Executive Summary

Introduction

The M1 Princes Motorway is the main road linking Sydney and the Illawarra. More than 50,000 vehicles use the motorway at the base of Mount Ousley near Wollongong each day, with heavy vehicles representing up to 15 per cent of daily vehicle movements.

The interchange will replace the existing intersection of the M1 Princes Motorway and Mount Ousley Road, bringing greater connectivity, safety and efficiency to those travelling through the gateway to Wollongong.

The Urban Design and Landscape Strategy Report guides the physical design of the Project in a way that is consistent with the overall Project objectives.

The core objectives of the project include:

- Improving safety by addressing conflicting movements and the interaction between light and heavy vehicles
- Improving travel time and efficiency for vehicles travelling on this length of the M1 Princes Motorway
- Providing for the growing freight task including supporting the expanding port at Port Kembla
- Enhancing accessibility to and from the M1 Princes Motorway and the Wollongong CBD.

Project Overview

Key features of the project include:

- A heavy vehicle bypass lane for southbound travel, separating light and heavy vehicles
- Separate off ramps for southbound light and heavy vehicles exiting the M1 Princes Motorway
- Two heavy vehicle safety ramps
- A bridge over the M1 Princes Motorway with signalised intersections connecting the M1 Princes Motorway, Mount Ousley Road and the new access road to the University of Wollongong
- A commuter car park
- A roundabout that provides access to the M1 Princes Motorway and the University access road
- A shared path along the bridge over the M1 Princes Motorway and the University access road
- A southbound access road between Mount Ousley Road and University Avenue
- A pedestrian and cyclist bridge over the southbound access road
- A shared path connecting to the existing path from Helen Street, and upgrades to the shared path adjacent to TAFE NSW Wollongong
- Upgrade and extension of the existing pedestrian bridge over the M1 Princes Motorway at Northfields Avenue
- Five metre high noise walls along the northern side of the motorway and the southern side of Dumfries Avenue; and along the southern side of the motorway and northern side of Falder Place
- Three and a half metre high noise walls along the southern side of Mount Ousley Road, between Gowan Brae Avenue and the cul-de-sac at the western end.

Design Refinements

During 2023, all aspects of the Mount Ousley interchange project were assessed to find opportunities to refine the scope and reduce overall cost while still achieving the project core objectives to improve road safety, travel times, and accommodate the efficient movement of future traffic and freight growth.

Key changes from the concept design include:

- Removing the pedestrian bridge over Mount Ousley Road and providing enhanced at grade cycle and pedestrian connections along and across Mount Ousley Road which are being developed as part of detailed design
- Replacing the eastern roundabout with signalised intersections to improve traffic efficiency
- Adjusting drainage and the road alignment to optimise the Projects design and reduce construction impacts including interactions with road users.

For more information about the Project, visit the Project website at nswroads.work/MountOusley.

1. Alignment Legibility

The overall structure of the interchange provides clear delineation of through traffic, heavy vehicle movement and access to Wollongong via Mount Ousley Road.

These movement paths are defined by large islands of landscape within the interchange aiding the integration with the broader landscape setting.

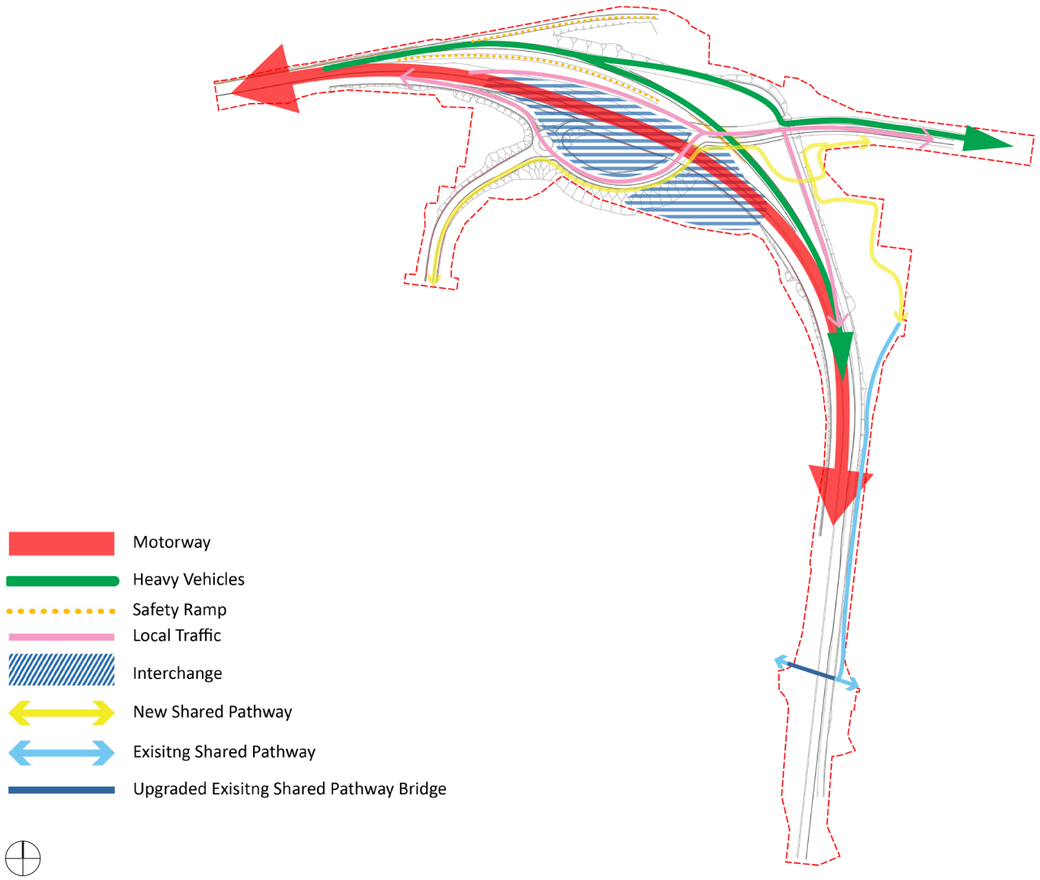

Figure 1: Alignment rationalisation

2. Active Transport Connections

The design incorporates shared pathway connections between eastern and western sides of the M1 Princes Motorway alignment, as well as enhancing north south linkages. This strengthens the community connections to the University of Wollongong and TAFE NSW Wollongong.

The design of these facilities has considered the user experience as well as safety to integrate the pathway in a seamless manner to provide for a more enjoyable and accessible experience.

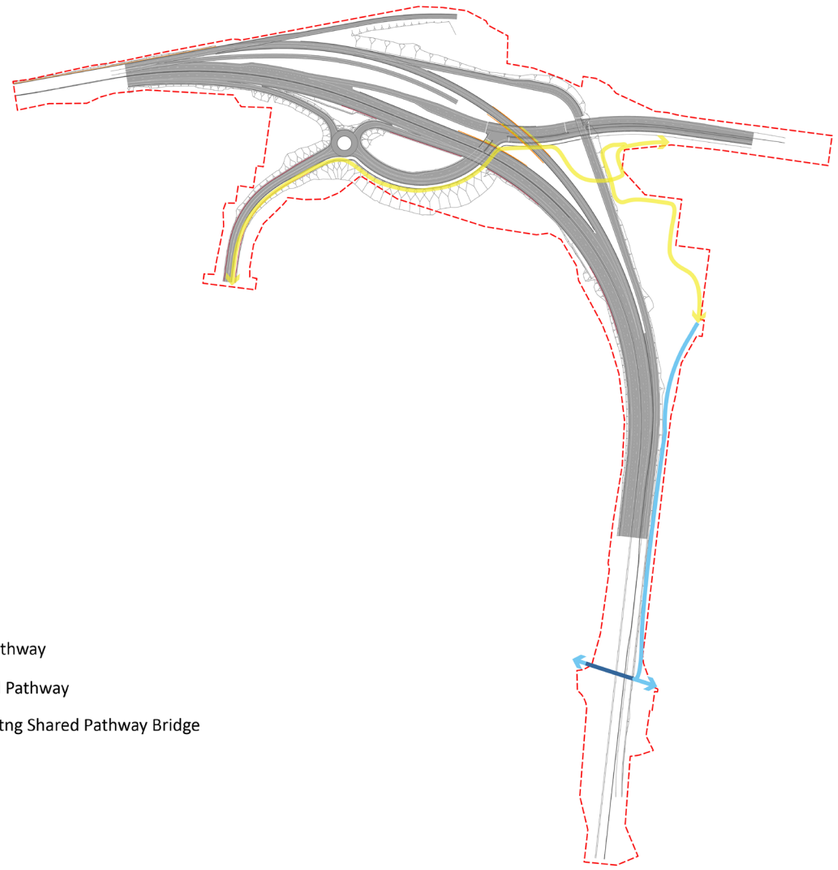

Figure 2: Active transport connections

3. Landscape Response

The landscape response seeks to replace and maximise the amount of vegetation within the interchange. This focuses on the creation of canopy and is reflective of the communities which sit on the foot-slopes of the escarpment including: Blackbutt Forest and Bluegum Forest communities.

Focus is on establishment of plantings which mitigate the scale of the infrastructure and that provides a continuity with the existing landscape setting. This is achieved through the use of local species reflective of the communities and associated with the setting.

4. Country

The Project seeks to integrate Country as a defining element of the interchange. The process will be developed through focused engagement, to determine the means of expression of Country be it the recording of stories, responses to landscape, and /or the integration of art within the built form of the structures.

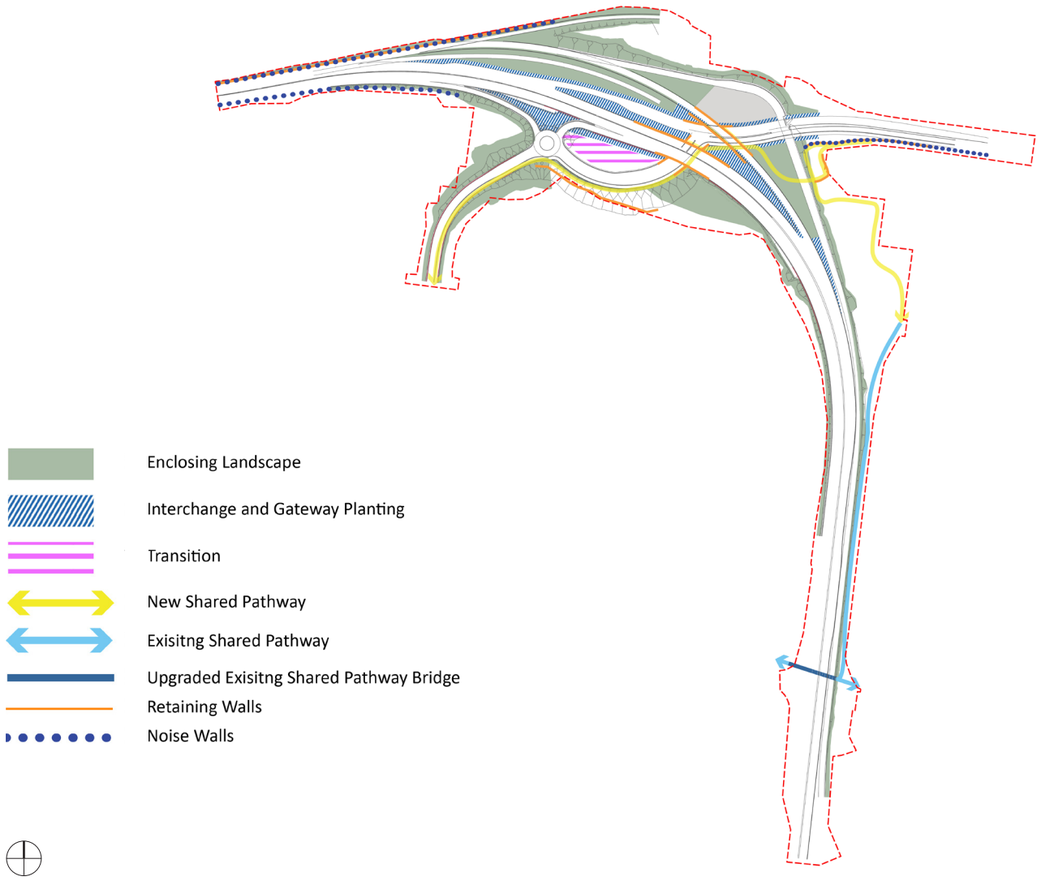

Figure 3: Landscape Response

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1 Introduction

1.1 Purpose

The document illustrates the design intent and objectives of the urban and landscape design and has been compiled in a report format to provide a holistic understanding of the design and its evolution informed by the contextual analysis and responses developed as part of the Review of Environmental Factors (REF) - Urban Design and Visual Impact Assessment (UDVIA) objectives and vision and previous community consultation.

The Project's design is currently at Detailed Concept Design which will be refined and resolved further as part of the ongoing design development and integrated design process.

Further design refinement during detailed design and the delivery may occur, however this report confirms the objectives and principles set out in the UDVIA and any modifications, which will be carried through in the detailed design.

A methodology to achieve Connection to Country has also been included, which will involve engagement with Aboriginal knowledge holders and artists during detailed design.

Figure 4: Mount Ousley interchange, the Project

1.2 Document structure

This report has been structured to identify design responses and strategies along the Project corridor.

Report chapters are organised as follows:

Executive Summary

Summarises the design including the overall configuration and key moves, alignment rationalisation, optimisation of active transport connectivity and structures, and maximisation of landscape along the road corridor.

1 Introduction

Introduces the Project and its components and includes a reference to the key guideline documents.

2 Contextual analysis

Provides a brief contextual analysis at the regional, and local levels with a particular focus on urban design and landscape related issues.

3 Vision

Describes the vision and narrative as well as Project objectives, principles and responses of the Project.

4 Developing a Connection to Country

Outlines the methodologies to engage on and identify opportunities to incorporate a connection to Country.

5 Design strategy

Outlines the factors that have been used to develop the design strategy for the Project.

6 Concept

Illustrates urban design and concept plans for the Project with references to other Project elements.

7 Project elements

Illustrate the urban and landscape design of the various Project elements including bridges, noise barriers and retaining walls.

8 Conclusion

Summarises the overall design outcomes.

1.3 Team structure

Mount Ousley interchange (the Project) is being delivered by Transport for NSW.

The Project's urban design and landscape has been developed in collaboration with the following team:

- Transport for NSW – client
- Fulton Hogan – contractor
- SMEC – design consultant
- TRACT, CM+ and Cultural Capital – urban design, landscape, and Country curation
- RESONATE – noise assessment and modelling.

1.4 Project overview

The main elements of the Project include:

- An overpass for safe access between Mount Ousley Road, the M1 Princes Motorway and the University of Wollongong.
- A dedicated heavy vehicle bypass lane, to separate heavy vehicles from general southbound traffic on the M1 Princes Motorway and light vehicles exiting at Mount Ousley Road.
- A dedicated southbound heavy vehicle exit ramp onto Mount Ousley Road, to separate heavy and light vehicles exiting the M1 Princes Motorway to Mount Ousley Road.
- A new access to the University of Wollongong to and from the M1 Princes Motorway and Mount Ousley Road including a new roundabout at the intersection of University Access Road and Ring Road.
- A controlled intersection for those exiting the M1 Princes Motorway at Mount Ousley Road.
- A new southbound service road, which would replace the existing southbound access from the M1 Princes Motorway to University Avenue.
- Two heavy vehicle safety ramps.
- A new pedestrian and cyclist bridge over the M1 Princes Motorway, and a new shared path connecting the University of Wollongong and the TAFE NSW Wollongong campus.
- Upgrades to the existing pedestrian bridge over the M1 Princes Motorway at Northfields Avenue.
- A new commuter car park, relocated to the southern side of the M1 Princes Motorway, with additional formalised parking spaces.
- New noise walls along the M1 Princes Motorway, between the motorway and nearby residential areas:
  - on the northern side of the M1 Princes Motorway, extending the existing noise wall along Dumfries Avenue as far as Foothills Road.
  - on the southern side of the M1 Princes Motorway, extending the existing noise wall along the edge of the motorway as far as the proposed western roundabout.
- New noise walls along Mount Ousley Road, between the M1 Princes Motorway interchange and Gowan Brae Avenue.

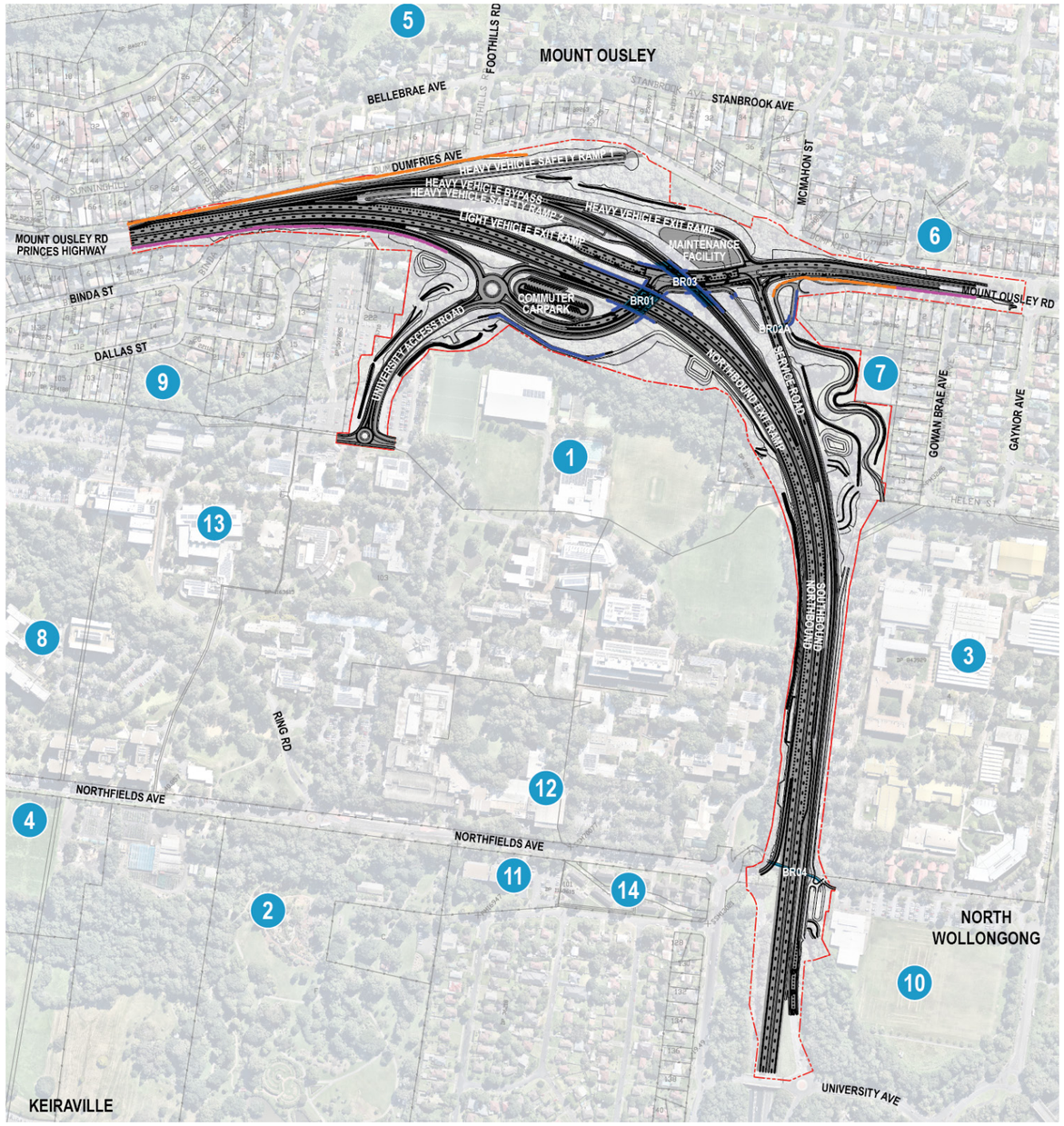

Figure 5: Regional context

LEGEND

- Project alignment
- Project boundary
- Bridge
- Retaining wall
- Noise wall
- Combined retaining wall and noise wall

1. University of Wollongong
2. Wollongong Botanic Garden
3. TAFE NSW - Wollongong
4. Kooloobong Oval
5. Greenslopes Reserve
6. Bass Park
7. Mount Ousley Zone Substation
8. Kooloobong Village - UOW Accommodation
9. Dallas Park
10. TAFE NSW - Sport Field
11. Bangalay - UOW Accommodation
12. University Hall
13. Early Start Discovery Space
14. Graduate House - UOW Accommodation

1.5 Key design standards and guideline documents

Key documents include:

- *Princes Highway Urban Design Framework - An urban design strategy guidance and design considerations for the upgrade and maintenance of the Princes Highway from Sydney to Eden, Centre for Urban Design, TfNSW 2021 - Draft*
- *Beyond the Pavement - Urban design approach and procedures for road and maritime infrastructure planning, design and construction, Centre for Urban Design, TfNSW 2020*
- *Landscape design guideline - Design guideline to improve quality, safety and cost effectiveness of green infrastructure in road corridors, RMS 2023*
- *Guideline for landscape character and visual impact assessment - Environmental impact assessment practice note EIA-N04, Centre for Urban Design, TfNSW 2023*
- *Bridge Aesthetics - Design guideline to improve the appearance of bridges in NSW, Centre for Urban Design, TfNSW 2019*
- *Noise wall design guideline - Design guideline to improve the appearance of noise walls in NSW, Centre for Urban Design, TfNSW 2021*
- *Shotcrete design guideline - Design guideline to improve the appearance of shotcrete in NSW, RMS 2016*
- *Water sensitive urban design guideline - Applying water sensitive urban design principles to NSW transport projects, RMS 2017*

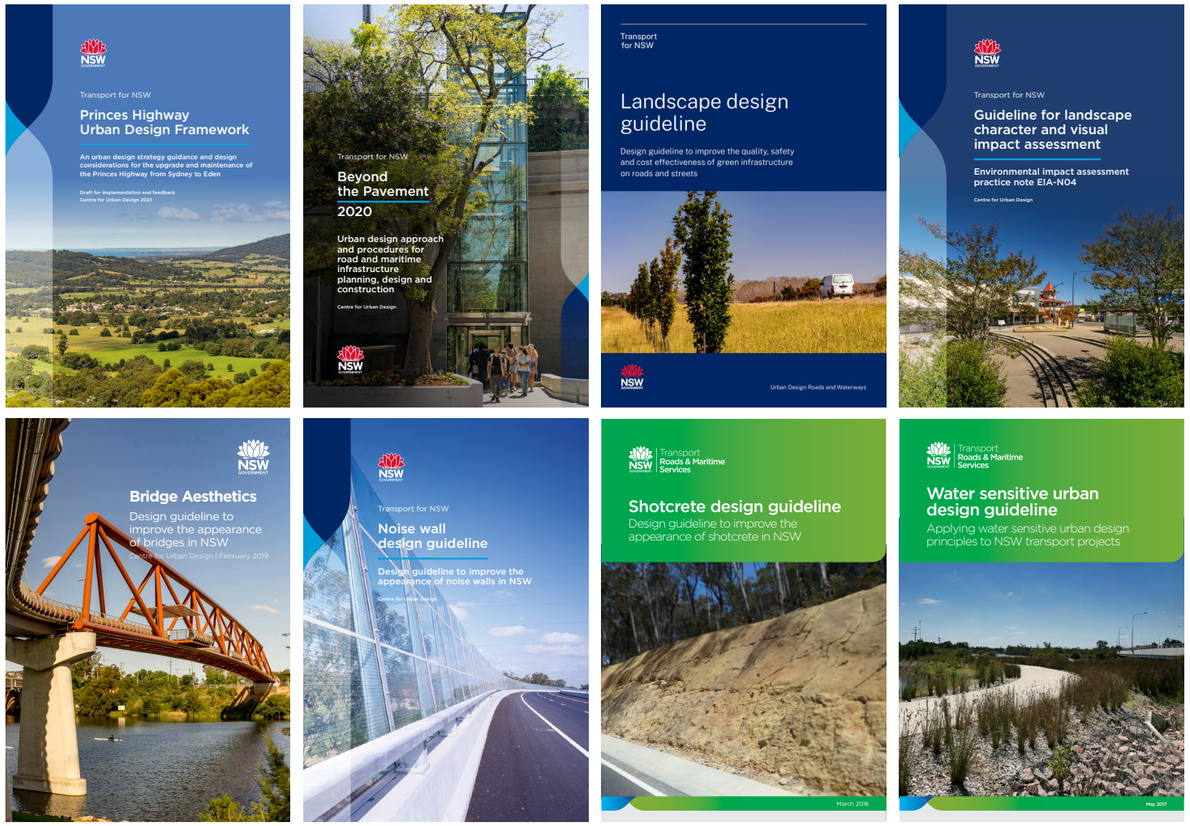

Figure 6: Guideline documents

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2 Contextual Analysis

2.1 Regional context

The Mount Ousley interchange (the Project) is located to the north of the centre of Wollongong in the foot slopes of the Illawarra Escarpment approximately 80 kilometres south of Sydney.

The interchange forms an important gateway to Wollongong – the steel city, the Illawarra Shoalhaven, and the broader South Coast Region. Wollongong and the South Coast Region are popular tourist destinations with Wollongong, serving as the main regional centre.

The Illawarra Escarpment is the dominant visual element of the region and has a strong impact on the overall site context. The escarpments high sandstone cliffs and plateau stretches from Stanwell Park in the north to the Shoalhaven River in the south. The slopes of the escarpment are largely forested and provide a range of recreational activities as well as contributing significantly to the visual context of the region.

The port areas of Wollongong contribute to its industrial character and history. Wollongong's Industrial heritage dates back to the 1850s, largely driven by coal mining in the region. This has resulted in heavy industrial infrastructure and extensive port activity. This heavy industry strongly influences the traffic movement utilising the interchange, with a high proportion of heavy vehicle traffic.

Figure 7: View of the Illawarra Escarpment and Wollongong

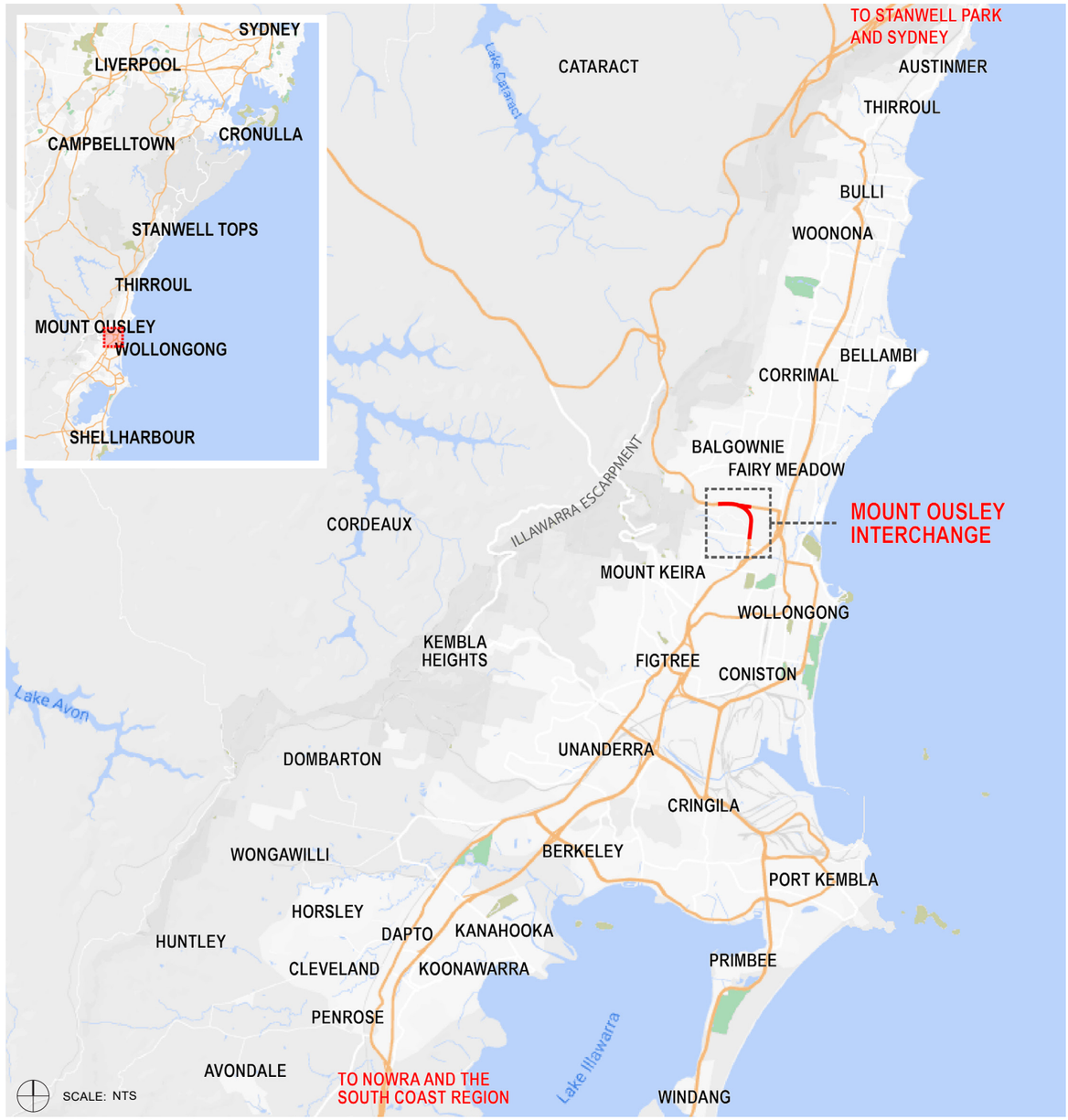

Figure 8: Regional context

2.2 Country

“Country” (with a capital C) has a specific and significant meaning for Aboriginal peoples. In the Aboriginal sense of the word, Country relates to the nation or cultural group and land that we belong to, yearn for, find healing from and will return to. However, Country means much more than land, it is our place of origin in cultural, spiritual and literal terms. It includes not only land but also skies and waters. Country incorporates both the tangible and the intangible, for instance, all the knowledges and cultural practices associated with land. People are part of Country, and our identity is derived in a large way in relation to Country”

— Dr Danièle Hromek, Budawang/Yuin, Researcher and spatial designer (2019, Connecting With Country Draft Framework) and 2021 , Princes Highway Urban Design Framework.)

The Project is situated on the traditional lands of the Wodi Wodi people of the Dharawal language group. The highway is within, and a part of, Country and provides a connection with Country for all who travel on it.

The REF identified some preliminary discovery in relation to Country as follows. Wollongong has a long and rich Aboriginal history spanning over 30,000 years. The name ‘Wollongong’ is an Aboriginal name and there are several interpretations of the name. In the local language it is believed to refer to ‘Seas of the South’ while other interpretations include ‘great feast of fish’, ‘song of the sea’, ‘sound of the waves’, ‘hard ground near water’, ‘many snakes’ and ‘five islands’.

Opportunities will be explored through consultation with Aboriginal knowledge holders to record, integrate and celebrate Aboriginal culture and a connection to Country within the Project’s urban and landscape design.

Figure 9: Illawarra Aboriginal History poster
Source: Department of Environment and Conservation, NSW (2005)

‘This is what Billy Saddler says is the correct Blackfellow name for Wollongong. He says the name“Woolungah” means a place where a marriage took place between the son of one great King and the daughter of another great King in the olden days, long before Captain Cook found this country. He explains that the word also means that there was a great feast of fish and other good things at the wedding, which was such a remarkable event that the place was named on account of it afterwards.’

(Bill Saddler, Illawarra Mercury 20 Nov 1894)

Figure 10: Figure 25. ‘Great Feast of Fish’
Source: http://www.simplyrecipes.com/feast_of_the_seven_fishes/

2.3 Local context

Located in the residential suburbs of Mount Ousley and Keiraville in the outer suburbs of Wollongong, the Project is nestled in the foot slopes between the Illawarra Escarpment and the coastal plains. The descent from the escarpment and its dramatic topography enable views over Wollongong and the coast. Heading north the escarpment provides a dramatic scenic backdrop to the west of the alignment.

The existing alignment is nestled within the canopy of the escarpment. Comprising a mix of native and exotic plantings the vegetation is a combination of planted and regenerated communities which envelop the interchange. This provides an attractive and scenic driving experience which fits within its surrounding context of the vegetation coming off the escarpment.

The location of the interchange is at a significant point in terms of access providing access to a range of key areas and facilities including the University of Wollongong, TAFE NSW Wollongong, access to and from Wollongong and Sydney, as well as access to the broader Illawarra region. This results in a high use of pedestrian, vehicle and cyclist activity accessing the educational and residential precincts on either sides of the corridor. Uniquely the local context is marked by the presence of the safety ramp reflecting the steep topography and the risk associated with this.

The site has also been marked by the installation of an artwork which celebrates the city of Wollongong's connection to the steel industry. The legibility of this element is reduced by its existing siting and the vegetation around it. Opportunities to celebrate this element are considered in the design.

Figure 11: M1 Princes Motorway

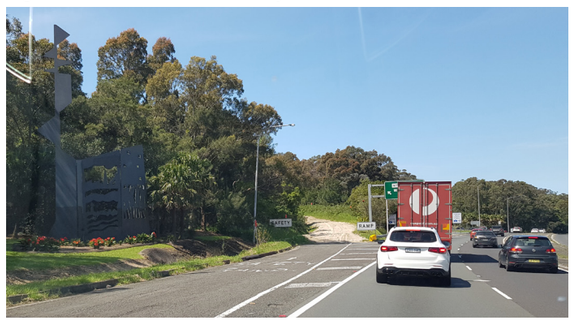

Figure 12: M1 Princes Motorway

Figure 13: Mount Ousley Road

Figure 14: Illawarra State Conservation Area

Figure 15: Gowan Brae Avenue

Figure 16: Mount Ousley Road

Figure 17: Mt Pleasant neighbourhood

Figure 18: Mt Pleasant neighbourhood

Figure 19: Mt Pleasant neighbourhood - Highbank Avenue

Figure 20: TAFE NSW Wollongong

Figure 21: University of Wollongong

Figure 22: University precinct

2.3.1 Land use

The land uses surrounding the Project are predominantly single dwelling residential and educational institutions. The residential areas are generally low density and are concentrated on the northern side of the M1 Princes Motorway and both sides of Mount Ousley Road. There are vacant parcels of steeply sloping land generally associated with the lower slopes and foothills of the Illawarra Escarpment to the northwest of the Project.

Open space areas in close proximity of the Project include areas used for conservation and public recreation. The conservation areas are the Illawarra Escarpment State Conservation Area, and the Illawarra Escarpment Landscape Area in the north. The Illawarra Escarpment Landscape Area is a locally listed heritage conservation area and provides a number of walking tracks. Public recreation is also available in the neighbourhood parks scattered through the residential areas. Larger open space areas include Wollongong Botanical Gardens and the vegetated sections along the creek lines.

The University of Wollongong and TAFE NSW Wollongong Campus are located on the southern and eastern sides of the M1 Princes Motorway respectively and occupy significant land holdings adjacent to the Project. They are key activity areas of the south coast attracting large numbers of local, regional and international students, staff and visitors. A masterplan was prepared for the campus in 2016, this is being reviewed in terms of the universities 2020 to 2050 strategy and the changes in learning resulting from Covid-19.

The following design principles will be incorporated into the design as it is developed :

- Respond to the requirements of the various land uses including:
    - visual mitigation, privacy and noise attenuation for residential uses;
    - visual mitigation of vegetation removal and new structures bordering recreational and educational uses.

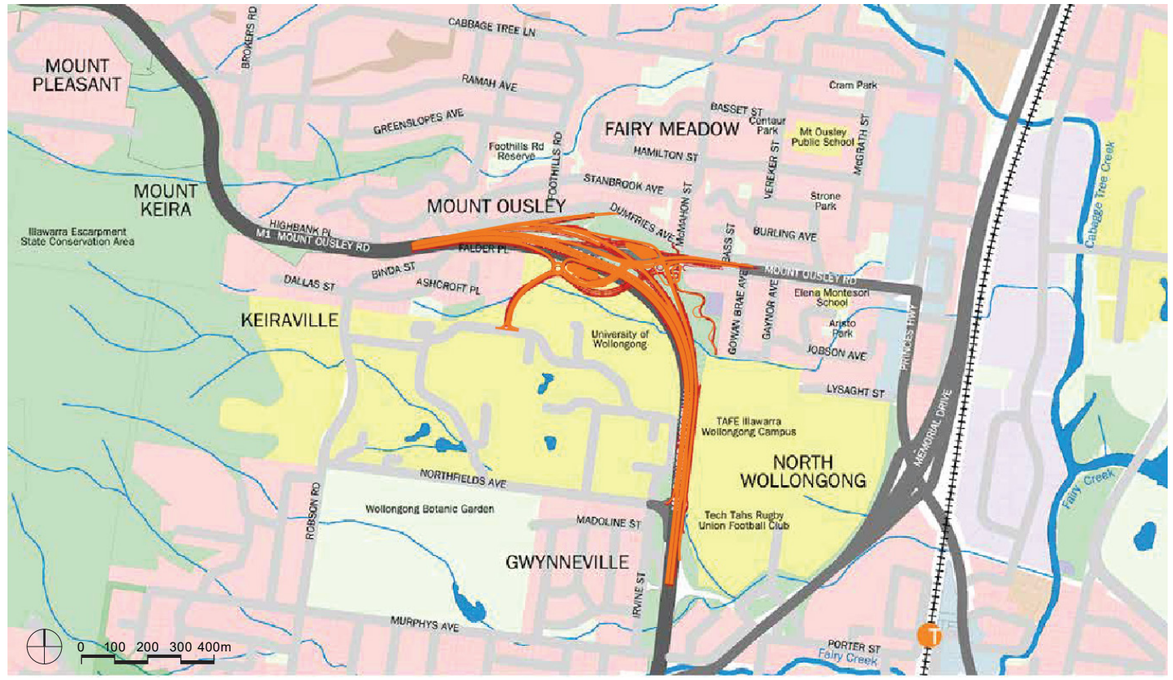

Figure 23: Land use (Source: MOI Urban Design Concept & Landscape Character & Visual Impact Assessment, 30 Oct 2017)

2.3.2 Topography, landform

The alignment of the M1 Princes Motorway passes from the plateau above Wollongong, falling from 350 at Clive Bissell Drive down a spur line to the flat coastal plans of the Wollongong Illawarra region at RL 10m at TAFE Wollongong. The Project sits on the lower section of the spur in the foot slopes of the escarpment at the transition between the escarpment (RL 60m at its western edge) and the flatlands.

This landform provides a complex setting in terms of levels and the connectivity of elements within the interchange with up to 10m cross fall across the general alignment resulting in steep tall batters on the high side and retaining walls on the low side of the alignment to provide a platform for the corridor.

The design should adopt the following principles:

- Use the topography to assist in providing separation and access for local traffic and pedestrian movements.
- Adopt integrated earth forms which maintain the flow and feel of the existing topography and reinstates the existing vegetation community.
- Provide elevated bridge elements above existing ground that provide opportunities for broader views and visual identity.
- Use topography to assist in efficiency of safety ramps.

2.3.3 Hydrology

The siting of the interchange sees the alignment located on the southern side of the spur line. Located on the southern side of Dumfries Avenue the catchment drains into an unnamed tributary of Cabbage Tree Creek to the east.

Drainage lines generally run parallel to and to the south of the key interchange elements as the tributaries flow west to east.

The following principle should inform the design:

- Enhance water catchments through the provision of water quality basins located strategically based on their catchments, and incorporating Water Sensitive Urban Design (WSUD) principles.

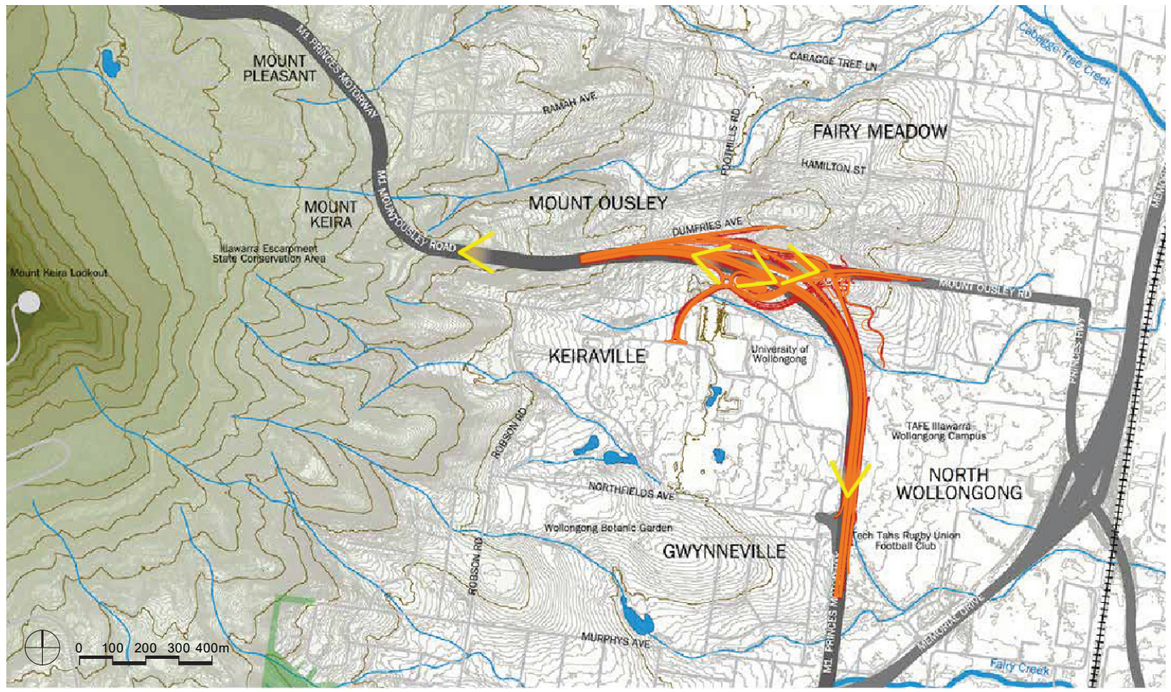

Figure 24: Landform, hydrology and views (Source: MOI Urban Design Concept & Landscape Character & Visual Impact Assessment, 30 Oct 2017)

2.3.4 Views

The descent from the plateau provides dramatic views as you lookout and across the coastal plans to the sea beyond. The drama of the escarpment evident on both the ascent and descent to the interchange. Key views are glimpses to the ocean as you head south and along Mount Ousley Road, and the view west to the escarpment to Mount Keira. The alignment generally provides an enclosed experienced dominated by the adjoining vegetation communities.

The design has:

- Considered the visual experience of the assent and descent providing visual links to significant topographic features of the area and the coastline.
- Use landscape to maintain the connection to the vegetated escarpment.

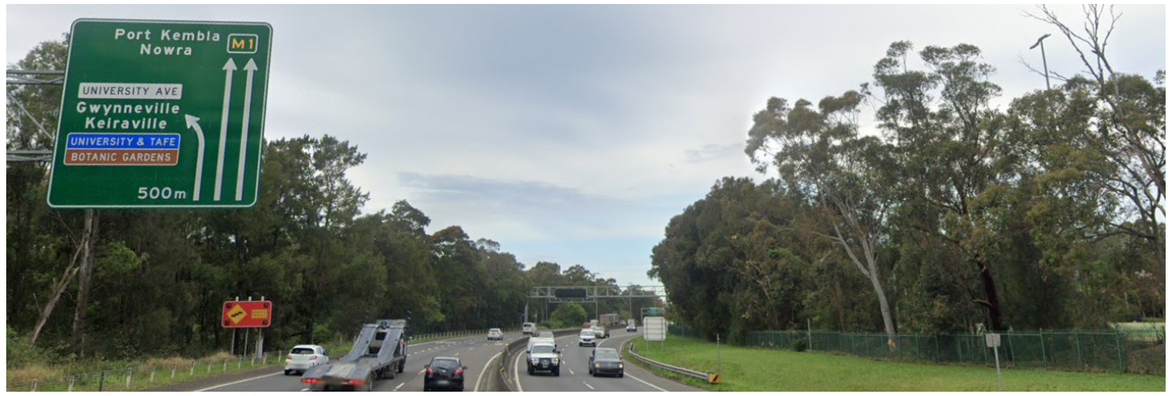

Figure 25: Flatlands south of interchange

Figure 26: Views to the ocean at approach to interchange

Figure 27: Mount Ousley Road to Mount Keira

2.3.5 Biodiversity

Significant vegetation cover is maintained on the plateau and the escarpment slopes. This presents as fingers which extend into suburban Wollongong along drainage courses and valleys as the ridge lines have been developed. The vegetation of the corridor presents as a native bushland setting. Two plant community types have been identified in the REF.

- Blackbutt Turpentine Bangalay Moist Open Forest on sheltered slopes, southern Sydney Bioregion – or Blackbutt Forest; Located on the higher northern slopes it forms the dominant community of the interchange.
- Sydney Blue Gum Bangalay – Lilly Pilly moist forest in gullies and sheltered slopes southern Sydney Bioregion – Blue gum Forest – located along the main drainage corridor and with the Wollongong university to the south of the alignment.

Both communities have been impacted by the presence of weed growth which needs to be considered and managed in the clearing and re-vegetation of the site.

The landscape design should adopt the following principles:

- Respond to the communities of the site and seek to reinstate the disturb lands maintaining the visual qualities and physical connection of the green fingers associated with the site and the broader escarpment.
- Use vegetation to contain and define the corridor and its hierarchy while providing visual and physical connections to the region through selection of culturally and locally important plant species.

2.3.6 Connectivity

Road network

The Project forms a critical intersection in the access to Wollongong and the Illawarra. It is Wollongong's connection to the M1 Princes Motorway and Princes Highway and so an important link to Campbelltown, Sydney and beyond.

The M1 Princes Motorway forms part of the National Land Transport Network is an integrated network of national and inter-regional transport corridors important in supporting economic growth and connectivity in Australia. The motorway accommodates large volumes of traffic with an average of approximately 50,000 vehicles per day at the bottom of Mount Ousley.

Freight makes up a significant portion (15%) of vehicles using the Motorway and Mount Ousley Road. This reflects the importance of the interchange in facilitating transport from Port Kembla, collieries, steel works and broader Illawarra region. Mount Ousley Road and the Princes Highway form the only approved 25/26-metre-long B-double routes near the study area. The impact of this freight component is compounded by speed limits required as a result of the steep descent and risk to heavy transport associated with this. The speed limit for heavy vehicles southbound along the M1 within the Project is 40km/hour. A heavy vehicle safety ramps is provided at the base of the incline.

Figure 28: Biodiversity (Source: MOI Urban Design Concept & Landscape Character & Visual Impact Assessment, 30 Oct 2017)

Congestion is also a product of interaction of local and through traffic mixing. This is compounded during peak times, weekends and holiday periods. Access to the University of Wollongong and TAFE NSW Wollongong are also facilitated through the site with road access via exit ramps to University Avenue from the M1 Princes Motorway south of the Mount Ousley intersection.

Mount Ousley Road forms the entrance into Wollongong but is not clearly discernible. Speed limits on this road are 60km/hour for light vehicles and 40km/hour for freight. The intersection at present is at grade providing greater risk of conflict due to the need to cross two lanes of motorway traffic. A poor crash history has resulted from this condition with 56 crashes during the five year period between July 2011 and June 2016 (inclusive). The two most common crash types were intersection and rear end crashes.

Parking

There is a commuter car park that is situated along the northern verge of Mount Ousley Road, provides opportunity for commuters to carpool on trips to Sydney and various locations, facilitating a reduction in road movements.

Cycleway connections

Wollongong has been a Union Cycliste Internationale (UCI) Bike City since 2021 in recognition of its long-term commitment to cycling. As part of this commitment, it has recently installed a number of separated cycle routes within town and beyond enhancing connectivity for all transport modes.

The presence of key educational facilities provides a key opportunity to strengthen existing and provide new links as part of the Project enhancing safety and adoption of active transport methods. The motorway corridor is currently crossed by a pedestrian bridge at Northfields Avenue removing part of the barrier to pedestrian and cyclist to the west. The Project will also provide improved pedestrian and cycle connectivity.

Bus routes

There are shuttle bus routes connecting Princes Highway to the educational precincts of the University of Wollongong and TAFE NSW Wollongong.

The design has:

- Improved and smoothened traffic flow by separating light vehicle and heavy vehicle movements.
- Added improved pedestrian and cycle connections from the residential neighbourhoods to the educational precincts.

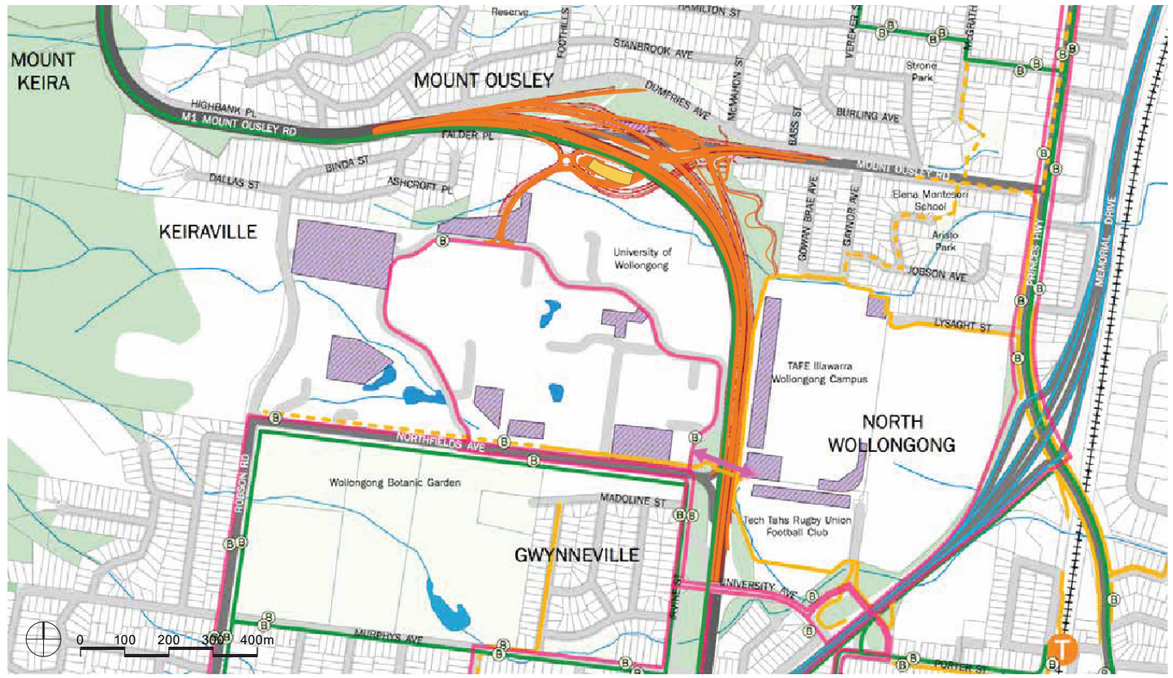

Figure 29: Connectivity (Source: MOI Urban Design Concept & Landscape Character & Visual Impact Assessment, 30 Oct 2017)

LEGEND

- Project alignment
- Reference design
- Major road
- Primary road
- Secondary road
- Existing shared path
- Proposed cycleway link (Source: City of Wollongong Bike Plan 2014-2018)
- On road cycleway
- Bus route
- Shuttle bus route
- Bus stop
- Train station
- Commuter car park
- Proposed car park
- University / TAFE car park
- Existing pedestrian overpass

2.3.7 Heritage

Aboriginal Heritage

The Project is on the land of the Wodi Wodi people of the Dharawal language group. Its people still have a connection to this land and the stories it can tell. Known heritage non sensitive sites within the Project area are limited with seven sites identified within 1 kilometre of the site. The disturbed nature of the site means that potential for archaeological remnants is low. As part of the Project, it will be important to understand the relationship between this community and Country and the opportunities this presents to sharing some of this knowledge.

Non-Aboriginal Heritage

The development of Wollongong followed closely behind Sydney as the new colony expanded its search for resources. The first land grants were issued in 1817. Key activities linked to these grants were related to timber getting and land clearing for agriculture. Coal mining, which began in 1849, and shaped employment and the development of the Wollongong Harbour for the next 130 years. The development of the port provided connections both within the state but to the broader region and international markets.

There are no registered heritage items or conservation areas located within the Project area. The Wollongong Local Environmental Plan (2009) identifies three houses with local heritage significance located close to the Project area. The Illawarra Escarpment is identified as a landscape conservation area, due to its prominence throughout the LGA.

The following principle has been adopted:

- Develop an art strategy that includes heritage and cultural interpretation.

Figure 30: Heritage (Source: MOI Urban Design Concept & Landscape Character & Visual Impact Assessment, 30 Oct 2017)