography, land use, landscape and heritage values.

1.5.1.1. Desktop analysis

Existing data has been gathered and reviewed, including:

- planning and policy documents
- information on sensitive visual receptors, proposal design, and similar examples of infrastructure elements proposed
- GIS mapping, including zone of theoretical visibility (ZTV) mapping, zoning / land use, topography and heritage information
- use Google Earth and Google Street View.

Using this data, a preliminary assessment of the landscape and potential visual receptors / viewpoints was undertaken and used to inform a subsequent site inspection. The existing environment was detailed, including topography and hydrology, land use, review of heritage aspects and Landscape Character Zones (LCZs) (refer [Section 1.5.1.4](#)).

1.5.1.2. Zone of theoretical visibility

The likely visibility of the Proposal, once operational, from surrounding areas was broadly mapped to define a ZTV. This provides an indication of which parts of the Proposal are likely to be visible from surrounding areas. The mapping typically shows ‘worst case’, i.e. within areas identified as having a view to the Proposal. Some receptors may only see a small portion of the Proposal, while other receptors may view a more substantial part of it. This mapping only accounts for landform, however, the obscuring effect of existing vegetation and built form has been described in the text to estimate a likely area from which the Proposal would be seen.

This map was generated using the function tool ‘Viewshed’ in ArcMap (version 10.8).

1.5.1.3. Site inspection

Site inspections were undertaken on 16 December 2021 and 24 February 2022. The purpose of the inspections was to:

- confirm initial reporting on landscape and visual resources and existing environment
- identify views seen by visual receptors within publicly accessible locations and allocate viewpoints from which to assess representative views

- assess landscape character
- undertake site photography to record views and landscape character.

1.5.1.4. Identification of Landscape Character Zones

Drawing from the desktop analysis and the site inspection, a landscape character assessment was undertaken to be able to assign a value to it in subsequent assessment. It considers the way different components of the environment, both natural (e.g. the influences of geology, soils, climate, flora and fauna), and cultural (the historical and current impact of land use, settlement, enclosure and other human interventions), interact together and are perceived to form a distinct pattern, which gives its particular sense of place.

To provide a framework for more clearly describing the area, and assessing how the Proposal would affect the elements that make up the landscape (including the aesthetic and perceptual aspects of the landscape and its distinctive character), distinct parts of the overall landscape have been separately defined and mapped as LCZs.

1.5.2 Landscape character impact assessment

Assessment of impact on landscape character considers the impact of change due to the Proposal on the landscape. As the construction phase is temporary, impact of the Proposal on landscape character is assessed at operation.

The consideration of potential impact on landscape character is determined based on the each LCZs sensitivity to change and the magnitude of change that is likely to occur. Sensitivity and magnitude are both assigned a rating based on a series of criteria, and then a matrix is used to combine the ratings to determine an overall impact rating.

Sensitivity

The sensitivity of a LCZ to the Proposal is assessed and rated as being High, Moderate, Low or Negligible. The rating is based on:

- susceptibility to change - the ability of the landscape to accommodate the Proposal without undue consequences for the maintenance of the existing situation or the achievement of desired landscape planning policies and strategies
- the value of landscape.

Criteria for the assessment of sensitivity of LCZs have been defined using a combination of the physical environment of the LCZ and policy and planning documents that relate to it. The following would influence the susceptibility of the LCZ to change:

- does the Proposal lie within or adjacent to the LCZ?
- is the Proposal similar in characteristic to other elements within the LCZ?
- is the Proposal compatible with land zoning and anticipated future characteristics?

The following would influence the value of the landscape:

- the geological, topographical, natural drainage and ecological characteristics and land cover of an area
- the agricultural qualities of an area and how these contribute to character
- the Aboriginal and non-Aboriginal heritage and cultural qualities of the area whether they are formally designated in planning documents, including the presence of individual items and broader conservation areas which reflect local traditions around community, cultural practice, stories, prior occupancy and significant events
- the planning designations of an area relating to landscape character (including desired future character)
- if available, the conclusions of the 'Movement and Place' assessment of the road corridor carried out prior to the commencement of the proposal
- how the settlements fit into their natural setting and topography
- the built form of the towns and cities, the composition of buildings, open space, civic and business areas and transport networks
- the character and quality of parks and other open space throughout the area
- the contribution of green infrastructure and vegetation
- the main cultural and recreational elements of an area
- the demographics of an area and how that influences of character
- the style of architecture, the materials, forms, historical mixes and design qualities
- the infrastructure environment including the scale and pattern of rail, footpaths, roads, active transport, bridges, electricity pylons, dams etc.
- major economic or industrial features such as factories, quarries etc
- the spatial qualities of an area, i.e. how enclosed or open it is, as defined by ridge lines, vegetation and built form
- sensory or spiritual aspects of a place (for example its scenic quality)
- how the area changes daily and seasonally, e.g. due to substantial night time activity, peaks which coincide with holiday periods or climatic conditions.

Magnitude

Magnitude of change is assessed and graded as being High, Moderate, Low or Negligible. The magnitude of the impact refers to the physical scale of the Proposal, how distant it is and the contrast it presents to the existing condition. The Proposal elements assessed include its location, the vertical and horizontal alignment, heights of cuttings and fill embankments, the location and form of bridges and walls, vegetation and planting after two to three years of growth.

Overall impact of change

A matrix is then used to combine the ratings for sensitivity and magnitude (refer *Table 1*) to determine an overall rating of landscape character impact.

Qualitative assessment of change

A rating for the quality of the change to the LCZ due to the Proposal is provided for each LCZ, being Beneficial, Adverse or Neutral. This rating is assigned based on professional judgment, but considers:

- the degree to which the Proposal fits within existing / proposed and desired landscape character
- the contribution to the landscape that the Proposal may make through its inherent design quality.

Table 1: Overall significance of landscape character effects

		MAGNITUDE OF EFFECT			
		High	Moderate	Low	Negligible
SENSITIVITY	High	High	High - Moderate	Moderate	Negligible
	Moderate	High - Moderate	Moderate	Moderate - Low	Negligible
	Low	Moderate	Moderate - Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

1.5.3 Visual Impact Assessment

1.5.3.1. Selection of viewpoints and visual simulation locations

A series of viewpoints was selected from which to assess the visual impact of the Proposal using a combination of information gathered from:

- desktop analysis, including ZTV mapping (refer *Section 1.5.1.1*)
- the site visit (refer *Section 1.5.1.3*).

Other factors such as proximity to the Proposal, number of visual receptors at each location and the type of visual receptors were taken into account when selecting viewpoints. Viewpoints were chosen to assess the changes due to the Proposal from publicly accessible locations, although some viewpoints were used to approximate these changes when seen from private locations such as residences or community facilities.

These viewpoints were then used to assess the visual impact due to the Proposal.

1.5.3.2. Assessment of views

The assessment of potential impacts on visual amenity is based on the sensitivity of the viewpoint to change, and the magnitude of change arising from the Proposal that is likely to occur. Sensitivity and magnitude are both assigned a rating based on a series of criteria, and then a matrix is used to combine the ratings to determine an overall visual impact rating.

The impact of the Proposal on views has been assessed during construction and at operation.

Sensitivity

The sensitivity of a viewpoint to the Proposal is assessed and rated as being High, Moderate, Low or Negligible. The rating is based on:

- susceptibility to change, i.e. how interested the visual receptor would be to the view
- value attached to the view experienced.

More sensitive viewpoints may include:

- those from residential areas
- those where the quality of the landscape or the views are intrinsic to the enjoyment of activity at that location (e.g recreational areas)
- heritage assets or other attractions where views are an important contributor to the experience
- communities where views contribute to the landscape setting of the area.

Magnitude

The magnitude of change to views and visual amenity depends on:

- size or scale of change in the view with regard to the:
 - loss or addition of features in the view and changes in its composition
 - degree of contrast or integration of any new features with the existing landscape, in terms of form, scale and mass, line, height, colour and texture
 - nature of the view of the proposal in terms of amount of time it would be experienced, and whether the views would be full, partial or glimpses.
- geographical extent of the visual impact with different viewpoints including the:
 - angle of view in relation to the main activity of the receptor
 - distance of the viewpoint from the proposal
 - extent of area over which the changes would be visible.
- duration and reversibility of visual impacts.

The extent of magnitude is assessed and graded as being High, Moderate, Low or Negligible.

Overall impact of change

A matrix is used to combine the ratings for sensitivity and magnitude to provide an overall rating of visual impact (refer *Table 2*). This rating does not contain a value judgment regarding the nature of the visual change (i.e. if the change is a positive or negative impact on views).

Qualitative assessment of change

A rating for the quality of the change to views seen from each viewpoint due to the Proposal is provided, being Beneficial, Adverse or Neutral. This rating is assigned based on professional judgment, but considers:

- the degree to which the Proposal fits within existing / proposed views
- the contribution to the view that the Proposal may make through its inherent design quality.

Table 2: Overall significance of visual effects

		MAGNITUDE OF EFFECT			
		High	Moderate	Low	Negligible
SENSITIVITY	High	High	High - Moderate	Moderate	Negligible
	Moderate	High - Moderate	Moderate	Moderate - Low	Negligible
	Low	Moderate	Moderate - Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

1.5.3.3. Creation of panoramas

A series of photographs were undertaken to produce a panorama from each viewpoint. These provided a baseline from which to assess changes arising from the Proposal.

1.5.3.4. Creation of visual simulations

Visual simulations are a type of photomontage which provides the most accurate representation of relative position and size of the Proposal at 2-3 years after completion from a chosen viewpoint. They were produced from some viewpoints to illustrate the nature of the change, but are not explicitly necessary for undertaking an assessment of visual impact.

Visual simulations were prepared from viewpoints which were deemed to experience the greatest potential impacts from the Proposal. These included places which were positioned closest to the Proposal and / or would include highly sensitive visual receptors. Visual simulations were not produced from other viewpoints for several reasons, including:

- they were deemed too far from the Proposal to receive clear views to the Proposal
- the changes would be screened from view by landform or vegetation
- where they had very few receptors or where receptors were deemed of negligible or low sensitivity.

1.5.4 Cumulative impact assessment

A cumulative impact assessment has been undertaken for both construction and operation, to assess the potential cumulative impacts of the Proposal with other projects in the area. This was undertaken based on a screening of other nearby projects to determine those that have the potential to cause cumulative impacts. The screening took into account projects that have been approved but where construction has not commenced, projects that have commenced construction, and projects that have recently been completed. The screening process is described further in Chapter 6 of the REF.

The cumulative impact assessment was based on the residual impacts of the Proposal (i.e. those that are expected to exist after application of management and mitigation measures).

1.5.5 Mitigation of impact

During the concept design phase, outcomes of contextual analysis, urban design development and landscape character / visual impact assessment have been fed back to the wider proposal team. This process prompts consideration and design changes where relevant in the concept design phase to avoid or reduce potential impacts of the Proposal on landscape character, views and visual amenity.

At the completion of the concept design a set of mitigation measures were developed, aimed at reducing or avoiding remaining adverse impacts of the Proposal.

1.5.6 Conclusion

A final conclusion is provided, summarising the overall impact of the Proposal and the urban design outcomes.

Contextual Analysis

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2. Contextual Analysis

2.1 Policy context

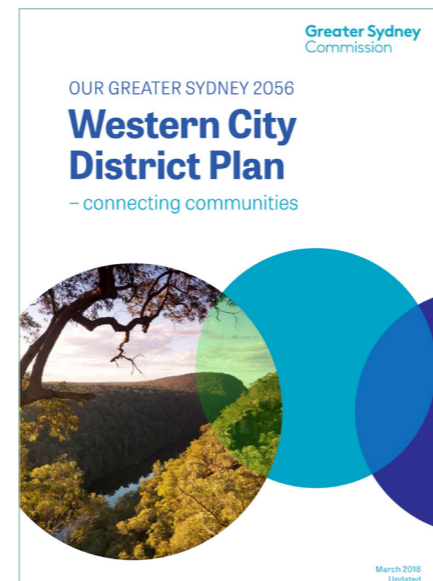
Design reference documents and guidelines relevant to urban design, landscape, and visual amenity in the vicinity of the Construction footprint have been assessed to ensure an understanding of existing and future aspirations for the area and the role of the Proposal within this context. The concept design has been undertaken in the context of planned urban growth and change in the Western Parkland City as described in the following documents:

2.1.1 The Western City District Plan (Greater Sydney Commission, 2018)

The Western City District Plan is a 20-year plan to manage growth in the context of economic, social, and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing the Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and bridge regional and local planning.

The vision for Greater Sydney is a metropolis of three cities – Western Parkland City, Central River City, and Eastern Harbour City. The Plan would be achieved by:

- WSA and the Western Sydney Aerotropolis Plan (2020) creating a once-in-a-generation economic boom that brings together infrastructure, businesses and knowledge-intensive jobs.
- the Western Sydney City Deal transforming the Western City District over the next 20 to 40 years by building on natural and community assets and developing a more contained Western City District with a diverse choice of jobs, transport, and services aligned with growth.
- delivering the first stage of the North-South Rail Link.
- collaborating and building solid relationships between Liverpool, Greater Penrith, and Campbelltown-Macarthur reinforced by the emerging Badgerys Creek Aerotropolis forming a unique metropolitan cluster.
- providing primary transport links for people and freight by unprecedented transport investments.
- developing a range of housing, providing access to public transport and infrastructure including schools, hospitals, and community facilities.
- linking walking and cycling paths, bushland, and a green urban landscape framed by the Greater Blue Mountains World Heritage Area, the Scenic Hills, and Western Sydney Parklands.
- enhancing and protecting South Creek, Georges River, and Hawkesbury Nepean River systems.
- mitigating the heat island effect and providing cooler places by extending urban tree canopy and retaining water in the landscape
- protecting the District's natural landscapes, heritage and tourism assets, unique rural areas, and villages.
- protecting the environmental, social, and economic values of the Metropolitan Rural Area.



2.1.2 Western Sydney Aerotropolis Plan (Western Sydney Planning Partnership, 2020)

The Western Sydney Aerotropolis Plan sets the planning framework for the Western Sydney Aerotropolis, Australia's next global gateway focused on WSA.

The 11,200 hectare Western Sydney Aerotropolis surrounds the site of WSA (without including the WSA site itself). It sits within the Penrith and Liverpool local government areas (LGAs). The Proposal sits within the Western Sydney Aerotropolis (refer Figure 1).

The Western Sydney Aerotropolis contains ten precincts, six of which would focus on initial precinct planning, including:

- Aerotropolis Core
- Agribusiness
- Badgerys Creek
- Mamre Road
- Northern Gateway
- Wianamatta-South Creek

The remaining four precincts comprise:

- Dwyer Road
- Kemps Creek
- North Luddenham
- Rossmore.

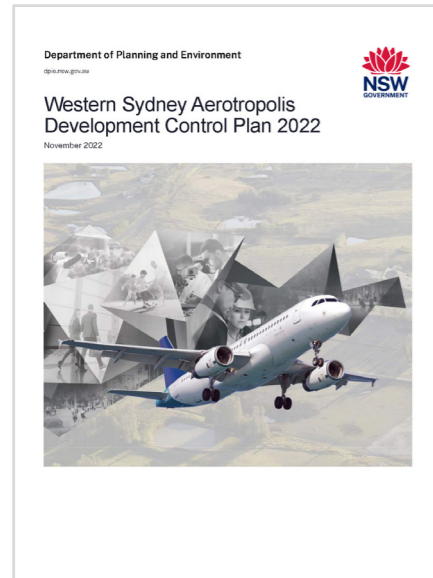
This Plan embraces the transformational potential of the Western Sydney Aerotropolis and WSA. It aspires to share the benefits of population and economic growth, create employment, develop skills, boost productivity, provide jobs closer to home, and achieve a 30-minute city.

The Plan balances this with an ambitious 'landscape-led' planning approach, where the structure and places of the Western Sydney Aerotropolis are defined by the Blue-Green Infrastructure Framework – a network of blue and green spaces and assets such as waterways, open spaces, and tree canopy.

The Plan begins by establishing a vision, objectives, and principles to give effect to these objectives. It identifies the intended land use planning outcomes for each of the ten precincts and a sequenced approach to precinct planning that optimises investment in substantial infrastructure and creates the impetus to activate the Western Sydney Aerotropolis early.

This Plan defines how the broader region's environment, waterways, strategic transport network, infrastructure, and the economy would combine to transform the Western Sydney Aerotropolis into a contemporary metropolitan city. Complementing Liverpool, Penrith, and Campbelltown, the Western Sydney Aerotropolis would be part of the metropolitan city cluster at the heart of the Western Parkland City.





2.1.3 Western Sydney Aerotropolis Development Control Plan (Department of Planning and Environment, 2022)

The Western Sydney Aerotropolis Development Control Plan (DCP) provides controls to supplement the Western Sydney Aerotropolis Plan (2020) and the State Environmental Planning Policy (Western Sydney Aerotropolis) 2020. The DCP aims to achieve connectivity, liveability, productivity and sustainability by:

- giving effect to the Greater Sydney Regional Plan and Western City District Plan
- recognising and reinforcing the distinctive characteristics of the Western Parkland City
- adopting the principles set in the Government Architect NSW's Better Placed design policy and Greener Places design framework
- encouraging development and building upon the objectives and principles under the WSA Plan (2021) and the Aerotropolis State Environmental Planning Policy (the Aerotropolis SEPP)
- supporting the implementation of the Precinct Plan
- protecting and enhancing green and blue infrastructure
- safeguarding of aviation controls and operations of the WSA, including those relating to vegetation and planting requirements
- supporting high levels of local accessibility, quality place and amenity outcomes to drive business relocation and economic growth
- encouraging design that maintains and enhances the character and heritage significance of Aboriginal and European heritage items and heritage conservation areas
- encouraging ecologically sustainable development and reducing the impacts of development on the environment
- delivering development in accordance with the principles of Water Sensitive Urban Design (WSUD).

The DCP outlines objectives and performance outcomes of Starting with Country, which acknowledges that the planning, design and delivery of places and buildings within the Western Sydney Aerotropolis should reflect and be informed by Aboriginal knowledge and expertise about the local area. It provides further objectives for preserving scenic and cultural heritage for both Aboriginal and non-Aboriginal heritage, protection of waterway health and riparian corridors, consideration of native vegetation and biodiversity, and outlines street tree planting requirements.



2.1.4 Western Sydney Airport Plan (The Department of Infrastructure, Regional Development and Communications, 2021)

The Western Sydney Airport Plan (the WSA Plan, 2021) sets out the vision for WSA. Since then, major earthworks have commenced, a terminal design has been created and an Experience Centre constructed on site where the community can watch firsthand the vision come to life.

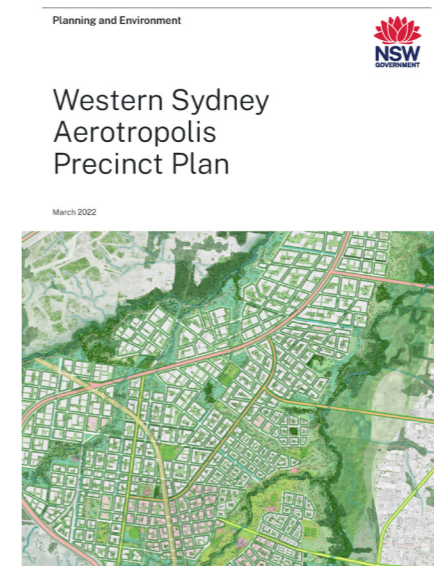
The WSA Plan (2021) was further developed to provide authorisation for the construction and operation of Stage 1 of the development. The document outlines the conditions for the design, construction and operation of the Stage 1 development, which include environmental standards and implementation of mitigation measures identified in the Environmental Impact Statement (EIS) finalised in September 2016 under the Environment Protection and Biodiversity Conservation Act 1999.

The WSA Plan (2021) has been updated to provide authorisation for a rail development on the WSA site.

The WSA is intended to achieve the following objectives:

- improving access to aviation services for Western Sydney
- resolving the long-term aviation capacity constraints in the Sydney basin
- maximising the economic benefit for Australia by maximising the value of the WSA as a national asset
- optimising the benefit of the WSA for employment and investment in Western Sydney
- delivering sound financial, environmental and social outcomes for the Australian community.

To help meet these objectives The WSA Plan (2021) has been developed using sound planning principles, notably flexibility, creativity and vision, and constructability and feasibility.



2.1.5 Western Sydney Aerotropolis Precinct Plan (Department of Planning and Environment, 2022)

The Western Sydney Aerotropolis Precinct Plan focuses on the initial precincts:

- Aerotropolis Core
- Badgerys Creek
- Wianamatta - South Creek (adjacent to Aerotropolis Core and Badgerys Creek)
- Northern Gateway
- Agribusiness.

These precincts are identified in the SEPP, Precincts - Western Parkland City, 2021 (the Aerotropolis SEPP).

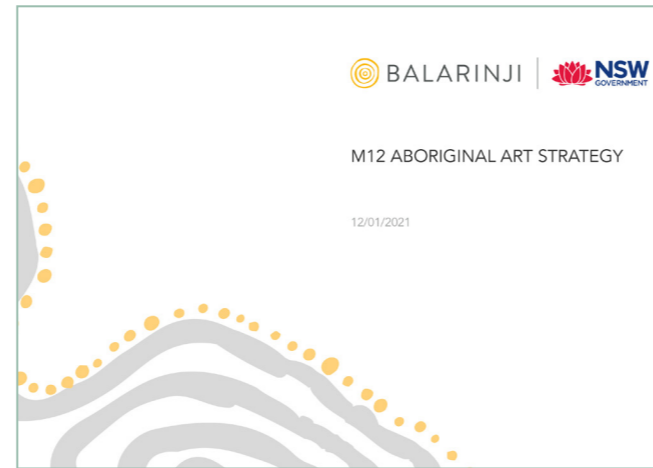
The Precinct Plan achieves the place-based planning principles and themes in the Western Sydney Aerotropolis Plan (2020), including sustainability, connectivity, productivity, liveability, place, and built form.

This Precinct Plan is the next step in realising the vision for the Western Parkland City. The Precinct Plan analyses the Western Sydney Aerotropolis as it is today and establishes place-based responses for its future, including the opportunities from catalysts such as Sydney Metro stations that would become the heart of new vibrant urban centres. It uses a landscape-led approach to plan for the Western Sydney Aerotropolis; an approach that recognises Aboriginal cultural values in design, heritage, and urban systems.

Relevance to Elizabeth Drive

The Plan identifies critical items with relevance to Elizabeth Drive, including:

- transport connections from Sydney Metro - Western Sydney, the M12 Motorway, upgrades to Elizabeth Drive and The Northern Road, Eastern () Ring Road, Western Sydney Freight Line and rapid bus corridors would connect people and goods throughout the Western Parkland City.
- the major east-west infrastructure of Elizabeth Drive would be significant drivers of logical infrastructure corridors.
- the importance of the biodiversity and vegetation corridors associated with the area to the south of Elizabeth Drive in the Badgerys Creek and Wianamatta-South Creek precincts and all the Aerotropolis Core precinct.
- movement and connectivity which prioritises public and active transport, including the provision of recreation walking paths across the creek corridors.



2.2 Supporting Design Reference Documents and Guidelines

The Proposal is supported by several initiatives as outlined below, which further describe the vision, objectives, and principles for the area in which Elizabeth Drive sits.

2.2.1 M12 Motorway Place, Design and Landscape Plan (Transport for NSW, 2022)

The M12 Motorway Place, Design and Landscape Plan (PDLP) aims to help develop and assist the implementation of an integrated urban design and engineering outcome that achieves urban design assurance and consistency across the M12 Motorway proposal. The five principles that underpin the PDLP comprise:

1. The Past: create a unique and distinct identity interpreting the rich sense of place.
2. The Future: positively influence the structure of the Western City Parkland.
3. The People: create an active community and enhanced user experience.
4. The Land: protect and re-establish natural systems.
5. The Project: creating infrastructure as art and celebrating naturalistic landforms and features to inform materials.

The overarching vision for the PDLP is 'Connection to Country', which seeks to create a distinctly unique and memorable piece of infrastructure that establishes the gateway to western Sydney.

Relevance to Elizabeth Drive

The PDLP identifies critical items with relevance to Elizabeth Drive:

- the WSA Gateway Bridge is designed to be a sweeping structure that spans the M12 carriageways and sits as a portal between the Elizabeth Drive ramps.
- integral to the bridge design is the outcomes of the M12 Aboriginal Art Strategy, which focuses on the life cycle of the Mariong (Emu) by utilising a system of panelling to integrate the bridge safety screens to provide an enlarged art canvas.

2.2.2 M12 Aboriginal Art Strategy (Transport for NSW, 2021)

The M12 Aboriginal Art Strategy provides a high-level translation of the site's narrative and Aboriginal aspirations. The Strategy has guided the artwork development and thinking about embedding Aboriginal sensibility in the M12 Motorway. The cultural design principles include:

1. Narrative Integration: Public Art and Interpretation should pay respect to the diverse cultural groups, acknowledging that they each have differing Creation, Dreaming and historic stories which have significance to places along the M12 corridor.
2. Protocols and Inter-connectedness: The design process has supported and facilitated the exchange of knowledge both between and within cultural groups to develop a co-designed and community endorsed M12 Aboriginal Art Strategy.
3. Respect for Country: The relationship between the physical and spiritual role of the Land as Mother. Everything starts with the Land Mother and comes from her people, cycles, seasons, the sky, stars, sunlight, and the cosmos, all connected through the ceremony, cultural practice, and through ecological management.
4. Aboriginal Culture is a living culture: The design celebrates the resilience and continuation of Aboriginal Culture.

Relevance to Elizabeth Drive

The M12 Aboriginal Art Strategy identifies critical items with relevance to Elizabeth Drive, including:

- the artwork located at the WSA Gateway Bridge is designed to be a sweeping structure that spans the M12 carriageways and sits as a portal between the Elizabeth Drive ramps.
- the concept is based on the phase of the Mariong (Emu) story where the female chases the male. The design uses a combination of negative space and transparency to display a series of Emu footprints in motion.

2.2.3 Western Sydney Aerotropolis Urban Design and Landscape Plan Report (Hassell, 2021)

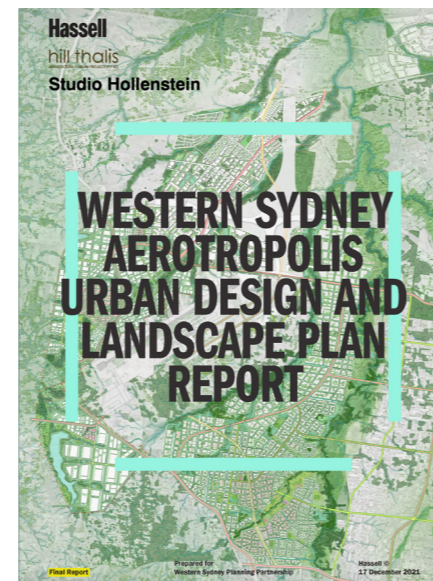
The Western Sydney Aerotropolis Urban Design and Landscape Plan Report comprises the urban design, public realm and landscape recommendations informing the Precinct Plan for the Western Sydney Aerotropolis initial precincts.

The report has been used to inform the Precinct Plan Report, which contains the required statutory mechanisms to implement the vision described by the Western Sydney Aerotropolis Plan (2020), and the development controls against which development proposals can be considered

Relevance to Elizabeth Drive

The Plan identifies critical items with relevance to Elizabeth Drive, including:

- coordinated development north of Elizabeth Drive to integrate with Northern Gateway west of Badgerys Creek.
- importance of Cosgroves Creek Park as a parkland network framed along Cosgroves Creek with playing fields, running and cycling tracks that extends from Luddenham Village, across The Northern Road across Elizabeth Drive to the Northern Gateway Precinct.
- areas to the east of the WSA site and south of Elizabeth Drive sit within the South West Growth Centre under the Western Parkland City SEPP, 2021.
- importance of the existing landscape character of Badgerys Creek which lies in the narrow area of land between the Badgerys and Wianamatta - South Creek systems. Largely flat, the land falls away from a gentle ridge that lies largely central between the creeks.
- enable amalgamation of lots to coordinate development across land use, transport, open space, water, environmental and infrastructure outcomes - this is particularly important across the mixed use zone between Thompsons and Wianamatta - South Creeks, and to the Enterprise zone west of Badgerys Creek Road and south of Elizabeth Drive.
- Elizabeth Drive would be a busy arterial road with controlled intersection and access. However, buildings should not address Elizabeth Drive as a 'back interface'.
- the Elizabeth Drive development interface needs to provide an attractive interface that complements the intent of the Western Parkland City. Development should be set back to allow deep soil planting of trees and understorey. Buildings should limit visual clutter and provide an attractive and clean edge.



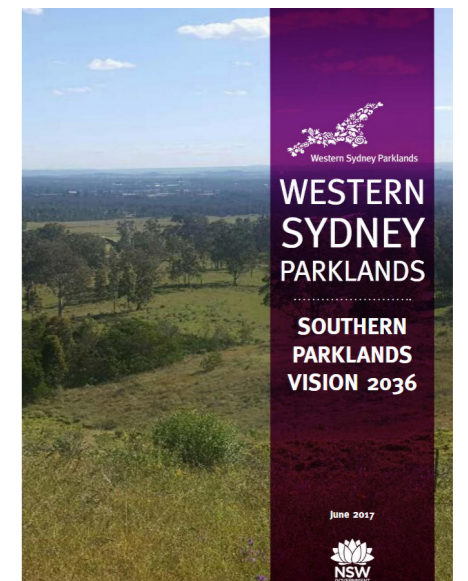
2.2.4 Western Sydney Parklands Southern Vision 2036 (Western Sydney Parklands, 2017)

The document provides a 20 year vision for the area of the Western Sydney Parklands, referred to as the Southern Parklands. It guides the evolution of development, use and facilities and informs the relationship with adjoining infrastructure and development.

Relevance to Elizabeth Drive

The Vision identifies critical items with relevance to Elizabeth Drive, including:

- Northern Slopes - the vegetation slopes to Elizabeth Drive and M12 Motorway to be conserved as a buffer to the adjoining infrastructure. The current Wylde mountain bike course would be retained and extended with the potential to consolidate other adventure sports through the slopes and valleys.



2.2.5 Southern Parklands Landscape Framework Final Report (Tyrrell Studio, 2018)

The Landscape Framework provides a long term physical plan for the development of the 1500 hectare Southern Parklands.

The Landscape Framework takes both the existing 'vision' and the overall Western Sydney Parklands Plan of Management and generates a plan that fits the aspirations of the vision. The Framework presents landform analysis, soils, hydrology, vegetation, surrounding urban development patterns, and regional recreation and tourism demand.

The overall plan locates different land uses in appropriate sizes and locations. A circulation strategy for vehicular access, parking, cycling, and pedestrian circulation responds to these land uses.

Finally, a higher level of design resolution is brought to the 'unstructured recreation' areas developed and managed by the Western Sydney Parklands Trust. The landscape framework includes proposals for accommodation, art, events, heritage interpretation, and land uses to increase visitation to the Southern Parklands and protect its unique landscape.

Relevance to Elizabeth Drive

The Framework identifies critical items with relevance to Elizabeth Drive, including:

- the importance of Elizabeth Drive having direct frontage onto the Southern Parklands, including direct access points to the northern tourism precinct provide dramatic topography, natural habitat, and a sense of escape. The most suitable tourism focus would be nature-based and ecotourism development and experiences.
- new infrastructure and destinations as indicated in Figure 7 would comprise:
 - *The Western Ridge Walk* is a journey along a ridge within the Southern Parklands, from lower elevations in the south, up to the dramatic viewing point of the Beauty Spot.
 - *The Lookout* is a multipurpose event structure on the highest point of the Southern Parklands. It forms the triumphant culmination of the Western Ridges Walk.

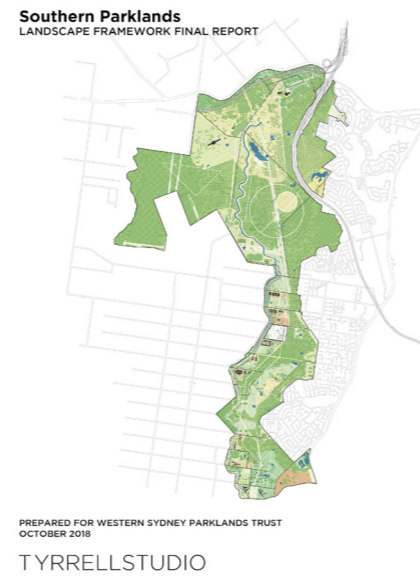
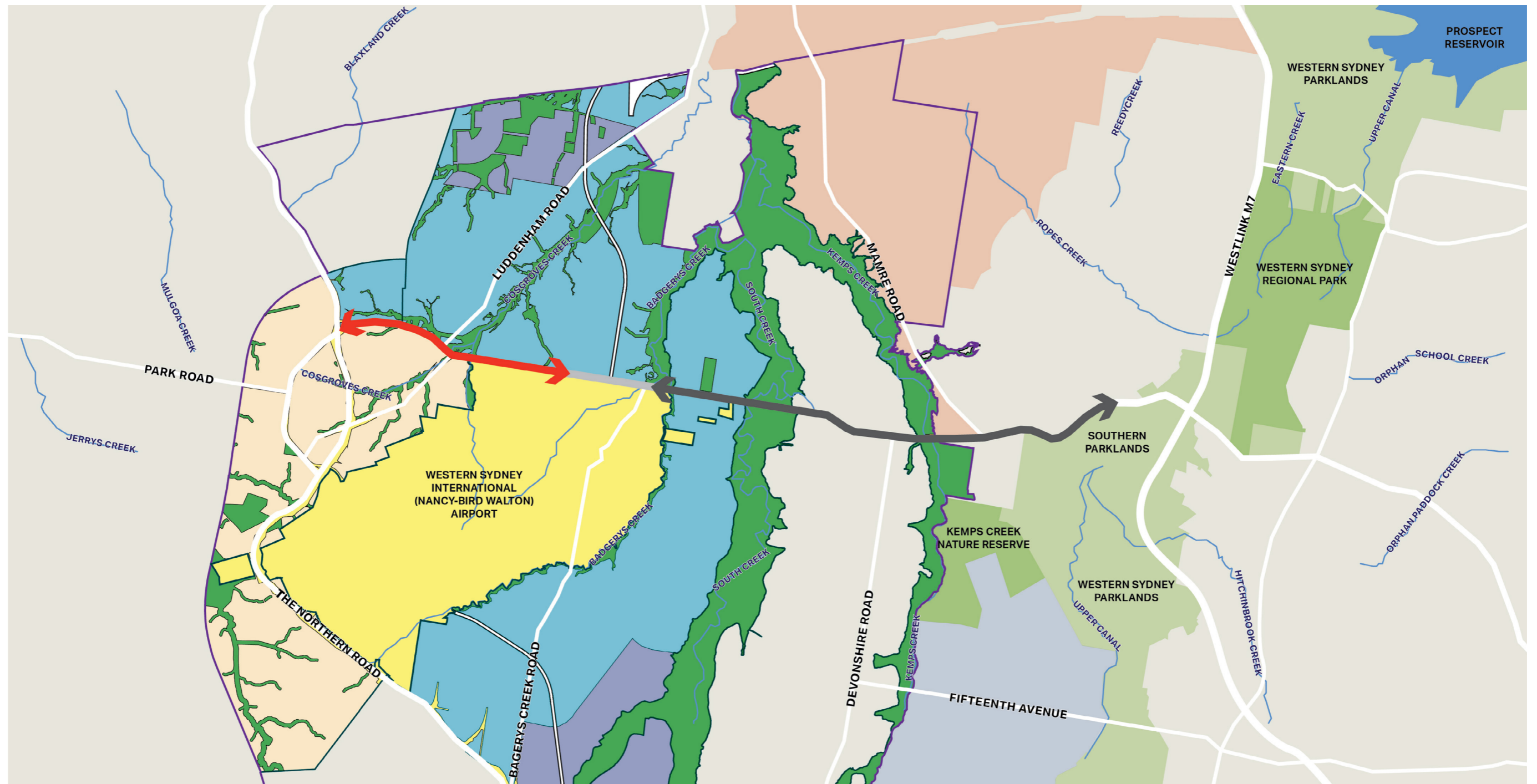


Figure 7: Landscape Framework Plan (Tyrrell Studio, 2018)



LEGEND

- ELIZABETH DRIVE UPGRADE WEST
- ELIZABETH DRIVE UPGRADE EAST
- WESTERN SYDNEY AEROTROPOLIS

- WESTERN SYDNEY AEROTROPOLIS PRECINCT BOUNDARY
- WESTERN SYDNEY EMPLOYMENT AREA
- SOUTH WEST GROWTH AREA

- AEROTROPOLIS SEPP:
- AGB - AGRIBUSINESS
 - ENT - ENTERPRISE

- ENZ - ENVIRONMENT AND RECREATION
- MU - MIXED USE
- SP2 - INFRASTRUCTURE

Figure 8: Future urban growth and land use change adjoining Elizabeth Drive

2.3 Urban growth context

The concept design for Elizabeth Drive responds to and informs planning decisions which occur adjacent to it. It includes an assessment of the impact of planned growth and change that would impact the corridor, including the effect of:

2.3.1 Elizabeth Drive and adjoining areas

The Elizabeth Drive Upgrade would complement other focus areas in Western Sydney (refer to *Figure 8*).

2.3.1.1. Western Sydney Employment Area (WSEA)

The Western Sydney Employment Area is located east of the Western Sydney Aerotropolis, generally along the Warragamba pipeline, and integrates with the Mamre Road precinct within the Western Sydney Aerotropolis. The focus for employment business in the Western Sydney Employment Area is to leverage the accessibility benefits of the motorway network for transport, logistics, warehousing and offices.

2.3.1.2. South West Growth Area

The South West Growth Area would comprise new communities in precincts like Oran Park, Turner Road, Leppington, East Leppington, Austral and Leppington North, Edmondson Park, Catherine Field, Glenfield, South Creek West, and also planning for new communities in Lowes Creek, Maryland.

The South West Growth Area would connect new suburbs with the Western Sydney Aerotropolis at Badgerys Creek and the broader Western Sydney Employment Area and substantial infrastructure like Camden Valley Way, Bringelly Road, Northern Road upgrades, and the South West Rail Link.

2.3.1.3. Western Parkland City SEPP

The Western Parkland City SEPP applies to the 11,200-hectare area surrounding WSA except for the Mamre Road Precinct, which has been zoned under State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP). The Western Parkland City SEPP also protects operations beyond the Western Sydney Aerotropolis through the incorporation of relevant safeguarding controls.

A combination of new and existing zones would be applied in the Western Parkland City SEPP to enable the unique development opportunities that the Western Sydney Aerotropolis provides (refer *Figure 8*). These have been defined for the initial precincts, with zoning for the remaining precincts to occur at a later stage:

- **Enterprise Zone:** the land where enterprise uses are supported while mitigating impacts of operations. Residential development and other noise-sensitive uses are not permitted.
- **Mixed Use Zone:** flexible employment, residential and noise-sensitive uses, and above contours in high amenity areas and well-connected areas to public transport.

- **Environment and Recreation Zone:** most of the Wianamatta–South Creek Precinct and other areas are identified for conservation, biodiversity, and recreational uses.
- **SP2 Infrastructure Zone:** new and existing road and rail corridors, transport facilities, land required for utilities, WSA, and associated land in Commonwealth ownership to support operations.
- **Agribusiness Zone:** to support high-tech agribusiness uses, including freight, logistics, and horticulture in the Agribusiness Precinct

2.3.1.4. Western Sydney Aerotropolis Precincts

The Aerotropolis Core, Badgerys Creek, and Wianamatta–South Creek Precincts form a continuous urban parkland system. They would offer substantial employment opportunities, propelled by their proximity to WSA.

The Core contains the City Centre for the Western Sydney Aerotropolis, forming a complementary centre to the metropolitan cluster of centers including Penrith, Liverpool, and Campbelltown.

The City Centre and Enterprise Zone would be an economic hub comprising a dense urban neighbourhood focused on the new metro station and Wianamatta - South Creek system. Thompsons Creek would form the regional park, complemented by linear corridors associated with retained creeks.

The Badgerys Creek precinct is entirely employment-focused. It would complement the role of the business park within WSA as well as the Northern Gateway employment functions.

The Wianamatta–South Creek precinct is defined by the Environment and Recreation zone as established by the Western Sydney Aerotropolis Plan (2020).

The Precinct accommodates a range of environmental and recreation functions, including water flows, ecology and biodiversity functions, recreation, and separate cycle routes.

As shown in *Figure 9*, The Aerotropolis Core, Badgerys Creek, and Wianamatta–South Creek Precincts would comprise:

- 1. Metropolitan centre** – A Metropolitan Cluster or Aerotropolis City Centre acts as a regional-scale mixed-use centre focusing on retail, services, and business activity serviced by a metro station.
- 2. Specialised centre/precinct** – strategic innovation and focused on an employment generator or theme - and contains a metro station.
- 3. Local centre** – local convenience and a mix of uses, but does not have to include residential. Smaller scale and more local convenience.
- 4. Neighbourhood hub** – the District plan refers to employment activity hub or Indigenous business hub. In the enterprise zone this could be a hub of business, with community facilities.

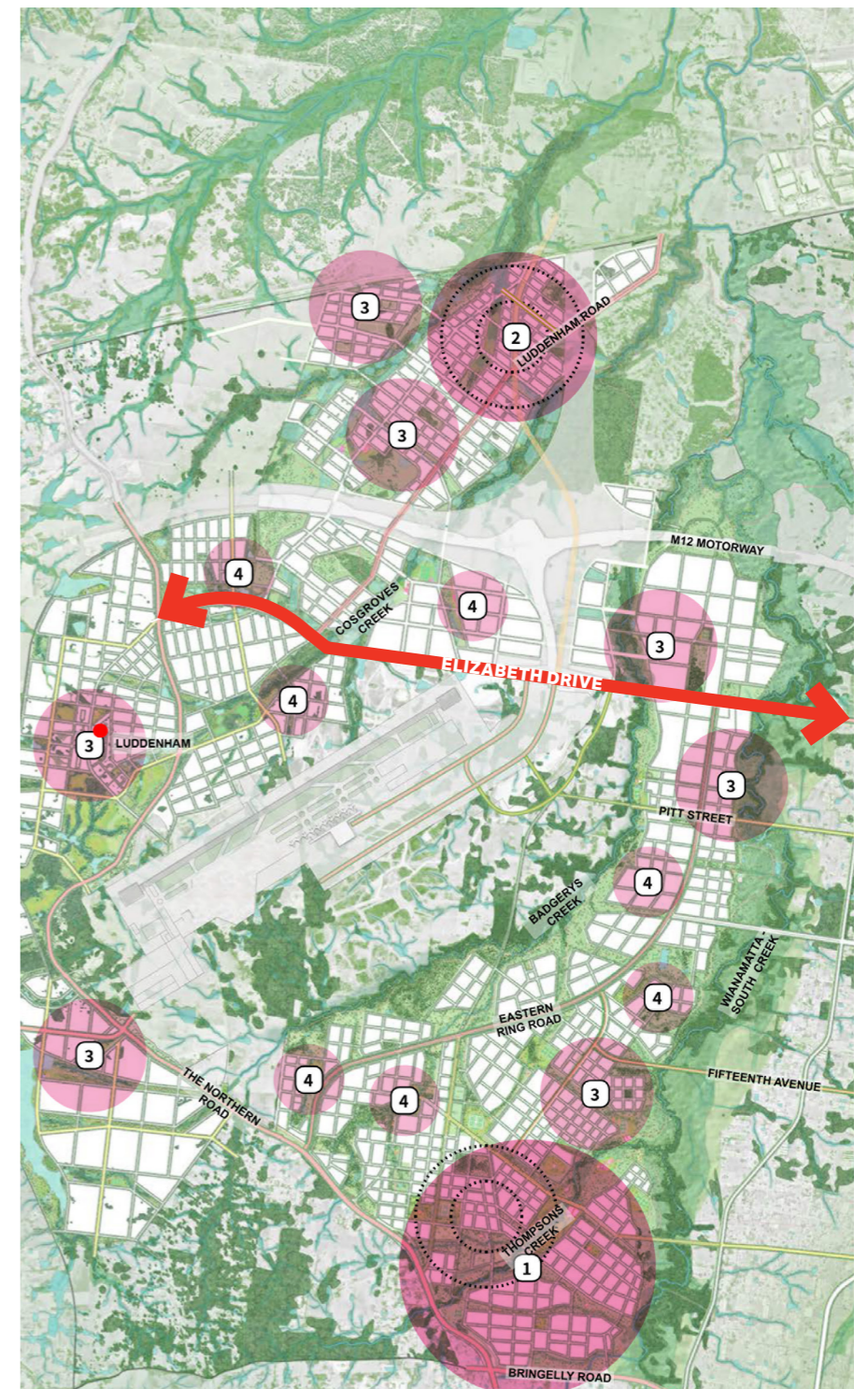
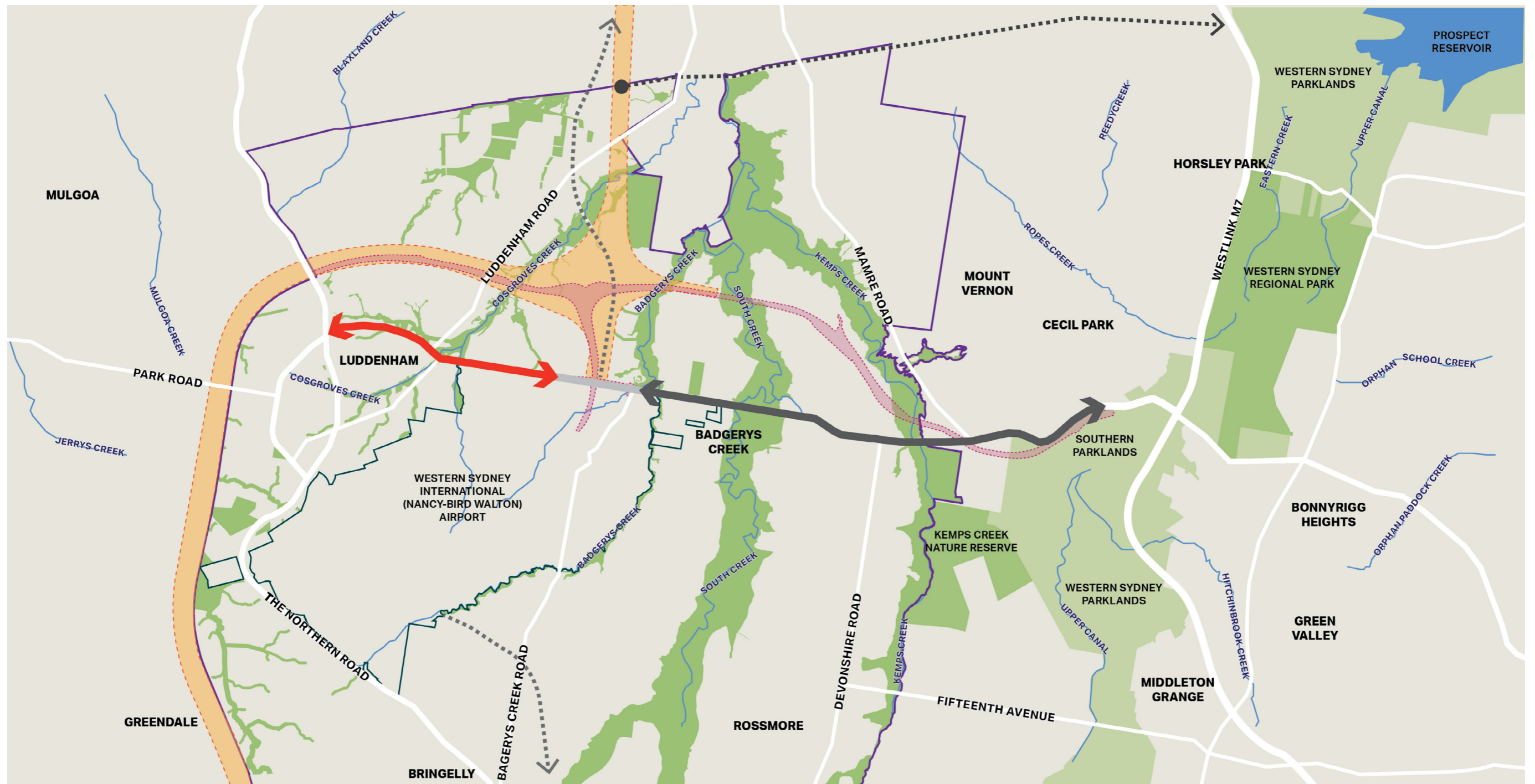


Figure 9: The Aerotropolis Core, Badgerys Creek, and Wianamatta–South Creek Precincts (Source: Western Sydney Planning Partnership)



LEGEND

- ELIZABETH DRIVE UPGRADE WEST
- ELIZABETH DRIVE UPGRADE EAST
- WESTERN SYDNEY AEROTROPOLIS
- WESTERN SYDNEY INTERNATIONAL (NANCY-BIRD WALTON) AIRPORT
- OUTER SYDNEY ORBITAL
- M12 MOTORWAY
- SYDNEY METRO - WESTERN SYDNEY AIRPORT
- WESTERN SYDNEY FREIGHT LINE

Figure 10: Future transport corridors adjoining Elizabeth Drive

2.3.2 Transport network

Elizabeth Drive would play an essential role as a primary arterial and active transport corridor for the Western Sydney Aerotropolis and Western Parkland City. Future transport network planning (refer Figure 10) would maximize the use of Elizabeth Drive. New connections would respond to proposed urban development through precinct planning.

The proposed network includes local and transit-focused streets that would connect to critical centres, including the Aerotropolis Core and WSA. The Fifteenth Avenue corridor would provide a direct connection to these centres from Liverpool, enabling Elizabeth Drive to function as a major east-west aerial road corridor for the Western Parkland City.

The proposed transport network servicing the Western Sydney Aerotropolis would accommodate freight on connections that maximise effective and reliable movements while protecting local amenity.

The main freight links would serve WSA and the Commercial Precinct to support economic activities along Eastern (WSA) Ring Road. The upgrade of The Northern Road is designed to serve the Agribusiness Precinct and the Freight and Logistics Precinct. The proposed M12 Motorway would be the primary access route to WSA and connect to Sydney's motorway network.

The proposed Outer Sydney Orbital Corridor would be the primary north-south transport corridor between Richmond Road in the north and the Hume Motorway near Menangle in the south with motorway interchanges at the M4 Western Motorway and M12 Motorway. It would include dedicated freight rail infrastructure, providing a regional connection between Port Botany, Western Sydney, and regional NSW.

The proposed Western Sydney Freight Line would link the Southern Sydney Freight Line with potential intermodal terminals in The Western Parkland City. It would serve freight, logistics, and related industries and consolidate the Western Sydney Employment Area as a critical freight and logistics hub. This line would also divert freight from the Main West Rail Line, unlocking passenger capacity.

The Western Parkland City would also be serviced by a mass transit / metro focused on connecting the region's major business, commercial educational and residential precincts. Six new stations would anchor destinations along the metro line connecting St Marys to the Aerotropolis Core. The stations within the Western Sydney Aerotropolis are:

- Luddenham, to service a future education, innovation and commercial precinct
- two stations within the WSA site, at the terminal and at the business park
- Aerotropolis Core, the commercial heart of the Western Sydney Aerotropolis.

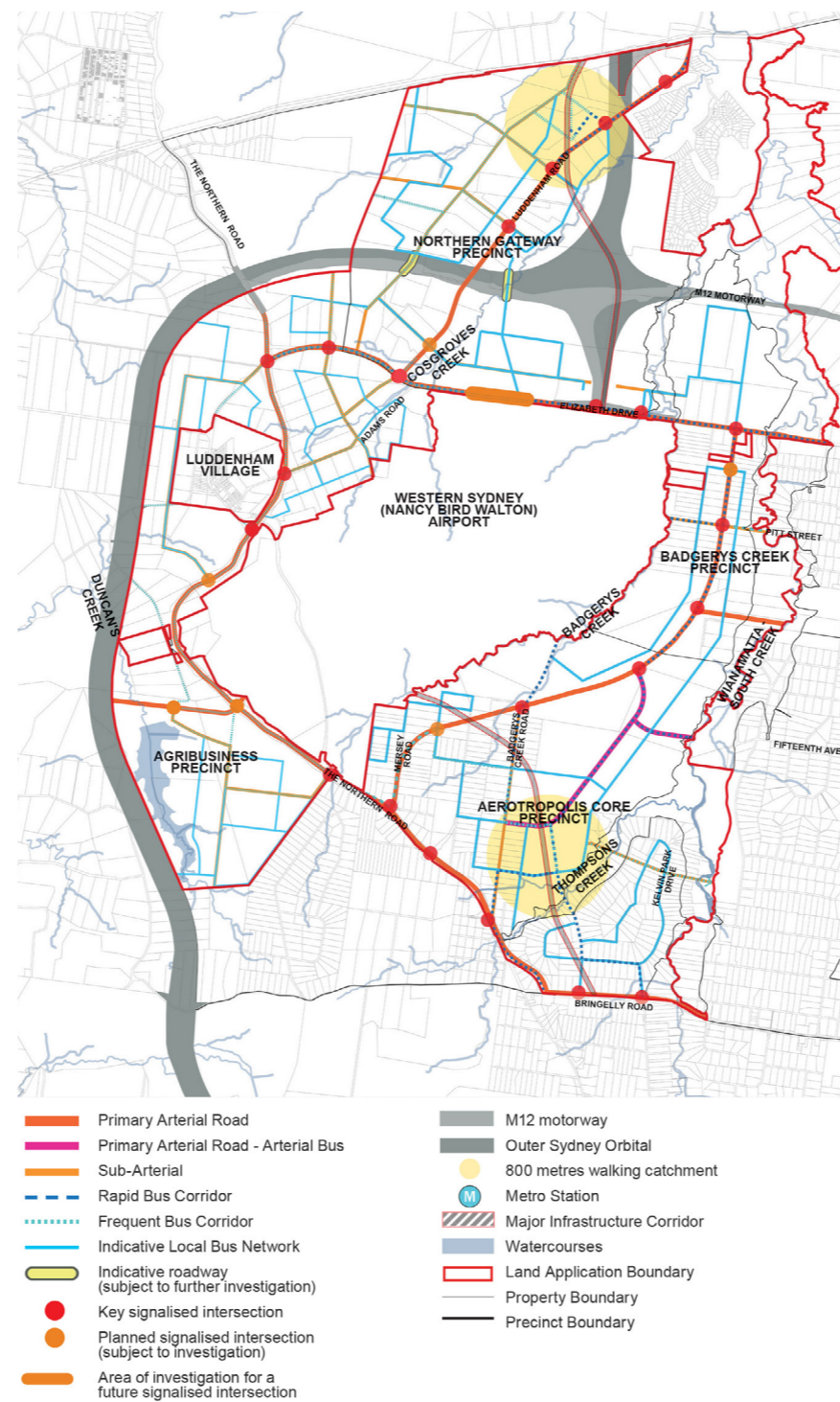


Figure 11: Transport Network as provided in the Western Sydney Aerotropolis Precinct Plan (Department of Planning and Environment, 2022)

2.3.3 Blue Green Grid

The Blue-Green Grid is the network of blue and green spaces, including waterways, riparian areas, bushland, parks, open spaces, tree canopy (including street trees), and private gardens.

2.3.3.1. The Wianamatta-South Creek and Kemps Creek Corridor

The Blue-Green Grid associated with Elizabeth Drive would embrace the Wianamatta-South Creek Catchment's natural blue and green systems as valuable assets.

The Wianamatta-South Creek corridor is the central element of the urban design and water management of The Western Parkland City.

The Wianamatta-South Creek corridor for Elizabeth Drive provides amenity and connection to recreational opportunities. Elizabeth Drive provides a critical east-west connection and materialises the strengthened connection to Western Sydney Parklands.

The Wianamatta-South Creek and Kemps Creek are identified as north-south Green Grid priority corridors in the Western City District Plan. The aim is to create continuous, regionally significant open space corridors providing ecological protection and enhancement, stormwater treatment, and regional recreational opportunities.

The Western City District Plan further identifies a Green grid corridor running along Cosgroves Creek south of the Western Sydney Aerotropolis.

2.3.3.2. Western Sydney Parklands

Western Sydney Parklands is one of the largest urban parks in the world and a vital community asset. The parklands cover 5,280 hectares and stretch 27 kilometres from Quakers Hill in the north down to Leppington in the south. It contains popular regional picnic and recreation areas, walking and cycling tracks, world-class sporting facilities, and native bushland. In 2016-2017 there was a total of 3.5 million recreational visitors to the parklands.

The Southern Parklands is the area bound from the south of Elizabeth Drive in Cecil Hills (north) to Bringelly Road (south) in Leppington, incorporating an area of approximately 1,500 hectares.

Western Sydney Parklands provides direct access points to the Southern Parklands from Elizabeth Drive to the northern tourism precinct, which provides dramatic topography, natural habitat, and a sense of escape. The most suitable tourism focus would be nature-based and ecotourism development and experiences. New infrastructure and destinations would comprise:

- *The Western Ridge Walk* is a journey along a ridge within the Southern Parklands, from lower elevations in the south, up to the dramatic viewing point of the Beauty Spot.
- *The Lookout* is a multipurpose event structure on the highest point of the Southern Parklands. It forms the triumphant culmination of the Western Ridges Walk.

2.4 Environmental Context

2.4.1 Regional context

The Proposal comprises a portion of the boundary between Penrith City and Liverpool City LGAs within the Greater Western Sydney Region (refer Figure 12). The Proposal is located 42 kilometres from the Sydney CBD and 13 kilometres from Penrith's centre. The Proposal directly interfaces with The Northern Road which runs north-south providing a connection from Londonderry to Narellan with the M7 Motorway situated to the west of the Elizabeth Drive West Project. The intersection of Elizabeth Drive and The Northern Road is eight kilometres from the eastern edge of the Blue Mountains National Park, part of the 1.03 million hectare World Heritage Listed Greater Blue Mountains Area. The Western Sydney Parklands are located to the east of Elizabeth Drive, providing over 1,300 hectares of recreational space.

The surrounding landscape is predominantly rural agribusiness land with WSA south of the road corridor and associated Western Sydney Aerotropolis precincts surrounding the site. Low-density residential suburbs are situated to the east of the M7 Motorway and both north and south of the M4 Motorway. The proposed Western Sydney Metro line would create a link from St Mary's station on the Western Train Line to WSA.

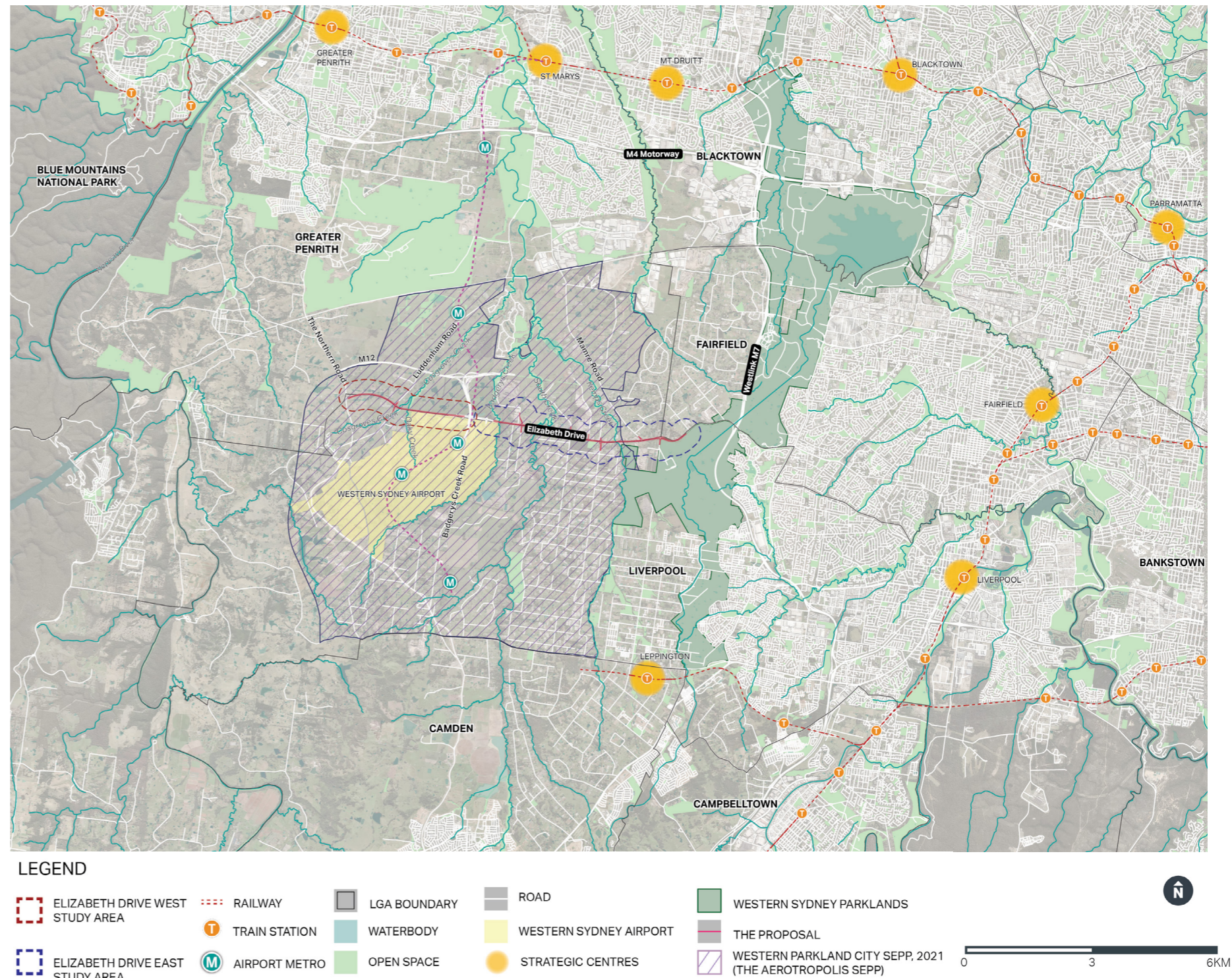


Figure 12: Regional Context Map

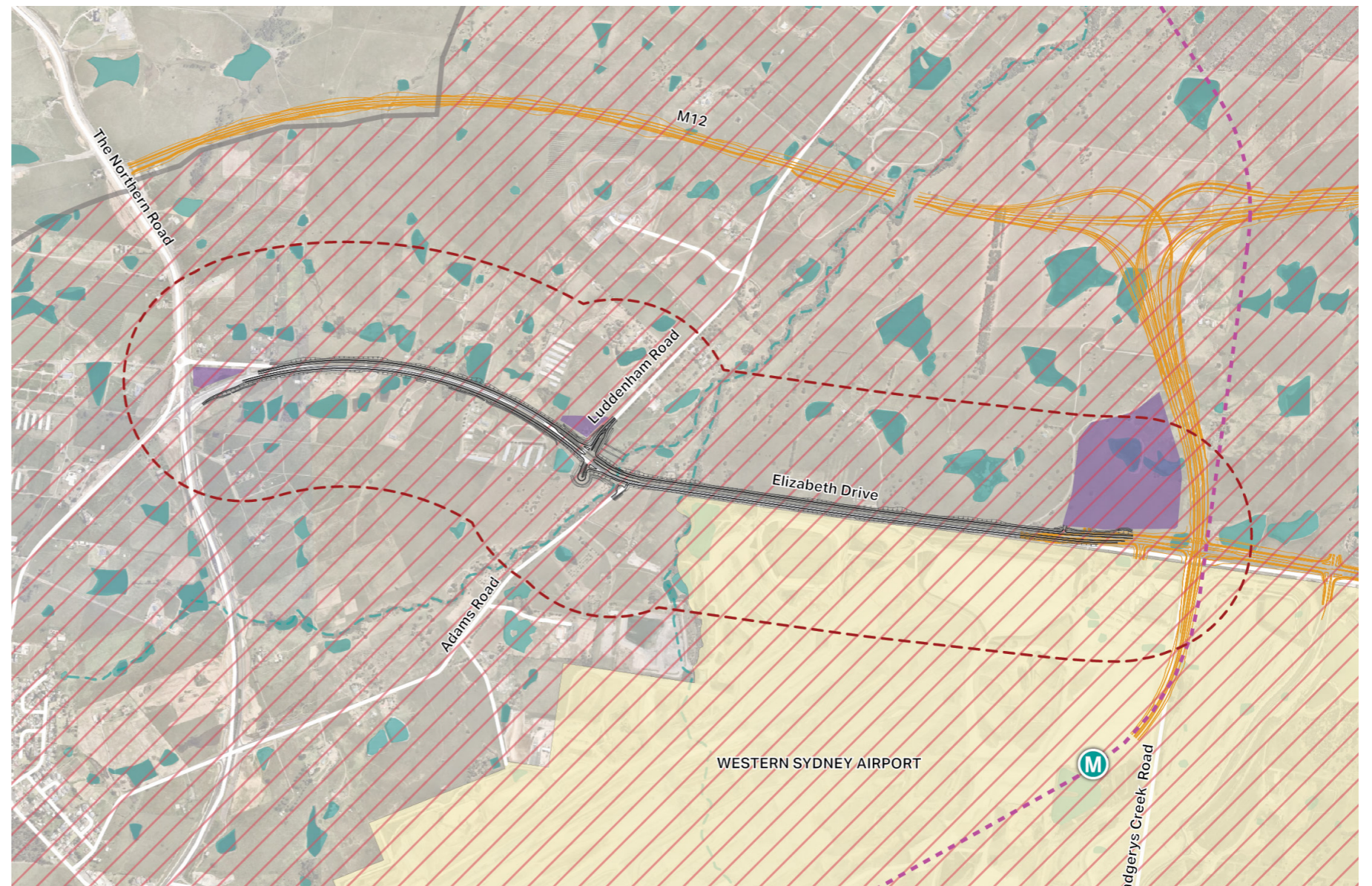
2.4.2 Local context

The land surrounding the Proposal is primarily rural land utilised for agribusiness. Luddenham Road and Adams Road are minor connecting roads that run north-south through the semi-rural landscape and intersect the central area of the Proposal. Luddenham Road hosts several recreational businesses such as go-karting, paintball, horse riding and a model park with the township of Luddenham located to the southwest of Elizabeth Drive. WSA is currently under construction on the southeastern boundary of the Construction footprint. The M12 Motorway, which is also under construction, would intersect the Proposal corridor from the north to connect with the WSA (refer Figure 13).

Several creek lines cross Elizabeth Drive between The Northern Road and the M7 Motorway. Cosgroves Creek and Oaky Creek directly cross the Proposal extents with Badgerys Creek, South Creek and Kemps Creek interfacing with Elizabeth Drive to the east of the Proposal. The waterways are well vegetated with the surrounding land cleared for agricultural use. A large number of farm dams used for domestic and stock purposes are evident in the surrounding landscape.

2.4.2.1. Landscape setting

The combination of agricultural farming lands and general settlement patterns are consistent with the visual and landscape qualities of South-Western Sydney. Vegetation has been retained within the riparian corridors with a series of farm dams dispersed across the undulating landscape. The landscape is predominantly cleared land with occasional trees which are predominantly eucalypts. Farm homesteads with associated structures are also visible from Elizabeth Drive.



LEGEND

- | | | |
|---------------|--|-----------------------------------|
| STUDY AREA | WESTERN PARKLAND CITY SEPP, 2021 (THE AEROTROPOLIS SEPP) | CONSTRUCTION ANCILLARY FACILITIES |
| ROAD | WESTERN SYDNEY AIRPORT | M12 |
| THE PROPOSAL | WATERBODIES | |
| AIRPORT METRO | WATERCOURSES | |

Figure 13: Landscape setting



2.4.3 Geology

The majority of the land surrounding the Proposal is Bringelly Shale with strips of Quaternary Alluvium at the western and eastern ends of the Proposal extents aligning to the low-lying areas riparian corridors of South Creek and Oaky Creek to the west and Badgerys Creek to the east (refer Figure 14).

Bringelly Shale consists of shale (claystone and siltstone), with occasional calcareous claystone, laminate, coal and fine to medium grained lithic sandstone. The maximum thickness is less than 250 metres. Quaternary Alluvium is deposited in association with fluvial activity along the surrounding creek corridors with deposits up to five metres thick that are typically made up of fine sands, silts and clays with some areas of gravelly clay.

This geology and the soils that they produce have resulted in the rolling rural / agricultural landscape over the region, punctuated by linear creek corridors with taller remnant riparian vegetation.

Table 3: Geological lithology of Elizabeth Drive West

Unit name	Lithology
Bringelly Shale	Shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal, and tuff
Quaternary Alluvium	Fine-grained sand, silt, and clay

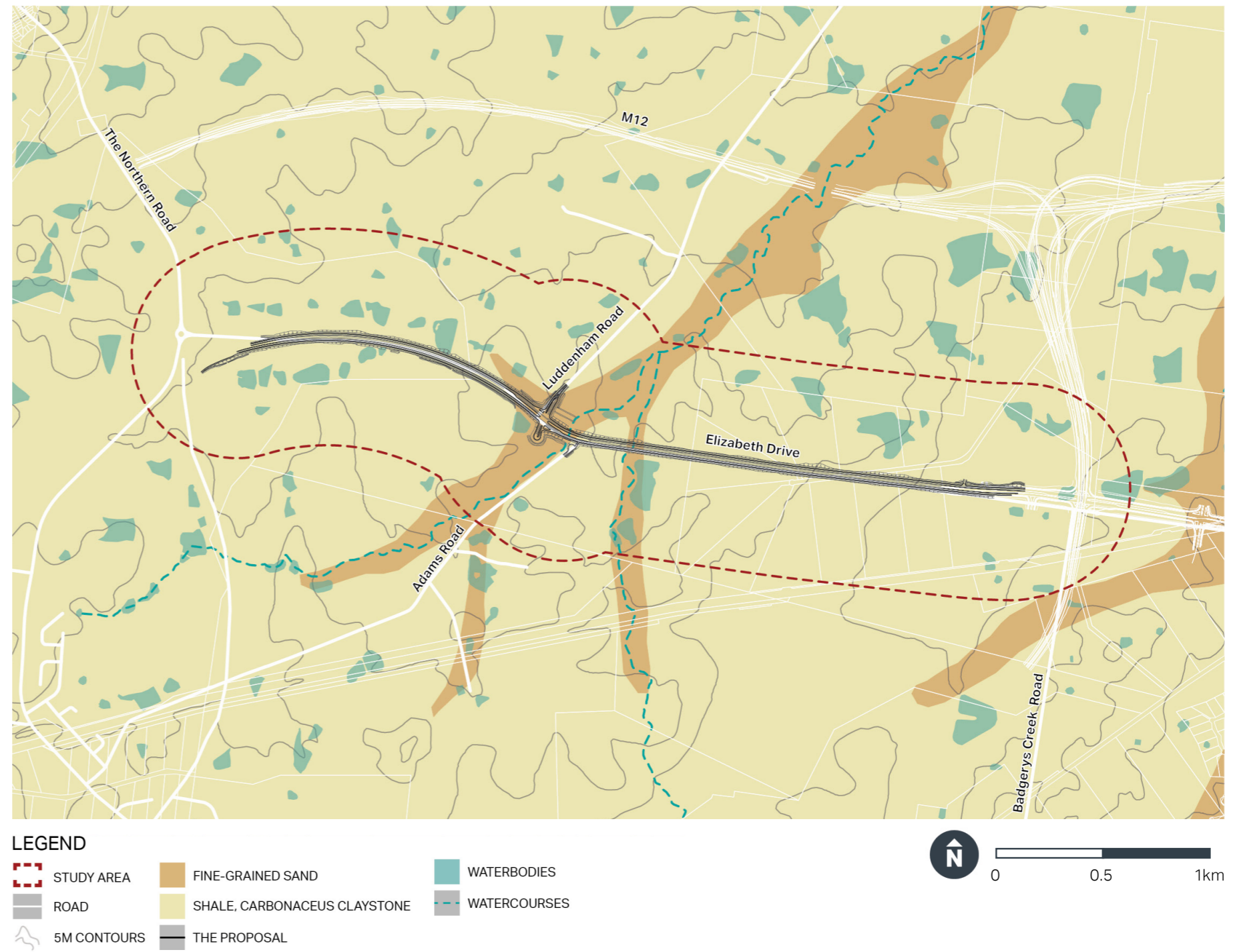


Figure 14: Geology

2.4.4 Topography and drainage

The topography of the site is gently undulating with an elevation range between 51 to 100 metres, as shown in Figure 15. At the western end of Elizabeth Drive between Luddenham Road and The Northern Road, the landscape is characterised by gently undulating hillsides to the north and south (refer Figure 16). The land to the east of Luddenham Road is relatively flat comprising a plains landscape between the Cosgroves Creek to the east of Luddenham Road and the proposed intersection with the M12 Motorway (refer Figure 17). The elevation increases to the southwest towards the small ridgeline which hosts the township of Luddenham. Intermittent waterholes sit within the gullies of the hills leading towards the waterways of Cosgroves and Oaky Creeks. These small riparian corridors are characterised by ephemeral creeks with little flow outside of rainfall.

The lowest areas can be seen to the northeast and east of the Proposal, aligned to the low-lying land of Cosgroves and Badgerys Creeks with the drainage lines falling to the northeast. These low-lying areas are at risk of flooding and may result in severe overtopping of Elizabeth Drive during flood events.

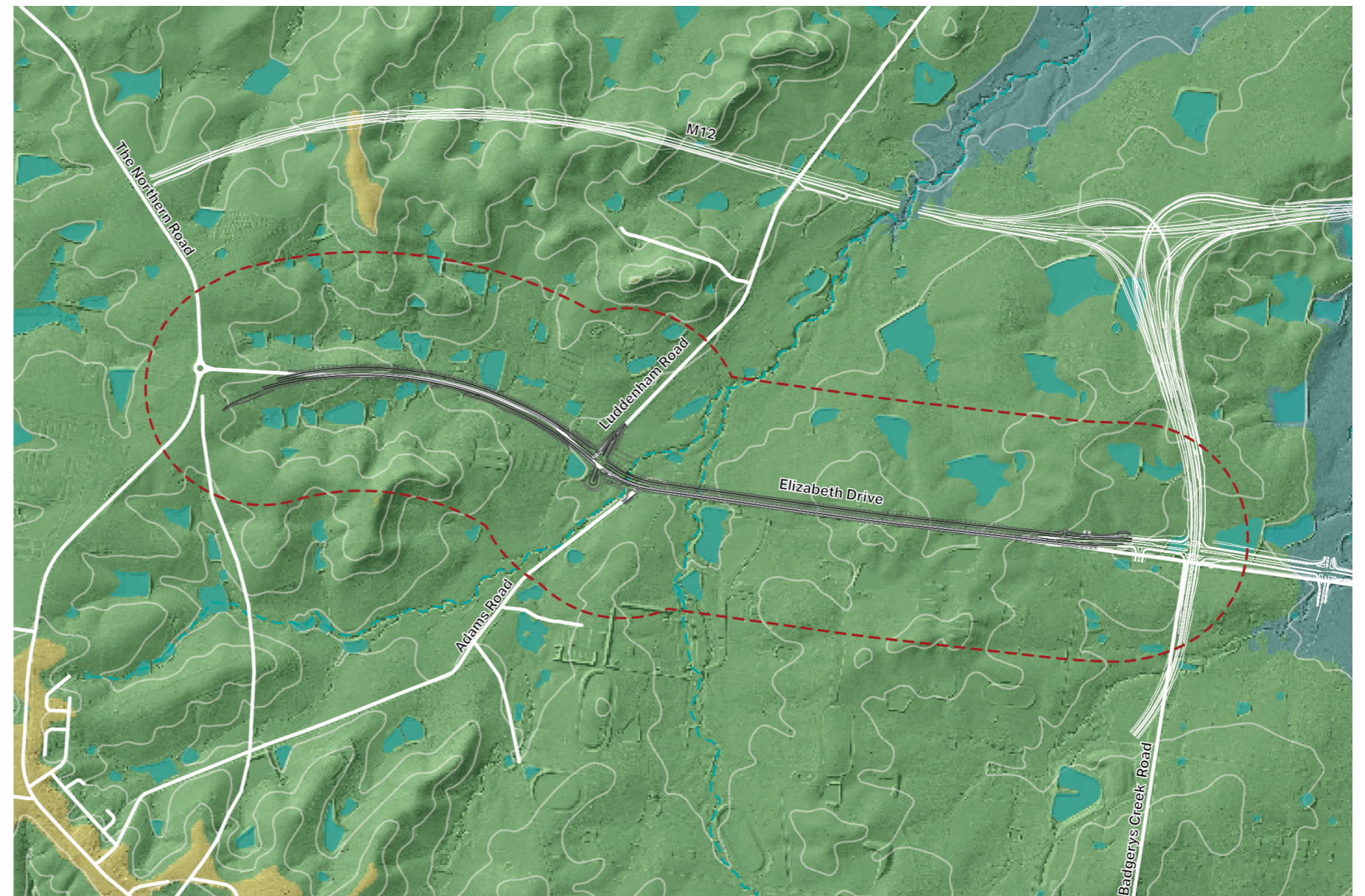
Drainage corridors across the landscape are punctuated by strings of dams, highlighting the rural / pastoral nature of the existing landscape. The creeklines appear in the landscape as linear vegetated corridors amongst the pastures.



Figure 16: Gently undulating hills with intermittent dams spread along drainage lines, seen from The Northern Road looking east within the study area



Figure 17: Flatter topography between Adams Road and the intersection with the proposed M12 Motorway, looking north from Elizabeth Drive



LEGEND

STUDY AREA	-60 TO 0M	151 TO 200M	WATERBODIES
ROAD	1 TO 50M	201 TO 244M	WATERCOURSES
5M CONTOURS	51 TO 100M	THE PROPOSAL	
	101 TO 150M		

Figure 15: Topography and drainage

2.4.5 Land use zoning

Land use zoning for the precinct has changed in response to the proposed Western Sydney Aerotropolis whereby both new and existing zones would be applied to enable further development opportunities in response to the WSA development (Western Parkland City SEPP).

The land uses within the locality comprise:

- a large Agribusiness area (AGB) is located to the southwest of the Construction footprint directly adjacent to WSA and surrounding the township of Luddenham as per existing land uses in this location.
- Environment and Recreation areas (ENZ) stretch along the creek lines and ephemeral tributaries of Cosgroves and Oaky Creeks crossing Elizabeth Drive, The Northern Road and the Proposed M12 Alignment. Environment and Recreation zones are present throughout the Enterprise and Agribusiness zones
- an Enterprise zone (ENT) has been applied directly to the north and northeast of the Elizabeth Drive West site and east of The Northern Road in accordance with the planned Western Sydney Aerotropolis infrastructure. The Proposed M12 Alignment, Luddenham Road and Badgerys Creek Road all intersect within this zone
- the area comprising WSA (currently under construction) is zoned SP2 Infrastructure, as well as The Northern Road and Elizabeth Drive.

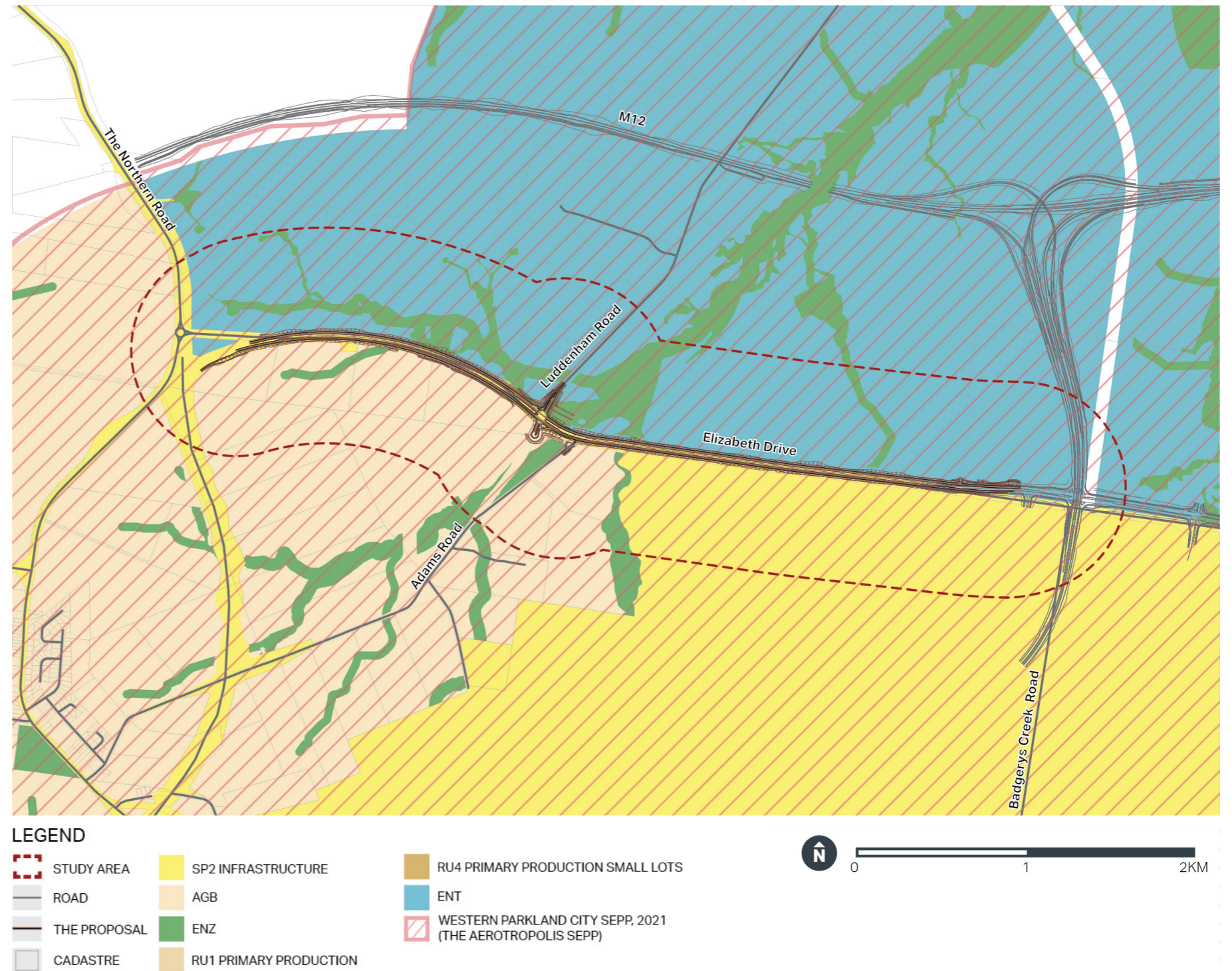


Figure 18: Land use zoning (State Environmental Planning Policy (Western Sydney Aerotropolis) 2020)

2.4.6 Flora and fauna

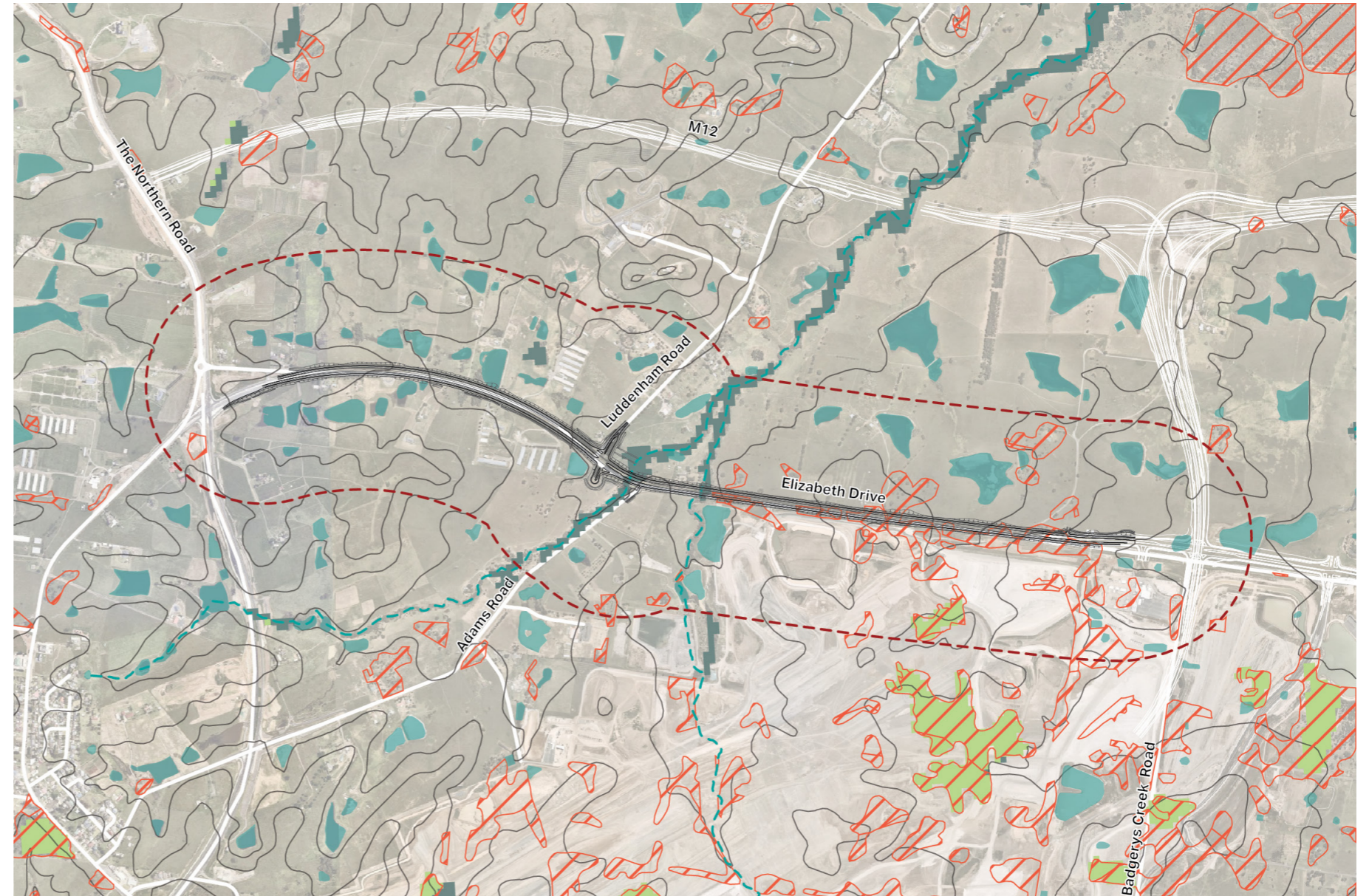
The surrounding landscape features large areas of historically cleared agricultural land with a network of water bodies scattered across the landscape. Some areas of vegetation have been retained, including Forested Wetlands which are aligned to the creek lines and larger areas of Grassy Woodland to the south of Elizabeth Drive.

Numerous Critically Endangered Ecological Communities (CEEC) are present in the wider landscape with several located at the eastern end of the proposal extent. The CEEC groupings highlighted within Figure 19 are Cumberland Plain Woodland in the Sydney Basin Bioregion, which is closely linked to the clay soils of the Wianamatta Group geology on the Cumberland Plain. This area experiences lower rainfall due to the proximity to surrounding elevated terrain, creating a rainshadow. The Cumberland Plain Woodland is characterised by an open tree canopy, with smaller eucalypts and wattles occurring sporadically within the mid-story and groundcovers dominated by grasses and herbs (Cumberland Plain Woodland in the Sydney Basin Bioregion - profile | NSW Environment, Energy and Science, accessed 2022). The impacts of grazing, drought and bushfires can lead to the fluctuating structure of these ecological communities.

The Cumberland Plain Woodland CEEC includes the Grassy Woodlands and Forested Wetland vegetation areas shown in Figure 19. Grassy Woodlands are commonly seen within rural and semi-rural Australia, featuring an open canopy of eucalypts such as boxes and red gums with some shrubs and small trees and diverse groundcover of tussock grasses and herbs as seen within the broader Cumberland Plain Woodland communities. Forested wetlands are found in areas of low altitude with a dominance of sclerophyllous trees. These areas are commonly associated with sclerophyll forests, however the presence of hydrophytes such as grasses, sedges and rushes are the distinguishing feature as they have adapted to periodic inundation.

Fauna species recorded in the surrounding areas including Koala (*Phascolarctos cinereus*), Barking Owl (*Ninox connivens*), Powerful Owl (*Ninox strenua*) and Masked Owl (*Tyto novaehollandiae*), Green and Golden Bell Frog (*Litoria aurea*) as well as other reptile, bird and mammal species. Threatened species such as the Grey-headed Flying fox (*Pteropus poliocephalus*), Swift Parrot (*Lathamus discolor*) and Gang-gang cockatoo (*Callocephalon fimbriatum*) and endangered species such as the Cumberland Plain Land Snail (*Meridolum corneovirens*) have been recorded within the site surrounds (Western Sydney Airport- Environmental Impact Statement Volume 2, 2016).

Several habitat features are important to the ongoing protection of faunal species within the local area. These features include the provision of feed trees, the presence of tree hollows and fallen logs as well as wetlands and watercourses. Environments such as these, in addition to other foraging or breeding habitat, provide refuge, nesting and feeding opportunities for a range of threatened fauna species.



LEGEND

STUDY AREA	WET SCLEROPHYLL FOREST	FRESHWATER WETLAND	THE PROPOSAL
ROAD	RAINFOREST	FORESTED WETLAND	WATERBODIES
5M CONTOURS	HEATHLAND	DRY SCLEROPHYLL FOREST	WATERCOURSES
	GRASSY WOODLAND	CEEC	



Figure 19: Native Vegetation and Critical Endangered Ecological Communities

2.4.7 Aboriginal and Non-Aboriginal heritage

The Darug Peoples are the traditional owners of the Cumberland Plain who have Cared for Country through sustainable land management practices over thousands of generations. Waterways such as South and Badgerys Creeks provided food and recreation opportunities through plant species such as tea tree, paperbark trees, geebung, wattles and ferns, as well as fish and shellfish. Several archaeological investigations have been conducted within the area regarding the development of WSA and surrounding infrastructure. Within these studies, points of significance and artefacts have been found including scarred trees, carved trees, white clay, shell middens, campsites and stone resources.

The M12 Motorway Heritage Working Paper (2016) has identified three sites of significance directly adjacent to the Proposal, including two potential archaeological deposits on either side of Cosgroves Creek on the northern side of Elizabeth Drive and an artefact scatter to the south of Elizabeth Drive, east of Oaky Creek. Beyond the identified sites, a larger collection of significant sites is evident to the northwest of the site area with further sites identified south of the Proposal site area within the WSA development site.

Europeans first entered the Nepean District in 1788, eleven years before settling within this area, as part of exploratory ventures. The land was considered to be an essential agricultural and pastoral resource for the colony and by the 1830s most of the land had been cleared for agricultural purposes. Elizabeth Drive was established during this period and dates from the early 1800s where it was used as an access road to farming estates (M12 Motorway Heritage Working Paper, 2016).

A number of state heritage items are identified within the township of Luddenham to the southeast of the Construction footprint with one site identified directly adjacent to Elizabeth Drive, the McGarvie Smith Farm. This property hosts several farm buildings dating from the 1930s including two significant farm buildings utilised for education in animal husbandry and pastoral experimentation. Additional structures noted include a silo, concrete remnants, timber posts, sheds, dams and earth ditches.

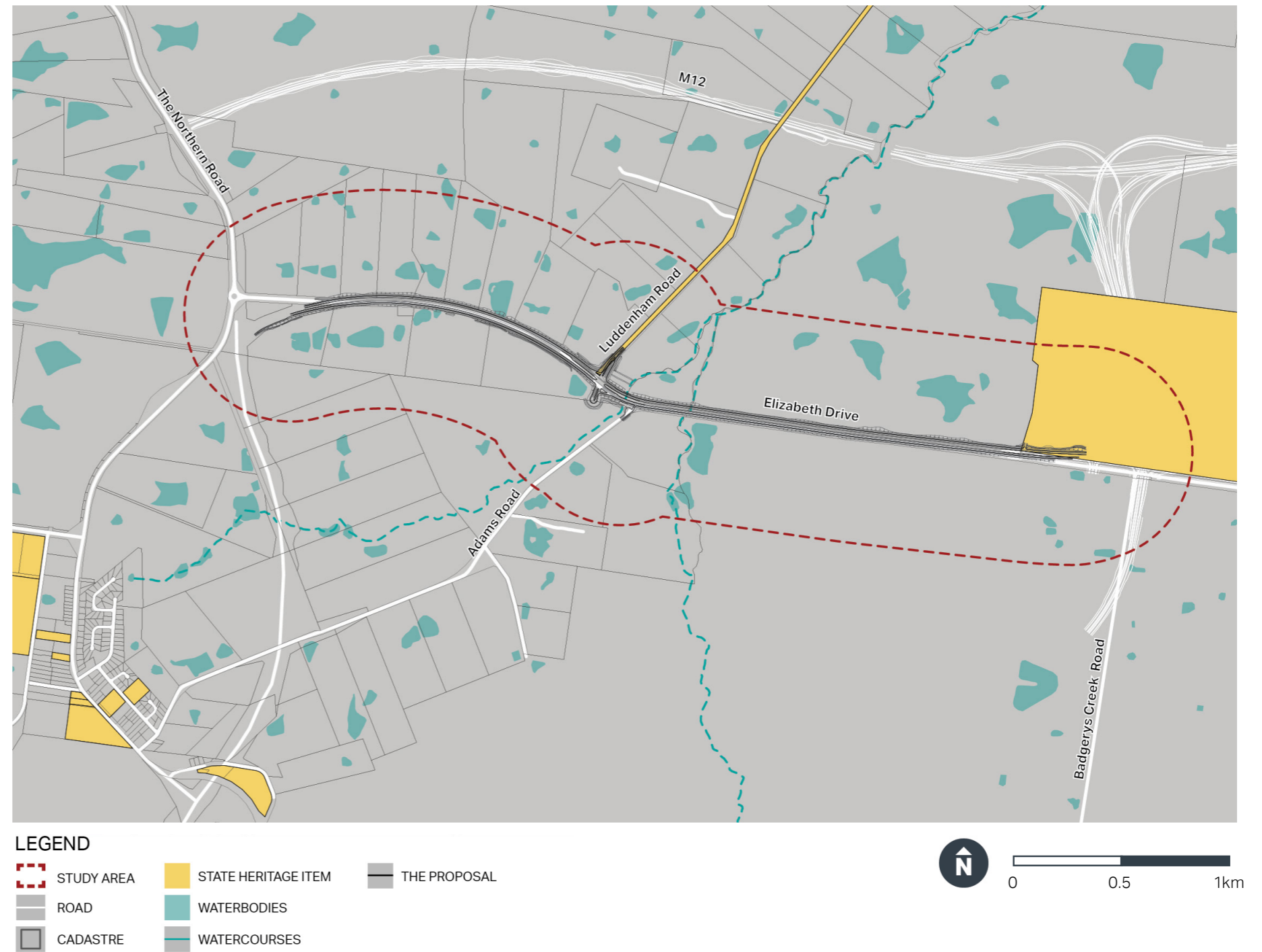


Figure 20: Heritage items

2.4.8 Landscape Character Zones

Three (3) LCZs have been identified within the study area (refer Figure 21):

- LCZ 1: Rural
- LCZ 2: Transport Corridor
- LCZ 3: Future Western Sydney Airport.

While Elizabeth Drive presently comprises a busy road, the narrow, predominantly two lane road corridor with an absence of formalised concrete kerbs or formal planting, gives the road a rural quality. This is in contrast to the more formalised transport corridor character of the recently completed roads in the vicinity, such as The Northern Road. It is for this reason that Elizabeth Drive is considered to fall within LCZ 1: Rural, rather than LCZ 2: Transport Corridor.

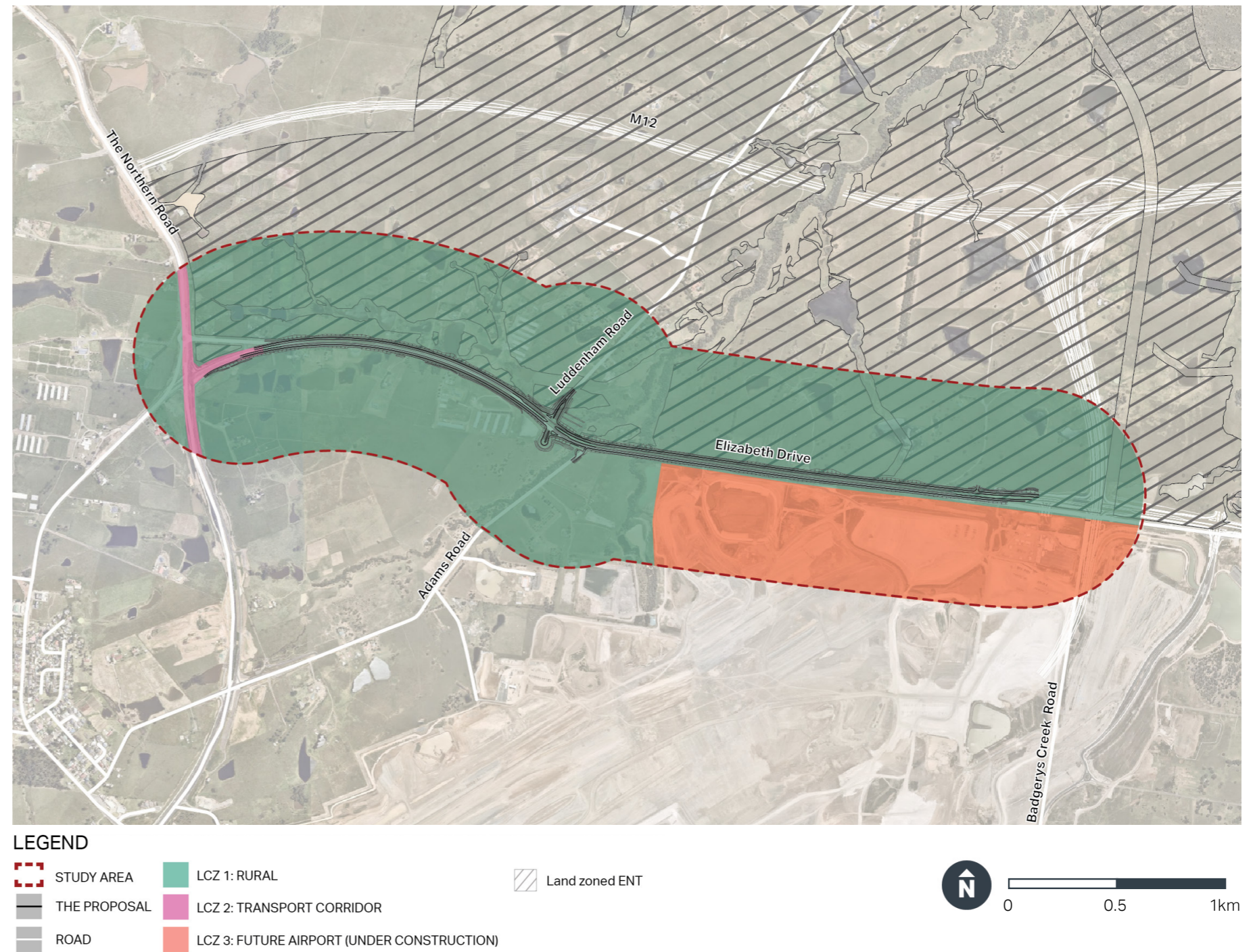


Figure 21: Landscape Character Zones

2.4.8.1. LCZ 1: Rural

While the existing character of this LCZ is rural, this area is subject to change with the development of the WSA and the Badgerys Creek Aerotropolis. These two conditions have been described in the following sections.

Existing landscape character

This LCZ comprises a majority of the landscape within the study area. Land use planning within the Construction footprint is governed by the provisions of SEPP (Western Parkland City) 2021 (the Aerotropolis SEPP). This LCZ is predominantly zoned ENT to the north of Elizabeth Drive, AGB to the south of Elizabeth Drive and to the west of the WSA. Bands of riparian corridors zoned ENZ cross the landscape. Elizabeth Drive is zoned SP2 Infrastructure, although at present the road corridor fits within the rural character of the landscape rather than as a separate character element.

The topography of the LCZ is typically gently undulating, with farm dams positioned along drainage lines as shown in Figure 22. The rural landscape is hillier between The Northern Road and Luddenham Road (referred to as 'the Hills' within the urban design response, refer Figure 22) but flattens out to a wider floodplain east of Luddenham Road ('the Plains' within the urban design response, refer Figure 23). The landscape is spatially open, with rural pastures compartmentalised by bands of vegetation associated with riparian corridors or along roads.

Due to a high amount of rainfall in the past year, vegetation comprises lush, green, pastures punctuated by occasional paddock trees, with other taller vegetation lining road and creek corridors (refer Figure 24) or positioned around homesteads. Creeklines within the study area are narrow and contain small patches and bands of indigenous vegetation. Roads that pass through this landscape experience a pattern of expansive views followed by visual enclosure as the road passes over riparian corridors, which often contain taller, dense vegetation.

Built form within this LCZ is typically limited to occasional rural homes set back from road corridors (refer Figure 25) and some clustered sheds, including poultry / egg producing sheds.

Component	Description
Land use	ENT, AGB, ENZ, with some SP2 along Elizabeth Drive
Topography and drainage	Flat to undulating
Vegetation	Predominantly pasture with some bands of indigenous vegetation along the creeklines and clusters of other taller vegetation along road corridors or surrounding houses
Built form	Scattered rural homesteads with agricultural sheds and fences
Spatial form	Open, with expansive views where clearings and topography permit



Figure 22: Gently undulating pastoral hillsides with farm dams strung along drainage lines



Figure 23: Flatter, floodplain pastures to the east of Cosgroves Creek



Figure 24: Trees are often positioned along road or creek corridors



Figure 25: Homes are positioned set back from road corridors and typically comprise a central home with surrounding outbuildings, sheds and farming or construction equipment.

Future landscape character

The character of the landscape within LCZ 1: Rural is expected to change dramatically with the development of the WSA and the Badgerys Creek Aerotropolis, which have been identified in the Western City District Plan (Greater Sydney Commission, 2018) as one of four metropolitan clusters in Western Sydney, each providing concentrations of higher order jobs and a wide range of goods and services to nearby urban areas.

The *Western Sydney Aerotropolis Precinct Plan (March 2022)* provides a more in-depth picture of what the Badgerys Creek Aerotropolis would comprise in respect to overall landscape character. Of the five precincts identified in the Plan, only two lie within the Proposal study area (refer Figure 26):

- Northern Gateway Precinct, which would be an employment precinct that can be easily accessed, with supporting residential areas where land is not severely affected by aircraft noise. It would provide skilled employment and business opportunities north of the
- Agribusiness Precinct, which would build on successful agricultural operations and develop new agribusiness opportunities while protecting and embracing important vegetation within the landscape.

To the north of Elizabeth Drive and west of Cosgroves Creek (and within the existing LCZ 1: Rural), the land fringing Elizabeth Drive would comprise a band of open space located near a drainage corridor. To the north of this would be a mix of enterprise land, including both business and light industrial land uses interspersed with neighbourhood centres.

North of Elizabeth Drive and east of Cosgroves Creek, the land adjacent to Elizabeth Drive would comprise light industrial.

To the south of Elizabeth Drive and west of the WSA (land also within the existing identified LCZ 1: Rural) the landscape would predominantly comprise Agribusiness, with some bands and pockets of open space and occasional neighbourhood centres.

Overall, the existing open rural landscape within LCZ 1: Rural, which at present comprises very large rural lots with few roads, would be bisected by a network of roads in a rough grid formation. Built form within the landscape would potentially comprise large lot industrial forms, including warehouses and small factories. Maximum building height within the study area would not exceed 24 metres.

The creeklines within the landscape would be preserved and buffered from the development by bands of open space fringed by more minor roads.

The road network, while providing direct access to major roads and centres, would respond to the topography of the landscape, provide pedestrian and cycle infrastructure, and contribute to tree canopy and the Blue Green Infrastructure framework (as outlined in the Western City District Plan, 2018 as the network of blue and green spaces, including waterways, riparian areas, bushland, parks, open spaces, tree canopy (including street trees), and private gardens).

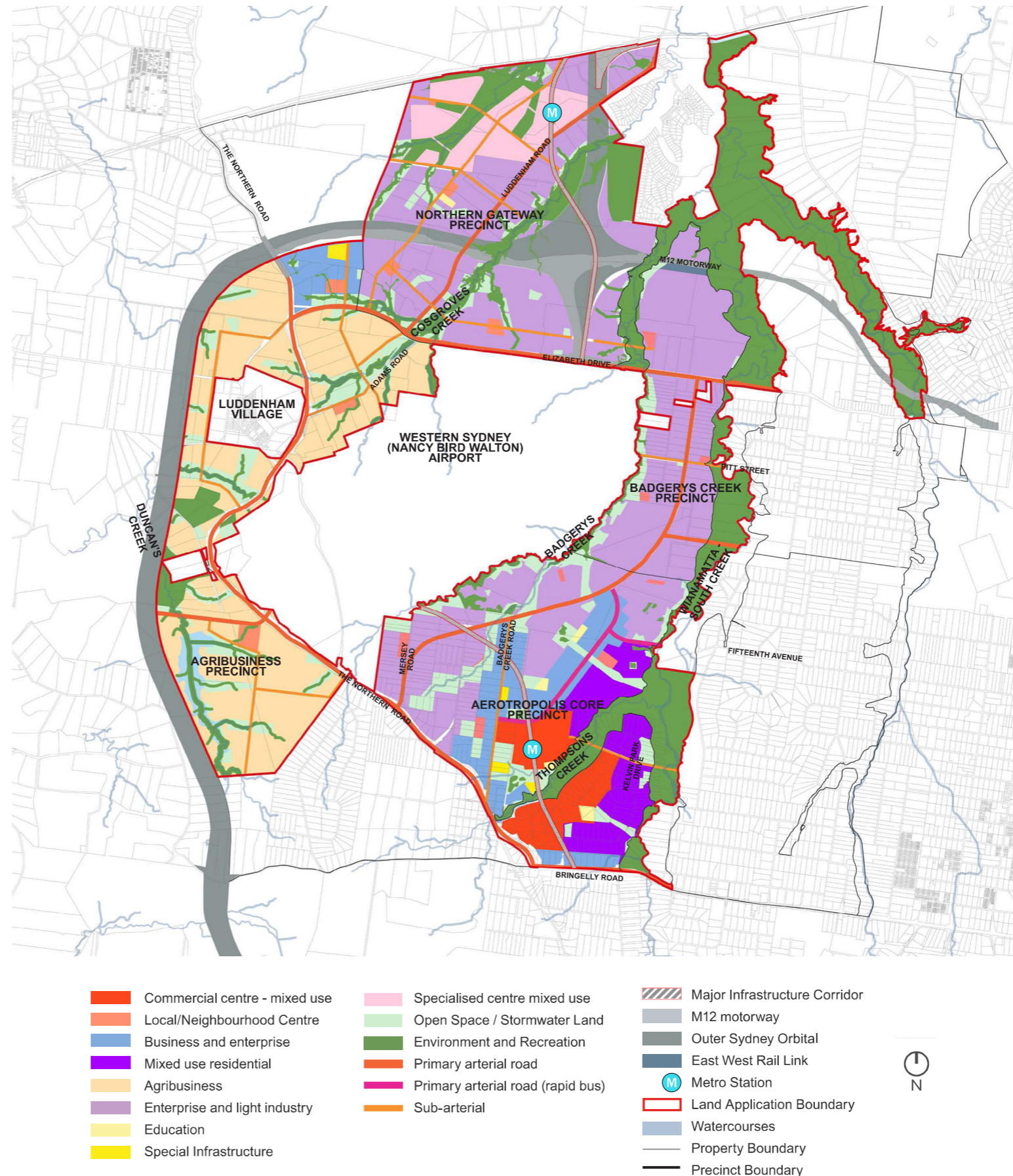


Figure 26: Land use and structure plan (Western Sydney Aerotropolis Precinct Plan (March 2022))

2.4.8.2. LCZ 2: Transport Corridor

Within the study area this LCZ comprises The Northern Road and its linear elements within the greater landscape, characterised by wide stretches of asphalt, with lanes often separated by a vegetated median strip (refer Figure 27). Verges are planted to varying degrees, from formalised plantings of shrubs and native grasses near major intersections (refer Figure 28) to less formal areas of pasture grasses (refer Figure 29) and bands of shrub and tree plantings.

This LCZ is used as a transport corridor for vehicles and often, but not always, has provision for cyclists to use the road. The Northern Road has a wide shoulder in addition to two lanes travelling in either direction, widening at major intersections, and a bi-directional cycle path on the western side of the road.

Built form within this LCZ predominantly includes small scale road infrastructure such as signs, lighting, fencing and traffic lights at signalised intersection. Most of the corridor is paved in hard surfaces: the road pavement and footpaths. Occasional homes and commercial properties are positioned along the road corridor but are considered to lie within the adjoining LCZs, in this case LCZ 1: Rural (refer Figure 30).

While utilitarian in design (in that the design of elements within the LCZ are based on functionality rather than aesthetic enjoyment), this LCZ contributes to the overall character of the area, with planting in the median and verge reflecting the open, rural landscape with patches and corridors of taller vegetation, providing a connection between the Mulgoa Valley and the Blue Mountains.

Component	Description
Land use	SP2 Infrastructure
Topography and drainage	Flat to undulating
Vegetation	Limited to shrubs and native grasses in the medians and at major intersections, pasture grass along the length of the corridor, with some young trees planted at strategic locations (within the study area, at intersections)
Built form	Signage, lighting (including traffic lights at intersections), guard rails and safety fencing
Spatial form	Open corridor with views to the surrounding landscape



Figure 27: The Northern Road comprises a wide corridor with two lanes and a wide road shoulder in either direction separated by a central median strip



Figure 28: Road verges are sometimes planted with shrubs, native grasses and trees, particularly around major intersections



Figure 29: Verges adjacent to other stretches of road are not formally planted



Figure 30: Occasional houses are set back from the road corridor, but much of the surrounding landscape is rural

2.4.8.3. LCZ 3: Future Western Sydney Airport

Existing landscape character

At present this LCZ is a large construction site where the WSA would be located. The landscape is flat to gently undulating, but changing as areas are cleared, leveled and grassed. The site is fenced at its perimeter, as shown in Figure 31.

The landscape is spatially open, with the gently undulating, cleared site terminating in a dark band of vegetation on the horizon and around the periphery.

Component	Description
Land use	SP2 Infrastructure
Topography and drainage	Flat to undulating
Vegetation	Cleared
Built form	Construction site
Spatial form	Open



Figure 31: The LCZ comprises a large, open construction site which is fenced around the perimeter

Future landscape character

The proposed WSA site layout is shown in Figure 32.

As is typical of airports, it is anticipated that the WSA would remain fenced at the perimeter for safety. The site would remain spatially open, bounded by the Badgerys Creek riparian corridor to the east and south, Elizabeth Drive to the north, and the planned Agribusiness Precinct of the Western Sydney Aerotropolis to the west.

The WSA site would be flat to gently undulating, with a flat, central rectangular portion of the site bounded by runways. A commercial park and parking are located on either side of the main access road off Elizabeth Drive, with smaller commercial and parking areas located along the Northern Road.

Built form would typically comprise commercial buildings outside the perimeter runways, with the long, low terminal building within the centre.

Vegetation within the site would typically be kept low, with some trees potentially lining the entry road and remnant bands of riparian vegetation along the southern and eastern boundaries of the site along Badgerys Creek.

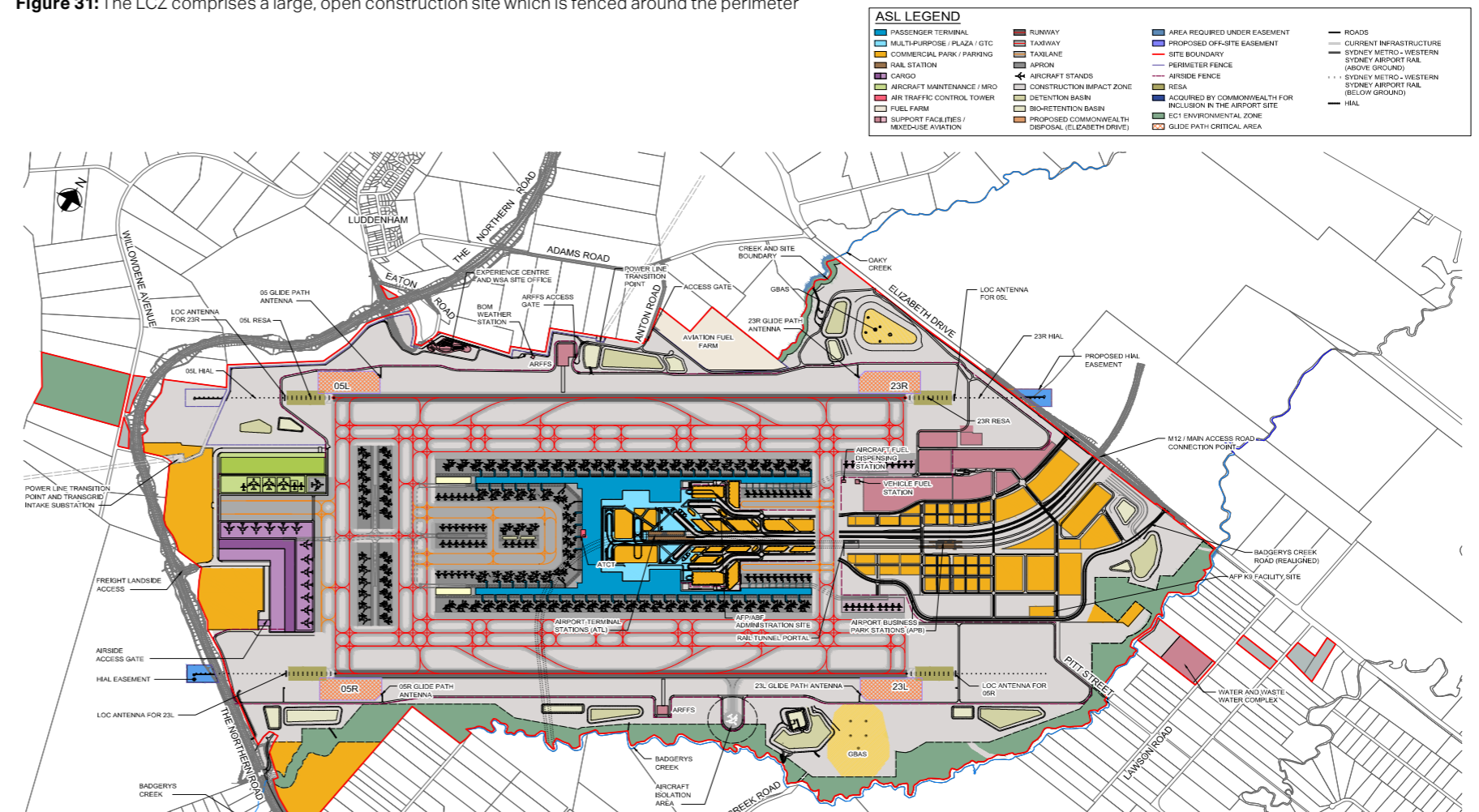


Figure 32: WSA site layout (westernsydney.com.au)

**Urban Design Vision,
Objectives and Principles**

03

3. Urban Design Vision, Objectives and Principles

3.1 Introduction

This section of the report highlights the overarching vision, urban design objectives and supporting principles for the Proposal and how it builds on the M12 Motorway Place, Design and Landscape Plan (Transport for NSW, 2022) approach of creating a design that is 'of place'.

The design considers the change in land use from what is predominantly a rural and semi-rural landscape towards a 24-hour Western Sydney Aerotropolis, promoting an active community and enhanced user experience, protecting and re-establishing natural systems, and creating a project identity.

3.2 Vision

The vision for the Elizabeth Drive Upgrade project is outlined below.

“The Elizabeth Drive Upgrade will play an essential role as a primary arterial and active transport corridor for the Western Sydney Aerotropolis and Western Parkland City. It provides a critical east-west connection to the Wianamatta–South Creek corridor and an expansive network of parklands and waterways to foster a cool and connected Western Parkland City.”




Figure 33: Visualisation showing the proposed view looking west along Elizabeth Drive

3.3 Urban Design Objectives and Principles

The Proposal would reinforce the character of Western Parkland City and Western Sydney Aerotropolis by ensuring a 'whole of corridor' design integrated with the surrounding context. The urban design objectives and associated principles provide the framework for achieving the project vision and guide the Proposal from inception through to completion.

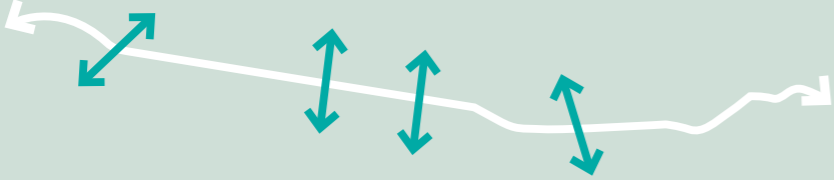

The urban design strategy and principles are also consistent with those outlined in the M12 Motorway Place, Design and Landscape Plan, which runs parallel to Elizabeth Drive, to ensure compatibility in the final environmental and design and outcomes.



Objective 1: Embrace the importance of water in the landscape by retaining the north-south ecological corridors and ephemeral creek systems.

Principles:

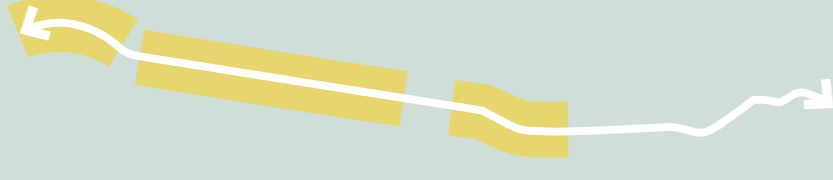

- Reinforce and maintain the Wianamatta - South Creek, Badgerys, Kemps, and Cosgroves Creek systems by providing references and interpretation of the new built elements through materials, signage and artwork.
- Locate opportunities to provide critical visual connections to the natural landscape and creek systems.
- Integrate the riparian vegetation communities and patterns in the landscape by reinforcing their identity on the approach to bridge crossings.

Objective 2: Contribute to the urban structure and streetscape of the Western Sydney Aerotropolis.

Principles:

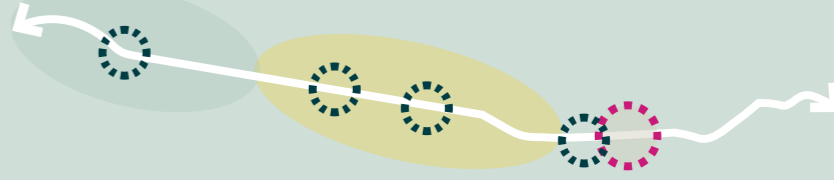

- Create a memorable experience for travellers arriving at the WSA.
- Integrate the shared user path and facilitate future connections for pedestrians and cyclists.
- Provide safe and appropriately located pedestrian crossings across the Proposal.
- Ensure that a functional public realm is easy to maintain and develop to achieve the desired future character of Western Sydney Aerotropolis.

Objective 3: The built form responds to landmarks and the natural topography/landform

Principles:


- Build on the M12 Motorway approach to the bridge connections and celebrate the journey across 'Country'.
- Maintain a materials palette and consistent design language sympathetic to the M12 Motorway character and features.
- Reinforce the rural landscape character of the 'Hills', the 'Plains' and the 'Ridgetop' vegetation communities from the M12 Motorway through specific planting treatments.

Objective 4: Maximise the benefit of and connectivity to the Western Sydney Parklands.

Principles:

- Maintain the approach experience and visible frontage with the Southern Parklands
- Provide direct access points to the Southern Parklands from Elizabeth Drive to the northern tourism precinct, which provide dramatic topography, natural habitat, and a sense of escape
- Provide connectivity to new infrastructure and destinations such as The Western Ridge Walk and The Lookout.




Objective 5: Starting with Country

Principles:

- Recognise Aboriginal connection to Country by protecting and enhancing natural features, including the north-south ecological corridors of Wianamatta -South Creek, Badgerys, Kemps and Cosgroves Creek systems.
- Celebrate Aboriginal culture and language through opportunities for Aboriginal art and interpretation elements, to integrate with that developed for the M12 Motorway.



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Urban Design Concept

04

4. Urban Design Concept

4.1 Introduction

The following pages outline the concept design for the Proposal. The Urban Design Concept Plans on pages 50 to 55 highlight the location of prominent design features such as the proposed road alignment, shared user paths, associated creek crossings, bridges, and planting typologies. A complete package of the landscape concept plans has also been prepared - refer to Appendix A of this Design Report.

4.2 Concept Design

The concept design response integrates the Proposal with the surrounding LCZs by applying the urban design objectives (described in Section 3.3) to project components. The urban design outcome is one that: enhances the driver experience by creating a consistent, legible and safe road corridor; provides an attractive and amenable active travel experience; and responds to the surrounding land use(s), tenants and residents along the road corridor by integrating the road corridor into the surrounding context.

The contextual landscape elements critical to the design outcome include:

- the 'rolling hills' landscape character to the west that provide sweeping views towards the east
- the transition to the 'plains' landscape character intersecting with major creeklines and riparian corridors
- the interface with the future WSA and the road corridor's function as a transport spine to facilitate future growth of the Western Parkland City
- it's current function as a connector for rural residents along the corridor, including facilitation as an active travel link for improved cyclist and pedestrian amenity, considering future land uses associated with the Aerotropolis.

Ultimately the urban design response addresses existing site conditions and immediate landscape context, while safeguarding for the future functional requirements of the road corridor as an important transport link in the Western Parkland City.

4.3 Urban Design Considerations

The varied topography, landscape context and interfaces, as described above, requires several design considerations to ensure a whole of corridor response. In summary these considerations include:

- a consistent and legible approach to the active travel link, including provision for sufficient shade, cyclist pedestrian amenity and safety
- integration of structural civil design elements including bridges, safety barriers, and roadside furniture to provide consistency along the road corridor
- ephemeral planting to existing creeklines, riparian corridors, drainage swales and permanent basins to improve water quality throughout the project
- appropriate landscape treatments to disturbed areas that respond to the surrounding landscape context
- the design aims to address the future aspirations to establish north-south recreational and active travel connections across Elizabeth Drive at the creeklines as highlighted in the Western Sydney Aerotropolis Precinct Plan (Department of Planning and Environment, 2022) and Western Sydney Aerotropolis Urban Design and Landscape Plan Report (Hassell, 2021).

4.4 Urban Design Concept

To deliver a whole of corridor approach, a multi-disciplinary design team must develop a shared vision for the Proposal, from design to procurement, construction, operation, and maintenance.

The adoption of consistent and appropriate design themes for common components such as bridges, abutments, retaining walls, noise walls and concrete finishes should result in a particular visual character and consistent finish. The urban design principles to achieve this outcome include:

- building on the M12 Motorway approach to the bridge connections and maintaining a consistent materials palette and design language
- creating a memorable experience for travellers arriving at the WSA
- the integration of the active transport link that facilitates future connectivity for pedestrians and cyclists.

These principles have been integrated in the urban design response by:

- providing a consistent approach to the bridge design and keeping materiality simple and legible, which doesn't deviate from the approach taken on the M12 Motorway
- framing the approach to the WSA interchange with a simplistic landscape that that doesn't overpower the interchange or diminish its legibility
- integrating a shared path system along both sides of the road corridor that is consistent in its materiality and design, with sufficient amenity for cyclists and pedestrians including tree planting for shade and safe crossing points at intersections
- Landscape design response
- Aboriginal art and interpretation strategy.

4.4.1 Aboriginal Art and Interpretation Elements

The M12 Motorway PDLP Urban Design Concept sets out strategies in which 'Connection to Country' would be woven into the M12 Motorway project. This includes embedding key interpretive themes into the project through to the application of integrated art and the approach to landscape design and plant selection. Themes explored within the M12 Motorway project were REFLECTING PLACE, SOURCING LOCALLY, and ABORIGINAL CULTURAL INTEGRATION OF ART AND INTERPRETATION, and included:

- the M12 Motorway design responding to the characteristics of Western Sydney as a locale, with an emphasis of being mindful of 'Connection to Country' and Aboriginal perspectives on the landscape
- Balarinji, an Aboriginal strategy and design agency, developing a high-level objective, which through a process of consultation with Aboriginal people, has been translated into meaningful physical design interventions to interpret Aboriginal heritage
- the reconnection of natural systems, enabling connections across the riparian areas and into Western Sydney Parklands
- drawing on natural features to inform materials, where red silcrete and mudstone were identified as being important to the Aboriginal communities and culture of this area. These materials or materials referencing their unique features and colour were incorporated into interpretive landscape elements, including hardscape, wayfinding and place making elements
- reinforcing gateways as a combination of integrated art and abstracted landscape to 'Connect to Country'
- identifying, protecting and enhancing significant views and vistas along the corridor, including riparian corridors, vegetation, water bodies, grasslands and Blue Mountains.

Relevance to Elizabeth Drive

The principles underpinning the **Objective 5: Starting with Country** include recognition of Aboriginal 'Connection to Country' by protecting and enhancing natural features, and celebrating Aboriginal culture and language through opportunities for Aboriginal art and interpretation elements.

Building on the strategy established as part of the M12 Motorway project, and in consultation with Balarinji, an integrated artwork strategy suitable for Elizabeth Drive Upgrade would be developed, to be coordinated as part of the detailed design response for the Proposal.

4.5 Urban design components

It is critical to adopt an integrated design approach to deliver the best possible outcome. This integration is achieved through multi-disciplinary teams regularly collaborating to resolve design issues. This approach has enabled urban design solutions to produce outcomes and values into the overall design for the Proposal.

The urban design response follows the urban design principles and objectives and aims to identify a specific direction for the Proposal. The description of urban design components expands on the following elements:

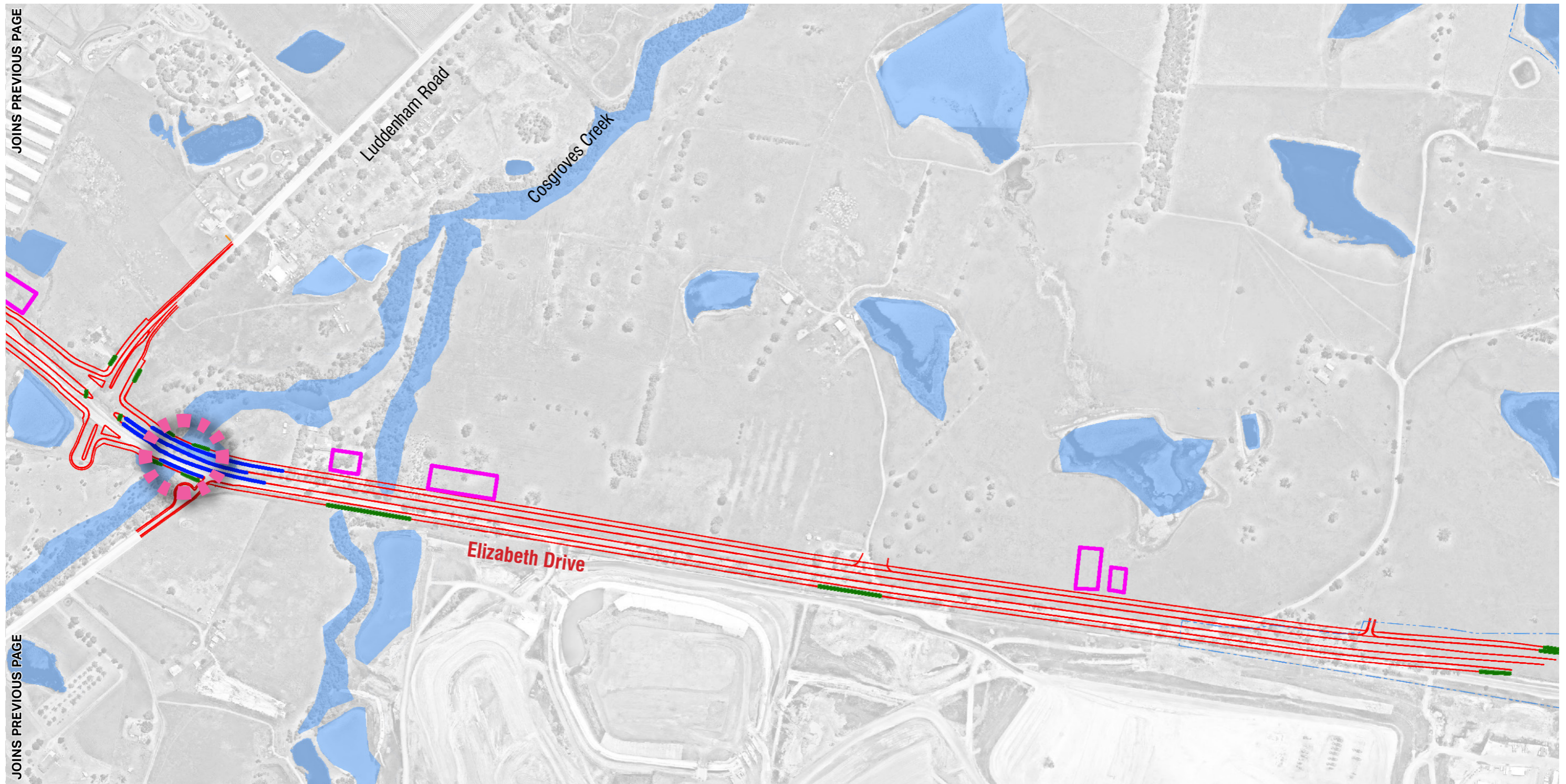
- bridges
- safety barriers
- shared path (active travel link)
- driveway access locations.

The above urban design components are further described below and their proposed locations illustrated in Figures 34 and 41.

Retaining walls are not proposed in the concept design. It is proposed that batters would be provided to address level changes between the road and adjacent properties, to be confirmed in the detailed design. Likewise, noise walls are not proposed in the concept design. This would be confirmed following the noise assessment. Should there be a requirement for either retaining walls or noise walls as part of the project, the design of these structures would be consistent to the approach established for Elizabeth Drive Upgrade East and incorporated at the detailed design stage.

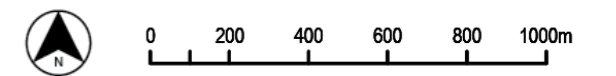


Figure 34: Key plan showing the Bridge (BR01) and the indicative locations of safety barriers and fences for the proposal



LEGEND

- | | | | | | |
|--|---------------------------------|---|---------------------------|---|--------|
|  | THE PROJECT EXTENT |  | NEW CONCRETE BARRIER |  | BRIDGE |
|  | DESIGN BY OTHERS |  | NEW WIRE ROPE BARRIER | | |
|  | FUTURE M12 OPERATIONAL BOUNDARY |  | PROPOSED SECURITY FENCE | | |
| | |  | PROPOSED PEDESTRIAN FENCE | | |



4.5.1 Bridges (BR01)

The proposed bridge (BR01) that crosses over Cosgroves Creek is located in the western section of the Proposal between the Elizabeth Drive intersections with Luddenham Road and Adams Road.

The proposed creek crossing consists of two independent bridges, one bridge per carriageway. The location of BR01 is identified in Figure 34.

The design for the bridge follows design policies and guidelines, including:

- Beyond the Pavement - Urban design approach and procedures for road and maritime infrastructure planning, design, and construction (Transport for NSW, 2020)
- Bridge Aesthetics – design guideline to improve the appearance of bridges in NSW (Transport for NSW, 2019)

The bridge should belong to the same design family and be part of a suite of unified elements along Elizabeth Drive. The overarching urban design approach to the bridge design has been:

- to design the visual expression of the bridges to be streamlined and straightforward to allow the surrounding landscape character to predominate
- to develop a consistent language to typical bridge elements to visually unify the bridges along Elizabeth Drive.

Urban design coordination across the Proposal ensures a consistent approach to the design and detailing for all bridges across the M12 Motorway and Elizabeth Drive Upgrade.

After construction of BR01, revegetation of the adjoining riparian corridor with the 'Creeks and Tributaries Plant Mix' would occur. This mix comprises plant species found within the Riparian Woodland vegetation community, native to the area. The environmental benefits of this rehabilitation and revegetation include:

- improved water quality
- reduced erosion, loss of bank vegetation
- increased habitat for both aquatic and terrestrial fauna/flora
- reduced likelihood of weed establishment
- improved connectivity (habitat links) between patches of surrounding remnant vegetation
- plant species are generally tolerant of waterlogged and saline soils

Creek banks would be stabilised where necessary with tubestock planting. Native trees belonging to the Riparian Woodland vegetation community, such as *Casuarina glauca* and *Melaleuca styphelioides* are proposed to stabilise the banks further.

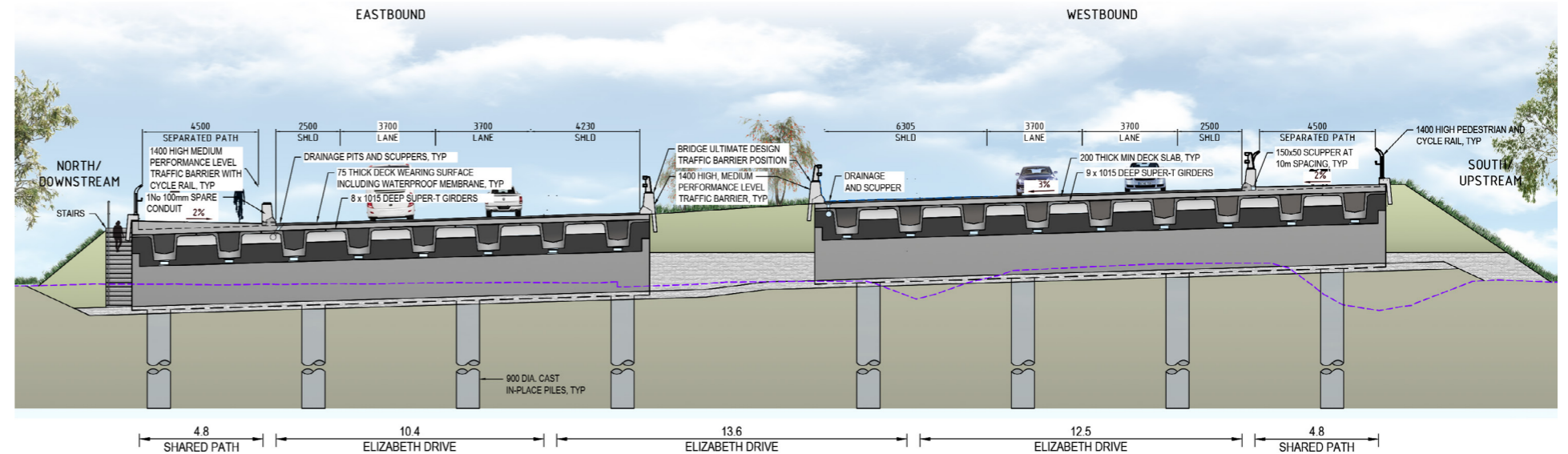


Figure 35: Typical cross section of proposed bridge (BR01)

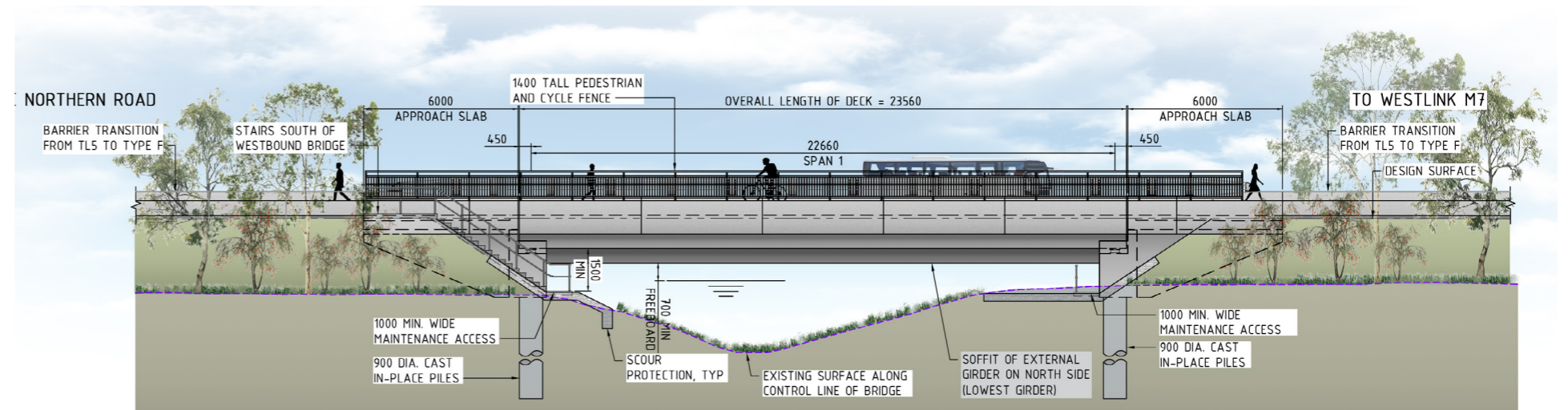


Figure 36: Typical elevation of proposed bridge (BR01)

4.5.2 Safety barriers and fences

A review of roadside safety barriers and fences was undertaken to design-out, simplify and integrate within the overall landscape design. Coordination was also undertaken to rationalise the barriers and fences to minimise awkward interface details and to provide an uncluttered and legible design outcome.

A total of four types of safety barriers and fences have been adopted for the proposal:

- type F concrete barrier (refer Figure 37) - these are located between shared paths and road carriageways at the bridge approach to Cosgroves Creek. The concrete bridge barriers are proposed to be extended on either side of the bridge decks to provide an improved urban design outcome
- twin-rail medium performance safety barrier (refer Figure 37) - these are located at the bridge over Cosgroves Creek and would provide visual connectivity to the surrounding landscape character along the creeklines and riparian corridors
- wire rope barrier (refer Figure 38) - these are located along the median along the road corridor to allow for the planting of non-frangible trees
- pedestrian fence (refer Figure 39) - these are proposed where required at the traffic islands of major road intersections to prevent pedestrian access into the median and along the back verge where the shared path interfaces with batters steeper than 3V:1H
- security fence around water quality basins (refer Figure 40) - these are located indicatedly around proposed water quality basins. Gate locations, fence extents and alignment would be subject to detailed design development of the basins and access tracks.

No boundary fencing is proposed for the concept design. Property fencing and boundaries are to be determined once detailed survey and property adjustment requirements are confirmed.



Figure 37: Twin-rail medium performance safety barrier transitioning to type F concrete barrier proposed to Cosgroves Creek Bridge (BR01)



Figure 39: Proposed pedestrian fence



Figure 38: Proposed wire rope barrier along the median

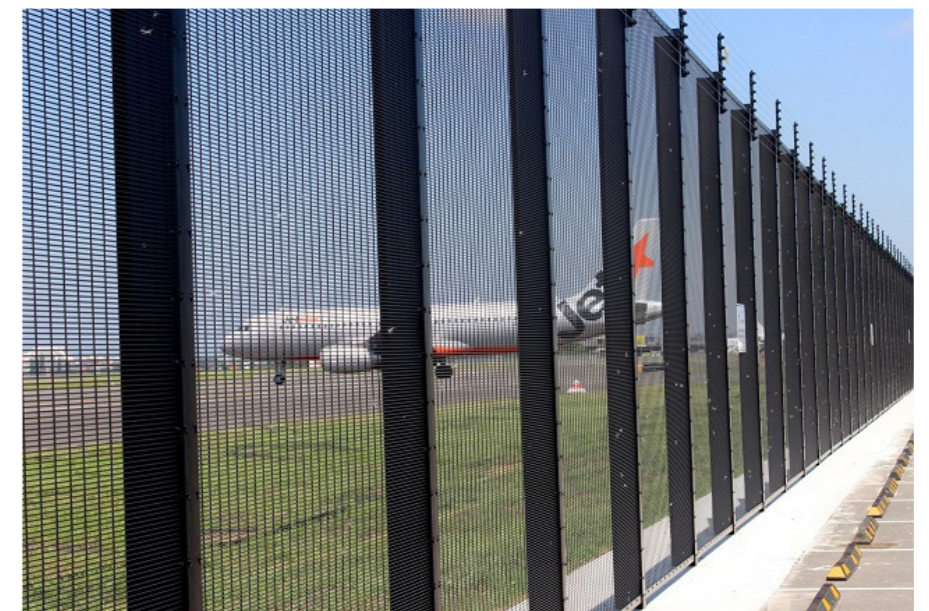


Figure 40: Proposed security fence around water quality basins along the road corridor

4.5.3 Shared path (active travel link)

New 4.5m wide shared paths would be provided along Elizabeth Drive on both sides. The intention for the shared paths is to allow for separated bi-directional movements between cyclists and pedestrians - 3.0m wide for cyclists and 1.5m wide for pedestrians. The shared paths would continue through on both sides of the proposed bridge. Cycle fences would be provided at the back of the paths on the creek side and Type F concrete safety barriers provided on the raised median.

Standard 3.6m wide pedestrian marked foot crossings with cycle lanterns would be provided at the proposed signalised intersection at Luddenham Road / Adams Road. The eastern and western legs of this intersection are proposed to be staggered two stage crossings with pedestrian refuge to be provided on the raised median. Further investigation and review of the signalised intersection arrangement to improve cyclist and pedestrian amenity is to be undertaken during detailed design.



Figure 42: Typical shared path (active travel link) with 3.0m wide bi-directional cycle path and 1.5m wide pedestrian path on both sides of the road corridor

4.5.4 Indicative property access locations

Property accesses impacted by the proposed road works would be re-established as left-in / left-out access only. Driveways and vehicular crossings impacted by the works are proposed to be reinstated as close to the original location where possible (refer Figure 41 for indicative locations).

It is to be expected that direct access to Elizabeth Drive would be restricted for new development as planned land use change occurs. Access arrangements for future new developments would be considered by Transport on a case-by-case basis.

Design details including driveway grades, finished pavement materials, layback details and design vehicle considerations would be developed at the detailed design stage in consultation with the relevant property owners. Where driveways cross over shared paths, the materiality of the shared path shall be continuous to visually reinforce active travel connectivity and to indicate priority for cyclists and pedestrians over vehicles entering and exiting driveways.

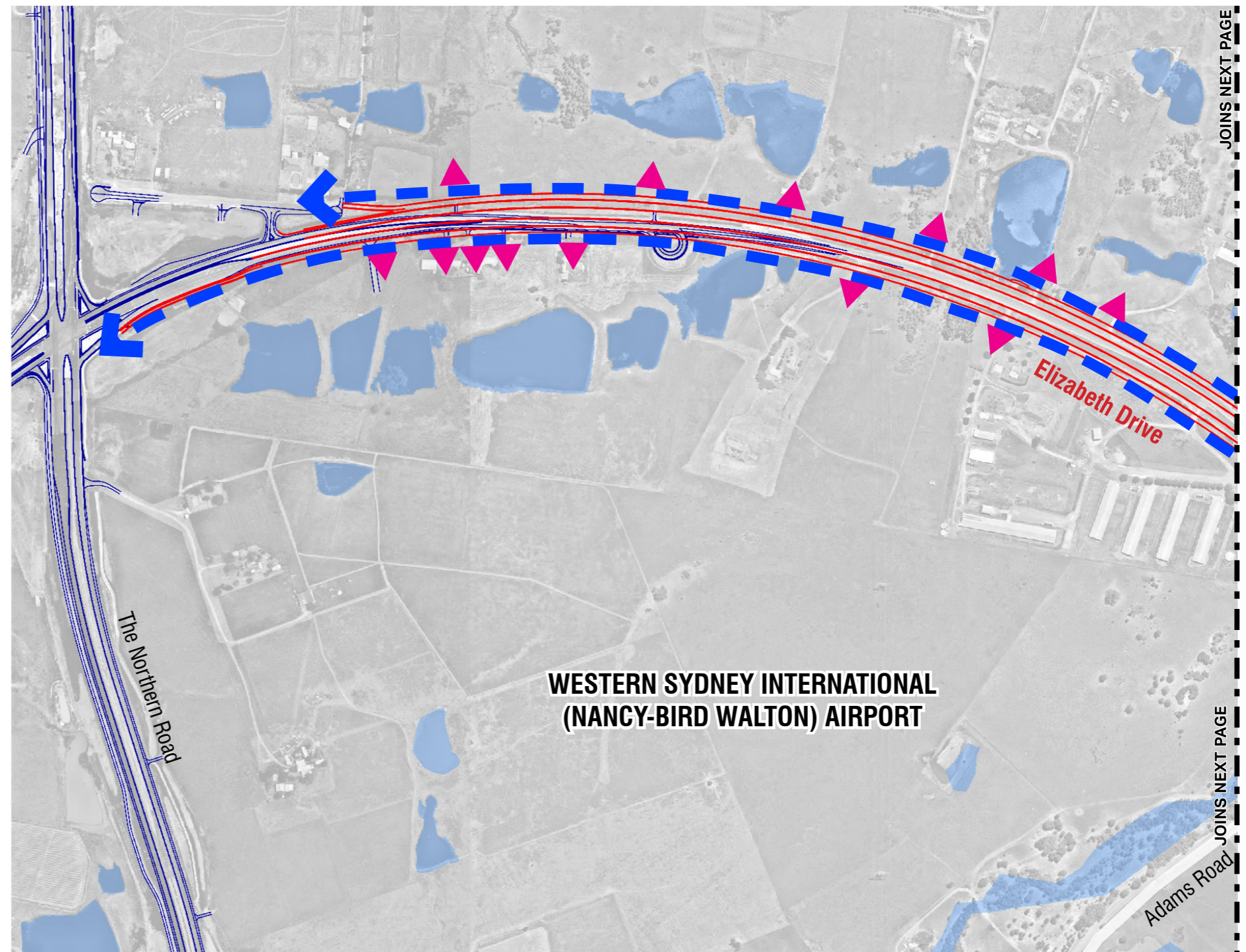
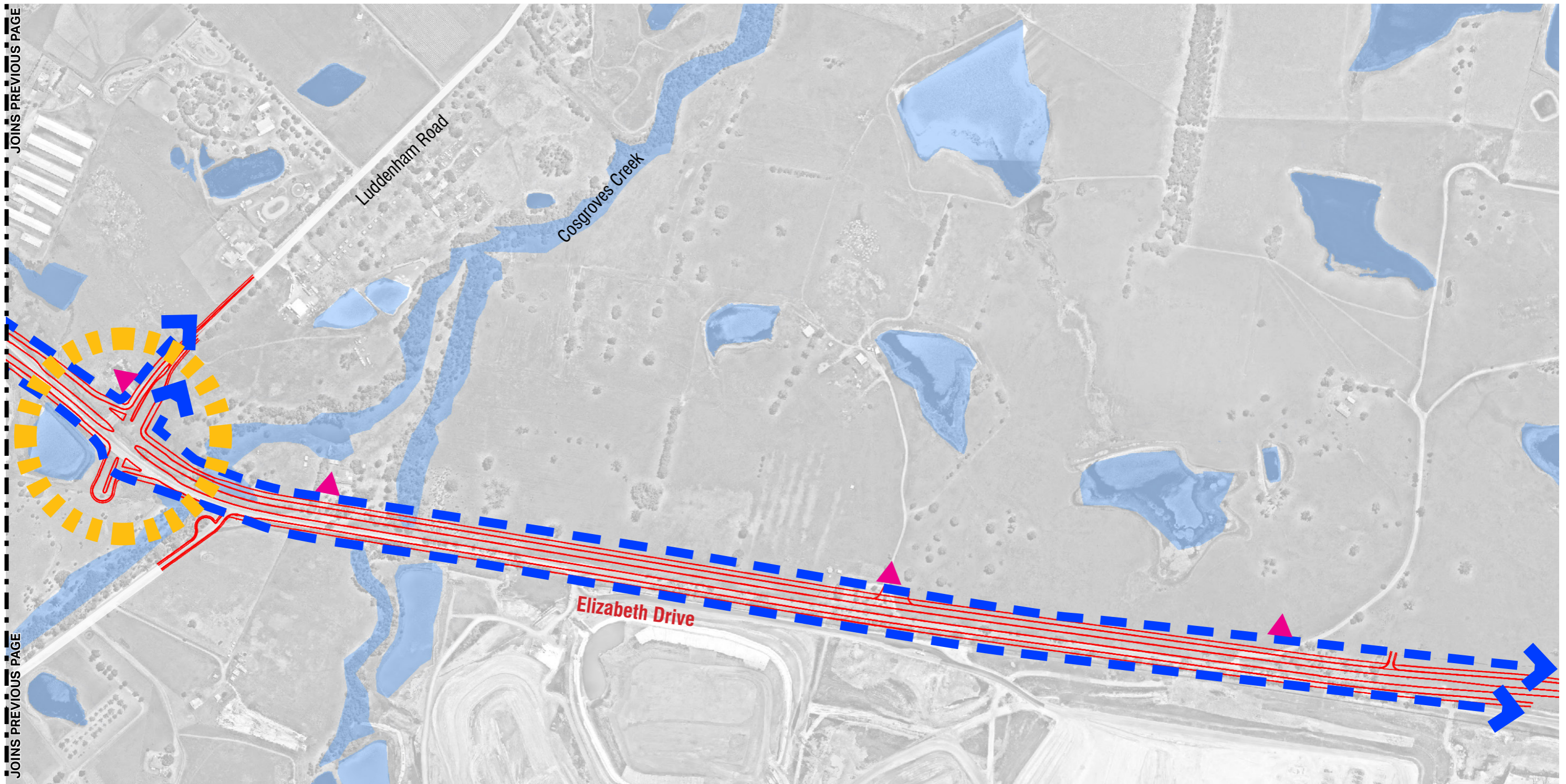


Figure 41: Key plan showing shared path alignment and Indicative property access locations for the proposal

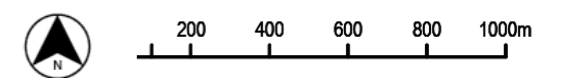


LEGEND

- THE PROJECT EXTENT
- DESIGN BY OTHERS
- FUTURE M12 OPERATIONAL BOUNDARY

- PROPOSED ACTIVE TRAVEL LINK
- EXISTING DRIVEWAY (INDICATIVE)

- INTERSECTION



4.5.5 Landscape strategy

The landscape design is an integral part of the Proposal. It is essential to maintain and enhance the character of the surrounding landscape, establish a legible character along Elizabeth Drive, enhance connectivity between areas of vegetation and provide an enjoyable road user experience.

Specific guiding principles are important in establishing an effective landscape strategy for proposal. The establishment of these principles would guide the landscape development for the road corridor. The landscape principles are as follows:

- reinforce the rural landscape character of the 'Hills' and the 'Plains' vegetation communities through specific planting treatments.
- reinforce and maintain creekline and riparian corridor systems including Cosgroves Creek
- locate opportunities to provide critical visual connections to the natural landscape and creek systems
- integrate riparian vegetation communities and patterns in the landscape by reinforcing their identity on the approach to bridge crossings.

These principles have been integrated in the landscape design response by:

- building upon the existing rural landscape character and providing a design response reinforced through the planting of tree, shrub and ground covers species from the Cumberland Plain Woodland community that highlights the different landscape themes to create legibility along the corridor.
- reinforcing the existing landscape at Cosgroves Creek, and applying ephemeral treatments to proposed drainage swales and permanent basins to improve water quality
- reinforcing the view corridors identified in the landscape character impact assessment through landscape treatments by opening up and framing views. Conversely, visual impacts have been also been appropriately mitigated with screening
- the coordinated approach to safety barrier locations along the road corridor to enable tree planting, in particular to the approach to Cosgroves Creek Bridge, in turn reinforcing the creekline and riparian corridor systems
- creating a linear corridor to connect existing vegetation remnants and ecological communities.

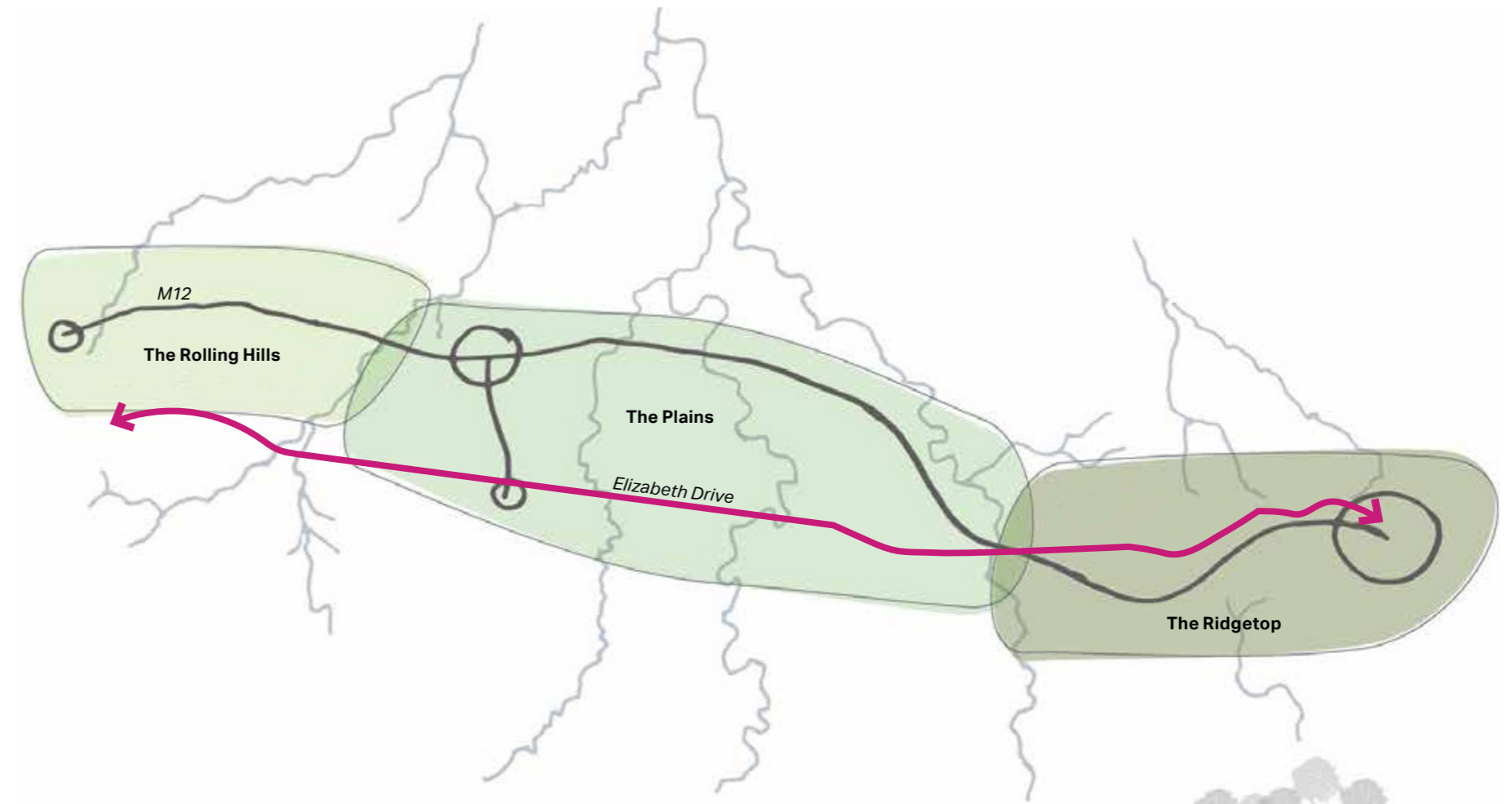


Figure 43: Conceptual diagram of landscape strategy from M12 Motorway extended to Elizabeth Drive corridor



Figure 44: The Rolling Hills typical landscape character



Figure 45: The Plains typical landscape character



Figure 46: The Ridgetop typical landscape character

4.6 Landscape Design Response

The landscape strategy for the proposal is based upon the following broad typologies to inform the landscape approach:

- the rolling hills
- the plains
- creeklines and riparian corridors.

These typologies align with those developed for the M12 Motorway Place, Design and Landscape Plan (Transport for NSW, 2022) as defined in the sitewide strategy. The alignment of landscape typologies for the two projects would ensure that a consistent landscape response along the road corridor and environmental outcome is achieved. This landscape strategy would establish the landscape treatments along creeklines and riparian corridors within the Proposal boundary, to be built upon as surrounding areas are progressed, to provide future ecological, water quality and recreational value for the Western Parkland City.

In addition to responding to the surrounding landscape character the direct benefits to the Project would:

- provide a vegetative cover to disturbed areas
- stabilise embankments and batters
- address the recommendations of the visual impact assessment
- provide integration with adjacent existing interfaces including rural properties, commercial areas and WSA
- establish a landscape approach for future major road connections
- provide a landscape interface that can be built upon and integrated for the future Western Parkland City.

The landscape strategy plan for proposal is illustrated in Figure 47. This strategy is the basis to further develop the landscape treatments, planting species and concept design plans (refer Appendix A).

4.6.1 Drainage and water sensitive urban design (WSUD)

The landscape design includes WSUD measures to meet environmental and sustainability objectives. Drainage design elements include water quality basins, drainage channels, swales and culverts. The landscape design includes planting to these drainage elements to improve environmental performance and increase the diversity of native flora. The locations of drainage and WSUD elements are also indicated in the landscape strategy plan and further detailed in the landscape concept plans.

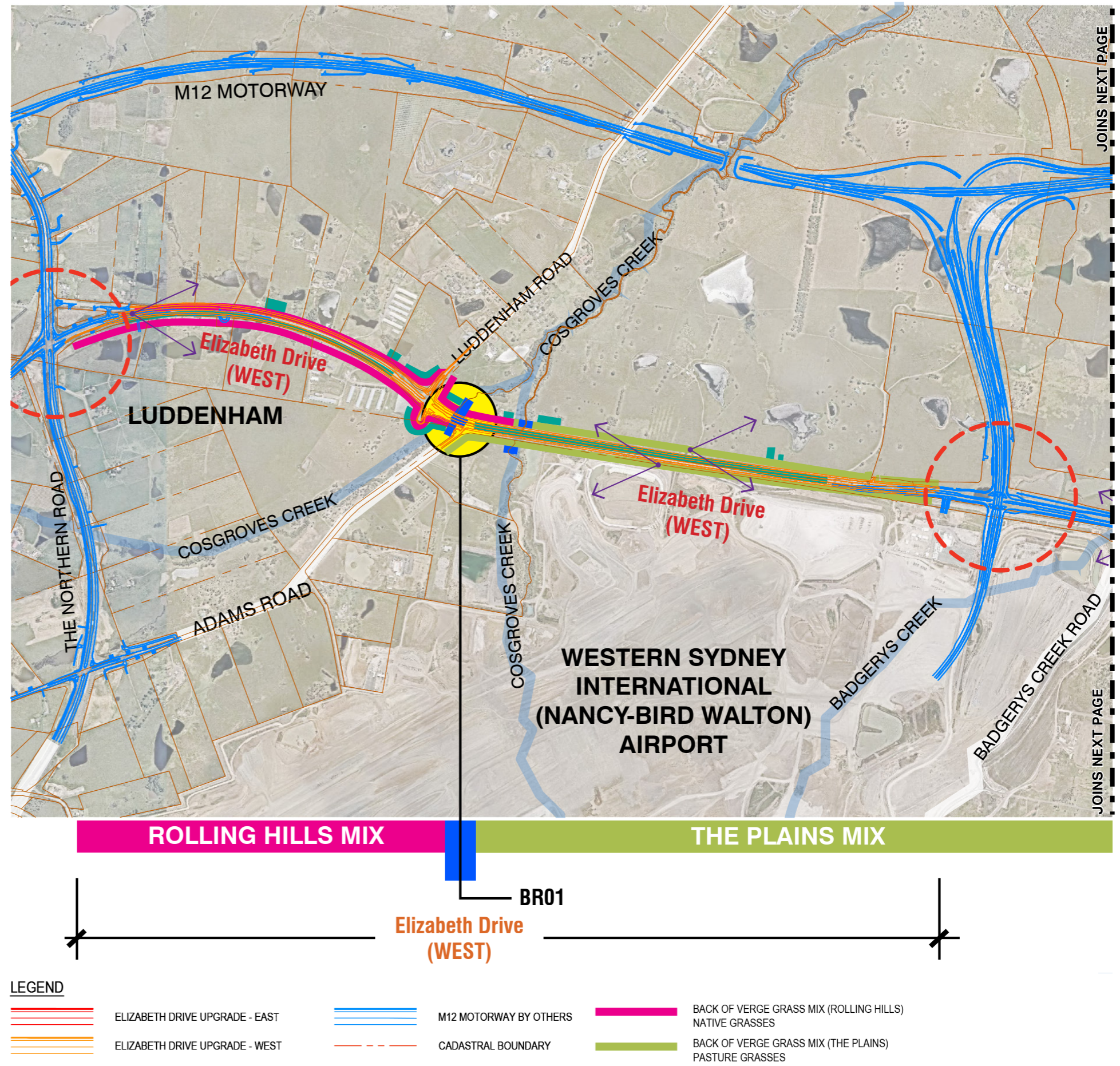
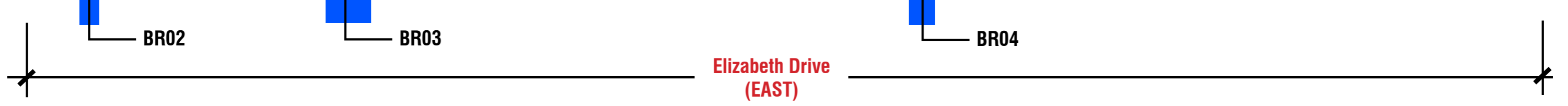
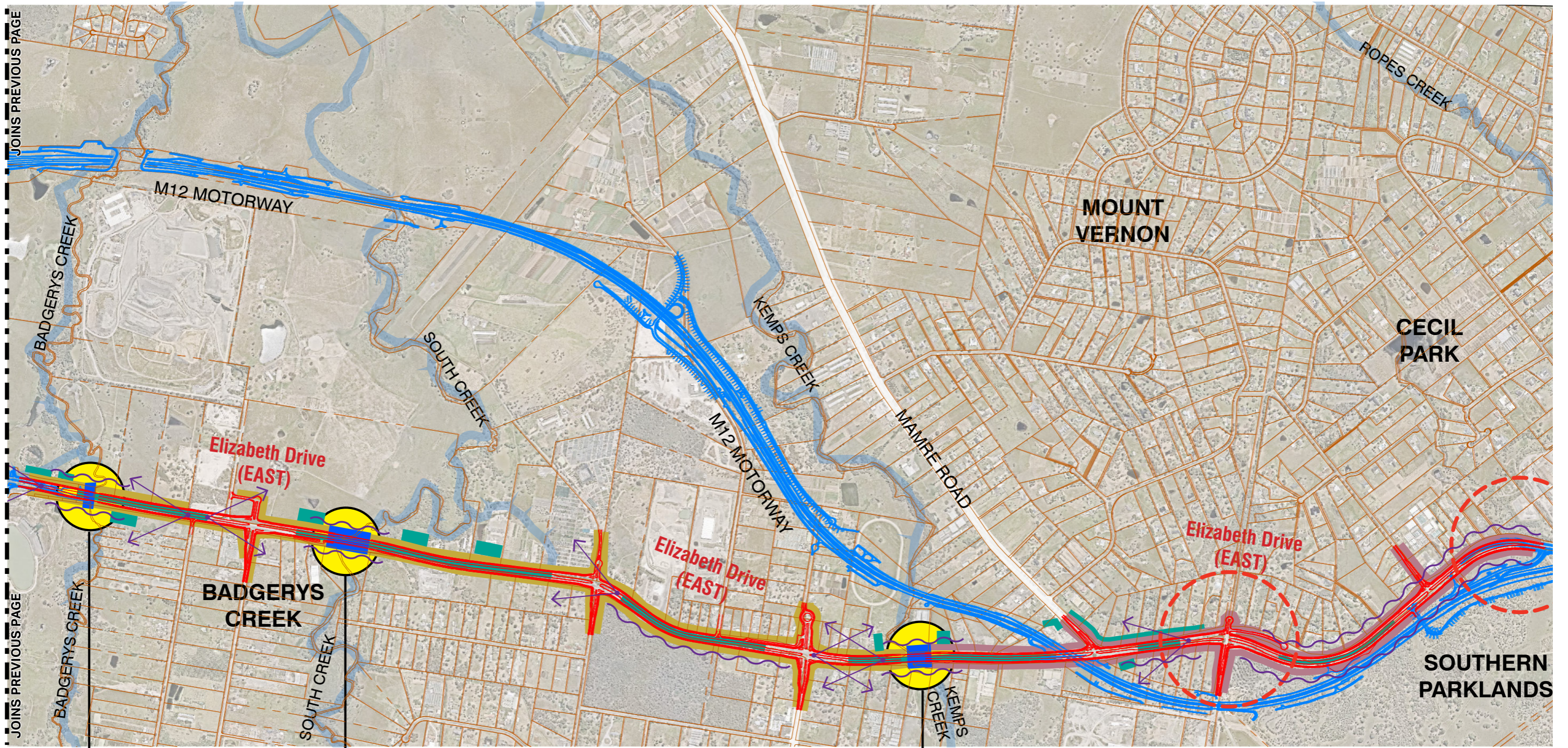


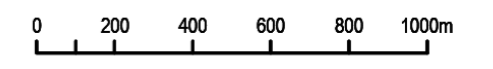
Figure 47: Landscape strategy for the proposal



█ BACK OF VERGE PLANT MIX (RIDGETOP)
 PASTURE GRASSES AND SHRUBS
█ BIORETENTION / SWALE PLANT MIX
 EPHEMERAL SHRUBS AND GROUNDCOVERS
█ CREEKS AND TRIBUTARIES PLANT MIX
 RIPARIAN SHRUBS AND GROUNDCOVERS

KEY VIEWS FROM THE PROJECT
 CLOSED VIEWS FRAMED BY EXISTING
 AND PROPOSED VEGETATION

GATEWAYS AND ENTRIES
 BRIDGE CROSSINGS





LEGEND

Project Elements

- Construction boundary
- Operational boundary
- The Project
- Cuttings and embankments
- Project carriageways
- New bridge (BR01)
- New separated path
- ▶ Driveway Access (indicative)
- New scour paving
- M12 Motorway
- B1 Concrete bridge barrier
- B2 Wire rope barrier

- B3 Security barrier
- B4 Pedestrian barrier
- Permanent drainage basin

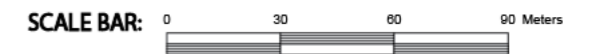
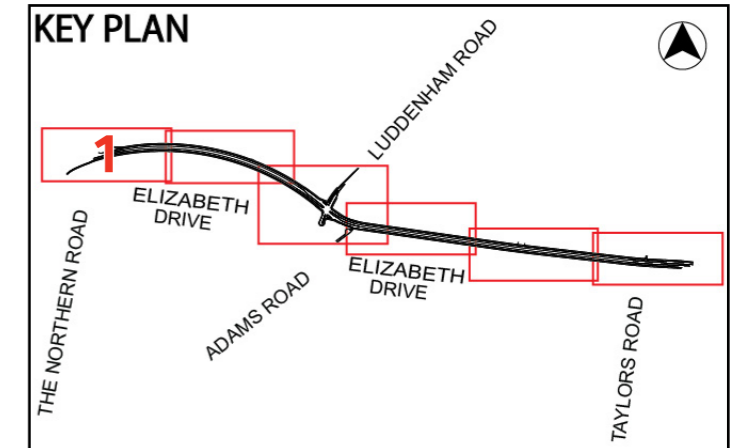
Existing Built and Natural Elements

- Existing contour lines
- Existing farm dams
- Existing creeklines
- Existing trees to be retained
- Cadastral boundary

Project Landscape Elements

- Non-frangible tree
- Frangible tree
- VG1 Ephemeral and Riparian Plant Mix
- VG2 Verge Plant Mix
- VG3 Median Maintenance Edge Plant Mix
- VG4 Intersection Median Plant Mix
- VG5 'Rolling Hills' Back of verge Plant Mix
- VG6 'The Plains' Back of verge Plant Mix

KEY PLAN



Landscape Concept Plan - Sheet 1



LEGEND

Project Elements

- Construction boundary
- Operational boundary
- The Project
- Cuttings and embankments
- Project carriageways
- New bridge (BR01)
- New separated path
- ▶ Driveway Access (indicative)
- New scour paving
- M12 Motorway
- B1 Concrete bridge barrier
- B2 Wire rope barrier

- B3 Security barrier
- B4 Pedestrian barrier
- Permanent drainage basin

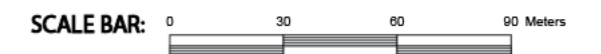
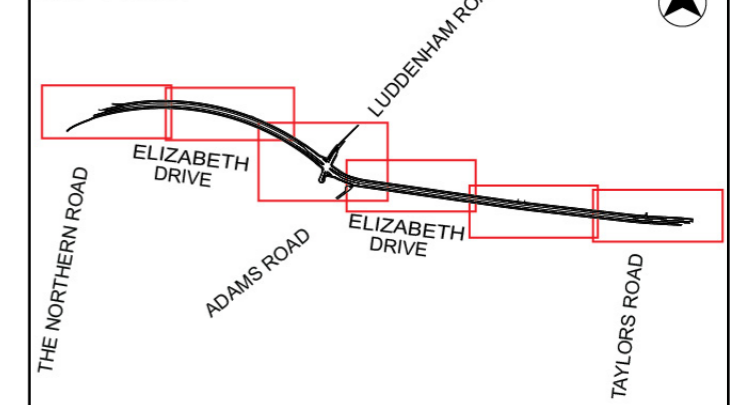
Existing Built and Natural Elements

- Existing contour lines
- Existing farm dams
- Existing creeklines
- Existing trees to be retained
- Cadastral boundary

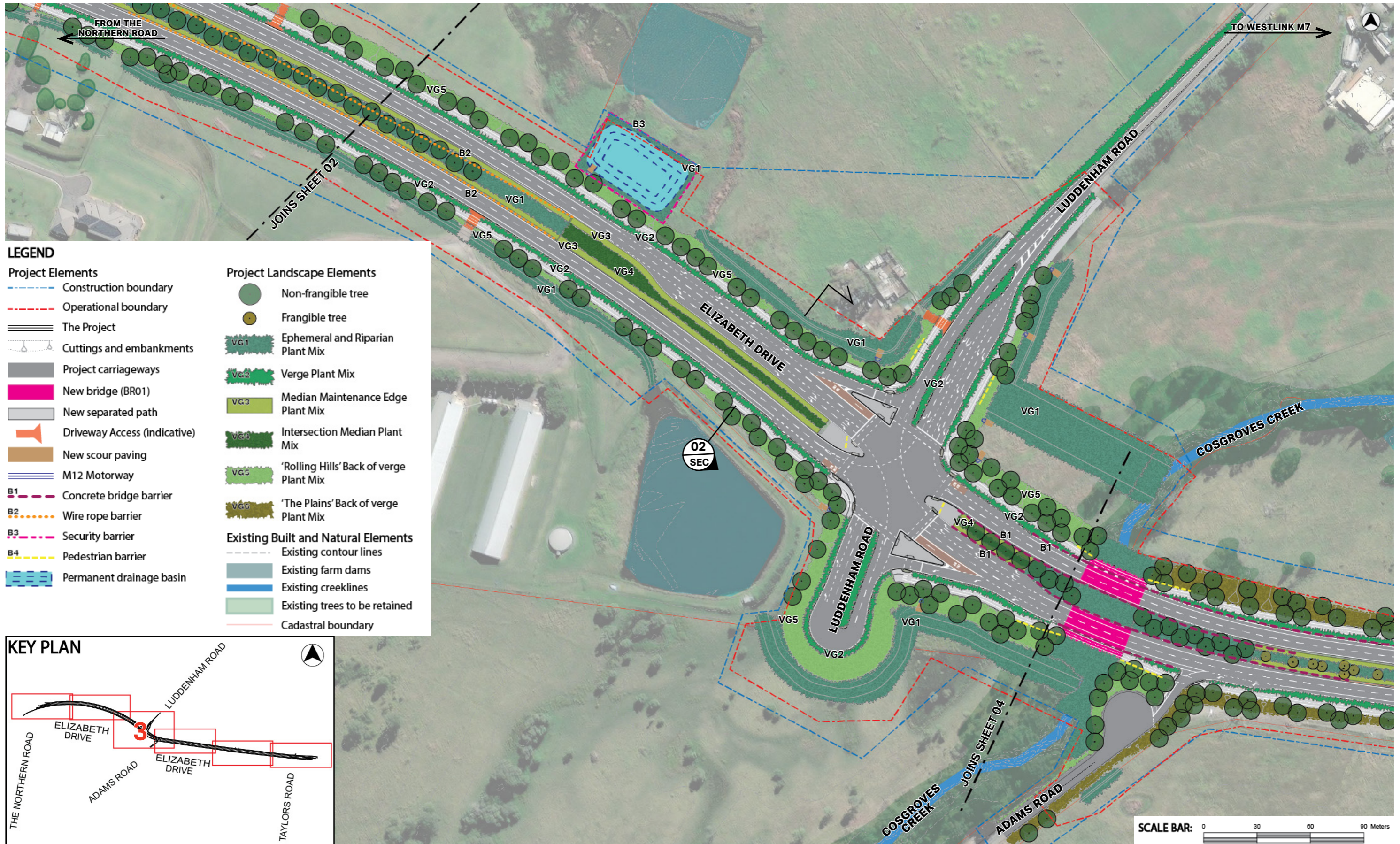
Project Landscape Elements

- Non-frangible tree
- Frangible tree
- VG1 Ephemeral and Riparian Plant Mix
- VG2 Verge Plant Mix
- VG3 Median Maintenance Edge Plant Mix
- VG4 Intersection Median Plant Mix
- VG5 'Rolling Hills' Back of verge Plant Mix
- VCG 'The Plains' Back of verge Plant Mix

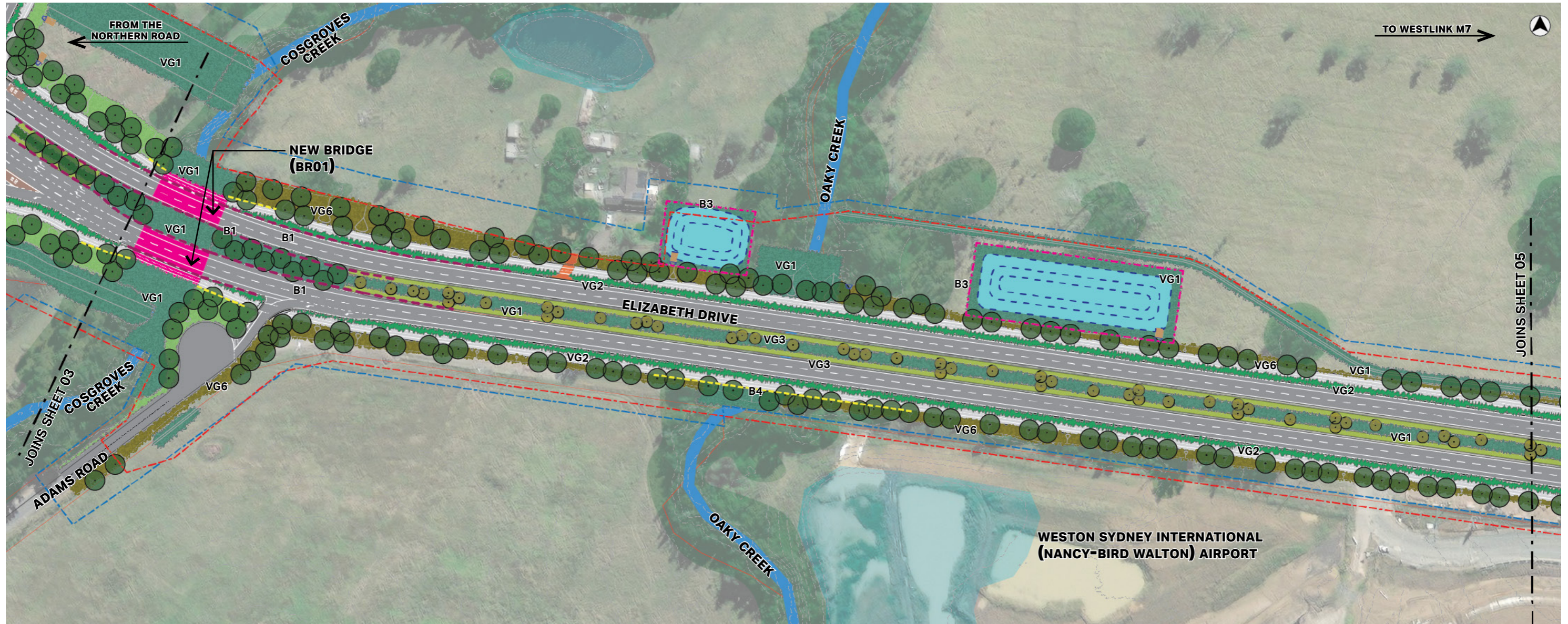
KEY PLAN



Landscape Concept Plan - Sheet 2



Landscape Concept Plan - Sheet 3



LEGEND

Project Elements

- Construction boundary
- Operational boundary
- The Project
- Cuttings and embankments
- Project carriageways
- New bridge (BR01)
- New separated path
- Driveway Access (indicative)
- New scour paving
- M12 Motorway
- B1 - Concrete bridge barrier
- B2 - Wire rope barrier

- B3 - Security barrier
- B4 - Pedestrian barrier
- Permanent drainage basin

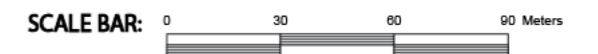
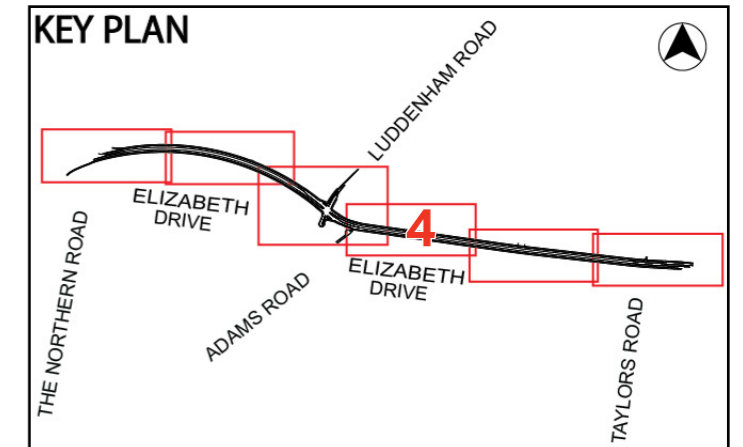
Existing Built and Natural Elements

- Existing contour lines
- Existing farm dams
- Existing creeklines
- Existing trees to be retained
- Cadastral boundary

Project Landscape Elements

- Non-frangible tree
- Frangible tree
- VG1 - Ephemeral and Riparian Plant Mix
- VG2 - Verge Plant Mix
- VG3 - Median Maintenance Edge Plant Mix
- VG4 - Intersection Median Plant Mix
- VG5 - 'Rolling Hills' Back of verge Plant Mix
- VG6 - 'The Plains' Back of verge Plant Mix

KEY PLAN



Landscape Concept Plan - Sheet 4



LEGEND

Project Elements

- Construction boundary
- Operational boundary
- The Project
- Cuttings and embankments
- Project carriageways
- New bridge (BR01)
- New separated path
- ▶ Driveway Access (indicative)
- New scour paving
- M12 Motorway
- B1 Concrete bridge barrier
- B2 Wire rope barrier

- B3 Security barrier
- B4 Pedestrian barrier
- Permanent drainage basin

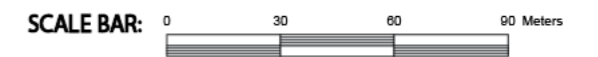
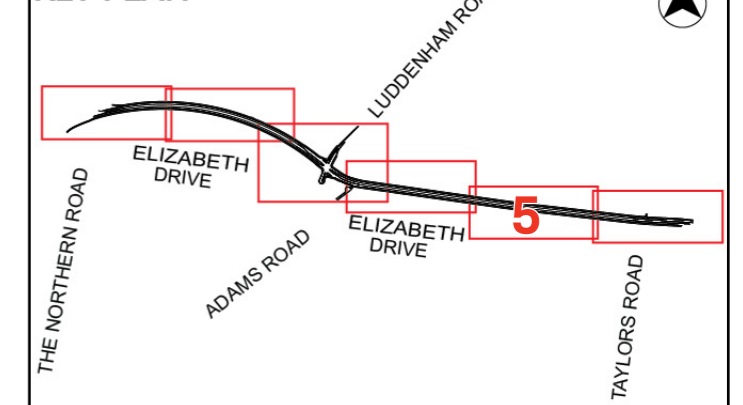
Existing Built and Natural Elements

- Existing contour lines
- Existing farm dams
- Existing creeklines
- Existing trees to be retained
- Cadastral boundary

Project Landscape Elements

- Non-frangible tree
- Frangible tree
- VG1 Ephemeral and Riparian Plant Mix
- VG2 Verge Plant Mix
- VG3 Median Maintenance Edge Plant Mix
- VG4 Intersection Median Plant Mix
- VG5 'Rolling Hills' Back of verge Plant Mix
- VG6 'The Plains' Back of verge Plant Mix

KEY PLAN



Landscape Concept Plan - Sheet 5



LEGEND

Project Elements

- Construction boundary
- Operational boundary
- The Project
- Cuttings and embankments
- Project carriageways
- New bridge (BR01)
- New separated path
- ▶ Driveway Access (indicative)
- New scour paving
- M12 Motorway
- B1 Concrete bridge barrier
- B2 Wire rope barrier

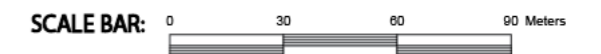
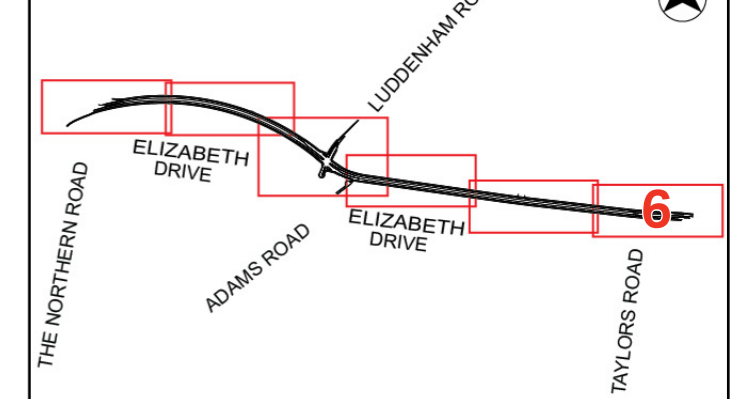
- B3 Security barrier
- B4 Pedestrian barrier
- Permanent drainage basin

- Existing Built and Natural Elements**
- Existing contour lines
 - Existing farm dams
 - Existing creeklines
 - Existing trees to be retained
 - Cadastral boundary

Project Landscape Elements

- Non-frangible tree
- Frangible tree
- VG1 Ephemeral and Riparian Plant Mix
- VG2 Verge Plant Mix
- VG3 Median Maintenance Edge Plant Mix
- VG4 Intersection Median Plant Mix
- VG5 'Rolling Hills' Back of verge Plant Mix
- VG6 'The Plains' Back of verge Plant Mix

KEY PLAN



Landscape Concept Plan - Sheet 6

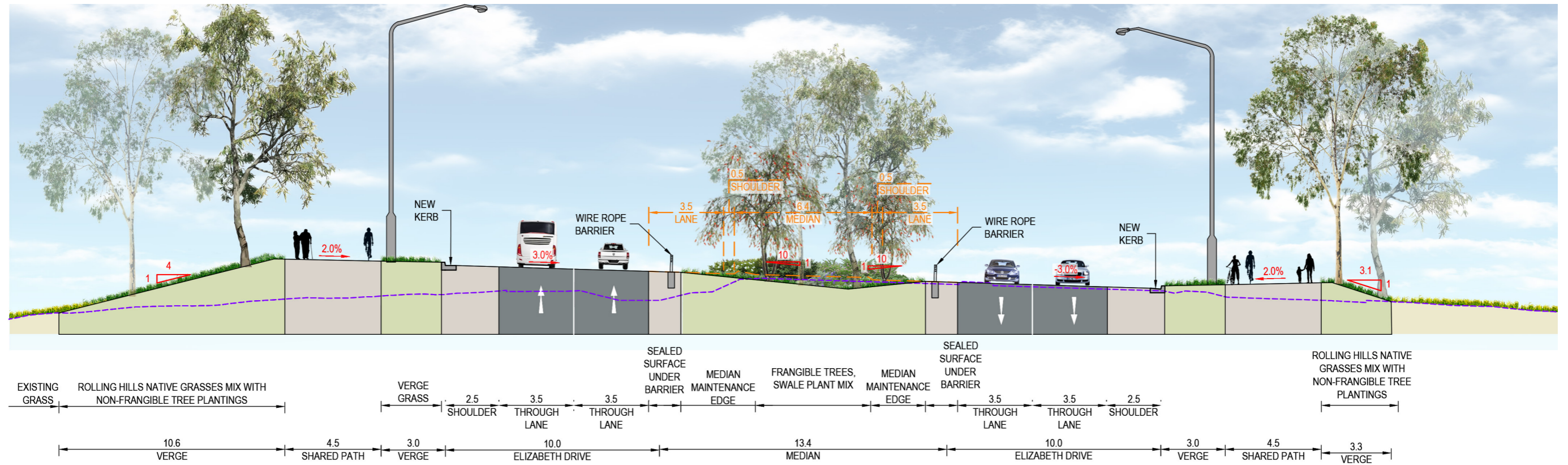


Figure 48: Section 01 - Typical Typology 'Rolling Hills' (Approx. CH 500)

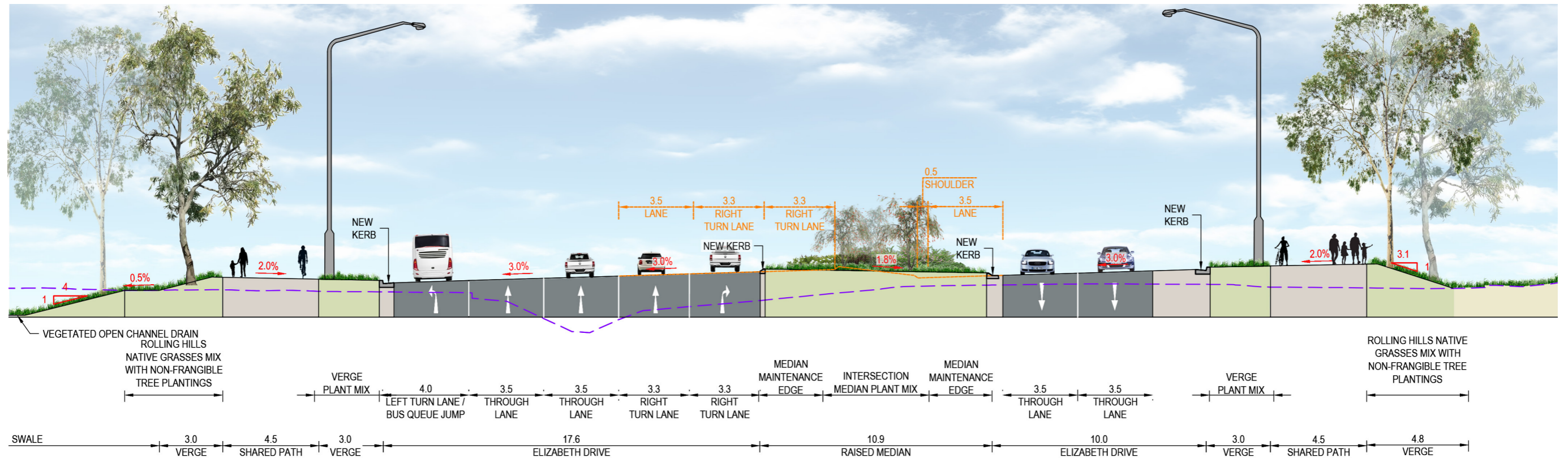


Figure 49: Section 02 - Typical Typology 'Rolling Hills' (Approx. CH 1660)

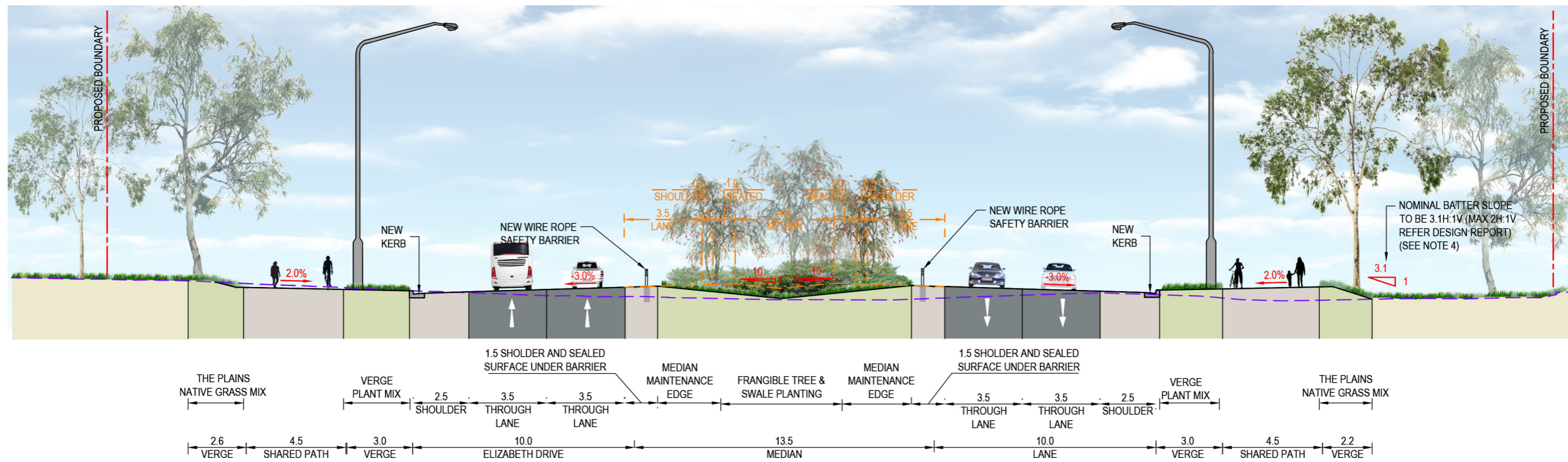


Figure 50: Section 03 - Typical Typology 'The Plains' (Approx. CH 2900)

4.6.2 Planting treatments

The planting treatment for this concept design considers assessing the existing landscape character and the nature of the Proposal. The treatment aims to integrate the road with the surrounding landform, bushland, riparian and rural environments through sympathetic earthworks and planting of vegetation complementary to the existing plant communities, enhancing connectivity and distribution along the corridor. The planting treatments also consider road safety, operational and maintenance requirements.

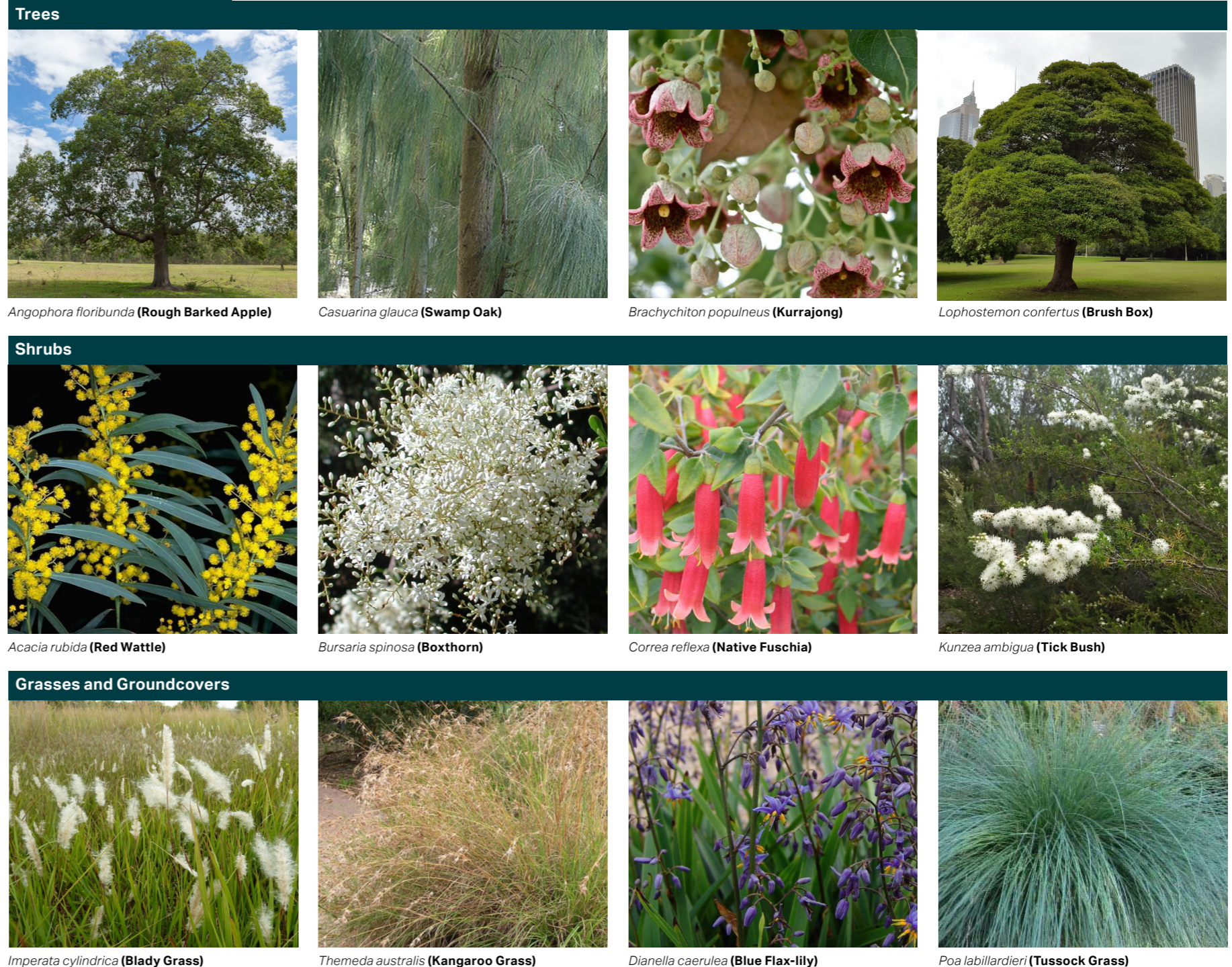
The landscape design concept generally reflects the distinctive qualities of the landscape zones and existing vegetation communities. The local environment through which the road corridor passes would contribute substantially to the aesthetic qualities of the road. The existing vegetation along the corridor comprises Shale Plains Woodland and Cumberland Plains / Hills Woodland community, and the riparian vegetation of the Alluvial Woodland and Cumberland Riverflat Forest at creek lines. These vegetation communities create a diverse and visually attractive landscape that provides variety and interest for users. The landscape treatments for the Proposal aim to take advantage of the area's scenic qualities while minimising the road's impact.

The landscape design achieves the transition between the Plains and the Hills through varying plant species to distinguish the different typologies as one travels through the LCZs. A more distinct and visible change in vegetation would be perceptible on the approach to and over the creek lines, comprising the transition from open woodland to denser Swamp Oak and Paperbark stands. In these riparian corridors, the Riparian Woodland vegetation community is used to support the revegetation of the creek lines following the construction of the Proposal. Plant species from this vegetation community are generally tolerant of waterlogged and saline soils, making them well-suited to flood-prone and high-risk salinity areas.

Revegetation of the road corridor would be installed through various application methods utilising locally collected seed-banks. These seeding mixes would consist of shrubs, grasses and groundcovers. The design proposes trees to control their location and spacing to satisfy road safety requirements and the Wildlife Management Assessment Report guidelines.

Planting a wide variety of endemic and native plant species would increase the overall resilience of the Elizabeth Drive landscape as they are well-adapted to the local environmental conditions. Large areas containing a diversity of plant species are more resilient than smaller, less diverse areas and less susceptible to the expected impacts of climate change. A total of approximately 1,020 trees are proposed, which would contribute to the Department of Planning and Environment's '5 million trees program'.

The planting and revegetation meet the various offset and visibility requirements. This coordination with the other discipline packages includes vegetation location concerning sight distances, maintenance access, drainage elements, lighting, fencing, barriers, and boundaries.



4.6.3 Indicative species list

Indicative plant species for the Proposal are listed below. The selection is due to their appropriateness for use within the region and applies to land inside the Western Sydney Parkland Commitment Areas and beyond the 3 kilometre wildlife buffer to avoid the likelihood of bird strike (Western Sydney Aerotropolis Development Control Plan, 2022).

Species	Common name	Type		
		Trees	Shrubs	Groundcovers / Grasses
Trees				
Non-Frangible Trees				
<i>Allocasuarina littoralis</i>	Black She Oak	●		
<i>Angophora costata</i>	Smooth Barked Apple	●		
<i>Angophora floribunda</i>	Rough Barked Apple	●		
<i>Brachychiton populneus</i>	Kurrajong	●		
<i>Casuarina glauca</i>	Swamp Oak	●		
<i>Corymbia maculata</i>	Spotted Gum	●		
<i>Eucalyptus fibrosa</i>	Red Ironbark	●		
<i>Eucalyptus moluccana</i>	Grey Box	●		
<i>Eucalyptus tereticornis</i>	Forest Red Gum	●		
<i>Lophostemon confertus</i>	Brush Box	●		
Frangible Trees				
<i>Acacia rubida</i>	Red Wattle		●	
<i>Bursaria spinosa</i>	Blackthorn		●	
<i>Correa reflexa</i>	Native Fuschia		●	
<i>Hakea sericea</i>	Willow Hakea	●		
<i>Kunzea ambigua</i>	Tick Bush		●	
<i>Leptospermum parvifolium</i>	Lemon Scented Tea Tree	●		
Verge Planting Mix				
<i>Dianella caerulea</i>	Blue Flax Lily			●
<i>Dichelachne micranthra</i>	Shorthair Plume Grass			●
<i>Imperata cylindrica</i>	Blady Grass			●
<i>Hardenbergia violaceae</i>	Purple Coral Pea			●
<i>Lomandra 'Tanika'</i>	Tanika			●
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			●
<i>Poa labillardieri</i>	Tussock Grass			●
Median Planting Mixes				
Intersection Median				
<i>Correa alba</i>	White Correa		●	
<i>Dianella caerulea</i>	Blue Flax Lily			●
<i>Doryanthes excelsa</i>	Gynea Lily		●	
<i>Grevillea juniperina</i>	Juniper Grevillea		●	
<i>Hardenbergia violaceae</i>	Purple Coral Pea			●
<i>Lomandra 'Verday'</i>	Verday Lomandra			●
<i>Poa labillardieri</i>	Tussock Grass			●
<i>Westringia fruticosa 'Mundi'</i>	Mundi Westringia		●	

Species	Common name	Type		
		Trees	Shrubs	Groundcovers / Grasses
Median Maintenance Edge				
<i>Dichelachne micranthra</i>	Shorthair Plume Grass			●
<i>Ficinia nodosa</i>	Knobby Club Rush			●
<i>Imperata cylindrica</i>	Blady Grass			●
<i>Lomandra 'Tanika'</i>	Tanika			●
<i>Microlaena stipoides</i>	Weeping Grass			●
<i>Poa labillardieri</i>	Tussock Grass			●
Median at Bridges				
<i>Acacia rubida</i>	Red Wattle		●	
<i>Bursaria spinosa</i>	Blackthorn		●	
<i>Carex appressa</i>	Tall Sedge			●
<i>Ficinia nodosa</i>	Knobby Club Rush			●
<i>Gahnia aspera</i>	Saw Sedge			●
<i>Juncus usitatus</i>	Common Rush			●
<i>Kunzea ambigua</i>	Tick Bush		●	
<i>Lomandra fluviatilis</i>	Wattle Mat Rush			●
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			●
<i>Themeda australis</i>	Kangaroo Grass			●
Back of Verge Grass Mixes				
Rolling Hills				
<i>Aristida ramosa</i>	Purple Wiregrass			●
<i>Bothriochloa macra</i>	Red-leg Grass			●
<i>Carex appressa</i>	Tall Sedge			●
<i>Chloris truncata</i>	Windmill Grass			●
<i>Dichelachne micranthra</i>	Shorthair Plume Grass			●
<i>Einadia nutans</i>	Climbing Saltbush			●
<i>Hardenbergia violaceae</i>	Purple Coral Pea			●
<i>Microlaena stipoides</i>	Weeping Grass			●
<i>Plectranthus parviflorus</i>	Cockspur Flower			●
<i>Poa labillardieri</i>	Tussock Grass			●
<i>Themeda australis</i>	Kangaroo Grass			●
<i>Wahlenbergia gracilis</i>	Sprawling Bluebell			●

Species	Common name	Type		
		Trees	Shrubs	Groundcovers / Grasses
The Plains				
<i>Aristida ramosa</i>	Purple Wiregrass			●
<i>Bothriochloa macra</i>	Red-leg Grass			●
<i>Carex appressa</i>	Tall Sedge			●
<i>Chloris truncata</i>	Windmill Grass			●
<i>Cymbopogon refractus</i>	Barbed Wire Grass			●
<i>Dichelachne micranthra</i>	Shorthair Plume Grass			●
<i>Echinopogon ovatus</i>	Hedgehog Grass			●
<i>Lomandra filiformis</i>	Wattle Mat Rush			●
<i>Microlaena stipoides</i>	Weeping Grass			●
<i>Themeda australis</i>	Kangaroo Grass			●
Bioretention / Swale Plant Mix				
<i>Carex appressa</i>	Tall Sedge			●
<i>Ficinia nodosa</i>	Knobby Club Rush			●
<i>Imperata cylindrica</i>	Blady Grass			●
<i>Juncus usitatus</i>	Common Rush			●
<i>Lomandra fluviatilis</i>	Wattle Mat Rush			●
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			●
Creeks and Tributaries Plant Mix				
<i>Allocasuarina littoralis</i>	Black She Oak	●		
<i>Carex appressa</i>	Tall Sedge			●
<i>Casuarina glauca</i>	Swamp Oak	●		
<i>Ficinia nodosa</i>	Knobby Club Rush			●
<i>Gahnia aspera</i>	Saw Sedge			●
<i>Juncus usitatus</i>	Common Rush			●
<i>Lomandra fluviatilis</i>	Wattle Mat Rush			●
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			●
<i>Melaleuca decora</i>	White Paperbark	●		
<i>Melaleuca styphelioides</i>	Prickly Paperbark	●		
<i>Melaleuca linarifolia</i>	Narrow Leaved Paperbark	●		

**Landscape Character
Impact Assessment**

05

5. Landscape Character Impact Assessment

5.1 LCZ 1: Rural

Description of works

The Proposal lies within this LCZ, with Elizabeth Drive upgraded from a two lane busy yet rural road to a widened four lane road with a central median strip, widening at the intersection with Luddenham Road to include turning lanes. The upgraded Elizabeth Drive would include formalised kerb and gutters, planted verges and upgraded signage and lighting.

Sensitivity: Low

This landscape would be subject to ongoing changes due to the development of the Western Sydney Aerotropolis centred around the WSA, which is under construction. The land to the north of Elizabeth Drive within this LCZ is zoned Enterprise Zone (ENT), which encourages development aimed at increasing employment and supporting businesses within the Western Sydney Aerotropolis.

The Elizabeth Drive corridor is zoned SP2 Infrastructure, and while at present the road is somewhat integrated into the rural character of the LCZ, the zoning allows the upgrade of the corridor as proposed.

Considering that these zonings would enable substantial future change to the landscape and character within the LCZ, the susceptibility of the LCZ to the Proposal changes is considered to be Low.

The value of the landscape is Low to Moderate. The LCZ contains occasional heritage items and areas of environmental value, particularly along the ephemeral watercourses of Cosgroves Creek and Oaky Creek. The rural landscape is picturesque and characteristic of the overall pastoral landscape of the area, however, as discussed above, would be subject to substantial change over the coming years due to the Western Sydney Aerotropolis.

Overall, the sensitivity of the landscape is therefore assessed as Low.

Magnitude: Moderate

The magnitude of change is considered to be Moderate and is influenced by:

- the change in scale in the road corridor which is large, with Elizabeth Drive changing from a more rural, narrow road corridor to a wider, formalised transport corridor
- the road corridor would change from a road corridor with narrow verges and predominantly free of formal planting, including a lack of footpaths, to one where the road corridor would include formalised kerb and gutters, footpaths, planted verges and a central median
- the changes would occur across a large proportion of the LCZ, particularly due to the linear nature of the upgrade and the gently undulating, predominantly cleared landscape
- the duration of the change would be long term, although with the maturation of the landscape along the length of the road the Proposal would decrease in visibility over time and blend into the surrounding landscape.

The changes between the existing and proposed Elizabeth Drive within the rural landscape are shown in Figure 51 and Figure 52.



Figure 51: Panorama showing the existing view looking west along Elizabeth Drive from the boundary of 2550 Elizabeth Drive



Figure 52: Visualisation showing the proposed view looking west along Elizabeth Drive from the boundary of 2550 Elizabeth Drive

Landscape Character Assessment: Moderate to Low

The rating is assessed as Moderate to Low as primarily influenced by:

- the LCZ would be subject to ongoing changes due to the development of the surrounding landscape as the Western Sydney Aerotropolis progresses, however, the rural landscape is picturesque and has a character unique to Western Sydney
- the increase in the scale and formality of the road corridor is an acceptable change within the zoning of the Elizabeth Drive road corridor and the development of the surrounding landscape
- the road would essentially go from being a component of the character of LCZ 1 to LCZ 2 - Transport Corridor within the landscape.

The 'Neutral' qualitative rating in Table 4 is in response to the changes resulting in the shifting of Elizabeth Drive from LCZ 1 to LCZ 2: Transport Corridor. While the changes may be considered Adverse within the rural setting of LCZ 1, the zoning of the road corridor and surrounding land, particularly to the north of Elizabeth Drive, would anticipate this change in landuse (and resulting landscape character) as the Western Sydney Aerotropolis is developed.

Once the Western Sydney Aerotropolis precincts within this LCZ (Northern Gateway and Agribusiness Precincts) are developed, the proposed scale and landscape of Elizabeth Drive is considered to be appropriate given the more built up, light industrial and enterprise surrounding landscape.

Table 4: Landscape character assessment - LCZ 1: Rural

Landscape Character Impact Assessment	
Sensitivity	Low
Magnitude of Change	Moderate
Landscape Character Impact	Moderate to Low
Qualitative Impact	Neutral

5.2 LCZ 2: Transport Corridor

Description of works

No works would occur within this LCZ. The upgrade to Elizabeth Drive would occur to the east of The Northern Road, tying back into the new alignment of the eastern end of Elizabeth Drive where it meets The Northern Road.

Sensitivity: Low

The landscape value of the LCZ is Low. The LCZ is utilitarian in design in that the function of the landscape is paramount to its design. The landscape surrounding the LCZ is picturesque, but would be subject to ongoing change due to the development of the Western Sydney Aerotropolis.

Magnitude: Low

While the Proposal would not occur within this LCZ, it would extend the transport corridor within the study area eastwards along the Elizabeth Drive road corridor. This trend is likely to continue as construction of the M12 continues to the north of the study area, with the M12 linking into Elizabeth Drive at the eastern end of the study area.

It is therefore important to consider the change in character of this road corridor as if it were already LCZ 2: Transport Corridor. As such, the upgrade would be a moderate but acceptable change, considering the zoning of the road (SP2 Infrastructure) and the changing landuse of the surrounding landscape.

Landscape Character Assessment: Low

Overall, the impact of the Proposal on this LCZ is considered to be Low (Neutral). The Proposal effectively results in the extending of the existing transport corridor east along Elizabeth Drive, a change that is in keeping with future changes in landscape character due to the developing Western Sydney Aerotropolis and the construction of the M12.

The 'Neutral' qualitative rating in Table 5 is in response to the changes not particularly affecting the existing LCZ within the study area, but resulting in an extension of the LCZ.

Table 5: Landscape character assessment - LCZ 2: Transport Corridor

Landscape Character Impact Assessment	
Sensitivity	Low
Magnitude of Change	Low
Landscape Character Impact	Low
Qualitative Impact	Neutral

5.3 LCZ 3: Future Western Sydney Airport

Description of works

No works would occur within this LCZ. The upgrade to Elizabeth Drive would lie adjacent to this LCZ along its northern boundary.

Sensitivity: Negligible

At present, this LCZ comprises a landscape under construction (for the WSA). This ongoing construction (as outlined in Section 2.4.8.3) renders the sensitivity of the LCZ Negligible as it is subject to constant change. The area comprises a large construction site that would be developed over the coming years into the WSA. The LCZ is therefore not susceptible to change based on the Proposal.

Magnitude: Negligible

The Proposal would not occur within the LCZ, although it does lie adjacent to the LCZ along its northern boundary. The change in scale, the geographic extent and the duration of change would not effect the character of this LCZ.

Landscape Character Assessment: Negligible

Overall, the impact of the Proposal on this LCZ is considered to be Negligible. The Proposal would not effect the character of the LCZ, particularly due to the fact that the LCZ is under construction and is likely to still be under construction after the Proposal is completed.

The Proposal, once completed, is considered to be consistent with the future character of the . The larger scale of the Elizabeth Drive road corridor and planting within the median and verges of the road would be in keeping with the future character of the WSA and its surrounds. The Proposal would have a 'Neutral' effect on the quality of this landscape zone.

Table 6: Landscape character assessment - LCZ 3: Future Western Sydney Airport

Landscape Character Impact Assessment	
Sensitivity	Negligible
Magnitude of Change	Negligible
Landscape Character Impact	Negligible
Qualitative Impact	Neutral

5.4 Summary of Landscape Character Impact Assessment

Of the three LCZs identified within the study area, one LCZ remained unchanged by the Proposal (i.e. a Negligible impact rating) and two returned a Low and Moderate to Low rating (refer Table 7).

The LCZ that returned the highest rating for impact to landscape character was LCZ1: Rural. Elizabeth Drive is presently a two lane road, and although busy, characteristically fits within the rural landscape due to its narrow width, lack of footpaths, kerbs and gutters, and pasture grass verges. Once upgraded, the road would be altered in character from a piece of infrastructure subservient to the rural character of the surroundings to a formalised transport corridor closer to the hierarchy of The Northern Road. This change would place it within LCZ 2: Transport Corridor, rather than within LCZ 1: Rural. Planting along the road corridor, including proposed trees along the road corridor boundary, would integrate the Proposal into the surrounding landscape.

While this comprises a change within the local landscape setting, the character of the landscape is already undergoing a series of changes due to the development of the Western Sydney Aerotropolis, with construction already underway on the WSA. The zoning of Elizabeth Drive as SP2 Infrastructure, and the land to the north of the Proposal as an Enterprise zone (ENT), creates an environment that allows for the ongoing development of this land, which somewhat lessens the impact of the Proposal as a change within the landscape.

The impact of the Proposal on LCZ 2: Transport Corridor remains Low, with the Proposal resulting in an extension of the extents of this LCZ within the study area.

Due to the above, the Proposal would be considered to have a Low effect on the overall landscape character of the area, with a neutral effect on the quality. The Proposal is also considered appropriate given the anticipated future character of the surrounding landscape.

Table 7: Landscape character impact assessment summary

Landscape Character Zone	Sensitivity	Magnitude	Landscape character impact rating	Qualitative rating
LCZ 1: Rural	Low	Moderate	Moderate to Low	Neutral
LCZ 2: Transport Corridor	Low	Low	Low	Neutral
LCZ 3: Future Western Sydney Airport	Negligible	Negligible	Negligible	Neutral

**Visual Impact
Assessment**

06

6. Visual Impact Assessment

6.1 Visibility of the Proposal

As shown in Figure 54, the Proposal would potentially be seen from within a large portion of the study area due to the gently undulating to flat terrain. The tallest element that would prevent views from further areas would be trees, which are typically positioned in larger numbers along riparian corridors (Cosgroves Creek and Oaky Creek within the study area) and along roads and property boundaries. The study area boundary of 500m on either side of Elizabeth Drive is considered the furthest distance that changes due to the Proposal would be seen, considering the visual nature of the Proposal, which comprises the upgrade of an existing road with no very large or visually prominent structures.

6.2 Visual receptors

Two (2) visual receptor types have been defined, each of which are considered to typically share defined sensitivity to change in the character of the current views:

- private domain – views from residences, workplaces and places of work or worship
- public domain – motorists / cyclists using public roads, or views from parks, sports fields and other public facilities.

Given the sparsely populated rural landscape, it is assumed that the Proposal would be seen from few homes, most of which are positioned along Elizabeth Drive. Workers on neighbouring rural properties are also likely to obtain views to the changes. The highest number of visual receptors would be motorists travelling on Elizabeth Drive and Luddenham and Adams Road, nearing the intersection with Elizabeth Drive.

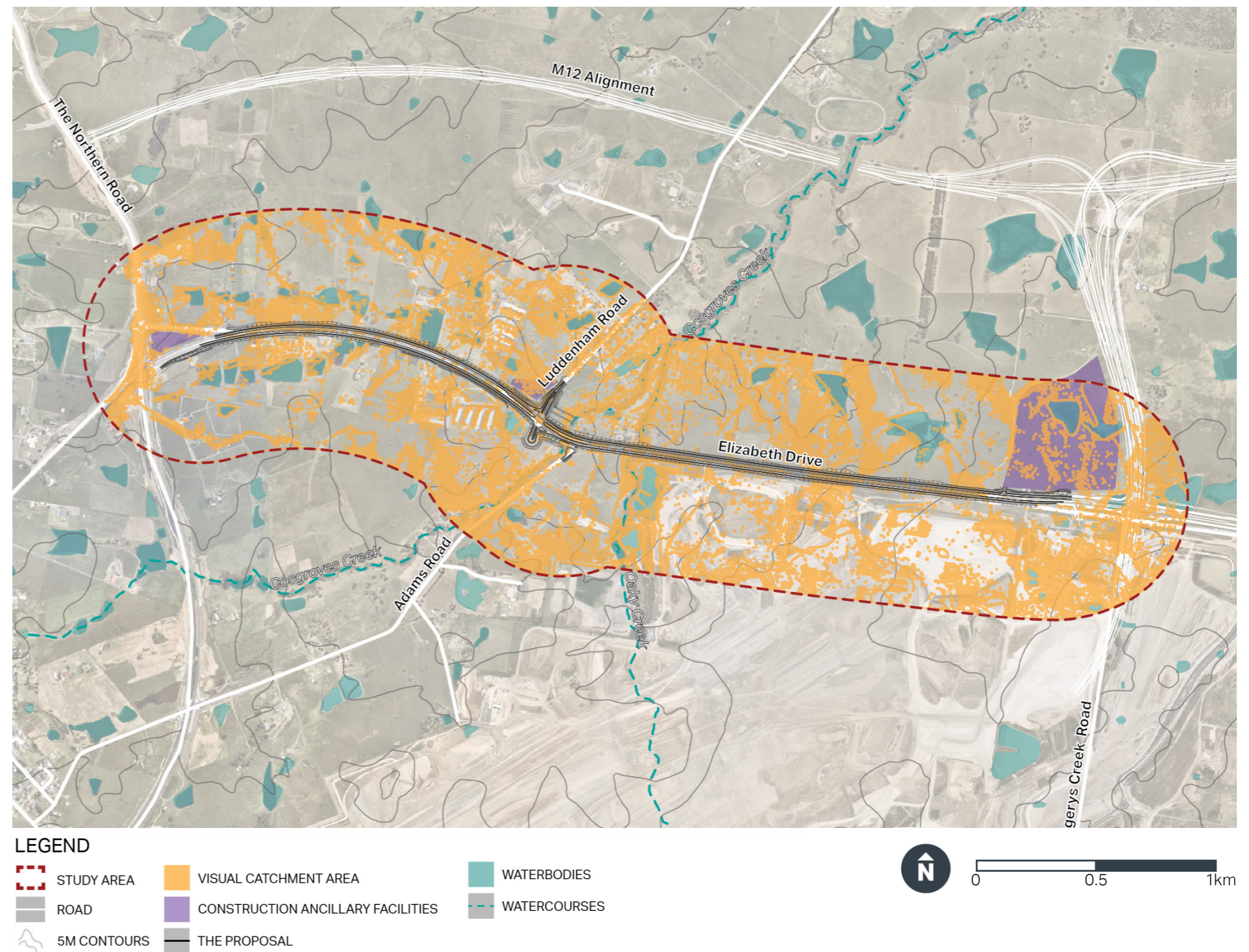


Figure 53: Zone of theoretical visibility

6.2.1 Representative Viewpoints

Seven (7) representative viewpoints have been chosen to assess potential impacts on existing views seen by the above visual receptors (refer Figure 55). These viewpoints are positioned along Elizabeth Drive and the adjoining roads, with the viewpoints placed and orientated to represent the clearest view to the changes. These viewpoints assess the view seen by passing travellers, but also consider potential changes seen by other receptors at each location, such as residents and workers on neighbouring properties.

The viewpoints and rationale for choice of viewpoint locations are listed below:

- **Viewpoint 1: The Northern Road**
Representative view for motorists travelling south along The Northern Road with views to the east nearing Elizabeth Drive capturing the changes to the western end of Elizabeth Drive.
- **Viewpoint 2: 2289 Elizabeth Drive, Luddenham**
Representative view for residents at 2289 Elizabeth Drive, who would receive views to the new western alignment of the road and intersection with The Northern Road.
- **Viewpoint 3: 2550 Elizabeth Drive, Luddenham**
Representative view for motorists on Elizabeth Drive and residents at 2550 Elizabeth Drive to changes to the road corridor.
- **Viewpoint 4: 889 Luddenham Road**
Representative view for motorists on Luddenham Road travelling south west towards the intersection with Elizabeth Drive and residents at 889 Luddenham Road.
- **Viewpoint 5: Adams Road**
Representative view for motorists travelling north along Adams Road towards the intersection with Elizabeth Drive. This viewpoint would see changes to the vegetation within the creek corridor to the west of Adams Road due to the Proposal.
- **Viewpoint 6: 2141 Elizabeth Drive, Luddenham**
Representative view for motorists travelling east along Elizabeth Drive and approaching the crossing point of Oakey Creek.
- **Viewpoint 7: Elizabeth Drive East**
Representative view for motorists travelling east along Elizabeth Drive.



LEGEND

- STUDY AREA
- CONSTRUCTION ANCILLARY FACILITIES
- THE PROPOSAL
- PROPOSAL FOOTPRINT
- ➔ VIEWPOINTS WITH DIRECTION OF VIEW
- ROAD

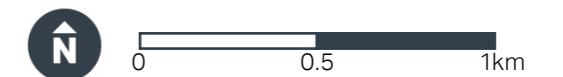


Figure 54: Representative viewpoints

6.3 Visual impact assessment

6.3.1 Viewpoint 1: The Northern Road

Viewpoint 1 is positioned on The Northern Road, approximately 300m north of the new intersection with Elizabeth Drive (refer Figure 56). This view is representative of that seen by visual receptors travelling south along The Northern Road.

Description of current view

The view from The Northern Road looking east comprises an elevated view to the surrounding rural landscape of gently undulating hills, as shown in Figure 57.

The foreground of the view includes The Northern Road corridor, including two lanes of traffic heading south, a wide paved road shoulder and wide verge with pasture grasses, and road infrastructure such as signage and lighting. The middleground of the view comprises a sweeping view of gently undulating green paddocks punctuated by farm dams and paddock trees. Darker bands of trees are visible at property edges and fringing road corridors. Occasional houses are clustered near roads.

The view terminates to the south and south east in a series of elevated paddocks on the horizon. Darker, vegetated hillsides are seen on the horizon beyond a valley to the east.

Elizabeth Drive is predominantly screened from this viewpoint by the undulating hillsides in the landscape. Passing cars on Elizabeth Drive can be seen in the middleground of the view for a small distance as they approach The Northern Road to the east (left) of the house in the middleground of the view near The Northern Road.

Sensitivity: Moderate

The sensitivity of this viewpoint is influenced by:

- the view is seen from a major road by a high number of motorists who would be expected to primarily be focussing on the road and traffic
- many of the motorists would be driving as part of work-related activities (including to and from work), and as such not having a primary focus on the amenity of the landscape
- location of a nearby sensitive receptor group comprising low numbers of rural residents, however, it is unlikely they would have views to the Proposal in the vicinity of this viewpoint

- the open pasture / rural landscape with occasional residential dwellings is common in this area
- the view towards the Proposal is a relatively fleeting one due to the high speed of travel by motorists. There is no footpath on the southbound carriageway of The Northern Road, therefore pedestrians would be rare at this location
- the quality of the existing view is picturesque but would be subject to change (development) due to the Western Sydney Aerotropolis
- there are no items of heritage value within the view, nor is the area known as a holiday or scenic destination.



Figure 55: Keyplan showing the location of Viewpoint 1 and the Proposal



Figure 56: Existing view from Viewpoint 1 looking to the south east, with The Northern Road extending to the south west to the right of frame.



Visual Impact Assessment: Construction

Anticipated change to the view	As the road pavement and verges are screened from view, it is likely that a majority of the construction work would be screened from this location. Passing construction vehicles would be seen in the gap between built form and vegetation. Glimpse views to a small area of the proposed ancillary facility (Ancillary Facility 1) may be seen, but would predominantly be screened by the house at the intersection of the old Elizabeth Drive and The Northern Road.
Sensitivity	Moderate
Magnitude	Low
	<ul style="list-style-type: none"> - The scale of change within the view is very small, with a majority of construction activity screened from view - There would be the minor addition of features within the view, typically limited to some construction traffic and equipment within the Elizabeth Drive road corridor, but seen from a reasonable distance - The changes would be seen over a very small proportion of the view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	Moderate to Low
Qualitative rating	Neutral
	There would be no change in the quality of the view at this viewpoint

Visual Impact Assessment: Operation

Anticipated change to the view	The changes would be screened from view from this location, with only a tiny portion of Elizabeth Drive visible from this position, and only passing traffic visible rather than the actual road or verges. At maturity, the canopy of some trees planted in the Elizabeth Drive road corridor nearing The Northern Road would be visible.
Sensitivity	Moderate
Magnitude	Negligible
	While passing cars on the proposed Elizabeth Road alignment would be seen nearing The Northern Road, the built form of the Proposal (i.e. the road pavement, verges, etc) would not be visible from this location.
Visual impact	Negligible
Qualitative rating	Neutral

6.3.2 Viewpoint 2: 2289 Elizabeth Drive, Luddenham

Viewpoint 2 is positioned on Elizabeth Drive on the verge near the driveway of 2289 Elizabeth Drive, approximately 100m west of the Proposal (refer Figure 58). The house is positioned approximately 50m north of the viewpoint (refer Figure 59). This viewpoint considers the view seen by residents at this and a neighbouring property, both accessed from the old western end portion of Elizabeth Drive, which has been separated from the new Elizabeth Drive alignment by planted verges.

Description of current view

The existing view looking east from this viewpoint is shown in Figure 60. The foreground of the view includes the road pavement and verge of the previous alignment of Elizabeth Drive extending east into the middleground. The northern verge of the road is mown turf, the southern verge between the previous and new Elizabeth Drive alignment has been planted with native shrubs and extends south west to the intersection with The Northern Road.

The view east along Elizabeth Drive is somewhat framed by a row of mature pine trees and fencing at the boundary of the residential property (to left of frame) and the ridgeline of a hillside on the southern side of Elizabeth Drive, which terminates the view with a band of pasture. Glimpse views to the rolling, pastoral landscape to the north and north east can be seen through the trees.

The middleground of the view east includes the cul-de-sac eastern end of the

old alignment of Elizabeth Drive, with a strip of planting separating the new road corridor from the old. The planting comprises native trees and shrubs. Mature trees line the southern side of the road, blocking distance views to the south east. The horizon is visible to the east above the road corridor, seen as a band of darker, vegetated hillsides above a band of paler green pastures in the distance.

Sensitivity: Moderate

The sensitivity of this viewpoint is influenced by:

- receptors would predominantly be residents in two houses near this location, with views to the Proposal likely to be clearly seen from most areas within the properties and from within the houses as well. It is unlikely that Elizabeth Drive in this location would be used by pedestrians or cyclists, not motorists who are not linked to the three residences accessed by this portion of road
- residents are typically considered to be sensitive visual receptors given their proprietary interest, and how the Proposal could be expected to result in changes to the outlook from their homes
- the duration of viewing would potentially be for a moderate to relatively high periods of time for residents within their homes, however, there are a low number of receptors at this location.



Figure 57: Keyplan showing the location of Viewpoint 2 and the Proposal



Figure 58: Residence at 2289 Elizabeth Drive

Visual Impact Assessment: Construction

Anticipated change to the view	<p>This viewpoint lies at close proximity to Ancillary Facility 1, which is positioned on the land between the old Elizabeth Drive alignment and the new road corridor that extends south west to intersect with The Northern Road.</p> <p>The ancillary facility would be seen to the south (potentially visible to the far right of frame in Figure 60), and be surrounded by temporary fencing and signage. Activities likely to be seen within the ancillary facility include car parking, site offices and amenities buildings, laydown and storage of materials, plant and equipment, and material crushing and stockpiling. The ordinarily quiet road would potentially contain construction traffic.</p> <p>Construction work within Elizabeth Drive would be seen in the middle to background of the view to the east (centre of frame in Figure 60) and predominantly comprise any taller machinery or vehicles used.</p> <p>The removal of trees in the middleground of the view on the southern side of Elizabeth Drive would result in the loss of an element within the view. Detailed views to road works are unlikely due to the distance to the works and the vegetation planted at the eastern end of the old Elizabeth Drive alignment.</p>
Sensitivity	Moderate

Magnitude	High
	<ul style="list-style-type: none"> - The construction phase would result in the addition of many large scale elements within the view within the ancillary facility, which screen views to the pastoral hillsides currently seen to the south of Elizabeth Drive - Direct, unscreened views to the ancillary facility would be in the foreground of the view, but would be seen at an oblique angle to the far right of frame - Receptors would predominantly comprise residents in the two neighbouring houses, who would see the changes from a close distance from their front gardens and from their houses - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	High to Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location during construction, introducing the visual clutter associated with construction traffic and an ancillary facility within the view.

Visual Impact Assessment: Operation

Anticipated change to the view	<p>The Northern Road intersection works were nearing completion at the time of writing this report, with only minor changes within this package of works still to come. A shared path within the wide road verge to the left of frame in Figure 60 are part of the Northern Road upgrade works, into which the shared path in the Proposal would connect.</p> <p>The extent of changes due to the Proposal would be visible within the view beyond the furthest (eastern-most) light post in the middleground of Figure 60. Changes due to the Proposal would include the addition of taller elements within the road corridor, including lighting and signage and trees, which would be planted on either side of the widened road corridor, with smaller trees and shrubs in the central median. Trees removed during construction would have been replaced with a larger number of new trees, resulting in a net gain of trees within the view once mature.</p> <p>The view along Elizabeth Drive to the horizon would be partially screened by trees within the road corridor once they had reached maturity.</p>
Sensitivity	Moderate
Magnitude	Low
	<ul style="list-style-type: none"> - At operation, the changes to the view would predominantly comprise the replacement of trees on the southern side of Elizabeth Drive, resulting in a more treed composition within the view, and the addition of new taller road infrastructure (including signage and lighting). The wider road corridor would not be visually prominent as the road pavement is not clearly seen due to the falling topography. - The scale of the new elements within the view would be in keeping with existing tall road infrastructure such as lights, electricity poles and signage. - The built form would be visually recessive due to the fine-grained nature of the additional elements (e.g. light poles). - The changes would be seen over a moderate proportion of the overall view, but comprise mostly of trees and shrubs. - The duration of the change would be long term with no chance of reversibility.
Visual impact	Moderate to Low
Qualitative rating	Neutral
	At operation, it is unlikely there would be a change to the quality of the views seen from this location, as the changes to built form would be visually recessive within the overall view. Additional trees and shrubs within the view would visually 'soften' views of the road corridor.



Figure 59: Panorama showing the existing view looking east along Elizabeth Drive from the driveway of 2289 Elizabeth Drive

6.3.3 Viewpoint 3: 2550 Elizabeth Drive, Luddenham

This viewpoint is positioned on Elizabeth Drive at the existing property boundary fence of 2550 Elizabeth Drive, looking north West (refer Figure 61). This view is representative of views seen by motorists heading west along Elizabeth Drive and considers changes seen by residents of two houses at this location (refer Figure 62), each set back from the existing road pavement by between 70m and 100m.

Description of current view

The view from Viewpoint 3 comprises the Elizabeth Drive Road corridor, including a wide turfed verge between the road pavement and the property boundaries, and the road pavement, with one lane travelling in either direction and no formalised kerb and gutter. The road corridor is fringed with a darker band of vegetation predominantly occurring outside the road reserve on either side. Electricity poles and wires are visible within the road verge, as well as wire boundary fencing.

Elizabeth Drive extends north west into the distance, curving out of sight in the middleground behind the trees. The topography slopes from south to north, with the northern side of the road set at a lower level to Elizabeth Drive. Taller vegetation within the view includes banks of Casuarinas, suggesting a drainage corridor lies in the middleground of the view.



Figure 60: Keyplan showing the location of Viewpoint 3 and the Proposal

Sensitivity: Moderate

The sensitivity of this viewpoint is influenced by:

- receptors would predominantly be motorists heading west along Elizabeth Drive. A high number of travellers would see this view
- residents in two houses near this location - views to the Proposal would likely be clearly seen from most areas within the properties and from within the houses as well. It is unlikely that Elizabeth Drive would be used by pedestrians as there is no provision for safe pedestrian traffic
- residents are typically considered to be sensitive visual receptors given their proprietary interest, and how the Proposal could be expected to result in changes to the outlook from their homes, however, there are a low number of residents at this location.
- motorists would be a less sensitive visual receptor group who would only see the view for short periods of time as they drove past the viewpoint. Many of the motorists would be driving as part of work-related activities (including to and from work), and as such not having a primary focus on the amenity of the landscape
- the duration of viewing would potentially be for moderate to relatively high periods of time for residents within their homes, and low for passing motorists (although motorists would see changes for longer periods of time as they travel along Elizabeth Drive).



Figure 61: Two residences at this viewpoint set back from the Elizabeth Drive between 70 and 100m

Visual Impact Assessment: Construction

Anticipated change to the view	At this location, changes to the view during construction would include site establishment (including set up of environmental protection controls), vegetation removal, earthworks and drainage works, main roadworks, including walking and cycling infrastructure, planting and turf in the verges and median and finishing work. The construction activity would be seen within the widened road reserve boundary and would also include disruption of normal traffic flow.
Sensitivity	Moderate
Magnitude	High
	<ul style="list-style-type: none"> - The construction works would result in the addition of construction activity to the view, including large construction equipment and earthworks, the scale of which is not uncommon within the landscape but has not been experienced at this location - There would be a loss of vegetation at the edges of the road corridor within the view, opening up views to the surrounding landscape, particularly to the north - Most receptors would comprise motorists, who would see the changes for a short period as they pass the location, however, the changes may be seen for longer periods due to disruptions in traffic resulting in slowed traffic flow or delays - Residents in the two neighbouring houses would see the changes from a close distance from their front gardens and from their houses for prolonged periods of time - Views from all locations would be direct and unscreened, and from close proximity. The changes would occur over a large proportion of the overall view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	High to Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location during construction, introducing the visual clutter associated with construction activity to a large proportion of the view.

Visual Impact Assessment: Operation

<p>Anticipated change to the view</p>	<p>Proposed changes to the view are illustrated in Figure 64. The road corridor would be widened to beyond the property boundary on either side, with the proposed changes including two lane carriageways heading east and west, separated by a median, and pedestrian / cycle paths on either side of the road. On the outer edges of both carriageways the road would be bounded by formalised kerb and gutters.</p> <p>New lighting, signage and safety fencing would be included within the view, as well as turfed batters planted with clumps of native trees to mitigate the change in levels between the road corridor and the surrounding landscape.</p> <p>Planting within the road corridor would include native grasses with intermittent trees planted on either side of the corridor, and the central median would be planted with grasses and native shrubs and, small frangible trees.</p>
<p>Sensitivity</p>	<p style="text-align: center;">Moderate</p>
<p>Magnitude</p>	<p style="text-align: center;">High</p> <ul style="list-style-type: none"> - The scale of the road corridor within the view is substantially larger than experienced in the existing situation - The changes would include the addition of elements within the view including cycle lanes, two carriageways separated by a central median and lighting - The changes would be seen for brief periods of time by motorists as they pass by, however, these changes would be seen along the length of time it took for the motorist to drive the length of Elizabeth Drive West as 3.6 kilometre of road would be effected - The changes would be seen for longer periods of time by residents, and from closer distances as the road upgrade would bring the road pavement closer to the houses - The changes would be seen over a large proportion of the view, would be long term with no chance of reversibility.
<p>Visual impact</p>	<p style="text-align: center;">High to Moderate</p>
<p>Qualitative rating</p>	<p style="text-align: center;">Neutral</p> <p>The Neutral qualitative rating at this location is due to the increase in road infrastructure seen at this location, which increases the visual prominence of the corridor within the rural landscape. However, planting, which includes shrubs and trees within the verges and medians, softens the visually 'hard' infrastructure. Additionally, with the development of the Western Sydney Aerotropolis, this widened road corridor would be appropriate given the future character of the area.</p>



Figure 62: Panorama showing the existing view looking west along Elizabeth Drive from the boundary of 2550 Elizabeth Drive



Figure 63: Visualisation showing the proposed view looking west along Elizabeth Drive from the boundary of 2550 Elizabeth Drive

6.3.4 Viewpoint 4: 889 Luddenham Road

This viewpoint is positioned near the driveway of 889 Luddenham Road, looking south west towards the intersection with Elizabeth Drive (refer Figure 65). This view is representative of views seen by motorists heading south west along Luddenham Road towards Elizabeth Drive and considers changes seen by residents of two houses near this location, one of which is shown in Figure 66.

Description of current view

The view from this viewpoint (refer Figure 66) comprises the Luddenham Road corridor extending south west towards the intersection with Elizabeth Drive, including a grassed verge between the road pavement and the property boundaries, the road pavement with one lane travelling in either direction and no formalised kerb and gutter. Fences line the property boundaries on either side of the road, comprising either wire picket fences or heavier brick structures. A row of trees can be seen fringing Luddenham Road on the southern side of the road within private property.

The landscape is relatively flat at this location. To the north west (right of frame) a single story brick house lies in the middleground of the view, screening views to the landscape beyond. The land to the left of the property comprises a large paddock (at the time of photography, being mown by tractor) with gently undulating paddocks and trees beyond. To the south, the view across the flat, green paddock terminates in a dark band of trees associated with the Cosgroves Creek riparian corridor. These trees terminate the view looking in this direction.



Figure 64: Keyplan showing the location of Viewpoint 4 and the Proposal

At the intersection with Elizabeth Drive, the view along Luddenham Road is terminated by street signage and taller vegetation, with electrical infrastructure (electricity stanchions) seen in the background.

Sensitivity: Moderate

The sensitivity of this viewpoint is influenced by:

- receptors would predominantly be motorists heading south west along Luddenham Road. A moderate to high number of travellers would see this view
- residents in two houses near this location are likely to receive views to the Proposal from most areas within the properties and from within the houses as well. It is unlikely that Luddenham Road would be used by pedestrians as there is no provision for safe pedestrian traffic
- residents are typically considered to be sensitive visual receptors given their proprietary interest, and how the proposal could be expected to result in changes to the outlook from their homes, however, there are a low number of residents at this location
- motorists would be a less sensitive visual receptor group who would only see the view for short periods of time as they drove past the viewpoint. Many of the motorists would be driving as part of work-related activities (including to and from work), and as such not having a primary focus on the amenity of the landscape
- the duration of viewing would potentially be for a moderate to relatively high periods of time for residents within their homes, and low for passing motorists (although motorists would see changes for longer periods of time as they travel along Elizabeth Drive)..

Visual Impact Assessment: Construction

Anticipated change to the view	<p>The changes within the view would be seen from a distance of approximately 150m along Luddenham Road. The changes would include the removal of some vegetation (although this may not be seen as these trees are screened from view by ones between the Proposal and the viewpoint), and general construction activity at the intersection of Luddenham Road and Elizabeth Drive, then extending along Elizabeth Drive southwards.</p> <p>Ancillary Facility 2 would be positioned west of the viewpoint in the block of land on the northern corner of the intersection. This would be seen within the view to the centre to right of frame from a distance of approximately 150m. The ancillary facility would be surrounded by temporary fencing and signage. Activities likely to be seen within the ancillary facility include car parking, site offices and amenities buildings, laydown and storage of materials, plant and equipment, and material crushing and stockpiling.</p>
Sensitivity	Moderate



Figure 65: Panorama showing the existing view looking south west along Luddenham Road towards the intersection with Elizabeth Drive from the verge

Visual Impact Assessment: Construction

Magnitude	High
	<ul style="list-style-type: none"> - The construction phase would result in the addition of many large scale elements within the view, particularly associated with the ancillary facility, which would screen views to the landscape beyond the site - The works would occur over a large proportion of the overall view, but would be seen in the middle to background - Most receptors would comprise motorists, who would see the changes for a short period as they approached and passed the intersection, however, the changes may be seen for longer periods due to disruptions in traffic resulting in slowed traffic flow or delays - Residents in the two neighbouring houses would see the changes from a close distance from their front gardens and from their houses for prolonged periods of time - Views from all locations would be direct and unscreened, and from close to moderate proximity. The changes would occur over a large proportion of the overall view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	High to Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location during construction, introducing the visual clutter associated with an ancillary facility within the view.

Visual Impact Assessment: Operation

Anticipated change to the view	Changes due to the Proposal would be seen in the middle to background of the view and visually comprise the addition of trees to the intersection of Luddenham Road and then to the east and west of the intersection along Elizabeth Drive. Some infrastructure, such as signage and lighting, would be seen, but be visually recessive from this distance.
Sensitivity	Moderate
Magnitude	Moderate
	<ul style="list-style-type: none"> - The Proposal would result in the upgrade of the intersection nearing Elizabeth Drive, and the addition of trees seen particularly to the west along the road (additional trees east of the interaction would be seen against a backdrop of riparian vegetation and therefore be less noticeable). Taller elements would comprise an addition to the view, including lighting, signage, and changes to electrical infrastructure. - The changes would be seen in the middle to background of the view, with the Elizabeth Drive corridor widened to include two carriageways, a central median and pedestrian / cycle paths. However, many of these changes are positioned on the ground plane, which is not visible from this viewpoint due to the distance and the topography - The changes could be seen over a large proportion of the middle ground of the view, but would be visually recessive within the greater view - The duration of the change would be long term with no chance of reversibility.
Visual impact	Moderate
Qualitative rating	Neutral
	The Proposal would not result in a change to the quality of the view from this location. The visible elements of the Proposal would be visually recessive, with the most visually prominent aspects of the view, such as the paddocks and vegetation within the riparian corridor, remaining unchanged.

6.3.5 Viewpoint 5: Adams Road

This viewpoint is positioned on Adams Road looking north east towards Elizabeth Drive (refer Figure 67). This view is representative of views seen by motorists heading north east along Adams Road.

Description of current view

The view from this location (shown in Figure 68) includes the Adams Road corridor extending north east, flanked to the left by the Cosgroves Creek riparian corridor and to the right by fenced paddocks.

The foreground of the view comprises the road pavement with the verge overgrown with pasture grasses and weeds to the south west, with the fenced paddock beyond. The north eastern side of the road includes a narrow, weedy verge and tall dense vegetation associated with the riparian corridor beyond. The riparian vegetation screens views to the landscape beyond the riparian corridor.

Elizabeth Drive passes to the north of Adams Road in an east-west direction, the intersection with Adams Road can be seen in the middle ground of the view. Elizabeth Drive is screened from view by landform to the north west (right of frame) and by vegetation to the north east (left of frame).

Sensitivity: Low

The sensitivity of this viewpoint is influenced by:

- receptors would comprise motorists heading north along Adams Road. A moderate number of travellers would see this view

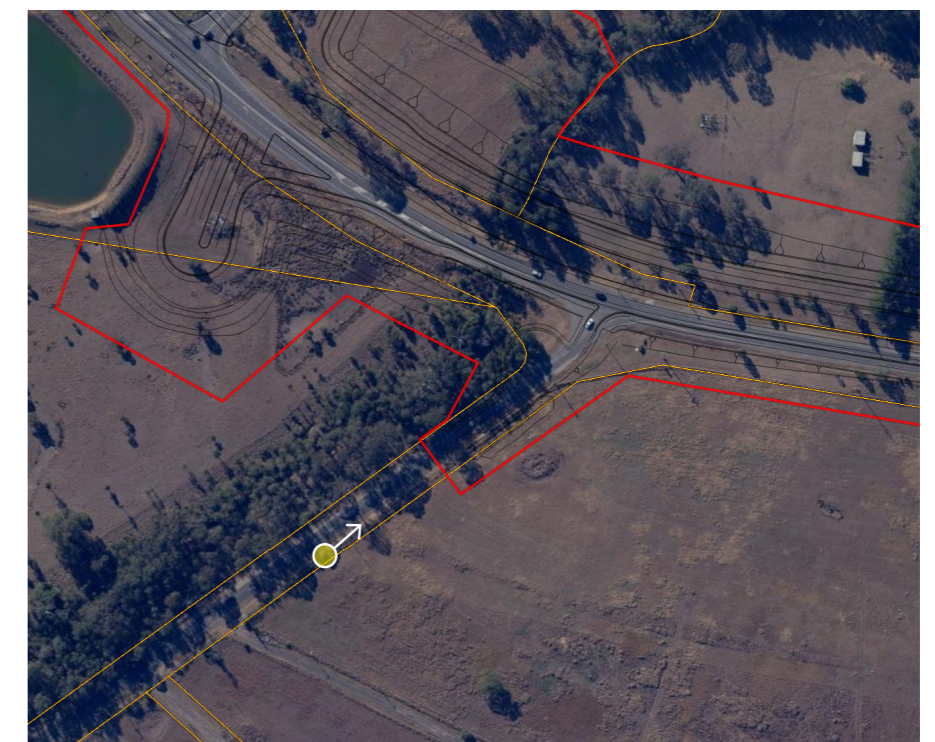


Figure 66: Keyplan showing the location of Viewpoint 5 and the Proposal

- motorists are unlikely to be a sensitive visual receptor group as they would only see the view for short periods of time as they drove past the viewpoint. Many of the motorists would be driving as part of work-related activities (including to and from work), and as such not having a primary focus on the amenity of the landscape
- the duration of viewing would be low for passing motorists, although motorists would see changes for longer periods of time as they travel along Elizabeth Drive
- there are no particular criteria met that would assign additional values to the views at this location (such as interpretive material or heritage assets).

Visual Impact Assessment: Construction

Anticipated change to the view	Changes to the view would be seen from approximately 50 metres away at the closest point. The removal of vegetation along the riparian corridor to the north east (to the left of frame in Figure 68) would open up the view to Cosgroves Creek and to Elizabeth Drive in the middleground of the view. Construction activity would be seen on Adams Road and Elizabeth Drive in the middle to background, and include earthworks and drainage works, main roadworks, planting and finishing work. There is likely to be disruption of normal traffic flow during the construction period.
Sensitivity	Low

Magnitude	High
	<ul style="list-style-type: none"> - The construction phase would result in the addition of many large scale elements within the view - The works would occur over a large proportion of the overall view, but would be seen in the middle to background - Visual receptors would comprise motorists, who would see the changes for a short period as they approached and passed the intersection, however, the changes may be seen for longer periods due to disruptions in traffic resulting in slowed traffic flow or delays - Views from all locations would be direct and unscreened, and from close to moderate proximity. The changes would occur over a large proportion of the overall view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location during construction, introducing the visual clutter associated with an ancillary facility within the view.

Visual Impact Assessment: Operation

Anticipated change to the view	Changes seen at this location would include the upgrade of Adams Road nearing the intersection of Elizabeth Drive, with new road infrastructure at the intersection. Elizabeth Drive would be widened predominantly to the north, with the changes difficult to see from this viewpoint due to landform and vegetation. Vegetation removed from both the northern verge of Adams Road and along Elizabeth Drive would have been seen during the construction phase, so the resulting intersection with Elizabeth Drive would visually comprise a larger, more open area, with additional road infrastructure such as lighting, signage and safety barriers seen within the view. New planting and turf would also be seen.
Sensitivity	Low
Magnitude	Low
	<ul style="list-style-type: none"> - The Proposal would result in the increase in the scale of the road leading up to the intersection within the view due to the widening of the road pavement and the removal of vegetation fringing the road and intersection - There would be additional features within the intersection, including lighting, signage and safety barriers, however, these elements are typical within any road corridor and visually recessive. Although there would be a reduction in the amount of taller vegetation within the view, there would be new turf and planting (including trees) within the Elizabeth Drive road corridor seen in the middle to background. - These changes would be seen across approximately half the area within the overall view, but would be seen for short periods of time in the middle to background - The duration of the change would be long term with no chance of reversibility.
Visual impact	Low
Qualitative rating	Neutral
	The Proposal would not result in change to the quality of the view from this location. While Adams Road would widen leading up to the intersection, a majority of the changes would be on Elizabeth Drive and would be difficult to see. While the removal of vegetation would be an adverse outcome within the view, this occurs within the construction phase of the project and has already been assessed.



Figure 67: Panorama showing the existing view looking north east along Adams Road towards the intersection with Elizabeth Drive from the verge

6.3.6 Viewpoint 6: 2141 Elizabeth Drive, Luddenham

This viewpoint is positioned on Elizabeth Drive looking east from outside the existing property boundary fence of 2141 Elizabeth Drive (refer Figure 69). This view is representative of views seen by motorists heading east along Elizabeth Drive and considers changes seen by residents at this location (refer Figure 70).

Description of current view

The view from this viewpoint comprises the Elizabeth Drive Road corridor, including a wide turfed verge between the road pavement and the property boundary on the northern side of the road (left of frame in Figure 71), and the road pavement, with one lane travelling in either direction and no formalised kerb and gutter. A paddock is seen to the south (right of frame).

The view to the east terminates in a dark band of tall vegetation associated with Oakey Creek in the middle ground, with a break in the vegetation seen in the middle of the view where Elizabeth Drive and an electricity easement pass the riparian corridor. Electricity poles and wires are visible within the road verge, as well as wire boundary fencing on either side.



Figure 69: Residence at 2141 Elizabeth Drive, Luddenham



Figure 68: Keyplan showing the location of Viewpoint 6 and the Proposal



Figure 70: Panorama showing the existing view looking east along Elizabeth Drive from the verge



Figure 71: Visualisation showing the proposed view looking east along Elizabeth Drive from the verge

Sensitivity: Moderate

The sensitivity of this viewpoint is influenced by:

- receptors would predominantly be motorists heading east along Elizabeth Drive. A high number of travellers would see this view
- residents at 2141 Elizabeth Drive are likely to see views to the Proposal from most areas within the property and from within the house as well. It is unlikely that this road would be used by pedestrians as there is no provision for safe pedestrian traffic
- residents are typically considered to be sensitive visual receptors given their proprietary interest, and how the Proposal could be expected to result in changes to the outlook from their homes, however, there are a low number of residents at this location
- motorists would be a less sensitive visual receptor group who would only see the view for short periods of time as they drove past the viewpoint. Many of the motorists would be driving as part of work-related activities (including to and from work), and as such would not have the amenity of the landscape as a primary focus
- the duration of viewing would potentially be for a moderate to relatively high periods of time for residents within their homes, and low for passing motorists (although motorists would see changes for longer periods of time as they travel along Elizabeth Drive).

Visual Impact Assessment: Construction

Anticipated change to the view	At this location, changes to the view during construction would include site establishment (including set up of environmental protection controls), vegetation removal, earthworks and drainage works, main roadworks, including walking and cycling infrastructure, planting and finishing work. The construction activity would be seen within the widened road reserve boundary and would also include disruption of normal traffic flow.
Sensitivity	Moderate
Magnitude	High
	<ul style="list-style-type: none"> - The construction works would result in the addition of construction activity to the view, including large construction equipment and earthworks, the scale of which is not uncommon within the landscape but has not been experienced at this location - There would be a loss of vegetation at the edges of the road corridor within the view, opening up views to the east along Elizabeth Drive through the Oakey Creek riparian corridor

Magnitude (continued)	<ul style="list-style-type: none"> - Most receptors would comprise motorists, who would see the changes for a short period as they passed the location, however, the changes may be seen for longer periods due to disruptions in traffic resulting in slowed traffic flow or delays - Residents would see the changes from a close distance from their front gardens and from their house for prolonged periods of time - Views would be direct and unscreened, and from close proximity. The changes would occur over a large proportion of the overall view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	High to Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location during construction, introducing the visual clutter associated with construction activity to a large proportion of the view. The removal of vegetation would increase the size of the gap seen in the riparian vegetation of Oakey Creek, opening up views along the Elizabeth Drive road corridor to the east.

Visual Impact Assessment: Operation

Anticipated change to the view	Proposed changes to the view are illustrated in Figure 72. The road corridor would be widened slightly to the south, but predominantly to the north to include two carriageways with two lanes each, a central median strip and cycle and pedestrian infrastructure. The outer edges of both carriageways the road would be bounded by formalised kerb and gutters. New lighting, signage and safety fencing would be included within the view, as well as turfed batters to mitigate the change in levels between the road corridor and the surrounding landscape. Planting within the road corridor would include native grasses with intermittent trees planted on either side of the corridor, and the central median would be planted with grasses and native shrubs.
Sensitivity	Moderate

Magnitude	High
	<ul style="list-style-type: none"> - The scale of the road corridor within the view is substantially larger than experienced in the existing situation - The changes would include the addition of elements within the view including cycle lanes, two carriageways separated by a central median and lighting - The changes would be seen for brief periods of time by motorists as they passed by, however, these changes would be seen along the length of time it took for the motorist to drive the length of Elizabeth Drive West as 3.6 kilometre of road would be affected - The changes would be seen for longer periods of time by residents, and from closer distances as the road upgrade would bring the road pavement closer to the houses - The changes would be seen over a large proportion of the view - The duration of the change would be long term with no chance of reversibility.
Visual impact	High to Moderate
Qualitative rating	Adverse
	The Adverse qualitative rating is due to the increase in road infrastructure seen at this location, particularly over Oakey Creek. Here the existing view includes the heavily vegetated riparian corridor. Inclusion of road infrastructure would increase visual prominence of the corridor within the rural landscape.

6.3.7 Viewpoint 7: Elizabeth Drive East

This viewpoint is positioned approximately 500 metres east of Viewpoint 6 on

Elizabeth Drive, looking east (refer Figure 73). This view is representative of views seen by motorists heading east along Elizabeth Drive.

Description of current view

The existing view seen looking east at this location is shown in Figure 74. The foreground of the view comprises the Elizabeth Drive road corridor stretching east, including the road pavement of two lanes, one in either direction, with a narrow shoulder, weedy pasture grasses in the verge, and a narrow band of eucalypt trees and shrubs fringing the road on the southern verge.

The WSA site lies to the south of the road, and can be seen as a large, cleared area with ongoing construction activity. From this viewpoint a large cleared mound can be seen in the background, screening views to the landscape and horizon beyond. To the north the view includes the boundary fencing of neighbouring properties, beyond which paddocks with stands of trees can be seen on an elevated tract of land.

The view to the east terminates at the crest of a gentle rise, with trees and electricity poles fringing Elizabeth Drive seen silhouetted against the horizon.

Sensitivity: Low

The sensitivity of this viewpoint is influenced by:

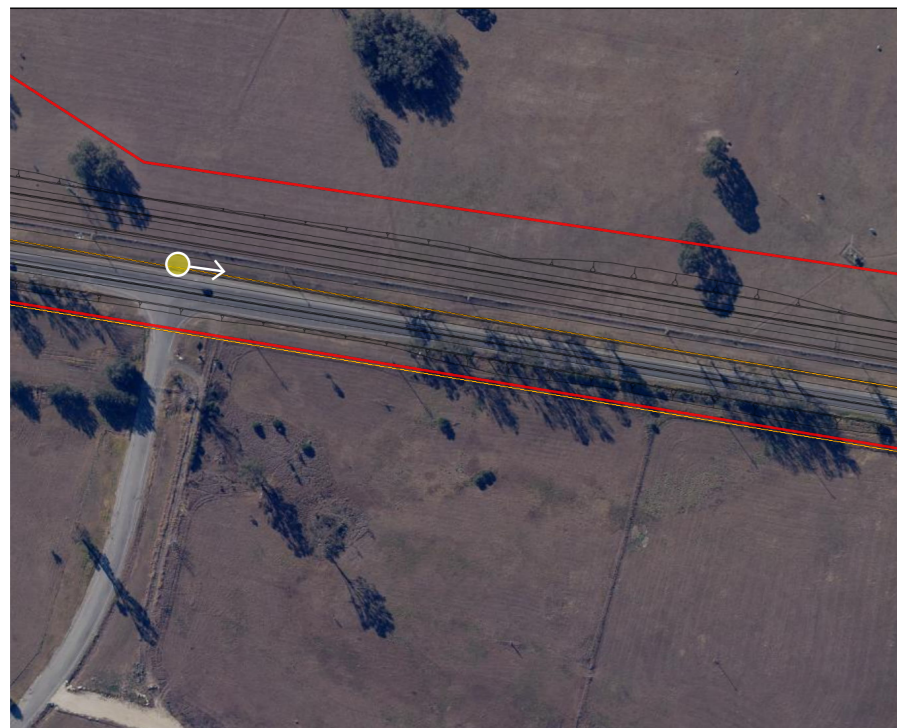


Figure 72: Keyplan showing the location of Viewpoint 7 and the Proposal



Figure 73: Panorama showing the existing view looking east along Elizabeth Drive from the verge



Figure 74: Visualisation showing the proposed view looking east along Elizabeth Drive from the verge. Note that cleared area visible in the background on the right would be 'flattened out' with completion of the WSA

- receptors would comprise motorists heading east along Elizabeth Drive. A high number of travellers would see this view
- motorists are unlikely to be a sensitive visual receptor group as they would only see the view for short periods of time as they drove past the viewpoint. Many of the motorists would be driving as part of work-related activities (including to and from work)
- the view seen at this location encompasses WSA, with ongoing construction activity. Some of the rural character of the area is lost with the ongoing development of this site
- the duration of viewing would be low for passing motorists, although motorists would see changes for longer periods of time as they travel along Elizabeth Drive.

Visual Impact Assessment: Construction

Anticipated change to the view	At this location, changes to the view during construction would include site establishment (including set up of environmental protection controls), vegetation removal, earthworks and drainage works, main roadworks, including walking and cycling infrastructure, planting and finishing work. The construction activity would be seen within the widened road reserve boundary and would also include disruption of normal traffic flow. Vegetation removal would open up views to the south to the WSA construction site, as well as to the horizon adjacent to Elizabeth Drive to the east.
Sensitivity	Low
Magnitude	High
	<ul style="list-style-type: none"> - The construction works would result in the addition of construction activity to the view, including large construction equipment and earthworks, the scale of which is common at this location due to the adjacent the WSA site - There would be a loss of vegetation at the edges of the road corridor within the view, opening up views to WSA and visually 'flattening out' the view along the horizon

Magnitude (continued)	<ul style="list-style-type: none"> - Receptors would comprise motorists, who would see the changes for a short period as they passed the location, however, the changes may be seen for longer periods due to disruptions in traffic resulting in slowed traffic flow or delays - Views would be direct and unscreened, and seen from close proximity. The changes would occur over a large proportion of the overall view - The duration of the change would be short term and would be fully reversible, as the construction period is temporary.
Visual impact	Moderate
Qualitative rating	Adverse
	The Proposal would result in an adverse effect on the view from this location, introducing the visual clutter associated with construction activity to a large proportion of the view. The removal of vegetation would open up views to WSA to the south, which would extend the seen area of construction within the view.

Visual Impact Assessment: Operation

Anticipated change to the view	<p>The upgraded Elizabeth Drive would extend to the north and south, widening predominantly to the north (left of frame) within the view (refer Figure 75). The existing road with a single lane travelling in either direction would be replaced by two carriageways with two lanes each, a central median strip and cycle and pedestrian infrastructure. The outer edges of both carriageways the road would be bounded by formalised kerb and gutters.</p> <p>New lighting, signage and safety fencing would be included within the view, as well as turfed batters to mitigate the change in levels between the road corridor and the surrounding landscape.</p> <p>Planting within the road corridor would include native grasses with intermittent trees planted on either side of the corridor, and the central median would be planted with grasses, native shrubs and occasional small, frangible trees.</p>
Sensitivity	Low

Magnitude	High
	<ul style="list-style-type: none"> - The scale of the road corridor within the view is substantially larger than experienced in the existing situation, however, with the construction of WSA, this wider road corridor would be visually appropriate given the nature of the adjoining site - The changes would include the addition of elements within the view including cycle lanes, two carriageways separated by a central median and lighting - The changes would be seen for brief periods of time by motorists as they passed by, however, these changes would be seen along the length of time it took for the motorist to drive the length of Elizabeth Drive West as 3.6 kilometre of road would be affected - The changes would be seen over a large proportion of the view - The duration of the change would be long term with no chance of reversibility.
Visual impact	Moderate
Qualitative rating	Neutral
	At this location the adjoining site has already begun to change from the rural character of the surrounding landscape to be developed into a busy, more urban WSA and Western Sydney Aerotropolis. The upgrade of the road corridor does not detract from the rural nature of the surrounding landscape. Planting within the road corridor, which includes scattered trees, native grasses and shrubs, would visually replace the trees and taller vegetation removed during the construction phase, thereby integrating the road into the landscape, which also contains similar stands of trees, particularly within paddocks or clustered along boundaries and roads.

6.4 Summary of Visual Impact Assessment

6.4.1 Visual impact during construction

The potential visual impact of the Proposal during construction is summarised in Table 8. Construction elements which would be visible would typically comprise construction activity within the road corridor (including the removal of roadside vegetation) and the presence of three ancillary facilities positioned within the study area. The changes would be seen from a low number of visual receptors living or working in surrounding properties and a high number of visual receptors travelling along Elizabeth Drive and connecting roads (including the Northern Road, Adams Road and Luddenham Road).

Overall, the visual impact experienced by visual receptors during construction would be High to Moderate (Adverse). The changes would be seen by a high number of receptors within the road corridor with a lower sensitivity to change and a low number of receptors with a higher sensitivity to change from the surrounding landscape. The changes would be seen from close proximity in high degrees of detail, particularly as travellers drove along Elizabeth Drive past the changes. However, these changes would be experienced in the short term and would be reversible to some extent.

The Adverse qualitative rating is in response to the removal of roadside vegetation, particularly at creek crossings, the visual clutter associated with construction, the addition of construction equipment and activity within a high proportion of many of the views experienced and the potential for these changes to be seen in conjunction with other construction activity in the surrounding landscape, particularly within the WSA site.

Table 8: Visual impact assessment summary - construction

Viewpoint	Sensitivity	Magnitude	Visual impact rating	Qualitative rating
1: The Northern Road	Moderate	Low	Moderate to Low	Neutral
2: 2289 Elizabeth Drive, Luddenham	Moderate	High	High to Moderate	Adverse
3: 2550 Elizabeth Drive, Luddenham	Moderate	High	High to Moderate	Adverse
4: 889 Luddenham Road	Moderate	High	High to Moderate	Adverse
5: Adams Road	Low	High	Moderate	Adverse
6: 2141 Elizabeth Drive, Luddenham	Moderate	High	High to Moderate	Adverse
7: Elizabeth Drive East	Low	High	Moderate	Adverse

6.4.2 Visual impact at operation

The potential visual impact of the Proposal at operation is summarised in Table 9. The most visually prominent changes would include the upgrade of Elizabeth Drive, with the addition of a vegetated central median strip separating carriageways with two lanes travelling in either direction and pedestrian / cycle paths on both sides of the road. The widened road would result in the removal of existing roadside trees (assessed within the construction phase of the Proposal) and the installation of new trees, turf and native grasses on both the verges and the central median strip. The proposed tree planting would potentially increase tree cover within the road corridor, which would partially offset adverse visual effects of the road upgrade.

Overall, the potential visual impact of the Proposal at operation is considered to be Moderate (Neutral). The scale of the road within the landscape would increase within views both to the road corridor and from within the road (i.e. the view seen by travellers on Elizabeth Drive). The road would change from a more informal but busy rural road to an upgraded transport corridor with formalised kerb and gutters and pedestrian / cycle infrastructure. However, considering the ongoing development of the surrounding landscape in response to the construction of the WSA and Western Sydney Aerotropolis, these changes are considered appropriate.

Table 9: Visual impact assessment summary - operation

Viewpoint	Sensitivity	Magnitude	Visual impact rating	Qualitative rating
1: The Northern Road	Moderate	Negligible	Negligible	Neutral
2: 2289 Elizabeth Drive, Luddenham	Moderate	Low	Moderate to Low	Neutral
3: 2550 Elizabeth Drive, Luddenham	Moderate	High	High to Moderate	Neutral
4: 889 Luddenham Road	Moderate	Moderate	Moderate	Neutral
5: Adams Road	Low	Low	Low	Neutral
6: 2141 Elizabeth Drive, Luddenham	Moderate	High	High to Moderate	Adverse
7: Elizabeth Drive East	Low	High	Moderate	Neutral

6.5 Cumulative impact assessment

The landscape surrounding the Proposal is undergoing a series of changes due to the development of the Western Sydney Aerotropolis and other projects in the area including the WSA, the M12 Motorway and the proposed Elizabeth Drive East Upgrade. These changes affect the overall landscape character of the surrounding area and the views available within the study area. The cumulative impact of these projects is considered in the assessment of landscape character (refer to Section 5.4), and the visual impact of the Proposal (refer to Section 6.4.8) during both construction and at operation.

Considering the change in landscape character, the Proposal's impact has been assessed as contributors to the anticipated character of the landscape rather than the cumulative impact of the projects on the landscape. The future character of the area is described in Section 3.1 and Section 4.8 using planning and design reference documents which include the LEPs for Liverpool, Fairfield and Penrith, the Western Sydney Aerotropolis Plan (2020), the WSA Plan (2021) and Draft Aerotropolis Precinct Plan (2020). The Proposal is considered appropriate given the anticipated future character of the surrounding landscape.

Considering the visual impact of the construction of these projects, construction activity (including vegetation clearing, earthworks, construction of built elements, and movement of construction vehicles within the construction sites and on the local road network and construction compounds) would become a typical element seen within the surrounding landscape, including along the entire length of Elizabeth Drive between the Northern Road and the Westlink M7. While this change in views from the existing rural setting would be an overall adverse impact in combination with the Proposal, the effect would be temporary (yet sustained due to the ongoing development) and, like the change in the character of the surrounding landscape, would be an anticipated change considering the development and its supporting infrastructure. A highly impacted group would be travellers on Elizabeth Drive, where construction activity and equipment would become a characteristic element within the views along the road corridor between the Northern Road and the Westlink M7.

After completing the Proposal, the Aerotropolis, the WSA, the M12 Motorway and the upgrade of Elizabeth Drive East Upgrade, views within the study area would have substantially changed. The rolling, rural landscape with heavily vegetated riparian corridors separating paddocks and occasional housing and agricultural enterprises would be replaced by a more urban landscape. The Proposal design would elevate Elizabeth Drive to a busy transport corridor within a landscape that includes areas of enterprise development, denser residential development, and more visually prominent transport infrastructure, including the M12 Motorway and a bustling WSA. Within this context, the Proposal is considered Moderate.

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Mitigation

07

7. Mitigation and Conclusion

7.1 Mitigation strategy

This chapter is divided into three sections, outlining:

- impacts avoided or minimised, or areas where the design development has resulted in an improved outcome
- mitigation measures to reduce any remaining impacts to landscape character, views and visual amenity
- opportunities that may not be related to the direct physical affects of the Proposal, but may result from secondary effects.

7.1.1 Impacts avoided/minimised and improved outcomes

Ongoing discussion with Transport and the design team has resulted in the following improved landscape outcomes:

- trees are now to be planted within the verges and central median of Elizabeth Drive and on approach to bridge crossings. The addition of trees in the landscape is beneficial for visual amenity, climate regulation, user comfort and landscape character. Most of the corridor has been designed with a wire rope barrier on the edges of the central median which transition to a concrete barrier on approach to the bridges to allow tree planting. Tree planting within the road corridor would reduce the impact on views within and to the upgraded road, and the impact on landscape character due to removal of existing roadside trees.
- tree species have been chosen from the Western Sydney Aerotropolis Development Control Plan (2022).
- while the landscape outside the road corridor would be subject to ongoing change with the development of WSA and Western Sydney Aerotropolis, the rural landscape of 'the Hills' and 'the Plains' to the east and west of Luddenham Road has been referenced in the urban design response with the use of plant species and planting design.
- a 4.5 metre shared path is located on both sides of the corridor, where as previous iterations of the design only allowed for 3.5m, to improve active travel amenity.
- plant species that root at the nodes or spread using rhizomes have been included in batter planting mixes to assist in stabilisation of proposed batter slopes.

7.1.2 Mitigation of remaining adverse impacts

The overall impact of the Proposal on landscape character is low, but would result in the replacement of a busy but less prominent rural road with a distinct transport corridor. There are no substantial impacts on landscape character that would require particular mitigation, however, measures to integrate the Proposal into the surrounding landscape have been considered and are outlined in Section 7.1.1.

The construction phase of the Proposal results in the highest impact to views from within the Elizabeth Drive road corridor and from the surrounding landscape. The following mitigation measures are recommended to minimise impacts as a result of construction:

- establish TPZs around trees to be retained. Tree protection would be undertaken in keeping with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs
- provide well-presented and maintained construction hoarding and site fencing with shade cloth (or similar material) (where necessary) to minimise visual impacts during construction. Hoardings and site fencing would be removed following construction completion
- provide cut-off or directed lighting within and outside of the construction site, with lighting location and direction considered to ensure glare and light spill is minimised
- keep construction areas clean and tidy and place refuse in appropriate receptacles.

Commitments / measures to be investigated during detailed design to improve landscape, visual and urban design outcomes include:

- a tree audit shall be undertaken to determine if some trees within the Proposal boundary could be retained, rather than clearing the entire operational project area. Further assessment of the landscape design (including the landscape species list) would be undertaken by an aviation ecologist to ensure safety aspects are met.
- further development and refinement of the Aboriginal cultural strategy and artwork interpretation in consultation with an Indigenous consultant, Traditional Custodians and cultural knowledge-holders, including re-engagement with the local community and incorporate artwork telling stories important to them
- continue to examine opportunities to increase tree canopy in the corridor, including between the kerb and shared path, that address safety sight distances and clear zones requirements
- review signalised intersection arrangement to investigate improved cyclist and pedestrian amenity.

7.1.3 Opportunities for pursuing in detailed design

Some batters have been designed as 1v:2h slopes. While some plants would grow on batters of this angle, is not ideal for plant growth and soil erosion and less steep batters would perform better. Any possibility to reduce the batter slopes would be explored (while ensuring minimal existing tree removal), and may include low retaining walls or a slightly expanded operational footprint.

The proposed bridge over Cosgroves Creek does not have provision for recreational and active travel connectivity along the the creekline. The establishment of north-south links across Elizabeth Drive is an important recreational opportunity to enhance the livability and amenity in the Western Parkland City. This opportunity would be further investigated during detailed design to not preclude future aspirations to establish north-south recreational and active travel links across Elizabeth Drive at the creeklines.

7.2 Conclusion

Elizabeth Drive would play an essential role as a primary arterial and active travel corridor for the Western Sydney Aerotropolis and Western Parkland City. An urban design concept has been prepared that responds to the local context, reinforces the surrounding landscape character and seeks to reduce impacts on landscape character and views. The urban design objectives and associated principles have been established to provide the framework for achieving the project vision and guide the Proposal from inception to delivery.

While this comprises a change within the local landscape setting, the character of the landscape is already in a state of change due to the development of the WSA, Western Sydney Aerotropolis and M12 Motorway. This change in character somewhat lessens the impact of the Proposal as a change within the landscape.

Overall, the Proposal would result in minor impacts to landscape character, with the highest impact comprising a Moderate to Low (Neutral) rating within the rural landscape. This low rating was in part due to the ongoing changes that are expected in the surrounding landscape due to the development of the WSA and Western Sydney Aerotropolis.

The visual impact experienced during construction would be considered as High to Moderate (Adverse). The changes would be seen by a high number of receptors within the road corridor with a lower sensitivity to change and a low number of receptors with a higher sensitivity to change from the surrounding landscape. The changes would be seen from close proximity in a high degree of detail, particularly as travellers drive along Elizabeth Drive West past the changes. However, these changes would be experienced in the short term and would be reversible to some extent.

The visual impact of the Proposal at operation would be considered as Moderate (Neutral). The scale of the road within the landscape would increase within views both to the road corridor and from within the road. The road would change from a more informal but busy rural road to an upgraded transport corridor with formalised kerb and gutters and pedestrian / cycle infrastructure. However, considering the ongoing development of the surrounding landscape in response to the construction of the WSA and Western Sydney Aerotropolis, these changes are considered appropriate.

7.3 References

- Beyond The Pavement* (2020), Transport for NSW
- Western Sydney Aerotropolis Development Control Plan* (2022), Department of Planning and Environment
- Western Sydney Aerotropolis Precinct Plan* (2022), Department of Planning and Environment
- Western Sydney Aerotropolis Urban Design and Landscape Plan Report* (2021), Hassell
- Environmental Impacts Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment EIA-N04* (2020), Transport for NSW
- M12 Aboriginal Art Strategy* (2021), Transport for NSW
- M12 Motorway Place, Design and Landscape Plan* (2022), Transport for NSW
- Southern Parklands Landscape Framework Final Report* (2018), Tyrrell Studio
- The Sydney Green Grid* (2017), The Office of the Government Architect
- The Western City District Plan* (2018), Greater Sydney Commission
- Western Sydney Aerotropolis Plan* (September 2020), Western Sydney Planning Partnership
- Western Sydney Airport Plan* (2021), The Department of Infrastructure, Regional Development and Communications
- Western Sydney Parklands Southern Vision 2036* (2017), Western Sydney Parklands
- Fairfield Local Environment Plan* (2013), NSW Government
- Penrith Local Environment Plan* (2010), NSW Government
- Liverpool Local Environment Plan* (2008), NSW Government

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Appendix

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Appendix A - Landscape Concept Plans

About AECOM

AECOM is the world's premier infrastructure consulting firm, delivering professional services throughout the project lifecycle – from planning, design and engineering to program and construction management. We partner with our clients in the public and private sectors to solve their most complex challenges and build legacies for generations to come. On projects spanning transportation, buildings, water, governments, energy and the environment, our teams are driven by a common purpose to deliver a better world. AECOM is a Fortune 500 firm and its Professional Services business had a revenue of approximately \$13.6 billion in fiscal year 2019. See how we deliver what others can only imagine at aecom.com and [@AECOM](https://twitter.com/AECOM).