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M12 Motorway Environmental Impact Statement

Appendix G Landscape character, visual impact assessment and urban design report

Roads and Maritime Services | October 2019

Architecture
Interior Design
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M12 MOTORWAY ENVIRONMENTAL IMPACT STATEMENT

LANDSCAPE CHARACTER, VISUAL IMPACT ASSESSMENT AND URBAN DESIGN REPORT

FINAL EIS

Prepared for Roads and Maritime
October 2019

HASSELL

‘Time of Burran’ by HASSELL

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Front cover image:
Artist's impression: Aerial view south across Airport Interchange towards location of future Western Sydney Airport, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Project
M12 Motorway Concept Design and Environmental Impact Statement

Document Number:
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Roads and Maritime Services

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Executive summary

The project team acknowledges the Traditional Owners of the land, the Darug peoples.

The area through which the project would traverse has been home to the Darug peoples for thousands of years, and they maintain an ongoing connection to Country.

Roads and Maritime Services (Roads and Maritime) is seeking approval under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to construct and operate the M12 Motorway project to provide direct access between the Western Sydney Airport at Badgerys Creek and Sydney's motorway network (the project). The project has been determined to be a controlled action under Section 75 of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act) and therefore will also be subject to approval from the Commonwealth Government.

The M12 Motorway would run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for a distance of about 16 kilometres and would be opened to traffic prior to opening of the Western Sydney Airport.

Hassell has been engaged as part of the Jacobs Arcadis Joint Venture (JAJV) to help shape an integrated engineering and urban design outcome. This report documents that process and describes the landscape character and visual impact as part of the Environmental Impact Statement (EIS).

This landscape character, visual impact assessment and urban design report (LCVIA) is one of a number of technical reports supporting the EIS for the project. It contains the assessment of the landscape and visual impact, based on the urban design concept for the project.

The urban design concept

The urban design concept for the project has been developed based on the overarching vision of 'connection to Country', which seeks to create a distinctly unique and memorable piece of infrastructure that establishes the gateway to western Sydney.

This report provides the basis for an integrated design process for the project, to ensure the implementation of the urban design vision, principles and objectives into the detailed design process, which would ultimately be constructed and operational.

The following urban design objectives have been developed to reinforce the aspirations of project vision:

- Create a unique and distinct identity interpreting the rich sense of place, Aboriginal and cultural heritage and connection to Country.
- Utilise structures, bridges and earthworks as expressions of identity, place, values and sustainability
- Create an active, liveable and vibrant study area
- Provide connectivity and access along and across the study area
- Accentuate natural patterns through revegetation and express the new through contrasting landmark plantings
- Create an enjoyable experience with diverse and distinctive views and sense of journey and arrival
- Design a simple, cohesive and sustainable motorway that offers a flexible and diverse choice of transport modes
- Engage with the community and stakeholders.

These urban design objectives form the basis for an integrated design solution, guiding the resolution of the urban design concept and detailing of project elements.

The urban design concept presented in this report would continue to be refined during detailed design where relevant to improve road network and safety performance and minimise impacts in response to feedback from the community and stakeholders.

Approach to landscape character and visual impact assessment

The approach to assessment of potential impact on landscape character and visual amenity follows the methodology as described by Roads and Maritime Guidance Note EIA-N04 for Landscape Character and Visual Impact Assessment (2018). It includes:

- A review of relevant planning context
- An assessment of landscape character impact during operation
- A representative viewpoint assessment of day time visual impacts during operation
- A general assessment of night time visual impacts.

This has involved landscape character impact assessment through the establishment and assessment of landscape character zones (LCZs) and visual impact against representative viewpoints within the study area. The study area, comprises land surrounding the project footprint, where there is potential for landscape and visual impact.

Secretary's Environmental Assessment Requirements (SEARs) have been issued for the project. This report responds to desired performance outcomes as they relate to urban design, landscape works and visual amenity, specifically:

- The project design complements the visual amenity, character and quality of the surrounding environment
- The project contributes to the accessibility and connectivity of communities
- The project contributes to an increase in tree canopy for greater Sydney
- The project minimises adverse impacts on the visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to improve visual amenity.

Each of these urban design outcomes are measured against the urban design objectives.

Overview of potential impacts

Impacts avoided or minimised

The project has gone through a process of design development, gradually refining it to the concept design that is present in the Environmental Impact Statement (EIS), including:

- Re-alignment of the project through the Western Sydney Parklands
- Provision for continuous shared pedestrian and cycle paths and future connections
- Integration of Aboriginal and non-Aboriginal heritage interpretation theme of 'connection to Country' and 'inter-connectedness'
- Holistic approaches to revegetation of the corridor in context of the broader Western Sydney EEC Cumberland Plain Woodland vegetation communities
- Initiatives to facilitate connections to creeks by provisioning for pedestrian and cyclist access in the future.

Landscape character impact

A total of eight LCZs have been identified for the purposes of the assessment. They are generally based on the surrounding land use, built form, vegetation cover and topography. Aboriginal and non-Aboriginal heritage items located within the LCZs have been taken into consideration when assessing the sensitivity of these zone and potential impacts.

The desired future character for each of the LCZs was drawn from the objectives and provisions set out in relevant strategic and statutory planning documents, particularly the *Western Sydney Aerotropolis - Land Use & Infrastructure Implementation Plan.*

The assessment of LCZs focuses on areas where permanent built elements are proposed. The assessment found impact on landscape character would be highest (rated as either HIGH or HIGH-MODERATE) in the following zones:

- LCZ 2 - Luddenham Rolling Hills
- LCZ 3 - Rural Plains
- LCZ 4 - Kemps Creek
- LCZ 6 - Ridgetop Woodland.

Visual impact
A total of 30 representative viewpoint locations with views across the project footprint have been assessed for visual impact. Each of these are assessed for a range of different visual receptor types depending on the locations. Visual receptor types include residents, pedestrians, public transport users, cyclists, motorists and recreational users.

The assessment found that visual impact of the project would be highest (rated as either HIGH or HIGH-MODERATE) at the following viewpoints:
_Viewpoint 02 - View east along The Northern Road
_Viewpoint 03 - View north near Luddenham Raceway
_Viewpoint 04 - View north along Luddenham Road
_Viewpoint 05 - View north-west along Luddenham Road
_Viewpoint 06 - View south along Luddenham Road
_Viewpoint 10 - View west along South Creek (Sydney University Lands)
_Viewpoint 16 - View north from Elizabeth Drive
_Viewpoint 17 - View east along Elizabeth Drive
_Viewpoint 19 - View south from Elizabeth Drive
_Viewpoint 20 - View north from Range Road
_Viewpoint 21 - View north-west from Sydney International Shooting Centre (SISC)
_Viewpoint 24 - View south from Cecil Road
_Viewpoint 25 - View north-west toward M7 to M12 Interchange.

An Urban Design and Landscape Plan (UDLP) will be prepared at detailed design to minimise landscape character and visual impacts, and detail and guide the implementation of landscape features to be installed as part of the project, including re-vegetation requirements.

Visual impact during construction
Temporary visual impact during the construction stage may occur as a result of construction activities and construction ancillary facilities.

Key potential visual impact during construction generally relate to residential receptors and the result from building and tree removal, visibility and overshadowing of residences from temporary structures, noise barriers and hoardings and visibility of constructional activities.

Given that majority of the project traverses rural properties, few residential receptors would be within close proximity to construction activities. These impacts are temporary in nature and would be mitigated where possible through appropriate siting of infrastructure, materials and finishes of sheds and hoardings, and management of light spill.

A Construction Environmental Management Plan (CEMP) would be prepared by the construction contractor providing details and measures taken to reduce potential adverse impacts as a result of construction works.

Summary of potential management measures

Management measures have been determined in response to identified landscape character and visual impacts. Some of these impacts can be mitigated by refinement of some aspects of the design during detailed design and construction phase. These include:

_Preservation of existing remnant vegetation particularly along creek corridors
_Revegetation opportunities within and beyond the project footprint
_Ensuring that all built elements are of architectural merit and quality as an enduring legacy to the region and benchmark for future projects
_Locating construction plant, equipment and ancillary facilitates to avoid and minimise visual impacts including light spill where practicable.

Artist's impression: Aerial view south-west across M7/M12 Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Glossary of terms and abbreviations

Term	Meaning
ACHAR	Aboriginal cultural heritage assessment report
AF	Ancillary facility
Airport access road	Part of the M12 Motorway connecting the Western Sydney Airport interchange with the Western Sydney Airport
AFMP	Ancillary Facilities Management Plan
BAR	Biodiversity Assessment Report
Batter	A receding slope of a wall, structure, or earthwork
BCA	Building Code of Australia
BR	Bridge
CASA	Civil Aviation Safety Authority
CHL	Commonwealth Heritage List
CMP	Construction Management Plan to be prepared by the construction contractor
Construction footprint	The construction footprint is the area required to build the project. This includes the area required for temporary work such as sedimentation basins, drainage lines, access roads, construction ancillary facilities.
CPTED	Crime Prevention Through Environmental Design
CSIRO	Commonwealth Scientific and Industrial Research Organisation
Cumulative Effects	Cumulative effects occur between projects, where the combination of effects created by multiple projects maybe greater than the sum of the individual effects.
DPE	Department of Planning, Industry and Environment
EEC	Endangered ecological community
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EIS	Environmental impact statement
Embankment	A receding slope of a wall, structure, or earthwork
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
Landform	The shape and form of the land surface which is the result of the action and interaction of natural and/or human factors
Landscape Character	The combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.
Landscape Character Zone	An area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately adjacent
LCVIA	Landscape Character, Visual Impact Assessment and Urban Design Report
LCZs	Landscape Character Zones
LEP	Local Environmental Plan
LUIIP	Western Sydney Aerotropolis - Stage 1 Land Use and Infrastructure Implementation Plan
Magnitude	The measurement of the scale, form and character of a development proposal when compared to the existing condition. In the case of visual assessment this also relates to how far the proposal is from the viewer. Combined with sensitivity, magnitude provides a measurement of impact.
M7 Motorway	The M7 Motorway is a major connecting road on Sydney's orbital motorway network. It runs for 40 kilometres and links the M5 Motorway with the M4 Motorway and the M2 Motorway
M12 Motorway	The proposed M12 Motorway which is the subject of this document (also known as 'the project')
NSW	New South Wales
NASF	National Airports Safeguarding Advisory Group
OEH	Office of Environment and Heritage
Operational footprint	Generally includes the M12 Motorway and additional areas required for operation and maintenance of the project

Term	Meaning
OSO	The Outer Sydney Orbital is a future transport corridor being investigated by the NSW Government which will provide for a connection between Box Hill in the north and the Hume Motorway near Menangle in the south. The OSO will provide for a major transport link (motorway and/or freight rail line) between western Sydney's growth areas, connecting with the planned Western Sydney Airport and future employment lands
Residual Impacts	Impacts that remain following the implementation of mitigation measures
Roads and Maritime	Roads and Maritime Services
RTA	Roads and Traffic Authority
SEARs	Secretary's Environmental Assessment Requirements
Sensitivity	The sensitivity of a landscape character zone or view and its capacity to absorb change of the nature of the proposal. In the case of visual impact this also relates to the type of viewer and number of viewers. Combined with magnitude, sensitivity provides a measurement of impact.
Study area	The term study area is used throughout this document to describe the locations investigated as part of this EIS. The study area varies based on the specific areas of interest targeted for each environmental issue (eg ecology, heritage, noise, visual amenity etc). The study area relevant to particular environmental issues is shown on figures, where relevant, throughout this EIS.
SWGC	South West Growth Centre
TECs	Threatened ecological communities
TfNSW	Transport for NSW
The project	M12 Motorway
TNR	The Northern Road
UDLP	Urban Design and Landscape Plan
VEM	Visual Envelope Map
Visual amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides attractive,visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Western Sydney Aerotropolis	As defined in the Western Sydney Aerotropolis Stage 1 Plan, the Aerotropolis surrounds the Western Sydney Airport site at Badgerys Creek and will comprise industrial, commercial and residential development.
WSA	The future Western Sydney Airport at Badgerys Creek
WSAGA	Western Sydney Airport Growth Area is defined in the Western Sydney Infrastructure Plan, and will include industrial, commercial and residential development surrounding the Western Sydney Airport site in Badgerys Creek.
WSIP	Western Sydney Infrastructure Program
WSP	Western Sydney Parklands
Wylde Mountain Bike Trail	The Wylde Mountain Bike Trail is a publicly accessible mountain bike riding trail located in the Western Sydney Parklands which caters for intermediate, competent and advanced standard mountain bike riders

Introduction

Aerial view looking west over the study area. Image Source: Roads and Maritime

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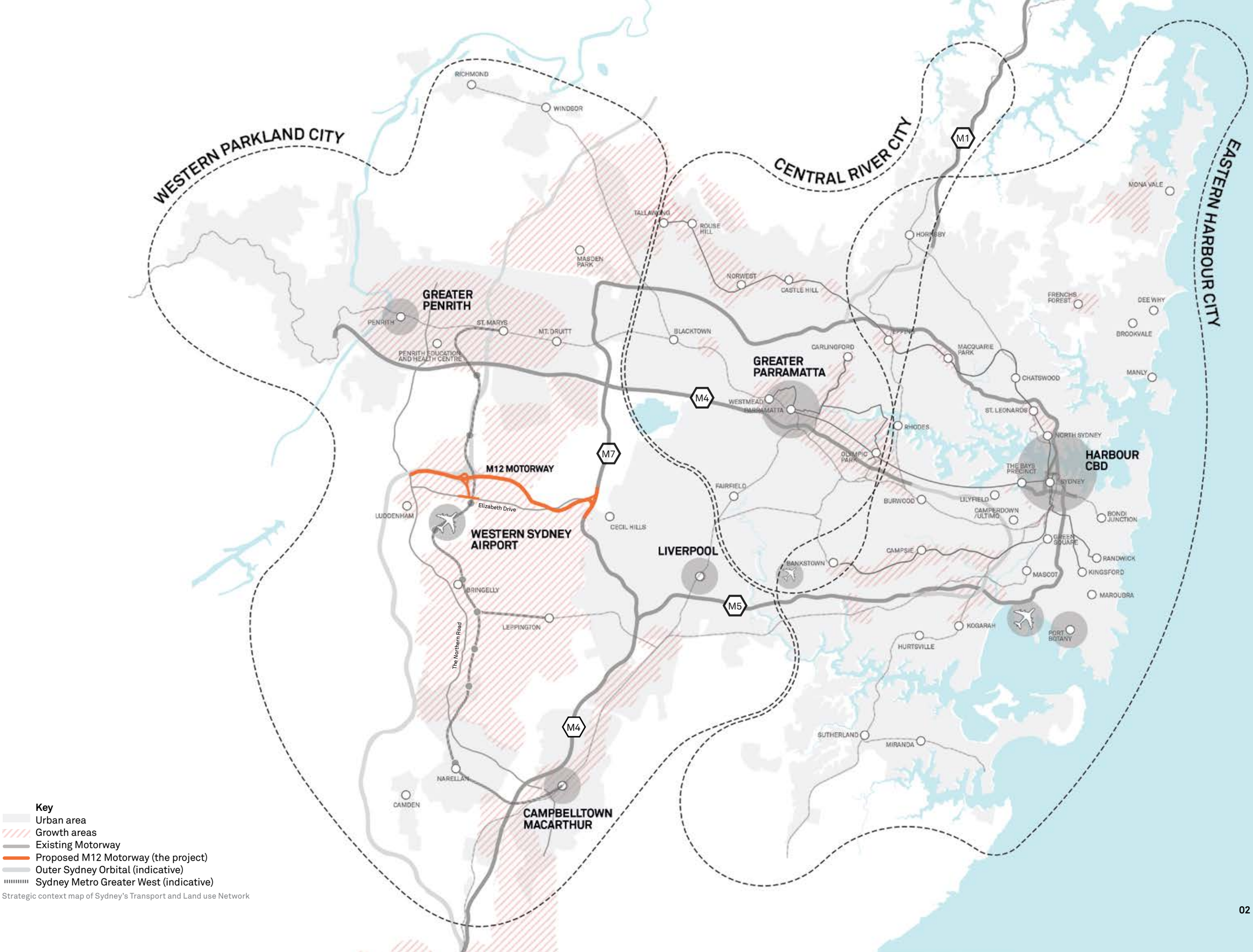


Strategic context map of Sydney's Transport and Land use Network

Project overview

Project background

Roads and Maritime is seeking approval under Part 5, Division 5.2 of the Environmental Planning and Assessment Act 1979 (EP&A Act) to construct and operate the M12 Motorway project to provide direct access between the Western Sydney Airport at Badgerys Creek and Sydney's motorway network (the project). In addition, the project has been determined to be a controlled action under Section 75 of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act) (EPBC 2018/8286) and therefore is also be subject to approval from the Commonwealth Government.

The M12 Motorway would run between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham for a distance of about 16 kilometres and would be opened to traffic prior to opening of the Western Sydney Airport. The project would commence about 30 kilometres west of the Sydney central business district, at its connection with the M7 Motorway. The project traverses the local government areas of Fairfield, Liverpool and Penrith. The suburbs of Cecil Park and Cecil Hills are found to the east of the M12 Motorway, with Luddenham to the west.

The project is predominately located in greenfield areas. The topography in and around the project comprises rolling hills and small valleys between generally north–south ridge lines. The existing land uses are semi-rural residential, recreational, agricultural, commercial and industrial. The main residential areas are Kemps Creek, Mount Vernon and Cecil Hills.

The project is required to support the opening of the Western Sydney Airport by connecting Sydney's motorway network to the airport. The project would also serve and facilitate the growth and development of Western Sydney which is expected to undergo significant development and land use change over the coming decades. The motorway would provide increased road capacity and reduce congestion and travel times in the future and would also improve the movement of freight in and through western Sydney.

The project location is shown in the adjacent figure in relation to its regional strategic context.

Project overview

Roads and Maritime proposes to build the M12 Motorway between the M7 Motorway at Cecil Hills and The Northern Road at Luddenham, over a distance of about 16 kilometres. The project would provide the main access from the Western Sydney Airport at Badgerys Creek to Sydney's motorway network and is expected to be opened to traffic before the opening of the Western Sydney Airport. The timing of opening of the M12 Motorway is subject to planning approval and completion of detailed design. However, the project is expected to open in 2025.

The project would include the following key features:

- A new dual-carriageway motorway between the M7 Motorway and The Northern Road with two lanes in each direction with a central median allowing future expansion to six lanes
- Motorway access via three interchanges/ intersections:
  - A motorway-to-motorway interchange at the M7 Motorway and associated works (extending about four kilometres within the existing M7 Motorway corridor)
  - A grade–separated interchange referred to as the Western Sydney Airport interchange, including a dual-carriageway four–lane airport access road (two lanes in each direction for about 1.5 kilometres) connecting with the Western Sydney Airport Main Access Road
  - A signalised intersection at The Northern Road with provision for grade separation in the future
- Bridge structures across Ropes Creek, Kemps Creek, South Creek, Badgerys Creek and Cosgroves Creek
- Bridge structure across the M12 Motorway into Western Sydney Parklands to maintain access to the existing water tower and mobile telephone/ other service towers on the ridgeline in the vicinity of Cecil Hills, to the west of the M7 Motorway
- Bridge structures at interchanges and at Clifton Avenue, Elizabeth Drive, Luddenham Road and other local roads to maintain local access and connectivity
- Inclusion of active transport (pedestrian and cyclist) facilities through provision of pedestrian bridges and an off-road shared user path including connections to existing and future shared user path networks
- Modifications to the local road network, as required, to facilitate connections across and around the M12 Motorway including:
  - Realignment of Elizabeth Drive at the Western Sydney Airport, with Elizabeth Drive bridging over the airport access road and future passenger rail line to the airport
  - A realignment of Clifton Avenue over the M12 Motorway, with associated adjustments to nearby property access
  - Relocation of Salisbury Avenue cul-de-sac, on the southern side of the M12 Motorway
  - Realignment of Wallgrove Road north of its intersection with Elizabeth Drive to accommodate the M7 Motorway northbound entry ramp
- Adjustment, protection or relocation of existing utilities
- Ancillary facilities to support motorway operations, smart motorways operation in the future and the existing M7 Motorway operation, including gantries, electronic signage and ramp metering
- Other roadside furniture including safety barriers, signage and street lighting
- Adjustments of waterways, where required, including Kemps Creek, South Creek and Badgerys Creek
- Permanent water quality management measures including swales and basins
- Establishment and use of temporary ancillary facilities, temporary construction sedimentation basins, access tracks and haul roads during construction
- Permanent and temporary property adjustments and property access refinements as required.

Project vision

The notion of ‘connection to Country’ represents the singular vision for the project which seeks to create a distinctly unique and memorable piece of infrastructure that establishes the gateway to western Sydney.

The vision sets a new benchmark for road-related infrastructure in New South Wales, one which is grounded in a ‘connection to Country’ from the earliest design thinking which would manifest collective aspirations of quality of life, accessibility, convenience and safety.

It is a vision that brings both Aboriginal and Non-Aboriginal heritage to the fore, as a means of engaging local communities to create a meaningful and enduring legacy for the parkland city that is embedded within the built fabric of the motorway.

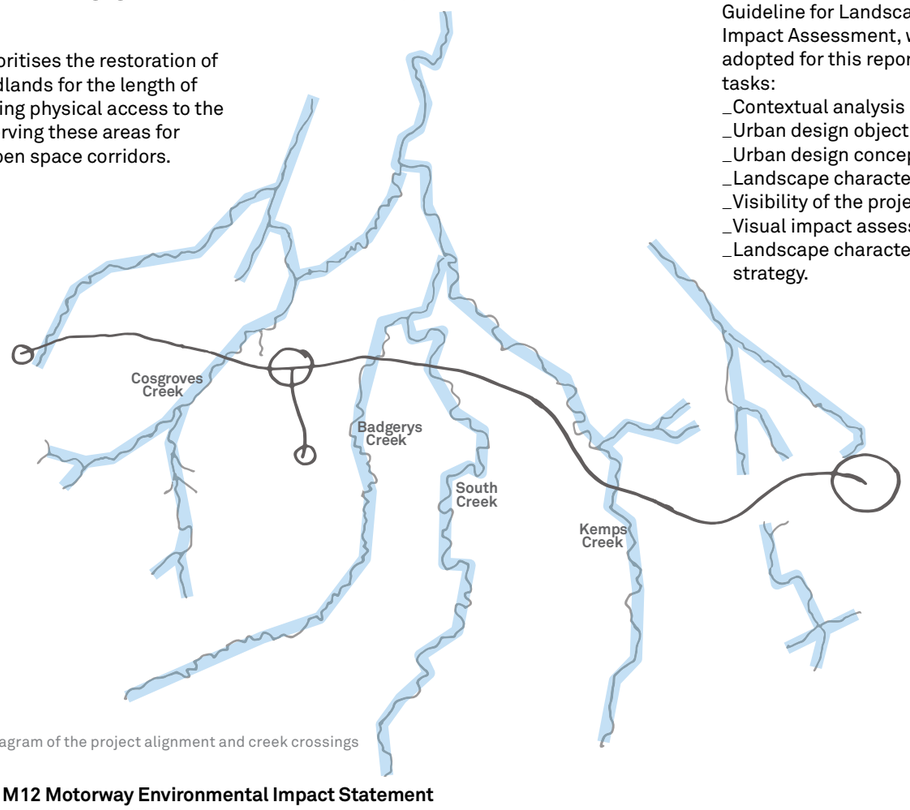
It recognises that the project is only the latest change to a landscape which has been influenced by human settlement for tens of thousands of years. It aims to apply the best of the knowledge gained over our history.

‘Connection to Country’ prioritises the restoration of the Cumberland Plain woodlands for the length of the project footprint, enabling physical access to the four main creeks and preserving these areas for future contiguous public open space corridors.

The project must be a memorable and responsive motorway, but would also need to be resilient, sustainable and innovative in the face of a changing future land use with the future Western Sydney Airport, Aerotropolis and surrounding development as the area transforms into the ‘Western Parkland City’.

The people of the Western Parkland City wish to live close to work and places of leisure and entertainment, to move conveniently across the city and beyond, and comfortably navigate multiple modes of transport and enjoy beautiful spaces which are grounded in the essence of each place. They wish to live in connected communities which foster interaction, which retain a vibrancy, and which celebrate a unique western Sydney landscape.

This report provides the basis for an integrated design process for the project, to ensure the implementation of the urban design vision into the detailed design process, which would ultimately be constructed and operational.



Figurative diagram of the project alignment and creek crossings

Purpose of the report

This report has been prepared to support the EIS for the project. The EIS has been prepared to address the Secretary’s Environmental Assessment Requirements (SEARs) for the project (SSI 9364), as well as the Australian Government assessment requirements under the EPBC Act. The EIS for the project provides sufficient information to enable the NSW Minister for Planning and the Commonwealth Minister for the Environment to make a determination on whether the project can proceed.

The purpose of this report is to describe the urban design process which has sought to develop of an integrated engineering and urban design outcome in accordance with Roads and Maritime’s urban design policy ‘Beyond the Pavement’.

In addition, the report describes the process taken to assess the impact of the project on the landscape character and visual amenity within the study area.

This report responds to Roads and Maritime Environmental Impact Assessment Practice Note - Guideline for Landscape Character and Visual Impact Assessment, which outlines a structure to be adopted for this report across the following main tasks:

_Contextual analysis
_Urban design objectives and principles
_Urban design concept
_Landscape character impact assessment
_Visibility of the project
_Visual impact assessment
_Landscape character and visual impact mitigation strategy.

Report structure

The structure of this document is broadly outlined as follows:

Section 00 - Executive summary
Provides a brief summary of the project including scope and findings of this report.

Section 01 - Introduction
Provides an introduction and outlines the purpose and structure of the report.

Section 02 - Policy and planning setting
Provides are a review of key statutory and guideline documents as relevant to the project.

Section 03 - Assessment methodology
Outlines the approach used to assess landscape character and visual impacts, and defines the study area.

Section 04 - Existing environment
Provides a contextual analysis of the project and the study area to understand existing land use, future land use, topography, hydrology, soil profiles, endemic vegetation profiles, and Aboriginal and non-Aboriginal heritage within the study area.

Section 05 - Urban design concept
Examines the development of the urban design objectives and major design outcomes for the project, and how those may be applied to the project. This includes the approach to landscape design for the project, with a strong emphasis on natural systems, endemic species and plant selection.

Section 06 - Landscape character impact assessment
Details the landscape character assessment of the project, with an assessment of the combined quality of built, natural and cultural aspects that make up an area and provide its unique sense of place.

Section 07 - Visual impact assessment
Defines the extent of the area that the project would be visible from and provide a detailed assessment of impacts on views of the project from their homes or other places of value in the community.

Section 08 - Cumulative impact assessment
Provides an assessment of any combined impacts as a result of other approved projects in the area.

Section 09 - Environmental management measures
Examines principles to mitigate landscape character and visual impacts during detailed design and construction.

Section 10 - Conclusion
Provides a summary of salient points and findings from the landscape and visual impact assessment.

Secretary's environmental assessment requirements

On 18 June 2018, the Secretary of the NSW Department of Planning and Environment issued to Roads and Maritime the draft Secretary's environmental assessment requirements (SEARs) for the M12 Motorway EIS. The SEARS were finalised and reissued on 12 July 2018. The project was then determined to be a controlled action under the EPBC Act, and updated SEARs were issued on 30 October 2018 that include the Commonwealth assessment requirements under the EPBC Act.

The SEARs include the Commonwealth requirements under the *Environment Protection and Biodiversity Conservation Act* (Commonwealth) (EPBC Act). The adjacent table lists those requirements relating specifically to the assessment of the Project's potential impacts on landscape character and visual impact assessment and urban design, with a reference to the section of this report where each requirement is addressed.

Secretary's Environmental Assessment Requirements (SEARs)

Desired Performance Outcome	Requirement	Section where addressed in report
7. Urban Design and Landscaping The project design complements the visual amenity, character and quality of the surrounding environment	1) The Proponent must: (a) identify the urban design and landscaping aspects of the project and its components; (b) assess the impact of the project on the urban, rural and natural fabric; (c) design elements of the project to be sensitive and responsive to the landscape surrounding the project, particularly the Western Sydney Parklands; (d) explore the use of Crime Prevention Through Environmental Design (CPTED) principles during the design development process, including natural surveillance, lighting, walkways, signage and landscape (e) identify urban design strategies and opportunities to enhance healthy, cohesive and inclusive communities. 2) The Proponent must : (a) estimate the number of trees (not covered by a biodiversity offset strategy) to be cleared by the project; and (b) for those trees to be cleared, describe how the project will achieve a net increase in tree canopy as part of the project's landscaping strategy.	1(a) **Refer Section 05 of this report** 1(b) **Refer Section 06 of this report** 1(c) **Refer Section 05 of this report for mitigation measures already incorporated into the concept design process** 1(d) **Refer Section 02 for review of CPTED Principles** **Refer to Section 05 of this report for urban design approach and measures already incorporated into the design** **Refer to Section 09 for management measures** 1(e) **Refer Section 05 of this report** 2(a) **Refer Section 05 for approach to tree replacement** 2(b) **Refer Section 05 for approach to tree replacement** **Refer Section 09 of this report for management measures**
8. Visual Amenity The project minimises adverse impacts on visual amenity of the built and natural environment (including public open space) and capitalises on opportunities to improve visual amenity	1) The Proponent must assess the visual impact of the project and any ancillary infrastructure on: (a) views and vistas; (b) streetscapes, key sites and buildings (c) heritage items including Aboriginal places and environmental heritage; and (d) the local community 2) The Proponent must provide artist impressions and perspective drawings of the project to illustrate how the project has responded to the visual impact through urban design and landscaping.	1(a), (b), (c), (d) **Refer Section 07 of this report for visual impact assessment of representative viewpoints.** 2) **Included throughout the report from Section 05 onwards.**

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Policy and planning setting

Wylde Mountain Bike Trail, Western Sydney Parklands.

02

Policy and planning setting

Work leading to the preparation of this report has been an iterative process and has included a review of related policy documents, guidelines and standards including those listed in the SEARs.

The following key documents provide the policy context for the urban design and landscape character and visual impact assessment for the project.

M12 Motorway: Strategic Urban Design Concept

The document seeks to develop a strategic urban design concept to *communicate a 'connection to Country' for people from a broad range of cultural and social backgrounds.*

An urban design concept and vision was prepared through a review of the context of the project including elements such as natural systems and Aboriginal heritage values, existing landscape patterns, changing land use, and landscape character:

The M12 Motorway would be a memorable, world class gateway from the planned western Sydney airport at Badgerys Creek to the Sydney metropolitan area, to New South Wales and to Australia. It will celebrate the unique sense of place and the journey from the Mountains to the City through considered alignment, views, art and interpretation.

Western Sydney Parklands Southern Vision 2036 (2017)

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

The project directly interfaces with two zones identified in the document as follows:

- Northern Slopes - the vegetation slopes to Elizabeth Drive / future M12 Motorway to be conserved as a buffer to the adjoining infrastructure. The existing Wylde mountain bike course to be retained and extended with potential consolidation of further adventure sports through the slopes and valleys
- Scenic Hills - lifestyle tourism and day facilities in the south facing slopes overlooking potential water bodies.

During the design process, alternative route options were assessed resulting in the project alignment moving north (closer to Elizabeth Drive) with the intention of minimising overall impacts and fragmentation of the Western Sydney Parklands and its vision for the future.

Western Sydney Parklands Plan of Management 2030 (2018)

The plan of management provides a framework and for the operation and development of Western Sydney Parklands. It is structured around four key Strategic Directions, each of which contain a number of outcomes and objectives.

The document indicates targets for long-term uses beyond 2030 and identifies substantial growth in long term infrastructure (22 per cent) and natural and cultural heritage conservation (37 per cent).

Of the 16 identified precincts, the project interfaces with the precinct (14) described as Cecil Park comprising of rolling hills, bush trails and includes the Sydney International Shooting Centre and Wylde Mountain Bike Trail.

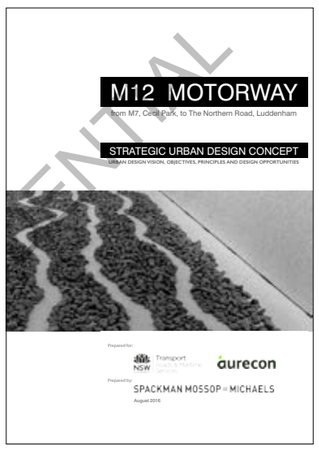
The desired future character of precinct 14 is to become a major recreation, sport, entertainment and tourism destination includes continuing conservation and protection of natural landscape as a setting for a future regional recreational park.

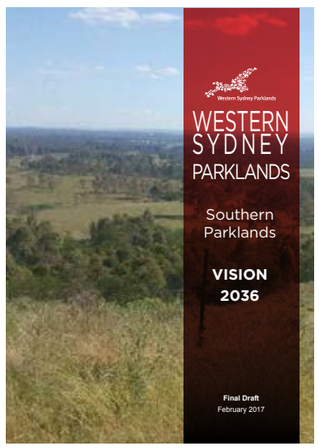
The project would have a direct impact on the future planning of this precinct of the Western Sydney Parklands and is discussed further in this landscape character assessment.

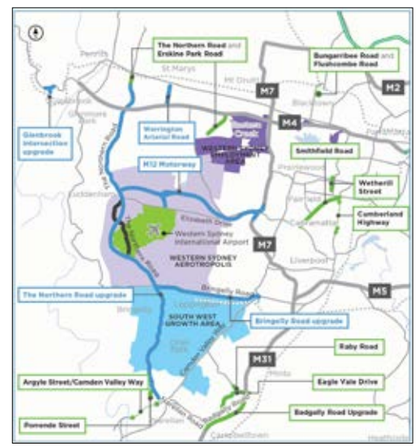
Western Sydney Infrastructure Plan

The Western Sydney Infrastructure Plan (WSIP) provides the main strategic direction for major road and transport linkages that will capitalise or seen as critical to the development of the Western Sydney Airport.

The M12 Motorway is identified within the South West Growth Centre as the new east-west motorway to the Western Sydney Airport.







Western Sydney Airport Plan (2016)

The Western Sydney Airport Plan sets out the vision for the development and operation of the Western Sydney Airport at Badgerys Creek.

The document describes the staged development of the airport with operations proposed to commence around the mid 2020s. It will accommodate about 63,000 passenger and freight air traffic movements per year.

The Plan identifies the new M12 Motorway as the primary, high capacity connector to the airport and critical to its success. It also identifies the capacity and spaceproofing requirements for six traffic lanes, two bus lanes and rail reservation (not part of this project).

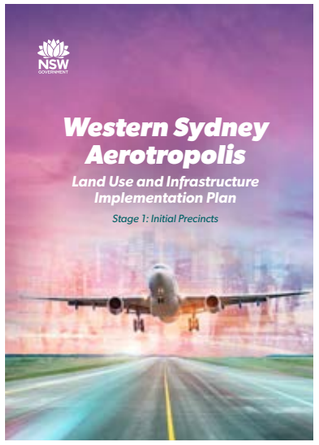
The Western Sydney Airport will become a major economic driver and catalyst for change in south-western Sydney.

Western Sydney Aerotropolis - Land Use and Infrastructure Implementation Plan
Stage 1: Initial Precincts, Department of Planning, Industry and Environment (2018)

The Land Use and Infrastructure Implementation Plan (LUIIP) for the Western Sydney Airport establishes an overall planning and urban structure for the staged development of the Aerotropolis - the metropolitan area with infrastructure, land uses, and economy centred on the airport. The vision for the Aerotropolis includes aviation-oriented business, enterprise and residential development that benefit from each other and their accessibility to the airport.

The LUIIP identifies the re-zoning of rural lands surrounding the proposed airport to predominantly 'flexible employment'. The four creek corridors are preserved as 'non-urban land'.

The document prioritises the planning and development of three initial precincts: Aerotropolis Core, Northern Gateway and South Creek. Of the three initial precincts, the project would traverse the Northern Gateway and South Creek. The project would also traverse the North Luddenham precinct which is envisioned to focus on agriculture and agribusiness, as well as high technology and research associated with food production and processing.



The Northern Gateway will serve as the main entrance to the airport via the M12 Motorway. The project proposes to create an iconic interchange that welcomes travellers to western Sydney through the bold use of use native tree planting, integrated art and aboriginal interpretation as part of one's connection to Country.

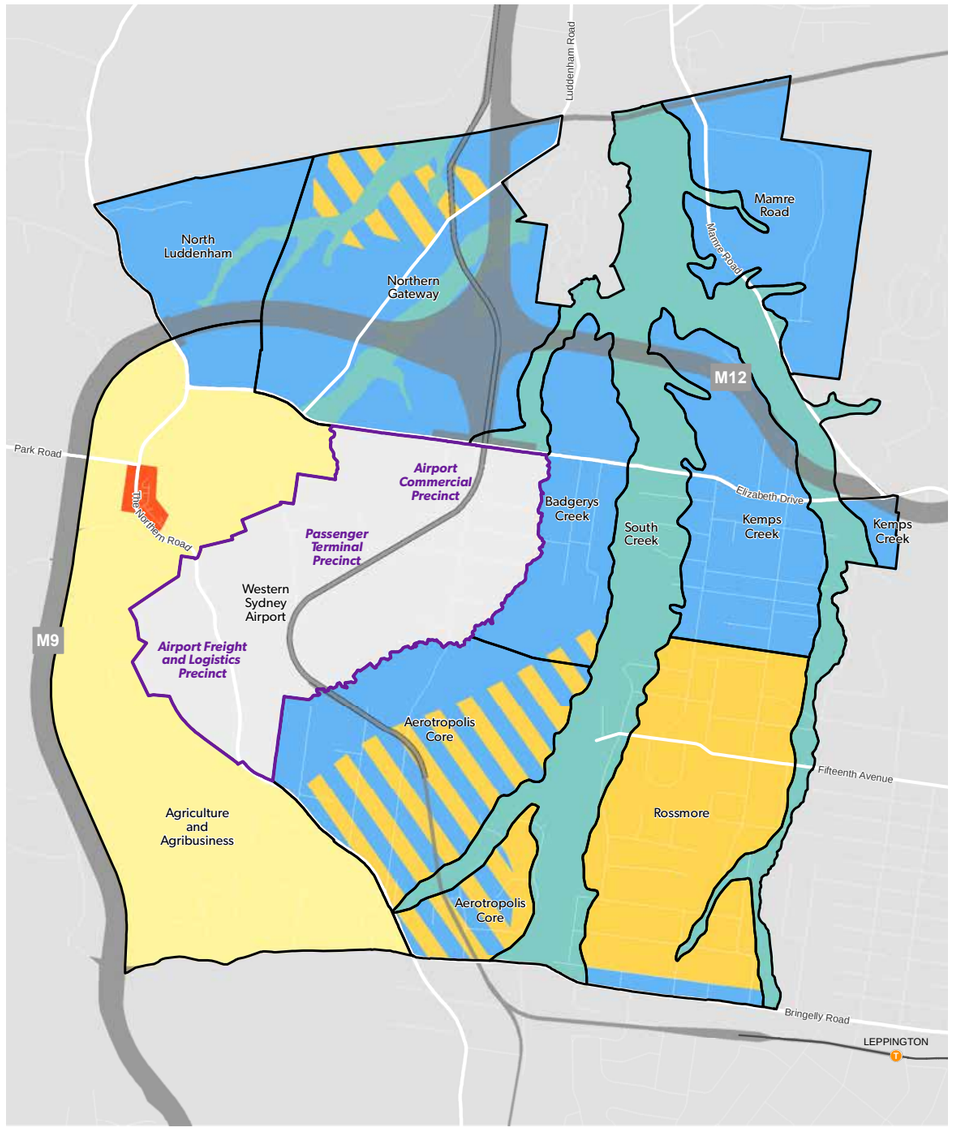
The Northern Gateway precinct will transform over time as land use is focused on education, high technology, and research and development associated with food production and processing.

The South Creek precinct encompasses the full extent of South Creek and its tributaries serving as the Western Sydney Parkland's City's green spine. It will enable a connected open space network through contiguous public parklands, continuous pedestrian and cycle paths, community facilities, restaurants, cafes and rehabilitated riparian corridors.

The project would interface directly with South Creek and has considered the importance of all creek crossings during the design process. A continuous shared path would follow the project alignment, enabling connection to the future green spine. Connection and access to creeks has been prioritised where feasible within the project footprint.

Beyond the priority precincts, the overall Aerotropolis will transform over time, eventually resulting in changed edge conditions along majority of the project footprint. At this stage of the concept design, it is difficult to anticipate the final development outcomes. As such, the design has sought to respond and reinforce existing vegetation patterns in a manner that is resilient and flexible enough to adapt to future change in the expectation that future development will reflect a similar approach.

The document also identifies potential transport connections to the Western Sydney Airport which would directly interface with the project, including new rail lines, freight lines and the planned Outer Sydney Orbital (M9). The latter will result in widening of infrastructure to be constructed as part of this project.



Western Sydney Aerotropolis - LUIIP - Stage 1 Precincts - Structure Plan

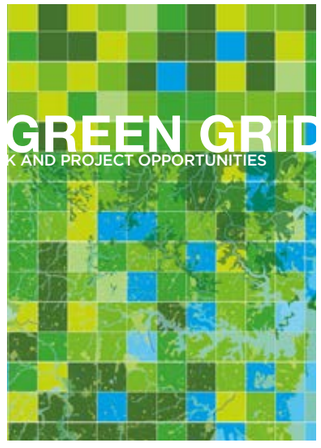
The Sydney Green Grid, Department of Planning, Industry and Environment (2017)

This document provides a forensic review of existing and proposed open space projects and opportunities, which are then prioritised based on their performance potential and overlap with current urban development needs and priorities.

The Sydney Green Grid is composed of a combination of four of the fundamental landscape layers [or grids] which underpin the geographic and urban structure of Sydney. They are:
_The Hydrological Grid
_The Ecological Grid
_The Recreational Grid
_The Agricultural Grid.

The document identifies the importance of opportunities associated with this project as part of the South West District. It recognises the M12 Motorway as a key east-west connector that intersects with a number of major north-south green grid opportunities. The continuity of these north-south green grid corridors is noted as critical to the success and long term effectiveness of the open space network for western Sydney.

Ensuring continuity of the future open space network has remained a fundamental consideration during the design process that facilitates a continuous east-west connection and enables future public open space connections.



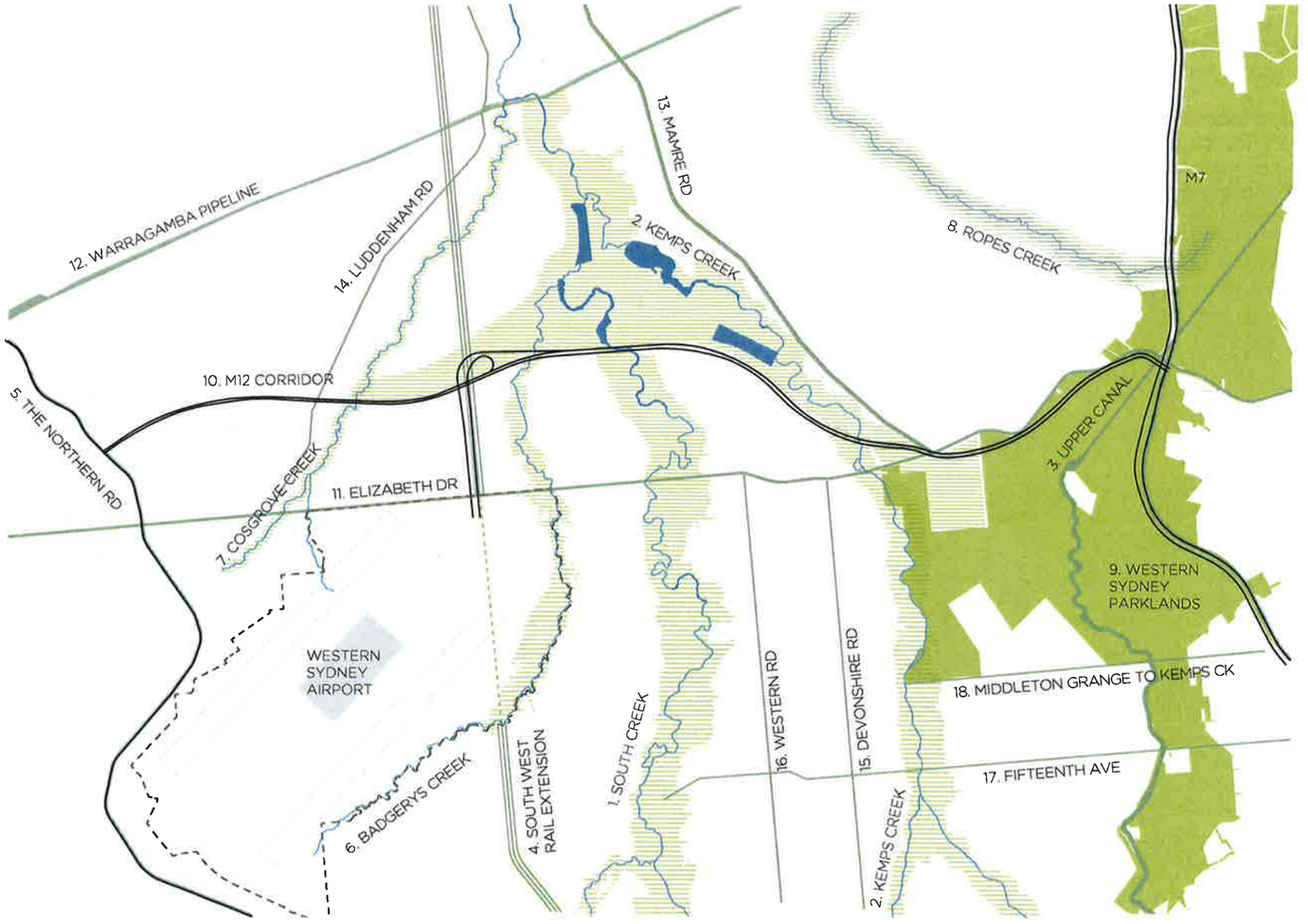
Five Million Trees for Greater Sydney, Department of Planning, Industry and Environment (2018)

Five Million Trees for Greater Sydney (5MT) program was created to expand the tree canopy across all 33 Local Government Areas (LGAs) within Greater Sydney. It is about planting more trees in our streets, parks, private yards, neighbourhoods and schools under the goal of increasing Sydney's urban tree canopy. Objectives of 5MT include:
_Five million more trees planted in Greater Sydneyb by 2030
_Increase Greater Sydney's urban tree canopy cover to 40%
_Ameliorate climate extremes by provide shade and cooling urban areas through tree planting
_Creating a healthier, more liveable and greener Greater Sydney.

The 5MT Grants Program has been created to support and increase tree planting in all LGAs across Greater Sydney.

Through collaboration with local and state government, organisations, community groups, schools and residents, the 5MT initiative will see millions of trees planted in Greater Sydney by 2030. riparian corridors.

The project would provide thousands of trees which will increase tree canopy cover in this location in Western Sydney.



Green Grid Opportunities as identified in the Sydney Green Grid document

Aerial view west over the intersection of Elizabeth Drive and Mamre Road.

Beyond the Pavement Urban Design Policy Procedures and Design Principles (2014)

In Beyond the Pavement, Roads and Maritime nominates overarching physical design outcomes that are sought on all Roads and Maritime projects. These include that road projects must fit sensitively with the landform and built, natural and community environments; contribute to the accessibility and connectivity of communities and permeability of movement; and that roads must contribute to the overall quality of the public domain for the community.

The document lists nine urban design principles that should govern the planning and design of road infrastructure to achieve these outcomes:

1. Contributing to urban structure and revitalisation
2. Fitting with built fabric
3. Connecting modes and communities
4. Fitting with the landform
5. Responding to natural patterns
6. Incorporating heritage and cultural contexts
7. Designing roads as an experience in movement
8. Creating self-explaining road environments
9. Achieving integrated and minimal maintenance design.

In relation to this project, an integrated approach to urban design has been adopted based on the above principles and is elaborated further in Section 05 of this report.

Roads and Maritime Urban Design Guidelines

In addition to the over aching principles established in 'Beyond the Pavement', Roads and Maritime have a number of detailed guidelines, dealing with specific issues and elements which have also formed the basis of the urban design principles for the project. Relevant guidelines have been reviewed below.

Bridge Aesthetics - Design guideline to improve the appearance of bridges in NSW (2012)
This document provides design objective, principles and practical guidance to produce bridges (of all types) of aesthetic value.

The guideline makes continuous reference to 'making bridges elegant' through the use of structurally expressive form that avoids clutter and fussy detailing.

The designing of bridges for the project has been a collaborative process. There are four general bridge types proposed in the project that uphold the values described in 'Bridge Aesthetics'. The approach to bridge design is described in Section 05 of this report.

Landscape design guideline - Design guideline to improve the quality, safety and cost effectiveness of green infrastructure in road corridors (2018)
This document has been published as part of the 'Beyond the Pavement' urban design initiative and sets down the urban design approach and minimum landscape standards for all projects on road corridors.

The guideline provides practical advice which has been incorporated into the concept design to maximise the quality of the landscape outcome for rural roads which include:

- The introduction of clear zones for non-frangible plantings
- The use of native grasses, groundcovers, sedges and trees have been preferred over short cut grass for ecological, aesthetic and reduced maintenance.
- Guidance on container pot sizing and native seed mix requirements.

The approach to landscape design for the project is described further in Section 05 of this report.

Noise Wall Design Guideline - Design guideline to improve the appearance of noise walls in NSW (2016)
This document establishes best practice principles and technical guidance for the integration of well-designed noise walls.

At this stage of the project concept design, no noise walls have been identified as part of the project. A general approach to noise wall design for the project is described in Section 05 of this report.

Water sensitive urban design guideline - Applying water sensitive urban design principles to NSW transport projects (2017)
The guideline describes the application of water sensitive urban design (WSUD) principles and techniques which are appropriate to the construction and operation of the NSW transport network.

The approach replicates the natural process and promotes the use of soft landscape areas for the conveyance, retention and treatment of stormwater.

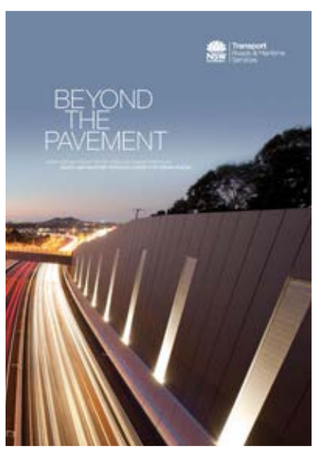
This document establishes design principles for WSUD which have been considered as an integral part of the project landscape, particularly around new water quality basins and existing creek lines.

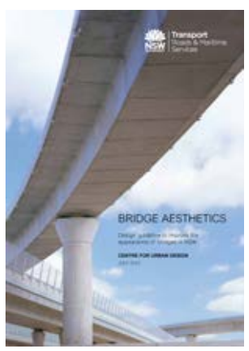
Guideline for Landscape Character and Visual Impact Assessment - EIA N04 (2018)

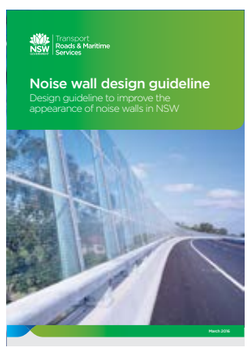
This document has been prepared to guide the preparation of landscape character and visual impact assessments under Roads and Maritime's environmental impact assessment (EIA) process within the broader context described by Roads and Maritime's 'Beyond the Pavement'.

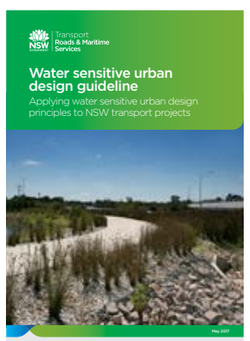
The guideline differentiates between visual assessment (the impact on views), and landscape character assessment (the impact on the aggregate of an area's built, natural and cultural character or sense of place).

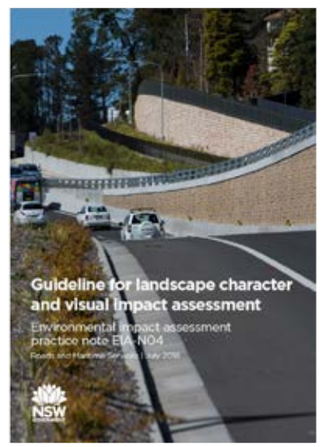
The guideline has formed the basis for landscape and visual impact assessment methodology and is described further on in this section of the report.











Sustainable Design Guidelines Version 4.0 (Roads and Maritime, 2017)

The Sustainable Design Guidelines seek to deliver sustainable development practices by embedding sustainability initiatives into the design and construction of transport infrastructure projects.

There are 14 compulsory requirements that project teams are required to consider where relevant to a project. Each compulsory requirement has a list of supporting initiatives that can be utilised to meet the compulsory requirements.

In relation to this report, compulsory requirement 13 (Urban Design) nominates eight principles that have been considered during the development of the urban design concept. They are:

_Draw on a comprehensive site and context analysis to inform the design direction
_Provide value-for-money design solutions that achieve high quality, low maintenance architectural and urban design outcomes that have longevity
_Provide connectivity and permeability for pedestrians
_Integrate the project with the surrounding area
_Protect and enhance heritage features and significant trees
_Maximise positive view opportunities
_Design an efficient and functional solution which enhances and contributes to local amenity and prosperity.

Technical guideline for Urban Green Cover in NSW (OEH, 2015)

The Urban Green Cover Guideline provides a framework for the considered integration of vegetation with permeable and reflective surfaces to minimise local temperatures and encourage evaporation from landscaped areas into the urban environment.

This document outlines a broad range of relatively low cost strategies to integrate green, permeable and reflective surface into cities and towns which may include bushlands, gardens, greenways, habitat corridors, street trees, green roofs and green walls.

In relation to this project, Section 05 of this guide emphasises the importance of using native vegetation for the enhancement of local habitat, ecology and overall lowering of the Urban Heat Island (UHI) effect. Consideration of the benefits of increasing urban green cover has been fundamental during the urban design process which has sought to revegetate the project footprint.

Crime Prevention through Environmental Design (CPTED), Queensland Government (2007)

This document is referenced by the SEARs for the project.

The overarching objective of the guideline is for incidents, opportunities and fear of crimes to be prevented or reduced by ensuring that CPTED principles are incorporated into all facets of the project. The guiding CPTED principles that should be considered and are relevant to the project include:

_Natural surveillance - creating urban environments to 'put eyes on a place'
_Legibility - design that allows people to easily know where they are or where they are going
_Territoriality - providing clarity between public and private areas
_Ownership - creating a sense of ownership of a place by the local community
_Management - places that are 'looked after' are considered to be safer
_Vulnerability - avoiding isolated places and giving people options to escape.

Key considerations and approaches adopted by the project are described in Section 05 of this report.

Australian Standard AS1428.1 Design for access and mobility

This document specifies the design requirement of new building work, as required by the Building Code of Australia (BCA) and the Disability Standards (Access to Premises - Buildings) Standards (Premises Standards), to provide access for people with disabilities. Particular attention is given to:

_Continuous accessible paths of travel and circulation spaces for people who use wheelchairs
_Access and facilities for people with ambulatory disabilities
_Access for people with sensory disabilities.

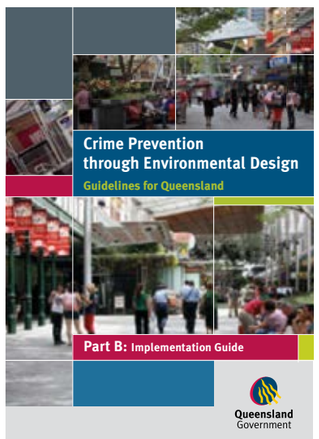
As part of the project, a continuous, accessible path of travel has been incorporated along the entire route. Stairs and vertical transport have been avoided in preference of accessible path grades of maximum one in thirty-three where feasible.

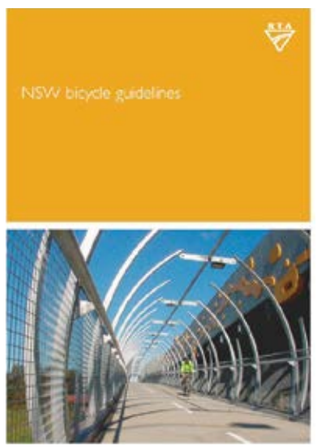
NSW Bicycle guidelines, RTA (2008)

This document provides technical guidance, standards and benchmarking for high quality bicycle transport facilities in NSW.

The document promotes safe, clear and efficient design requirement that have been adopted during design of shared paths in the project which include:

_Minimum shared path widths no less than three metres
_Minimum clear zones of 0.5 metres
_Use of frangible plant species adjacent to paths
_Location of trees that take into account mature sizing and maintain good sight lines.





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Assessment methodology

Existing pedestrian bridge over the M7 Motorway

03

Assessment methodology

This LCVIA been completed in accordance with the Environmental Impact Assessment Practice Note: Landscape Character and Visual Assessment EIA-NO4.

The report differentiates between landscape character assessment - the overall impact of a project on an area's character and sense of place, and visual impact assessment - the effect on views.

Through an integrated urban design process, this report seeks to address how the project fits into the study area to support local connections and contribute to the quality of the built outcome.

The following section describes the approach taken to achieve an integrated urban design outcome through the assessment and mitigation of potential landscape character and visual impacts.

Approach to urban design
The urban design concept for the project has been developed based on an overarching design philosophy, urban design principles and objectives, to achieve an integrated project design in accordance with 'Beyond the Pavement'.

Following review and contextual analysis of the project, the urban design concept identifies a series of proposals that have been implemented and integrated with the civil engineering works. Consideration has been given to the relationship between the various project elements which include: road pavements, lighting, structures, road furniture, integration of culture, art, and landscape concepts based on the developed civil concept design.

The urban design concept for the project has been an iterative process, forming part of a multidisciplinary collaboration with the project team. As a result, a number of potential impacts have sought to be minimised or avoided.

Further detail on the urban design concept including outcomes of mitigation measures incorporated into the design is provided in Section 05 of this report.

Approach to landscape character and visual impact assessment
Landscape character impact and visual impact of the project are separately assessed. The method to measure impact is based on the combination of the sensitivity of the existing character or view to change and the magnitude of the project on that area or view.

In accordance with the EIA Practice Note EIA-N04 the process undertaken for this Landscape Character and Visual Impact Assessment has included the following:
- _A desktop review to determine existing conditions
- _A review of relevant guidelines, planning and policies
- _Identification of landscape character zones and existing visual including visual catchment
- _An assessment of landscape features during construction and operation
- _A representative viewpoint assessment of day time impacts
- _A general assessment of night time impacts
- _Development of mitigation measures and assessment of residual risk to the project after measures are implemented.

Landscape character impact assessment

Landscape character refers to the combined quality of built, natural and cultural aspects which make up an area and provide its unique sense of place.

A number of landscape character zones (LCZ) have been identified during the contextual analysis. They are generally based on the study area's surrounding land use, vegetation cover and topography. The purpose of dividing the study area into character zones is to make the assessment process easier to undertake and understand.

The impact of the project on each LCZ is based on the sensitivity of the zone, and the magnitude of the project's impact in that zone. Consideration has been given to future land uses within each LCZ given the strategic context of the project within the future Western Sydney Aerotropolis and the South West Growth Centre.

Landscape character sensitivity
Landscape character sensitivity refers to the value placed on the overall quality of a LCZ based on a number of characteristics, including those identified through contextual analysis, and in combination with the level of amenity it provides to the community. Landscape character sensitivity has been rated against the inherent capability of the LCZ to absorb change as a result of the of the project.

Magnitude
Magnitude is the measurement of the scale, form and character of a development project and the degree of intrusion when compared to the existing condition. All elements of the project need to be considered. Critical issues include:
- _Changes to landform
- _Changes to urban structure or vegetation patterns
- _The nature, density and scale of existing and proposed works.

Landscape character Impact
The impact has been calculated using the landscape character and visual impact grading matrix provided in the practice note (refer table below), which provides consistent terminology for the assessment.

The Landscape Character Assessment is provided in Section 06 of this report.

Visual impact assessment

Visual impact is the measure of the potential change that new interventions would have on the existing visual environment.

Visual impact depends upon the following:
- _The visual catchment area, or the extent of visibility of the proposed changes
- _Visual sensitivity, or the quality of the view and how sensitive it is to the proposed change, related to the direction and composition of the view
- _Magnitude, or the nature of the project and its proximity to the view.

The process undertaken in this visual impact assessment has included the following:
- _Define an estimated visual catchment
- _Ground truth the estimated catchment
- _Illustrate the visual catchment in the form of a Visual Envelope Map (VEM)
- _Establish viewpoint locations and assess for visual sensitivity to change
- _Assess likely impacts at viewpoints locations
- _Finalise catchment and visual impacts.

Visual envelope map
The VEM illustrates the visual catchment of the project. The VEM defines areas from which the project can be viewed from a 1.5 metre vantage point which is the typical height of a person at eye level. Areas that are cloaked in dense vegetation, with tree canopies higher that 1.5 metre are generally excluded from the visual catchment area.

The visual catchment was initially determined through desktop analysis using GIS mapping data to review topography and ascertain the theoretical extent from which landform would allow views to the project. Further plan analysis was undertaken to ascertain the influence of vegetation, land use and distance to the raw GIS/landform data.

Mapping was then validated via ground truthing to check the extent to which vegetation, land use and distance restrict views to the project. Ground truthing was limited to the extent that some private lands located within the nominated visual catchment area were not able to be accessed. This is a typical limitation of visual analysis, particularly in rural areas where large tracts of land were inaccessible.

The VEM has formed the basis for the selection of viewpoint locations. Each viewpoint was then assessed for potential visual impacts dependant on visual sensitivity and the magnitude of change.

Visual sensitivity
Visual sensitivity refers the quality of the existing view and how sensitive the view is to the proposed change. Visual sensitivity is related to the direction of view, the composition of the view and may cross more than one landscape character zone.

Sensitivity \ Magnitude	High	Moderate	Low	Negligible
High	High Impact	High-Moderate	Moderate	Negligible
Moderate	High-Moderate	Moderate	Moderate-low	Negligible
Low	Moderate	Moderate-low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Landscape character and visual impact grading matrix

Magnitude
Magnitude refers to the form (scale, size and character) of the project and its proximity to the viewer. For the purposes of this assessment, magnitude considers the frequency and duration of the view, and distance at which it is viewed.
With these factors in mind, a judgement has been made for the quantum of change within each view, with a rating of magnitude applied.

Frequency
As a method of better articulating magnitude (which is a departure from the Environmental Impact Assessment Practice Note guideline), the frequency considers the number of people who might view the project and are categorised as follows:
_**Low frequency:** residences where there are few inhabitants and visitors to private properties
_**Medium frequency:** roads, public spaces or parks that have average usage by the general public
_**High frequency:** public spaces and thorough fares that have high usage.

Duration
Duration refers to the length of the time people would have to view the project. It is a term that is used when describing the magnitude of the project at any given view point.
_**Short duration:** views from naturally vegetated (forest or woodland) areas or industrial areas that are partially obscured by topography, vegetation or structures
_**Moderate duration:** views from roads where the duration of the view is short to moderate and many of the viewers are frequent users of the road
_**Long duration:** views are from residential and public recreational areas.

Distance
The greater the distance, the less detail is observable and the more difficult it is to distinguish changes from their background, which in turn diminishes visual impact.

Distance zones were determined around the project within the visual catchment area based on an observer eye height of 1.5 metres above ground level. The distance zones are as follows:
_**Foreground zone:** Areas within 0 metres to 250 metres of the viewer. Within this range the observer experiences the maximum discernment of landscape details, such as shape, colour and contrast.
_**Middle ground zone:** Areas between 250 metres to one kilometre . Within this range, vegetation textures and land use patterns are visible to the observer.
_**Distant zone:** Areas greater than one kilometre from the project. Within this range, textures and patterns are indistinct to the observer. The viewer is unaware of individual details and discerns broader landscape units as patterns of light and dark.

View locations that fall within the foreground zone are considered to be in the zone of highest potential visual impact because the project would be part of their ground views.

Changes to views in the middle ground are considered to be important but less important than in the foreground. This is because the subject site is further from the viewer and would therefore occupy a lower proportion of the total view from the identified viewer location.

It is considered that visual impact or viewer locations within the distant zone is of least significance, however, still worthy of consideration. In some cases, wholesale change of broad distant views in terms of colour, texture and pattern can still be noteworthy.

Visual impact assessment
This section includes a detailed assessment of the project from selected viewpoints, with a rating given for magnitude and sensitivity, which provides the overall visual impact assessment for each viewpoint location.

To assist in making the visual assessment process easier to comprehend and more accurate, each assessment provides an existing image of each viewpoint.

For the purpose of the assessment, a visualisation is also provided to illustrate the basis project concept which includes:
_Its location within its setting
_The vertical and horizontal alignment and overall three dimensional form of the road
_Heights of cuttings and fill embankments
_The location and form of bridges and walls
_Vegetation and planting after two to three years of growth, have been assessed.

The results of the visual impact assessment is provided in Section 07 of this report.

Cumulative Impact Assessment

Cumulative impacts are those that result from successive, incremental, and/or combined effects of a project when added to other existing, planned, and/or reasonably anticipated future projects. The cumulative effect of multiple projects may decrease or intensify the landscape and visual impacts on a particular receiver or area.

A review of the cumulative impacts of this project has been completed taking into account other transport projects in the vicinity of the project that have been:
_Approved but where construction has not commenced
_Commenced construction
_Recently completed.

In addition, a general discussion is provided describing the implications of future land use initiatives that may result in a cumulative impact.

The Cumulative impact assessment is provided in Section 08 of this report.

Management Measures & Residual Impacts
Following the identification of potential landscape character and visual impacts, any potential opportunities for mitigation were identified and are outlined in Section 09 of this report.

Assuming the implementation of the proposed mitigation measures, a further assessment of landscape and visual impact has been made. The resulting impacts are the likely residual landscape and visual impacts of the project.

Study area
For the purpose of this report, the study area is broadly defined as a one kilometre radius from the operational footprint of the project.

The project operational footprint comprises about 285 hectares of mostly rural land lying north of Elizabeth Drive between the M7 Motorway and The Northern Road. It includes the connection to the future Western Sydney Airport.

The study area is considered to be equally broad for the urban design concept and landscape character and visual impact assessment within this report.

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Existing environment

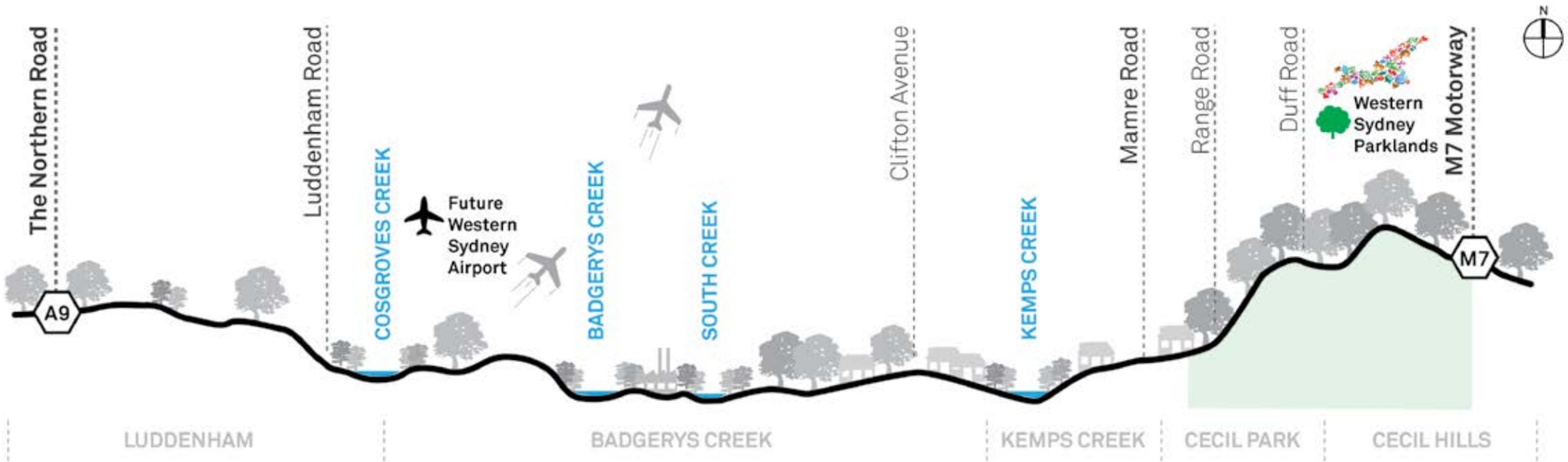
Aerial photo over South Creek and Badgerys Creek. Source: Roads and Maritime

04

Overview

An analysis of the project study area was undertaken to understand existing conditions, with the following natural, built and community contexts examined:
_Existing land use
_Potential land use
_Soil landscapes
_Topography
_Hydrology and flooding
_Endemic vegetation
_Landscape character
_Aboriginal heritage
_Non-Aboriginal heritage.

The analysis has assisted the development of an urban design concept that is of its place. The project vision of 'connection to Country' would ensure it fits within the landscape to create a diverse journey and reflect the range of experiences across the project, which is illustrated in the adjacent figure.

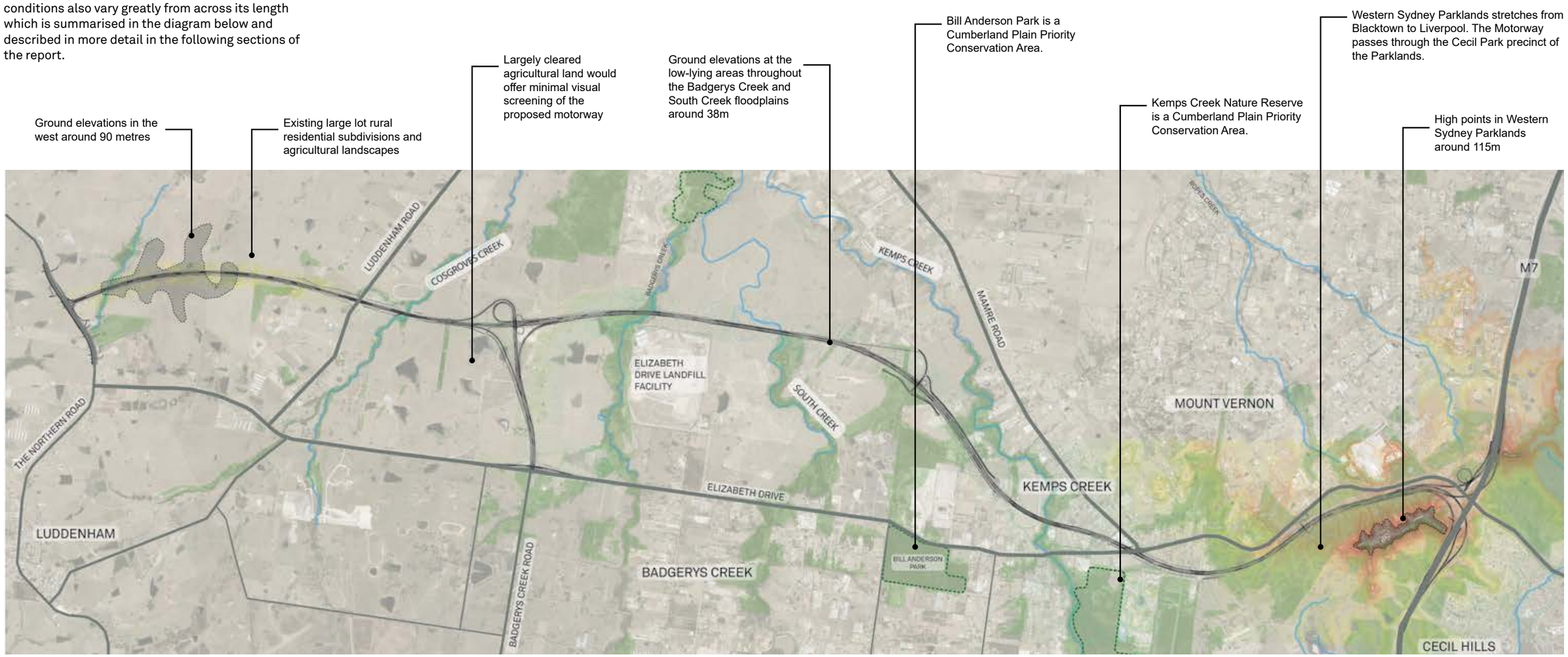


Figurative long section illustrating the major (conceptual) landscape features along the study area - Not to scale

Location

The project would lie within the broader landscape region commonly referred to as the Cumberland Plain of south-western Sydney. It runs from the M7 Motorway at Cecil Hills in the east to The Northern Road at Luddenham and transverses four major creeks and two major rural roads (Luddenham Road and Elizabeth Drive).

The existing landscape features, land uses and conditions also vary greatly from across its length which is summarised in the diagram below and described in more detail in the following sections of the report.



Existing context - Not to scale

LEGEND

- M7 Motorway
- Highway
- Main roads
- Secondary roads
- Existing vegetation
- Conservation site
- Creek

Soil landscapes

The study area is located on the Cumberland Plain, a relatively flat, low lying subregion of the Sydney Basin. The Cumberland Plain is a depression characterised by Wianamatta shales with interleaved Minchinbury sandstone. Weathering has given rise to a topography of flats and rolling hills. The Cumberland Plain is surrounded by the elevated Hawkesbury Sandstone ridges of the Blue Mountains, Hornsby Plateau and Woronora Plateau.

The Soils and Contaminations Assessment Report identifies the following soil landscapes:

_South Creek: Fluvial deposits which are located along all four creek channels
_Blacktown: Residual soils which are located in the flat to gently undulating terrain between creek channels
_Luddenham: Residual soils which are located on the low rolling hills at both ends of the alignment
_Picton: Residual and colluvial soils located at the eastern end of the project.

The location and extent of each soil landscape is closely related to surface landform and topography. For further detail, refer to Appendix O of the EIS: Soils and Contamination Assessment Report.

Design opportunities
The design should ensure that appropriate landscape types and plant selection are proposed to suit the soil and climatic conditions in the vicinity of the project.

As much of the original vegetation along the study area has been removed, the soil mapping allows an insight into what vegetation types and patterns may have existed previously.

Contextual analysis - Soil landscapes - Not to scale

LEGEND

- Blacktown (bt) - Residual
- Luddenham (lu) - Erosional
- Picton (pn) - Colluvial
- South Creek (sc) - Alluvial
- Berkshire Park (bp) - Alluvial
- Disturbed Terrain (xx) - Disturbed

Topography

Across the study area the landscape is generally that of the Cumberland Plain, with low lying areas around creek lines, and undulating topography between. From west to east, the study area transitions from gentle undulations and low lying areas across the western section, before a steep transition through Western Sydney Parklands near Cecil Hills.

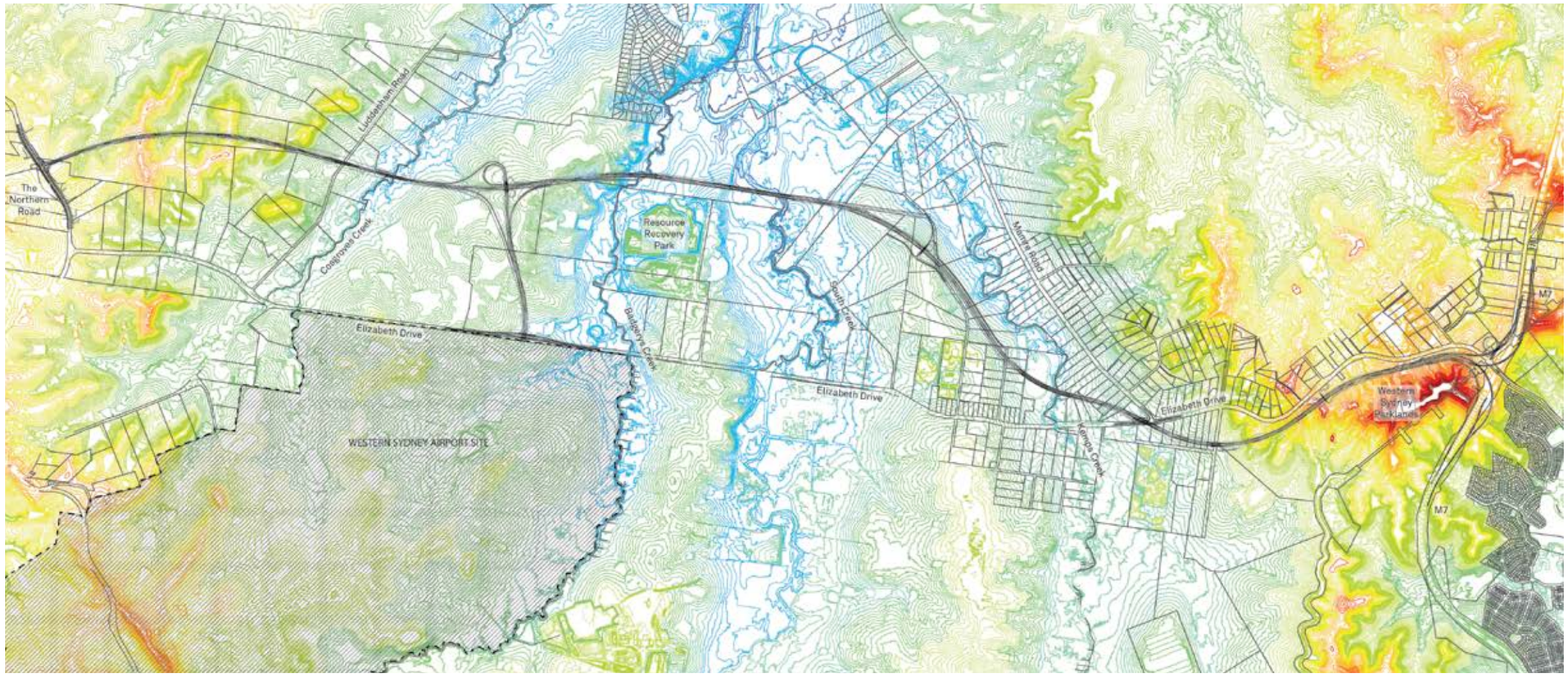
The topography of the study area may be characterised into three general terrain types as follow:
_Rolling hills terrain, which occurs in the western and eastern portions of the proposed alignment
_Flat to gently undulating terrain, which occurs in the central portion of the alignment
_Creek channels/alluvial floodplain terrain, which dissects the flat to gently undulating terrain within the central portion of the alignment.

Within the rolling hills terrain, the topography typically comprises picturesque, rounded hills with slopes. The hills gently climb towards The Northern Road ridge line, which allows for panoramic views in all directions.

The topography of the flat to gently undulating terrain typically comprises gentle rises and undulations with broad rounded crests with slopes. A number of creeks (Cosgroves Creek, Badgerys Creek, South Creek, Ropes Cr and Kemps Creek), dissect the terrain, with each creek flowing to the north.

The topography of the alluvial floodplains adjacent to the creeks comprises low slopes which extend from the creek channels out to a maximum distance of about 500 metres.

Toward the eastern end of the study area, through Cecil Hills and Western Sydney Parklands, the terrain comprises a distinctive set of elevated ridges, wooded hills and slopes, that climb to peaks of approximately RL 115 metres Australian Height Datum (AHD). There a multiple vantage points that follow the ridge line which offer panoramic views across the study area.



Contextual analysis - Topography - Not to scale

Design opportunities
The topography along the study area offers the user a constantly changing landscape experience, with the design opportunities to create a variety of responses to the landform with a celebration of ridgelines and creek crossings, retain and maximise opportunities for views to mountains, floodplains and riparian study areas.

Hydrology and flooding

The broader landscape of the area has been shaped by the watercourses that flow from south to north into the Nepean River.

The following watercourses run through the study area:
_Cosgroves Creek
_Badgerys Creek
_Kemps Creek
_South Creek
_Ropes Creek
_Hinchinbrook Creek.

The main catchment within the study area is South Creek, which is listed as a sub-catchment of the Hawkesbury-Nepean system, with the other main creeks throughout the study area of Cosgroves Creek, Badgerys Creek and Kemps Creek. These creek systems eventually drain into South Creek further north of the project.

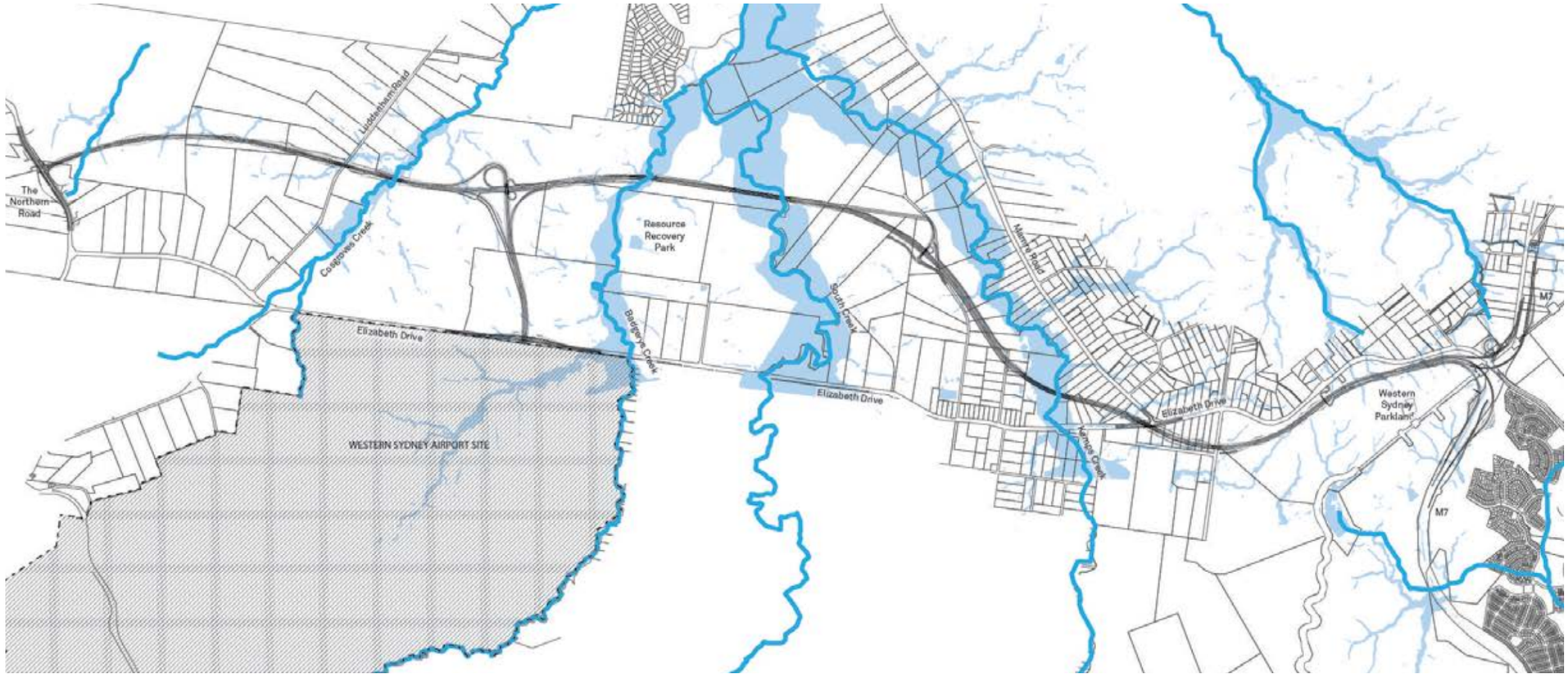
The South Creek Catchment is currently regarded as one of the most seriously degraded sub-catchments in the Sydney Region, largely due to long term clearing of vegetation and increased impervious areas due to urbanisation.

The creeks within the study area are all subject to flooding and generally have wide and relatively flat floodplains. Flooding extents will dictate much of the Motorway landform, structures, drainage, vegetation as well as the placement of paths and footbridges along the study area.

Design opportunities
The creek lines that cross the study area provide a basis for any potential future north/south parklands and open space associated with the Greater Sydney Commission's 'Western Parkland City', which will be based around the Western Sydney Airport. The project can act as a catalyst for future active transport providing east to west connectivity along the footprint.

The creek lines also offer the ability for the project to rehabilitate riparian vegetation where possible. In addition, creek crossings could provide a diverse range of user experiences, in contrast with the ridgelines and high points at each end of the project.

Bridge structures, must be sensitively placed and elegantly design to minimise any visual impact to the riparian corridors.



Contextual analysis - Hydrology / Flooding - Not to scale

Native vegetation

Much of the endemic vegetation throughout the project area has been cleared and removed, generally for agricultural pursuits and then urban development.

Although much of the remaining vegetation is fragmented, these pockets do make a significant contribution to the scale and character of the study area as illustrated in the adjacent figure.

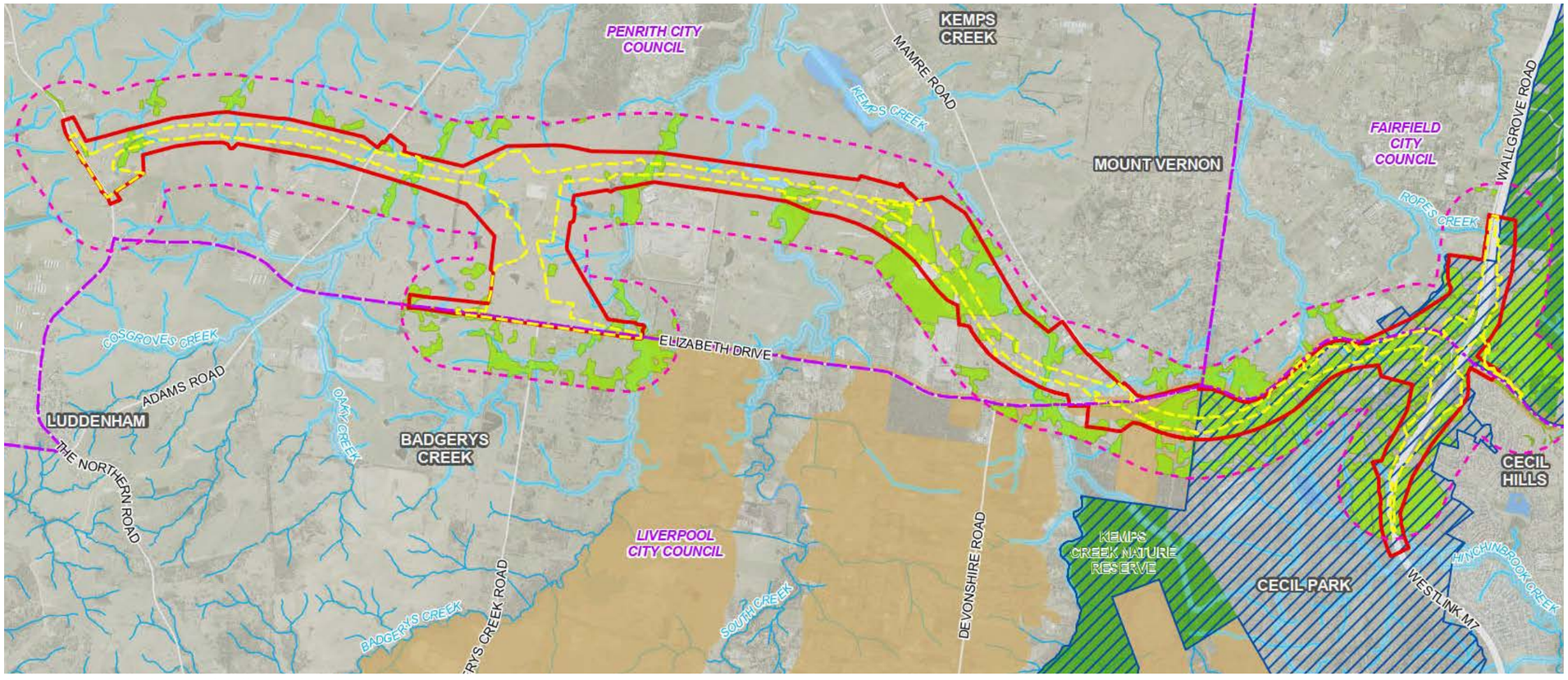
Cumberland Plain woodland is the dominant vegetation community, and includes 'Shale Hills Woodland, Shale Plains Woodland, Spotted Gum Forest, Grey Box Woodland and Grey Box / Ironbark Woodland'.

Several other ecological communities listed under the *Threatened Species Conservation Act 1995* may integrate with Cumberland Plain Woodland. These include Cooks River/ Castlereagh Ironbark Forest Moist Shale Woodland Shale / Sandstone Transition Forest and Shale Gravel Transition Forest.

Design opportunities
The project should attempt to maximise revegetation in disturbed areas and revegetate any areas between remnant areas of endemic Cumberland Plain Woodland vegetation to create biodiversity study areas and re-link them.

With the disjointed existing landscape areas, there is a great opportunity to accentuate the existing natural patterns through revegetation and reinforce the previous landscape patterns throughout the project.

Where applicable, landscape plantings could express new patterns through contrasting landmark plantings or designed landscape interventions to highlight entry / exit points or focal areas.



Contextual analysis - Native vegetation - Not to scale

Existing land use

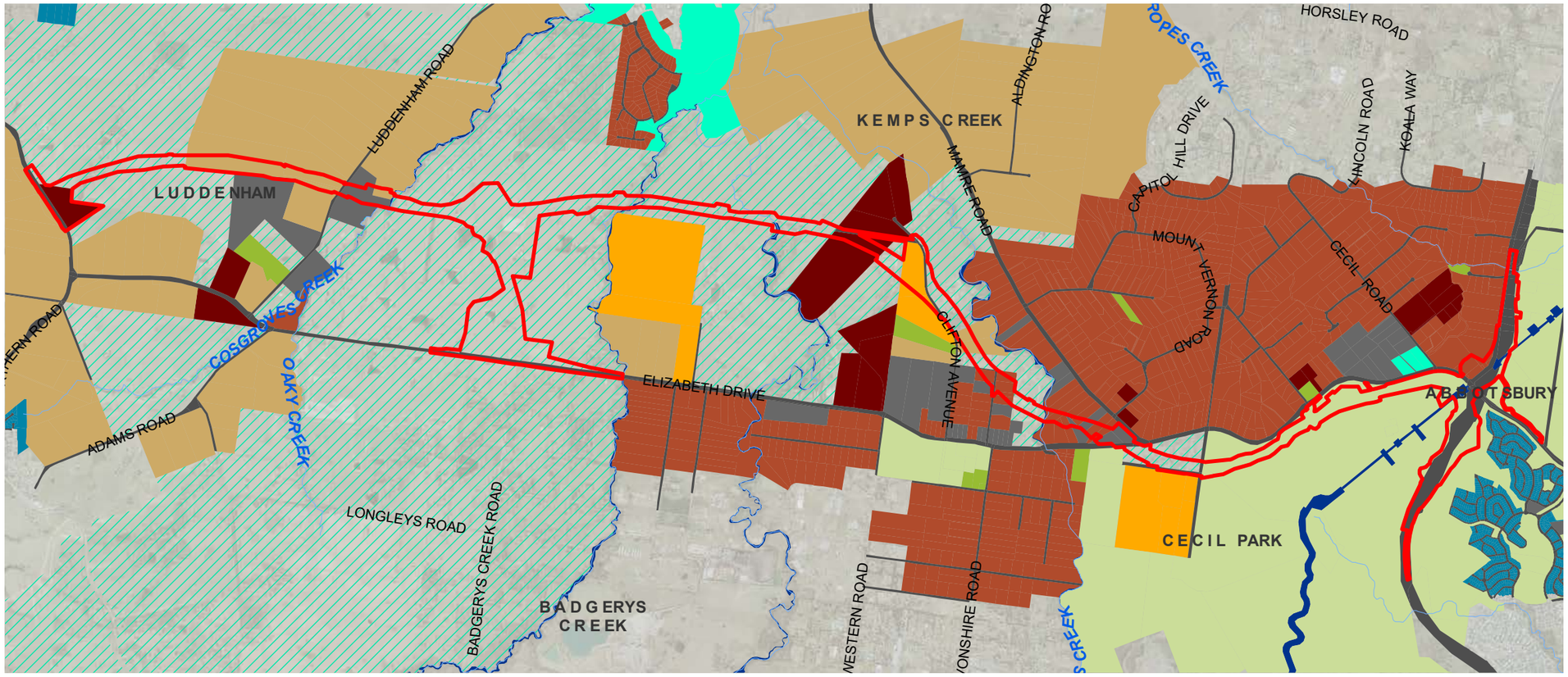
Land use patterns vary quite considerably across the study area, generally consisting of agriculture, residential, parklands, educational, rural and agricultural facilities or services such as quarries, waste management centres or nurseries.

Throughout the study area, much of the native vegetation has been cleared, generally for agriculture and more recently for development or housing.

Land use patterns are clearly defined by topographical features such as creek lines, hills and plains. From the east, Cecil Hills and Mount Vernon contain the highest proportion of residential properties. The flood plains, historically attributed as less desirable land, contain the highest proportion of commercial and industrial uses. Towards The Northern Road in the east, land uses are mostly attributed with rural and agricultural lands.

Design opportunities
The analysis shows the function of the land and landscape along the study area, which can inform how the landscape treatments for the project could be designed and implemented according to the adjacent land use. This may include considerations for screening to nearby residents, or broad open vistas across the landscape.

The mapping also indicates opportunities to reinforce potential future parkland or open space connections adjacent the project.



Contextual analysis - Land use - Not to scale

LEGEND

- The project construction footprint
- Cadastre
- Waterways

Environmental areas
- Conservation area
- Watercourse or water infrastructure

Rural and agriculture
- Grazing
- Intensive agriculture
- Rural
- Rural residential

Urban
- Commercial/ industrial
- Community use
- Education
- Recreation
- Residential
- Resource and waste facility

Infrastructure
- Roads and transport

Potential and known future land use

Across western Sydney, land use is rapidly changing to accommodate a growing population.

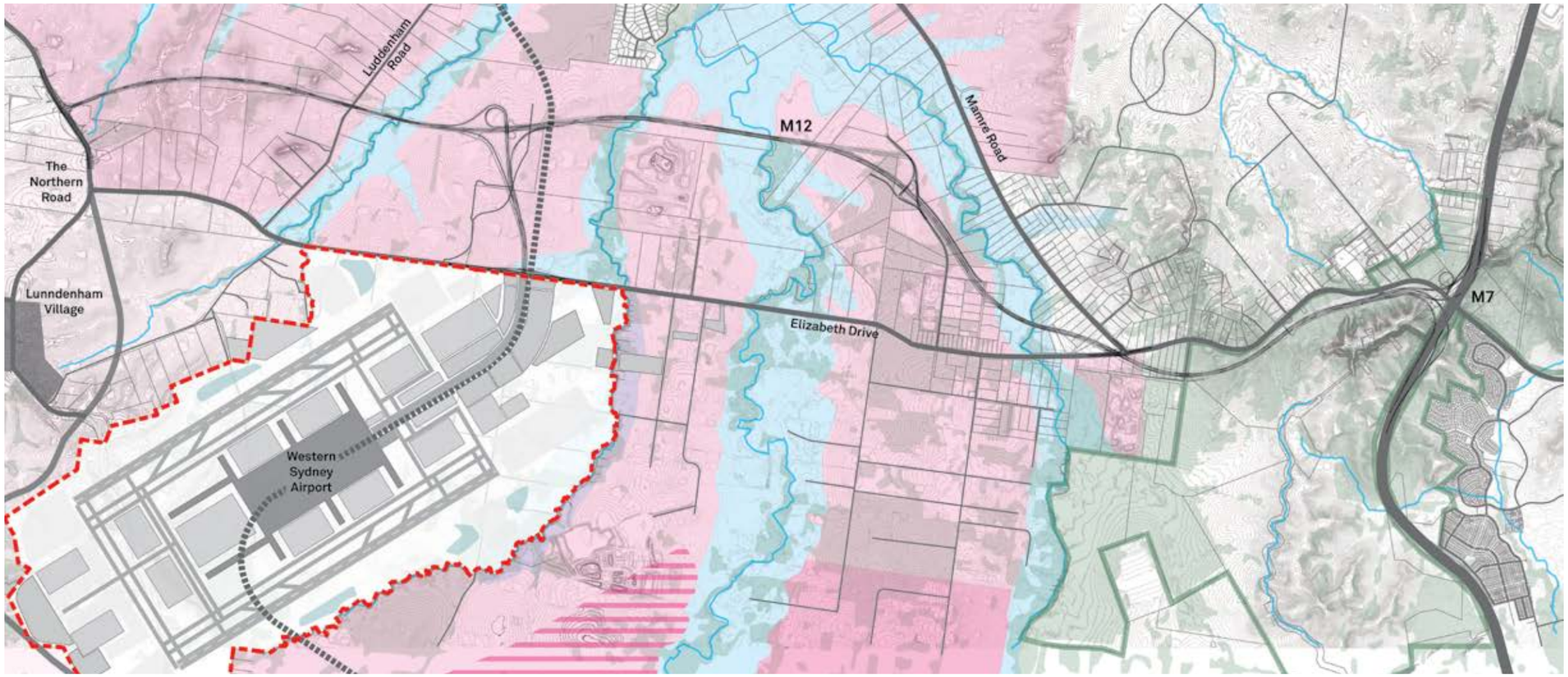
The project study area sits within the South West Growth Centre, which will accommodate much of Greater Western Sydney's future housing and employment needs. These growth areas will provide better access to employment, infrastructure and services.

Existing land use across the rural and rural residential landscapes of the project area will change in response to the planned Western Sydney Airport and the commercial, industrial and employment needs that will be required to support the Western Sydney Airport.

Following the release of the Western Sydney Aerotropolis - Land Use and Infrastructure Implementation Plan 'Stage 1: Initial Precincts' (LUIIP), the Western Sydney Aerotropolis precincts and initial land zoning is a fundamental consideration of urban design concept for the project (refer Section 05). The LUIIP identifies the project as the main entry point for the Western Sydney Airport and surrounding development.

Design opportunities
Consideration of future land use changes can influence landscape treatments. Vegetation can be utilised as buffers to filter undesirable views and reinforce future landscape patterns

The urban design concept for the project should be designed for the present but be adaptable and robust to be influenced and able to accommodate future land uses.



Western Sydney Aerotropolis Stage 1 Land Use and Infrastructure Implementation Plan

The LUIIP identifies the re-zoning of rural lands surrounding the proposed airport to predominantly 'flexible employment' (shown in pink). The four creek corridors are preserved as 'non-urban land'.

Aboriginal cultural heritage

The project would be on the land of the Mulgoa, Cabrogal and Cannemegal of the Darug (Dharug, Daruk) language group. It would pass through the Deerubbin Local Aboriginal Land Council (LALC) area and the northern boundary of Gandangara LALC. The project study area was traditionally the cornerstone of the three cultural groups from the area; Darug, Dharawal and Gandangara, and was a place where these groups would come together for ceremony. Aboriginal people lived a fluid, resilient existence.

The study area has a 40,000-year history; it is a freshwater place; and the Country is on red silcrete foundations. The Darug Nation are custodians of the land, comprising 35 clans and five to six kin groups within each clan.

Aboriginal stories form part of this place and they live within the land and people. They are layered, nuanced and weave a tapestry of history and social information. They draw on Songlines that were once intimately known by Aboriginal people in the area.

Of key relevance, the area is heavily interspersed with creek systems. These creeks have emerged as a key Aboriginal theme of the area. They are freshwater places which are associated with local learning and feature in local stories. The creek systems provide a wealth of resources, ranging from food and medicine through to construction materials.

The Aboriginal Cultural Heritage Assessment Report (ACHAR) has identified four major landscape types for the purpose of investigating the Aboriginal cultural heritage values in the area. These are:

1. Luddenham rolling hills - are an area of slightly higher relief in the west
2. Cecil Hills - a distinctive set of elevated ridges in the east
3. Creek Flats - flat to gently undulating terrain in the central part of the study area
4. Gentle Slopes - landscape concentrated along the borders of the creek valleys.

The landscape types are directly related to the varying topography along the project footprint.

Design opportunities

The project presents opportunities to work with local Aboriginal communities, discover the inherent associative cultural values associated and explore how these could relate to the identity of place, then potentially identify key heritage sites for interpretation and develop an integrated art strategy that is reflective of Sydney's Aboriginal heritage and identity.

Balarinji, on behalf of Roads and Maritime, has consulted with the local aboriginal community as part of the design process, identifying key interpretive themes for the project. This is described further in Section 05 of this report.

The project vision of 'connection to Country' would seek to embed key interpretive themes into the project through the use of integrated art and approaches the plant selection.

Non-Aboriginal heritage

The non-Aboriginal Heritage Assessment has identified the following thirteen registered or potential heritage sites considered to occur within the study area. These are:

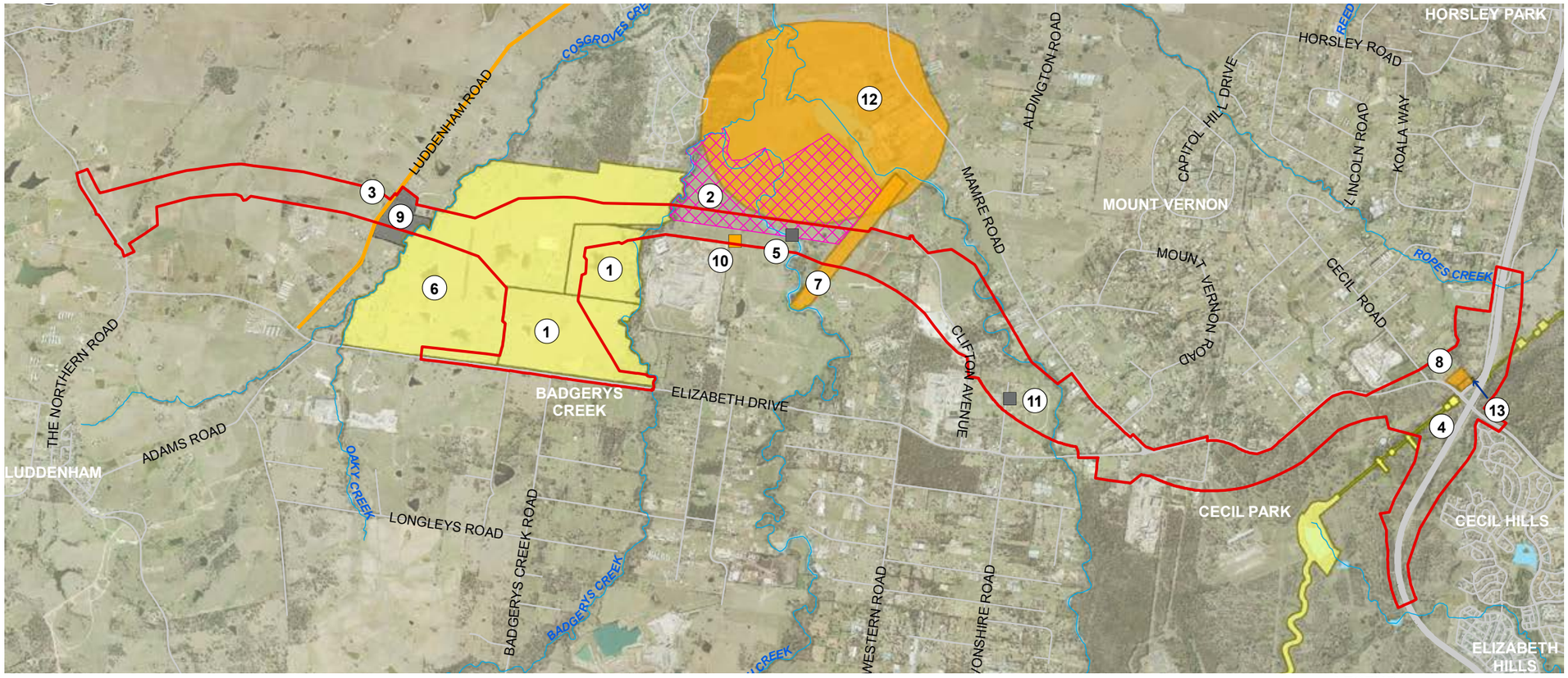
_Item 1: McGarvie Smith Farm
_Item 2: Fleurs Radio Telescope
_Item 3: Luddenham Road Alignment
_Item 4: Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)
_Item 5: South Creek Bridge
_Item 6: McMaster Field Station/McMaster Farm
_Item 7: Fleurs Aerodrome
_Item 8: Cecil Park School, Post Office and School Church
_Item 9: Karingal
_Item 10: Exeter Farm Archaeological Site
_Item 11: Artefact Scatter
_Item 12: South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape.
_Item 13: Former Cecil Park Public Hall

The non-Aboriginal heritage assessment identified that only nine of the 13 heritage items have been assessed as having either local, State or National heritage significance, these are:

_Item 1: McGarvie Smith Farm (State significance)
_Item 2: Fleurs Radio Telescope (State and potentially National significance)
_Item 3: Luddenham Road Alignment (local significance)
_Item 4: Upper Canal System (Pheasants Nest Weir to Prospect Reservoir) (State significance)
_Item 6: McMaster Field Station (State significance)
_Item 7: Fleurs Aerodrome (local significance)
_Item 8: Cecil Park School, Post Office and School Church (local significance)
_Item 10: Exeter Farm Archaeological Site (local significance)
_Item 12: South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape (local significance).

Design opportunities

The project presents opportunities to provide a design that takes into consideration and responds sensitively to the existing heritage items. This could include the retention of key views and vistas to individual items reinforced by ordered tree plantings.



Heritage item number	Heritage item name
Item 1	McGarvie Smith Farm
Item 2	Fleurs Radio Telescope Site
Item 3	Luddenham Road Alignment
Item 4	Upper Canal System (Pheasants Nest Weir to Prospect Reservoir)
Item 5	South Creek Bridge
Item 6	McMaster Field Station/McMaster Farm
Item 7	Fleurs Aerodrome

Heritage item number	Heritage item name
Item 8	Cecil Park School, Post Office and School Church
Item 9	Karingal
Item 10	Artefact Scatter and Trees, Exeter Farm
Item 11	Artefact Scatter, Salisbury Avenue
Item 12	South, Kemps and Badgerys Creek Confluence Weirs Scenic Landscape
Item 13	Former Cecil Park Public Hall

LEGEND

M12 study area
Waterways
Assessed heritage significance
State and potentially National
State
Local
None

Contextual analysis - Non-Aboriginal heritage - Not to scale

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The Aboriginal 'Six Seasons' - The time of Burrugin

Artist's impression: Aerial view south-west across M7/M12 Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Overview

The urban design concept for the project has been developed based on the overarching design philosophy and urban design objectives and principles, to achieve an integrated project design.

Following review and contextual analysis of the project, the urban design concept identifies a series of proposals that have been implemented and integrated with the civil engineering works. The proposals provide a balanced approach between function and form and between hard and soft project elements, that would create a unique sense of place. This would be done through considered alignments, views, art and interpretation.

The urban design concept for the project has been an iterative process, forming part of a multidisciplinary collaboration with the project team. As a result, a number of mitigation measures have been incorporated into the concept design. These measures have sought to minimise or avoid potential impacts and are listed at the end of this section of the report.

This section of the report describes the relationship between the project, alignments, structures, road furniture, integration of culture, art, and landscape concepts based on the developed civil concept design.

This urban design concept section of the report consists of the following components:

_Design philosophy
_Strategic Urban Design Objectives
_Urban Design Principles and Objectives which consist of the following main themes:
  _Connection to Country
  _Positively influence the structure of the Western Parkland City
  _Create an active study area and enhance user experience
  _Create a project identity
  _Re-establish natural systems
_Urban design elements
_Urban design concept plans at 1:5000 scale describing main project items, including typical cross sections
_Mitigation measures incorporated into the concept design.

Design philosophy

The quality of urban design is becoming the accepted measure of a transport scheme's success in the urban and regional environment. Good design of our public domain is fundamental to quality of life. Streets, roads, expressways and motorways constitute a large portion of our public spaces and may be considered as some of our most important public places.

The project is a rare opportunity to provide a well vegetated motorway that is integrated to both the natural landscape systems and the inherent cultural and historical values of the country. It would celebrate the unique sense of place and the journey from the mountains to the city through a considered alignment, views, art and interpretation.

The design aspirations are based on delivering high quality integrated design outcomes that display relevance, fit, durability and delight.

The design team has aimed to draw on the project vision of a *Connection to Country* as a methodology for an integrated landscape solution which reflects the complex layers of the regional landscape.

Strategic urban design objectives

The urban design objectives for the project have been built upon the work established in the strategic urban design concept report and the urban design objectives that provide the framework for achieving the project urban design vision. They were:

1. Create a unique and distinct identity interpreting the rich sense of place, and Aboriginal and cultural heritage
2. Utilise structures, bridges and earthworks as expressions of identity, place, values and sustainability
3. Create an active, liveable and vibrant study area
4. Provide connectivity and access along and across the study area
5. Accentuate natural patterns through revegetation and express the new infrastructure through contrasting landmark plantings
6. Create an enjoyable experience with diverse and distinctive views and a sense of journey and arrival
7. Design a simple, cohesive and sustainable motorway that offers a flexible and diverse choice of transport modes
8. Engage with the community and stakeholders.

The project has used and been informed by these strategic objectives to develop specific project-based principles and objectives that have been developed into the urban design concepts within the project design.


Rich sense of place


Expressions of identity, place and values


Active, liveable and vibrant study area


Connectivity and access


An enjoyable experience


Natural patterns


Simple, cohesive and sustainable


Community and stakeholders

Urban design principles and objectives

The success of any project is heavily based on its ability to successfully deliver its original vision.

The aforementioned strategic urban design objectives describe a series of strategic goals that the project must deliver. These strategic objectives form the basis of design and evaluation from concept design through to construction. They shall be considered in addition to the economic, safety, engineering and environmental objectives for the project and contribute to the delivery of a truly unique user experience.

To help the project ensure these objectives are realised, a number of principles and objectives have been developed to help guide the decision-making process, provide a platform for engaging with stakeholders, and inform the physical designs proposed.

The urban design principles and objectives are split into the following main themes and explored further within this section of the report:

- Connection to Country, which consists of the following stages:
  - Description of principle
  - Objectives of approach
  - Methodology
  - Design outcomes taken forward into concept design
- Positively influence the structure of the Western Parkland City
- Create a project identity
- Create an active study area and enhance user experience
- Re-establish natural systems.

Artist's impression: Shared user path view east along M12 Motorway, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Connection to Country

The project team acknowledges the Traditional Owners of the land, the Darug peoples. The area through which the project traverses has been home to the Darug peoples for thousands of years, and they maintain an ongoing Connection to Country.

It is understood that the original inhabitants of the area where the project is proposed, belonged to the Darug (Dharug, Daruk) language group. Neighbours are the Dharawal language group to the east and south and Gandangara language group to the west and south-west.

The clans that occupied the area in around the project were known as the Cannemegal (Warmuli), Mulgoa, and Cabrogal. The Gomerrigal-Tongara occupied the areas to the north, based along South Creek. The Cabrogal people occupied the areas to the south generally around what is now Liverpool. All clans relied on the mixed food sources available from the creek networks and the surrounding woods.

Today the Project sits within the boundaries of the Deerubbin Local Aboriginal Land Council (DLALC) and it runs just north of the Gandangara Local Aboriginal Land Council (GLALC) boundary which is formed in part by Elizabeth Drive and covers parts of the Liverpool and Campbelltown local Government areas.

Principle - Designs that are 'of place'

The urban design proposal is 'of its place' – specific to Western Sydney, enhancing cohesive and inclusive communities. The following are the main themes that would provide a basis for the design integrations related to a Connection to Country.

Reflecting place
The design responds to the characteristics of Western Sydney as a locale and the biodiversity of the Cumberland Plain. The project would not be a generic insertion of infrastructure, but a living and responsive transport artery, serviced by attractive interventions and enriched by large extents of vegetation and tree planting.

The project is mindful of Connection to Country and Aboriginal perspectives on the landscape. The four major creek crossings along the project and the woodlands have inspired the design and continue to provide ideas and opportunities.

The design reflects on the six season calendar of the Dharawal people (and accepted by the Darug people) and consideration has been given to colour and form used in planting throughout the project footprint.

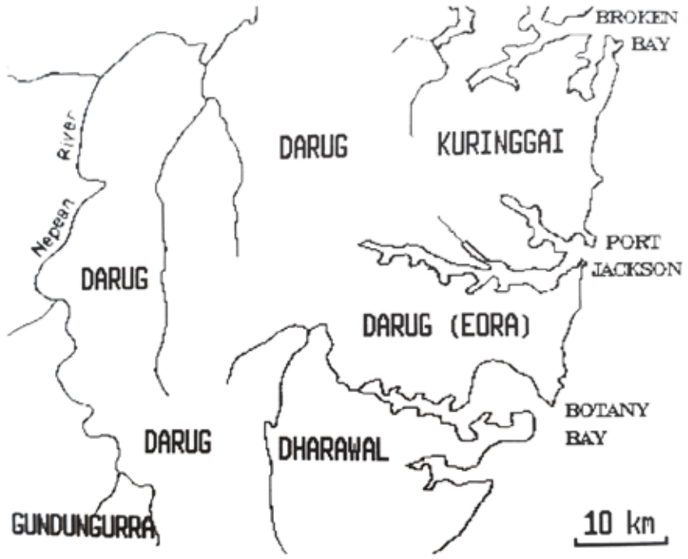
Sourcing locally
The design would bring balance to the natural environment by sourcing seed from the region to vegetate the project footprint and propagate local, native and suitable plant life. Native grassland and grassy woodland plants are resilient, attractive to pollinators and resilient to pests, aesthetically beautiful, and a low fire risk – ideal features for incorporation within the project footprint.

Cultural Interpretation
The project has worked with Balarinji, an Aboriginal strategy and design agency. They have developed the strategic high-level objective and translated it into meaningful physical design interventions to interpret Aboriginal heritage which can be integrated into the concept design for the project.

Balarinji is a Sydney-based, Aboriginal-owned agency founded on authentic engagement with Aboriginal people, culture, art, stories and identity. Their ethos is to deepen understanding of Aboriginal Australia for major projects nationally. The company's work spans public art; curatorial, urban regeneration and infrastructure; and branding campaigns.

The design interventions have been enriched through a process of consultation which identifies how the study area and broader area is considered by Aboriginal people. This includes how it may have changed over time. They would also be verified and endorsed by the local community.

Outcomes from this process have been developed throughout the concept design and documented in this section of the report.



'Distribution of linguistic tribes in the Sydney area in 1788' from 'The Darug and their neighbours: The traditional Aboriginal owners of the Sydney region', by James Kohen (1993)

The strategic design phase of the project identified a high-level objective to 'Create a unique and distinct identity interpreting the rich sense of place, Aboriginal and cultural heritage'.

Objectives of approach

Roads and Maritime sought proposals from qualified groups to undertake a process which takes the strategic high-level objective to *'create a unique and distinct identity interpreting the rich sense of place, Aboriginal and cultural heritage'* and translate this into meaningful physical design interventions to interpret Aboriginal heritage. The interventions would be integrated into the concept design.

The design interventions would be enriched through a process of consultation which identifies how the project footprint and broader area is considered by Aboriginal people, including how it may have changed over time.

The design interventions may be stand-alone elements; such as artworks or interpretive signage; or may be integrated into elements of primary infrastructure, including bridges, earthworks, planting and noise barriers; or be a combination of both.

The project would consider the following:
- The project footprint would be appreciated at different scales and speeds
- The project would be an international arrival and departure point
- Constraints such as safety, cost, biodiversity, flooding, adjacent land use, road & rail transport projects (existing and likely future) and presence of identified non-Aboriginal heritage items.

Following the proposal, Balarinji was engaged to manage the Aboriginal cultural interpretation process that would inform the concept design to create a unique and distinct identity interpreting a rich sense of place, that embraces Aboriginal and cultural heritage across the project.

Connection to Country
Methodology

Tasks

The following tasks were identified to provide a process of investigation and outcomes for Aboriginal cultural interpretative design integration for the project.

Stakeholder Identification
Contact relevant stakeholders already identified as a result of work undertaken to date and identify additional stakeholders.

Research and Consultation
Undertake desktop studies and develop and lead a program of consultation with identified stakeholders.

Report on consultation
Following consultation, prepare a summary of the process and the opportunities which emerge for future consideration in collaboration with the concept design team.

Design
In collaboration with the concept design team, develop design responses which allow the themes identified during consultation to be expressed in the project footprint in the concept design.

Preliminary Aboriginal narrative report

Based on desktop studies, a report was prepared that outlined a preliminary overarching Aboriginal narrative for the proposed project footprint to assist in integrating Aboriginal culture and values into the overall design.

Aboriginal people have been living in the Sydney region for up to 20,000 years. Sydney has been an area of rapid change in the 230 years following the First Fleet's arrival in 1788, developing from a sparsely populated wetland landscape to the modern city we know today.

The report traced the overarching themes of that contact history. There are stories for translation, to be developed in conjunction with the relevant connected Aboriginal communities. The report provided a base for continued enquiry to enrich the historical record with an Aboriginal-centric view from community engagement.

The main items covered by the report were as follows:
_Regional prehistory
_Life before European settlement
_Post European Aboriginal history overview
_Resistance and resilience vs loss and displacement
_Colonial influence and intervention
_European land use and disturbance
_Western Sydney in the 1980s and the growth of the
_Aboriginal population
_Land councils and land rights
_Native title and traditional descent
_Places of importance.

Consultation

An inclusive consultation process with representatives and community members who originate from or live and work in the Aboriginal community through which the motorway would run was undertaken to identify opportunities for translation and further development that would help to deepen a sense of place and understanding of the Aboriginal context across the project footprint as a coherent narrative.

The process has provided a genuine opportunity for the western Sydney Aboriginal community to provide their local story to input into the project's design.

Cultural design principles
Cultural design principles providing a high-level translation of the study area narrative and Aboriginal aspirations specific to the project and more broadly reflective of universal Aboriginal experience and thinking were prepared to guide the design team's thinking about interpreting and embedding Aboriginal sensibility into the project. They seek to encourage questions and curiosity for project designers to consider Aboriginal integration in a new way.

Key themes
Based on the consultation responses and analysis, key themes and opportunities were developed which would inform the subsequent design process
_Local Totems:
  _The importance of local totems was raised consistently throughout the exercise
_Dreaming Stories:
  _There are a number of Dreaming stories that are related to the totems of Western Sydney,
_Red Silcrete:
  _Red Silcrete as a material was strongly associated with the Western Sydney region and that the colours of the finds would provide a potential colour palette for future artistic interpretation.
_Natural Resources:
  _Natural Resources were a key theme that was highlighted throughout and included stories on yams, native flora and fauna, Aboriginal astronomy, creeks and freshwater places.

Consultation workshop. Images courtesy of Balarinji.

“The Darug Emu story goes back to the creator, the Rainbow Serpent. To the Darug, the Emu is significant for women and men because she represents Mother. Emu is often depicted to represent Mother Earth in art, song and dance. The Emu story connects across Darug land and Australia wide. In Darug Country the Emu is often related to Women’s business but in other areas the Emu is men’s business. This is the story of the Great Emu in the sky which stretches across the Milky Way Constellation. The constellation changes with the seasons: when the emu is tucked in, he is sitting on the eggs and they cannot be hunted but when he is stretched out or running it’s ok to hunt and collect Emu eggs. It is important to show the Emu and the change in seasons in the landscape. The Bowerbird nest also has a strong Dreaming around the creeks.”

Julie Jones and Corrina Norman-Dadd
Darug Tribal Aboriginal Corporation

Design

Following preliminary consultation a process was undertaken to prepare conceptual design directions underpinned by the locally endorsed Aboriginal narrative.

These design directions were gathered through an inclusive consultation process with artists and Elders who originate from or live and work in the Aboriginal community through which the project would run.

Workshop. Image courtesy of Balarinji.

Interpretation elements
The integration of artwork would be appreciated at different scales, speeds and time of day depending on user type, which would include motorists, cyclists, pedestrians and aircraft passengers. The integration would also respond to the context of the project being an international arrival and departure point.

Across the project footprint, the following project elements have been considered for design integration:
_Public works of art
_Interpretive signage
_Bridges, abutment walls
_Throw screens
_Noise barriers
_Retaining walls
_Earthworks
_Planting designs.

Connection to Country
Outcomes

The concepts and story boarding provided within this section are indicative only.

Story, scale, form, placement, colour, lighting and materiality would be explored further in the next phase of the project when concepts would be developed in consultation with locally connected Aboriginal artists.

The Great Emu in the Sky

Theme: Connection to culture
Connection to Country
Where: Large landmark sculpture

Aboriginal people were the original astronomers. They relied on the night sky and stars as a navigation system and calendar, as well as a cultural diary indicating when to travel and when to eat certain foods.

Below the Southern Cross, the Great Emu can be seen stretched across the Milky Way constellation. This forms the inspiration for The Great Emu in the Sky landmark sculpture. The Emu story is interconnected across Australia. Most Aboriginal groups tell their own story of the Emu in the Sky. According to creation stories, Emus were creator spirits that cared for the land. More locally in Ku-ring-gai National Park, in Sydney's north, there are many rock engravings, one of which features the Emu, and at certain times of the year, the Emu constellation shines directly over the engraving.

This concept is inspired by these stories and the Emu imagery, which featured in many of the local artists' works.

It is intended this piece would be a stand-alone artwork situated in the proximity of the airport interchange where it would be visible to motorists, shared path users, metro passengers and from the air.

Emu footprints

Theme: Connection to Country
Connection to culture
Where: Across the project footprint

Most Creation and Dreaming stories relate to the physical and spiritual role of the Land as Mother. Everything starts with the Land as Mother and comes from her – people, cycles, seasons, the sky, stars, sunlight, the cosmos - all connected through ceremony, through practical living, and through ecological management. According to creation stories, Emus were Creator Spirits that cared for the land. Emus are featured in the artist's work and rock engravings that can be found around Sydney.

This concept of embedding Emu footprints across the project shows a connection to the land and the creation stories of those that have travelled the route before us.

Emu overbridge / wayfinding

Theme: Connection to culture
Where: Roadside and shared user path

There is a more than 14,000-year tradition of Aboriginal communities in this area using art to tell stories, recount journeys, share knowledge of the land and pass down beliefs. Art is as important to the contemporary Aboriginal community as it was for their ancestors. It's a way to celebrate their relationship with Country and their place within it.

The Emu narrative would be integrated across overbridges and wayfinding. The artworks would be a celebration of the resilience of culture and links themes of people, spirit and land.

Colour and materiality would be explored further during design development in consultation with selected artist(s).

Earth layers - Overbridge / wayfinding

Theme: Connection to Country
Connection to people
Where: Roadside
Shared user path

The geology of the Cumberland Plain is significant for the Aboriginal community. Archaeological finds in the area are primarily open artefact scatters and camp sites. There is a long history of tool making in the area, which indicates a high level of geological and engineering knowledge, and effective use of technology.

This concept depicts this history. It is intended that works would be integrated into the physical infrastructure at bridges, including piers, abutments and throw screens, and for elements like retaining walls and any noise walls. It would also be included in wayfinding elements.

Materiality is to be explored further during design development in consultation with selected artist(s).

Gum leaf canopies

Theme: Connection to Country
Where: Shared path

This concept explores the importance that the landscape plays within Aboriginal culture and the community's ability to read the nuances of land in shade structures located along the shared path.

Colour and materiality will be explored further during design development in consultation with selected artist(s).

Belonging to land – Dharawal six seasons

Theme: Connection to Country
Where: Roadside
Shared user path

Natural resources are a key theme for the project along with the Aboriginal community's ongoing ability to read the natural landscape. This concept is based on the Dharawal Elder Frances Bodkin's Six Aboriginal Seasons. For thousands of years Dharawal people used seasonal indicators to guide when and what to eat and how to live within, and manage, the natural environment.

Travellers would experience the six seasons and seasonal indicators the Dharawal people used.

This concept allows travellers to experience being 'In Country'. Everything starts with the Land Mother and comes from her – people, cycles, seasons, the sky, stars, sunlight the cosmos, all connected through ceremony, through practical living, and through ecological management.

Materiality to be explored further during design development in consultation with selected artist(s).

Proposed next steps

There is a growing global acknowledgement of the power of First Nations' knowledge for enriched placemaking, however this is not yet visible in major public projects in Australia.

The project approach set out in this Report pursues such enrichment, not only through effective engagement with the Aboriginal community, but by going further by conceptualisation and design. It presents a sense of scale and imagination that would inspire and educate locals and tourists alike. Deep cultural stories and history can be experienced leisurely or at speed, on the ground or from the air, and from a range of views and perspectives. The project would bring stories to life in a celebration of culture and resilience. The Dreaming survives in ways we can all respect and appreciate.

The project demonstrates that the local Aboriginal voice has been invited, heard and considered in the early stages of the design. It seeks to inform the eventual shape of the art, design and interpretive opportunities to embed Aboriginal sensibility across the project corridor.

Caveat
The concepts and story boarding provided in this report are indicative only. The story, scale, form, placement, colour, lighting and materiality would need to be explored in depth through ongoing consultation with locally connected Aboriginal Artists, Elders and key stakeholders. The Intellectual Property in the knowledge, stories and Artistic work provided remains with the Artists and knowledge holders.

The concept designs featured in this report carry shared Intellectual Property between Balarinji (design of the concepts) and the Local Artists (Creator and knowledge holders of artistic works, and contributors to concepts).

Concepts would be further developed in greater detail during design development in consultation with selected artist(s).

In relation to this copyright, and to preserve the integrity of interpretation, the local artists and knowledge holders, together with Balarinji, must be involved in further developing any concepts, artistic works or stories from this Report into eventual designs.

> **"Specific grind marks in the rocks and land were used to mark country so you would know when you are in Darug country or travelling into another clan's country.**
>
> **Engravings are very important to the local community. It would be great to see engravings created by local Darug men in natural materials from the area."**
>
> Julie Jones and Corrina Norman-Dadd
> Darug Tribal Aboriginal Corporation

Connection to Country
Design outcomes taken forward into concept design

Planting that is 'of place'

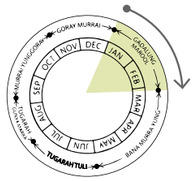
The project would celebrate the seasonal landscape and signatures of country, by highlighting and celebrating the unique flora and fauna cycles that characterise Sydney's six seasons. These seasons are highlighted in the neighbouring Dharawal Calendar' with all of the information and inspiration presented in this section of the report taken from Frances Bodkin's *Dharawal seasons and climatic cycles* publication.

The six seasons offer a myriad of diverse planting opportunities across the study area and within the individual precincts. Following is an exploration of six seasons design outcomes that would be taken forward into delivery.

The Aboriginal cultural interpretation process identified the importance of Aboriginal community's ability to read the natural landscape, and therefore the project would use this strong response to highlight the seasonal plantings across the length of the project celebrating the following six seasons:
Time of Burran (January - March)
_*Gadalung Marool* - Hot and dry
Time of Marrai'gang (April - June)
_*Bana'murrai'yung* - Wet becoming cooler
Time of Burrugin (June - late July)
_*Tugarah Tuli* - Cold, frosty, short days
Time of Wiritjiribin (August)
_*Tugarah Gunya'marri* - Cold and wind
Time of Ngoonungi (September - October)
_*Murrai'yunggory* - Cool, getting warmer
Time of Parra'dowee (November - December)
_*Goray'murrai* - Warm and wet

The following descriptions and diagrams illustrate how the seasonality could be applied across the project at key locations.

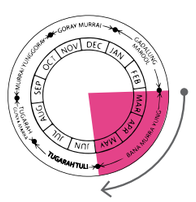
Some examples of seasonal planting palettes that could be adopted is shown on this page also.



Time of Burran

Design narrative
During this hot, dry season, spring flowers have now produced seed and fruit ready to be gathered and enjoyed first thing in the morning (Bodkin, 2008).
Colour - Yellow

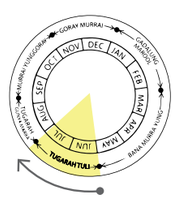
'Hot and dry; eat only fruit and seeds'
Burran (Eastern Grey Kangaroo) start having their babies (Bodkin, 2008).



Time of Marrai'gang

Design narrative
The lilly pillys ripen on the trees. However, when the lilly pillys start to fall, it is time to begin the yearly trek to the coastal areas (Bodkin, 2008).
Colour - Pink

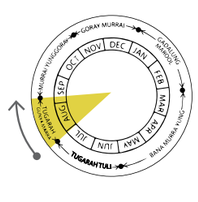
'Wet, getting cooler; time to make cloaks and start the journey to the coast'
Marrai'gang, the tiger quoll seeks her mate (Bodkin, 2008).



Time of Burrugin

Design narrative
The Burringoa - *Eucalyptus tereticornis* - starts to produce flowers, indicating that it is time to collect the nectar of certain plants.
Colour - White

'Cold; time to gather the nectar for ceremony'
Burrugin, the echidna, begin their gatherings (Bodkin, 2008).



Time of Wiritjiribin

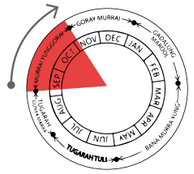
Design narrative
The time of the flowering *Acacia floribunda*. At the end of this time *Acacia decurrens* - flower, which indicates the beginning of the gentle spring rains (Bodkin, 2008). Colour - Yellow

'Cold and windy: build shelters; plenty of fish'
Wiritjiribin (Lyrebird) builds his mounds when season ends (Bodkin, 2008).

Time of Marrai'gang

Time of Burran

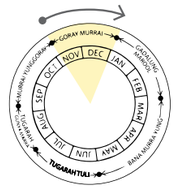
Time of Burrugin



Time of Ngoonungi

Design narrative
A time of the year when the flying foxes gather in the darkening skies, with the appearance of the splashes of the bright red *Telopea speciosissima* (Bodkin, 2008). Colour - Red

'Cool, getting warmer; time for major ceremony'
Gathering of the Ngoonuni (Grey-headed Flying Fox) (Bodkin, 2008).



Time of Parra'dowee

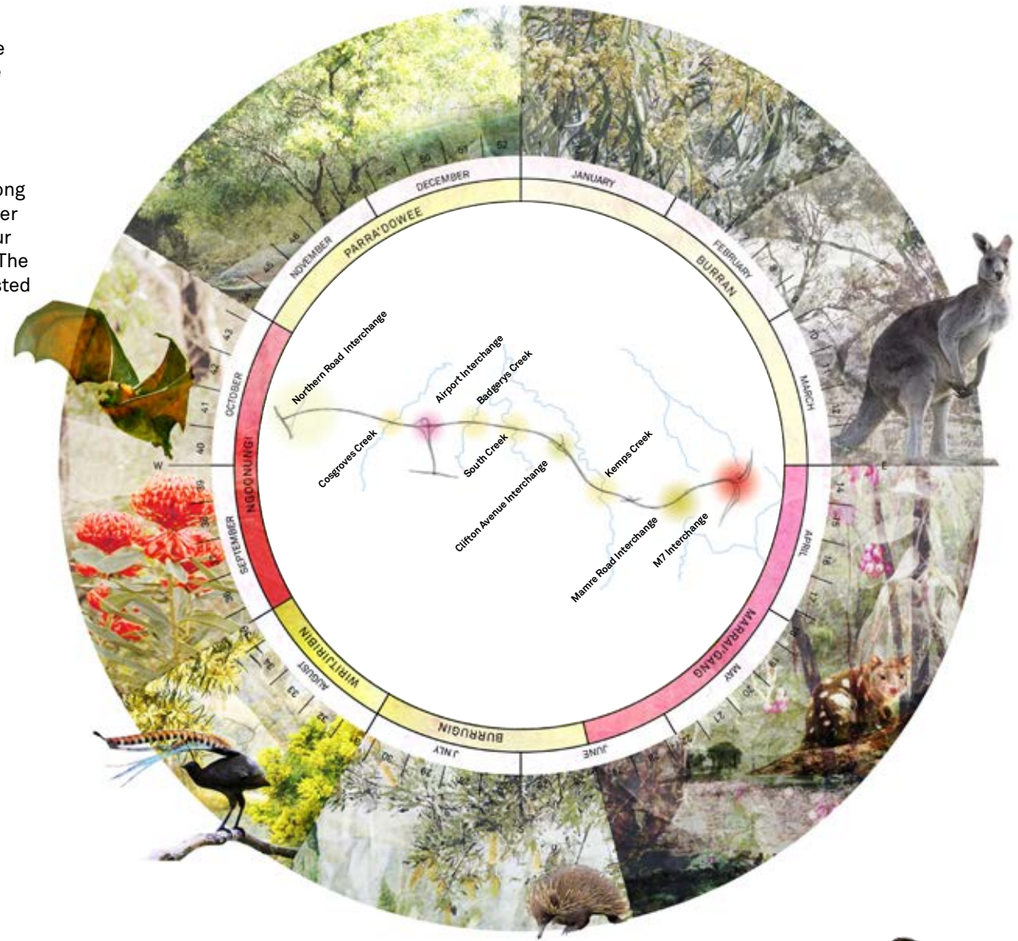
Design narrative
It is the time of the blooming of the Kai'arrewan (*Acacia binervia*) which announces the occurrence of fish in the bays and estuaries (Bodkin, 2008). Colour - Yellow, Cream

'Warm and wet; do not camp near rivers'
Parra'dowee the Great Eel calls his children to him (Bodkin, 2008).

Six seasons planting design
The Aboriginal cultural interpretation plan advocates the meaningful integration of native species into the landscape design to allow the travellers to experience being 'in Country'.

The planting palette would incorporate and showcase flowering species which reflect the changing seasons at these select locations along the project, acting as a subtle but visible marker along with route with vibrant splashes of colour which would celebrate the seasonal changes. The proposed location for these interventions is listed below.

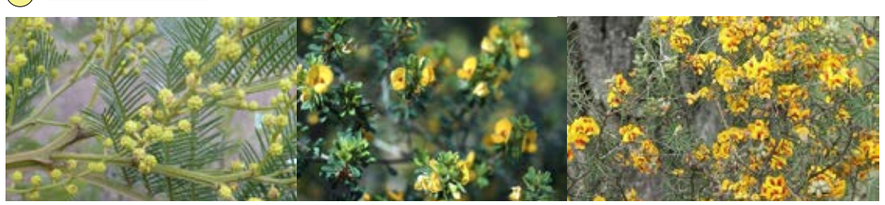
- The Northen Road Interchange:
  _Time of Burran
- Cosgroves Creek:
  _Time of Parra'dowee
- Western Sydney Airport Interchange:
  _Time of Marrai'gang
- Badgerys Creek:
  _Time of Parra'dowee
- South Creek:
  _Time of Parra'dowee
- Clifton Avenue Intersection:
  _Time of Burrugin
- Kemps Creek:
  _Time of Parra'dowee
- Mamre Road Intersection:
  _Time of Wiritjiribin
- M7 Motorway Interchange:
  _Time of Ngoonungi



The six seasons calendar according to the Dharawal people applied to the project.

Time of Ngoonungi

Time of Wiritjiribin



Time of Parra'dowee

Artist's impression: Motorist's view east along M12 Motorway, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Artist's impression: Motorist's view north at Airport Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

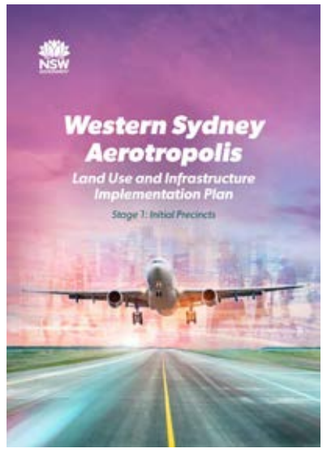
Positively influence the structure of the Western Parkland City

Consider and enhance future land use - Shaping the urban structure and future built fabric

Over the coming decades the region of south western Sydney will experience tautology in land use from what is predominantly a rural and semi-rural landscape towards a 24-hour economy centred around the future Western Sydney Aerotropolis.

The Land Use and Infrastructure Implementation Plan (LUIIP) enables the creation of the Western Sydney Aerotropolis will change the local urban character and involve large land releases adjacent to the project, intended to deliver a wide variety of housing, employment opportunities and open space for the area.

The project would form an integrated network with local and arterial roads, footpaths and natural systems to provide connection, convenience, movement and choice to the local communities as the precincts develop in the future.



Western Sydney Aerotropolis - Land Use and Infrastructure Implementation Plan: Stage 1: Initial Precincts. Department of Planning and Environment.

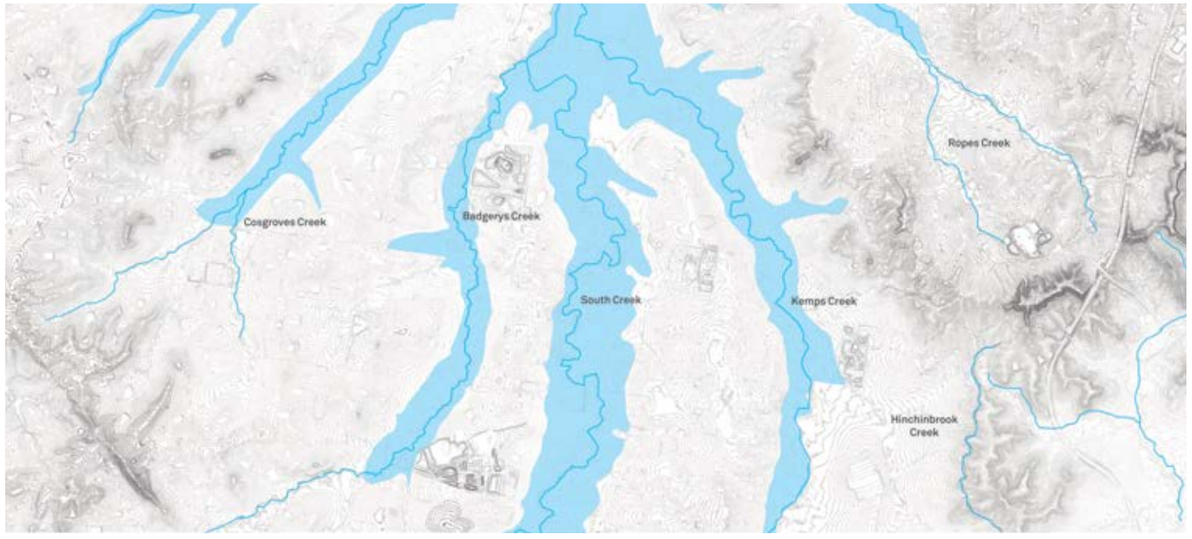
How the project would interact and engage with present and future land uses

The design team has considered how the project would interact and engage with present and future land uses. A sequence of layered diagrams have been prepared to succinctly summarise previous analysis illustrating key relationships and strategic drivers that underpin the urban design approach for the project.

Indicative section along the motorway alignment illustrating the major built and landscape features proposed with the present and future land uses.

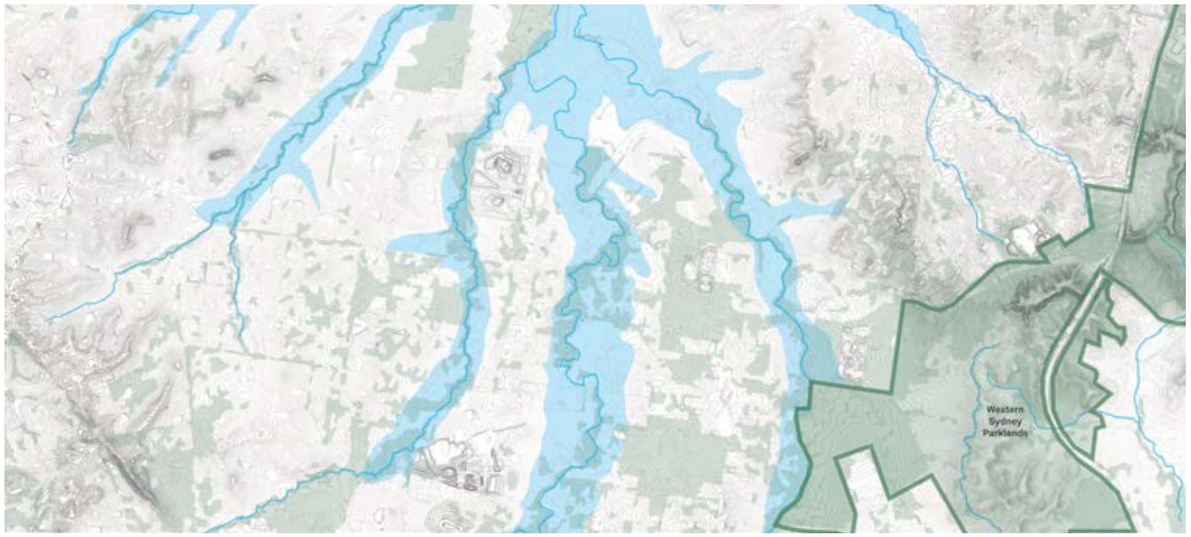
1. Topographical variation

Changes in topographical elevations of up to 60m define the rolling hills and flats of the valley that are bound to the ridge lines at either end of the project footprint.



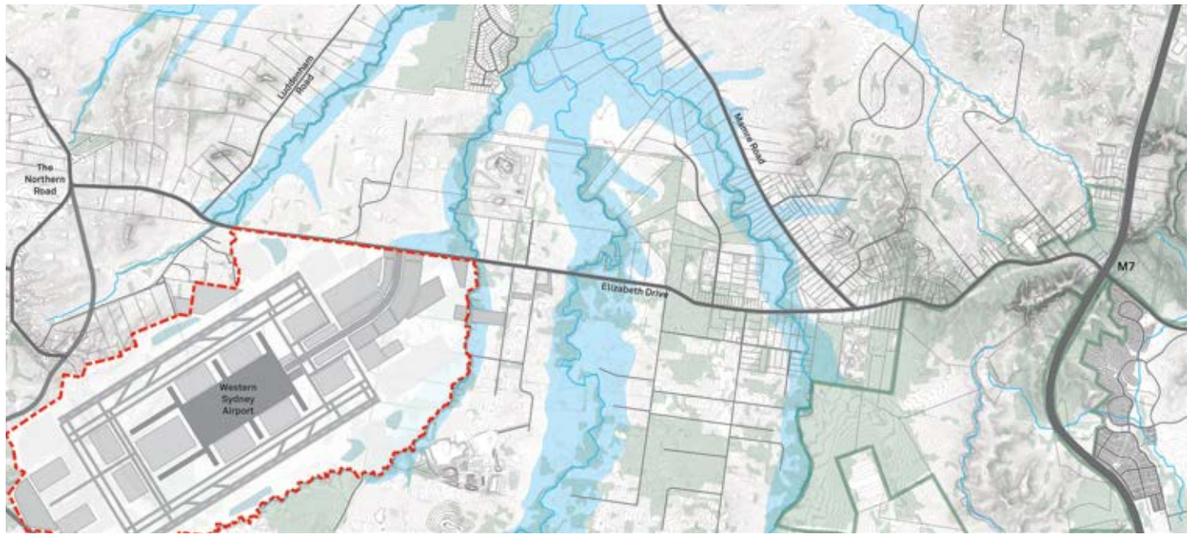
2. Creek corridors and flooding regime

The landscape is prone to inundation and flooding across the project, with significant floodplain extents.



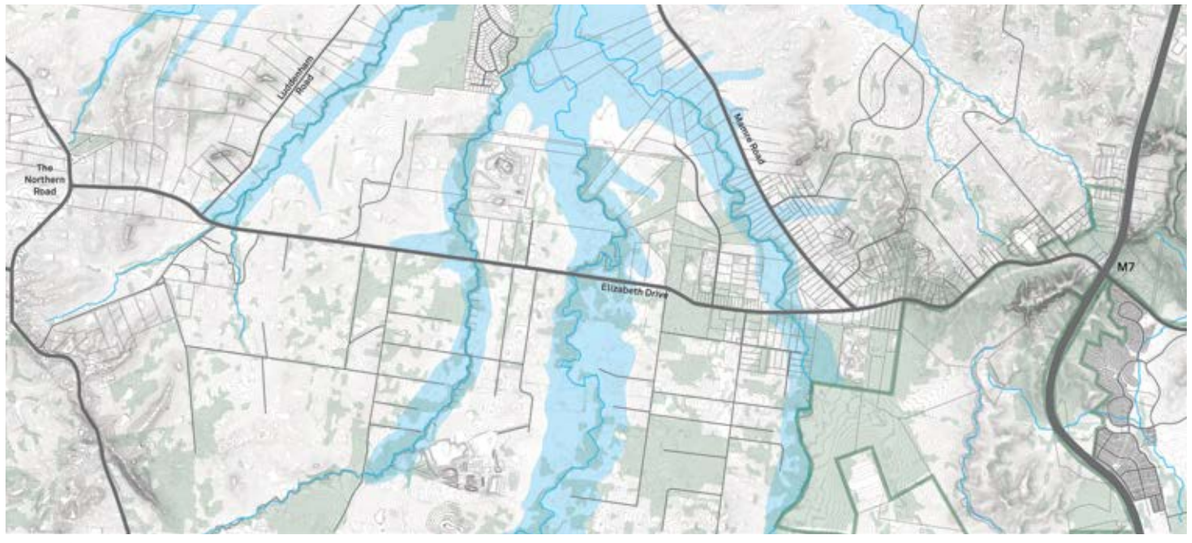
3. Existing significant parklands

Existing canopy across the study area is generally fragmented, degraded and focused around creek lines, which are not publicly accessible. Existing open space is generally focused around Western Sydney Parklands and nearby nature reserves that consolidate remnant pockets of Cumberland Plain Woodland.



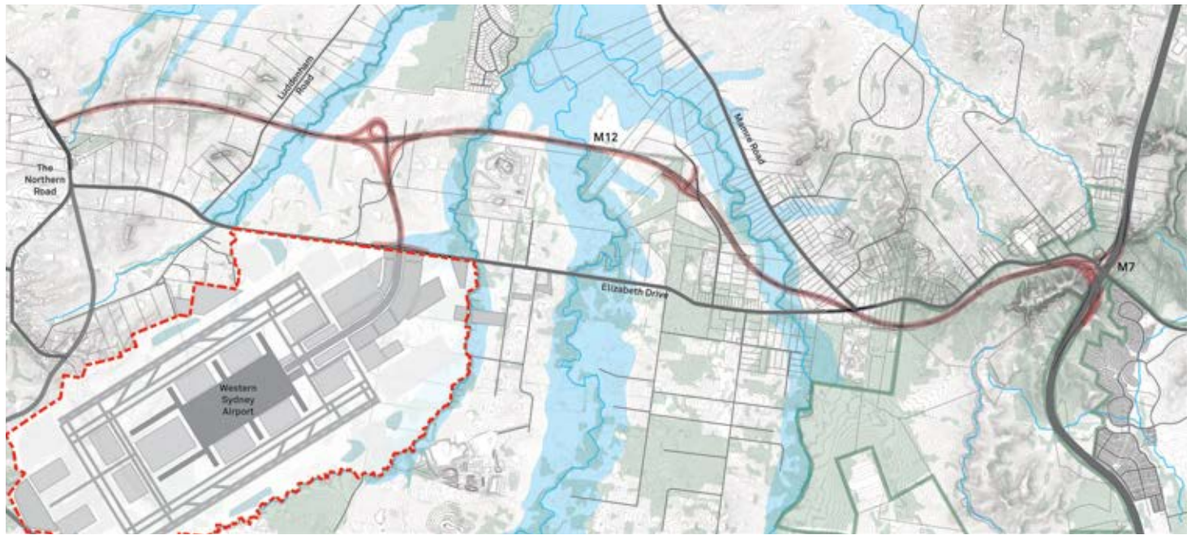
5. Western Sydney Airport - 'Catalyst for change'

The airport (shown here in an ultimate state) will act as a catalyst for development of the Western Sydney Aerotropolis which will transform the land use and identity of the overall study area.



4. Development patterns

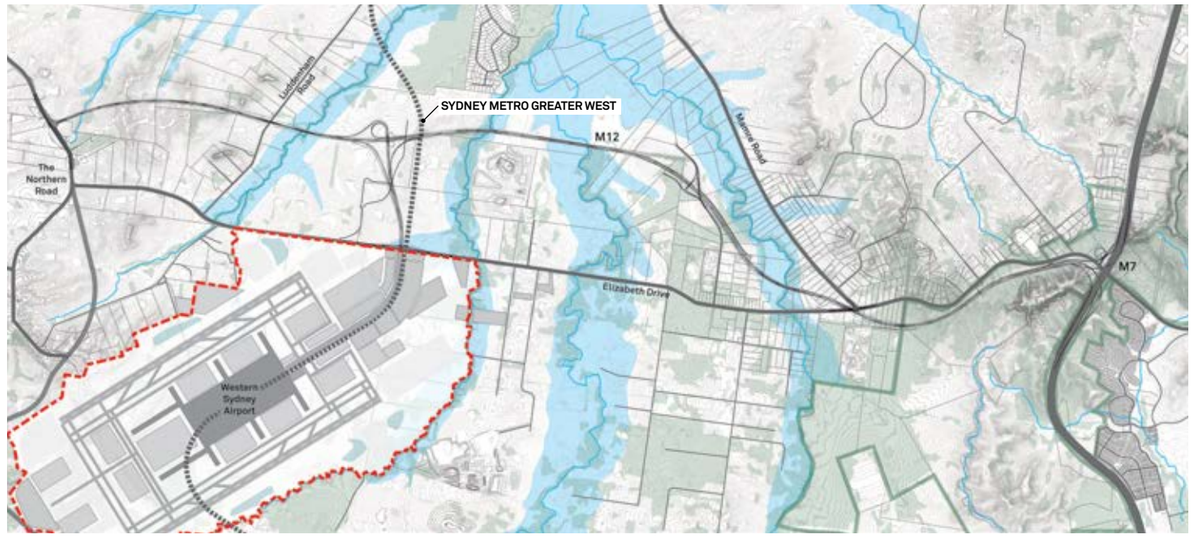
As natural barriers, creek lines and floodplains have defined settlement patterns, land use, lot size and road networks. Only Elizabeth Drive traverses across the study area, providing a connection from the M7 Motorway to The Northern Road.



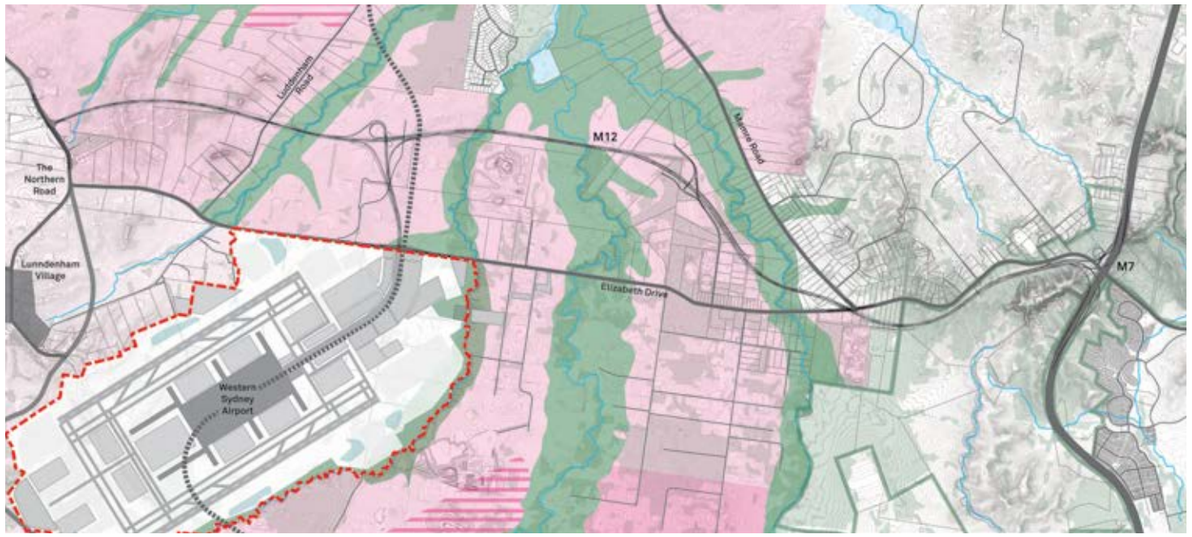
6. The M12 motorway

The project would provide the primary vehicular connection to proposed airport and improve east-west connections for the area between the two north-south arterial roads in the M7 Motorway to The Northern Road.

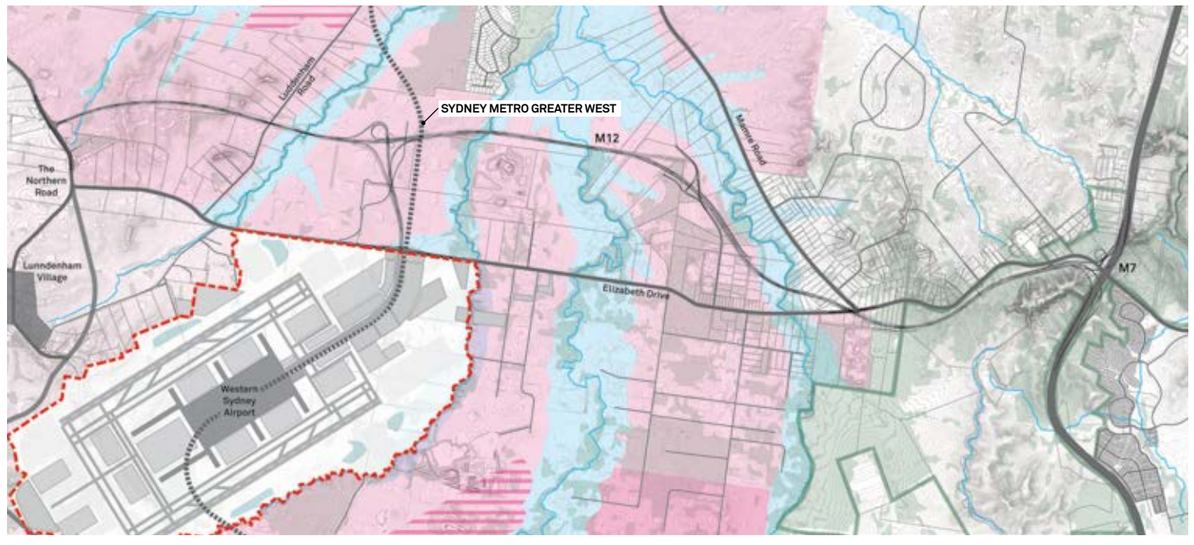
Positively influence the structure of the Western Parkland City



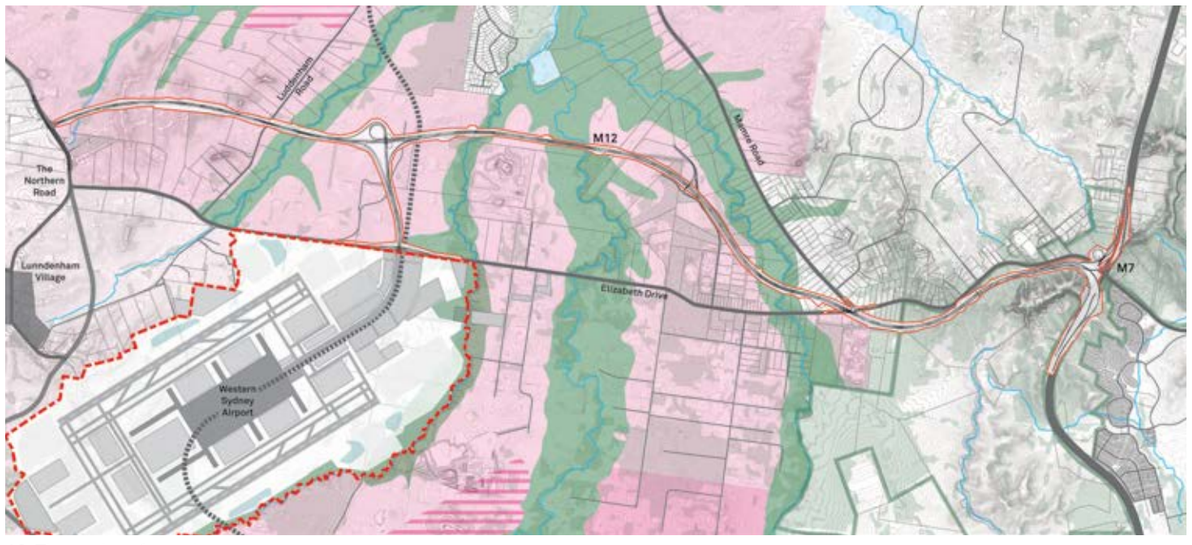
7. Sydney Metro Greater West
The new Sydney Metro Greater West would traverse the project as it connects the airport to Western Sydney, providing for a passenger rail connection between the Main West Line near St Marys and the Main South Line near Macarthur.



9. North south riparian parklands
With flood zones designated as non-urban land in the LUIIP, the project would create an east-west connection across these riparian areas that provides opportunity to restore and connect fragmented riparian corridors in the future and improve public connections to Western Sydney Parklands.

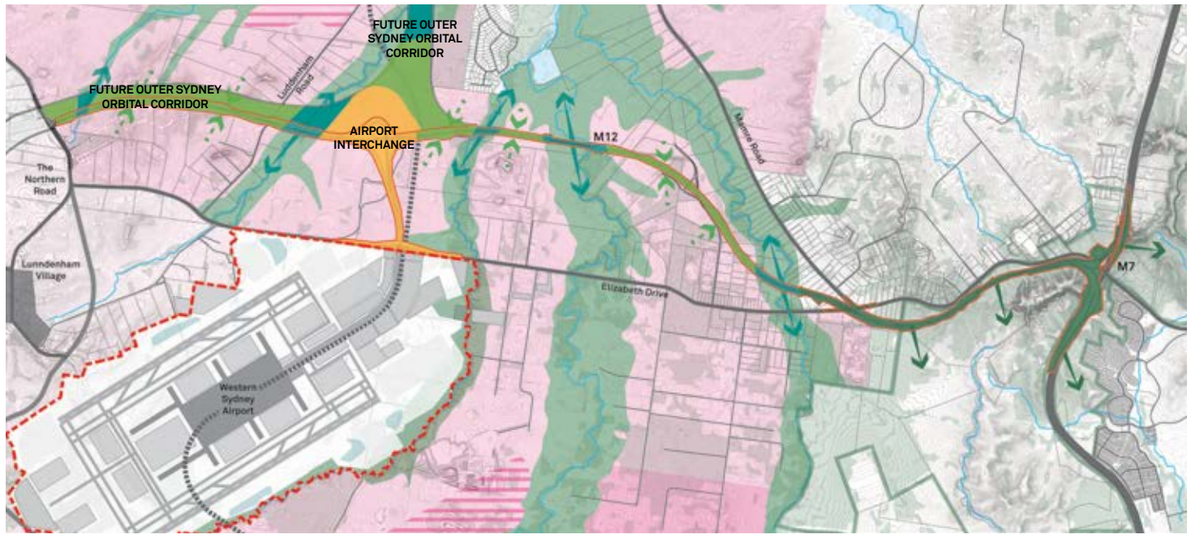


8. Western Sydney Aerotropolis
The LUIIP identifies the re-zoning of rural lands surrounding the proposed airport to predominantly 'flexible employment' (shown in pink). The four main creek corridors are preserved as 'non-urban land'.

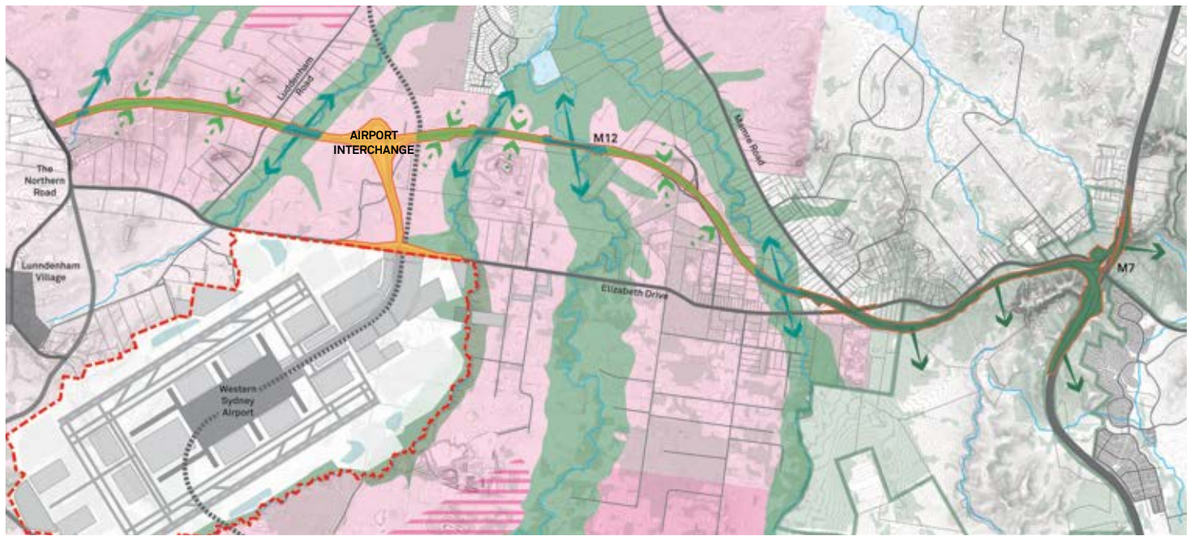


10. The project footprint
As one of the first major infrastructure works of the region, the project footprint would enable the extensive riparian corridors and future open space by providing new pedestrian and cyclist connections, with possibilities to provide access to creeks within the project boundary in the future.

11. Cumberland Plain Woodland restoration
With riparian corridors becoming connectors to potential future open space, the project can also revegetate and restore degraded landscape areas using Cumberland Plain Woodlands species to provide and reinforce a landscape identity for the study area.



13. A scalable concept at the Airport Interchange
With consideration of future infrastructure projects such as the Outer Sydney Orbital and the Sydney Metro Greater West , the landscape and urban design approach at the Airport Interchange must be resilient and scalable so that it can be extended easily to adjacent projects when they are realised in the future.



12. Gateway to the Airport and Western Sydney
In response to the proposed airport, the landscape and urban design approach seeks to create a visual marker that amplifies the sense of arrival and departure to Western Sydney.

14. The project
An urban design and landscape project that is the cornerstone of the future Aerotropolis.

Create a project identity

A project-wide approach to all design elements has been taken to demonstrate a coherent urban design concept for the project.

The underlying theme for project identity is based on the ideas of 'Welcome to Sydney' and a 'Connection to County'. In the near future, the project's surrounding landscape would potentially be the first and last impression of Sydney - Australia's global city.

This section of the report outlines the overall strategies and approach to key elements to achieve a memorable motorway identity, including the creation of gateways, integrating infrastructure with art, and the creation of naturalistic landforms to provide identity.

Following this, there is a section exploring how the project identity can be made through material selections, drawing on local and natural features to inform material palettes, integrated furniture, signage, wayfinding and art, and a furniture concept for the project.

Create gateways
There are a number of instances along the study area where there are opportunities for gateway treatments detailed with integrated art and abstracted landscape. These would occur at motorway entries and interchanges as shown on the adjacent diagram.

To highlight the relationship of the motorway to the future Western Sydney Airport, a structured landscape intervention is proposed to act as a 'gateway' gesture, announcing one's arrival to or departure from western Sydney. The gateway plantings would comprise of grids of native trees aligned to the proposed runway access.
The interchange would likely integrate significant public art element/s which would be of a scale suited to the proposed infrastructure and changing land uses.

Infrastructure as Art
There is opportunity to create moments of integrated art and abstracted landscape features at key points along the project. They would be identifiable markers which would form part of a holistic language unique to the study area but also relative to place.

They would be integrated into the following elements:
_Retaining and noise barriers
_Bridge piers and elements
_Pedestrian bridges and throw screens
_Public domain elements and furniture
_Potential rest stop and activity or observation nodes along the shared path network.

Naturalistic landforms
The project journey is experienced through the landscape transitions through different characters. Landscape vistas engage the user and contribute to the understanding of place. Significant vistas have been identified along the study area, through the manipulation of landform and vegetation we can help create a journey where significant vistas are enhanced, and the undesirable are hidden.

There are a number of significant landscape vistas that would be retained as listed below:
_Riparian corridors
_Large stands of existing vegetation
_Rolling hills
_Water bodies
_Grasslands and plains
_Blue mountains to the project's west.

Precedent examples of large-scale projects with gateways, naturalistic landforms and infrastructure integrated with art.

Drawing on natural features to inform materials
Consultation with the Aboriginal community and archaeological records have highlighted Red Silcrete as a significant material within local Aboriginal culture. It is used for tool making, often heated to high temperatures to make it more conducive to knapping. The raw material turns a deeper reddish tone when heated and is thought that the material would have been traded between cultural groups.

Mudstone was also identified as having local significance to Aboriginal communities. The banding that occurs on the stone (Bringelly shale), along with the use of Red Silcrete, or materials referencing this colour would be incorporated into interpretive landscape elements.

Materials palette
The study area is characterised by earthy tones and natural materials. The project will build upon this and look to use materials and textures which reflect the biological, geological and cultural characteristics of the site. The use of materials such as stone and timber, weathering steel and brushed or exposed aggregate concrete would create a simple but considered palette related to context.

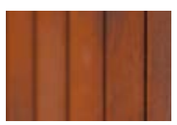
Wayfinding and place making elements would look to use this palette in order to maintain a consistent characteristic.

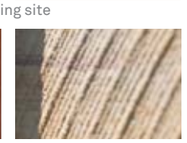
Red Silcrete

Mudstone (Bringelly)

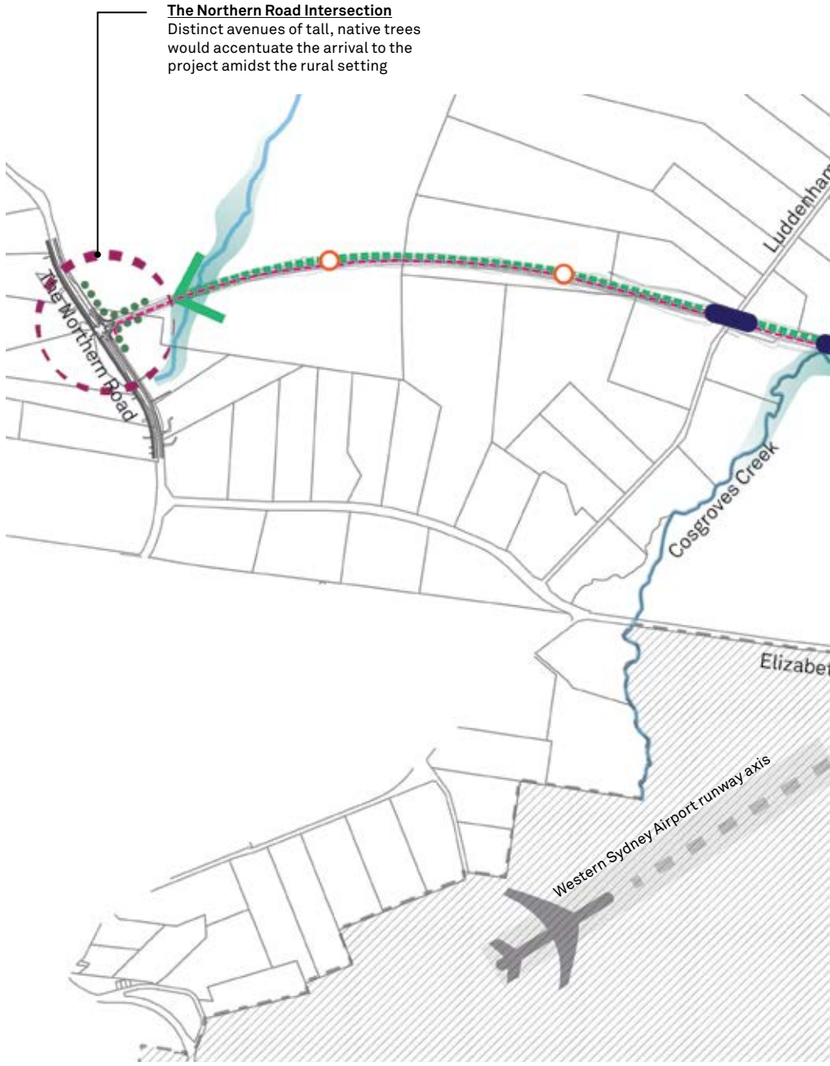
Existing site images

Colour tones from existing site





Baseline motorway materials



Project identity diagram

Airport 'Gateway' Interchange
Landmark tree plantings following the axis of the future runways and major interpretive artwork elements would create a unique 'gateway' experience' that is visible to pedestrians, motorists and air passengers.

Bridges over riparian corridors
Bridges will be identifiable landmarks enabling future parkland connectivity as identified in the LUIIP

Parkland Motorway Interchange
The M7-M12 motorway interchange would reinforce the woodland character of the Western Sydney Parklands

Airport Boulevard
A continuous boulevard of native trees would emphasise the approach / departure from the airport, with the intention that it continues through into the airport site in the future.

- Motorway entry /exit nodes as key landscape markers
- Continuous east-west shared pedestrian and cycle path
- Consistent landscape characters across the project footprint
- Potential heritage interpretation device locations
- Potential major interpretive 'Gateway' artwork location
- Bridge / large infrastructure element

Create an active study area and enhance user experience

Active transport link

The project would deliver a dedicated shared user path along the length of the alignment west of Western Sydney Parklands, an opportunity to enhance healthy communites. The shared user path will act as a connection for cyclists and pedestrians, stitching together the future parklands that would follow the creek lines. The route would connect future communities and act as a commuter, recreational and leisure resource.

For the link to be utilised to its full potential, the project would commit to these active use elements where supported by known land use and continue to work with authorities during detailed design and construction to continue to determine their appropriate location and configuration. Interventions along its length for users to engage with could include the following:

Rest stops and activity nodes
There are a number of locations along the shared user path where activity nodes and rest stops could be incorporated, as the proposed shared user path would connect with existing roads and future path networks as land uses change in an ultimate project state.

Rest stops could be provided for users to join / exit the path as not all users may wish to utilise the full length of the route. The rest stops could include parking facilities, cycle stands, a shade shelter, litter bins, bike pumps or water fountains.

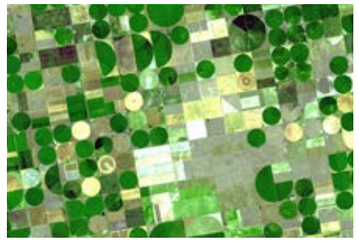
Activity nodes could include fitness equipment, viewing points, or information and artwork boards. This would further enhance the user experience and provide added value to the route.

Baseline infrastructure
If the project determines that rest stops and activity nodes are not reasonable and feasible, there would be a baseline level of amenity incorporated into the share path route regardless. The path would be safe, secure and welcoming to users. There would be adequate lighting, entry and exit points which are accessible to all, and access provision for emergency services.

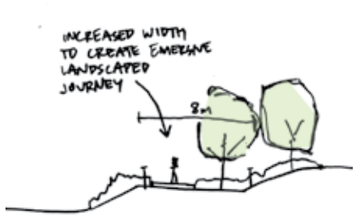
Future development along the study area should look to make additional connections to the shared user path and provide additional amenity.


Precedent examples of active transport corridors, project identity items and physical activity elements.





Examples of varying elements and level of details that user groups of the motorway may encounter.



Experiential pedestrian and cycle journey separated from the main carriageways where possible.

Enhance user experience

A variety of user groups would experience the project at contrasting speeds and perspectives. As speed increases, the level of detail that users perceive decreases. The project offers the opportunity for elements along the study area to take advantage of this change in perception and enhance the user experience with examples listed below.

Shared user path
Shared path users can appreciate information at a smaller scale including wayfinding posts, information boards or storytelling. The project can incorporate these along the shared user path route to help guide users and provide cultural interpretation.

Where possible, shared user paths have also been separated from the main carriageways, maximising amenity for users and creating a safer, more pleasant journey.

Motorists
For motorists the key experience highlights would involve large pieces of infrastructure such as bridges, noise walls, clear views through planting and landforms. Any cultural interpretation on these elements needs to be at a scale that can be appreciated at 80 kilometres per hour or above.

Airline passenger
The project offers the unique opportunity to create a landscape design which can be perceived from the air. Passengers arriving or taking off from Western Sydney Airport would be able to perceive any mass scale planting or landform elements included within the project design, including the gateway planting of grids of native trees aligned to the proposed runway access.

Residents
In the future, much of the landscape either side of the project may become residential or industrial land uses. The project would consider how the motorway is perceived by future residents and make efforts to safeguard the landscape intent against the existing and future land uses and expected landscape conditions, where possible.

Active study area diagram

Motorist
(Key bridges, Structures, Landforms and Maritime, Gateways)

Shared path user
(Significant artworks /place making feature)

Shared path user
(Place / cultural marker, information board)

Shared path user
(Direction / distance marker)

Activity / observation Node
(Approximately every one kilometre. Including marker post, fitness equipment, seating, litter bin, water fountain, lookout point)

Shared path route
(Pedestrians and Cyclists. To include Lighting, seating, water fountains, bike pumps)

Air passenger / motorist / shared path user
(Abstract landscape / landform)

Existing / future neighbour
(Residential / industrial)

Future parkland connections along riparian corridors

Shared path route
(Pedestrians and Cyclists. To include Lighting, seating, water fountains, bike pumps)

Western Sydney Parkland Trails

Existing shared pedestrian and cycle paths

Re-establish natural systems

The Cumberland Plain of Sydney has been an important agricultural resource for Sydney since early colonial settlement and most likely earlier. Extensive vegetation clearing along with intensive farming practices have led to the gradual decline in native vegetation and the degradation of waterways.

The project has employed the following ecologically based strategies to re-establish a resilient natural environment.

Species selection
The project would prioritise the use of Cumberland Plain Woodlands and local native species sourced from locally sourced seed (where possible).

The project would seek to balance the vision for the Western Parkland City with the operational requirements of the Western Sydney Airport. Careful consideration would be given to ensure landscape works are compatible with the relevant Civil Aviation Authority (CASA) safeguards, to manage the risk of wildlife strikes in vicinity of the airport.

Water quality
There are a number of new water quality control basins as part of the project and the project would use riparian vegetation to help filtrate water captured along the project before it moves into water courses. This is especially relevant along existing creek lines considering the extent of future development which would take place across the South Creek catchment.

Riparian fingers
The dendritic pattern of Cosgroves, Badgerys, South (Wianamatta) and Kemps Creeks fan across the corridor. These riparian zones are the life source of the Hawkesbury River and are essential fingers of habitat, movement, recreation and amenity across the study area.

From verge edge to creek, from Cecil Hills to Luddenham, the project would act to sustain the catchment of the Hawkesbury River by cleansing and recycling runoff; natural creek lines would be preserved and improved, with new ribbons of habitat and access provided by the project.

Green grid
There is opportunity to draw upon the aspirations of the work done by the Government Architect on the *Sydney Green Grid* in regard to promoting the creation of a network of high-quality open spaces that supports recreation, biodiversity and waterway health within the project.

The project would create a motorway and shared user path network that connects existing services, and provide for future strategic, district and local centres, public transport hubs, and residential areas.

Landscape typologies

The project would pass through multiple vegetation communities that form part of the Cumberland Plain Woodlands. This has informed the plant selection and arrangement which is described further within this section of the report.

The general structure and character/s of proposed vegetation can be categorised into the following types:

Open Woodlands

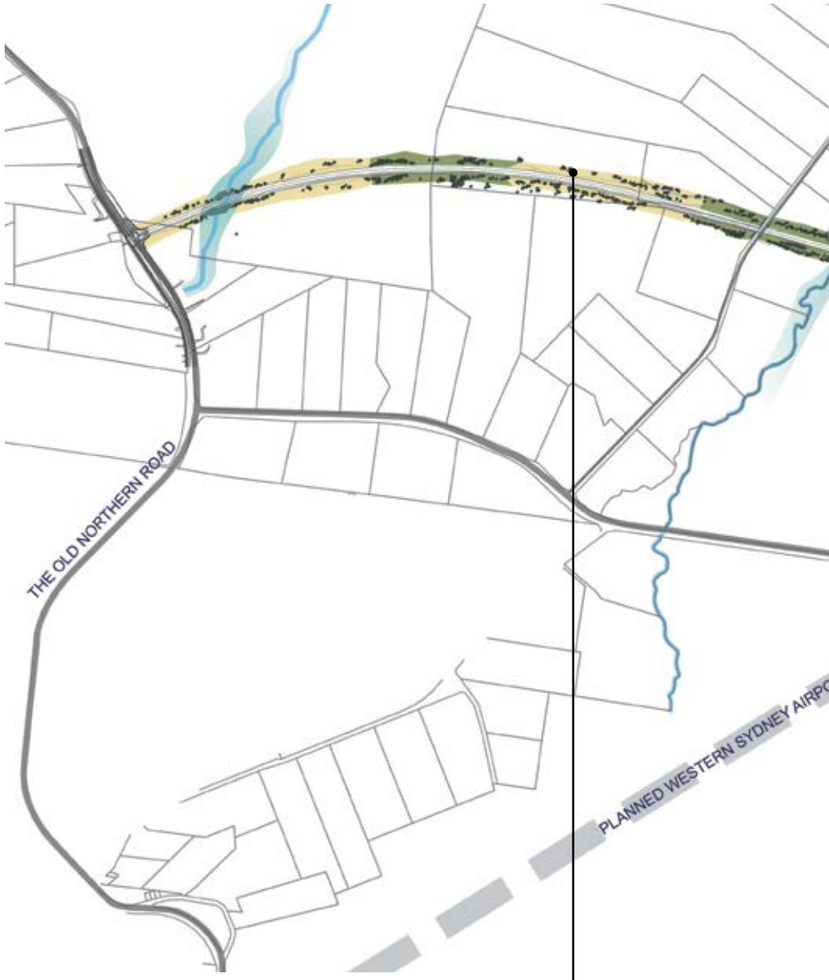
Native Grassland

Riparian Forest

Stands of trees

Gateway Landscape

The following diagram shows the landscape concept for the project, with a description of the proposed vegetation character types.



Natural systems diagram

Native grassland
Native grasslands derived from clearing of the woodland and forest are part of the Cumberland plain woodland community. They are void of any canopy vegetation

Gateway landscape
A clear juxtaposition in pattern to the existing Cumberland Plain Woodland will be created to enhance the arrival experience at key node points along the study area.

Stand of trees
Tree-dominated stands of the community are largely relics or regrowth of originally taller forests and woodlands, likely to have had scattered shrubs and a largely continuous grassy ground cover.

Riparian forest
A tall mixed open forest to woodland distinguished by its dominance of either a mixed or single species eucalypt tree layer, with few She-oak or Swamp Mahogany trees, and a prominent ground cover of soft leaved herbs and grasses.

Open woodlands
Typically comprises an open tree canopy, a near-continuous ground cover dominated by grasses and herbs, sometimes with layers of shrubs and/or small trees.

Artist's impression: Shared user path view north-east at Airport Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Artist's impression: Aerial view south-east across Range Road, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Urban design elements

Throughout the project, the structural elements would be a factor which reinforces the projects identity and perceived quality for road users, adjacent residential properties, pedestrians and cyclists. The design of all structures has been undertaken in consideration of all other elements such as topography, landscape works, local land-use and provides a cohesive and unified design outcome.

Earthworks design

The project would address the need for the design of the road and its earthworks to respond sensitively to landform and natural topography by the following:

_Optimising cut and fill embankments, flattening cut batters and rounding out the tops and edges of cuts to blend the cutting within the surrounding landscape. Where possible, the top embankment of any cut would be laid back to 3H:1V with all tops and edges 'rounded off' and 'feathered' into the adjoining landform. This principle is also highlighted within the landscape design approach section of this report with typical sections illustrated.

_Integrating the road landscape into existing vegetation patterns by maintaining the vegetation patterns of this landscape, retaining views and connection with the landscape

_Blending all water quality control ponds with adjoining landscape through appropriate earthworks design using naturalistic formations.

Shared user path alignment

Landscape cuttings would aim for a gradient of 1:4 where possible (maximum 1:2), with densely planted medians to assist with headlight glare issues, and shared user path alignments located on widened benches rather than adjacent to the main carriageway.

Experiential pedestrian and cycle journey

By separating and maximising the distance between shared user paths and carriageways, there is opportunity to create a safer, more pleasant journey for the pedestrian. Landform and planting can be utilised to create a sequence of interesting moments along the journey.

Excess fill opportunities

If available in delivery, excess fill would be utilised within the project footprint as an alternative solution to any noise barriers and extended earthwork formations, which is a more sensitive approach both visually and ecologically.

Excess fill batters would be a minimum of 1:3 grade and planted out to help mitigate noise pollution, and potentially used to screen views of the motorway in residential areas.

Landscape design

The general approach to` landscape design across the project is essentially to maximise 'green volume', preserve important view corridors, and create meaningful landscape interventions wherever space permits. The project footprint is generally greenfield throughout, with a consistent width along the majority of the project.

Where space permits, large areas of new tree planting would be incorporated on both sides of the motorway that would, in time, present a continuous green canopy above the edges of the motorway alignment and contribute to the vision of the Sydney Green Grid to promote the creation of a network of high-quality open spaces that supports recreation, biodiversity and waterway health.

Within the project footprint itself, widened median areas would be planted and seeded with low maintenance massed plantings of low native shrubs and grasses, with trees at significant locations where safety offsets permit.

At significant interchanges along the project, extensive tree canopy would be developed in a grid arrangement to maximise 'green volume' as counterpoint to the scale of the new infrastructure at these locations.

Principles used in the landscape concept design of the upgrade are summarised in the following subsections.

Macro scale

The landscape design needs to be strongly built on the key attributes of the area and the treatments must be simple and consistent. The aim is to ensure the integrity of the landscape journey along the Motorway and the wider Sydney Motorway network is maintained and enhanced, whilst fitting with the surrounding scenic landscape quality.

_Strengthen and enhance the existing landscape patterns experienced along the route.

_Minimise the extent of clearing and earthworks in the upgrade cross section design to conserve existing vegetation communities and fauna habitat

_Integrate measures required to conserve natural drainage crossings of the route and provide fauna movement corridors under and over the road alignment where required

Micro scale

_Use vegetation treatments appropriate to reinforce key landscape patterns

_Generally base plant species selection on those growing locally within the identified landscape areas described in the EIS, consistent with safety (eg headlights, frangibility) and functional (eg erosion control, species availability) requirements

_Blend all water quality control ponds with adjoining landscape through naturalistic earthworks formations

_Blend cut and fill formations into adjoining terrain where possible

_Use landscape solutions at interchange gateways that draw upon the special qualities of place.

Precedent examples of high quality roadside urban design elements.

Net increase in trees

In accordance with the SEARs listed in Section 01 of this report, the project must estimate the number of trees (not covered by a biodiversity offset strategy) to be cleared by the project, and for those trees to be cleared, describe how the project would achieve a net increase in tree canopy as part of the project's landscape works strategy.

Based on a desktop assessment of recent aerial photography, approximately 960 trees (excluding trees covered by a biodiversity offset strategy) would be removed within the project construction footprint.

As part of the landscape revegetation strategy for the project, the project would draw upon existing vegetation patterns and characteristics of vegetation communities to implement new tree planting as part of the landscape design and project works, providing tree canopy where space permits within the project boundary. This would provide a net increase in trees for the project.

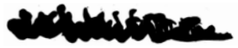
Landscape typologies

The approach to the provision of vegetation along the project has sought to draw upon existing vegetation patterns and characters of vegetation communities that belong to the broader group of the Cumberland Plain Woodlands which are identified in the Biodiversity Assessment Report (BAR) as part of the EIS.

Informed by an understanding of the pre-European condition as well as the existing and proposed development patterns, a series of landscape typologies have been developed and applied across the project.

The intention of these typologies is to set a general structure and approach for planting design that enhances motorists and pedestrians' / cyclists' journey as part of a broader landscape. The journey along this east-west corridor is typified by the repeating transition between the open plains, woodlands and the forested creeks.

The typologies are as follows:
_Open grasslands
_Grassy woodlands
_Riparian / River Flat Forests
_Shrubby woodlands and forest
_Gateway landscape.

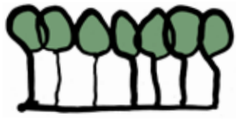


Open Grasslands
Clearings and open rural landscape with sparse tree and shrub layers and high cover of grasses and forbs.

Grassy Woodlands
Open grassy woodlands that comprise the Cumberland Plain Woodland.

Riparian / River Flat Forests
Open eucalypt forest forming narrow ribbons along streams and creeks that drain the Cumberland Plain.

Shrubby Woodlands and Forest
Open eucalypt forest with an understorey that varies between dense shrubs and low sparse shrub cover and an abundance of ground cover and grasses.



Gateway landscape
Structured forestation of selected tree species as a gateway to the airport.

Landscape typologies.

Water quality control ponds

There are numerous water quality control ponds throughout the upgrade. The objective is to create water quality control basins that are an asset to the visual and ecological amenity of the area as well as ensuring adjacent areas are not adversely affected by runoff during the construction and operational phases of the project.

Shape
Water quality control ponds would be designed as a shape that is informal and responds to local conditions. Where possible, margins of basins would be graded to blend with existing adjoining landform.

Basins would be revegetated with selected native grasses and sedges, generally with direct planting of containerised trees and shrubs at selected locations.

Road furniture

Various types of road furniture would be required along the upgrade route. This includes signage (eg regulatory, directional), vehicular barriers, gantries, security cameras, emergency phones, services boxes and lighting. Road furniture, particularly signage and gantries would be the most visible element along the new motorway.

These elements are an accepted part of the driving experience, but they need to be designed well to be apparent, but not obvious or be 'features' in the landscape. This is particularly true in this area of scenic quality.

Key design principles for road furniture throughout the project are as follows:
_Road furniture needs to be designed as a suite of architectural elements, that is visually simple and refined
_Ensure an integrated approach to the location of road furniture elements in the context of the overall road experience.

Precedent examples of high quality roadside urban design elements.

Precedent examples of high quality roadside urban design elements.

Urban design elements

Fencing, safety handrails and anti throw screens

Where it is determined that fencing, safety handrails and anti throw screens are required on the project to satisfy safety requirements, the design would be developed to minimise the impact on views across the carriageway as much as possible.

The design of these elements must also consider and be integrated with the outcomes of the Aboriginal 'Connection to Country' art process.

As with the other structural elements, these elements would be designed according to the following design principles:

- The screen would be a peripheral element to the true function of the bridge and would avoid obscuring the superstructure
- Screen posts would be integrated and align with the safety barrier posts perpendicular to the bridge
- There would be a neat, elegant transition to the bridge barrier safety screens. The screen would taper to meet the barrier and avoid any abrupt stepping
- The design, detailing and materials shall be integrated with all other urban elements
- Fencing and safety handrail systems shall be minimal and elegant, with a simple materiality and appearance that is coordinated with other structures and materials
- Anti vandalism and graffiti would be considered in the design of fencing and safety handrail finishes and maintenance.

Retaining walls

As with the bridges, the fundamental urban design approach for retaining walls is simplicity and refinement without any unnecessary embellishment or decoration.

The retaining walls have been considered as part of the wider family of road infrastructure elements including the bridges and headlight screen and noise barriers (where required) to be consistent with the overall visual language of the project.

Where appropriate, retaining walls would be considered as part of the integrated Aboriginal 'Connection to Country' art process.

The key design principles for retaining walls throughout the project are as follows:

- All retaining walls must be designed to be a suite of elements
- Retaining walls must be designed as a simple, robust and integrated element
- Neutral in colour with non-reflective finishes
- Wall tops are to form continuous smooth flowing lines with no stepping
- Wall plan layouts are simple, with straight or large radius curved alignments, without sharp changes of direction
- All retaining structures be fully integrated into the adjacent landform
- Fixings for retaining structures must be concealed or expressed as part of the structure's design if concealment cannot be achieved.

Crime Prevention Through Environmental Design (CPTED) - Principles and project considerations

The urban design has sought to minimise or prevent opportunities (and fear of) for crimes by implementing CPTED principles throughout the project.

The CPTED principles have guided the approach to all built elements including the following key outcomes:

- Maximising natural surveillance and sightlines for shared path users and pedestrians under/over bridges and near bridge abutments.
- Preventing access to operational areas through fencing and built edges.
- Provision for lighting along all paths (refer to principles for lighting)
- Design of clear, predictable routes to avoid entrapment locations supported by wayfinding and signage.

The outcomes listed above form the basis for the concept design as described in the report. Further consideration and review must be undertaken for all future design stages of the project.

Noise barriers and headlight screens

The noise barrier analysis identified that noise barriers may potentially provide a reasonable noise benefit.

Other design factors such as cost to benefit ratio, constructability, and overhead power line clearance may result in these barriers being considered unfeasible and/or unreasonable. Other considerations from a community perspective may include:

- Potential visual or urban design impacts
- Potential overshadowing impacts
- Potential community safety/crime prevention considerations such as isolated walkways
- Form of future development in the area
- Preferences of the local community as gauged during the community consultation phase.

The noise barriers identified as potentially reasonable would be considered in conjunction with other mitigation measures for their feasibility and reasonability during the detailed design stage of the project.

If it is determined that headlight screens or noise barriers (including noise mounds and landscape buffers) are required for the project, then the design of barriers need to enhance the driver experience and contribute to a considered and choreographed journey along the project.

Headlight screen and noise barrier designs must also be integrated with the outcomes of the Aboriginal 'Connection to Country' art process.

The local context and setting of the project make it especially important that views of the surrounding natural environment are maintained as much as possible. Where requirements dictate, the use of transparent noise barriers would take precedence.

The design of noise barriers and headlight screens would be characterised by the following:

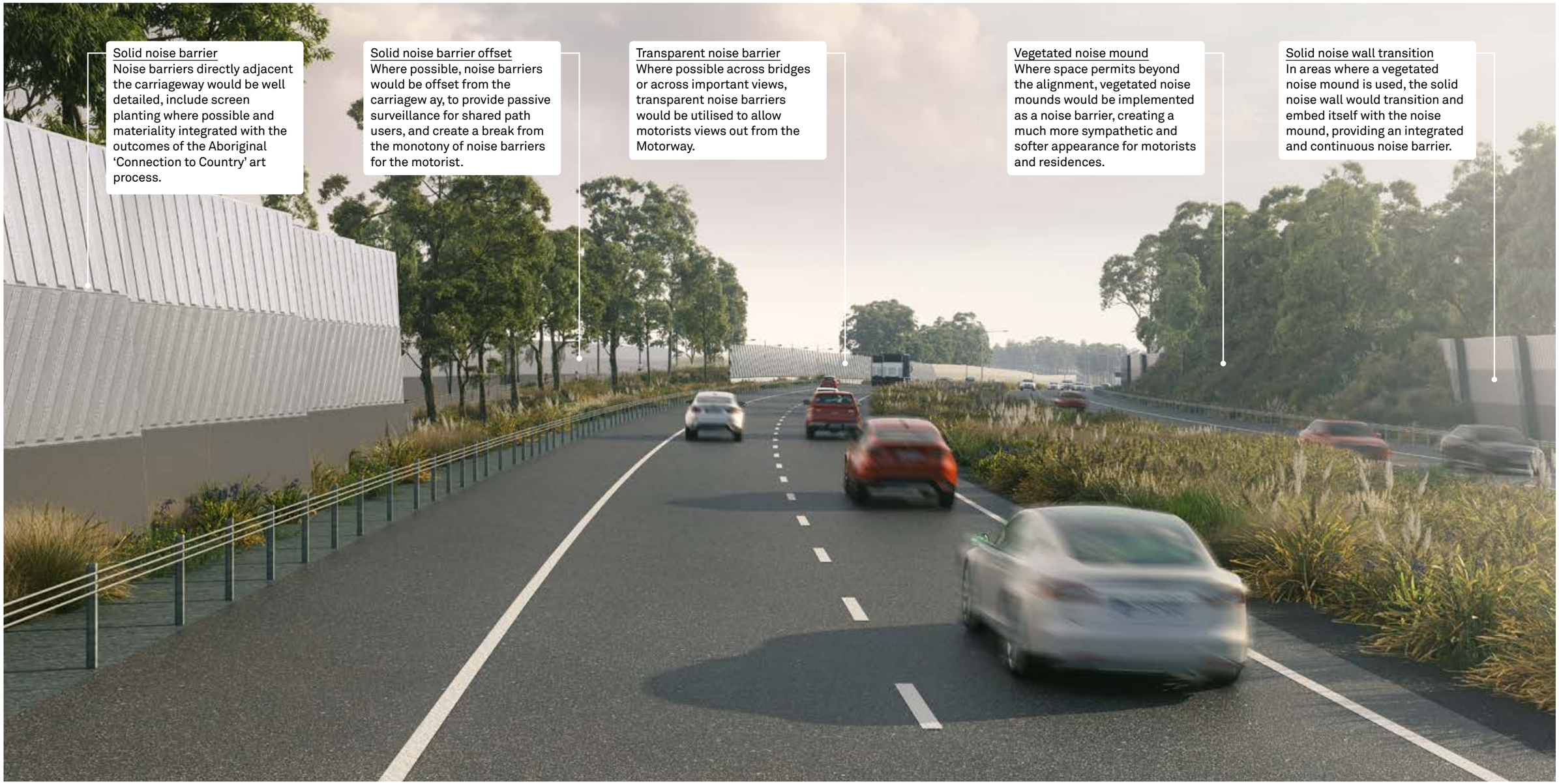
- Simple, uncomplicated and consistent treatments
- Smooth and gradual transitions, with consistent alignment with tops generally running parallel with the road alignment, without stepping
- Providing sufficient space for screen planting to both sides where possible
- A consistent design approach similarly applied to other road elements, a considered palette of design elements, materials and colour
- Using noise earth mounds and landscape buffers instead of noise structures, where reasonable and feasible.

Other noise mitigation measures (such as low noise pavement, at-property treatment) are discussed in Appendix K of the EIS.

The below precedent images highlight the level of design and quality of potential noise barriers and headlight screens on the project.

Indicative potential noise barriers
The artists impression on the following page illustrates the potential design of noise barrier types that could be provided if determined reasonable and feasible for the project.

Precedent examples of high quality roadside urban design elements.



Artist’s impression illustrating the potential design of noise barrier types that could be provided for the project, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Artist's impression: Aerial view west across M7/M12 Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Bridge design

Bridges are often the most visible and enduring legacy of road projects. The project includes a number of bridges along the corridor, and a refined and elegant structural design has been adopted. The key design principles for bridges throughout the project are as follows.

Unobtrusive appearance
The bridges would be visually unobtrusive allowing the landscape and environmental attributes of the area to be fully appreciated by road users. The bridges have clean lines and incorporate piers and abutments sympathetic to the structural form. Pier headstocks have not been used, unless unavoidable. All piers have been architecturally profiled and shaped.

Bridge designs include a high standard of bridge architecture. The design of these structures has carefully considered the form, span, profiles, finishes and pier rhythm in conjunction with well-coordinated detailing.

Coordinated design of bridges
The design, form, materials and finishes of the bridges are consistent across the project to ensure visual continuity, with variety where required to punctuate the design or provide visual interest.

Transparency
The bridge superstructure has been designed to be as transparent as possible to optimise views through the bridge to the landscape beyond, including minimising the depth of structure and refining the bridge abutments. The bridge designs wherever possible "float" above the landscape rather than being grounded on a large vertical abutment.

Integrated art
The main bridge elements would integrate indigenous art and sculptural forms, following the outcomes of the Connection to Country art process.

Access to creeks and active transport networks
The design of bridges include would not preclude accessibility to the creek lines for active transport and potential future north/south pedestrian connectivity.

Bridge typologies

Bridges (BR) throughout the project have been grouped together according to their urban design appearance, importance, engineering function, and visibility to the general public and road users.

- M12 / M7 Interchange
  The design intent has sought to achieve a refined approach that incorporates recognisable elements of the existing M7 Motorway Lighthorse Interchange. The proposed Interchange includes two elevated bridges which are to be constructed using precast segmental sections, with column piers with a tapered capital.

- Creek bridges
  Four bridges spanning over creeks all share the same construction and engineering design, and allow potential for subtle variation in architectural finish and artistic interpretation.

- M12 overbridges
  The four bridges over the project carriageways would be highly visible and all feature an extended off form, tapered leg piers, that allows for and integrated artwork and finish. The design also has a similarity of form with the pier designs along the M7 Motorway.

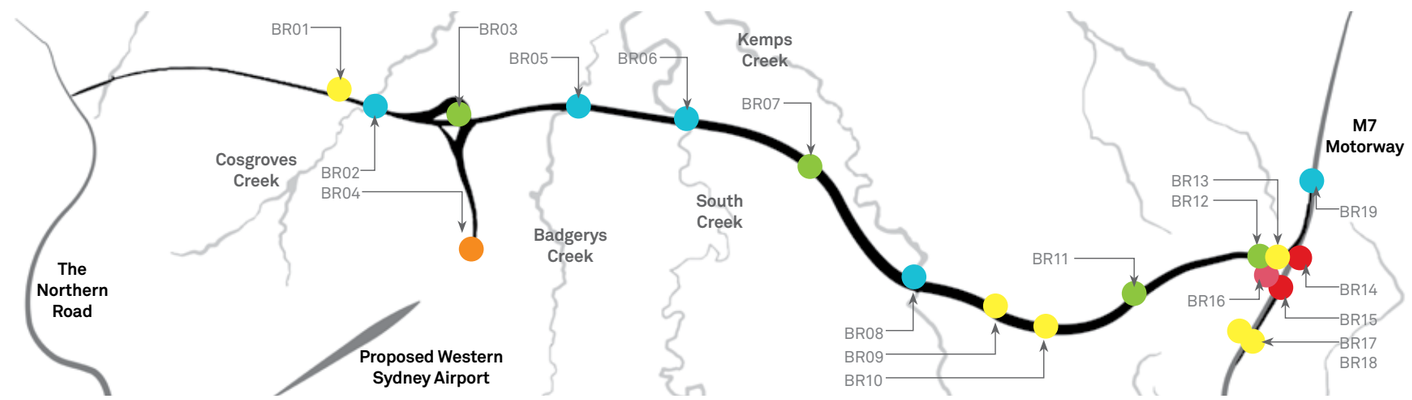
- M12 over local / arterial roads
  The six bridges over local and arterial roads would feature an extended off form, tapered trouser leg pier, that allows for and integrated artwork and finish, except for Bridges 13, 17 and 18 which do not require piers. The design also has a visual similarity with the M7 Motorway bridges.

- Gateway bridge
  The bridge connection to the future Western Sydney Airport would be treated individually. The bridge shares the same pier detail as the M12 Motorway overbridges and M12 Motorway over local roads bridges but would feature a set of curved retaining wall abutments, which would provide a new entry portal to the Airport.

- Shared user path bridge
  With a high level of visibility, the extension of existing steel truss bridge over M7 Motorway would adopt a matching form and quality.

Typical details for each typology are included within this section of the report.

No.	Bridge name	Bridge superstructure type	Bridge typology
BR01	Bridge over Luddenham Road	PSC Super T-girder	M12 over local / arterial roads
BR02	Bridge over Cosgroves Creek	PSC Super T-girder	Creek bridges
BR03	Airport access road overbridges	PSC Super T-girder	M12 overbridges
BR04	Twin bridges on Elizabeth Drive over airport access road and airport railway line	Precast segmental concrete using span-by-span construction method	Gateway bridge
BR05	Twin bridges over Badgerys Creek	PSC Super T-girder	Creek bridges
BR06	Twin bridges over South Creek	PSC Super T-girder	Creek bridges
BR07	Clifton Avenue overbridge	PSC Super T-girder	M12 overbridges
BR08	Twin bridges over Kemps Creek	PSC Super T-girder	Creek bridges
BR09	Twin bridges over Elizabeth Drive	Precast segmental concrete using span-by-span construction method	M12 over local / arterial roads
BR10	Twin bridges over Range Road	PSC Super T-girder	M12 over local / arterial roads
BR11	Water Tower access road overbridge	PSC Super T-girder	M12 overbridges
BR12	Bridge over Elizabeth Drive to the M7 Motorway northbound	Precast segmental concrete using span-by-span construction method	M12 / M7 Interchange
BR13	Bridge over Wallgrove Road to the M7 Motorway northbound	Composite steel box girder	M12 over local / arterial roads
BR14	Bridge over the M7 – M7 Motorway Southbound to M12 Motorway Westbound	Precast segmental concrete using span-by-span construction method and balanced cantilever method	M12 / M7 Interchange
BR15	Bridge over the M7 – M12 Motorway Eastbound to M7 Motorway Southbound	Precast segmental concrete using span-by-span construction method and balanced cantilever method	M12 / M7 Interchange
BR16	Shared user path bridge over the M7 Motorway Northbound exit ramp	Steel truss structure with concrete deck	Shared user path bridge
BR17	Bridge over road reserve for the M7 Motorway interchange southbound entry ramp	PSC Super T-girder	M12 over local / arterial roads
BR18	Bridge over road reserve for the M7 Motorway interchange northbound exit ramp	PSC Super T-girder	M12 over local / arterial roads
BR19	Bridge over Ropes Creek	PSC Super T-girder	Creek bridges



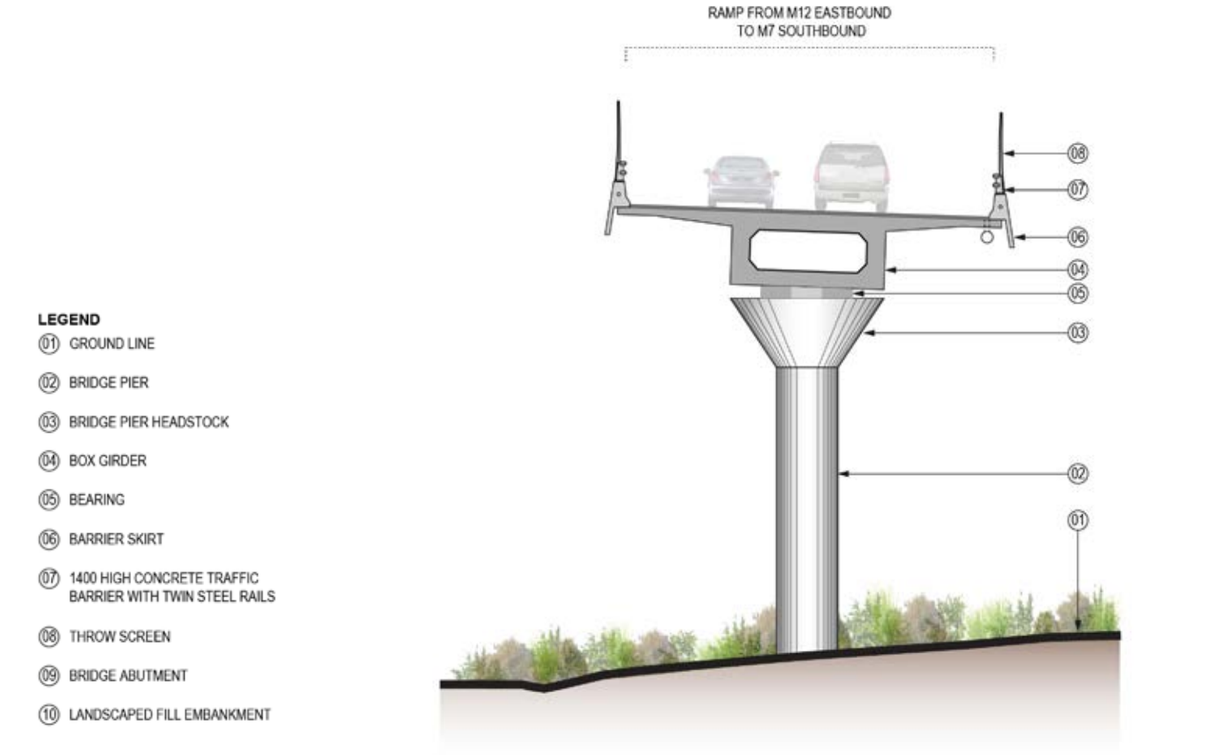
Bridges - Key plan

Urban design elements

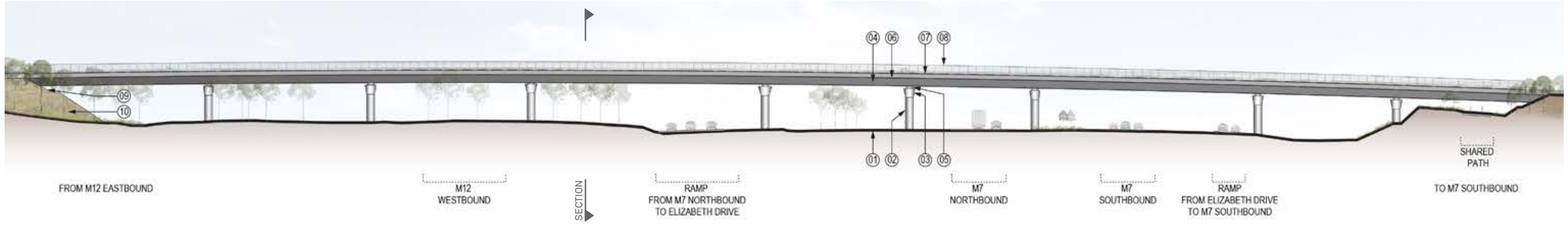
M12 / M7 Interchange bridges

M7 Light Horse Interchange

Pier detail



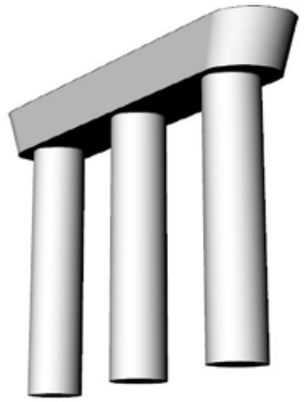
Section - BR15 - Bridge over M7 – M12 Eastbound to M7 Southbound



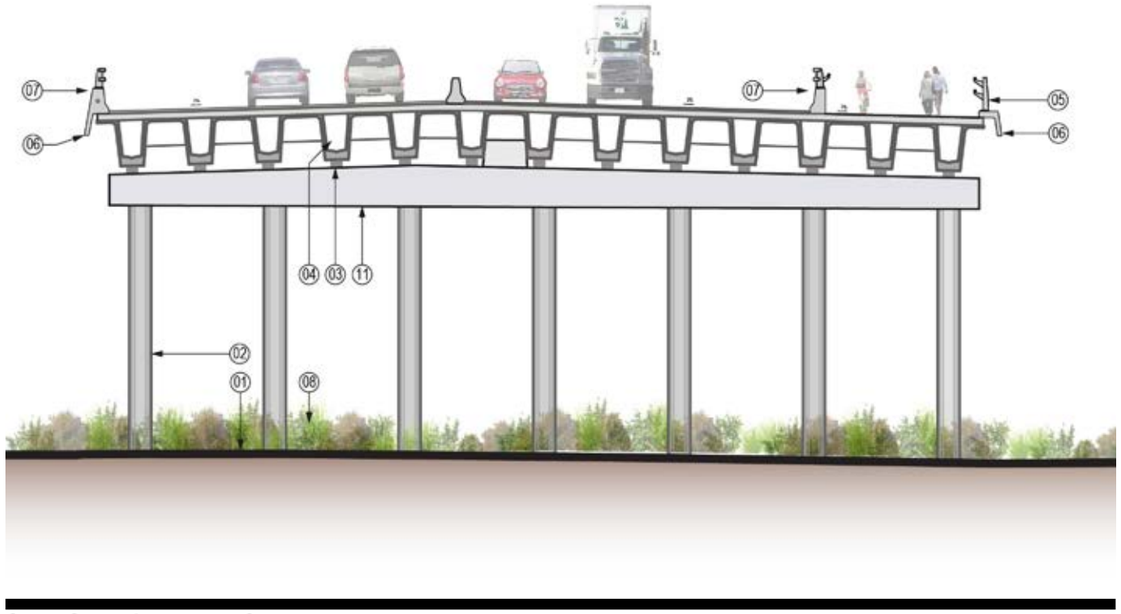
Elevation - BR15 - Bridge over M7 – M12 Eastbound to M7 Southbound

Creek Bridges

Pacific Highway bridge over Bonville Creek



Pier detail



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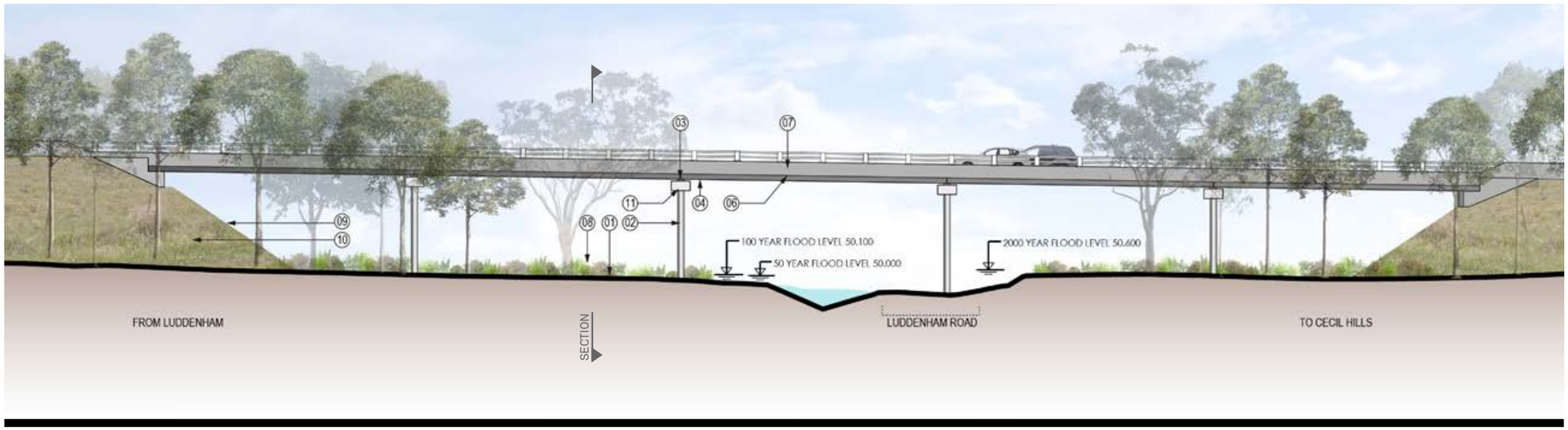
Section - BR02 - Bridge over Cosgroves Creek

LEGEND

01 GROUND LINE
02 BRIDGE PIER
03 BEARINGS
04 SUPER-T BOX GIRDER
05 1300 HIGH PEDESTRIAN BALUSTRADE WITH HAND RAIL
06 BARRIER SKIRT
07 1400 HIGH CONCRETE TRAFFIC BARRIER WITH TWIN STEEL RAILS
08 RIPARIAN LANDSCAPE PLANTING
09 BRIDGE ABUTMENT
10 LANDSCAPED FILL EMBANKMENT
11 BRIDGE PIER HEADSTOCK



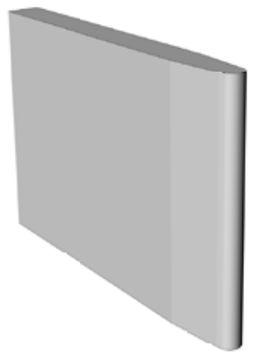
0 5 10 20m
1:500

Elevation - BR02 - Bridge over Cosgroves Creek

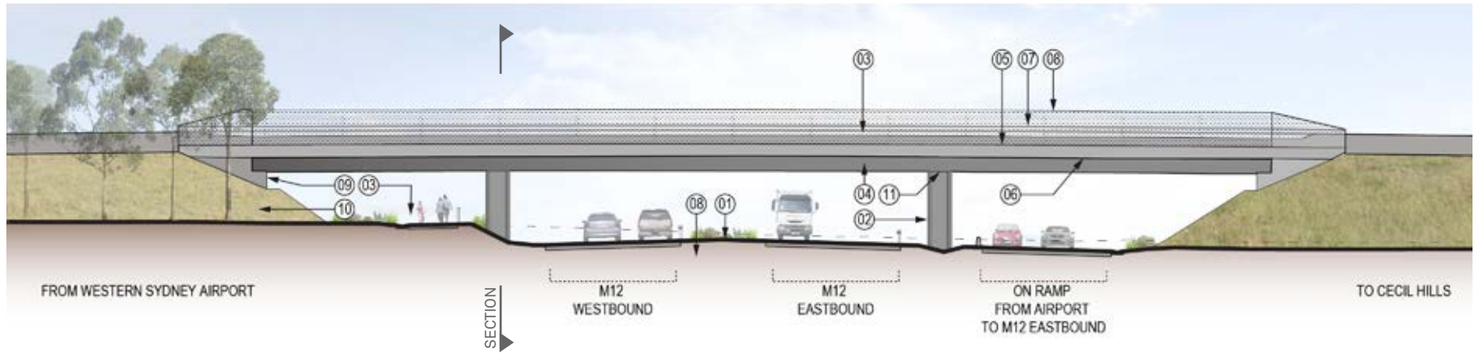
Urban design elements

M12 overbridges

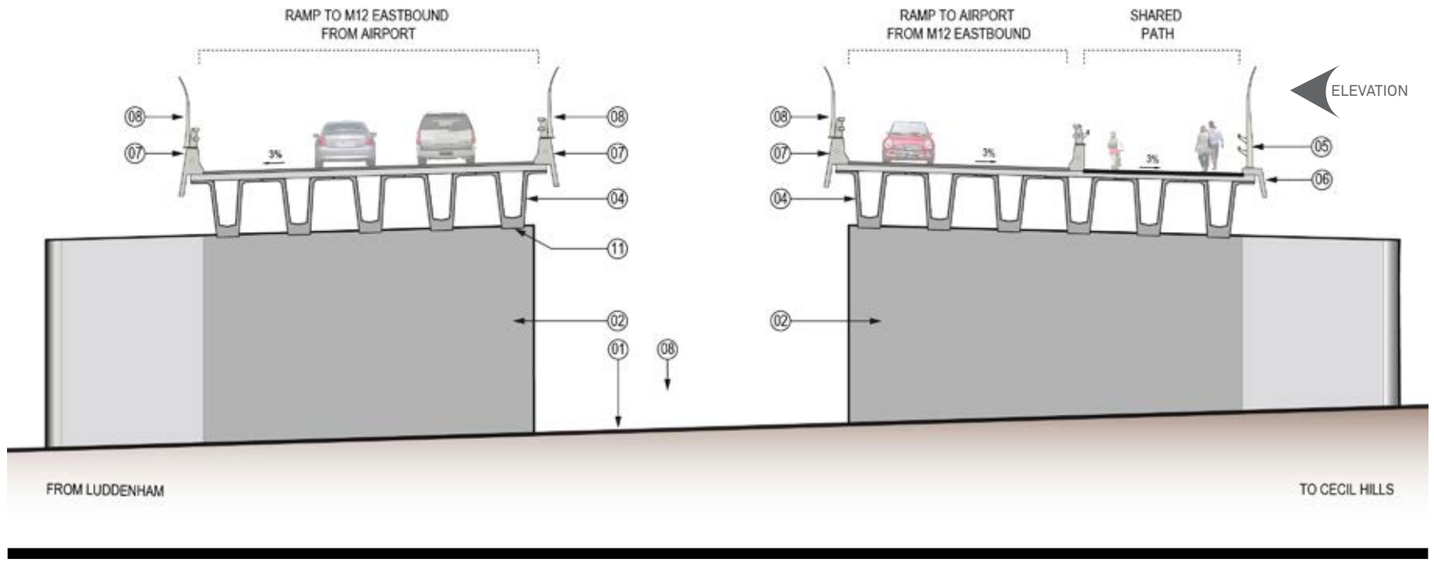
Newcastle Inner City Bypass - Shortland to Sandgate



Pier detail



Elevation - BR03 - Airport access road overbridges



Section - BR03 - Airport access road overbridges

LEGEND

01 GROUND LINE

02 BRIDGE PIER

03 SHARED PATH

04 SUPER-T BOX GIRDER

05 1300 HIGH PEDESTRIAN BALUSTRADE WITH HAND RAIL

06 BARRIER SKIRT

07 1400 HIGH CONCRETE TRAFFIC BARRIER WITH TWIN STEEL RAILS

08 THROW SCREEN

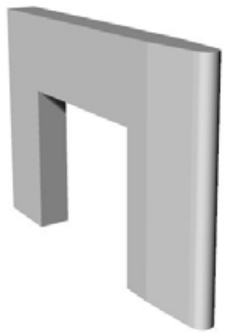
09 BRIDGE ABUTMENT

10 LANDSCAPED FILL EMBANKMENT

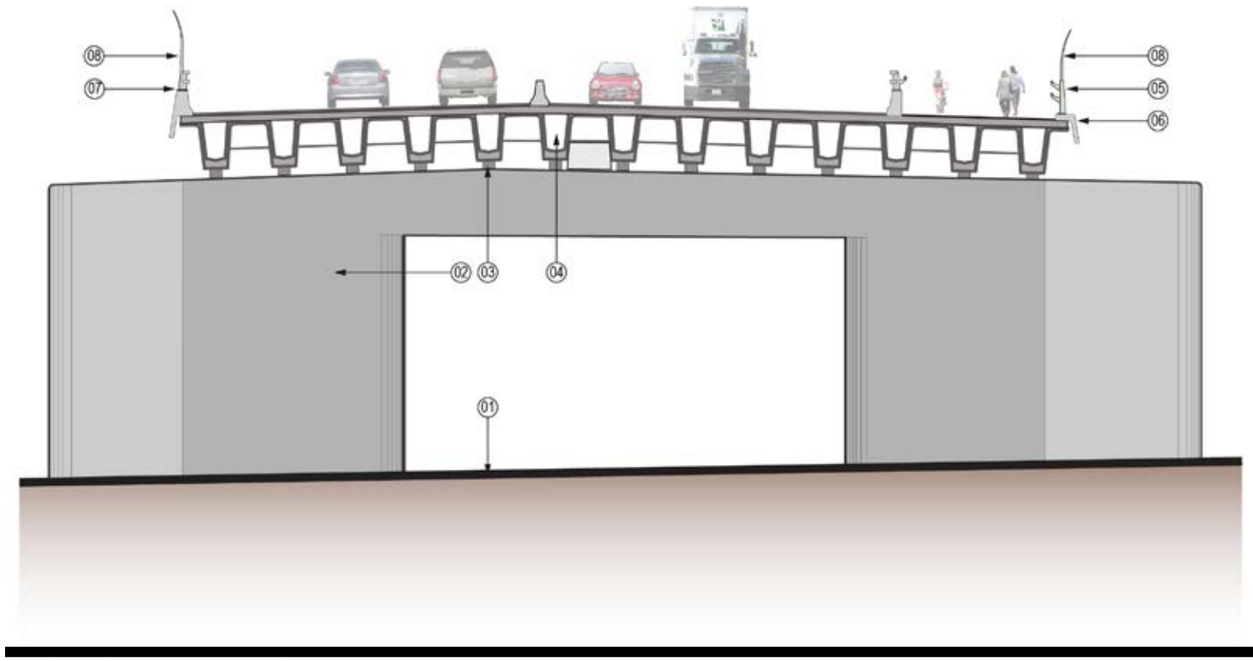
11 BRIDGE PIER DESIGN INTEGRATED WITH BOX GIRDER

M12 over local roads

Newcastle Inner City Bypass - Shortland to Sandgate



Pier detail



0 2 4 8m

1:200

Section - BR01 - Bridge over Luddenham Road

LEGEND

01 GROUND LINE

02 BRIDGE PIER

03 BEARINGS

04 SUPER-T BOX GIRDER

05 1300 HIGH PEDESTRIAN BALUSTRADE WITH HAND RAIL

06 CONCRETE KERB WITH SKIRT

07 1400 HIGH CONCRETE TRAFFIC BARRIER WITH TWIN STEEL RAILS

08 3m HIGH STEEL MESH THROW SCREEN

09 BRIDGE ABUTMENT

10 LANDSCAPED FILL EMBANKMENT

0 5 10 20m

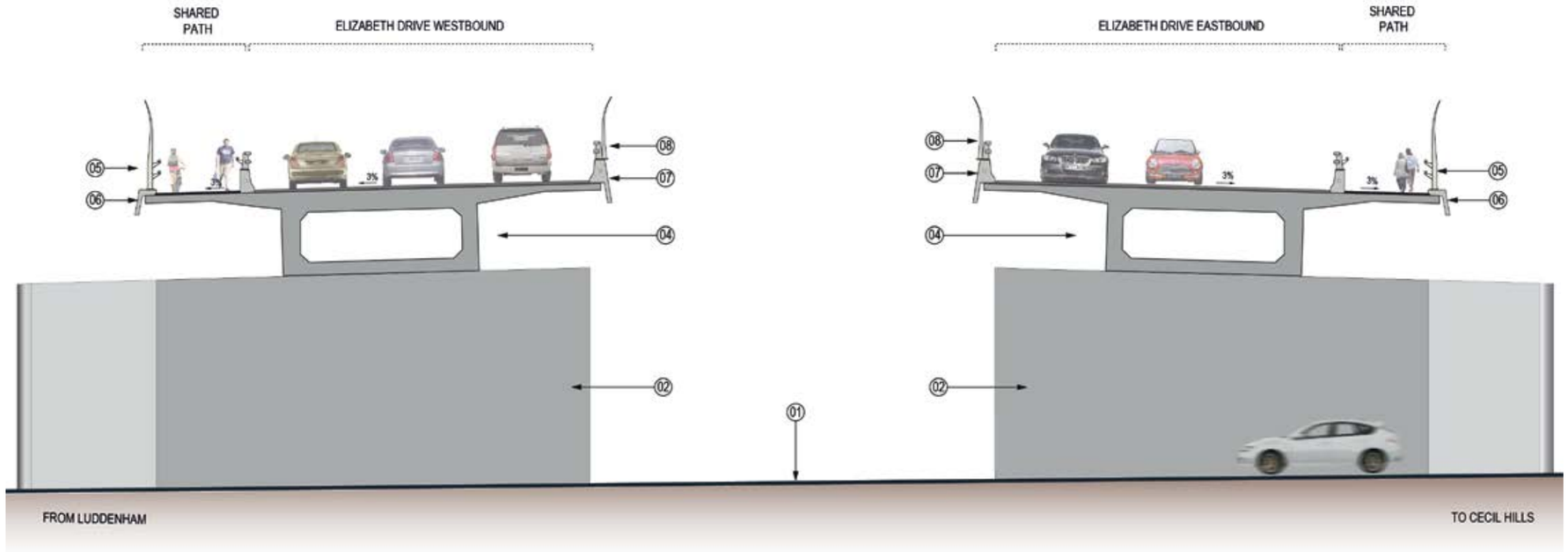
1:500

Elevation - BR01 - Bridge over Luddenham Road

Urban design elements

Gateway bridge

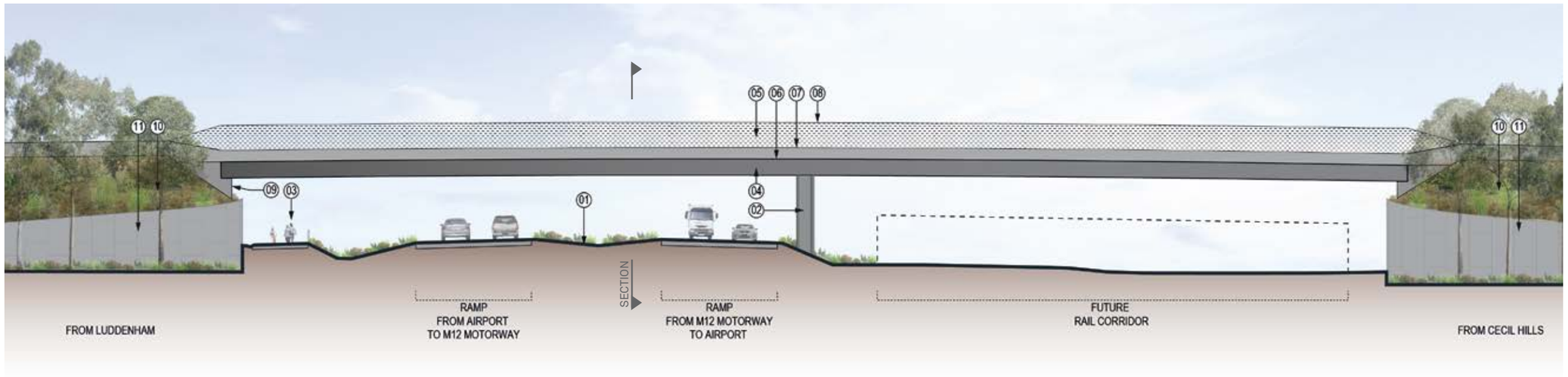
Newcastle Inner City Bypass - Shortland to Sandgate



Section - BR04 - Twin bridges on Elizabeth Drive over airport access road and airport railway line

LEGEND

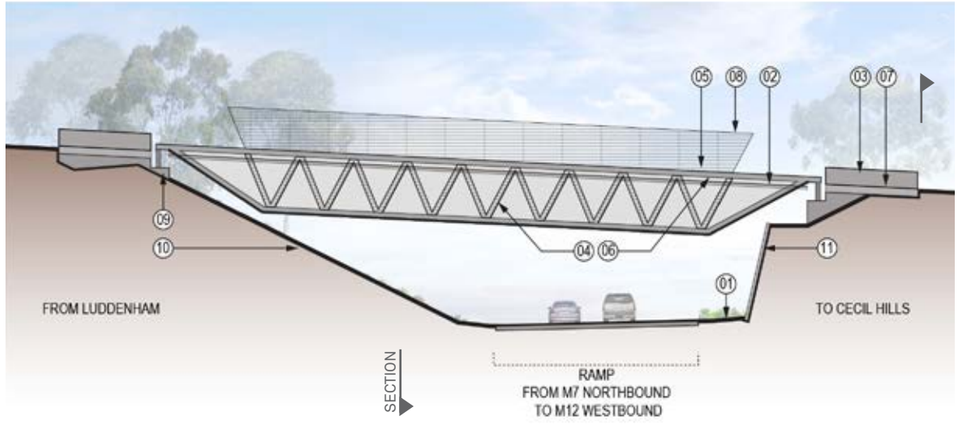
01 GROUND LINE
02 BRIDGE PIER
03 SHARED PATH
04 BOX GIRDER
05 1300 HIGH PEDESTRIAN BALUSTRADE WITH HAND RAIL
06 BARRIER SKIRT
07 1400 HIGH CONCRETE TRAFFIC BARRIER WITH TWIN STEEL RAILS
08 THROW SCREEN
09 BRIDGE ABUTMENT
10 LANDSCAPED FILL EMBANKMENT
11 CURVED RETAINING WALL WITH PRECAST CONCRETE FASCIA PANELS



Elevation - BR04 - Twin bridges on Elizabeth Drive over airport access road and airport railway line

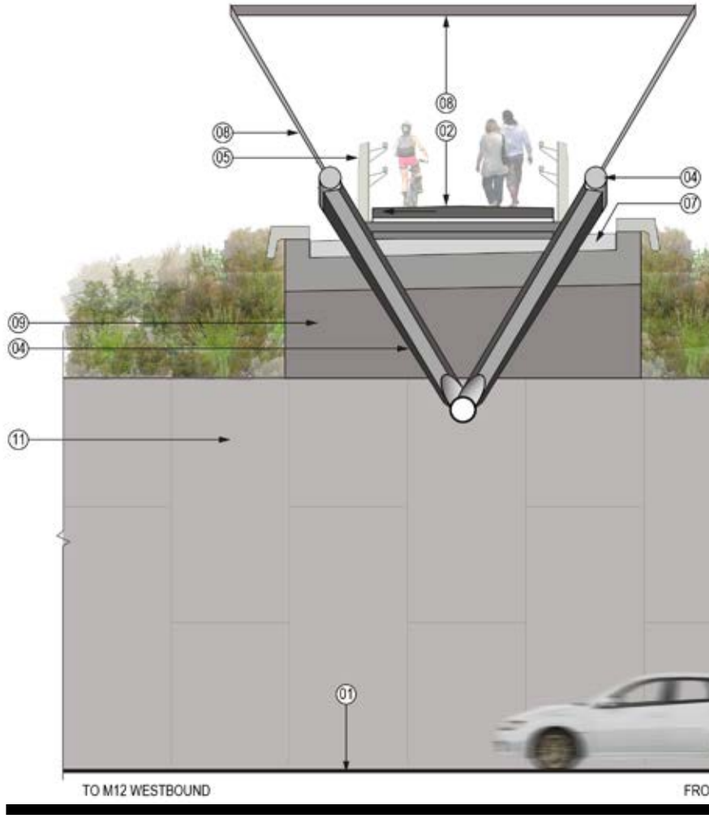
Shared user path bridge

Existing M7 shared user path bridge near Elizabeth Drive



0 5 10 20m
1:500

Elevation - BR16 - Shared user path bridge over M7 Northbound exit ramp



0 2 4 8m
1:200

Section - BR16 - Shared user path bridge over M7 Northbound exit ramp

LEGEND

01 GROUND LINE

02 BRIDGE DECK

03 NAME PLATE ON PARAPET

04 STEEL TRUSS SUPERSTRUCTURE

05 1300 HIGH PEDESTRIAN BALUSTRADE WITH HAND RAIL

06 BARRIER SKIRT

07 APPROACH SLAB

08 THROW SCREEN

09 REINFORCED CONCRETE ABUTMENT

10 LANDSCAPED FILL EMBANKMENT

11 SOIL NAIL RETAINING WALL WITH PRECAST CONCRETE FASCIA PANELS

Urban design concept

The urban design concept presented within this section has been developed and based on the project vision, objectives and principles to provide an integrated urban design concept for the project.

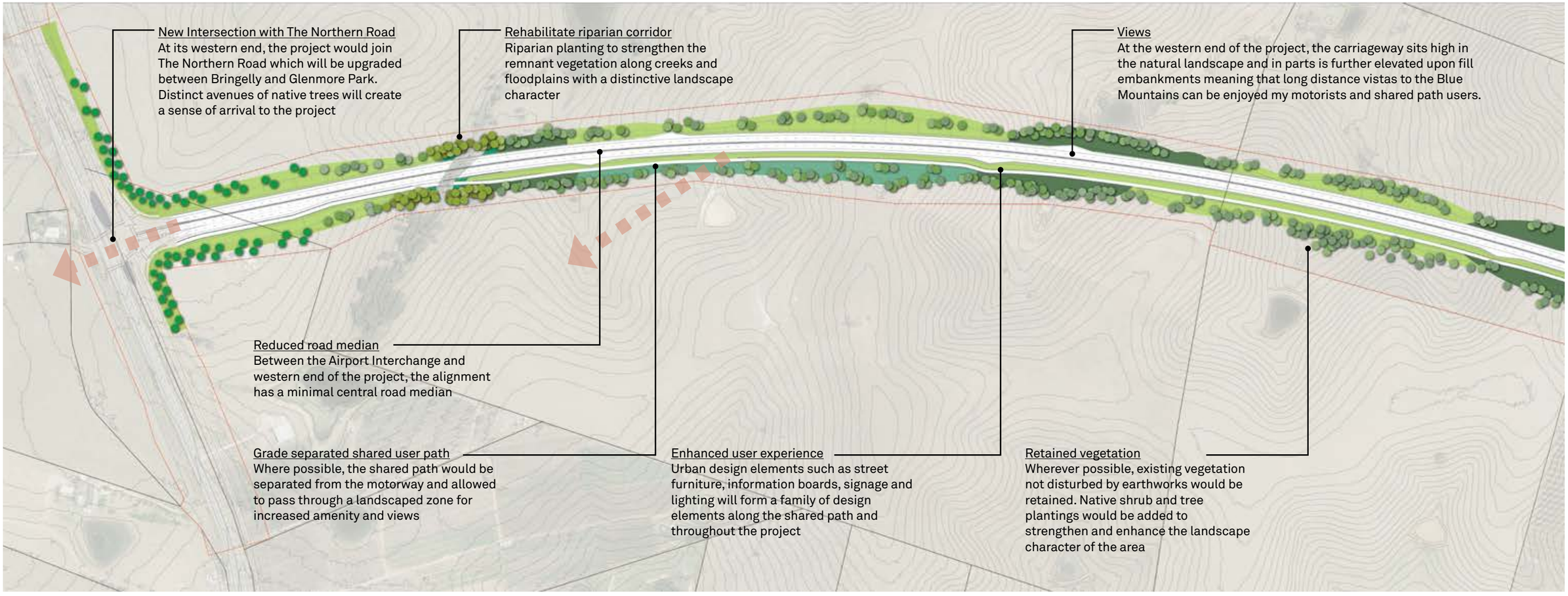
The urban design concept identifies a series of works recommended for implementation within the identified operational footprint of the project, in conjunction with the construction of the engineering works. It seeks to provide a balance between the hard and soft elements to deliver a project that makes a positive contribution to its setting.

The urban design concept section consists of following elements:

- Urban design concept plans highlighting the main project elements and urban design outcomes and opportunities
- Typical cross sections illustrating the alignment on fill embankment and in cutting
- A series of alignment cross sections illustrating the specific treatments, including interfaces with adjoining area.

Artist's impression: Aerial view south over Airport Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Urban design concept plan



Urban Design Concept Plan - Sheet 01 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- P1 - Grasslands mix
  Native forbs and grasses layer
- P2 - Riparian margins mix
  Native sedges, reeds and grasses
- P3 - Native shrub (frangible) mix
- P4 - Forest mix
  Dense native trees and shrubs layers
- P5 - RIiver Flat Forest mix
- P6 - Water quality treatment mix

Broadacre Cumberland Plain Woodland
Revegetation works using limited tree planting in random groups to allow filtered views of the surrounding landscape or continuous dense planting to reinstate or reinforce original vegetation pattern

Cumberland Hills Open Woodland Revegetation
Revegetation works associated with the shale hills of the Western Sydney Parklands

Swamp Oak Forest
Revegetation works using dense tree planting to reinstate existing riparian vegetation along creek corridors

River-Flat Forest on Alluvial Flats
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Shale-Gravel Transition Open Forest
Revegetation works using dense tree and shrub planting to reinstate or reinforce original vegetation patterns

Structured Plantings
Constructed landscape consisting of large scale tree plantings in organised patterns at key node points along the corridor

Key plan

Urban design concept plan

Urban Design Concept Plan - Sheet 02 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
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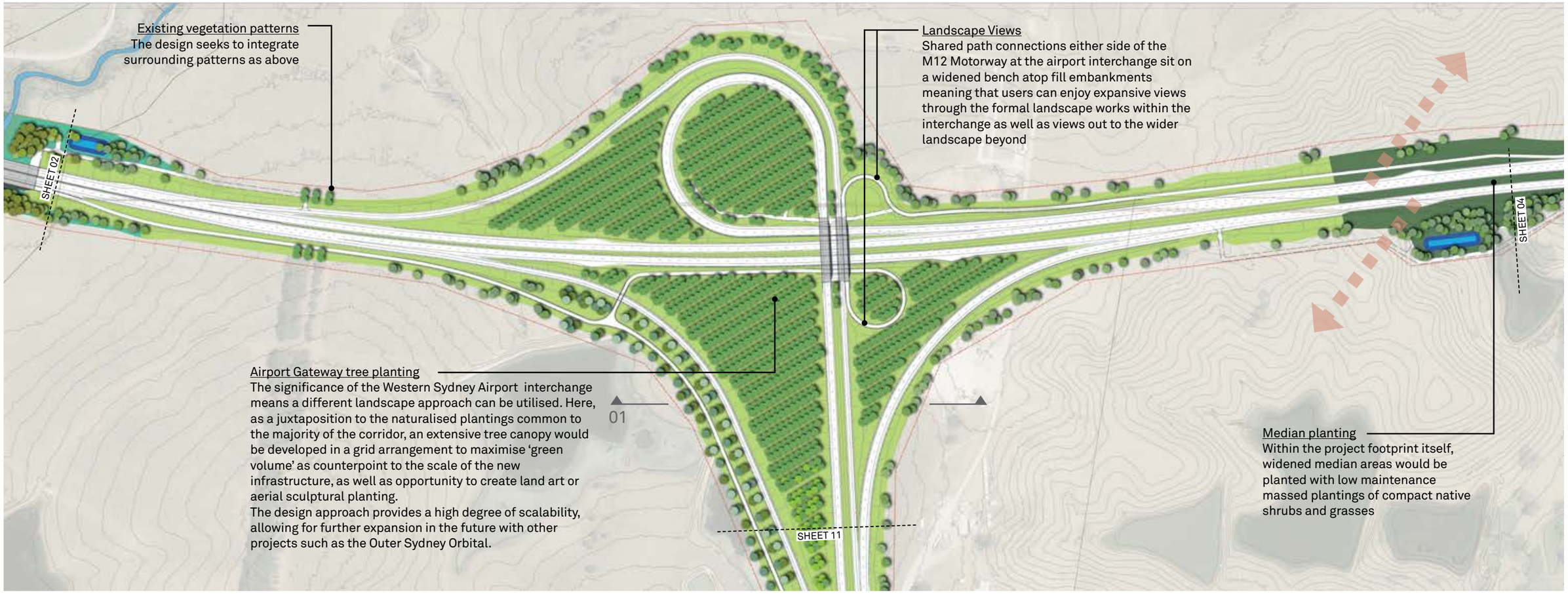
Key plan



Urban Design Concept Plan - Sheet 03 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- P1 - Grasslands mix
  Native forbs and grasses layer
- P2 - Riparian margins mix
  Native sedges, reeds and grasses
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- P4 - Forest mix
  Dense native trees and shrubs layers
- P5 - Rliver Flat Forest mix
- P6 - Water quality treatment mix

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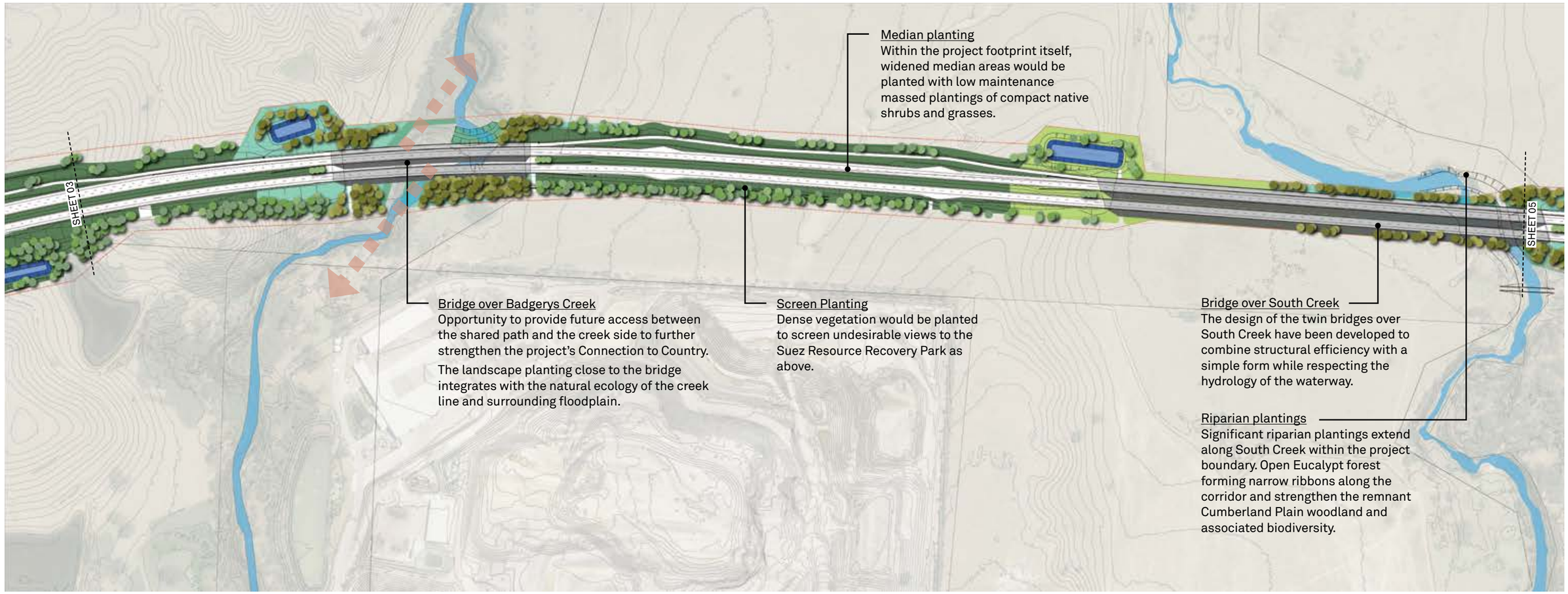
Key plan

Urban design concept plan



Urban Design Concept Plan - Sheet 04 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
- **P2 - Riparian margins mix** Native sedges, reeds and grasses
- **P3 - Native shrub (frangible) mix**
- **P4 - Forest mix** Dense native trees and shrubs layers
- **P5 - Rliver Flat Forest mix**
- **P6 - Water quality treatment mix**

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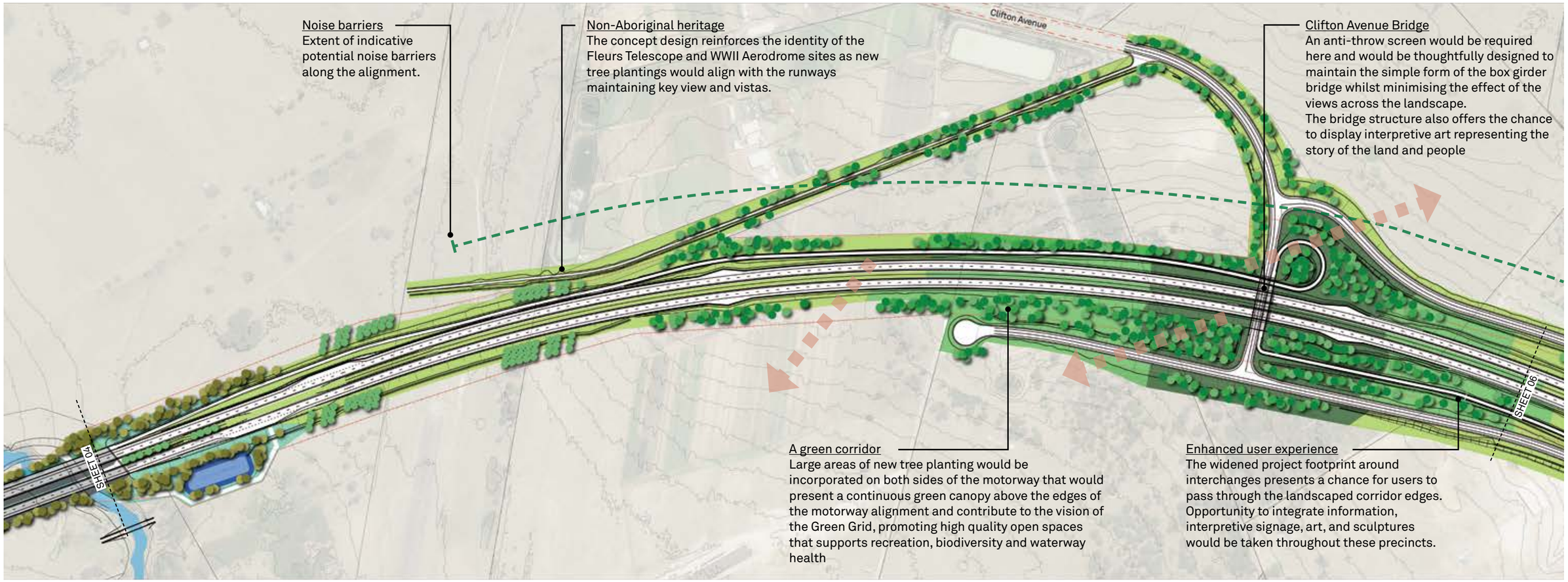
Key plan



Urban Design Concept Plan - Sheet 05 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
- **P2 - Riparian margins mix** Native sedges, reeds and grasses
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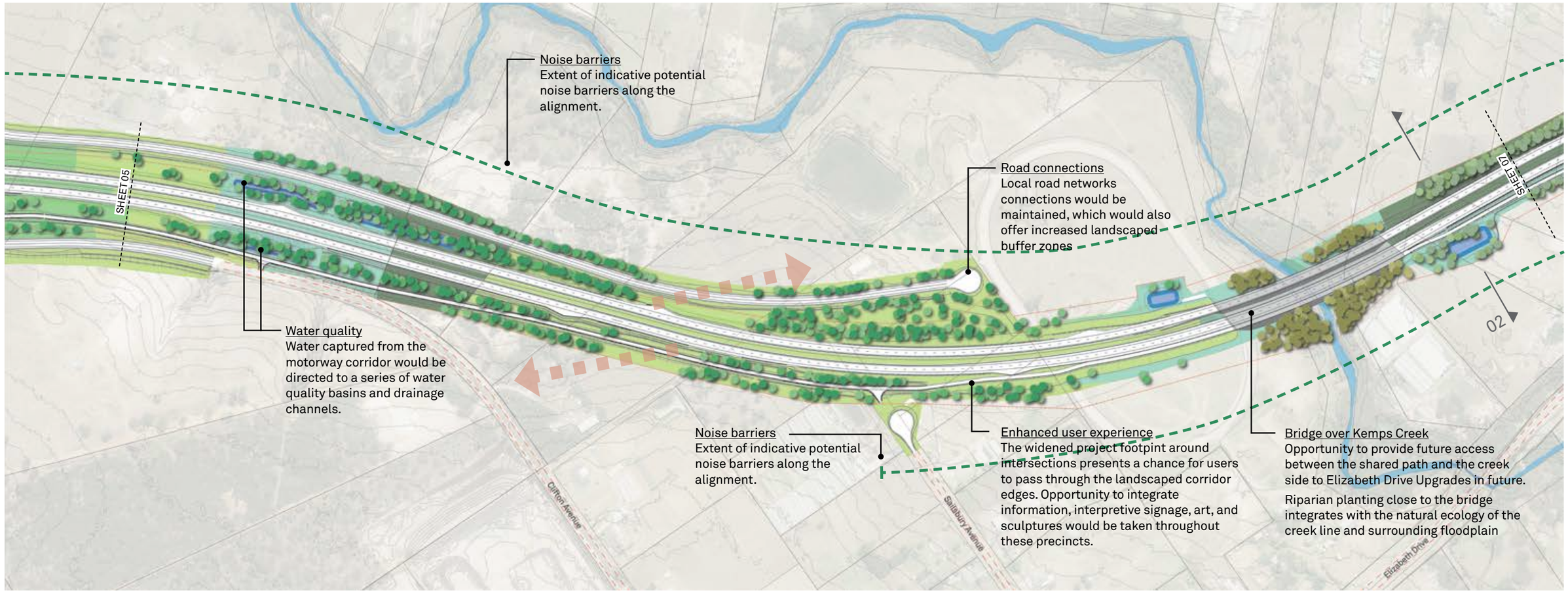
Urban design concept plan



Urban Design Concept Plan - Sheet 06 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
- **P2 - Riparian margins mix** Native sedges, reeds and grasses
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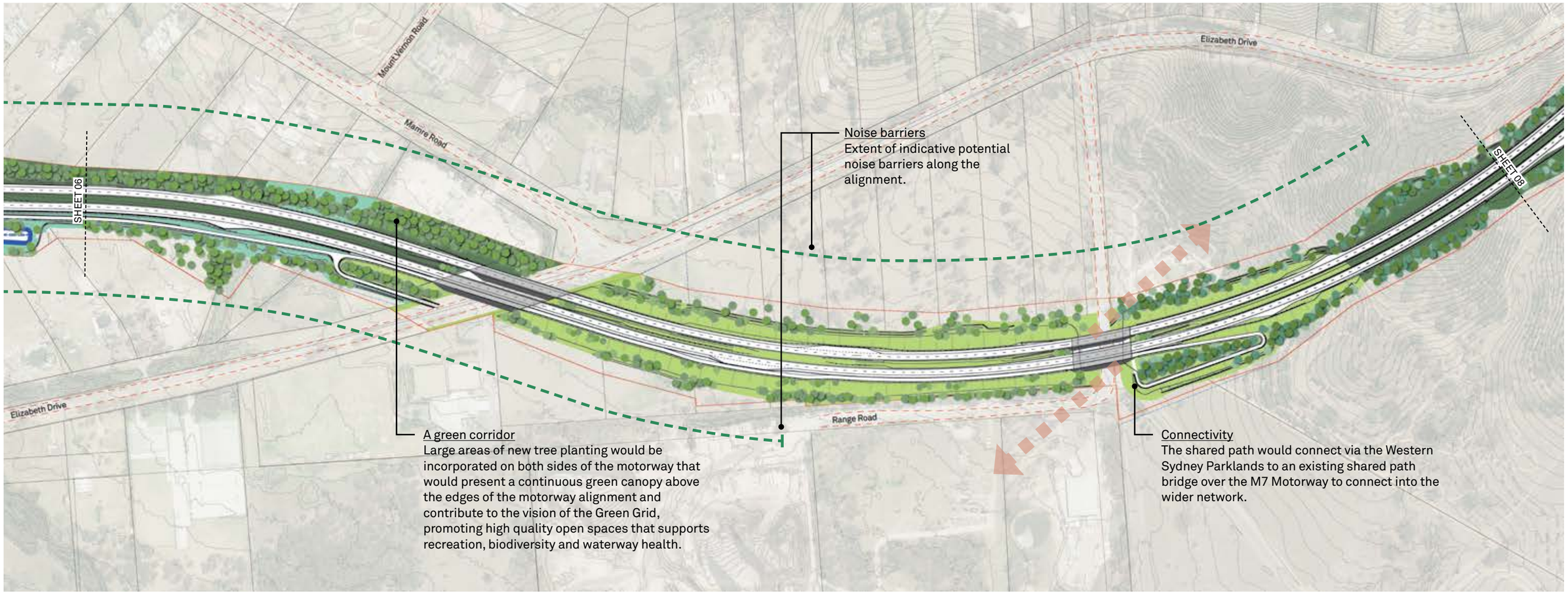
Key plan



Urban Design Concept Plan - Sheet 07 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- P1 - Grasslands mix
  Native forbs and grasses layer
- P2 - Riparian margins mix
  Native sedges, reeds and grasses
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Key plan

Urban design concept plan

Urban Design Concept Plan - Sheet 08 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
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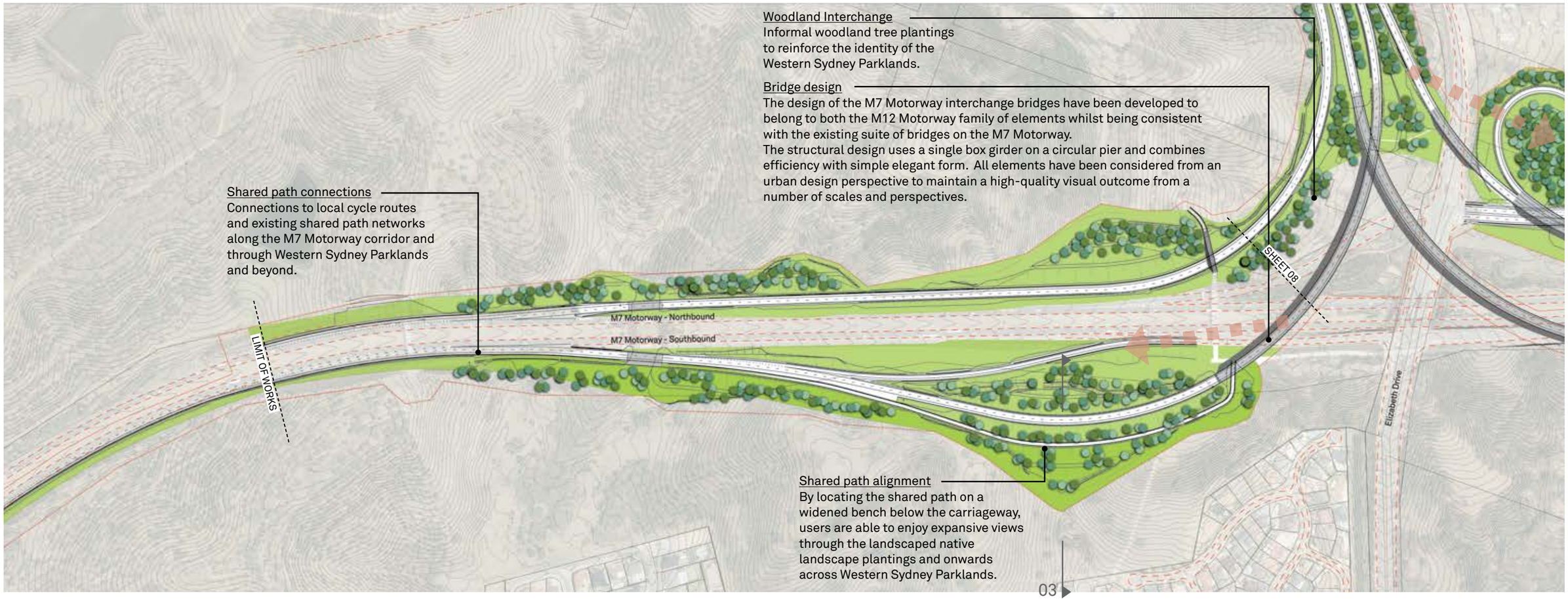
Key plan



Urban Design Concept Plan - Sheet 09 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- P1 - Grasslands mix
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Structured Plantings
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Key plan

Urban design concept plan

Urban Design Concept Plan - Sheet 10 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
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- **P4 - Forest mix** Dense native trees and shrubs layers
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Structured Plantings
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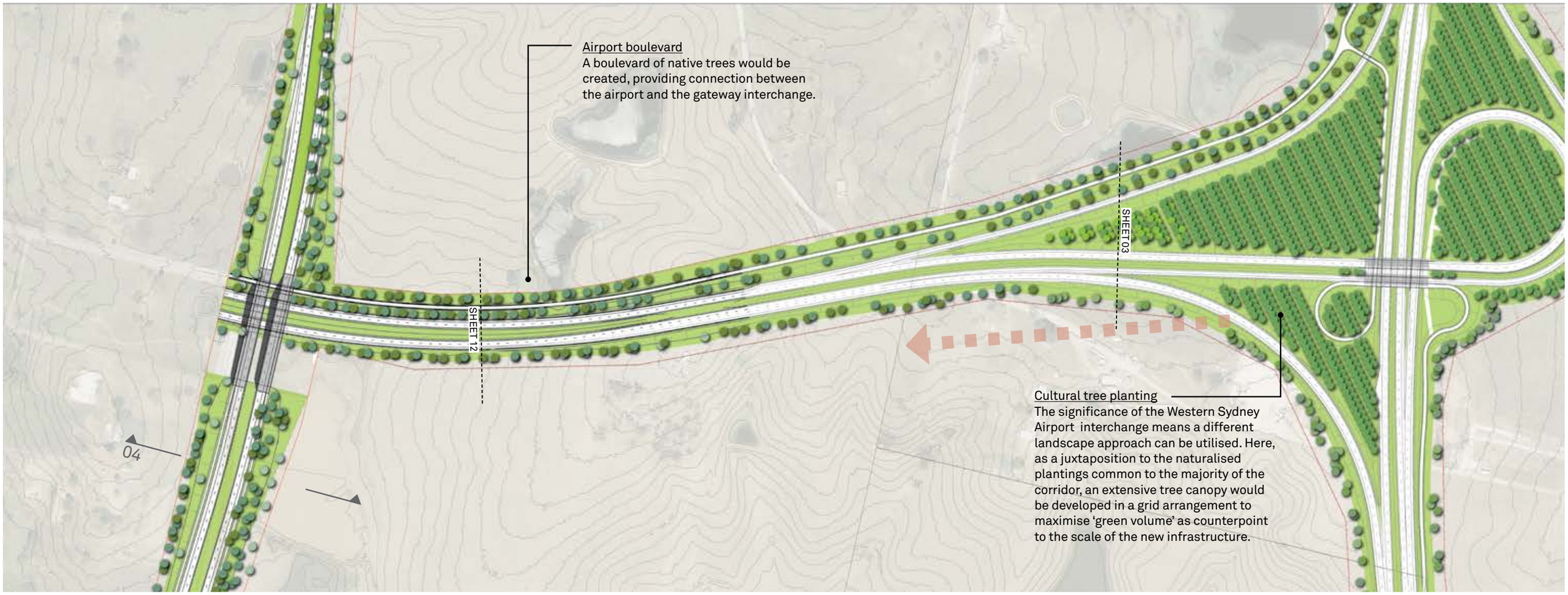
Key plan



Urban Design Concept Plan - Sheet 11 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- **P1 - Grasslands mix** Native forbs and grasses layer
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Key plan

Urban design concept plan

Urban Design Concept Plan - Sheet 12 of 12 - 1:5000@A3

0 50 100 200m

1:5000

LEGEND

- Boundary
- M12 Motorway alignment
- Shared path alignment
- Noise barrier extents
- Overhead power lines
- Permanent water basin
- Views
- Existing road network

- Pasture grass
- P1 - Grasslands mix
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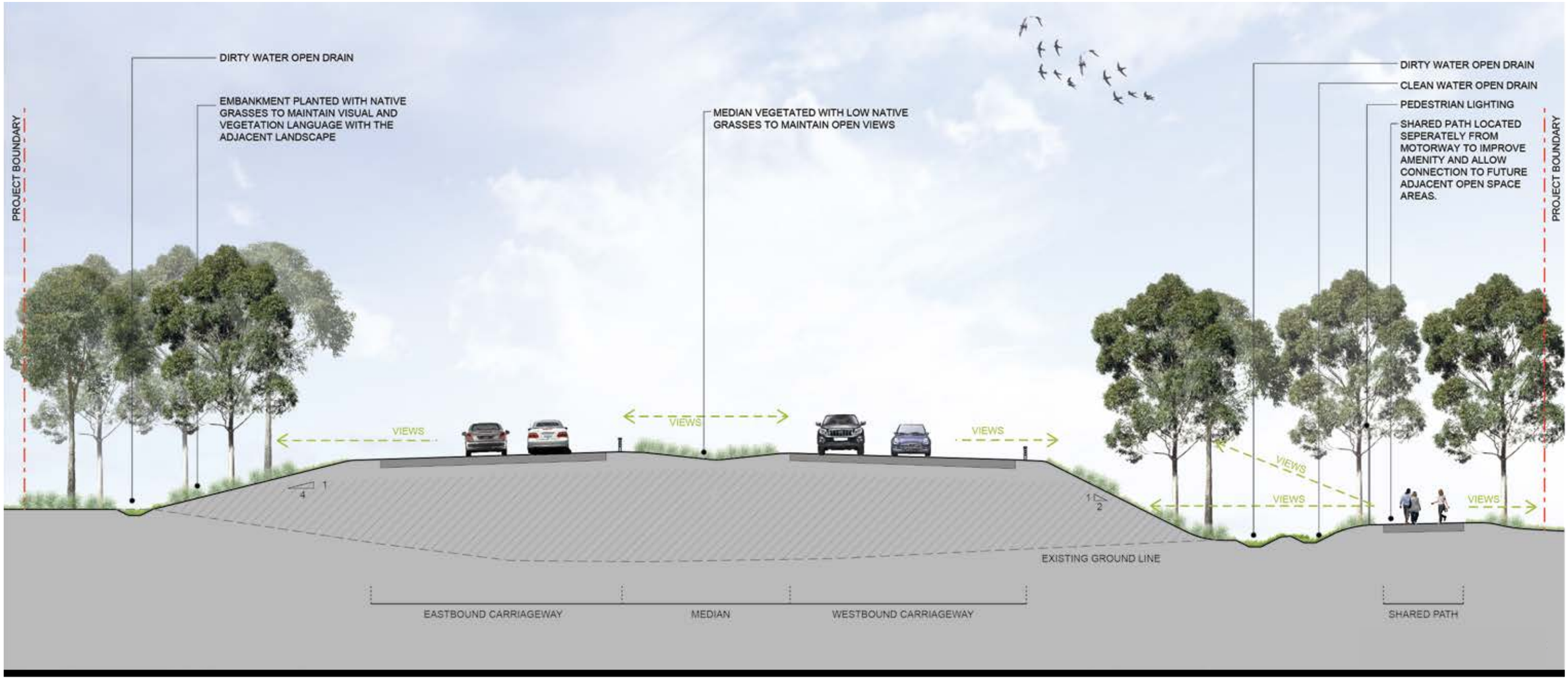
- P6 - Water quality treatment mix

- **Broadacre Cumberland Plain Woodland**
  Revegetation works using limited tree planting in random groups to allow filtered views of the surrounding landscape or continuous dense planting to reinstate or reinforce original vegetation pattern
- **Cumberland Hills Open Woodland Revegetation**
  Revegetation works associated with the shale hills of the Western Sydney Parklands
- **Swamp Oak Forest**
  Revegetation works using dense tree planting to reinstate existing riparian vegetation along creek corridors
- **River-Flat Forest on Alluvial Flats**
  Revegetation works using dense tree planting to reinstate or reinforce original vegetation patterns along creek corridors and alluvial flats
- **Shale-Gravel Transition Open Forest**
  Revegetation works using dense tree and shrub planting to reinstate or reinforce original vegetation patterns
- **Structured Plantings**
  Constructed landscape consisting of large scale tree plantings in organised patterns at key node points along the corridor

Key plan

Typical sections

Alignment on fill embankments



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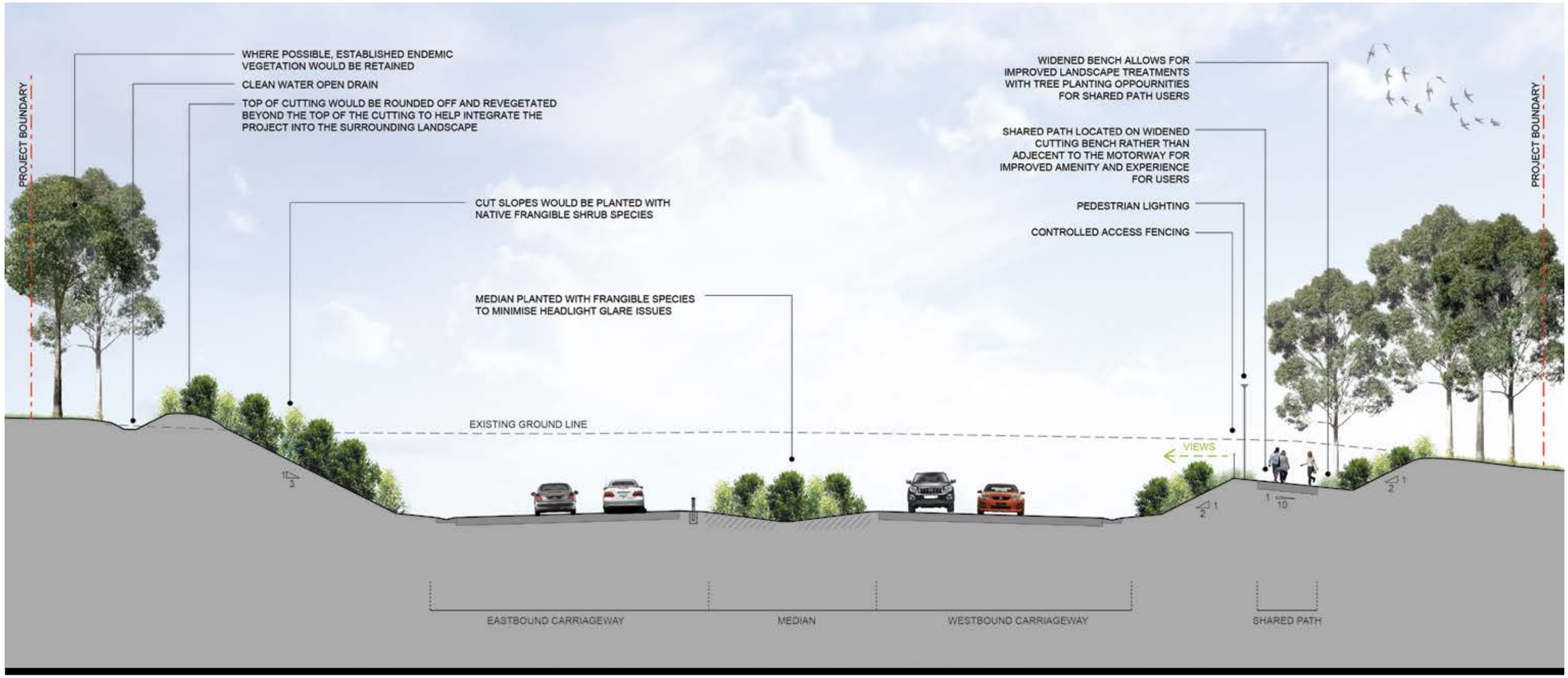
Typical cross section - Mainline corridor on fill embankment

Urban design concept plan

Typical sections
Alignment in cutting



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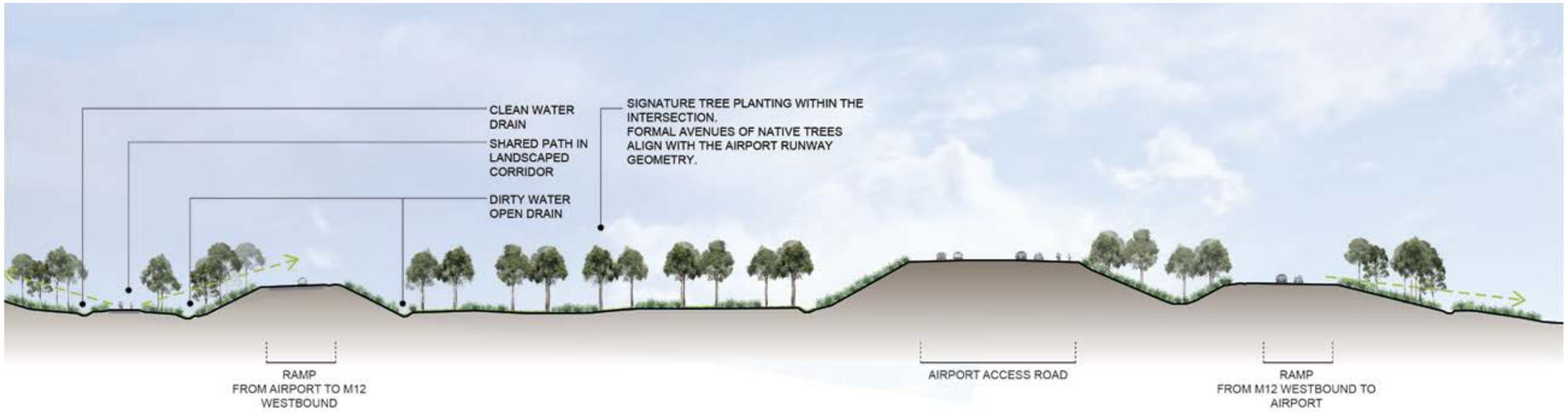
Typical cross section - Mainline corridor in cutting

Project alignment sections
Refer urban design concept plans for locations



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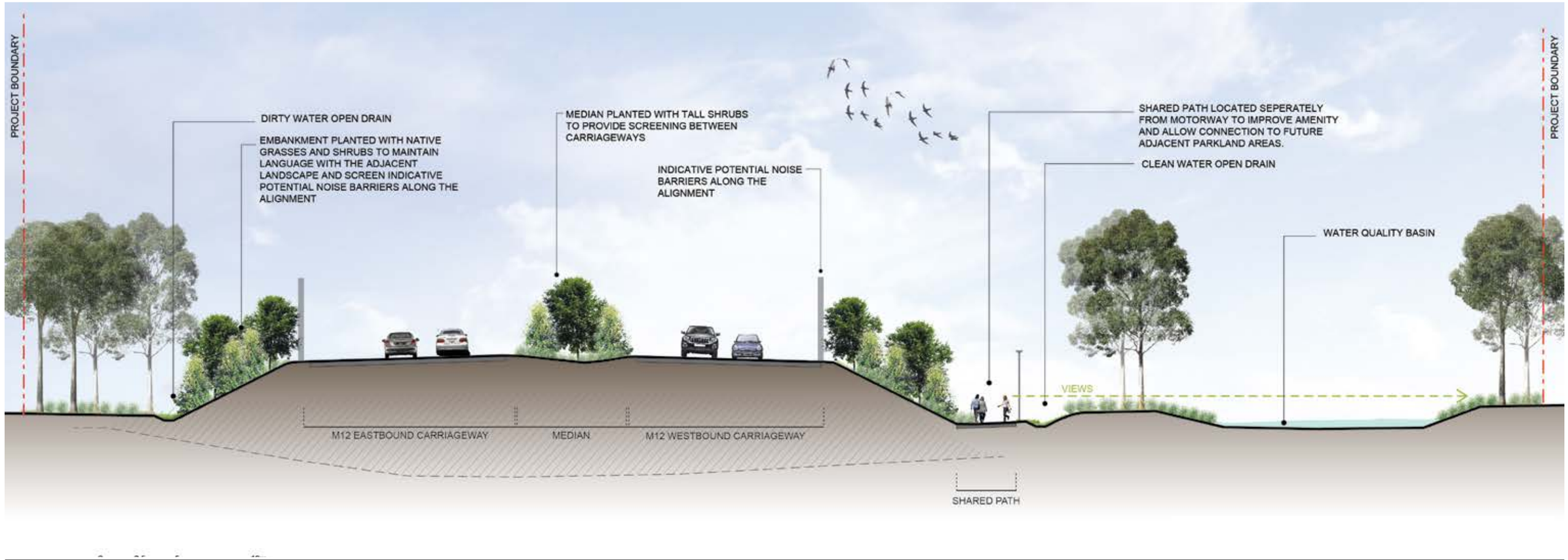
01 - Cross section - Airport interchange

Urban design concept plan



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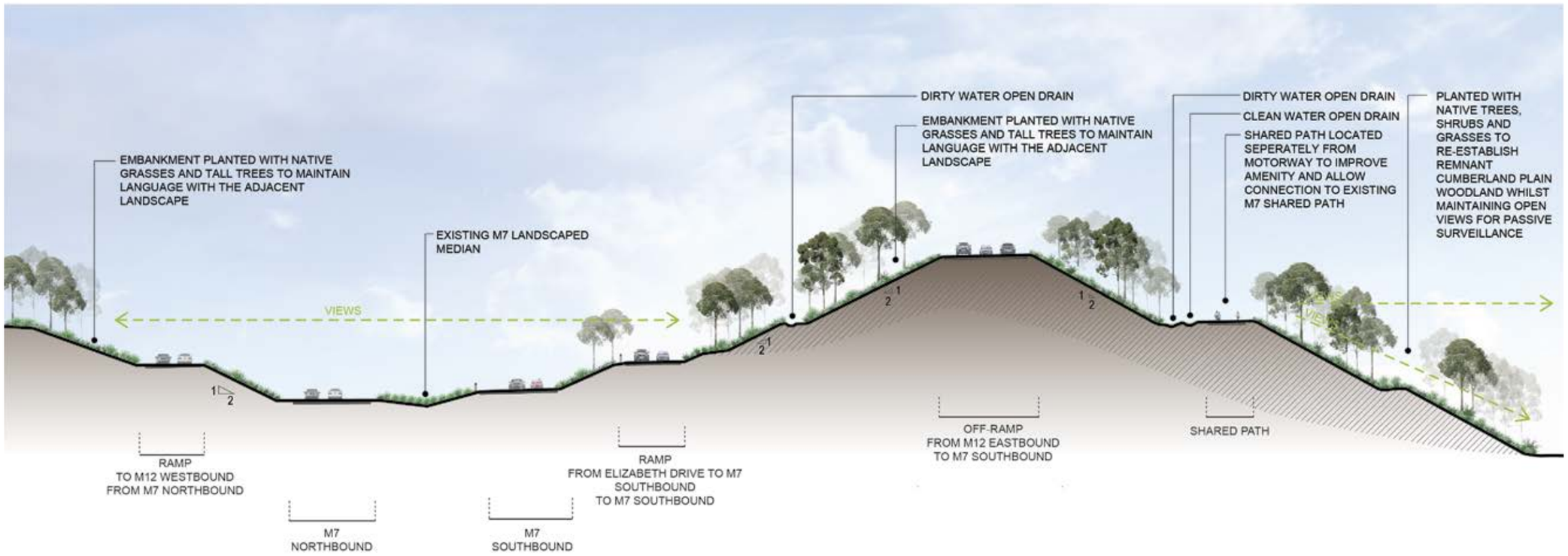
02 - Cross section - Water quality basin



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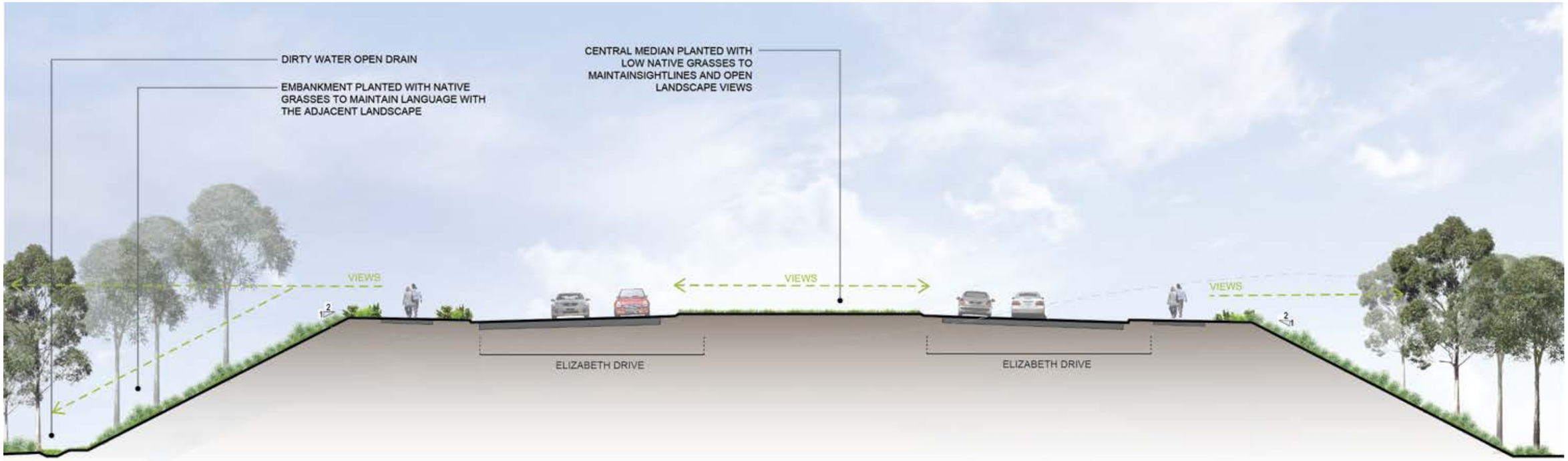
03 - Cross section - Off ramp to the M7 southbound

Urban design concept plan



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04 - Cross section - Elizabeth Drive

Artist's impression: Motorist's view north-west along M12 Motorway, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Artist's impression: Motorist's view north-west along M12 Motorway, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

Mitigation measures incorporated into the concept design

The urban design process for the project has been an iterative approach of testing ideas and arrangements through a range of discussions and workshops with the design team.

The process of assessment has sought to arrive at a preferred arrangement that best satisfies a range of issues including:
_Existing and future land uses and desired future characters
_Road alignments
_Vegetation
_Visual impacts
_Safety and security
_Aboriginal and non-Aboriginal heritage
_Maintenance.

As a result of the collaborative design process, there are features and details embedded in the concept design that have already mitigated impacts identified during the process of assessment. Key features are described on this page.

MITIGATION MEASURES INCORPORATED INTO THE CONCEPT DESIGN

No.	Mitigation Measure	Description
CON-1	**Re-alignment of the M12 Motorway through the Western Sydney Parklands**	A series of alignment options through Western Sydney Parklands were considered which resulted in the re-alignment of the project further north. This led to: _Consolidation of impacts and reduction of fragmented areas of WSP _Avoiding potential impacts to the Sydney Water Canal (heritage item) and utilities.
CON-2	**Bridges and structures (including retaining walls)**	_Bridges were designed to span across riparian corridors extending to the 1:100 flood zone, minimising impact to creek lines and existing remnant vegetation. _A simple, consistent palette of materials and bridge types was considered to ensure that the form of the structures are robust and of high architectural merit and quality, avoiding visual clutter. _Retaining walls were considered with visually recessive finishes and colours, allowing the broader landscape character to remain the visual dominant element.
CON-3	**Revegetation**	_Landscape restoration promoting the use of local native species belonging to the EEC Cumberland Plain Woodland to offset loss to existing vegetation _Identification of potential unsightly views, such as the SUEZ Resource Recovery Park, with screening vegetation proposed to minimise visual impact. _Screening has also been maximised in front of rural residences within close proximity of the alignment particularly along Salisbury Avenue and the southern portion of Mamre Road.
CON-4	**Access and Connectivity**	_The project would deliver a dedicated shared user path along the length of the alignment west of Western Sydney Parklands _Where possible, paths were separated from road pavements to provide improved experience for users and moved to north or south of the alignment to best interact with proposed land use. _LED path lighting has been considered to minimise safety concerns. _Initiatives to facilitate connections to creeks by provisioning for pedestrian and cyclist access in the future. _In the Western Sydney Parklands, any impacts to existing connections have been reinstated. _Western Sydney Parklands Trust would be delivering the relocation of the Wylde Mountain Bike Trail routes prior to construction. Roads and Maritime would continue to work with the Trust to achieve this.
CON-5	**Integration of Aboriginal and non-Aboriginal heritage**	_Integration of Aboriginal heritage through creating a unique motorway identity and 'Connection to Country' through the integration of findings and recommendations from the Aboriginal cultural heritage design process. _Integration of Non-Aboriginal heritage interpretation theme of 'Connection to Country' through appropriate use of native vegetation, plantings and views maintained to important heritage items adjacent to the corridor.
CON-6	**Desired future character and changing land use**	_Consideration of the high variability of the future landscape and changing land uses to create a concept that is resilient and can grow/adapt to changing edge conditions and construction of future infrastructure.
CON-7	**Lighting**	_All shared user paths delivered for the project would be lit _The project would utilise low maintenance LED fitting where possible to reduce vandalism, and maintenance requirements.
CON-8	**Net increase in trees**	_About 960 trees (excluding trees covered by a biodiversity offset strategy) would be removed within the project construction footprint. The project would implement significant new tree planting as part of the landscape design and project works, providing tree canopy where space permits within the project boundary. This would provide a net increase in trees for the project.
CON-9	**Interchanges and Intersections**	_The urban design would utilise key interchanges with the airport and the M7 Motorway to create a series of gateways and entry points to and from western Sydney.
CON-10	**Noise barriers (if required)**	_Noise barriers would be well designed and detailed with transparent walls and vegetated noise mounds taking precedence over solid walls where possible. _Noise barriers would be aligned to provide space for screen planting to both the motorist and residences facing the walls. _The design of the walls would include sections set back from the edge of carriageways, and provide changes of materiality and alignment where possible. _Walls must also be integrated with the outcomes of the 'Connection to Country' art process, with a considered palette of design elements, materials and colour. _The design of barriers would have simple, uncomplicated and consistent treatments, with smooth and gradual transitions, consistent alignments with tops generally running parallel with the road alignment, without stepping.

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Landscape character impact assessment

The Aboriginal 'Six Seasons' - The time of Parra'dowee

06

Aerial view west over proposed M12 Motorway corridor. (Source: Roads and Maritime)

Landscape character impact assessment

This section of the report describes the landscape character assessment of the project.

Landscape character is the aggregate of built, natural and cultural aspects that make up an area and provide its unique sense of place. Landscape in this context is taken to include all aspects of a tract of land – the built, planted and natural topographical and ecological features.

The assessment methodology provided in Section 03 outlines the process undertaken for this landscape character assessment.

Sensitivity	Magnitude			
	High	Moderate	Low	Negligible
High	High Impact	High-Moderate	Moderate	Negligible
Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
Low	Moderate	Moderate-Low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Landscape character and visual impact grading matrix

Aerial view west over the intersection of M7 Motorway and Elizabeth Drive

Landscape character zones

As part of the assessment process, the study area has been divided into Landscape Character Zones (LCZs). LCZs are defined as *'an area of landscape with similar properties or strongly defined spatial qualities, distinct from areas immediately nearby'.*

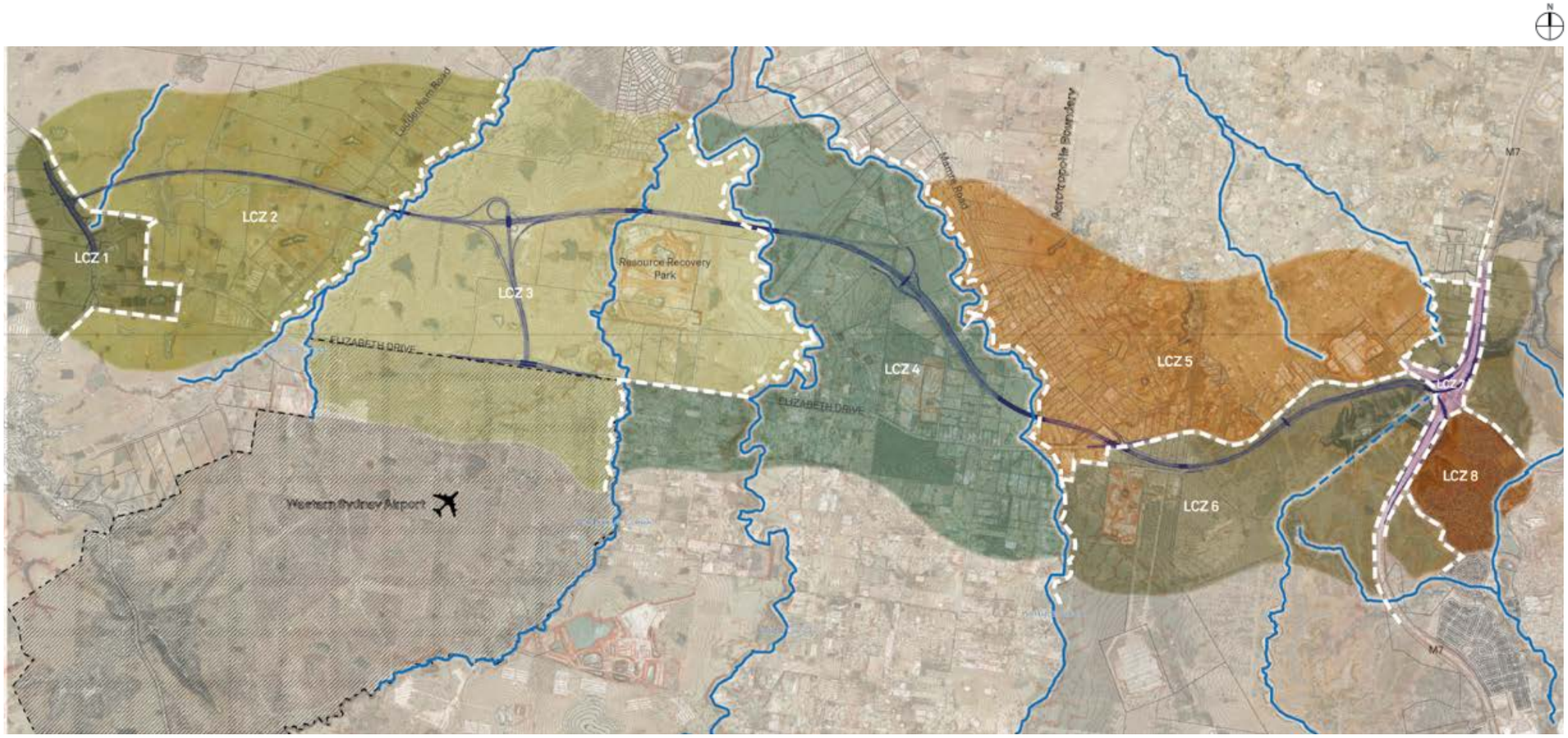
The LCZs facilitate detailed assessment of the character area of each zone to any changes as a result of the project.

Based on the strategic and contextual analysis and ground truthing, eight LCZs have been identified within the study area as outlined below:

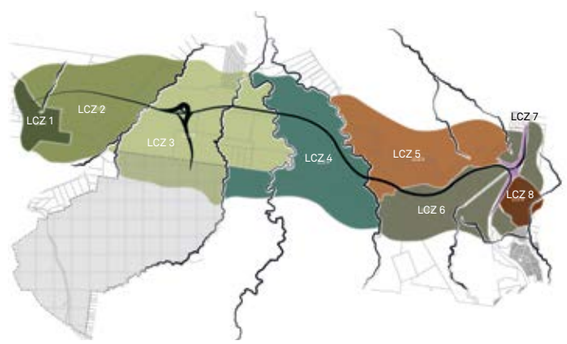
_LCZ 1 - The Northern Road ridgeline
_LCZ 2 - Luddenham rolling hills
_LCZ 3 - Rural plains
_LCZ 4 - Kemps Creek
_LCZ 5 - Rural residential
_LCZ 6 - Ridgetop woodlands
_LCZ 7 - M7 Motorway
_LCZ 8 - Cecil Hills residential.

The following section provides a description of each LCZ, including the existing character, the proposed work, the expected landscape character changes and assessment of the landscape character impact.

The majority of the study area is subject to extensive re-zoning and development as part the Western Sydney Aerotropolis - Land Use Infrastructure and Implementation Plan (LUIIP). This may result in broad changes to existing landscape character/s over time as development occurs. As a result, consideration of the strategic planning context has formed a key part of the assessment of the landscape character impact.



Landscape Character Zones (LCZ's) Map - not to scale



Landscape Character Zones (LCZ's) - Key Plan

Landscape Character Zones (LCZ's)

LCZ 1 - The Northern Road ridgeline

Rural residential lands which include commercial and primary production uses following The Northern Road, while generally following the dominant local ridgeline across the landscape.

LCZ 2 - Luddenham rolling hills

Low density rural lands, maintaining a strong rural landscape character based on gently undulating hills, where native vegetation has been extensively cleared and exotic species have been planted along some property fence lines.

LCZ 3 - Rural plains

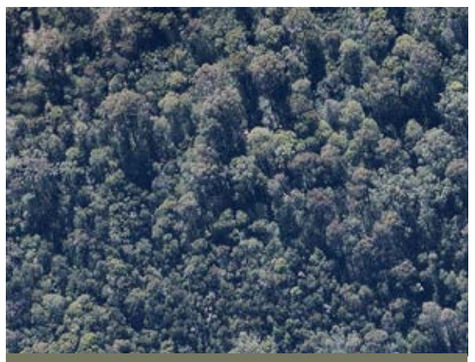
Flat rural lands that are prone to flooding and have a strong landscape character. Stands of native Eucalypts and farm dams are dotted throughout, across generally open pastures.

LCZ 4 - Kemps Creek

Landscape between South Creek and Kemps Creek, generally comprised of flat, low-lying rural lands which include residential, commercial and primary production uses. There is also a number of education and recreational facilities.

LCZ 5 - Rural residential

Rural residential lands which include both agricultural and commercial activities that maintain the rural landscape character of the area on the undulating hills. Pockets of native vegetation mostly confined along fence lines and creeks.



LCZ 6 - Ridgetop woodlands

Established parklands, areas of remnant vegetation and open recreational spaces on elevated, undulating landforms, including the Western Sydney Parklands and the Kemps Creek Nature Reserve.

LCZ 7 - M7 Motorway

A combination of significant road bridges, retaining walls and underpasses at the intersection of Elizabeth Drive and the M7 Motorway, which are set within the broader Western Sydney Parklands.

LCZ 8 - Cecil Hills residential

A predominantly two storey residential housing estate with low tree canopy coverage.

Landscape character impacts during construction

Detailed construction planning would occur before construction starts and would consider methods and scheduling to manage community and environmental issues. These include noise, access, amenity and general disruption and ensure concurrence with the latest work, health and safety legislation.

Equipment and plant requirements would be refined during detailed design and during the development of the construction methodology by the construction contractor. The construction methods and management measures to minimise environmental impacts would be detailed in the Construction Environmental Management Plan (CEMP), which would be prepared by the construction contractor.

The construction strategy for the project has been designed to ensure that construction occurs in a safe and efficient manner while managing identified constraints and minimising environmental impacts. The general principles of the construction strategy are to:

- Achieve safe and convenient access for construction vehicles and the public, plant and equipment along the length of the project and to and from public roads while at the same time minimising impacts
- Consider impacts on road users, the effect on urban amenity and the suitability of local road pavements
- Manage impacts on existing infrastructure including local roads, utilities and services
- Recognise that modifications to existing infrastructure come with increased safety risks to road users and construction personnel and can result in the need to undertake work at night or to implement traffic switches
- Manage community and environmental issues including noise, access, amenity and general disruption.

The construction footprint

The project construction footprint is the total area required to construct the project. The construction footprint is generally broader than the operational footprint, and includes all areas required for road works, bridge works, access for construction vehicles and plant, drainage infrastructure, temporary sediment basins, utilities and services adjustments, temporary stockpiles and temporary ancillary facilities (such as construction compounds and batching plants).

A construction footprint for the project has been provided in Chapter 05 of the EIS. It seeks to minimise environmental impacts while providing sufficient room to allow the project to be constructed in a safe manner. The construction footprint represented in the EIS is indicative only and would be subject to refinement during detailed design and construction.

Overview of construction activities

Construction of the project would generally include the following key activities:

- Site establishment and mobilisation
- Early works and property adjustments
- Demarking of any environmental protection exclusion areas
- Clearing, grubbing and topsoil stripping, including clearing of all areas within the project boundary (except within any nominated environmental protection exclusion areas) and temporary ancillary facilities
- Demolition of existing buildings
- Earthworks and haulage of material
- Stockpiling and storage of materials
- Traffic management and access
- Construction of the motorway, intersections, interchanges and road widening
- Construction of bridges
- Construction of drainage structures
- Installation of noise mitigation measures
- Relocation or existing or installation of additional utilities and services
- Changes to property access
- Installation of signposting, lighting and roadside furniture
- Landscape works, waste disposal and rehabilitation of disturbed areas with no future use
- Finishing work
- Site rehabilitation and demobilisation.

Construction ancillary facilities

Construction ancillary facilities have been identified based on the concept design and would provide support to the construction of the project. These may include material and earthworks stockpiling areas, construction support areas for bridges, a main project office and compound area, secondary offices located as needed along the length of the construction footprint, workshops for servicing plant and equipment, double-handling and laydown areas; and concrete and/or asphalt batching plants.

The ancillary facilities would generally comprise:

- Temporary buildings (generally prefabricated) including offices and meeting rooms, amenities and first aid facilities(the size and number of office facilities at the main compound would be greater than at the secondary compounds)
- Hardstand parking areas with sufficient space to accommodate the numbers of construction workers expected at any site
- Materials laydown, storage and handling areas, including purpose-built temporary structures as required and appropriately bunded storage for hazardous and non-hazardous substances
- Secure perimeter fencing, including visual screening of construction compounds where necessary
- Bridge construction support areas
- Workshops with appropriate safety and environmental controls for servicing plant and equipment.

Nine potential locations of ancillary facilities (AF) located within the construction footprint have been identified:

- AF 1 - East of The Northern Road
- AF 2 - North of Elizabeth Drive, opposite the Elizabeth Drive/Badgerys Creek Road intersection
- AF 3 - North of Elizabeth Drive, between the proposed airport access road and Sydney Metro Greater West rail line
- AF 4 – West of Clifton Avenue, north of proposed mainline
- AF 5 – West of Mamre Road, north of Elizabeth Drive
- AF 6 – South of Elizabeth Drive, opposite Duff Road
- AF 7 – West of the M7 Motorway, north-east corner of Western Sydney Parklands
- AF 8 – East of the M7 Motorway, south of Elizabeth Drive
- AF 9 – East of the M7 Motorway, north of Elizabeth Drive.

The final type, location and number of ancillary facilities would be determined by the construction contractor and identified in an Ancillary Facilities Management Plan (AFMP) prepared as part of the CEMP and agreed with Roads and Maritime.

Potential impacts to landscape character during construction

Temporary impacts during the construction stage may occur as a result of construction activities and construction ancillary facilities being located in the existing landscape.

Based on information available at the time of preparing this report, it is understood that construction of the project would result in substantial changes to the landscape within the construction footprint. The impacts to the landscape character would result from a combination of any of the following:

_Major earthworks and dust dispersal
_Vegetation removal
_Building removal
_Stockpiling of materials and storage
_Presence of temporary structures including noise barriers (if required)
_Hoardings
_Ancillary facilities including construction machinery, plant operations and site offices
_Increased vehicle movements and personnel in the area.

In general terms, the potential impacts would vary across the project, largely dependent on the extent and combination of factors described above. As a minimum, the entire construction footprint would be enclosed by temporary hoarding and accessed by heavy trucks and machinery.

LCZs that have a HIGH sensitivity to change, would experience the largest reduction in landscape quality during construction. Based on the operational assessment further on in this section, HIGH landscape sensitivities have been identified for:

_LCZ 1 - The Northern Road ridgeline
_LCZ 2 - Luddenham rolling hills
_LCZ 3 - Rural plains
_LCZ 5 - Rural residential
_LCZ 6 - Ridgetop woodlands

In particular, zones that would be subject to the highest loss of existing vegetation, such as LCZ 6, would be adversely affected during construction.

Majority of potential ancillary facilities sites are located within LCZs that have a HIGH sensitivity to change. Due to their scale, function and focus of construction activities, it has been considered that temporary impacts to landscape character would increase in close proximity to ancillary facilities.

Overall, impacts during construction are temporary in nature and would be mitigated where possible through appropriate siting of infrastructure, materials and finishes of sheds and hoardings, and management of increased traffic in the study area.

When considered in context of the broader study area and beyond, the construction works present a small portion of the overall footprint of the LCZs. As a result, it has been considered that general impacts during construction are relatively low.

A CEMP would be prepared by the construction contractor providing details and measures taken to reduce potential adverse impacts as a result of construction works.

Aerial view west over Cosgroves Creek with the Blue Mountains in the distance.

Landscape character impacts during operation
LCZ 1 - The Northern Road ridgeline

Existing landscape character

The Northern Road is a major arterial road that generally runs north to south from Bligh Park to Narellan following a natural ridge line. It consists of a generally two-lane road (one lane for each direction) with a gently rolling alignment that creates a distinct country road character with broad, sweeping contextual views, particularly west towards the Blue Mountains.

Within the vicinity of the project, the visual character is characterised by a mix of rural, rural-residential, commercial and primary production (paddocks with crops planted) properties that retain a generally open landscape character. Few stands of remnant vegetation remain in this zone which are typically confined to the creek lines.

Buildings are generally set back from the road corridor, with introduced tree plantings following extended driveways or fence lines.

Desired future character

A number of developments are identified within the study area of LCZ 1. The zone falls within the Agriculture and Agribusiness and North Luddenham Precincts of the LUIIP. It would build on existing agricultural operations in this area.

The Outer Sydney Orbital (also referred to as the M9) is also identified in the LUIIP as a major strategic link between western Sydney, the Central Coast and Illawarra. It would run along the same general alignment of the project within LCZ 1.

An upgrade to The Northern Road is under way and would generally involve widening from a two to a four-lane road from Narellan to Penrith. The work would also include the widening of The Northern Road to support a new intersection with the M12 Motorway. The Northern Road Upgrade is subject to a separate environmental impact assessment process.

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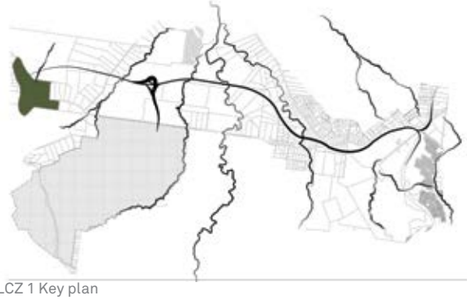
LCZ 1 Key plan

01 Roadside produce vendors along The Northern Road.

02 View of property near proposed intersection of The Northern Road and M12 Motorway

03 Western panoramic views to the Blue Mountains

04 Aerial view over LCZ 1

The proposed work

The project proposes to tie into road widening upgrades along The Northern Road, which includes a future intersection north of Elizabeth Drive.

The proposed work would generally include:
_A new dual carriageway motorway with two lanes in each direction
_A continuous shared user path connection along the southern side of the project
_Roadside furniture and elements such as barriers, fences and signs
_Native plantings on roadside areas.

The table below outlines a description of the expected change as a result of the proposed work.

Landscape sensitivity to change

LCZ 1 is generally a picturesque rural landscape, largely experience by rural residents, workers and motorists along The Northern Road. The elevated setting of the study area provides high touristic and scenic value, forming part of a tourist drive.

It is an open landscape with sparse pockets of vegetation cover, providing distant rural views including glimpses west to the Blue Mountains.

The rural quality of LCZ 1 is essential to its character and is sensitive to change with limited capacity to absorb any major new motorway infrastructure. As a result, a **HIGH** sensitivity to change was recorded.

The landscape sensitivity of LCZ 1 would likely decrease over time as re-zoning and development of the North Luddenham and Agriculture and Agribusiness precincts as well as the Outer Sydney Orbital (OSO) are realised.

Magnitude of change

Assuming that the upgrade of The Northern Road would be completed by the time the project is operational, the project would further increase both the scale and amount of existing infrastructure in this zone.

The Northern Road would have changed from an rural arterial road to an arterial road with a major motorway intersection. Beyond the footprint of the project, the magnitude of change would reduce as strategic projects such as the OSO are constructed and the amount of large-scale infrastructure is increased. The re-zoning of the Agriculture and Agribusiness and North Luddenham precincts would also increase the amount of development, further reducing impact to landscape character over time.

Overall, the assessment indicates that the magnitude of the project would be **LOW** as The Northern Road Intersection would already have been upgraded and this project would form a small proportion of the overall character zone which would further reduce over time as development occurs.

Landscape Character Impact

The qualitative assessment indicates that the landscape character impact of the proposed work in LCZ 1 is expected to be **MODERATE**.

LCZ 1 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Gently undulating terrain following the ridge line.	Generally, only minor cuttings to achieve desired road design levels.
Hydrology	A single tributary to South Creek drains in a north-east direction across the area. Farm dams provide attractive landscape features	Existing watercourses would be maintained with new culverts constructed under the motorway.
Vegetation	Extensive clearing with pockets of introduced vegetation along driveway entries.	Large amounts of roadside vegetation would be implemented, potentially altering contextual views.
Built form and heritage	Predominantly rural residential.	No change as a result of this project.
Key activity areas and land use	Access to commercial properties along The Northern Road.	No change as a result of this project. Future work as identified in the LUIIP, including the OSO and The Northern Road project, would increase the amount of transport infrastructure in this zone. Rural landscape character would likely be retained as part of the Agriculture and Agribusiness and North Luddenham precincts. The latter would involve high technology and research institutions associated with food production.
Public domain	Public domain is limited to existing road reserves.	Provision for a continuous shared user path along the motorway would facilitate improved east-west access, connecting to riparian corridors and Western Sydney Parklands.
Spatial Quality	Scenic quality and 'country road' character of The Northern Road that follows the ridge line.	Although for a relatively short length of The Northern Road, the scale of the proposed infrastructure would significantly change the scale relationship of the road within the rural landscape setting.
Connectivity and access	The Northern Road is the main road providing access to rural properties.	No change. The M12 Motorway would not provide additional access to properties.

LCZ 1 - Landscape Character Impact Summary	
Landscape sensitivity to change	HIGH
Magnitude of change	LOW
Overall rating of landscape character impact	**MODERATE**

Landscape character impacts during operation
LCZ 2 - Luddenham rolling hills

Existing landscape character

LCZ 2 is characterised by a picturesque rural landscape with gently undulating hills that gradually fall towards Cosgroves Creek.

Land uses vary from large, broad acre paddocks to medium-sized rural residential allotments closer toward Elizabeth Drive and Luddenham Road. In addition, strings of farm dams follow natural overland flow paths near Elizabeth Drive.

Luddenham Road is the main rural road that provides access to rural allotments in this zone and offers a pleasant driver experience. This would be impacted by the project.

The majority of the original Cumberland Plain Woodlands have been extensively cleared with native vegetation confined to sparse strips along creek tributaries. In contrast, plantations of olive trees are located on the Luddenham Raceway property.

Desired future character

LCZ 2 falls within the Stage 1 priority precinct of the LUIIP referred to as the Northern Gateway. Sitting on the northern side of the future airport, this precinct is envisioned as a hub for high-technology focussed on tourism, health, education, research and development associated with food production and processing.

The Outer Sydney Orbital is also identified in this zone as a major future transport project that would involve significant widening of the project footprint in this zone.

It is anticipated that re-zoning of this precinct, including future transport developments, would lead to significant changes to the existing landscape character within this zone over time.


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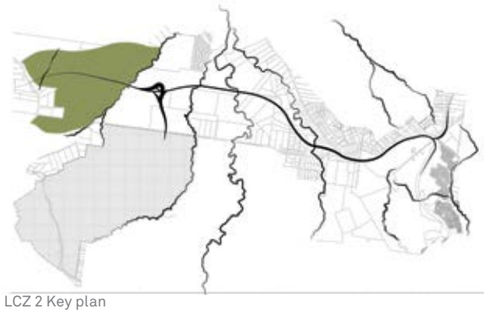

LCZ 2 Key plan


04

01 View north along Luddenham Road

02 Open paddock views towards Cosgrove Creek.

03 Typical character shot of rolling hills

04 Aerial view over Landscape Character Zone

The proposed work

In this zone, the proposed work would include:
_A new dual-carriageway motorway with two lanes in each direction
_Bridge structures over Luddenham Road and Cosgroves Creek
_A continuous shared user path connection along the southern side of the project
_Roadside revegetation work, native grasses, shrubs and broad-acre tree plantings derived from Cumberland Plain vegetation communities.

The table below outlines a description of expected change as a result of the proposed work.

Landscape sensitivity to change

LCZ 2 has a high scenic value as the rural landscape, undulating terrain and sparse vegetation cover combine to provide an attractive landscape.

The landscape is largely experienced by local residents, visitors and travellers along Luddenham Road who would have a limited capacity to absorb any new major infrastructure.

As a result, the landscape values of LCZ 2 indicate a **HIGH** sensitivity to change.

The landscape sensitivity would likely reduce over time with the rezoning and development of the Northern Gateway precinct and the Outer Sydney Orbital, which would transition the character of the area into an economic hub associated with the airport.

Magnitude of change

The project would introduce a new motorway alignment through predominantly greenfield sites and represents major new infrastructure in a setting with low levels of development.

As a whole, the undulating topography would localise and conceal the motorway, limiting impact on to the broader landscape and would be offset by plantings and earthworks formations that match and reflect the local character.

In consideration of future land use changes, the eventual transformation of LCZ 2 would reduce over time as the surrounding development and infrastructure increases. As a result, a **MODERATE** magnitude of change has been identified.

Landscape character impact

The qualitative assessment indicates that the landscape character impact of the project in LCZ 2 is expected to be **HIGH - MODERATE.**

LCZ 2 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Softly undulating terrain with localised high points and elevation changes falling toward Cosgroves Creek.	A combination of cut and fill embankments required to achieve road design levels and clearances heights for bridge structures.
Hydrology	A number of tributaries and farm dams draining eastward to Cosgroves Creek.	Existing watercourses would be maintained with new culverts constructed under the motorway.
Vegetation	Extensively cleared with sparse pockets of remnant woodland confined to watercourses.	Large amounts of roadside vegetation would screen and integrate the motorway into its context.
Built form and heritage	No heritage items identified.	Two new bridge crossing to be constructed (over Luddenham Road and Cosgrove Creek). Future work associated with LUIIP rezoning would involve redevelopment and construction in this zone.
Key activity areas and land use	Access to rural lots predominantly from Luddenham Road.	No change as part of this project. Future change would focus on high technology, research and development within the Northern Gateway Precinct as identified in the LUIIP.
Public domain	Public domain is limited to existing road reserves.	Provision for a continuous shared user path along the motorway would facilitate improved east-west access, connecting to riparian corridors and Western Sydney Parklands.
Spatial Quality	The scenic value of the rolling hills provides a picturesque and pleasant driving experience along Luddenham Road.	The introduction of two bridges over Luddenham Road and Cosgrove Creek would change the character in the immediate vicinity which would largely be offset by new vegetation.
Connectivity and access	Luddenham Road provides the majority of access to properties in this zone.	No change.

LCZ 2 - Landscape Character Impact Summary	
Landscape sensitivity to change	HIGH
Magnitude of change	MODERATE
Overall rating of landscape character impact	**HIGH-MODERATE**

Landscape character impacts during operation
LCZ 3 - Rural plains

Existing landscape character

Extending from Cosgroves Creek to South Creek, LCZ 3 is characterised by a relatively flat and open rural landscape. Similar to LCZ 2, this zone has undergone extensive clearing allowing for broad landscape views however due to the flatter topography, with views are typically confined within one kilometre.

Compared to LCZ 2, there is a higher concentration of farm dams, as well a native and exotic planting which typically follow property or paddock boundaries. Pockets of shale plains woodland and shale hills woodlands are evident in this zone.

The creek lines (Cosgroves Creek, Badgerys Creek and South Creek), which drain in a northerly direction, provide continuous threads of remnant floodplain forests through this character zone. They are of high ecological and aesthetic value and provide a sense of enclosure and expanse for motorists as they traverse the open plains.

Elizabeth Drive is the main rural road running through this zone. As described earlier, Elizabeth Drive provides a pleasant 'rural road' drivers experience, made more interesting by the higher proportion of roadside vegetation when compared with LCZ 2.

There are some land uses present in this zone that are out of character with the rural landscape such as the Suez Elizabeth Drive Landfill and Kemps Creek Resource Recovery Park.

The Non-Aboriginal Heritage Assessment identifies two sites of local significance in this character zone - The McGarvie Smith Farm (State significance) and McMaster Farm (State significance). Presently located within larger landholdings owned by Sydney University, these sites have significance for their contribution to various forms of scientific research dating back to the 1930's.

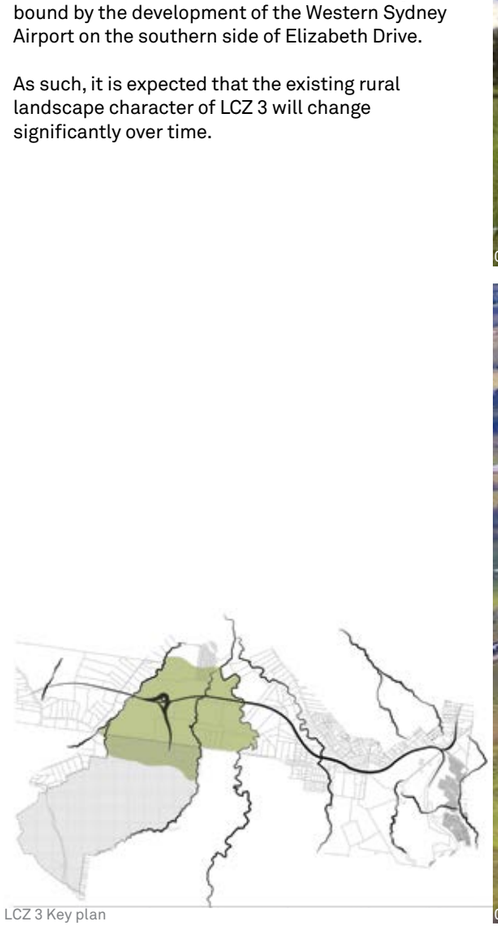
Desired future character

Similar to LCZ 2, LCZ 3 falls within the Northern Gateway Priority Precinct of the LUIIP. A portion of the character zone also falls within the Badgerys Creek precinct.

The landscape character of this area will transform over time into an employment, research and transport hub to support the development of the Western Economic Corridor, served by the M12 Motorway, Outer Sydney Orbital and the Sydney Metro Greater West rail link.

This landscape character zone will eventually be bound by the development of the Western Sydney Airport on the southern side of Elizabeth Drive.

As such, it is expected that the existing rural landscape character of LCZ 3 will change significantly over time.



LCZ 3 Key plan

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01 Estalbished , roadside tree plantings following Elizabeth Drive

02 Continous views to creek lines across flat, open paddocks.

03 Badgerys Creek.

04 Aerial view over Landscape Character Zone

The proposed work

In this zone the proposed work would include:
_A new dual-carriageway motorway with two lanes in each direction
_A continuous shared user path along the project connecting The Northern Road to Western Sydney Parklands and Elizabeth Drive
_A grade separated interchange with the Western Sydney Airport
_A bridge structure and embankments at Elizabeth Drive
_Twin bridges over Cosgrove Creek, Badgerys Creek and South Creek
_Modifications to local road network, if required, to facilitate connections across and around the motorway
_Roadside planting comprising of native grasses and trees arranged in a grid formation as part of a key entry node to Western Sydney Airport.

Landscape sensitivity to change

The broad, pastoral plains of LCZ 3 are of scenic value experienced mostly by travellers along Elizabeth Drive and few residents.

It is an open landscape that is strongly defined by intersecting creeks where native vegetation is concentrated.

The broad landscape and dense creeks are essential to its character. This LCZ which would have some ability to absorb any major change in its setting due to the lack of publicly accessible areas in this zone.

The location of the McGarvie and McMasters Farms in this zone increase the areas sensitivity to change due to their local heritage values. As a result, a **HIGH** sensitivity to change has been identified.

Magnitude of change

The project would introduce new, large scale, road-related infrastructure in this zone comprising of a major motorway interchange and connection to the future airport over Elizabeth. This would represent large new built form in a visually exposed area.

The proposed vegetation would mitigate some of the impact over time, however proposed design elements such as the 'abstracted gateway landscape would reinforce a new identity in this zone linking with future development of the Western Sydney Airport and adjacent land uses. This would result in a reduced impact over time as development occurs.

The project alignment would impact the access to two local heritage items - McGarvie Smith Farm and McMaster Farm however, buildings themselves would remain.

As a result, the magnitude of the project is expected to be **HIGH** in this zone.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character of the proposed work in LCZ 3 is expected to be **HIGH**.

The table below outlines a description of the expected change as a result of the proposed work.

LCZ 3 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Relatively flat agricultural lands. The elevated landforms of the Suez Kemps Creek Resource Recovery Park present as visible elements above the surrounding landscape.	Predominantly fill embankments are required to achieve road design levels and clearances heights for bridge structures. The grade separated interchange to Western Sydney Airport would be visible at distance across the open plains.
Hydrology	Tributaries drain in a northerly direction to the three main watercourses Cosgrove Creek, Badgerys Creek and South Creek.	Existing watercourses would be maintained with new culverts / bridges constructed under the motorway to maintain 1:100 flood zones.
Vegetation	Largely cleared agricultural land with remnant woodland following watercourses. Pockets of remnant Cumberland Plain woodland are sparsely distributed through this zone.	New roadside vegetation comprising of native grasses, shrubs and tree plantings would partially screen the motorway. A new 'interchange landscape' comprising of trees set out on a grid is proposed to reinforce the gateway to Sydney identity.
Built form and heritage	Predominantly agricultural/pastures with minimal built form. The McGarvie Smith Farm and McMaster Farm are identified to be of non-aboriginal heritage significance.	Two new bridge crossing to be constructed (over Luddenham Road and Cosgrove Creek). McGarvie Smith Farm and McMaster Farm would be retained however access would be impacted.
Key activity areas and land use	Suez Kemps Creek Resource Recovery Park Elizabeth Drive Landfill are the main source of commercial activity in this zone.	No change as part of this project. Future changes in land use associated with the Western Sydney Aerotropolis would completely transform the landscape character as it is eventually developed into an employment and research hub.
Public domain	Public domain is limited to existing road reserves.	Provision for a continuous shared user path along the motorway corridor would facilitate improved east-west access, connecting to riparian corridors, Western Sydney Parklands and Western Sydney Airport.
Spatial Quality	The scenic value of the rural landscape character and vegetated creek lines provide a pleasant driving experience through the corridor.	Significant road-related infrastructure is required to construct the interchange connection to the airport including upgrades to Elizabeth Drive.
Connectivity and access	Elizabeth Drive provides majority of access to rural properties in this zone.	No change.

LCZ 3 - Landscape Character Impact Summary	
Landscape sensitivity to change	HIGH
Magnitude of change	HIGH
Overall rating of landscape character impact	**HIGH**

Landscape character impacts during operation
LCZ 4 - Kemps Creek

Existing landscape character

LCZ 4 is characterised by the low-lying areas and wide flood plains between South Creek and Kemps Creek, generally within the suburb extents of Kemps Creek.

The development patterns north of Elizabeth Drive in this zone vary considerably from commercial, primary production, education, recreation to rural residential land uses, all of which result in an inconsistent character. The southern side of Elizabeth Drive is predominantly rural residential with large areas of remnant woodland.

Compared with LCZ 1, LCZ 2 and LCZ 3, there are larger areas of remnant woodland in this zone comprised of a range of vegetation communities belonging to the Cumberland Plain. This includes Flood Plain Forest, Shale Plains Woodland, Shale Gravel Transition Forest and Castlereagh Iron Bark Forest.

On the southern side of Elizabeth Drive, Bill Anderson Park, which forms part of the Cumberland Plain Priority Conservation Lands, provides a high ecological value in this zone. As a result, areas of scenic value are concentrated around riparian corridors and conservation areas.

The Non-Aboriginal Heritage Assessment identifies two items of local significance within LCZ 4:
_The Fleurs Aerodrome (local significance) - A former WWII airstrip located on the southern side of the project alignment
_The Fleurs Radio Telescope Site (State and potentially National significance) located approximately 100 metres north of the project alignment.

Although both are disused and derelict sites, the above items are considered to contribute to the overall landscape character as identifiable objects in the landscape and a reference to local site history.

Desired future character

This zone falls within the strategic precincts identified in the LUIIP as South Creek and Kemps Creek.

South Creek has been reserved as ‘non-urban land’ allowing for the creation of a central green spine as part of a broader open space network connecting to the Western Sydney Parklands.

The Kemps Creek precinct is identified as a mixed-use and flexible employment precinct.

Although the future character of this area is uncertain, the planning context indicates that there will be an expected increase in urban intensity. Also, it is expected that the creation of new public open space along South Creek, will have a positive effect on the landscape character of this zone over time as riparian corridors are rehabilitated as part of future public parklands.


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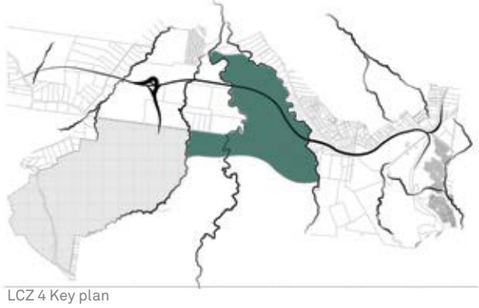
LCZ 4 Key plan

01 Stands of remnant bushland and River-Flat Forests

02 CSIRO Fleurs Telescope Site

03 View from Elizabeth Drive toward race track and South Creek.

04 View along South Creek

The proposed work

In this zone the proposed work would include:
_A new dual-carriageway motorway with two lanes in each direction with a central median facilitating future expansion to six lanes
_A continuous shared user path along the project connecting The Northern Road to Western Sydney Parklands and Elizabeth Drive
_Twin bridges over Clifton Avenue with changes to local road network to facilitate connections across and around the motorway
_Twin bridges over Elizabeth Drive
_Twin bridges over Kemps Creek
_Noise walls to the north of the alignment from west of Clifton Avenue to east of Range Road, and to the south of the alignment from east of Clifton Avenue to west of Range Road
_Revegetation along the project footprint comprising of native grasses, shrubs and woodland trees drawing upon the character and floristic profiles of the Cumberland Plain vegetation communities.

The table below outlines a description of the expected change as a result of the proposed work.

Landscape sensitivity to change

LCZ 4 is a flood plain landscape enclosed by the densely vegetated watercourse following Kemps Creek and South Creek. The landscape is experienced by a large number of motorists and workers accessing the area from Elizabeth Drive, as well as some local residents and visitors.

Development patterns in this zone are a mix of lower built and spatial quality, and therefore, considered to have a reasonable ability to absorb major infrastructure.

The identified heritage items - Fleurs Telescope Site and Fleurs Aerodrome, would also be sensitive to changes in the setting.

Areas of higher ecological value, such as Bill Anderson Park, are largely outside of the project footprint. In consideration of this and combined with the low-lying topography and typically non-residential land uses, a **MODERATE** level of sensitivity to change has been identified for LCZ 4.

Magnitude of change

The project introduces new, large scale, road-related infrastructure in this zone. The majority of the project would be blended into the surrounding context, with a combination of cut and fill embankments and revegetation work along the project footprint which would improve biodiversity.

The twin bridges proposed over Kemps Creek and extended lengths of noise wall would be visible. However, given the flat, low-lying topography and distribution of vegetation and buildings in the area, views to the structure would be partially obscured.

The project would encroach into the southern portions of the Fleurs Telescope and Fleurs Aerodrome sites; however, they would not be directly impacted.

The magnitude of change would reduce over time as flexible employment lands are developed as part of the Kemps Creek precinct of the LUIIP.

As a result, the magnitude of the project is expected to be **HIGH** in this zone.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character of the project in LCZ 4 is expected to be **HIGH-MODERATE.**

LCZ 4 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Flat, low-lying and wide-open plains	A combination of cut and fill embankments required to achieve road design levels and clearances heights for bridge structures.
Hydrology	Watercourse in this zone drains into Kemps Creek and South Creek in a northerly direction. Significant margins along creek lines preserved as flood zones for major 1:100 event.	Existing watercourses would be maintained with new culverts / bridges constructed under the motorway to maintain 1:100 flood zones.
Vegetation	Key areas of Conservation Land include Bill Anderson Park as well as distributed stands of remnant woodland on private properties.	New roadside vegetation comprising of native grasses, shrubs and tree plantings would partially screen and integrate the motorway into the surrounding context.
Built form and heritage	Concentrations of houses, commercial sheds and buildings Nearby heritage items include: Fleurs Telescope and Aerodrome	Two new bridge crossing to be constructed (over Clifton Road and Kemps Creek). The project alignment would physically separate the two heritage items which may result in an adverse impact.
Key activity areas and land use	Local commercial town centre focussed along Elizabeth Drive.	No change as part of this project. Future land use change may intensify development within Kemps Creek
Public domain	Public domain is limited to existing road reserves and access to commercial properties along Elizabeth Drive.	Provision for a continuous shared user path along the project would facilitate improved east-west access, connecting to riparian corridors, Western Sydney Parklands.
Spatial Quality	The landscape generally has an open, rural quality which is enhanced along creek lines where remnant vegetation is concentrated.	Significant road-related infrastructure is required to construct the interchange connection to the airport including upgrades to Elizabeth Drive.
Connectivity and access	Elizabeth Drive and Clifton Road provides majority of access to rural properties in this zone.	Clifton Road re-alignment and bridge crossing over motorway.

LCZ 4 - Landscape Character Impact Summary	
Landscape sensitivity to change	MODERATE
Magnitude of change	HIGH
Overall rating of landscape character impact	**HIGH-MODERATE**

Landscape character impacts during operation
LCZ 5 - Rural residential

Existing landscape character

LCZ 5 extends east of Kemps Creek, following Elizabeth Drive towards the M7 Motorway. It is dominated by rural residential properties, but also includes both agricultural and commercial activities.

Mamre Road is the main arterial connector through this zone which is dotted with a mixture of commercial and rural residential properties

Smaller lot sizes are supported by a more extensive road network in comparison to other zones. Houses are generally set back consistently from the road, and a combination of native and exotic tree plantings along fence lines clearly define property boundaries.

The landscape character is clearly defined by gentle to moderately steep hills that gradually climb from the extensively cleared, lower slopes around Kemps Creek to the tree-covered hill tops of Mount Vernon.

The vegetation on top of the hills of Mount Vernon extends south towards Western Sydney Parkland and is comprised mostly of remnant Shale Hills/ Plains Woodlands followed by Castlereagh Scribbly Gum Woodland.

Desired future character

LCZ 5 generally falls beyond the land use changes associated with the LUIIP. However, parts of this zone, that lie in Fairfield City (Cecil Park), are identified within an Urban Investigation Area (UIA) under the Greater Sydney Region Plan (Greater Sydney Commission, 2018).

As a result, studies have commenced to explore future development opportunities of the UIA that would evolve as the region grows to facilitate the Aerotropolis. The *Horsley Park and Cecil Park Urban Investigation Area Urban Capability Assessment, Draft Structure Plan Options - November 2018,* identifies potential changes in land use that support new employment lands, transport corridors, boulevards and a general increase in residential density.

Although the future character of this area is uncertain, the planning context indicates that there will be an expected increase in urban intensity.

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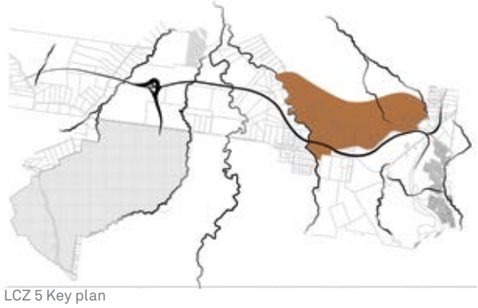
LCZ 5 Key plan

01 Rural - Commercial frontages along Elizabeth Drive and Mamre Road

02 Distant hill tops of Mount Vernon.

03 Regional views from rural-residential properties of Mount Vernon.

04 Aerial view over landscape character zone.

The proposed work

In this zone, the proposed work would be confined to a small portion of the overall character zone between Kemps Creek and Mamre Road which includes:

- A new dual-carriageway motorway with two lanes in each direction with a central median facilitating future expansion to six lanes
- Twin bridges over Elizabeth Drive continuing southeast toward Western Sydney Parklands
- Noise walls to the north of the alignment from west of Clifton Avenue to east of Range Road, and to the south of the alignment from east of Clifton Avenue to west of Range Road
- A continuous shared user path along the project connecting The Northern Road to Western Sydney Parklands and Elizabeth Drive
- Roadside planting and revegetation along the length of the project comprised of native grasses, shrubs and trees to partially screen the motorway.

Landscape sensitivity to change

LCZ 5 is generally a tranquil, scenic, rural-residential suburb largely experienced by local residents and visitors, as well as travellers along Mamre Road.

The residential quality of the area is essential to its character along with tree-topped backdrop of Mount Vernon as a key landscape feature. In contrast, the streetscape environment along Mamre Road is considered to be of poor spatial and built quality.

LCZ 5 is considered to be sensitive to change with low capacity to absorb any new major infrastructure. As a result, a **HIGH** sensitivity to change was recorded.

Magnitude of change

The project would introduce some road related infrastructure within a confined area of the overall character zone comprising of large new bridge structures over Elizabeth Drive.

Physical impacts of the project would be limited to commercial properties at the intersection of Mamre Road and Elizabeth Drive.

Extended lengths of noise wall would be visible. However, given the flat, low-lying topography and distribution of vegetation and buildings in the area, views to the structure would be partially obscured.

The scale of the bridges would recede over time as new plantings mature. As a result, the magnitude of the project is expected to be **MODERATE** in this zone.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character impact of the project in LCZ 5 is expected to be **HIGH-MODERATE.**

The table below outlines a description of the expected change as a result of the proposed work.

LCZ 5 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Low-lying slopes climbing gradually to the hill tops of Mount Vernon.	No change.
Hydrology	Hillsides drain into Kemps Creek.	Existing watercourses would be maintained with new culverts / bridges constructed under the motorway to maintain 1:100 flood zones.
Vegetation	Riparian vegetation along Kemps Creek and tree-covered hill tops comprising of remnant Cumberland Plains Woodland Vegetation communities.	New roadside vegetation comprising of native grasses, shrubs and tree plantings would partially screen and integrate the motorway into the surrounding context.
Built form and heritage	Predominantly rural residential dwellings with some commercial frontages along Elizabeth Drive and Mamre Road.	A new bridge structure over Elizabeth Drive near Mamre Road, and extended lengths of noise walls to both sides of the alignment.
Key activity areas and land use	Local commercial frontages along Mamre Road. Kemps Creek Sporting and Bowling Club is located on Elizabeth Drive which would be sensitive to change.	Commercial lands along Elizabeth Drive acquired as part of the project. No impact to Kemps Creek Sporting and Bowling Club as a result of the project.
Public domain	Public domain is limited to existing road reserves.	Provision for a continuous shared user path along the project would facilitate improved east-west access, connecting to riparian corridors, Western Sydney Parklands.
Spatial Quality	High visual value of open, rural residential character with backdrop of tree-lined hills.	No change.
Connectivity and access	Elizabeth Drive and Mamre Road are the major roads in this zone supported by a network of local streets.	Minor changes to existing intersection configuration.

LCZ 5 - Landscape Character Impact Summary	
Landscape sensitivity to change	HIGH
Magnitude of change	MODERATE
Overall rating of landscape character impact	**HIGH-MODERATE**

Landscape character impacts during operation
LCZ 6 - Ridge top woodlands

Existing landscape character

LZC 6 is characterised by the areas of remnant and revegetated bushland between Elizabeth Drive and the M7 Motorway. It forms part of the broader, regional Western Sydney Parklands which hosts various outdoor recreational activities such as the Sydney International Shooting Centre (SISC) and the Wylde Mountain-Bike (MTB) Trail.

The landscape character in this zone is defined by the active land uses described above and by the north-south running ridge line that forms the catchment boundary between the Hawkesbury-Nepean, Georges River and Parramatta River catchments. Vantage points along the ridge line provides sweeping panoramic views of Greater Western Sydney. West of the ridgeline, the woodlands gently roll and drain towards Kemps Creek.

The vegetation in this zone is comprised predominantly of Grey Box - Forest Red Gum Grassy Woodlands which belong to the endangered ecological community of the Cumberland Plains.

Kemps Creek Nature Reserve is also located within this zone and has been identified as Priority Conservation Land under the Cumberland Plain Recovery Plan. Among the vegetation communities mentioned above, the Reserve also includes remnant Shale-Gravel Transition Forest , Castlereagh Swamp Woodland and contains one of the best remaining examples of woodland bird communities.

Adjacent to, and in direct contrast to the Nature Reserve the Reserve lies Brandown Quarries site, which is accessed from Range Road.

Desired future character

LCZ 6 forms part of the southern parklands area referred to as Cecil Park that is identified in the *Western Sydney Parklands Plan of Management 2030*.

The desired future character of this zone is expected to become a major recreation, sport, entertainment and tourism destination includes continuing conservation and protection of natural landscape as a setting for a future regional recreational park.


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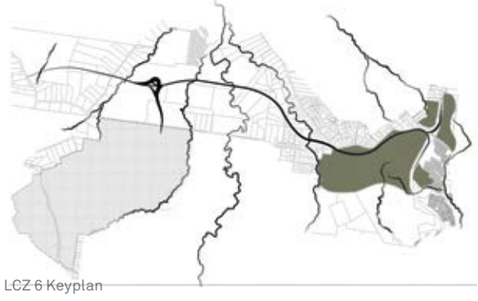
LCZ 6 Keyplan

01 Remnant Cumberland Plain Woodlands and swamps adjacent to Brandowne Quarries.

02 Shale hills woodland in Western Sydney Parklands

03 Remnant Cumberland Plain Woodlands in the Western Sydney Parklands

04 Panoramic views of the Cumberland Plains from vantage points along the ridge line within Western Sydney Parklands

The proposed work

In this zone the proposed work would include:
_A new dual-carriageway motorway with two lanes in each direction with a central median facilitating future expansion to six lanes
_Twin bridges over Range Road
_Noise walls to the north of the alignment from west of Clifton Avenue to east of Range Road, and to the south of the alignment from east of Clifton Avenue to west of Range Road
_A continuous shared user path to Range Road
_A bridge crossing near Duff Road
_Revegetation along the project footprint comprising of native grasses, shrubs and woodland trees drawing upon the character and floristic profiles of the Cumberland Plain vegetation communities (Grey Box - Forest Red Gum Grassy Woodlands).

The table below outlines a description of the expected change as a result of the proposed work.

Landscape sensitivity to change

In this zone, the established parklands and its character is a major contribution to the overall Western Sydney Parklands network of native vegetation, open spaces and recreational amenities. Looking into the future, the importance of these parklands to balance the needs of a growing western Sydney would become increasingly evident as time goes on.

LCZ 6 is generally experienced by parkland users, travellers along Elizabeth Drive, and visitors to existing recreational facilities in the southern parklands precinct. Recreational facilities in this zone include the Wylde MTB Trail and SISC which are high value to the community and would be sensitive to change.

In addition, existing parkland vegetation (both remnant and revegetated) can be interpreted as having a high sensitivity to change.

With consideration of the ecological, habitat and recreational amenity of this zone, a **HIGH** level of sensitivity to change was recorded.

Magnitude of change

The proposed work would introduce significant, new road-related infrastructure in this zone.

The project would result in the fragmentation of the Western Sydney Parklands, impacting existing uses (such as the Wylde MTB Trail) and restricting access across the project which would affect existing and future land use.

The project footprint would also have an adverse impact on biodiversity as the ecological and habitat values of fragmented woodland would be affected. Despite this, the project would avoid any impacts to the Kemps Creek Nature Reserve, which is outside of the construction and operational footprints of the project. `

As a result, the magnitude of change is expected to be **HIGH** in this zone. The impact would reduce over time as revegetation becomes established and matures.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character impact of the project in LCZ 6 is expected to be **HIGH**.

LCZ 6 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	North to south running ridge line sloping toward Kemps Creek.	A combination of cut and fill embankments required to achieve road design levels and clearances heights for bridge structures.
Hydrology	Hillsides drain into Kemps Creek.	Existing watercourses would be maintained with new culverts / bridges constructed under the motorway to maintain 1:100 flood zones.
Vegetation	Endangered ecological communities endemic to the Cumberland Plain Woodlands (Grey Box - Forest Red Gum Grassy Woodland).	New roadside vegetation drawing on characteristic of local vegetation communities to sensitively integrated into woodland character and minimise impact to fragmented parcels of land.
Built form and heritage	Built element related to parkland and recreational amenities.	New bridge over Range Road.
Key activity areas and land use	The entire parkland offers concentration of open space and recreational facilities. Wylde MTB Trail and Sydney International Shooters Centre are two facilities that would be sensitive to change.	Western Sydney Parklands Trust would relocate the Wylde MTB Trail to an alternative location within the parklands.
Public domain	As above.	Residual lands between the proposed alignment and Elizabeth Drive would result in fragmentation of the parklands.
Spatial Quality	Scenic parklands offer a range experience relative to topographical elevation.	No change.
Connectivity and access	Existing network of parkland paths and roads allow access through this zone.	New pedestrian and cycle infrastructure would be required to reinstate access along and across the project.

LCZ 6 - Landscape Character Impact Summary	
Landscape sensitivity to change	HIGH
Magnitude of change	HIGH
Overall rating of landscape character impact	**HIGH**

Landscape character impacts during operation
LCZ 7 - M7 Motorway

Existing landscape character

Set within the broader Western Sydney Parklands of LCZ 6, this zone is unique in character. The M7 Motorway is characterised by a dedicated corridor (and area immediately adjacent) that prioritises efficient vehicular movements onto and off the motorway from Elizabeth Drive. It includes a higher proportion of traffic lanes to facilitate the full range of turning movements as well as a signalised intersection.

The M7 Motorway is considered as a high-quality piece of road infrastructure and has set a benchmark for other projects since its completion.

A combination of road and pedestrian bridges are defining elements in this zone, characterised by concrete box girder bridges and tall concrete retaining walls that are simply detailed.

Pedestrian bridges have been designed as signature elements comprising of bespoke, steel structures with integrated throw screens.

A network of grade-separated shared user paths follow the eastern side of the motorway providing a pleasant and well considered pedestrian and cycle connectivity that links the entire parklands and neighbouring areas such as Cecil Hills (LCZ 8).

The landform immediately surrounding this zone is highly modified comprising of steep, typically 2:1 engineered cut and fill embankments. Native woodland plantings have been used in the median and on roadside batters to integrate the motorway into the parklands, however on some of the steeper slopes plantings have been unsuccessful.

Desired future character

There is no strategic work associated with the Aerotropolis that are identified within the LUIIP in this landscape character zone.


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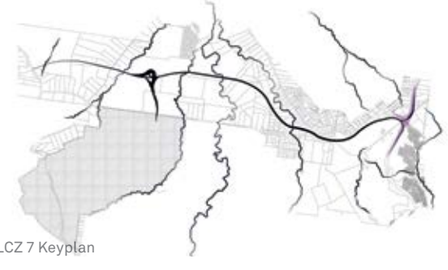

LCZ 7 Keyplan

01 View of typical M7 Motorway retaining wall and bridge abutments.

02 Shared user path network along eastern side of M7 Motorway

03 View south adjacent to engineered cuttings and embankments with limited vegetation.

04 Identifiable bridges become motorway landmarks.

The proposed work

The proposed work in this zone would include a motorway to motorway interchange connecting the M7 Motorway and M12 Motorway comprising of:

- A multi- layered motorway interchange with three new concrete box girder bridges over existing infrastructure
- Concrete retaining walls and bridge abutments at each bridge location
- Re configuration of Wallgrove Road to include on-ramp loop connection to the M7 Motorway Northbound
- Revegetation of new batters and earthwork drawing upon local vegetation communities of the Cumberland Plain Woodlands
- Modification to existing shared user path alignments around new infrastructure.

The table below outlines a description of the expected change as a result of the proposed work.

Landscape sensitivity to change

The character of LCZ 7 is currently defined by road-related motorway infrastructure including adjacent landscaped areas and engineered landforms.

The vegetation is generally of poor quality as trees have struggled to establish on steep and unnatural slopes.

The zone is a transient space, experienced by those passing through; motorists, cyclists and / or pedestrians. Overall, the sensitivity of this zone is expected to be **LOW**.

Magnitude of change

New road and bridge alignments would combine to introduce larger scale infrastructure than what already exists in this zone.

The general footprint of the project would be widened to accommodate three new bridges that weave over the existing intersection of the M7 Motorway and Elizabeth Drive. This would require landscape works of re-modified embankments.

Overall, given that it is already a highly modified environment with existing infrastructure, the proposed infrastructure would result in a **MODERATE** magnitude of change with limited views from neighbouring character zones.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character impact of the proposed work in LCZ 7 is expected to be **MODERATE - LOW**.

LCZ 7 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Highly modified and engineered cut and fill embankments.	Footprint of motorway embankments follows new alignments extending further into adjacent parcels of Western Sydney Parklands
Hydrology	Engineered drainage and swale system integrated into motorway and landform profiles.	No change.
Vegetation	Native woodland vegetation planting in medians and roadside embankments	Cleared vegetation would be reinstated on new embankments within constraints of new infrastructure.
Built form and heritage	Existing M7 Motorway vehicular and pedestrian bridges are identifiable elements	Four new on/off ramps; three of which would be bridges constructed above existing structures. The M7 Motorway northbound off ramp to the M12 Motorway westbound would comprise of structures cut into the flank of the ridge with typical 1:2 batters. Associated retaining walls, bridge piers and abutments would also be required.
Key activity areas and land use	Not applicable	No change.
Public domain	The motorway is sensitively integrated with the Western Sydney Parklands through a network of shared user paths and bridge crossings	Connections across Western Sydney Parklands to be reinstated as part of the project.
Spatial Quality	A vegetated corridor design for a high-speed environment with occasional views out across bridges.	No change.

LCZ 7 - Landscape Character Impact Summary	
Landscape sensitivity to change	LOW
Magnitude of change	MODERATE
Overall rating of landscape character impact	**MODERATE-LOW**

Landscape character impacts during operation
LCZ 8 - Cecil Hills residential

Existing landscape character

LCZ 8 is located south-east of the intersection of the M7 Motorway and Elizabeth Drive. It is characterised by predominantly two-storey residential housing with very low tree coverage.

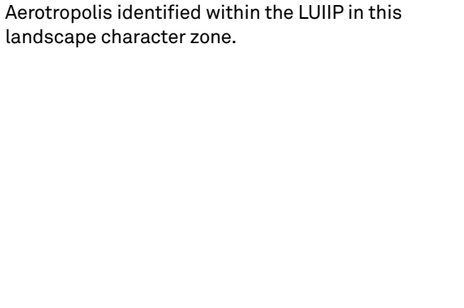
Previously a working farm, the area was developed in the 1980s into a new housing estate. As a result, the aesthetic of the neighbourhood is consistent with regular lot sizes with wide frontages, modern homes and consistent building setbacks.

Streets are curvilinear, looping around topographical and drainage features, providing a continuity of open space from the adjacent Western Sydney Parklands to the village centre which is focused around watercourses that feed into Hinchinbrook Creek.

The edge of the residential suburb is generally buffered from the M7 Motorway by the Western Sydney Parklands.

Desired future character

There is no strategic work associated with the Aerotropolis identified within the LUIIP in this landscape character zone.



LCZ 8 Keyplan

01 Typical streetscape character

02 Residential housing typically located in low-lying areas between ridgelines

03 Adjacent parkland buffer to M7 Motorway

04 Context view over Cecil Hills

01

02

03

04

The proposed work

In this zone the proposed work would interface with the western edge of the character zone as generally described in LCZ 7. Work near this zone would include:

- Southbound on-ramp to the M7 Motorway from the M12 Motorway requiring modifications to landform to accommodate the new, single lane bridge
- Reconfiguration of existing shared user path connectivity along the eastern side of the M7 Motorway to accommodate the proposed alignments
- Revegetation of new batters and earthwork drawing upon local vegetation communities of the Cumberland Plain Woodlands.

The table below outlines a description of the expected change as a result of the proposed work.

Landscape sensitivity to change

LCZ 8 is generally a modern suburb set within the valley. It is surrounded by hills and parkland and is predominantly experienced by local residents and visitors. The surrounding hills and parkland comprise of Cumberland Plain Woodland and offer high scenic and recreational value. They also provide a buffer to the existing M7 Motorway.

The suburban quality and peripheral parklands are essential to the character of the area. LCZ 8 is sensitive to change with some capacity to absorb change. As a result, the sensitivity of this zone is expected to be **MODERATE**.

Magnitude of change

The project would introduce motorway infrastructure along the western edge of LCZ 8 which would involve widening of the M7 Motorway corridor to facilitate the new motorway to motorway interchange (described in LCZ 7).

Regrading of slopes and paths work would be undertaken along the top of the hills adjacent to the motorway, as required. New vegetation would re-establish the existing landscape character and buffer any motorway elements.

As a result, the magnitude of the project is expected to be **LOW** in this zone.

Landscape character impact assessment

The qualitative assessment indicates that the landscape character impact of the project in LCZ 8 is expected to be **MODERATE-LOW** during operation.

LCZ 8 - Description of Change		
Attribute	Description of existing condition	Description of changes
Topography	Preserved hillsides with residential development concentrated on lower slopes falling toward Hinchinbrook Creek.	New cut and fill embankment along the western edge of the character zone to facilitate motorway elements.
Hydrology	Creek tributaries and overland flow travel in an easterly direction	No change.
Vegetation	Limited street tree canopy comprising of various exotic species. Native vegetation follows riparian corridors and hill tops of the Western Sydney Parklands.	No change.
Built form and heritage	Predominantly two-storey residential housing of average quality developed in the 1980's	No change.
Key activity areas and land use	Cecil Hill Town Centre located in the centre of this zone comprising schools, supermarkets and community centres etc	No change.
Public domain	The surrounding parklands, creek corridors and ponds provide an abundance of contiguous publicly accessible open space	Connections across Western Sydney Parklands to be reconciled as part of the project.
Spatial Quality	The quality of the urban environment is poor however is offset by expansive open parklands	No change.
Connectivity and access	A single access road to the suburb is located beyond the project work along Elizabeth Drive. The network of open spaces and parkland connect to the broader Western Sydney Parklands	Existing pedestrian and cyclist connectivity to be reinstated.

LCZ 8 - Landscape Character Impact Summary	
Landscape sensitivity to change	MODERATE
Magnitude of change	LOW
Overall rating of landscape character impact	**MODERATE-LOW**

Summary of landscape character impacts

The landscape character impact assessment of the project represents a qualitative assessment based on the eight LCZ's.

The impact assessment ranges from **MODERATE - LOW** to **HIGH** as indicated in the adjacent table.

The majority of impact ratings across the project are **MODERATE** to **HIGH - MODERATE**, resulting primarily from the changes to existing landscape character, the extent of the project, and where the project would traverse through existing, scenic greenfield landscape settings.

There are areas where the project would create a new road corridor and travel through rural landscapes including floodplains, riparian corridors and woodlands. As a result, the overall impact is considered to be higher in these individual zones.

A number of **HIGH** and **HIGH - MODERATE** landscape character impacts locations were identified at the following locations:
_LCZ 2 - Luddenham rolling hills
_LCZ 3 - Rural plains
_LCZ 4 - Kemps Creek
_LCZ 5 - Rural residential
_LCZ 6 - Ridgetop woodlands.

A **HIGH** impact rating has been indicated at two locations. In LCZ 3, the sheer scale and footprint of the airport gateway interchange bridge over Elizabeth Drive is considered to adversely impact the relatively flat terrain of the plains.

In LCZ 6, the project would transverse areas of the Western Sydney Parklands where ecologically sensitive Cumberland Plain Woodlands occur. As a result, residual land between Elizabeth Drive and the M12 Motorway would become fragmented.

It is noted that substantial land use changes are planned as part of the Western Sydney Aerotropolis which have influence the impact assessment. This is particularly the case in LCZ 2 and LCZ 3 which fall under the 'Northern Gateway' priority precinct and are anticipated to front the economic transformation of the area.

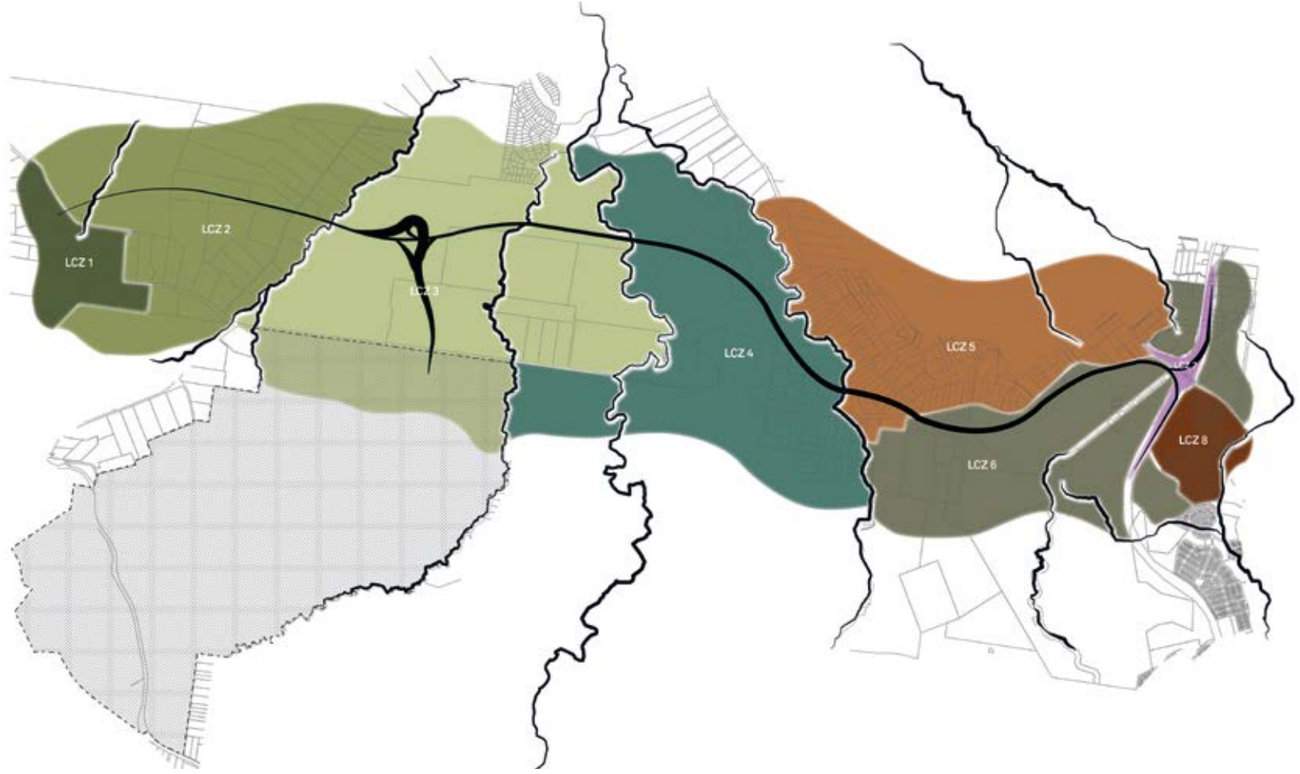
A **HIGH-MODERATE** impact rating has been indicated at three locations. In LCZ2, the undulating topography would localise and conceal the motorway somewhat, limiting impact on to the broader landscape and future land use changes will transform this zone.

In LCZ4, the majority of the project would be blended into the surrounding context, and the twin bridges proposed over Kemps Creek would be visible but the low-lying topography and distribution of vegetation and buildings in the area would reduce views to the structure, in a zone that will change to flexible employment lands as part of the Kemps Creek precinct of the LUIIP.

LCZ5 is a scenic, rural-residential area and the project would introduce some road related infrastructure within a confined location within the zone, reducing the overall impacts which would further reduce over time as plantings mature and the surrounding land use changes.

Mitigation measures related to landscape character impacts are described in Section 09.

OVERALL LANDSCAPE CHARACTER IMPACT SUMMARY	
Landscape character zone	**Overall rating of landscape character impact**
LCZ 1 - The Northern Road ridgeline	**MODERATE**
LCZ 2 - Luddenham rolling hills	**HIGH-MODERATE**
LCZ 3 - Rural plains	**HIGH**
LCZ 4 - Kemps Creek	**HIGH-MODERATE**
LCZ 5 - Rural residential	**HIGH-MODERATE**
LCZ 6 - Ridgetop woodlands	**HIGH**
LCZ 7 - M7 Motorway	**MODERATE-LOW**
LCZ 8 - Cecil Hills residential	**MODERATE-LOW**



Keyplan of landscape character zones

Artist's impression: Aerial view west across M7 / M12 Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

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The Aboriginal ‘Six Seasons’ - the time of Ngoonungi

Visibility of the project

The visual catchment or visibility of the project is the extent from which the project can be seen from within the study area. The approach to determining the visual catchment is outlined in assessment methodology in Section 03 of this report. The outcomes of the process are illustrated in the adjacent Visual Envelope Map (VEM).

The VEM illustrates the degree of visibility of the project throughout the study area. It ranges from 100 metres to approximately one kilometres in some locations. Typically, the extent of visibility is greatest in areas where topography is flattest such as the rural plains of LCZ3, or along localised high points such as Luddenham Road.

Visibility tends to be most confined in areas of densely vegetated terrain such as the Western Sydney Parklands or riparian corridors.

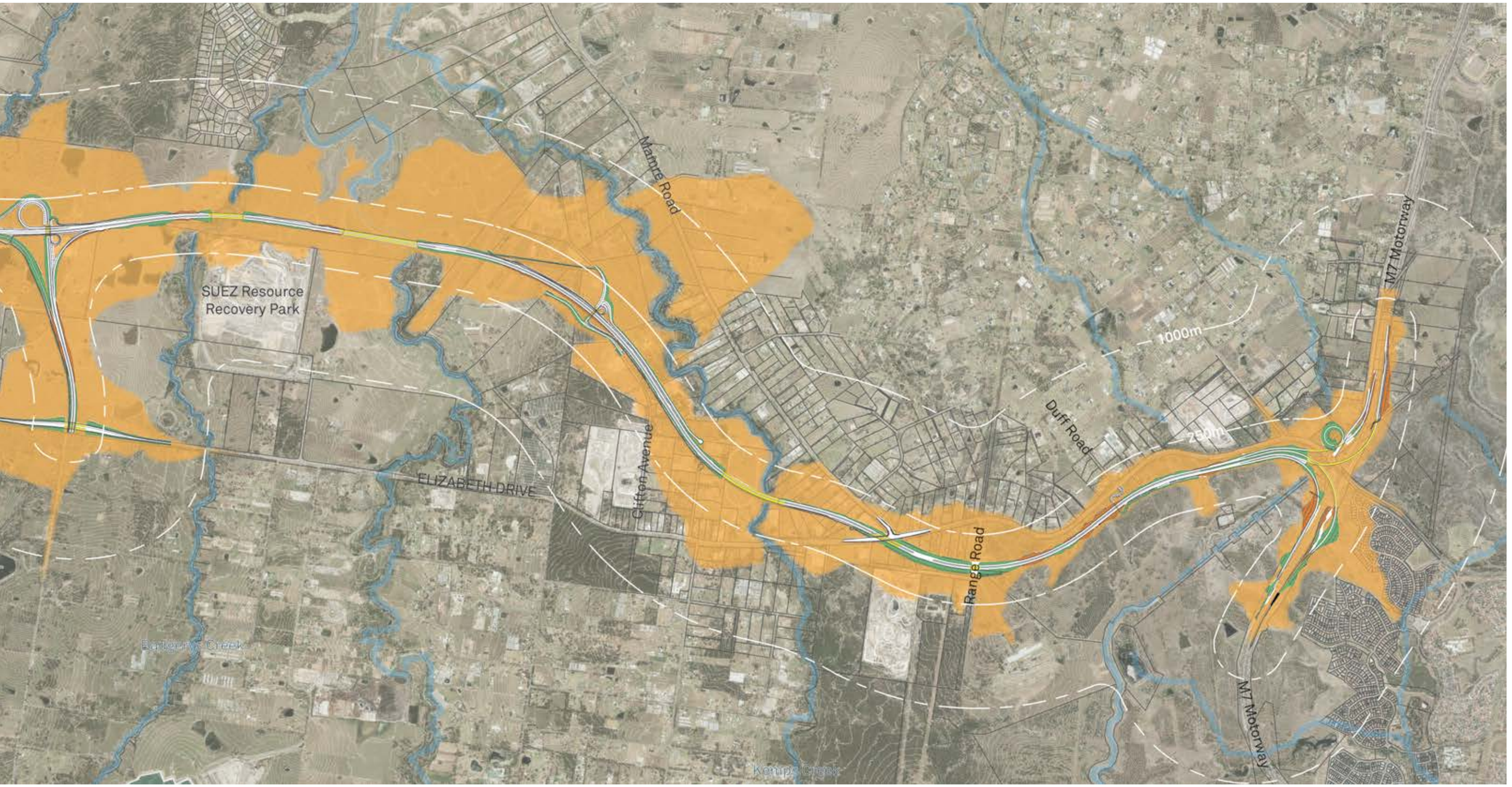
Future land use changes that may affect visibility of the project.

As described earlier in this report, it is noted that substantial land use changes are planned within the study area. They include the development of employment lands, the Western Sydney Airport and transport projects such as the Outer Sydney Orbital and the Sydney Metro Greater West rail link.

As a general consideration, it is expected that future development within the study area will reduce the overall extent of visibility of the project. As new employment lands transform the area, so too would news buildings and infrastructure obstruct views of the project.

In cases where there are no major changes to land use, such as the areas of the Western Sydney Parklands, Cecil Hills and Mount Vernon, the visibility of the project is unlikely to change in the foreseeable future.

Visibility envelope mapping - Scale: 1:25000



Legend

- Visual catchment
- Cadastral boundary
- Road alignment offset
- Ridgeline
- Bridge
- Fill embankment
- Cut embankment

Viewpoint locations

Viewpoint locations are publicly accessible places where full or screened views of the project can be viewed and there is human activity. This activity may include residential, industrial, business, schooling, recreation or road users themselves.

Illegal or uncommon uses of land which results in a view of the site have not been considered.

Due to the major large landholders along the project (particularly in the western portion of the project), some viewpoints cannot be physically accessed as they are located on private property. Therefore, a view from the nearest accessible point was taken, and this is noted within the visual impact assessment.

Key viewpoints that have been identified based the VEM and in consultation with the project team and are assessed in this report are listed in the adjacent table. Specifically, viewer locations have been chosen to:

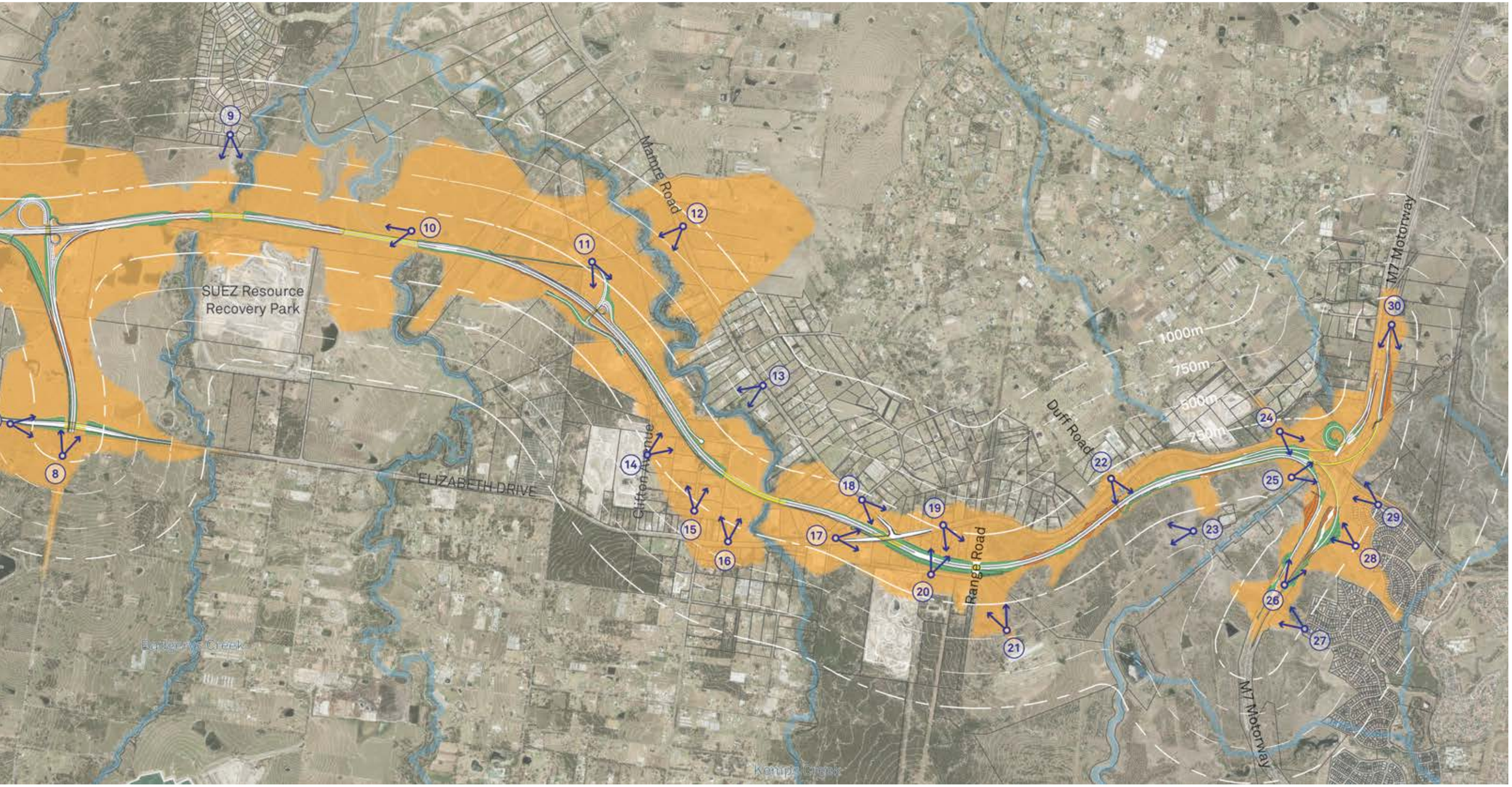
1. Address views from public vantage points (streets, lookouts, public places etc)
2. Typically represent homes or particular views that might be experienced from people's homes or properties
3. Address location of high impact and major change (bridges, overpass)
4. Address areas where there are no current road alignment, where new infrastructure is introduced in native forest or agricultural areas
5. Address places of interest or high perceived cultural value such as heritage conservation items, lookouts, schools or community facilities as well as nearby private residences
6. Typically represent the full 16 kilometre project and nominated catchment area.

An analysis of significant views and viewer locations relating to the proposed works has been done in accordance with sections 6.1-6.3 of the practice note.

Viewpoint locations

Viewpoint	Location
01	View east along The Northern Road
02	View east along The Northern Road
03	View north near Luddenham Raceway
04	View north along Luddenham Road
05	View north-west along Luddenham Road
06	View south along Luddenham Road
07	View east along Elizabeth Drive
08	View north from Badgerys Creek Road
09	View south from Twin Creeks Golf and Country Club
10	View west along South Creek (Sydney University Lands)
11	View south along Clifton Avenue
12	View west from Mamre Road
13	View west from Mamre Road
14	View east from Clifton Avenue
15	View south from Salisbury Avenue
16	View north from Elizabeth Drive
17	View east along Elizabeth Drive
18	View south from Mamre Road
19	View south from Elizabeth Drive
20	View north from Range Road
21	View north-west from Sydney International Shooting Centre (SISC)
22	View south from Duff Road
23	View from Western Sydney Parklands (beauty spot)
24	View south from Cecil Road
25	View north-west toward M7 - M12 Interchange
26	View north along the M7 Motorway
27	View west from Anjou Circuit
28	View west from Jaquetta Close
29	View west along Elizabeth Drive
30	View south along shared user path and M7 Motorway

Viewpoint locations - Scale: 1:25000



Legend

- Viewpoint identifier
- Visual catchment
- Cadastral boundary
- Road alignment offset
- Ridgeline
- Bridge
- Fill embankment
- Cut embankment

Visual impact assessment

The Roads and Maritime EIA Practice Note EIA-N04 clearly identifies a difference between the landscape character impacts and visual impacts of a proposed development. A Visual impact assessment helps to define the day to day visual effect of a project on people's views from their home or from other places of value in the community. Visual impact is the measure of the potential change that new interventions would have on the existing visual environment.

This section includes a detailed assessment of the project from selected viewpoints, with a rating given for magnitude and sensitivity, as shown in the matrix below, which provides the overall Visual impact assessment for each viewpoint location.

To assist in making the visual assessment process easier to comprehend and more accurate, each assessment provides an existing image of each viewpoint. A visualisation is also provided to illustrate the location, scale and form of the project in its setting.

These visualisations are subject to further design development and refinement.

Sensitivity \ Magnitude	High	Moderate	Low	Negligible
High	High Impact	High-Moderate	Moderate	Negligible
Moderate	High-Moderate	Moderate	Moderate-low	Negligible
Low	Moderate	Moderate-low	Low	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Landscape character and visual impact grading matrix

Visual impacts during construction

A general assessment has been prepared describing any additional impacts to visual amenity that are common across the project, both temporary and permanent.

A detailed description of the construction work is provided in Section 06 of this report and provides the basis for this assessment.

Temporary visual impacts during the construction stage may occur as a result of construction activities and construction ancillary facilities (AF) being located in the existing landscape.

Construction activities are generally divided between site preparation and project infrastructure. Activities would range from major earthworks and removal of vegetation and the presences of construction plant, equipment, stockpiling areas and storage.

As described in Section 06 of this report, nine potential sites were identified for ancillary facilities (AF) during construction, each located within the construction footprint:

_AF 1 - East of Northern Road
_AF 2 - North of Elizabeth Drive opposite the Elizabeth Drive/Badgerys Creek Road intersection
_AF 3 - North of Elizabeth Drive between proposed airport access road and the Sydney Metro Greater West rail line
_AF 4 – West of Clifton Avenue, north of proposed mainline
_AF 5 – West of Mamre Road North of Elizabeth Drive
_AF 6 – South of Elizabeth Drive opposite Duff Road
_AF 7 – West of the M7 Motorway, North east corner of Western Sydney Parklands
_AF 8 – East of the M7 Motorway, south of Elizabeth Drive
_AF 9 – East of the M7 Motorway, north of Elizabeth Drive.

The final type, location and number of ancillary facilities would be determined by the construction contractor.

Key potential visual impacts during construction primarily relate to residential receptors, who would experience the longest duration of views of construction activities.

The visual impacts would result from a combination of any of the following:
_Building removal
_Tree removal
_Visibility or overshadowing of temporary structures
_Temporary noise barriers
_Hoardings
_Visibility of ancillary facilities including construction machinery, plant operations and site offices
_Temporary lighting (discussed further on)
_Increased vehicle movements and personnel in the area.

Based on the VEM, majority of the project would traverse rural properties or parklands resulting in few residential receptors located within close proximity to construction activities.

The closest receptors would vary across the project. In rural areas, there are receptors along The Northern Road and Luddenham Road that are located about 250 metres from the project. A higher proportion of receptors are located in the more developed areas between Clifton Avenue and Mamre Road. In this area, viewers range from 50 metres to 500 metres from the project.

As a result, it has been considered that general impacts during construction are relatively low, except where viewership is highest within the visual catchment, particularly near Viewpoints 15, 16 and 18.

Equally, in terms of ancillary facilities, it has been considered that impacts are more moderate due to their scale and function. The location of AF5 would have in the highest proportion of receptors and result in a higher impact during construction. This could be evident near Viewpoints 17 and 18.

Overall, impacts during construction are temporary in nature and would be mitigated where possible through appropriate siting of infrastructure, materials and finishes of sheds and hoardings, and management of light spill. Refer to Section 09 of this report for environmental management measures.

A CEMP would be prepared by the construction contractor providing details and measures taken to reduce potential adverse impacts as a result of construction works.

Night time and lighting impacts

Lighting impacts would be common across the project and would comprise both permanent (operational) and temporary (construction) impacts resulting from upgrades to existing lighting or new lighting.

Lighting during construction
Construction would require some works at night and these areas would be subject to artificial lighting. This would essentially create artificial daylight conditions for the duration of the construction period. If unmanaged, noise, light spill and dust from construction activities may impact on the health and well-being of nearby residents and occupants nearest to construction works.

Areas closed to ancillary sites may experience temporary adverse changes to local amenity due to light spill from any night-time construction works.

All night work and lighting would be carried out in accordance with statutory requirements and guidelines to ensure that there are no unacceptable lighting impacts, particularly on nearby residential receptors. All procedures and management measures taken would form part of the CEMP, which may include measures such as lighting levels, projection angles and direction and length of frequency of exposure.

Ecological light pollution may potentially affect nocturnal fauna by interrupting their life cycle or impacting on species that are more vulnerable to predation (eg. some small mammals), particularly through Western Sydney Parklands.

Fauna within the study area would already be accustomed to light pollution from the existing lighting on Elizabeth Drive and M7 Motorway and the increased artificial lighting associated with the project is unlikely to have a significant effect. For more information, refer to the Biodiversity Assessment Report of the EIS.

Lighting during operation
Permanent road lighting would not be provided along the full length of the project and limited to the following locations:
- Entry and exit ramp merge and diverge areas at the Western Sydney Airport Interchange
- Entry and exit ramp merge and diverge areas at the M7 Motorway
- For 500 metres in advance of The Northern Road intersection
- The Elizabeth Drive realignment over the airport access road
- Complete length of shared user paths.

All lighting would be designed to ensure relevant guidelines are adhered to regarding required light levels and the need to manage light spill, pollution and glare.

The Civil Aviation Safety Authority (CASA) specifies lighting requirements near airports and these would also be complied with by the project. Lighting would be designed in accordance with relevant CASA regulations such as the National Airports Safeguarding Framework – Guideline E.

Where permanent, operational lighting is provided, increased traffic and light spill from the roadway would add to changes to the visual environment. They represent a notable change from the existing rural areas which has limited lighting.

The increase in lighting may impact on the visual amenity from rural properties, particularly any residential receptors within proximity to these limited sections of the project mentioned above.

Overall, changes to night time amenity may be a concern for some property owners, however it is expected that illuminance and light spill would be mostly confined within the operational footprint.

As a result, impacts are considered to be minor in context of the project as a whole. Impacts would also reduce over time, as the project assimilates into an increasingly urban environment as part of the planned land use changes defined in the LUIIP.

For the purposes of the following viewpoint assessments, a brief description for operational lighting has been provided for each viewpoint.

Example of current landscape character across the project.

Visual impacts during operation

Viewpoint 01
01 - View east along The Northern Road

This view is from The Northern Road looking east towards the project across the pleasant, open, rural landscape toward Luddenham Hills.

Project elements visible
_New project alignment including minor cut and fill embankments
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties, and travellers along the Northern Road.

Frequency
Low frequency views from residences where there are few inhabitants and visitors to private properties.

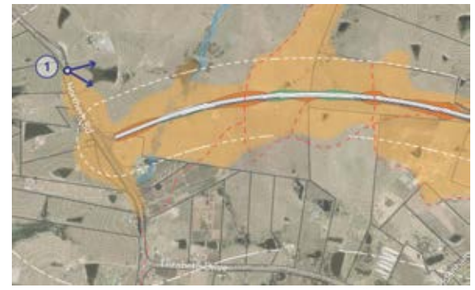
Duration
Short duration view for travellers including motorists, cyclists and pedestrians. From this viewpoint residential views are constrained due to the angle and distance from view.

Distance
Middle ground zone from approximately 750 metres from the project. Within this range, vegetation textures and land use patterns are visible to the observer.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone could possibly be visible in this view, however is unlikely.

A temporary construction site Ancillary Facility (AF) 1 may be located on the eastern side of The Northern Road and may be visible from this view. The site would be surrounded by temporary fencing and may include temporary buildings (generally prefabricated), hardstand parking areas, materials handling areas, and bridge construction support areas.

Operational lighting
Road lighting would be visible up to 500 metres from the intersection with The Northern Road.



Key plan of viewpoint location 0 100

01 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH The outlook from the viewpoint is picturesque over the rural landscape which has a low capacity to absorb the proposed introduction of a major new motorway and would be sensitive to major change. The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be sensitive to changes in the setting.	**LOW** The new project alignment would see the introduction of a major new built element within a predominately greenfield site, with minor cut and fill embankments. Overall, a small portion of the project would be visible from this view due to the angle and distance from the viewer location. The picturesque quality of the open rural landscape is retained in this view as the project would be concealed between the rolling hills. It is assumed that The Northern Road Upgrade work would be completed by the time the project is operational, further reducing the magnitude of change as a result of this project.	**MODERATE** It is noted that visual impact would reduce over time as The Northern Road Upgrade is completed and North Luddenham precinct is developed as part of the LUIIP.


Viewpoint 01 - View of existing condition

Viewpoint 01 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 02
02 - View east along The Northern Road

Viewpoint 02 is a typical roadside view from The Northern Road directly opposite the M12 Motorway intersection. The view comprises the rural residential dwellings located on relatively flat and open terrain with dense stands of riparian vegetation in the background.

Project elements visible
_New motorway intersection and alignment including minor cut embankments
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties, and travellers along The Northern Road.

Frequency
Medium frequency views from residences where there are few inhabitants and visitors to private properties.

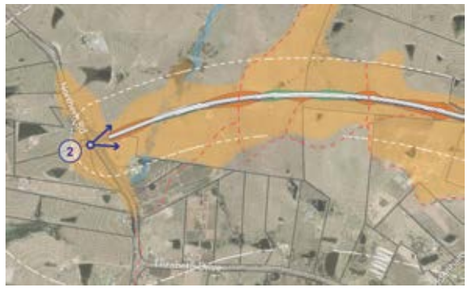
Distance
Foreground zone view with maximum discernment of new infrastructure and landscape details.

Duration
Long duration view from arterial road where the duration of the view is short, and adjacent residential views.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone could possibly be visible in background of this view.

A temporary construction site (Ancillary Facility - AF 1) may be located on the eastern side of The Northern Road and may be visible in this view. The site would be surrounded by temporary fencing and may include temporary buildings (generally prefabricated), hardstand parking areas, materials handling areas, and bridge construction support areas.

Operational lighting
Road lighting would be visible up to 500 metres from the intersection with The Northern Road.

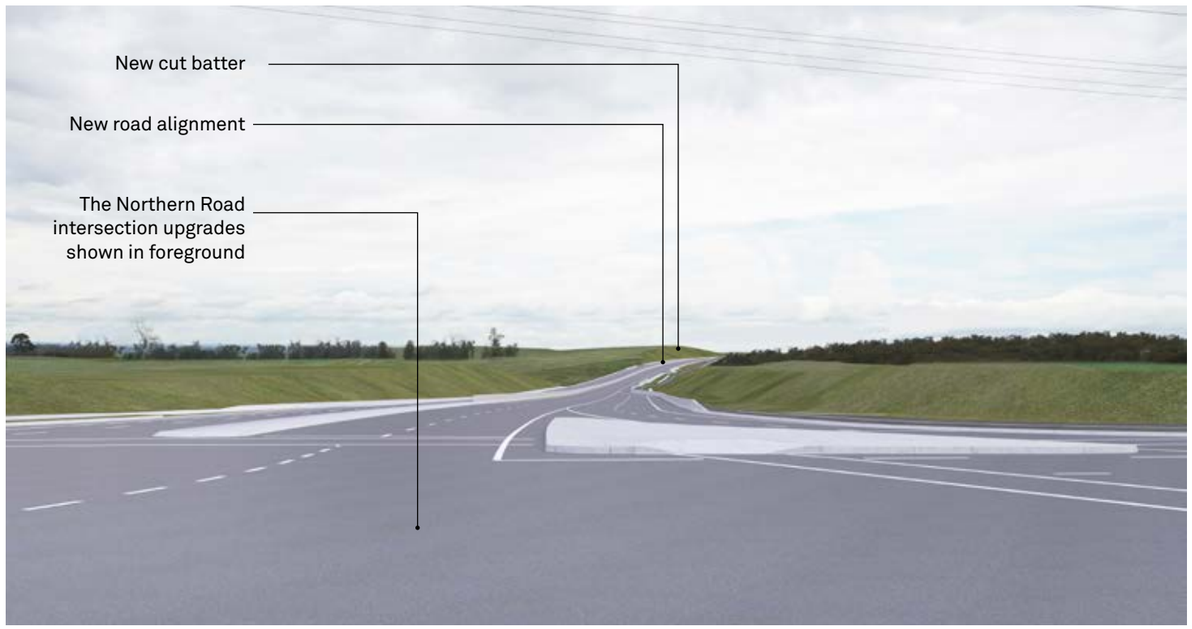


Key plan of viewpoint location 0 100

02 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH	**HIGH**	**HIGH**
The rural outlook from the view is picturesque. The landscape has a low capacity to absorb the proposed introduction of a major new intersection, especially from an elevated outlook over the picturesque rural landscape which is highly sensitive to the introduction of a major new interchange. There are a low number of viewers in Luddenham that overlook the landscape. They would be highly sensitive to change in their surroundings.	The new project infrastructure would introduce major new built elements into the rural setting which would require the demolition of the existing dwellings in this view to enable the connection to the new intersection upgrade along The Northern Road. It is expected that The Northern Road Upgrade would be completed by the time this project would commence construction and has been included in the visualisation below. As a result, the project works would have an adverse impact of the visual amenity of this view.	It is noted that visual impact would reduce over time as The Northern Road Upgrade is completed and North Luddenham precinct is developed as part of the LUIIP.


Viewpoint 02 - View of existing condition



Viewpoint 02 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 03
03 - View north near Luddenham Raceway

Viewpoint 03 is located on the private access road off Luddenham Road near the Luddenham Raceway. The viewpoint looks north toward the project in between the rolling hills.

A single dwelling is visible from this viewpoint along the tree topped hills which provide a scenic backdrop.
Farm dams and verdant green hills provide a high-quality visual environment.

Project elements visible
_New motorway including major fill embankments grading toward twin bridges over Luddenham Road.
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
The viewpoint is representative of views from nearby dwellings and private properties.

Frequency
A low frequency is considered for nearby dwellings.

Duration
A long duration view primarily from private properties.

Distance
The viewpoint falls within the middle ground zone approximately 400 metres from the project.

Construction Activities
During construction, the site would be surrounded by temporary safety barriers and fencing which would create a safe work zone which would be highly visible from nearby residential receptors in this view.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting along shared user paths may be visible from this viewpoint.

Key plan of viewpoint location

03 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH The outlook from this viewpoint is of high scenic quality and characterised by the rolling Luddenham Hills typical of LCZ 2. The open, rural landscape has a low capacity to absorb a change in its setting and is typical of views experienced by nearby residents. The lack of vegetation and general openness of the rolling hills in this view provide little capacity to absorb a change in view.	**MODERATE** From the viewpoint, the project would introduce significant new infrastructure which includes cut and fill batters within close proximity to residential properties. The visual amenity of the rural landscape would be slightly reduced with the siting of the road into the landscape with cut and fill batters, somewhat reducing the impact of the project. Neighbouring views from residential properties would be adversely affected by the scale of the introduced infrastructure.	**HIGH-MODERATE** It is noted that visual impact would reduce over time as the future North Luddenham precinct (LUIIP) is developed.


Viewpoint 03 - View of existing condition

Viewpoint 03 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 04
04 - View north along Luddenham Road

Viewpoint 04 is located on the verge of Luddenham Road looking in a northerly direction toward the project
In this view, the gently undulating, pastoral landscape is framed by dense riparian vegetation following Cosgrove Creek. Rural dwellings and buildings are located in the mid-ground views on localised high points.

Project elements visible
_New motorway including major fill embankments grading toward twin bridges over Cosgrove Creek
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Predominantly motorists' views travelling north along Luddenham Road. Residential dwellings within the visual catchment comprise of a small portion of likely viewers.

Frequency
A medium frequency has been considered for travellers and low frequency for nearby residents.

Duration
Predominant views of short durations have been considered for motorists and a long duration for nearby residents.

Distance
Middle ground views approximately 500 metres from the project.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible in the background of this view.
Construction of major bridges and embankments would likely be visible above fencing.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting along shared user paths may be visible from this viewpoint.

Key plan of viewpoint location 0 100

04 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH	**MODERATE**	**HIGH-MODERATE**
The outlook from this viewpoint is that of an open, rural landscape framed by vegetation following Cosgrove Creek into the distance which has little capacity to absorb the introduction of major new project infrastructure. Due to the angle of the view in relation to Luddenham Road, this viewpoint is more representative of views experienced from nearby residences which would be sensitive to a change in view.	The project would introduce major new infrastructure into the horizon of this view which includes major fill embankments and bridge structures over Cosgrove Creek. Nearby residences who share a similar view would be affected by the new infrastructure which would also impede any broader landscape views. The distance of the infrastructure in this view would enable it to blend into its surrounding once vegetation matures.	It is noted that planned land use changes, including the Northern Gateway Priority Precinct would lead to a reduction in visual impact over time.


Viewpoint 04 - View of existing condition

Viewpoint 04 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 05
05 - View north-west along Luddenham Road

Viewpoint 05 represent the typical road side environment along Luddenham Road as the scenic, rolling hills provide visual amenity for motorists and nearby residents.

Project elements visible
_New motorway alignment including major fill embankments and twin bridges over Luddenham Road.
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Predominantly a motorist's view of the project.

Frequency
A medium frequency of views is considered from travellers and nearby residents

Duration
Short to medium duration on approach to the overbridge.

Distance
The distance to the viewpoint is about 150 metres from the project and falls within the foreground zone.

Construction Activities
During construction, temporary safety barriers and fencing would create a safe work zone in this view. The construction of major bridge structures would be visible and would likely require periodic closure of Luddenham Road.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting along shared user paths may be visible from this viewpoint.

Key plan of viewpoint location 0 100

05 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE Views from this location are typical of a motorists perspective and cone of vision heading north along the road corridor. The view is mostly framed by road furniture and roadside vegetation opening to a backdrop of the rural hills and has some ability to absorb the introduction of new project infrastructure.	**HIGH** From this location, the project would introduce new bridge elements into the foreground of this view. Sight lines along Luddenham Road would be obstructed by the new bridge momentarily disconnecting the scenic experience and amenity of the rolling landscape. The presence of existing roadside furniture reduces the quality of the view and somewhat offsets the impact of the project. Although, neighbouring views from residential properties would be adversely affected by the large-scale infrastructure.	**HIGH-MODERATE** It is noted that planned land use changes, including the Northern Gateway priority precinct, would lead to a reduction in visual impact over time.


Viewpoint 05 - View of existing condition

Viewpoint 05 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 06
06 - View south along Luddenham Road

Viewpoint 06 is a high-quality view looking across the Luddenham rolling hills. Views from this location are expansive and of high visual amenity for motorists and nearby residents.

Project elements visible
_New motorway alignment including major fill embankments grading toward twin bridges over Luddenham Road
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties and travellers heading south along Luddenham Road.

Frequency
Low frequency views from dwellings where there a few inhabitants and medium frequency for motorists.

Duration
Similarly, nearby dwellings would experience a long view duration whilst motorists experience short duration of views.

Distance
The viewpoint is taken in the middle ground zone at approximately 500 metres from the project.

Construction Activities
During construction, temporary safety barriers and fencing would create a safe work zone in this view. The construction of major bridge structures and embankments would be visible and would likely require periodic closure of Luddenham Road.

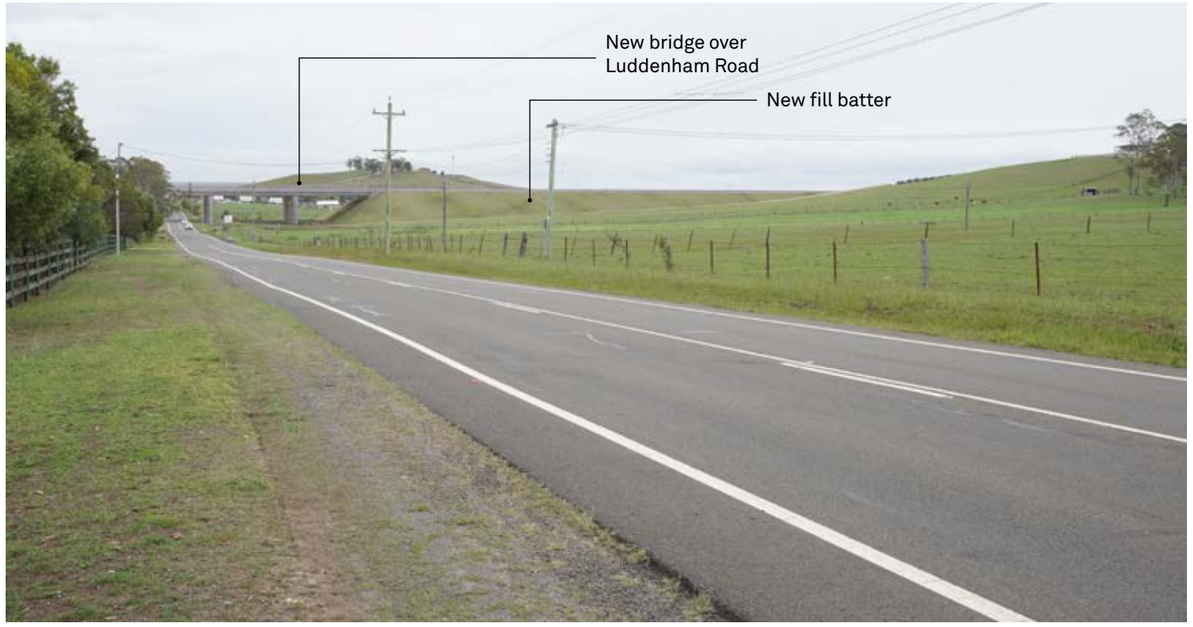
Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting along shared user paths may be visible from this viewpoint.

Key plan of viewpoint location 0 100

06 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH	**HIGH**	**HIGH**
Views from this location are generally of a high scenic quality looking towards the undulating rural hills along a pleasant rural road. The general openness of this view results in a low capacity to absorb the introduction of major new project infrastructure. The view is taken from the roadside with the straight section of Luddenham Road leading viewers (typically motorists) eyes into the distance. Similar views would be experienced from nearby residences where viewers would be sensitive to a change in the setting.	The project would introduce significant new project infrastructure in a view within a rural landscape. The scenic quality of this view along Luddenham Road would be adversely affected by the proposed fill embankments and bridge structures that dominate the centre of this view.	It is noted that planned land use changes including the Northern Gateway priority precinct would lead to a reduction in visual impact over time.


Viewpoint 06 - View of existing condition



Viewpoint 06 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 07
07 - View east along Elizabeth Drive

Viewpoint 07 is located along Elizabeth Drive looking east towards the proposed overbridge from Taylors Road.
Views from this location are typical of the roadside experience along this portion of Elizabeth Drive, near the future airport site.

Project elements visible
_Road widening including major fill embankments along Elizabeth Drive leading towards the overbridge.
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Predominantly motorists travelling along Elizabeth Drive, as there are few residential dwellings within the visual catchment of this viewpoint.

Frequency
A high frequency for motorists.

Duration
A short to medium duration.

Distance
The view is taken in the foreground zone being located in direct vicinity of the project at the corner of Taylors Road.

Construction Activities
The view is taken from within the operational footprint of the project and therefore not representative of nearby views.

A temporary construction site (Ancillary Facility - AF 3) may be located on the northern side of the Elizabeth Drive and may be visible in the background of this view. The site would be surrounded by temporary fencing and may include temporary buildings (generally prefabricated), hardstand parking areas, materials handling areas, and bridge construction support areas.

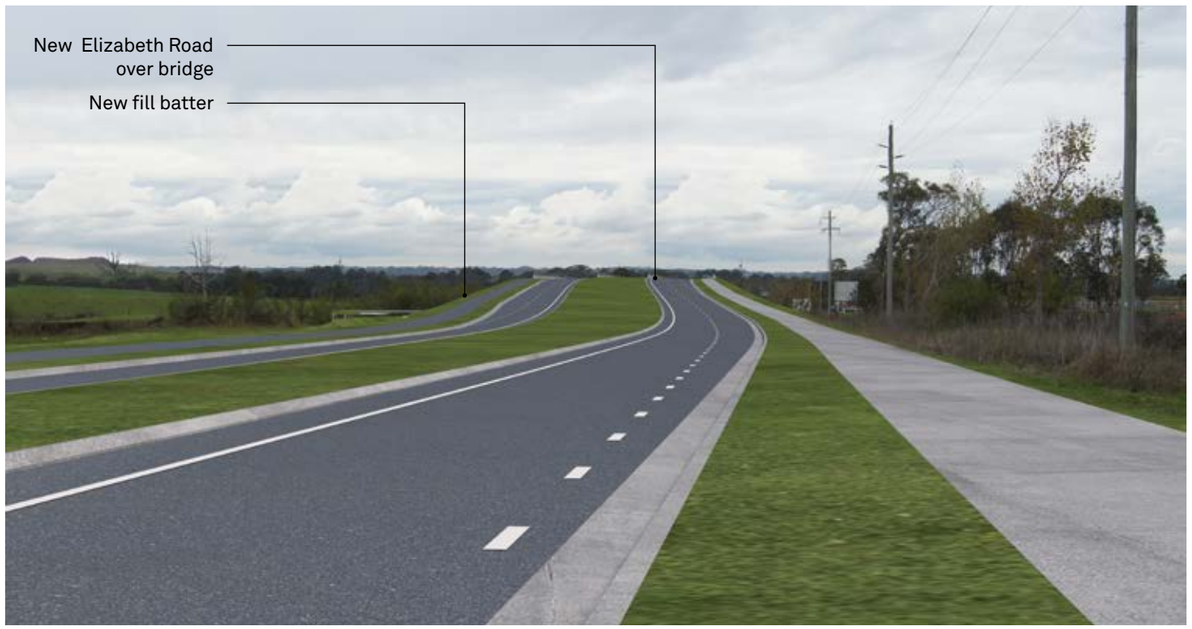
Operational lighting
New road lighting from the airport interchange and along Elizabeth Drive, would be visible from this viewpoint.

Key plan of viewpoint location 0 100

07 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The subtle changes in elevation along Elizabeth Drive offer contextual views toward Mount Vernon, however, roadside furniture and degraded verge conditions detract from the overall quality of this view. The landscape has the ability to partially absorb the introduction of major new project infrastructure as the combination of the relatively flat topography, roadside furniture and distant vegetation obscure contextual views to the ridge lines of Western Sydney Parklands in the background.	**MODERATE** The project would introduce larger project infrastructure to what is currently visible in this view along Elizabeth Drive which includes a new over-bridge, road widening and realignments to facilitate a direct motorway connection to the airport. With consideration of the existing quality of the roadside environment, the amenity of this view would not be severely affected. The impact would likely reduce over time as land use and development change.	**MODERATE** It is noted that planned land use changes including the Northern Gateway priority precinct and Western Sydney Airport would lead to a reduction in visual impact over time.


Viewpoint 07 - View of existing condition



Viewpoint 07 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 08
08 - View north from Badgerys Creek Road

Viewpoint 08 is located on Badgerys Creek Road looking in a northerly direction to the proposed Elizabeth Drive overbridge and M12 intersection. In this view, the road environment is of poor quality with preliminary construction works associated with the Western Sydney Airport already underway. Background views to rural properties and dwellings are visible beyond Elizabeth Drive.

Project elements visible
_New motorway alignment including major fill embankments grading toward Elizabeth Drive overbridge.
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Viewers comprise of motorist heading north along Badgerys Creek Road and nearby residences which will likely reduce over time with construction of the Western Sydney Airport.

Duration
Predominantly short duration of views for motorists and longer duration for nearby residents.

Frequency
High frequency of views for motorists and, low frequency of views from residences where there are few inhabitants and visitors to private properties.

Distance
Viewpoint is located within the foreground zone approximately 220 metres from the project.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would be visible this view Construction of major bridges and embankments would likely be visible above fencing.

A temporary construction site AF 3 may be located on the northern side of the Elizabeth Drive and may be visible on the right-hand side of this view.

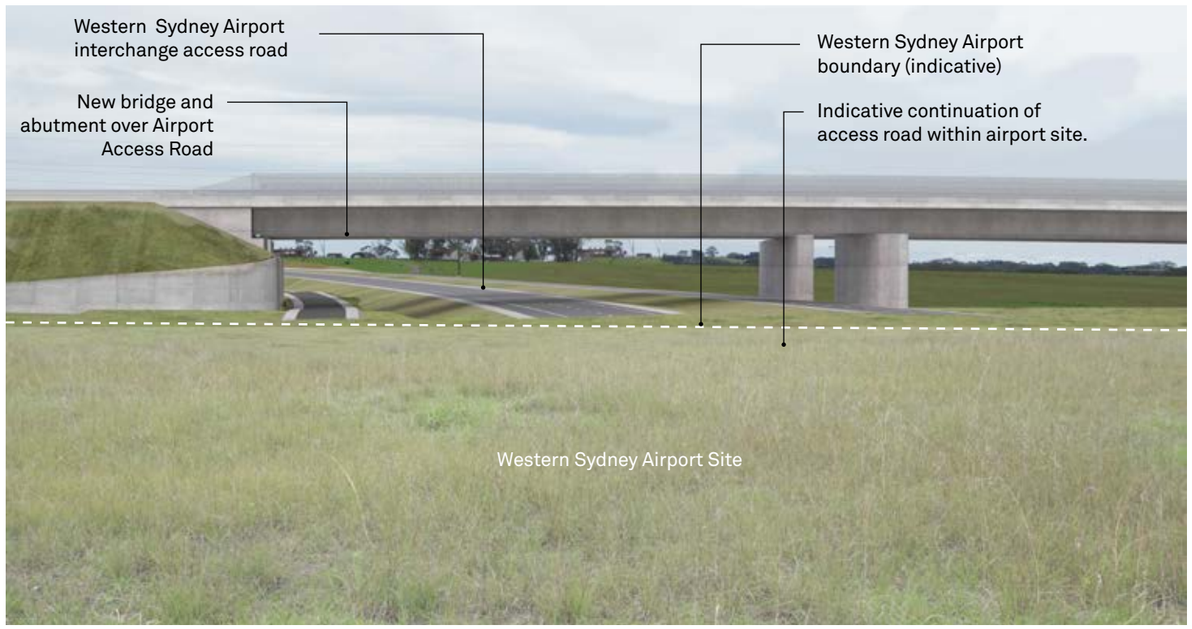
Operational lighting
New road lighting from the airport interchange and along Elizabeth Drive, would be visible from this viewpoint.

Key plan of viewpoint location 0 100

08 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW	**MODERATE**	**MODERATE-LOW**
In this view, the outlook is dominated by the existing road environment in the foreground. New construction work related to the development of the Western Sydney Airport is evident from this view which would increase over time. As a result, viewpoint 08 would likely have a high ability to absorb the change.	The new project infrastructure would introduce major new built elements into the existing roadside environment setting. Although the quality of the view is of low visual amenity, views from this location are in close proximity to the large project infrastructure. The magnitude would likely reduce over time once the Western Sydney Airport is constructed with more visible infrastructure.	It is noted that planned land use changes including the Northern Gateway priority precinct and Western Sydney Airport would lead to a reduction in visual impact over time.


Viewpoint 08 - View of existing condition



Viewpoint 08 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 09
09 - View south from Twin Creeks Golf and Country Club

Viewpoint 09 is located on Farmingdale Court which lies on the southern extent of the Twin Creeks Country and Golf Club development. The vacant lot in the foreground of this view partially retains the existing rural character of the area until it is developed akin to the adjacent lot in the middle ground of this view.
In this view, the rising topography would conceal the project from view and is typical of views for nearby residents and visitors.

Project elements visible
_Nil

Potential viewers
Local residents and visitors to nearby dwellings.

Frequency
A low frequency for residences.

Duration
A long duration.

Distance
The view is approximately 1000 metres from the project.

Construction Activities
Nil

Operational lighting
Nil

Key plan of viewpoint location 0 100

09 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE	**NEGLIGIBLE**	**NEGLIGIBLE**
This view looks across newly constructed dwellings and residential lots (yet to be developed). There would be a low number of viewers from nearby (and future) residences that would be sensitive to a change in their surroundings. The landscape has a high ability to absorb the introduction of major new project infrastructure as the development is shielded from any distant views.	From this viewpoint, the project would be concealed from view by the rising hill along the southern edge of the development.	


Viewpoint 09 - View of existing condition


Viewpoint 09 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 10
10 - View west along South Creek (Sydney University Lands)

Viewpoint 10 is located adjacent to South Creek within private property owned by Sydney University. The view looks across the rural floodplains with vistas to Badgerys Creek in the distance. South Creek and an existing stand of dense riparian vegetation are visible in the foreground of this view provide high visual amenity.

Project elements visible
_New motorway alignment including twin bridges over South Creek
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Viewers would be limited to workers and/or visitors having access to private property.

Frequency
A low frequency view

Duration
Duration would be short to medium as there a no dwellings in this area.

Distance
Viewpoint is within the foreground zone, approximately 100 metres from the project.

Construction Activities
During construction, majority of the view would be taken up with the construction footprint of the motorway. Major project elements would be visible above fencing and hoardings. The diversion of South Creek would also be visible during construction.

Operational lighting
There would be no road lighting in this section of the project.

Key plan of viewpoint location 0 100

10 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH	**HIGH**	**HIGH**
The outlook from this viewpoint has a picturesque quality across the open, rural flood plains. Extensive clearing and grazing of the land has resulted in a highly degraded riparian corridor along South Creek which is visible in this view. The landscape has a low capacity to absorb the proposed introduction of major new project infrastructure.	The project would introduce major new built elements into this picturesque visual setting. A major bridge structure over South Creek would dominate the visual landscape as it spans over the floodplain and obstructs contextual views beyond.	


Viewpoint 10 - View of existing condition

Viewpoint 10 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 11
11 - View south along Clifton Avenue

Viewpoint 11 is located on the edge of the proposed local road tie in works along Clifton Avenue, looking in a southerly direction. The visual quality of the streetscape in this view is relatively poor due to degraded roadside environment and a construction site in the background.

Project elements visible
_New motorway alignment including major fill embankments grading toward Clifton Avenue overbridge
_Potential noise barriers
_Property access road
_Drainage channels
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Viewers comprise of motorists and pedestrians using Clifton Avenue, workers of adjacent commercial land uses, and residences to the east of Clifton Avenue.

Frequency
Low frequency of views for motorists and high frequency of views from residences and adjacent commercial businesses, where there are few inhabitants and visitors to private properties.

Duration
Predominantly short duration of views for motorists, and long duration for nearby residences and workers

Distance
Viewpoint is located within the immediate foreground zone.

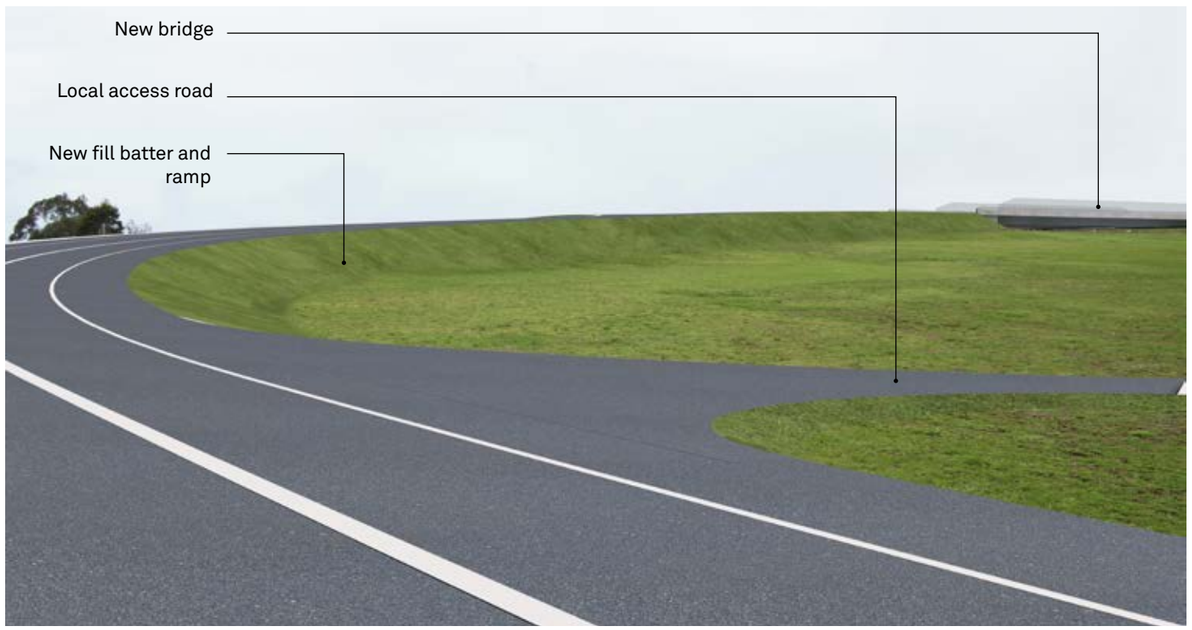
Construction Activities
The view is located within the construction footprint. Construction of all project elements would be visible in this view.

Operational lighting
There would be no road lighting in this section of the project.

Key plan of viewpoint location 0 100

11 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW The landscape has a high capacity to absorb the proposed introduction of a new motorway approach and overbridge from this location, as it is a modified landscape adjacent to an existing road corridor. In this view, the outlook is a combination of roadside vegetation, commercial property and filtered views to a recently modified and cleared landscape setting. The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be sensitive to change in the setting.	**MODERATE** The project would introduce larger project infrastructure in this view which includes the realignment of Clifton Avenue towards a new bridge over the motorway. Disturbed roadside vegetation and terrain would be ameliorated through the introduction of vegetated embankments which would further reduce impacts over time. Potential noise barriers If noise barriers are required in this location, the magnitude of change would remain MODERATE.	**MODERATE-LOW**


Viewpoint 11 - View of existing condition



Viewpoint 11 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 12
12 - View west from Mamre Road

Viewpoint 12 is located on Mamre Road near Abbotts Road and looks in a westerly direction across paddocks and thin tree lines toward the project in the distance. The rural landscape in this view offers visual amenity for travellers and motorists and is typical of nearby views. Vegetation along Kemps Creek is a defining visual element in this view providing a uniform landscape backdrop.

Project elements visible
_New motorway alignment including minor cur and fill embankments
_Minor vegetation clearing
_Landscape works.

Potential viewers
Nearby residents and travellers along Mamre Road.

Frequency
Low frequency of views from residences and high frequency from travellers.

Duration
Moderate duration view from arterial road where the duration of the view is short, and residential views which are constrained due to the angle and distance from view.

Distance
In the far-middle ground zone approximately 950 metres. Within this range, vegetation textures and patterns are homogenous to the observer.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone could possibly be visible in this view, however is unlikely.

Operational lighting
There would be no road lighting would be visible from this viewpoint.

Key plan of viewpoint location 0 100

12 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW The landscape in this view provides visual amenity as it looks beyond Mamre Road across an open clearing toward the tree line along South Creek. The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be sensitive to change in the setting. Glimpses of distant hills can be seen between the thinner stands of trees which has a high capacity to absorb the introduction of major new project infrastructure. As a result, a **LOW** sensitivity rating was recorded.	**NEGLIGIBLE** In this view the project would be heavily screened by riparian vegetation. At this distance, the project would blend into its surroundings as individual element are not recognisable. <u>Potential noise barriers</u> If noise barriers are required in this location, the magnitude of change would remain NEGLIGIBLE.	**NEGLIGIBLE**


Viewpoint 12 - View of existing condition

Viewpoint 12 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 13
13 - View west from Mamre Road

Viewpoint 13 is also located on Mamre Road and looks in a westerly direction towards Kemps Creek. The outlook in this view is pleasant as the visual landscape is strongly defined by dense riparian vegetation along Kemps Creek. Commercial properties and ancillary facilities are also visible in which detract from the visual amenity of this view.

Project elements visible
_No project elements visible from this viewpoint location.

Potential viewers
Nearby residents and travellers along Mamre Road.

Frequency
Low frequency of views from residences and high frequency from travellers.

Duration
Moderate duration view from arterial road where the duration of the view is short, and residential views which are constrained due to the angle and distance from view.

Distance
In the far-middle ground zone approximately 900 metres. Within this range, vegetation textures and patterns are homogenous to the observer.

Construction Activities
During construction no project elements would be visible from this viewpoint.

Operational lighting
There would be no road lighting in this section of the project.

Key plan of viewpoint location 0 100

13 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be sensitive to change in the setting. In this view existing dense vegetation along Kemps Creek has a high capacity to absorb the introduction of major new project Infrastructure.	**NEGLIGIBLE** The adjacent visualisation demonstrates that the project would not be visible. Potential noise barriers If noise barriers are required in this location, the magnitude of change would remain NEGLIGIBLE.	**NEGLIGIBLE**


Viewpoint 13 - View of existing condition


Viewpoint 13 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 14
14 - View east from Clifton Avenue

Viewpoint 14 is located on Clifton Avenue and faces east across rural-residential properties towards Kemps Creek. The outlook from this view is a mixture of residential dwellings, sheds and intensive crop farming resulting in a mixed visual environment. Stands of native vegetation are visible in the background including glimpses of distant hills.

Project elements visible
_No project elements visible from this viewpoint location.

Potential viewers
Nearby residents and travellers along Clifton Avenue.

Frequency
Generally, low frequency for both residents, travellers and workers.

Duration
A long duration of views for nearby residents.

Distance
On the edge of the foreground zone approximately 250 metres from the project.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone could possibly be visible in this view, however is unlikely.

Operational lighting
There would be no road lighting in this section of the project.

Key plan of viewpoint location 0 100

14 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The view looks across commercial crop plantings within rural-residential allotments. The mixture of dwellings, buildings and plantings would provide some ability to absorb the proposed introduction of major new project infrastructure in this view. Although this view is not of high scenic quality, it represents low frequency views from nearby residences and visitors who would be sensitive to a change in setting.	**NEGLIGIBLE** A combination of topography, existing vegetation and built form result in no visibility of the project from this viewpoint location Potential noise barriers If noise barriers are required in this location, the magnitude of change would remain NEGLIGIBLE.	**NEGLIGIBLE**


Viewpoint 14 - View of existing condition


Viewpoint 14 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 15
15 - View south from Salisbury Avenue

Viewpoint 15 is located on Salisbury Avenue looking north toward the proposed works. The outlook in this view has a clear rural-residential visual quality that is typically accessed by residents or visitors.

Project elements visible
_Major new infrastructure including major fill embankments
_Potential noise barriers
_Road furniture including road lighting and security fencing
_Minor vegetation clearing
_Landscape works.

Potential viewers
Predominantly residents and visitors to nearby properties.

Frequency
Low frequency of views from residences where there are few inhabitants and visitors to private properties.

Duration
A short duration for viewers travelling along Salisbury Avenue and residents due to the orientation of dwellings restricting views to the project.

Distance
Middle ground zone approximately 300 metres from the project

Construction activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible at the end of Salisbury Avenue.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting may be visible along the shared user path.

Key plan of viewpoint location 0 100

15 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE This viewpoint looks across of a rural-residential street and is taken from roadside where viewers may be sensitive to a change in the setting.	**LOW** From this viewpoint, the project would introduce new fill embankments in the centre of the view, toward the end of Salisbury Avenue. The project elements do not overly detract from the visual quality of the street. Also, the loss of existing trees would be ameliorated over time as new vegetation establishes. Potential noise barriers If noise barriers are required in this location, the magnitude of change would change to MODERATE.	**MODERATE-LOW** Potential noise barriers If noise barriers are required in this location, the overall visual impact would change to MODERATE.


Viewpoint 15 - View of existing condition

Viewpoint 15 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 16
16 - View north from Elizabeth Drive

Viewpoint 16 is located on Elizabeth looking north across rural properties and racecourse toward the project. The view provides high visual looks across rustic, rural-residential properties towards a horse trotting track and scenic views of Mount Vernon and Kemps Creek in the distance.

Project elements visible
_Major road infrastructure including major fill embankments
_Extended twin bridges over the existing trotting track and Kemps Creek
_Potential noise barriers
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties, and travellers along the Elizabeth Drive.

Frequency
High frequency of views for motorists and, low frequency views from residences where there are few inhabitants and visitors to private properties.

Duration
Predominantly short duration of views for travellers and longer duration from nearby residences and commercial properties.

Distance
Middle ground zone approximately 350 metres from the project.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible in this view. Construction of major project elements including batters and bridges would be visible above fences and hoardings.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting may be visible from this viewpoint.

Key plan of viewpoint location 0 100

16 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE	**HIGH**	**HIGH-MODERATE**
The outlook of this view is pleasant, as the rural character of the roadside verge and rural property sit in front of a scenic backdrop. In the centre of this view, attention is drawn to the existing high-voltage power lines, providing some capacity to absorb the proposed introduction of major new project infrastructure. Viewership would comprise of nearby residents and travellers alike who would be sensitive to change in the setting.	In this view, a significant amount of project infrastructure would be introduced. A combination of fill embankments, twin bridges and potential noise barriers extend over Kemps Creek and dominate the middle ground which adversely affects the rural quality of the environment. At this distance, potential noise barriers, bridge and pier structures are identifiable elements which contrast with the surrounding landscape. Views to distant tree-line and hill tops will have reduce visibility above the project which offset some of the impacts. <u>Potential noise barriers</u> If noise barriers are required in this location, the magnitude of change would remain HIGH.	


Viewpoint 16 - View of existing condition

Viewpoint 16 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 17
17 - View east along Elizabeth Drive

Viewpoint 17 is located along Elizabeth Drive approximately 150 metres east of Mamre Road and looks in an easterly direction toward the project.

The outlook of this view is characterised by Elizabeth Drive which is a major rural, freight and haulage corridor of generally low visual amenity. Wide, open verges with pockets of vegetation and views across adjacent properties to distant tree lines provide an offset to the road environment.

Project elements visible
_New motorway infrastructure including major fill embankments
_Twin bridges over Elizabeth Drive
_Potential noise barriers
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Visitors and workers in nearby commercial properties and travellers along Elizabeth Drive.

Frequency
Moderate frequency views for commercial properties along Elizabeth Drive and high frequency views for travellers.

Duration
Moderate duration views from nearby properties and short duration for travellers.

Distance
Foreground view in direct vicinity of the proposed works.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone which would be visible in this view. Construction of major embankments and bridges would be visible including the operation of heavy machinery.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting may be visible from this viewpoint.

Key plan of viewpoint location 0 100

17 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be sensitive to change in setting. The existing vegetation in the background provides most of the visual amenity from this viewpoint which has some capacity to absorb the introduction of major new project infrastructure.	**HIGH** The new project infrastructure would introduce major new built elements across the arterial road corridor. A new bridge over Elizabeth Drive including associated structures such as abutments, throw screens, potential noise barriers and embankments are clearly identifiable in this view. Despite the scale of the visible infrastructure, the visual amenity of Elizabeth Drive would not be adversely affected. <u>Potential noise barriers</u> If noise barriers are required in this location, the magnitude of change would remain at HIGH.	**HIGH-MODERATE**


Viewpoint 17 - View of existing condition

Viewpoint 17 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 18
18 - View south from Mamre Road

Viewpoint 18 is located on the corner of Mamre Road and Mount Vernon Road looking in a south-easterly direction toward Elizabeth Drive. Mamre Road is a busy arterial road which has resulted in a degraded streetscape and roadside quality. The view is framed by dense strips of native roadside vegetation and is typical representation of nearby views in the area.

Project elements visible
_Major road infrastructure including major fill embankments
_Twin motorway bridges over Elizabeth Drive
_Potential noise barriers
_Road furniture
_Vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties and travellers along Mamre Road.

Distance
View is located in the foreground zone approximately 200 metres from the project.

Frequency
Low frequency of views from residences where there are few inhabitants and visitors to private properties. Mamre Road experiences a high volume of traffic movement and therefore traveller's views are of a high frequency.

Duration
Moderate duration view from arterial roads where the duration of the view is short, and residential views which are constrained due to the angle and distance from view.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible in the background of this view where construction of embankments and overbridge is located.

Operational lighting
There would be no road lighting in this section of the project.

Key plan of viewpoint location 0 100

18 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE In this view, the outlook along Mamre Road generally represents similar views from nearby residences where viewers would be sensitive to a change in the setting. Densely vegetated roadside verges confine the view, increasing the capacity for the landscape to absorb the proposed major new project infrastructure.	**LOW** The project would introduce major new built infrastructure into this roadside view along Mamre Road. The project elements, which would include fill embankments, bridges and bridge abutments, would be visible as the elevated project alignment travels over Elizabeth Drive through to the Western Sydney Parklands. Majority of the project would be visually screened by existing built environment and roadside vegetation. Potential noise barriers If noise barriers are required in this location, the magnitude of change would change to MODERATE.	**MODERATE-LOW** Potential noise barriers If noise barriers are required in this location, the overall visual impact would change to MODERATE.


Viewpoint 18 - View of existing condition

Viewpoint 18 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 19
19 - View south from Elizabeth Drive

Viewpoint 19 is located along the verge of Elizabeth Drive about 300 metre east of Mamre Road and faces an easterly direction toward Western Sydney Parklands and Brandown Quarries.

Beyond Elizabeth Drive (foreground), the view provides high scenic value for travellers and nearby residents with the dominant visual character of the Cumberland Plain Woodlands. Glimpses of industrial machinery and plant material associated with Brandown Quarries are visible in the background which detract from the amenity of the view.

Project elements visible
_Major road infrastructure including major fill embankments
_Twin bridges over Range Road
_Potential noise barriers
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Nearby residents, visitors and travellers along Elizabeth Drive.

Frequency
Nearby residences would experience a low frequency of views.

Duration
View would be of a long duration for nearby residences.

Distance
On the edge of the middle ground zone, this view is approximately 300 metre from the project.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible.

Operational lighting
There would be no road lighting in this section of the project. Pedestrian lighting may be visible from this viewpoint, although unlikely.

Key plan of viewpoint location 0 100

19 - Visual impact assessment		
VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH The outlook of this view provides a scenic backdrop to Elizabeth Drive of high visual amenity which has a low capacity to absorb the proposed introduction of major new project infrastructure. Despite being taken from the roadside, this view represents similar views for nearby residents along Elizabeth Drive and is less likely to reflect travellers views due to the indirect angle across the road.	**MODERATE** The project infrastructure would introduce major new built elements into the woodland setting which include new bridge structure and fill embankments. Project elements, including road furniture are recognisable at this distance and would adversely affect the scenic quality of this view. Stands of trees in the foreground of this view offset some of the impacts the infrastructure, with impacts further ameliorated over time as new woodland plantings are established. Potential noise barriers If noise barriers are required in this location, the magnitude of change would change to HIGH.	**HIGH-MODERATE** Potential noise barriers If noise barriers are required in this location, the overall visual impact would change to HIGH.


Viewpoint 19 - View of existing condition

Viewpoint 19 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 20
20 - View north from Range Road

Viewpoint 20 has been located along Range Road in front of the Brandown Quarries site looking north toward the project.

The immediate roadside environment associated with the Brandown Quarry site is characterised by industrial waste and detracts from the high-quality visual environment of the Cumberland Plain Woodlands beyond.

Project elements visible
_Major fill embankments following proposed motorway alignment
_Potential noise barriers
_Vegetation clearing
_Landscape works.

Potential viewers
Viewers predominantly limited to those accessing Brandown Quarries.

Frequency
A moderate frequency of views from this location.

Duration
A short duration of views from this location.

Distance
The viewpoint is located directly in front of the project within the foreground zone.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone and would be visible behind the foreground trees. Construction of major embankments would be highly visible.

Operational lighting
There would be no road or pedestrian lighting visible from this viewpoint.

Key plan of viewpoint location 0 100

20 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The outlook in this view is a combination of a picturesque open woodland backdrop and industrial / waste management uses in the foreground. The view is taken from roadside and generally similar for all viewers along this section of Range Road. Considering the visual amenity and quality of the landscape and the typically short duration of views from viewers who are not particularly sensitive to a change in setting, a **MODERATE** visual sensitivity has been recorded.	**HIGH** The visual amenity of the existing open woodland would be affected by the project which introduces new tall fill batters in this view and requires extensive clearing of existing woodland vegetation. Views across the low-lying terrain would be completed impeded, disconnecting the viewer from the broader Western Sydney Parklands. Project elements such as road furniture, fencing and signage would be legible at this distance, partially screened by foreground vegetation along the degraded roadside environment along Range Road. Potential noise barriers If noise barriers are required in this location, the overall visual impact would remain at HIGH.	**HIGH-MODERATE**


Viewpoint 20 - View of existing condition

Viewpoint 20 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 21
21 -View north-west from Sydney International Shooting Centre (SISC)

Location
Viewpoint 21 is located near the Sydney International Shooting Centre (SISC) that forms part of the Western Sydney Parklands. The view faces a north-west orientation following the road towards the project.

Project elements visible
_Major road infrastructure including major fill embankments
_Twin bridges over Range Road
_Potential noise barriers
_Road furniture
_Extensive vegetation clearing
_Landscape works.

Potential viewers
Parkland user and/or visitors to the SISC.

Frequency
A low frequency of views has been considered.

Duration
Views would be of a short to medium during depending on the type of visitor to the parkland.

Distance
The view is located in the middle ground zone approximately 500 metres from the project

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would be visible in this view. Construction work associated with the major embankments and bridge structure would also be visible.

The existing access road to the Sydney International Shooting Centre may require temporary closure/s or diversions to facilitate construction work.

Operational lighting
There would be no road lighting in this section of the project. Shared user path lighting may be visible from this viewpoint.

Key plan of viewpoint location 0 100

21 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH The view from this outlook draws on the established woodland character of the Western Sydney Parklands. The parklands provide high visual amenity, relief and screening from nearby industrial uses and main arterial roads. The landscape has a low capacity to absorb the proposed introduction of major new project infrastructure which would interrupt the amenity of this view.	**HIGH** The project infrastructure would introduce major new built elements within the scenic Western Sydney Parklands. A new bridge, potential noise barrier and fill embankments would affect the visual amenity for viewers in this location as the extent of vegetation clearing and infrastructure dissects the visual continuity of the woodlands. Impacts may reduce over time once vegetation has established. <u>Potential noise barriers</u> If noise barriers are required in this location, the overall visual impact would remain at HIGH.	**HIGH**


Viewpoint 21 - View of existing condition

Viewpoint 21 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 22
22 - View south from Duff Road

Location
Viewpoint 22 is located along Duff Road near the corner of Elizabeth Drive, directly adjacent to Irfan College and looks in a southerly direction toward the project.

Project elements visible
_Major road infrastructure including major cut and fill embankments
_New access road over the project to Western Sydney Parklands
_Road furniture
_Vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties, travellers along Duff Road and attendants at Irfan College.

Frequency
Nearby residences and visitors would experience a low frequency of views.

Duration
View would be of a long duration for nearby residences and visitors.

Distance
The view is located within the foreground zone, approximately 200 metres from the project.

Construction Activities
During construction, temporary safety barriers and fencing which would create a safe work zone would be visible in this view.

A temporary construction site (AF 6) may be located to the south of Elizabeth Drive opposite Duff Road and may be visible in this view. The site would be surrounded by temporary fencing and may include temporary buildings (generally prefabricated), hardstand parking areas, materials handling areas, and bridge construction support areas.

Operational lighting
There would be road lighting and pedestrian lighting in this part of the project. However, given the distance and existing vegetation, would not be highly visible from this viewpoint.

Key plan of viewpoint location 0 100

22 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The streetscape in this view has a rural-residential character with a backdrop of the Western Sydney Parklands. The view has a moderate capacity to absorb the proposed introduction of new project infrastructure. Along with nearby residents, a considerable number of viewers would be generated by Irfan College for a long duration who would experience a similar outlook to this roadside view.	**MODERATE** The project would introduce new built elements that are of a similar scale and proportion existing elements in this view. A new access road over the project along with new fill batters would require clearing of existing woodland which would affect the visual amenity in this view. Impacts would likely reduce over time as vegetation establishes. In consideration of the scale of the infrastructure in this location, which is commensurate with the existing rural-residential quality along Duff Road, a **MODERATE** magnitude of change was recorded.	**MODERATE**


Viewpoint 22 - View of existing condition

Viewpoint 22 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 23
23 - View from Western Sydney Parklands (beauty spot)

Viewpoint 23 is located atop the ridge line within the Western Sydney Parklands near location commonly referred to as the 'Beauty Spot'.

The view from this outlook encapsulates the Cumberland Plains of Greater Western Sydney. Panoramic views towards the Blue Mountains are framed by the woodlands and grasslands which are of high visual amenity and would be highly sensitive to a change in setting due to the ecological, scenic and touristic value.

Project elements visible
_Major road embankments and bridges above tree canopy.

Potential viewers
Parkland users consisting mostly of pedestrians and cyclists.

Frequency
A low frequency of views has been considered.

Duration
Views would be of a short to medium during depending on the type of visitor to the parkland.

Distance
The view is located in the middle ground zone approximately 400 metres from the project.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone could possibly be visible in this view, however is unlikely.

Ancillary facility sites along the project footprint may potentially be visible amongst the tree canopy.

Operational lighting
New road lighting may be visible from this viewpoint on approach/exit to the M7/M12 interchange (right side of the viewpoint).

Key plan of viewpoint location 0 100

23 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH Given the regional significance of this view as a key viewpoint of Greater Western Sydney the panoramic view is considered to be highly sensitive to change.	**LOW** The project would introduce new significant infrastructure in the background of this view which is indicated in the visualisation below. The project would pass through densely vegetated areas of parkland and rural settings that would effectively screen majority of the infrastructure avoid any major impacts to the visual amenity of this view. Any potential impact would be further reduced over time as new landscape works establishes and blends into the surrounding context.	**MODERATE**


Viewpoint 23 - View of existing condition

Viewpoint 23 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 24
24 - View south from Cecil Road

Viewpoint 24 has been located at the corner of Cecil Road and Elizabeth Drive looking in a southerly direction towards the project. In this view, the roadside environment provides little visual amenity and detracts from the scenic backdrop of the Western Sydney Parklands.

Project elements visible
_Major road infrastructure including fill embankments grading towards the M7 Motorway to M12 Motorway Interchange
_Road furniture
_Extensive vegetation clearing
_Landscape works.

Potential viewers
Residents from nearby properties, and travellers along Cecil Road.

Frequency
Medium frequency of views from residences where there are few inhabitants and visitors to private properties.

Duration
Long duration view from arterial road where the duration of the view is short, and adjacent residential views.

Distance
Foreground zone view with maximum discernment of new infrastructure and landscape details.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would likely be visible in this view as construction of embankments and bridge structures are completed through Western Sydney Parklands.

Operational lighting
There would be new road lighting along the main carriageways leading to the M7 to M12 interchange which would be partially visible from this viewpoint.

Key plan of viewpoint location 0 100

24 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The outlook from this view is of generally lower visual amenity comprising mostly of road pavement and furniture. The view is taken from the roadside (and generally the same view from nearby residences) where viewers would be moderately sensitive to a change in the setting, with views into Western Sydney Parklands.	**MODERATE** The project would introduce major new built elements into the woodland setting of the Western Sydney Parklands adjacent to Elizabeth Drive. New bridge structures and fill embankments would require clearing of vegetation and modification to existing landform within close proximity to Elizabeth Drive. The existing roadside environment is of poor visual amenity and would not be affected by the project.	**MODERATE**


Viewpoint 24 - View of existing condition

Viewpoint 24 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 25
25 - View north west toward M7-M12 interchange

Viewpoint 25 has been located along the ridge line within the Western Sydney Parklands where there is a break in tree canopy allowing for direct views to the M7 Motorway and Elizabeth Drive.

Project elements visible
_Major road infrastructures including major fill embankments for motorway interchange on and off ramps
_New interchange bridges over the existing M7 Motorway
_Road furniture
_Extensive vegetation clearing
_Landscape works.

Potential viewers
Visitors (pedestrians and cyclists) to Western Sydney Parklands.

Frequency
Visitors to the parklands would be of low frequency.

Duration
A short duration of views for pedestrian and cyclist travelling through the parklands.

Distance
In close proximity (about 100 metres) to the project within the foreground zone.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would be visible from this elevated vantage point.

Construction of major embankments and motorway interchange bridges would be visible for the duration of the project.

Operational lighting
New road lighting would be highly visible along the interchange bridges from this viewpoint.

Key plan of viewpoint location 0 100

25 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE The landscape in the foreground of this view is of high visual amenity however the existing clearing within the view allows a direct line of sight to the existing M7 Motorway infrastructure and Elizabeth Drive. The existing road infrastructure and existing woodlands would provide some ability to absorb the proposed introduction of major new project infrastructure in this view.	**HIGH** The project would introduce a large motorway-to-motorway interchange over the existing roads in the middle of the view. New bridges, on/off ramps and cut and fill embankments would be visible in this view. The parkland and vegetation in the foreground would be mostly unaffected which obscures majority of the project from view except through the existing clearing.	**HIGH-MODERATE**


Viewpoint 25 - View of existing condition

Viewpoint 25 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 26
26 - View north along M7 Motorway

Viewpoint 26 is located along the southbound M7 Motorway looking in a northerly direction.

Project elements visible
_Major road infrastructure including fill embankments grading towards the M7 Motorway and M12 Motorway Interchange
_Road furniture
_Vegetation clearing
_Landscape works.

Potential viewers
Travellers along the M7 Motorway and parkland users.

Frequency
High frequency of view for motorists.

Duration
Short duration of views for motorists.

Distance
Foreground zone view with maximum discernment of new infrastructure and landscape details.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone that is isolated from the operation M7 Motorway.

Staged construction of interchange bridges, on and off ramps and modified embankments would be visible from this viewpoint.

Operational lighting
There would be new M7/M12 interchange road lighting visible from this viewpoint.

Key plan of viewpoint location 0 100

26 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW	**LOW**	**LOW**
From this view the existing M7 Motorway infrastructure dominates the view, flanked by dense woodlands as part of the Western Sydney Parklands. The view is taken from the roadside (and generally the same view for pedestrians and cyclists through the parklands), where viewers would not be overly sensitive to change in setting.	The project would increase the amount of infrastructure already present from this viewpoint. A new on-ramp would result in the widening of existing pavements and connects to new bridges in the background of the view. The project would require modification to existing fill embankments to facilitate the new motorway-to-motorway interchange.	


Viewpoint 26 - View of existing condition

Viewpoint 26 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 27
27 - View west from Anjou Circuit

Viewpoint 27 has been located on the southern extent of the Cecil Hill residential estate looking west to the project. The landscape in this view is picturesque with rolling grassy hills and large stands of Cumberland Plain Woodland that forms part of the Western Sydney Parklands. The landscape is considered to be of high visual amenity to adjacent residents, buffering any visual impacts associated with the existing M7 Motorway.

Project elements visible
_Nil

Potential viewers
Primarily residents and visitors to nearby houses along the edge of the Cecil Hills housing estate.

Frequency
Nearby residences would experience a low frequency of views.

Duration
Views would be of a long duration.

Distance
View is located in the foreground zone approximately 250 metres from the project.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone could possibly be visible in this view, however is unlikely.

Operational lighting
There would be some new road lighting in this part of the M7 to M12 interchange. It would be unlikely that lighting would be visible from this viewpoint as the project is heavily screened by existing vegetation.

Key plan of viewpoint location 0 100

27 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
MODERATE	**NEGLIGIBLE**	**NEGLIGIBLE**
The existing M7 Motorway is partially visible from this viewpoint and therefore the landscape has a moderate capacity to absorb an increase in motorway infrastructure in this view.	From this viewpoint, any modification to the existing M7 Motorway to facilitate the new motorway-to-motorway interchange is no longer visible.	


Viewpoint 27 - View of existing condition


Viewpoint 27 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 28
28 - View west from Jaquetta Close

Viewpoint 28 is located on Jacquetta Close looking upward in a westerly direction toward the project.

The outlook in this view has a picturesque quality that forms part of the broader Western Sydney Parklands and Cumberland Plain Woodlands. The view provides high visual amenity to nearby residents of Cecil Hills, buffering any visual impacts associated with the existing M7 Motorway.

Project elements visible
_New major road infrastructure including major embankments for the M12 Motorway to M7 Motorway off ramp
_Road furniture
_Vegetation clearing
_Landscape works.

Potential viewers
Primarily residents and visitors to nearby houses along the edge of the Cecil Hills housing estate.

Frequency
Nearby residences would experience a low frequency of views.

Duration
Views would be of a long duration.

Distance
View is located in the foreground zone approximately 250 metres from the project.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would likely be visible.

Due to the angle of the view, majority of construction work would likely not be visible.

Operational lighting
There would be new road lighting that may be visible from this viewpoint. Pedestrian lighting along shared user paths may also be visible from this viewpoint.

Key plan of viewpoint location 0 100

28 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
HIGH The landscape, which currently screens the existing M7 Motorway from residents' view, has a low capacity to absorb the proposed introduction of major new project infrastructure.	**MODERATE** The project would introduce new fill embankments into this view with vehicles and road furniture possibly visible at this distance. Existing vegetation provides some ability to screen the infrastructure which would improve over time as new plantings are established.	**HIGH-MODERATE**


Viewpoint 28- View of existing condition

Viewpoint 28 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 29
29 - View west along Elizabeth Drive

Viewpoint 29 has been located approximated 300 metres west of the M7 Motorway along Elizabeth Drive. The visual environment of Elizabeth Drive is relatively poor and typical of views in the area experienced largely by travellers. Strongly defined roadside vegetation frames the view and provide visual relief for motorists.

Project elements visible
_New motorway infrastructure including major interchange bridges

Potential viewers
Pedestrians and travellers along Elizabeth Drive.

Frequency
A high frequency of views would be experienced.

Duration
A short duration of views would occur from this viewpoint location.

Distance
This view is located on the edge of the foreground zone approximately 250 metre from the proposed interchange.

Construction Activities
During construction, Elizabeth Drive would remain operational but may require temporary diversions or closure to facilitate stage construction of motorway-to-motorway interchange.

Operational lighting
New road lighting, following the M7/M12 interchange bridges, would be visible from this viewpoint.

Key plan of viewpoint location 0 100

29 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW From this viewpoint, existing vegetation narrows the field to the project. The outlook along the road corridor is a low quality view, dominated by existing road and motorway infrastructure, and mostly experienced by travellers. As a result, it has been considered that this viewpoint has a high capacity to absorb a change in view .	**LOW** The project would introduce a single bridge structure over the existing M7 Motorway over bridge. The new bridge elements would be visually contained by existing woodland vegetation on either side of Elizabeth Drive.	**LOW**


Viewpoint 13 - View of existing condition

Viewpoint 13 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Viewpoint 30
30 - View south along shared user path & M7 Motorway

Viewpoint 30 has been located along the existing shared user path that runs along the eastern side of the M7 Motorway. The visual environment in this view is dominated by motorway infrastructure. Landscaped medians and roadside embankments offer important visual relief for viewers.

Project elements visible
_New shared user path alignment including cut embankments
_New motorway infrastructure including M7 to M12 Motorway interchange bridges and on/off ramps,
_Road furniture
_Minor vegetation clearing
_Landscape works.

Potential viewers
Shared user path users and travellers along The M7 Motorway.

Frequency
Low frequency for pedestrians and cyclist and high frequency for motorists.

Duration
Predominantly short duration of views.

Distance
Fore ground zone located at the proposed start of the modified shared user path location. Background views of the proposed over bridges visible to approximately 800 metre in the distance.

Construction Activities
During construction temporary safety barriers and fencing which would create a safe work zone would be visible and limited to the eastern side the existing M7 Motorway carriageways.

Operational lighting
A large amount of new road lighting would be visible from this viewpoint, associated with the M7 to M12 interchange. Existing pedestrian lighting would be reinstated following the shared user path realignment.

Key plan of viewpoint location 0 100

30 - Visual impact assessment

VISUAL SENSITIVITY	MAGNITUDE OF CHANGE	VISUAL IMPACT
LOW The existing motorway environment in this view has a high ability to absorb the proposed modifications required to support the M7 to M12 Motorway interchange.	**LOW** The project would introduce additional infrastructure to the existing M7 Motorway already in this view as part of the motorway-to-motorway interchange. The existing corridor would be widened to accommodate new intersection configuration and on / off ramps. Re -profiling of adjacent batters would require new landscape works on modified areas to match in with the existing woodland character.	**LOW**


Viewpoint 14 - View of existing condition

Viewpoint 14 - Visualisation of the project (Basic form and arrangement - Subject to design development)

Summary of visual impacts

Visual impact helps to define the day to day visual effects of development on people's views. The potential impacts of the project on each viewpoint was assessed based on a composite of the sensitivity of the view and magnitude of the project in that view.

For a project of this scale and complexity, it is difficult to summarise the individual ratings determined for each of the viewpoints into a single, overall visual assessment.

The major benefit of visual impact assessment is to identify the areas of high impact in order that they can be addressed through engineering and urban design changes and mitigation strategies. In this way, we can be sure that areas of high impact are addressed in the best way possible.

A total of thirty viewpoints were selected for the project. Viewpoint locations were focused around the areas of the highest anticipated magnitude and the areas where there are the most people in the most sensitive settings.

Out of the thirty viewpoints, visual impacts were determined as follows:

- Four viewpoints would have a HIGH visual impact
- Nine viewpoints would have a HIGH-MODERATE impact
- Five viewpoints would have a MODERATE impact
- Four viewpoints would have a MODERATE-LOW impact
- Three viewpoints would have a LOW impact
- Five viewpoints would have a NEGLIGIBLE impact.

The range of visual impacts resulted in a generally broad spread of impacts across the study area.

Ratings of HIGH impact occur where the project would traverse through areas where existing, high quality rural views are relatively undisturbed and within close proximity to residential receptors or where the scale of project significantly impacts the integrity of the view.

MODERATE-HIGH impacts were recorded in areas where high quality views would generally not be as affected by the project.

MODERATE impacts result from a variety of conditions where magnitude or sensitivity ratings are high.

MODERATE-LOW impacts were recorded in less sensitive areas where low quality views would be reasonably affected by the project.

LOW impacts generally occur in less sensitive agricultural areas where the views of the project would be at a distance.

Specific mitigation measures have been prepared in Section 09 of this report to ensure that areas assessed at high impact are properly and appropriately considered at design and implementation stages. In this way, the identified visual impacts are minimised and addressed to the greatest possible extent.

Potential noise barriers

The visual impact of potential noise barriers was assessed. Out of the thirty viewpoints, the viewpoints where the visual impact increased when potential noise barriers were included on the project were as follows:

- Viewpoints 15 and 18 increased from MODERATE-LOW to MODERATE
- Viewpoint 19 increased from HIGH-MODERATE to HIGH.

The noise barriers identified as potentially reasonable would be considered in conjunction with other mitigation measures for their feasibility and reasonability during the detailed design stage of the project.

Specific mitigation measures have also been prepared in Section 09 of this report regarding potential noise barriers.

SUMMARY OF VISUAL IMPACTS

Viewpoint	Location	Overall rating of visual impact
01	View east along The Northern Road	**MODERATE**
02	View east along The Northern Road	**HIGH**
03	View north near Luddenham Raceway	**HIGH-MODERATE**
04	View north along Luddenham Road	**HIGH-MODERATE**
05	View north-west along Luddenham Road	**HIGH-MODERATE**
06	View south along Luddenham Road	**HIGH**
07	View east along Elizabeth Drive	**MODERATE**
08	View north from Badgerys Creek Road	**MODERATE-LOW**
09	View south from Twin Creeks Golf and Country Club	**NEGLIGIBLE**
10	View west along South Creek (Sydney University Lands)	**HIGH**
11	View south along Clifton Avenue	**MODERATE-LOW**
12	View west from Mamre Road	**NEGLIGIBLE**
13	View west from Mamre Road	**NEGLIGIBLE**
14	View east from Clifton Avenue	**NEGLIGIBLE**
15	View south from Salisbury Avenue	**MODERATE-LOW**
16	View north from Elizabeth Drive	**HIGH-MODERATE**
17	View east along Elizabeth Drive	**HIGH-MODERATE**
18	View south from Mamre Road	**MODERATE-LOW**
19	View south from Elizabeth Drive	**HIGH-MODERATE**
20	View north from Range Road	**HIGH-MODERATE**
21	View north-west from Sydney International Shooting Centre (SISC)	**HIGH**
22	View south from Duff Road	**MODERATE**
23	View from Western Sydney Parklands (beauty spot)	**MODERATE**
24	View south from Cecil Road	**MODERATE**
25	View north-west toward M7 - M12 Interchange	**HIGH-MODERATE**
26	View north along M7 Motorway	**LOW**
27	View west from Anjou Circuit	**NEGLIGIBLE**
28	View west from Jaquetta Close	**HIGH-MODERATE**
29	View west along Elizabeth Drive	**LOW**
30	View south along shared user path & M7 Motorway	**LOW**

Artist's impression: Motorist's view south approaching Elizabeth Drive overbridge at Airport entry, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

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The Aboriginal 'Six Seasons' - The time of Wiritjiribin

The existing rural and agricultural landscape character within the study are will be subject to a huge degree of change over time, as the Aerotropolis develops.

Cumulative impact assessment

Cumulative impacts are those that result from successive, incremental, and/or combined effects of a project when added to other existing, planned, and/or reasonably anticipated future projects. The cumulative effect of multiple projects may decrease or intensify the landscape and visual impacts on a particular receiver or area.

The following section provides an assessment of the cumulative impacts of this project taking into account other transport projects that have either:
_Been approved but where construction has not commenced
_Commenced construction
_Been recently completed.

The major transport projects identified for assessment include:
_The Northern Road Upgrade
_the Western Sydney Airport.

The upgrade of The Northern Road

The upgrade of The Northern Road involves the imminent upgrades and widening to 16 kilometres of The Old Northern Road, Narellan to Jamison Road, South Penrith. Of particular note, the M12 Motorway would provide a major new intersection with The Northern Road, north of Elizabeth Drive.

The upgrade of The Northern Road would result in high landscape and visual character impacts, fundamentally altering the existing 'rural road' character north of Elizabeth Drive.

The project would result in a minor increase in cumulative impact as changes to the existing visual character of LCZ 1 would have already begun and the footprint of the project works in this zone would be relatively small.

Cumulative impacts to the visual amenity of Viewpoints 01 and 02 would increase as two new roads would be visible at these locations, however, this project would be a small contributor.

The overlapping footprints of the The Northern Road and M12 Motorway projects may result in increased cumulative impacts for nearby residents as a result of prolonged construction periods. Compensatory mitigation could be considered for residents' subject to sustained cumulative impacts such as provision of streetscape treatments to be undertaken in conjunction with upgrades to The Northern Road.

Western Sydney Airport

The Western Sydney Airport is located at Badgerys Creek on the southern side of Elizabeth Drive and spans approximately 1,800 hectares. It included the construction and operation of new domestic and international services, with staged development in response to demand. The initial stage includes the development of a single 3,700 metre runway coupled with landside and airside facilities such as passenger terminals, cargo and maintenance areas, car parks and associated infrastructure facilitating safe and efficient movement of 10 million passengers per year as well as freight operations.

As demand increases, additional aviation infrastructure and aviation support precincts are expected to be developed until the first runway reaches its capacity of 37 million passengers per. At this time, expected to be around 2050, a second parallel runway is expected to be required. In the longer term, the airport development is expected to fully occupy the site, with additional passenger and transport facilities for around 82 million passenger movements per year.

The proposed airport size, scale and character is significantly larger than the project and will involve substantial modification of the landscape and existing rural visual quality to a more urbanised and commercial landscape character.

The existing landscape character of LCZ 3 would be subject to the most immediate change, resulting in high cumulative impact during construction due to the continued presence of construction facilities and construction activities occurring over this period.

Once both projects are complete and operational, they would result in a high cumulative impact as the rapidly changing character of the area would be strongly influenced by the new airport and project infrastructure. The cumulative impact would be most evident in Viewpoints 07 and 08.

Future changes in land use and infrastructure that may have a cumulative impact.

The proposed airport will be a catalyst for the development of future residential, commercial and industrial uses throughout Western Sydney. Surrounding areas are designated as future employment zones as part of the LUIIP.

Future development of surrounding areas as a result of infrastructure investment in the region will lead to increased urbanisation over time. This will generally reduce the impact of the project as it becomes part of the changing urban visual character of the area.

In addition, at the time of preparing this report, other major transport projects such as the Outer Sydney Orbital (OSO) and Sydney Metro Greater West (construction would commence in 2021) were under development.

Depending on the final design outcomes of these projects, there may be an increase in the urban character of the area and have a visual impact. These projects will also change the local character of the roads in the area. Construction of the Sydney Metro Greater West likely to mean there will be both concurrent and consecutive activities with the construction of the M12 Motorway project.

Future development of Western Sydney Parklands

The *Western Sydney Parklands Plan of Management 2030* (2018) provides a framework for future planning for the development of the parklands. It seeks to intensify the existing character and recreational uses within LCZ 6 (referred to as Cecil Park) to become a major regional recreational park.

It is noted that modifications to the Western Sydney Parklands would be required to facilitate this project, which would include the relocation of existing recreational facilities such as the Wylde MTB Trail. As a result, LCZ 6 would be subject to the most immediate change, in the short term. The relocation of the Wylde MTB Trail would take place prior to construction commencing.

Once complete and operational, the cumulative impacts of the project would reduce over time as new vegetation matures, and new cycle connections (as part of the project) improve connectivity to new recreational facilities.

Any further (future) development of the parklands, would seek to realise the desired future character of the southern parklands. This would generally increase the amenity and conservation values of LCZ 6, resulting in a positive impact in the long term, as an integral part of the Western Parkland City.

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Environmental management measures

The Aboriginal ‘Six Seasons’ - The time of Marrai’gang

09

Environmental management measures

Roads and Maritime policies such as 'Beyond the Pavement' seek to deliver positive design outcomes for all its projects, to deliver safe, efficient and high-quality infrastructure.

A key principle is for projects to fit into the built and natural environments for the avoidance of adverse impacts.

This section seeks to summarise measures taken throughout the design process, as well any key mitigation strategies of principles to mitigate landscape character and visual impacts during detailed design and construction.

Mitigation incorporated into the concept design
As a result of the collaborative design process, there are features and details embedded in the project concept design that have already mitigated impacts identified during the process of assessment. These are described in Section 05 of this report.

Environmental management measures

In accordance with the Section 7.2 of *EIA-N04 - Environmental Impact Practice Note,* the purpose of this section is to develop strategies to manage landscape character and visual impact.

The environmental management measures are divided into two parts with the purpose of:
- Identifying safeguards and measures that should be implemented during detail design
- Outlining any further, important aspects and details of the concept proposal to be further investigated in detailed design to improve the urban design outcome.

Artist's impression: Aerial view north-west across M7/M12 Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years of planting. Subject to change during detailed design.

Environmental mitigation measures to be incorporated during detailed design and construction

This assessment should result in further design consideration that aims to eliminate or minimise adverse impacts through careful planning and design of the project. This ensures that mitigation becomes incorporated into the realised project outcome.

The ongoing design development process needs to refine and develop design detailing to achieve a high quality outcome that improves the project's built, natural and community environment is befitting of the project location within western Sydney and its future development as the new 'Gateway to Western Sydney'.

Key mitigation measures will be employed during detailed design development in the future stages of this project. The following table provides safeguards and mitigation measures specific to the project.

Residual impacts
There is potential, through the implementation of safeguards and management measures, to lessen some adverse effects created by the project.

During the construction phase, implementation of revegetation, planting in combination with the preservation of remnant vegetation may potentially reduce high impact ratings to moderate-high or moderate, depending on the extent and success of the planting and location of the viewer. This would be particularly evident throughout the Western Sydney Parklands and over the creeks (Cosgroves Creek, Badgerys Creek, South Creek and Kemps).

In addition, careful consideration and detailing of major, permanent built elements such as bridges, abutments and walls may also potentially reduce impacts in areas of the project where the landscape is broad and open in nature. This would be particularly evident in LCZ3 where views of the airport interchange and Elizabeth Drive over bridge will remain an enduring legacy of the project.

ENVIRONMENTAL MANAGEMENT MEASURES				
Impact	**Reference**	**Environmental management measure**	**Responsibility**	**Timing**
Impacts to views and landscape character from construction and operation of the project	**LVIA01**	An Urban Design and Landscape Plan (UDLP) will be prepared to minimise landscape character and visual impacts, and detail and guide the implementation of landscape features to be installed as part of the project, including re-vegetation requirements. This will include requirements for the provision of vegetative screening to soften the appearance of structural elements of the project such as noise walls and provide screening of sensitive views. The UDLP will also consider the requirements of the heritage interpretation framework that will be prepared for the project (NAH02). The UDLP will be prepared in accordance with applicable guidelines, be consistent with the concept project identity in the EIS and relevant urban design objectives and principles for the project including consideration of implementation of Crime Prevention Through Environmental Design (CPTED) principles, and in consultation with relevant councils.	Roads and Maritime / Contractor	Detailed design
	LVIA02	A detailed Landscape Plan will be prepared for the project and implemented throughout construction. The plan will guide the implementation of measures to minimise landscape character and visual impacts, including revegetation requirements.	Contractor	Detailed design, prior to construction and during construction
	LVIA03	Existing vegetation within the construction footprint will be retained and protected where possible. This includes densely vegetated areas such as remnant riparian forests and Cumberland Woodlands in Western Sydney Parkland.	Contractor	Detailed design and during construction
	LVIA04	Site levels and grades for the project will integrate with the surrounding terrain to assist with the visual assimilation of the project into the surrounding landscape where practicable. Engineer slopes with gradients no steeper than 3H:1V where possible to maximise the establishment of vegetation on these batters and allow for appropriate maintenance.	Contractor	Detailed design
	LVIA05	Project elements such as ancillary facility hoardings will be designed and maintained to minimise impacts to landscape character and visual amenity. This will include selecting colours and materials that are visually recessive and blend into the surrounding landscape where practicable, and the prompt removal of graffiti.	Contractor	Detailed design, prior to construction and during construction
	LVIA06	Where noise mitigation such as noise barriers are required, they will be designed with the aim of minimising visual impacts.	Contractor	Detailed design
	LVIA07	Temporary and permanent lighting will be designed and implemented with consideration of: _The need to orientate lighting to minimise light spill and glare impacts on nearby receivers _The need to minimise vandalism and maintenance requirements _Requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.) for operational lighting _Opportunities to implement sustainability initiatives in design such as energy efficient or solar lighting.	Contractor	Detailed design, prior to construction and during construction

ENVIRONMENTAL MANAGEMENT MEASURES				
Urban design elements	**LVIA08**	The findings and recommendation of the Aboriginal cultural heritage design process managed by Balarinji will be incorporated into the urban design and implemented as part of the project, including interpretive initiatives.	Roads and Maritime / Contractor	Detailed design, prior to construction and during construction
	LVIA09	Shared user paths to be delivered as part of the project will not preclude connections to future open space corridors and land use as identified in the Western Sydney Land Use and Infrastructure Implementation Plan (LUIIP) (DPIE 2018). Where further design of adjacent open space corridors is undertaken, shared user paths will be provided to connect at an appropriate location. Shared user paths will be designed to be located away from road-side edges to provide an immersive landscape experience for pedestrians and cyclists, where possible.	Roads and Maritime / Contractor	Detailed design
	LVIA10	Establish an Urban Design Review Panel to provide advice and input into the development of the UDLP.	Roads and Maritime	Detailed design
	LVIA11	Highly visible elements of the project including potential noise barriers, retaining walls, bridge structures and urban design material selection will be designed to satisfy functional requirements and adopt the design principles detailed in the M12 EIS Landscape Character, Visual Impact Assessment and Urban Design Report. The proposed designs will be documented in the relevant UDLP for the project.	Contractor	Detailed design
	LVIA12	Consider a standard design for retaining walls and major structures across the project, to present a coordinated 'suite of elements'.	Contractor	Detailed design
Safety in design	**LVIA13**	The project must consider CPTED principles during detailed design to minimise safety risks to all users. The project must undertake periodic CPTED reviews by a qualified professional and implement any additional recommendations where reasonable and feasible.	Contractor	Detailed design
Revegetation and landscaping	**LVIA14**	A tree management strategy will be prepared for the project, outlining: _Measures to minimise tree removal to retain and protect as many trees within the construction footprint as reasonable and feasible _Measures to avoid damage to trees that are to be retained within the construction footprint to ensure the maintenance of health and stability of the trees in accordance with AS4970-2009 Protection of trees on development sites _Requirements for the pruning of trees to be undertaken by a suitably qualified person in accordance with AS 4373-2007 Pruning of amenity trees _Consideration of maintenance requirements and safety standards _Requirements for the replacement trees where removal cannot be avoided including: _Net increase in the number of trees (not identified as within an EEC) _Where it is not practicable to plant trees in the operational footprint an alternate location will be identified in consultation with relevant councils and in consideration of future development in the local area _Minimum pot size in accordance with part 3.2.1 (Rural road reserves) in the Roads and Maritime Landscape Guideline (2018) subject to long term viability of the plant.	Contractor	Detailed design and prior to construction
	LVIA15	Revegetation for the project will consider the land use requirements of the National Airports Safeguarding Framework (NASF) (National Airports Safeguarding Advisory Group, n.d.) to minimise the risk of wildlife strikes at Western Sydney Airport.	Contractor	Detailed design
	LVIA16	Undertake appropriate soil analysis and identify soil preparation requirements for landscaping treatments to inform the Urban Design and Landscaping Plan and vegetation management in accordance with Roads and Maritime's Batter Surface Stabilisation Guideline (2015).	Contractor	Detailed design and during construction

Urban design opportunities to be investigated further during detailed design

The project is important for Sydney in terms of scale and its contribution to connecting the broader city to the Western Sydney Airport and new employment lands.

Consequently, there are key opportunities that have been identified during the concept design process that can significantly enhance the quality of the urban design outcome of the project.

While the opportunities do not necessarily relate to an identified impact, they have been recognised during this assessment process and should be considered further during detail design and are listed on this page.

URBAN DESIGN OPPORTUNITIES FOR FURTHER INVESTIGATION	
No.	**Opportunity**
Opp-1	Investigate opportunities for the incorporation of local seed stock in the implementation of revegetation of Cumberland Plain Woodland vegetation communities along the project footprint
Opp-2	Explore opportunities for implementation / enabling of *Sydney Green Grid* objectives and the creation contiguous, vegetated parklands connecting the Western Sydney Parklands to the riparian corridors of Kemps Creek, South Creek and Badgerys Creek
Opp-3	Investigate opportunities to expand EEC communities of Cumberland Plain Woodland through prioritisation of local implementation of any biodiversity offsets required under the *Biodiversity Conservation Act 2016*.
Opp-4	Consider use of wire rope barriers in median to allow for non-frangible tree plantings.
Opp-5	Consider how the project can integrate with adjacent uses and characters by extending beyond the project boundary, for example, adjacent to the WWII air strip and Fleurs Radio Telescope.
Opp-6	Consider implementation of feature lighting to amplify the night-time experience for motorists and views from above.
Opp-7	Explore low-maintenance methods of 'greening' retaining walls at the motorway interchanges.
Opp-8	Consider how the project responds and integrates with future land use changes. Monitor adjacent uses and assess impact to the project as a result of changing landscape and visual character.
Opp-9	Further develop and refine indicative concepts for the Aboriginal heritage interpretation ensuring they are seamlessly integrated into the project design.
Opp-10	Explore opportunities to activate and connect fragmented areas of Western Sydney Parklands through the introduction of additional pedestrian, cyclists and recreational infrastructure.

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Conclusion

Conclusion

This urban design and landscape character and visual impact assessment report has considered the existing landscape character, detailed the urban design aspects of the project and assessed changes to LCZ's and visual impact assessment overlaid with local community sensitivities and cultural associations at selected viewpoints along the project footprint.

The report outlined strategic urban design objectives that would form the basis of design and evaluation from concept design through to construction, including a number of principles and objectives developed to help guide the decision making process, provide a platform for engaging with stakeholders, and inform the physical designs proposed.

The urban design concept identified a series of proposals that have been implemented and integrated with the civil engineering works, based on the urban design principles and objectives such as a connection to Country, creating an active study area and enhancing user experience, creating a project identity, and re-establishing natural systems.

The concepts provide a balanced approach between function and form and between hard and soft project elements, that would create a unique sense of place. This would be done through considered alignments, views, art and interpretation.

A number of mitigation measures have been incorporated into the concept design, seeking to minimise or avoid potential impacts.

The project would involve substantial modification of the landscape within the study area. The most common existing land uses in the study area are rural, with agricultural and rural-residential properties. Given these types of land uses, the project would generally result in a MODERATE to HIGH level of both landscape character and visual impacts.

Despite this, measures have been incorporated into the concept design through a process of design development. This involved gradual refinement to avoid or minimise impacts where possible, including:
_The re-alignment of the project through Western Sydney Parklands closer to Elizabeth Drive
_Revegetation works along the entire project footprint that respond to local vegetation patterns and screen undesirable project elements or adjacent land uses
_A continuous, east-west shared pedestrian and cycle path from The Northern Road to the M7 Motorway and Western Sydney Airport enabling connections to future parklands envisaged in the LUIIP.

The key landscape character impacts of the project relate to sensitive landscape character zones that are likely to experience a noticeable change in outlook as a result of new operational infrastructure or landscape elements. These areas include LCZ 3 - Rural Plains and LCZ 6 - Ridgetop Woodlands.

Visual impacts arising from the project primarily relate to new, permanent operational infrastructure and landscape elements impacting on existing views. Key visual receptors subject to HIGH visual impacts include:
_Residential viewers within close proximity to the project (often in elevated locations), such as those in Luddenham Hills and Kemps Creek
_Travellers' views along scenic roads such as Luddenham Road
_Recreational viewers within Western Sydney Parklands.

Impacts during construction primarily relate to residential receptors and result from building and tree removal, visibility and overshadowing of residences from construction facilities, temporary noise barriers and hoardings, and the visibility of constructional activities such as spoil haulage. These impacts are generally low due to the rural nature of the existing environment. Construction impacts are temporary in nature and would be mitigated where possible through appropriate siting of infrastructure, selection and use of appropriate materials and finishes of sheds and hoarding, and the management of dust dispersal and light spill.

A number of mitigation and management measures have been recommended to reduce the landscape character and visual impacts of the project.

These measures generally consist of utilising locally endemic planting to screen and provide some visual continuity with the surrounding landscape. Retention of as much existing remnant vegetation as possible would help to reduce visual impacts.

These landscape and urban design recommendations, including the range of Roads and Maritime guideline documents reference throughout this report need to form the basis of all future detailed design activities associated with the project. Importantly, they also need to be applied to future infrastructure projects in the area.

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Appendix A
Plant selection

Artist's impression: Aerial view south over Airport Interchange, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

A

Plant selection

Planting strategy

The planting strategy draws predominately on plant species that belong to identified vegetation communities of the Cumberland Plains which mostly comprise of:
_Cumberland Shale Plains Woodland
_Cumberland Shale Hills Woodland
_Cumberland River Flat Forest
_Cumberland Swamp Oak Riparian Forest
_Castlereagh Shale-Gravel Transition Forest.

In addition, species that are known performers in highly modified and harsh roadside environments, or species that are considered special to an existing community or council or cultural heritage have been considered.

The following typical planting typologies could potentially be utilised on the project and are subject to further development during detailed design stages:
_Turf areas
_Riparian planting
_Native grasses and groundcovers
_Frangible shrubs
_Forest mix
_Broadacre trees
_Feature trees
_Feature planting.

An outline of the indicative plant species and a planting palette, subject to detailed design and market availability, are provided in the following tables.

Aboriginal cultural interpretation - Plant selection recommendations

The Aboriginal cultural interpretation plan provides recommendations for native plant species of high cultural significance based on their role as:
_Seasonal or landscape markers
_Spiritually significant
_Source of food
_Medicinal purposes.

The species nominated in the Aboriginal cultural interpretation Plan have been identified in the following planting palettes according to their corresponding times of the six season calendar year or general significance.

Significant species key
- Time of Burran
- Time of Marrai'gang
- Time of Burrugin
- Time of Wiritjiribin
- Time of Ngoonungi
- Time of Parra'dowee
- Non-seasonal significance

Turf areas

Zoysia macrantha	Prickly Couch


Zoysia macrantha

Riparian planting

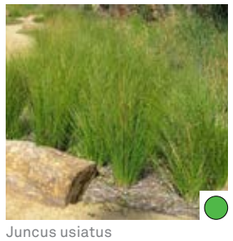
Carex appressa	Tall Sedge
Carex fascicularis	Tassel Sedge
Ficinia nodosa	Knobby Club Rush
Lepironia articulata	Grey Sedge
Juncus continuus	Rush
Juncus usiatus	Tussock Rush

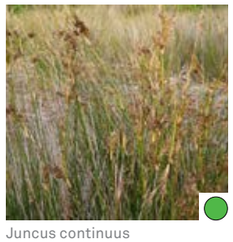

Carex appressa


Carex fascicularis


Ficinia nodosa


Lepironia articulata


Juncus usiatus


Juncus continuus

Native grasses and ground covers

Anthropodum milleflorum	Vanilla lily
Artisida vagans	Speargrass
Austrodanthonia tenuior	Wallaby Grass
Billardiera scandens	Apple Dumpling
Dianella caerulea	Blue flax lily
Dianella longifolia	Blueberry flax lily
Dianella revoluta	Flax Lily
Dichelachne micrantha	Plume Grass
Dichondra repens	Kidney Weed
Echinopogon ovatus	Hedgehog Grass
Glycine clandestina	Love Creeper
Goodenia hereracea	Hope Goodenia
Hardenbergia violacea	Native Sarsparilla
Hibbertia aspera	Rough Guinea Flower
Lepidosperma laterale	Variable Swordsedge
Lomandra filiformis	Wattle Mat-rush
Lomandra hystrix	Slender mat rush
Lomandra longifolia	Spiny-headed mat rush
Microlaena stipoides	Weeping Grass
Poa labillardierei	Tussock grass
Pratia purpurescens	White Root
Themeda australis	Kangaroo Grass
Tricoryne elatior	Star lily
Wahlenbergia gracilis	Australian Bluebell


Anthropodium milleflorum


Artisida vagans


Austrodanthonia tenuior


Billardiera scandens


Dianella caerulea


Dianella longifolia


Dianella revoluta


Dichelachne micrantha


Dichondra repens


Echinopogon ovatus


Glycine clandestina


Goodenia hederaceae


Hardenbergia violacea


Hibbertia aspera


Lepidosperma laterale


Lomandra filiformis


Lomandra hystrix

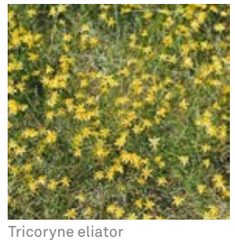

Lomandra longifolia


Microlaena stipoides


Poa labillardierei


Pratia purpurescens


Themeda australis


Tricoryne eliator


Wahlenbergia gracilis

Plant selection

Frangible shrubs

Acacai binerva	Myall Wattle
Acacia decurrens	Black Wattle
Acacia implexa	Lightwood
Acacia falcata	Sickle Wattle
Acacia pubescens	Downy Wattle
Acmena smithii	Common Lily Pily
Asperula conferta	Common Woodruff
Bursaria spinosa	Blackthorn
Callistemon 'Endeavour'	Bottlebrush
Callistemon viminalis	Weeping Bottlebrush
Dodonea viscosa	Hop bush
Dodonea triquetra	Large leaf hop bush
Dillwynia sieberi	Prickly Parrot Pea
Dillwynia tenuifolia	Parrot Pea
Indigofera australis	Native Indigo
Leptospermum polygalifolium	Mountain Tea Tree
Leptospermum trinervium	Paperbark tea-tree
Leucopogon juniperinus	Prickly beard-heath
Lissanthe strigosa	Peach Heath
Melaleuca nodosa	Prickly Leaved Paperbark
Olearia microphylla	Small leaved Daisy Bush
Ozothamnus diosmifolius	Rice Flower
Pultenaea parviflora	
Syzygium paniculatum	Magenta Lily Pily


Acacia binerva

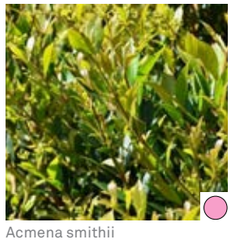

Acacia decurrens

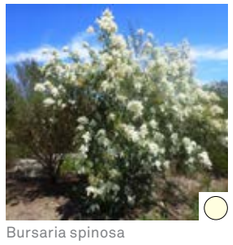

Acacia implexa

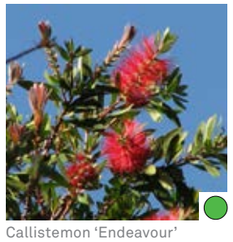

Acacia falcata


Acacia pubescens


Asperula conferta

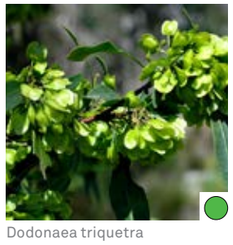

Acmena smithii


Bursaria spinosa


Callistemon 'Endeavour'


Callistemon viminalis


Dodonea viscosa


Dodonaea triquetra


Dillwynia sieberi


Dillwynia tenuifolia


Indigofera australis


Leptospermum polygalifolium


Leptospermum trinervium


Leucopogon juniperinus


Melaleuca nodosa


Olearia microphylla


Ozothamnus diosmifolius


Pultanaea parviflora


Syzygium paniculatum

Trees

Acacia parramattensis	Parramatta Wattle
Angophora floribunda	Rough Barked Apple
Angophora subvelutina	Broad-leaved Apple
Allocasuarina littoralis	Black She-oak
Casuarina glauca	Swamp oak
Corymbia maculata	Spotted Gum
Eucalyptus amplifolia	Cabbage Gum
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus eugenioides	Thin-leaved Stringybark
Eucalyptus fibrosa	Red Ironbark
Eucalyptus moluccana	Grey Box
Eucalyptus tereticornis	Forest Red Gum
Melaleuca decora	White feather honey myrtle
Melaleuca styphelioides	Paper bark


Acacia parramattensis


Angophora floribunda


Angophora subvelutina


Allocasuarina littoralis


Casuarina glauca


Corymbia maculata


Eucalyptus amplifolia


Eucalyptus crebra


Eucalyptus eugenioides


Eucalyptus fibrosa


Eucalyptus moluccana


Eucalyptus tereticornis


Melaleuca decora


Melaleuca styphelioides

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Appendix B
Artist's impressions

Artist's impression: Aerial view west along M12 Motorway, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

B

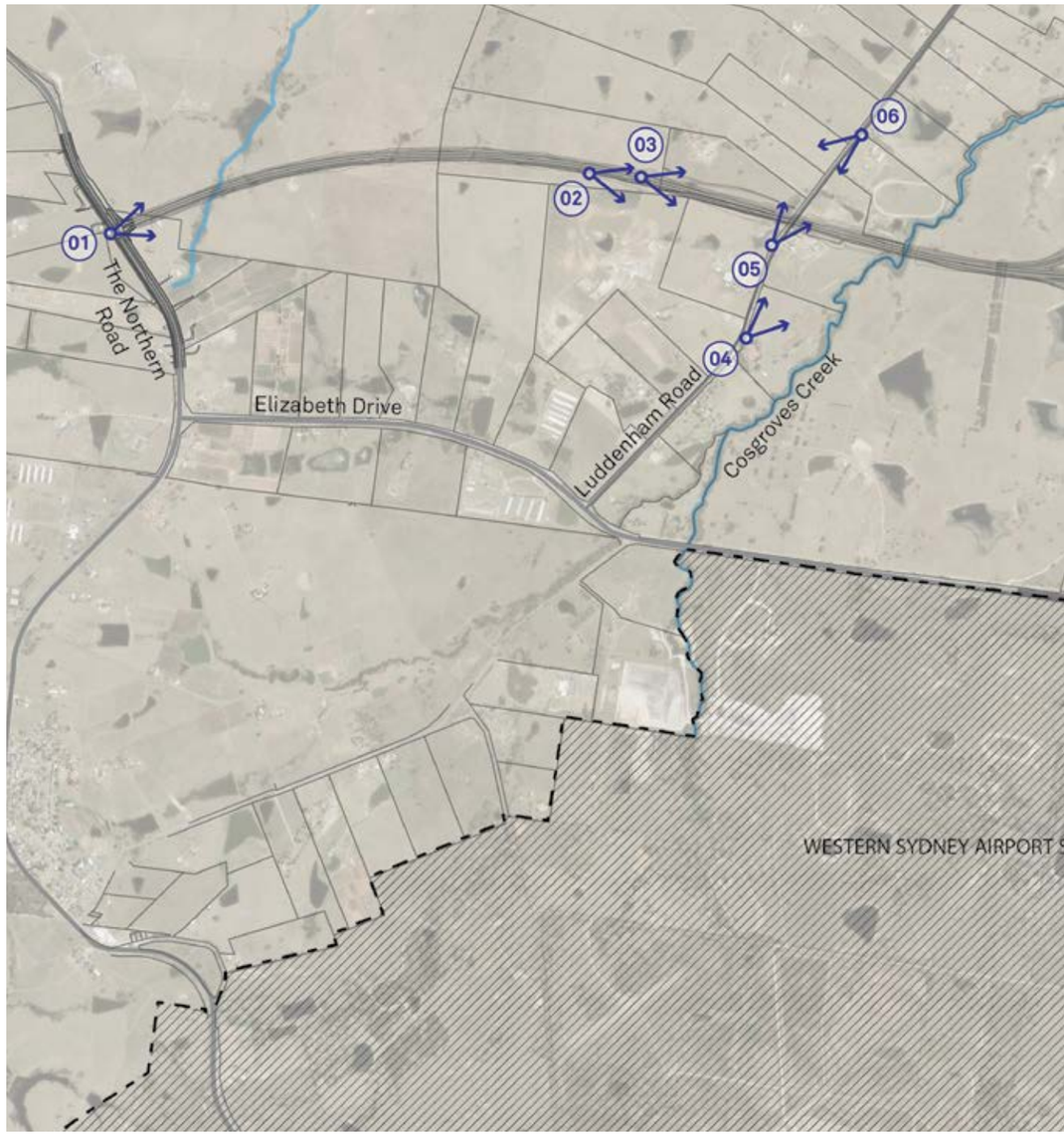
Artist's impressions

As per the Secretary of the NSW Department of Planning and Environment's Secretary's environmental assessment requirements (SEARs) for the M12 Motorway EIS, artist impressions and perspective drawings of the project to illustrate how the project has responded to the visual impact through urban design and landscape works are included within the Urban Design Report. These impressions are included throughout the report from Section 05 onwards, and combined within this Appendix B.

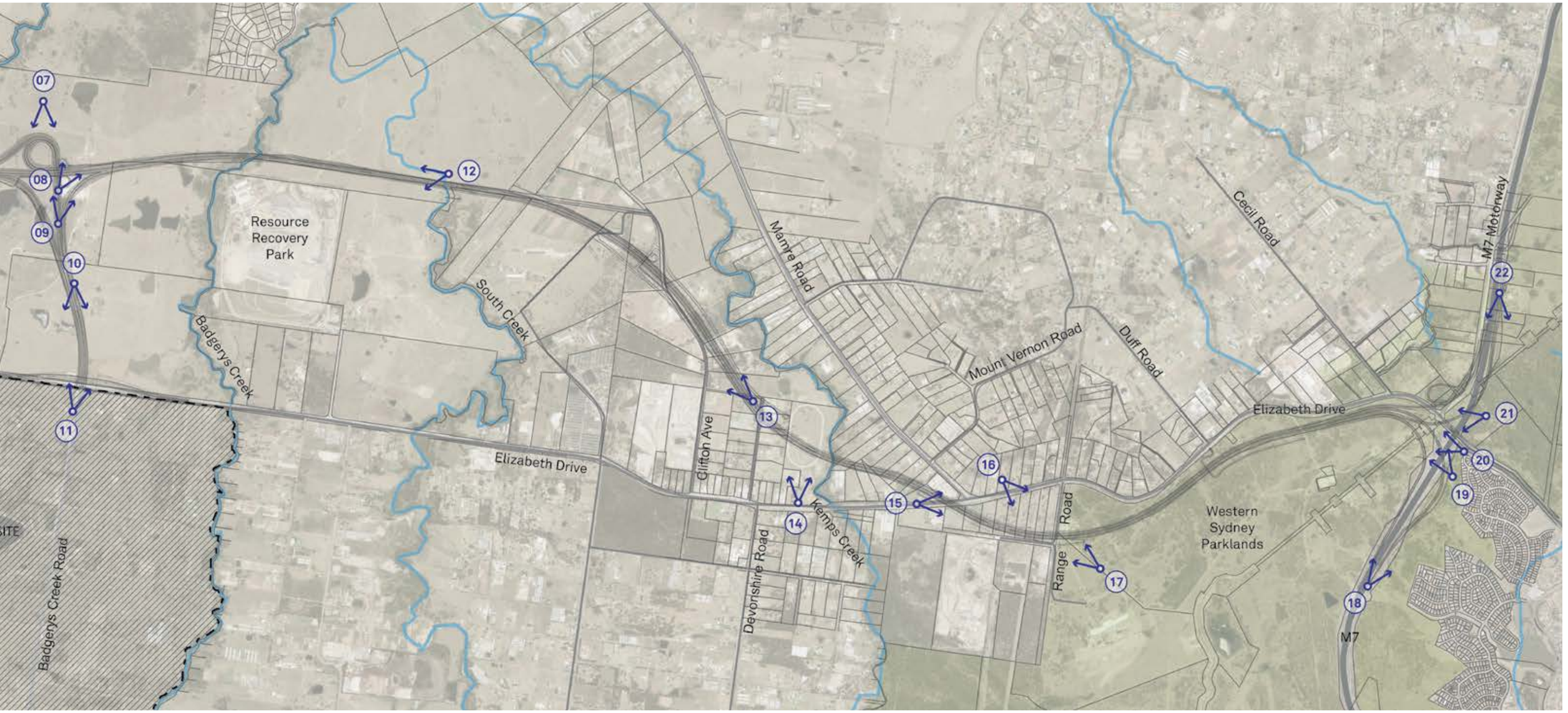
This appendix includes a table and diagram highlighting the location of artist's impressions across the Project, with each impression shown following.

Note that all artist's impressions illustrate the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. They are not final designs and are subject to change during detailed design.

Artist's impressions	
01	View east along The Northern Road
02	Shared path view east along M12 Motorway
03	Motorist's view east along M12 Motorway
04	View north-west from Luddenham Road
05	View north along Luddenham Road
06	View south along Luddenham Road
07	Aerial view south over Airport Interchange
08	Shared path view north-east at Airport Interchange
09	Motorist's view north at Airport Interchange
10	Motorist's view south towards Airport entry
11	View north from Badgerys Creek Road at Airport entry
12	View west along South Creek (Sydney University Lands)
13	Motorist's view north-west along M12 Motorway
14	View north from Elizabeth Drive to M12 Motorway
15	View east along Elizabeth Drive
16	Aerial view south-east across Range Road
17	View north-west from Sydney International Shooting Centre (SISC)
18	View north along M7 motorway
19	Aerial view south-west along M12 Motorway
20	Aerial view west along M12 Motorway
21	Aerial view north-west across M7/M12 Interchange
22	View south along M12 on ramp at M7 motorway



Artist's impression locations - Scale: 1:25000



Legend (1) Viewpoint

01 View east along The Northern Road

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

02 Shared path view east along M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

03 Motorist's view east along M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

04 View north-west from Luddenham Road

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

05 View north along Luddenham Road

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

06 View south along Luddenham Road

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

07 Aerial view south over Airport Interchange

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

08 Shared path view north-east at Airport Interchange

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

09 Motorist's view north at Airport Interchange

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

10 Motorist's view south towards Airport entry

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

11 View north from Badgerys Creek Road at Airport entry

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

12 View west along South Creek (Sydney University Lands)

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

13 Motorist's view north-west along M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

14 View north from Elizabeth Drive to M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

15 View east along Elizabeth Drive

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

16 Aerial view south-east across Range Road

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

17 View north-west from Sydney International Shooting Centre (SISC)

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

18 View north along M7 motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

19 Aerial view north-west across M7/M12 Interchange

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

20 Aerial view west along M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

21 Aerial view south-west along M12 Motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

22 View south along M12 on ramp at M7 motorway

Note: Artist's impression, illustrating the anticipated final built urban design outcome in its setting with established vegetation at approximately 10 years after planting. Subject to change during detailed design.

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