Mordialloc Bypass

Landscape and visual impact assessment report

Client: Major Road Projects Authority

Date: September 18 2018

Prepared by:

ASPECT Studios®

Prepared for:

MAJOR ROAD PROJECTS AUTHORITY

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- has been prepared by ASPECT Studios for Major Road Projects Authority
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1. Glossary

Term definitions

alignment the geometric layout of a road

experience/experiential impact the accumulation of different human senses (seeing, hearing, touching, smelling and tasting), experiences and instincts combine to create certain feelings about or within an area; impacts upon human enjoyment or feelings within an area are highly qualitative, however, professional judgments can be made based on human experience

landscape character area (LCA) distinct areas of landscapes that are relatively similar in visual character and land use; similarities typically occur due to similar geology, topography, vegetation, historical and recent land use, materials and urban formation

Ramsar a site protected by an international treaty on the conservation and wise use of wetlands and their resources

scenic view/quality scenery or a view that is valued for its pleasantness or attractive setting or backdrop and that typically brings enjoyment and comfort to people living, working, recreating, visiting or traveling through an area

visual amenity amenity is a broad term that generally means the qualities, attributes and characteristics of a place that make a positive contribution to quality of life. Amenity values can include both visual amenity, and the ability for people to live and recreate within their surroundings without any unreasonable interference with their health, welfare, convenience and comfort. Natural landscapes and views often contribute to visual amenity, such as areas of high heritage, cultural or social significance due to their natural features or scenic quality. Amenity values can be highly subjective; what may have amenity value for one person, may not be valued by another. Similarly, people have different levels of perception or tolerance for things that may impact amenity. (References: GLVIA, 2013 and EPA, Environmental Factor Guideline: Social Surroundings)

visual audience an individual or group of people who are at risk of being visually or experientially impacted by the proposal; typically described as “visual receptors” in other landscape and visual impact assessments

Commonly used abbreviations

CPTED Criminal Prevention Through Environmental Design

EES Environment Effects Statement

LVIA Landscape and Visual Impact Assessment

LUDS Landscape and Urban Design Strategy

2. Executive summary

This Environment Effects Statement (EES) technical report regarding the Mordialloc Bypass assesses the landscape and visual impacts associated with the construction and operation of the project, which is being developed by Major Road Projects Authority.

The proposed project is approximately 9.7km long, with two-lane, 7.5km-long carriageways in each direction and a path for walking and cycling. It goes through the suburbs of Clayton South, Dingley Village, Braeside, Waterways, Aspley Gardens, Chelsea Heights and Bangholme in the City of Kingston, with small areas of proposed works in the City of Greater Dandenong. It passes between the western boundary of Braeside Park and the eastern boundary of the Woodlands Industrial Estate constructed wetlands, traverses constructed wetlands at Waterways, and passes within 1km of the Ramsar-listed Edithvale– Seaford Wetlands. The northern and southern ends of the alignment pass through and along the border of the South East Green Wedge.

The assessment was undertaken to determine the project's potential visual and urban design impacts on the landscape character and visual amenity in the area within a 1km radius of the project site.

Legislation, policy, site visits and desktop analyses were used to assess the existing conditions of the study area for its overall landscape character and associated value, and to identify potential sensitive sites.

Nine landscape character areas (LCAs) within the study area were identified as having potential to be impacted by the project. The LCAs combine landscape features, land use, development and history to identify distinctive spatial qualities and their anticipated value to society. Nineteen sensitive sites and associated views were identified as having potential to be impacted by the project.

The impact assessment identified five low to moderate impacts and three high on LCAs, even with best practice non-standard mitigation measures being implemented. A total of eight views were identified as having moderate to high impacts even if non-standard mitigation measures are applied.

Impacts are mostly due to the project's proximity to residential areas, publicly accessible open space and other identified sensitive sites. Impacts are amplified for several of the project's road design components such as bridges, noise walls, or those sections that require fill over 2.5m high (e.g. for ramps leading up to bridges).

This report identifies Environmental Performance Requirements that are applicable to all project phases. These aim to provide a desired environmental outcome and level of certainty regarding the project's environmental performance.

3. Introduction

3.1 Project description

The Mordialloc Bypass project (the project) is the proposed construction of a new freeway connecting the Dingley Bypass with the Mornington Peninsula Freeway; and is predominately to be constructed within an existing road reservation. The project passes between the western boundary of Braeside Park and the eastern boundary of the Woodlands Estate (constructed) wetlands, traverses constructed wetlands at Waterways and approaches to within one kilometre of the Ramsar-listed Edithvale-Seaford Wetlands. The northern and southern ends of the project pass through or border the South East Green Wedge.

The project corridor is approximately 9.7 kilometres in length, comprising two, two-lane 7.5 kilometre long carriageways (with a path for walking and cycling) along the greenfield alignment, and 2.2 kilometres of roadworks required to integrate the project with the Mornington Peninsula Freeway. It is expected that each carriageway will provide for two 3.5 metre wide lanes, with a 3.0 metre wide outside shoulder and 1.0 metre wide inside shoulder. The Mordialloc Bypass will also provide connections from the freeway onto the Dingley Bypass, Centre Dandenong Road, Lower Dandenong Road, Governor Road, Springvale Road and new north facing ramps at Thames Promenade. There will also be an overpass at Old Dandenong Road. Mordialloc Creek and the associated Waterways Wetlands will be spanned by twin 400 metre long bridges.

The proposed alignment allows for a future upgrade of the project to a six-lane freeway standard road within the construction footprint.

The proposed alignment is generally located within the existing road reservation, most of which is already covered by Public Acquisition Overlay, and some of which is in VicRoads' ownership.

The proposed project consists of:

- Four- lane freeway standard cross-section (two lanes in each direction), divided by a centre median
- 100 km/hr posted speed limit
- Full diamond interchanges at Springvale Road, Governor Road and Lower Dandenong Road whereby Mordialloc Bypass is elevated over the arterial roadway with northbound and southbound entry and exit ramps providing access for all directions of travel.
- Half single point urban interchange at Centre Dandenong Road whereby Mordialloc Bypass is elevated over Centre Dandenong Road and southbound entry and northbound exit ramps provide accessibility to and from the south.
- Addition of northbound entry and southbound exit ramps at the existing Mornington Peninsula Freeway interchange at Thames Promenade to provide access to and from Mordialloc Bypass. The existing interchange provides ramps to and from Mornington Peninsula Freeway to the south only. The proposed entry and exit ramps will create a full diamond interchange at Thames Promenade.
- An at-grade T-signalised intersection at Dingley Bypass.
- Elevation of the bypass over Old Dandenong Road and Bowen Parkway to maintain existing connectivity on these routes.
- Shared use path running north-south along the length of the Mordialloc Bypass and connecting existing paths along the north side of Dingley Bypass and the south side of Springvale Road adjacent to Chelsea Heights Hotel.
- Bus queue jump lanes provided in intersection configurations at the proposed Springvale Road and Centre Dandenong Road interchanges.

3.2 Project area

Melbourne's southern movement corridor connects the Mornington Peninsula and the southern and bayside suburbs to the central city and national employment and innovation clusters in Monash and Dandenong. In addition to enabling cross-city movements, the corridor provides road users with access to residential zones, recreation areas and employment and activity centres within the City of Kingston and adjacent municipalities, including the national employment and innovation cluster in the City of Monash. This project connects the Mornington Peninsula Freeway in the south to the Dingley Bypass in the north.

3.3 Study area description

The proposed alignment is about 25km south-east of Melbourne's central business district (CBD) and 5km east of Mordialloc. It goes through the suburbs of Clayton South, Dingley Village, Braeside, Waterways, Aspley Gardens, Chelsea Heights and Bangholme in the City of Kingston, with small areas of proposed works in the City of Greater Dandenong. It passes between the western boundary of Braeside Park and the eastern boundary of the Woodlands Industrial Estate constructed wetlands, traverses constructed wetlands at Waterways, and passes within 1km of the Ramsar-listed Edithvale– Seaford Wetlands. The northern and southern ends of the alignment pass through and along the border of the South East Green Wedge.

The project area is a long-established reserved road corridor. However, the area surrounding the road corridor includes sensitive and high value environments, including Mordialloc Creek, the Waterways wetlands, Braeside Park, Edithvale–Seaford Wetland and Woodlands Industrial Estate wetlands. In the 1960s, portions of the project were included in the new green wedge zones.

3.4 Sub-study areas

To assist with the preparation of the impact assessment, the alignment of the bypass has been broken into four sub-study areas of investigation these are; North, Middle, South and Thames Promenade, see Figure 2. Each sub-study area and their associated impacts have been mapped accordingly on Appendix items 15.1.3-15.1.5 Landscape and Visual Impact Assessment Mappings.

Thames Promenade has been assessed separately from the rest of the project, as it is the only sub-study area that has the existing Mornington Peninsula Freeway already operating within the project site.

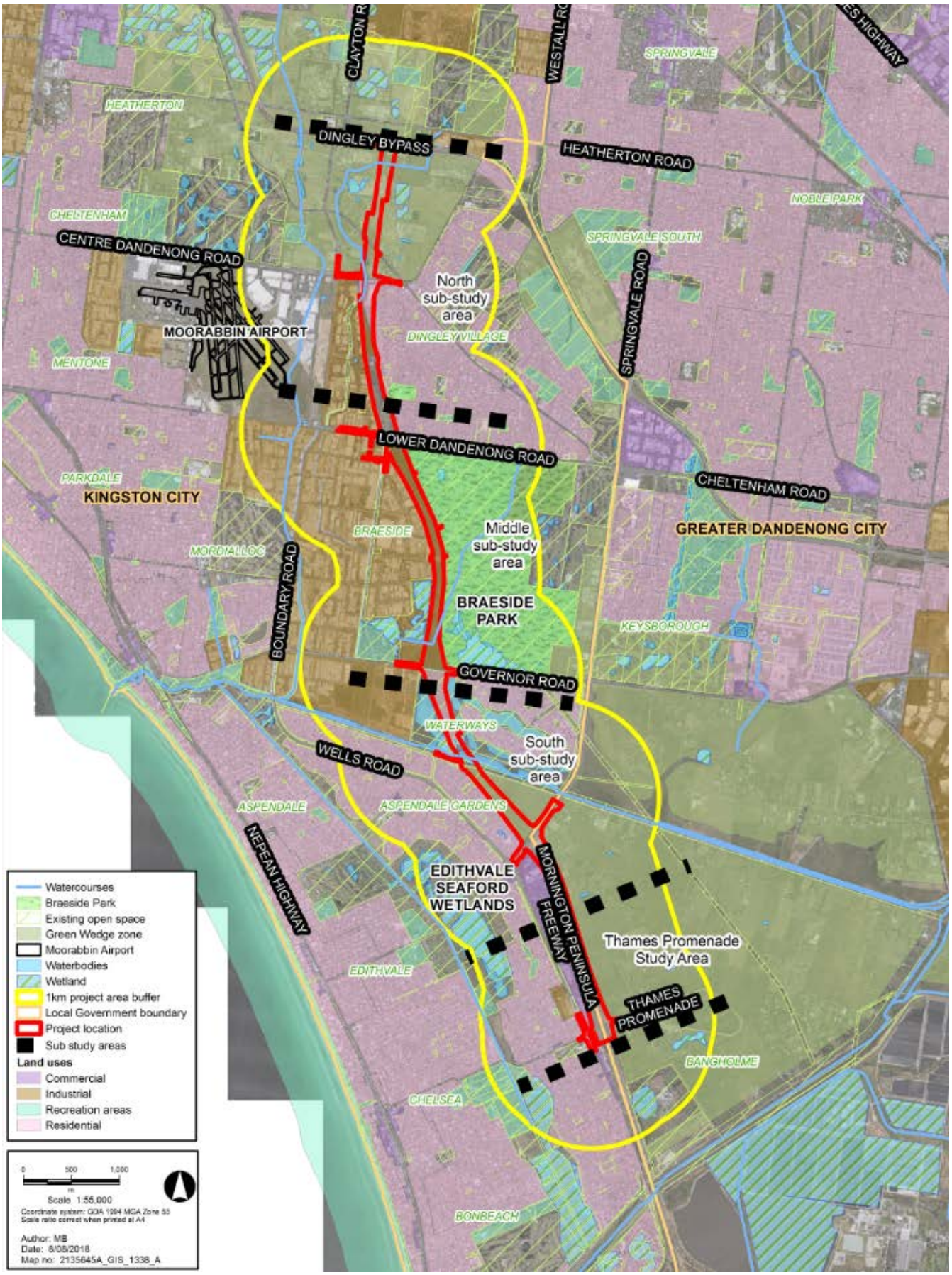


Figure 1. *Project area and study area*

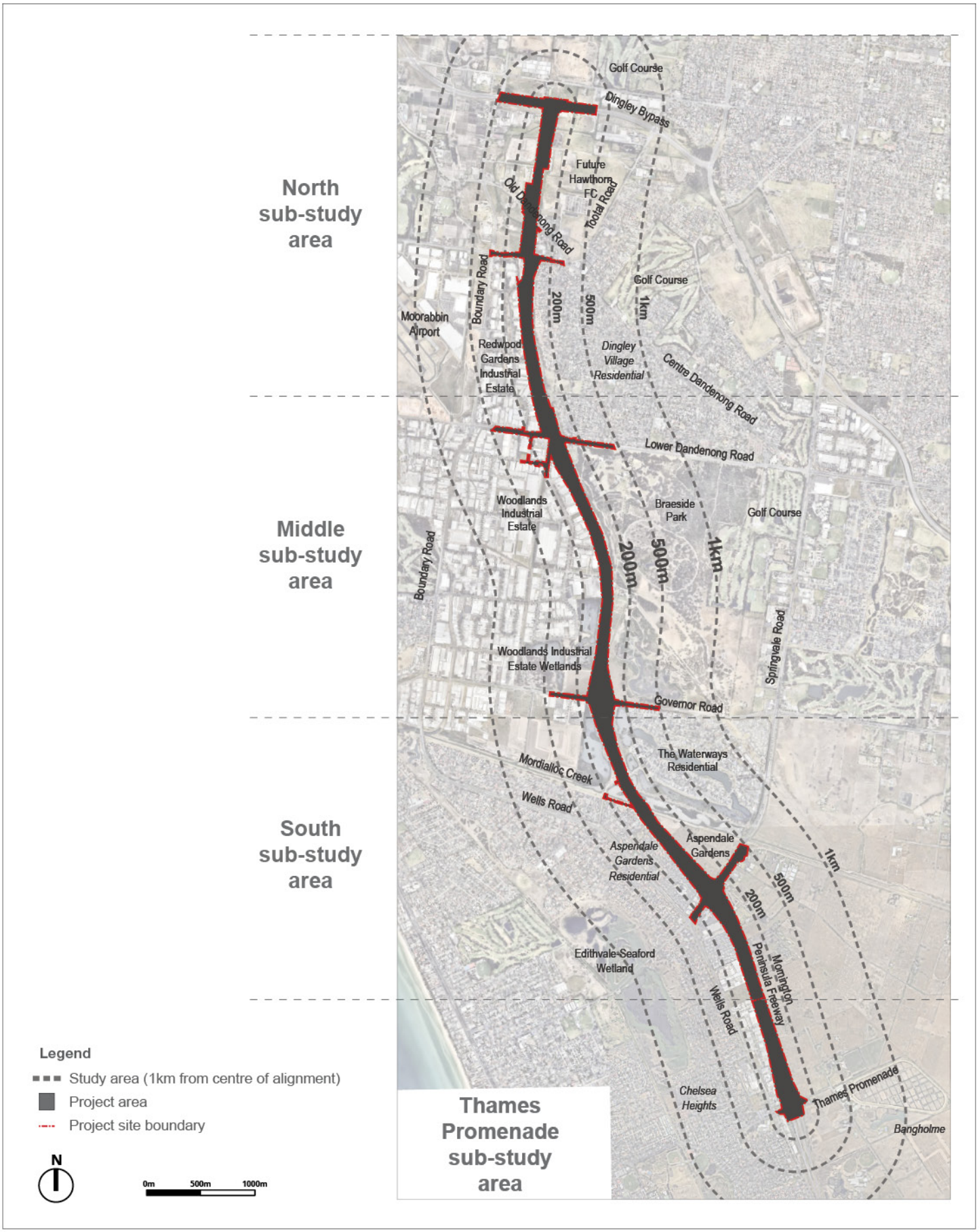


Figure 2. *Sub-study areas (north, middle, south, Thames Promenade)*

4. EES scoping requirements and objectives

The following summarises specific requirements for the assessment of landscape and visual effects included in the EES Scoping Requirements document for the Mordialloc Bypass. The Victorian Minister for Planning's decision to require an EES included the procedures and requirements applicable to its preparation, in accordance with section 8B (5) of the EE Act (Appendix A).

Key matters for the EES to examine:

- The potential effects on biodiversity values, including through direct or indirect loss, degradation or fragmentation of habitat, or through other causes (including roadkill), as well as related ecological effects
- The potential effects on Indigenous cultural heritage values
- Other effects on land uses and the local communities.

EES evaluation objectives:

- Amenity and environmental quality – to minimise adverse noise and other amenity effects on nearby residents and land uses, having regard to relevant limits, targets or standards
- Social, land use and infrastructure – to minimise potential adverse social and land use effects, including impacts on existing infrastructure and open space
- Biodiversity – to avoid or minimise potential adverse effects on native vegetation, listed threatened and migratory species and ecological communities, and habitat for these species, as well as address offset requirements for residual environmental effects consistent with state and Commonwealth policies.
- Transport efficiency, capacity and safety – to provide for an effective connection between the Mornington Peninsula Freeway and the Dingley Bypass, to improve travel efficiency, road safety, and network capacity, as well as improve amenity and local transport networks in the Aspendale/Dingley area.

Amenity and environmental quality

The EES scoping objective 'Amenity and environmental quality' identifies as key considerations: social amenity, audiences that are important within the study area, social wellbeing and access to public spaces.

Evaluation objective:

- To protect the health and wellbeing of residents and local communities, and minimise effects on air quality, noise and the social amenity of the area, having regard to relevant limits, targets or standards.

Key issues:

- There is potential for increased noise and vibration levels during the project construction to significantly affect amenity in adjacent residential and parkland areas.
- There is potential for increased noise levels from the project’s operation to significantly affect amenity in adjacent residential and parkland areas.

Priorities for characterising the existing environment:

- Identify dwellings and any other potentially sensitive receptors (e.g. community centres, open spaces) that could be affected by the project's potential effects on air quality, noise or vibration levels.

Design and mitigation measures:

- Identify potential and proposed design responses and/or other mitigation measures to avoid, reduce and/or manage any significant noise effects for sensitive receptors during the project construction and operation arising from specified air pollution indicators, noise, vibration and lighting, in the context of applicable policy and standards.

Assessment of likely effects:

- Assess likely noise increases, vibration and lighting impacts at sensitive receptors along the road corridor during the project construction and operation (both with and in the absence of the proposed mitigation measures).
- Assess potential safety hazards to the public arising from the project construction.

Approach to manage performance:

- Measures to manage other potentially significant effects on amenity, environmental quality and social wellbeing (including access to open spaces) should also be addressed in the EES, including a framework for identifying and responding to any emerging issues, as part of the Environmental Management Framework (EMF).

Social, land use and infrastructure

The EES scoping requirements identify social, land use and infrastructure areas of significance.

Evaluation objective:

- To minimise potential adverse social and land use effects, including impacts on existing infrastructure and open space.

Key issues:

- There is potential for dislocation due to severance causing reduced access to social networks and community facilities.
- There will be temporarily restricted access to regionally significant open spaces, including Braeside Park.
- There is potential for effects on the landscape and recreational values of the Mordialloc Creek, the Waterways and Braeside Park environs from the project; in particular the elevated structures, such as bridges over Mordialloc Creek and the Springvale Road intersection.
- There is potential for changes to the existing infrastructure in the project area and in its vicinity.

Priorities for characterising the existing environment:

- Describe the demographic and social character of residential communities in the vicinity of the project, as well as local movement patterns and any places with particular community, recreational or cultural significance.
- Characterise the landscape, existing viewshed and recreational values of the Mordialloc Creek, the Waterways and Braeside Park environs.

- Identify any existing infrastructure, land use plans or related objectives for land within, adjacent to or affected by the project, including for Edithvale–Seaford Wetland and Braeside Park.

Design and mitigation measures:

- Identify potential and proposed design responses and measures to minimise adverse social and land use effects.
- Identify potential and proposed design options and measures to mitigate adverse effects on the landscape values and associated recreational values of the Waterways, Braeside Park and Mordialloc Creek environs.

Assessment of likely effects:

- Assess the potential effects on communities living near the project, in terms of potential dislocation and severance or reduction in access to social networks, community facilities and valued places.
- Evaluate the consistency of the project with the policies and provisions of the Kingston and Greater Dandenong Planning Schemes and other relevant land use planning strategies.
- Assess the likely effects on the landscape and recreational values of the Waterways, Braeside Park and Mordialloc Creek environs.

Approach to manage performance:

- Describe any further measures that are proposed to enhance social outcomes, and either manage risks to landscape and recreational values, or enhance visual amenity outcomes for residents living in the vicinity of the project, including as part of the EMF.

Transport efficiency, capacity and safety

Key issues:

- Effective integration of the proposed project with local transport networks including public transport and shared bicycle pathways.

Priorities for characterising the existing environment

- Characterise existing transport patterns —private vehicles, commercial/freight heavy vehicles, active and public transport— to identify influences on capacity, travel times, safety and accessibility. This should have regard to both existing and known planned future land uses within the area, in which transport patterns might be affected by the project.

Design and mitigation measures

- Provide potential design solutions that optimise linkages with the existing local road network to maintain or enhance network functionality (for commercial and private vehicles and active and public transport).
- Address potential risk areas for road safety and outline any specific measures to avoid, minimise and mitigate road safety issues.

Assessment of likely effects

- Assess the effects on network accessibility, safety and connectivity for commercial and private vehicles and active and public transport.

5. Study overview

5.1 Aims and objectives

The overall aim of this landscape and visual impact assessment is to minimise adverse effects on the amenity and environmental quality of nearby residents, land uses, open space and biodiversity.

As such, this landscape and visual impact assessment report has the following objectives:

- To identify the landscape character and the values of the area
- To identify locations and areas of valued amenity and views
- To assess the potential impact upon existing landscape character and value
- To assess the potential impact upon publicly accessible places and places of cultural and natural value
- To assess the potential visual impact upon residents adjacent to the project
- To recommend mitigation measures, if required, that may minimise or avoid impacts to the landscape character and visual amenity.

5.2 Scope of work

Task 1: Existing conditions

Task 1 identifies the landscape and visual values within the study area. The analysis was informed by:

- review of other relevant strategic documents
- review of maps and reports prepared for Major Road Projects Authority by various consultants, which identify values important to the assessment
- site investigation and photography
- identification of existing physical features
- identification of natural and cultural values
- identification of the landscape character areas
- identification of key views and places of public significance and value.

Task 2: Landscape and visual impact assessment

The purpose of this task is to undertake an evaluation of the anticipated urban design, landscape and visual impacts for the alignment, based on a series of evaluation criteria.

Landscape and visual impact assessment (LVIA) is a term used to identify proposed change in the landscape that affects, either detrimentally or positively, the landscape character or value of an area.

The LVIA report's final task is to identify potential mitigation measures for the project to minimise impacts.

The assessment is informed by:

- 3D modelling of alignment on 3D topography
- photomontages of the project from key view points
- cross sections
- viewshed analysis
- review of best practice mitigation measures.

See Figure 3 for a flowchart of this process.

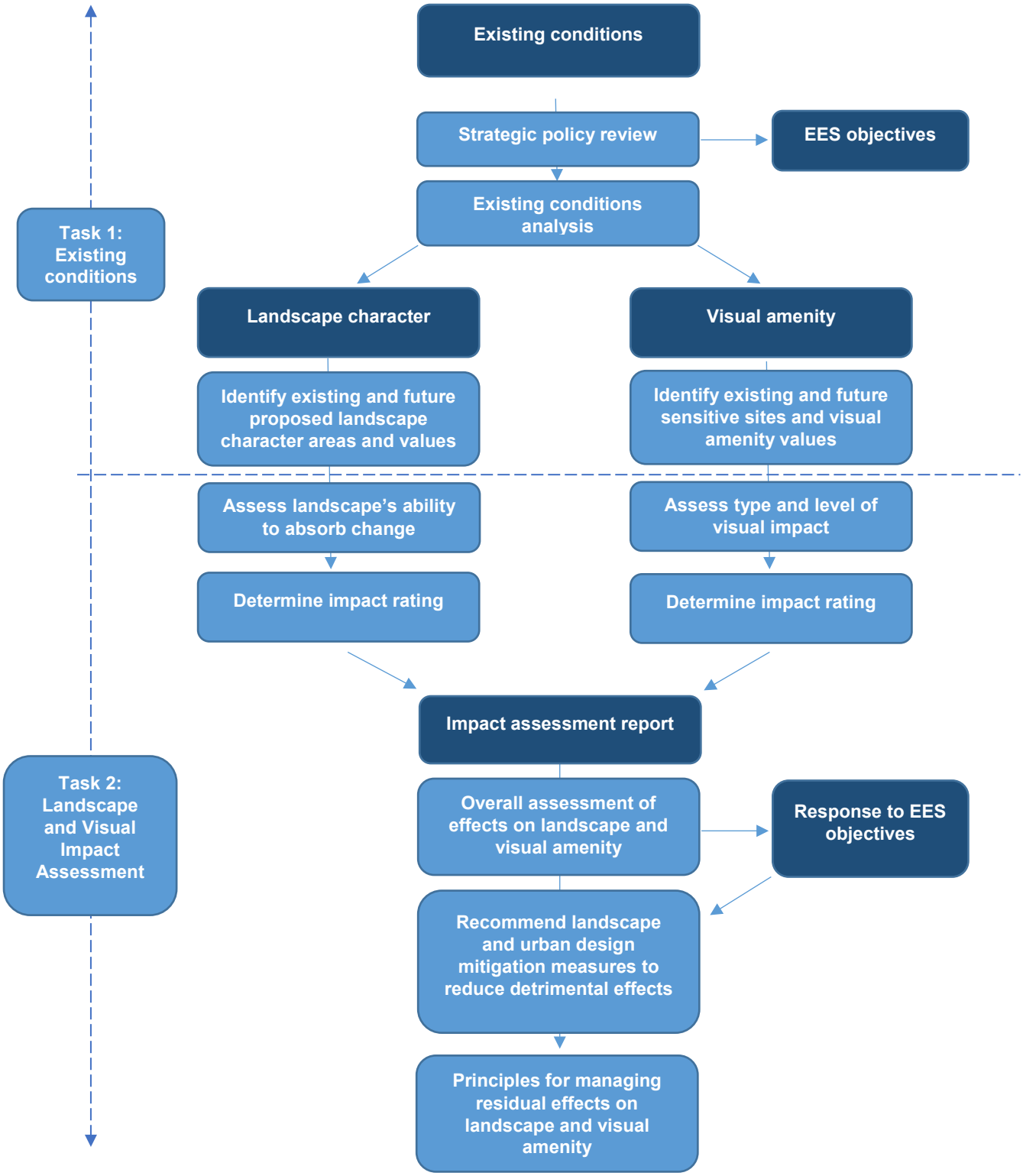


Figure 3. *Scope of work and study process diagram*

6. Legislation and policy review

This section outlines legislation and policy relevant to the landscape and visual environment within the study area.

6.1 Federal

6.1.1 Environment Protection and Biodiversity Conservation Act, 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), any work that could significantly impact threatened flora and fauna species and vegetation communities listed under the EPBC Act requires referral to, and potentially approval of, the Commonwealth Minister for the Environment and Energy.

Relevance to project

This project is a controlled action and will require assessment and approval under the EPBC Act before it can proceed. The environmental issues—especially Ramsar wetlands, listed threatened species and communities, and listed migratory species—will inform the landscape mitigation opportunities recommended to minimise impacts.

6.2 State

6.2.1 Victorian State Planning Policy Framework

The State Planning Policy Framework (SPPF) informs planning and responsible authorities on the planning policies that need to be considered when planning in their respective areas.

The objectives of planning in Victoria as set out in section 4(1) of the *Planning and Environment Act 1987* are:

- To provide for the fair, orderly, economic and sustainable use and development of land
- To provide for the protection of natural and man-made resources and the maintenance of ecological processes and genetic diversity
- To secure a pleasant, efficient and safe working, living and recreational environment for all Victorians and visitors to Victoria
- To conserve and enhance those buildings, areas or other places that are of scientific, aesthetic, architectural or historical interest, or otherwise of special cultural value.

Relevant clauses for the project include:

- 12.04–2, which provides guidance to protect landscapes and significant open spaces that contribute to character, identity and sustainable environments
- 15.01–1, which focuses on the provision of environments that are safe and functional, and that reinforce sense of place and cultural identity

- 15.01–2, which aims for urban design outcomes that contribute positively to local urban character and minimise detrimental impacts upon neighbouring properties
- 18.01–2, which aims to locate transportation routes in a way that minimises impact upon the environment
- 18.02–4, which regulates the design of transport routes to achieve visual standards appropriate to the importance of the route with reference to landscape treatments
- 11.04–1, which aims to ensure that land use and development adjoining regional open space networks, national parks and conservation reserves complements the open space in terms of visual and noise impacts, treatment of waste water to reduce turbidity or pollution and preservation of vegetation.

Relevance to project

The SPPF provides guidance to recognise and protect neighbourhood character and sense of place with specific regard for the built environment and heritage elements, and to protect landscapes and significant open spaces that contribute to character, identity and sustainable environments.

6.2.2 Urban design guidelines for Victoria, August 2017

The Urban Design Guidelines for Victoria are policy guidelines within the SPPF of the Victoria Planning Provisions. Relevant guidelines for this project include to:

- locate major infrastructure corridors and installations to minimise their potential to be a barrier to cross movement
- provide conveniently located grade-separated pedestrian and bicycle crossings across rail corridors, motorways and other natural barriers, to connect neighbourhoods and key destinations
- establish a continuous system of pedestrian paths connecting neighbourhoods, along all streets, continuing through public spaces, and to activity centres and public transport nodes
- locate pedestrian and bicycle crossings on direct, desirable routes to destinations such as schools, parks, activity centres and public transport stops, or that link neighbourhoods
- use a style, scale and materials for barriers that contribute to the existing or desired future character of an area
- light only those public space areas and paths intended for night use
- where a path passes through an underpass, light the approach and exit path to the same level as the underpass
- control unwanted light spill to sensitive uses from public space lighting.

6.2.3 Living Links – Port Phillip and Westernport Catchment Management Authority

Living Links is an ambitious, large scale program to retain and protect the natural values of the Port Phillip and Westernport catchment in the face of continuing development, and to make this area a world-class urban ecosystem.

Relevant strategic projects for Living Links include (numbers correspond with Figure 4):

1. establishing a corridor to connect Karkarook Park in Oakleigh South to Braeside Park in Braeside, which has been identified as a priority in the Sandbelt Open Space Project Development Plan and the Kingston Cycling and Walking Strategy 2009–13; there is no path currently linking these two points through the Kingston Green Wedge Zone (in planning phase)
2. connecting the Dandenong Creek Corridor at Bangholme to Port Philip Bay at Mordialloc via the Mordialloc Creek, which also connects a number of other Living Links corridors; this corridor has environmental, recreational and cultural values (in planning phase)
3. making environmental improvements to Mordialloc Creek – east of Boundary Road (in planning phase)
4. creating a Mordialloc Creek bike path link (in planning phase)
5. creating Mortim Lands wetlands (concept only; no progress)
6. creating Mordialloc Creek/Pillars Road wetlands to improve flood storage and environmental value (in planning phase).

Relevance to project

Living Links is a strategic project that highlights strategic region-wide links of biodiversity and open space, valued by the community for being integral to sustainable development. It then seeks funding and cooperation from existing partners to make proposed projects (highlighted in pink in Figure 4) a reality – some of which have already been completed. Strategically, it identifies key cycling, pedestrian, ecological and open space corridors (highlighted in orange in Figure 4) and highlights the desire for more strategic connection of these four elements across the broader area.

For more information visit http://livinglinks.com.au

Figure 4. *Living Links proposed projects and corridors (numbers are referenced in Section 4.2.3) Source: LivingLinks.com.au*

6.3 Local

6.3.1 Greater Dandenong Planning Scheme

The Greater Dandenong Local Planning Policy Framework contains several policy statements and objectives relevant to the landscape and visual assessment within the south of the project. The project is partially adjacent to the Greater Dandenong Green Wedge Zone, which is a part of the greater South East Green Wedge (see Figure 5). The Greater Dandenong Green Wedge Management Plan (revised January 2017) sets out the vision, objectives and actions for the future management of the green wedge. A memorandum of understanding has been signed with Kingston, Frankston and Casey City councils (South East Non Urban Areas Memorandum of Understanding, 1998), which sets out the strategic principles and processes for planning of the south east non-urban area.

Key policy statements and objectives include:

21.03–1: Vision

- A city whose green wedge provides a green, spacious relief from the surrounding urban development and supports a range of activities including agriculture, water treatment, recreation, education and rural living that are carefully located and designed to respect the important environmental, cultural heritage, water management, landscape, and amenity values and functions of the region
- A healthy community that embraces a sense of pride and belonging and works together to achieve an economically, socially and environmentally sustainable future
- A well balanced, satisfied community, which has easy and equitable access to services that are important to people's everyday life.

21.03–2: Achieving the vision

- Sustainable environment: strategies that reduce air, water and noise pollution; promote ecologically sustainable development; allow for increased residential densities in appropriate locations and provide for diverse housing needs without compromising the valued characteristics of the area; protect and reinforce the rural landscape in Greater Dandenong's Green Wedge; and reinforce the green wedge zone as a 'green space' between urban growth corridors.

21.05–1: Urban design, character, streetscapes and landscapes

Objective:

- To facilitate high quality building design and architecture.

Strategies

- Ensure building design is consistent with the identified future character of an area and fully integrates with surrounding environment.
- Encourage high standards of building design and architecture, which allows for flexibility and adaptation in use.
- Encourage innovative architecture and building design.

Objective:

- To facilitate high quality development, which has regard for the surrounding environment and built form.

Strategies

- Promote views of high quality landscapes and pleasing vistas from both the private and public realm.
- Promote all aspects of character: physical, environmental, social and cultural.
- Encourage planting and landscape themes, which complement and improve the environment.
- Encourage developments to provide for canopy trees.

21.05–4: Green Wedge

Objective

- To ensure the open, landscape-dominated vistas throughout the Greater Dandenong Green Wedge are maintained and protected.

Strategies

- Ensure new use and development has a low visual impact and respects the rural character of the surroundings.

21.06: Open space and natural environment

- The Greater Dandenong Green Wedge provides a broad area of open space within the broader developed urban area of Melbourne. While it does not provide specific habitat corridor values, it does provide a stepping stone for more mobile fauna such as migratory birds and remnant habitat for aquatic species.

Relevance to project

The green wedge zone that abuts the project area in the southern reach is of key consideration. The above policy outlines that the green wedge is valued for its landscape and environmental significance, amenity values, productive agricultural potential, recreational opportunity and water management. The green wedge seeks to protect the rural landscape character of the areas within it. Figure 6 identifies key directions of the Greater Dandenong Green Wedge Management Plan that need to be considered by the proposed Mordialloc Bypass.

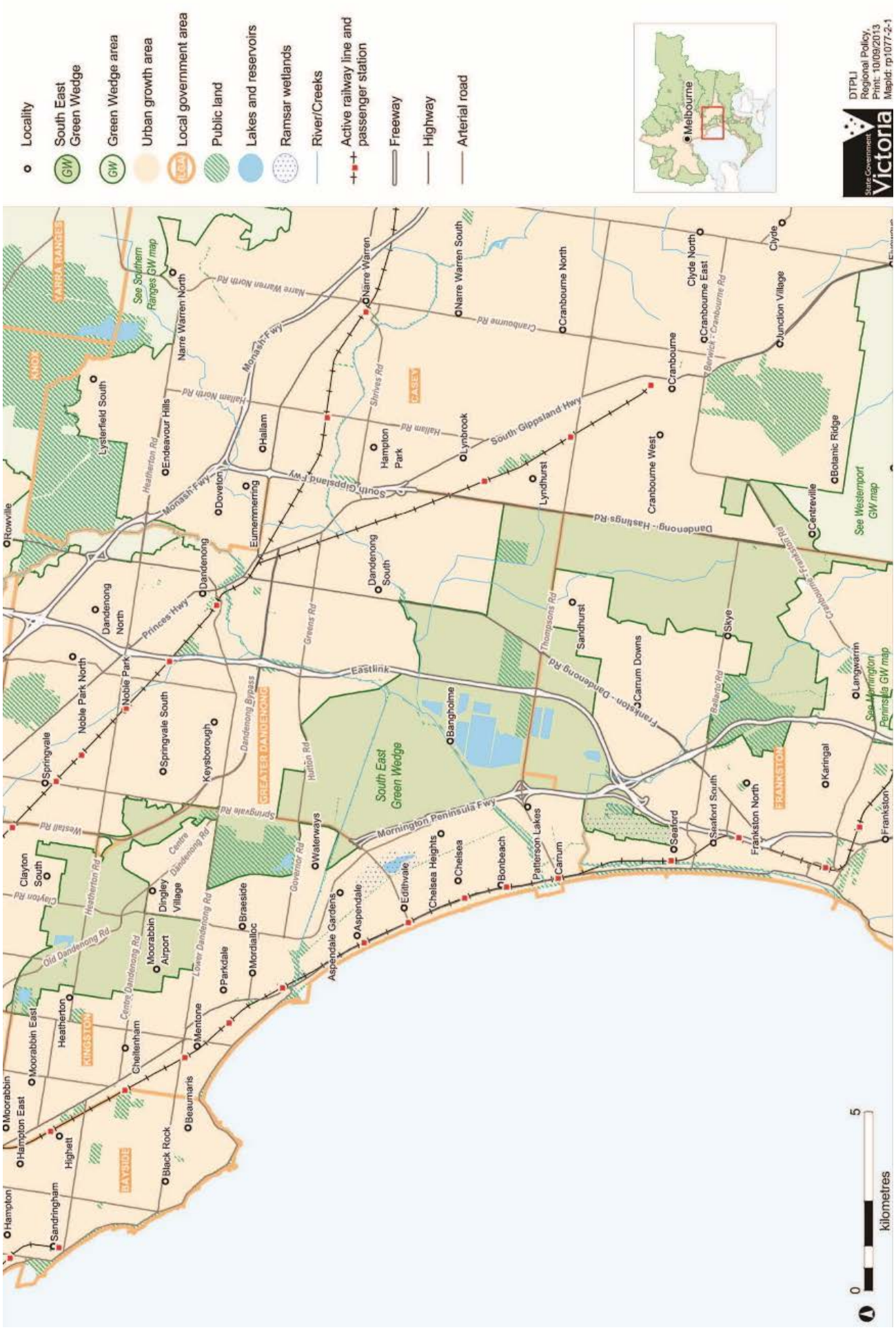


Figure 5. *The South East Green Wedge. Source: www.planning.vic.gov.au/policy-and-strategy/green-wedges*

Figure 6. *The existing natural environment and possible habitat links. Source: Greater Dandenong Green Wedge Management Plan.*

6.3.2 City of Kingston Planning Scheme

The Kingston Local Planning Policy Framework contains a number of points relevant to the landscape and visual assessment. In summary, the policy identifies the following directions:

- To protect and enhance the amenity of Kingston's residential areas and other sensitive land uses through appropriate management of transport networks
- To protect and improve the flood storage and water quality treatment functions of existing floodplains and waterways, and to consolidate their habitat and recreation importance.

More specific local planning issues and policy that affect the landscape and visual assessment have been reviewed below.

Relevance to project

Planning policy highlights amenity, appropriate land use and water quality as important to protect and enhance for their ecology and community wellbeing benefits.

All zones and overlays are depicted in Figure 7 and Figure 8.

Clause 21.09 – Environment, wetlands and waterways

Objective:

- To protect and improve the flood storage and water quality treatment functions of existing floodplains and waterways, and to consolidate their habitat and recreation importance
- To improve the aesthetic, cultural and conservation value of the Mordialloc Creek and its surrounding natural landscape to add value to its primary drainage and flood management function
- To ensure that all development within and adjacent to existing floodplains is consistent with floodplain management objectives and maximises the potential for creation of public open space, wetlands and recreational and cultural activities.

Relevance to project

Mordialloc Creek and other wetlands, watercourses and floodplains are important for flood management, but should also be viewed as open spaces and valued for their recreational, scenic, cultural and conservation value.

Clause 22.03 – Sandbelt Open Space Project policy

The Sandbelt Open Space Project provides a regional strategy for the development of a series of linked parks extending across the Heatherton and Dingley areas. The concept is based on the conversion of land that has been used for sand extraction and landfill into open space, to provide for a wide range of regional and local recreation opportunities. The Municipal Strategic Statement supports the implementation of the Sandbelt Open Space Project as a major strategic objective for the management and rehabilitation of non-urban land in the Heatherton area. The Sandbelt Open Space Project policy is based on the principles of the Sandbelt Open Space Project Development Plan (May 1994), prepared by Melbourne Parks and Waterways. It includes the following objectives:

- To implement the objectives of the Sandbelt Open Space Project and associated development plan

- To promote the development of a series of connected parks providing for a wide range of regional and local recreation opportunities within a quality environment
- To promote the rehabilitation and conversion of extractive industrial and landfill sites to open space or other productive after uses that are compatible with the Sandbelt Open Space Project
- To recognise different concepts of leisure and recreation and provide for equitable access to both passive and active recreational pursuits not widely accessible elsewhere.

Relevance to project

The strategic directions outlined in this plan from 1994 remain relevant. They highlight an ongoing desire from the community for more connections to open space and recreational opportunities.

A map of key strategic direction from this plan is highlighted in Figure 9.

Clause 22.04 – South East Non-urban Area Policy

The South East Non-urban Area Policy sets out strategic objectives for the management of non-urban land in the City of Kingston. Its objectives include to:

- protect and further develop the scenic and landscape values of the non-urban area.

Clause 22.04–3 sets out council policy that all planning outcomes must:

- protect and create a high quality rural landscape
- result in an urban form that is of a high design standard and low visual impact.

Policy relating to the Keysborough/Wetlands Framework Plan (see Figure 11) is also relevant to the proposed Bypass and its interface with Braeside Park. The policy states that the use and development of land ought to:

- protect and further develop a ‘green space’ character for the Keysborough/Wetlands area; a vision that comprises both the ecological and landscape values of the area
- contribute to the creation of a high quality landscaped environment which enhances the area’s non-urban appearance
- contribute to the creation of public open space and ecological habitat linkage
- protect the park from visual intrusion and incompatible activities on adjoining land
- ensure that landscaping and urban design along the freeway reserve and main roads contribute to the rural character.

Relevance to project

This policy supports the primary objective of maintaining the rural character of the proposed route and limiting visual impacts on the Braeside Park area. Landscaping and design are mentioned as the methods in achieving this outcome. Habitat corridors are also noted as being necessary to achieve the desired linkages between areas of environmental significance. Strong value is placed on creating a high quality, scenic rural landscape that values, protects and enhances ecology.

Kingston Lodge overlays

Two overlays regarding Kingston Lodge, now referred to as the Waterways, are pertinent to this Report.

Design and Development Overlay – Schedule 6 (DDO6)

Objective:

- To ensure that the development of land is based on ecologically sustainable design principles
- To employ best practice design techniques for environmental residential living, with emphasis on:
    - resource conservation
    - waste management
    - enhancement of landscape values
    - fauna habitat protection and creation generally consistent with maintenance of a high standard of community amenity and having special regard for the proximity of areas set aside for floodplain management, wetland-based water treatment and passive recreation
- To conserve and enhance landscape character that is supportive of the development and maintenance of indigenous flora and fauna habitats, and consistent with the purposes of each reserve and the amenity of nearby urban residential precincts.

Incorporated Plan Overlay – Schedule 2 – Kingston Lodge

Objective:

- To preserve and, where practicable, enhance the performance of highly valued local and regional assets in the Keysborough non-urban area, including:
    - waterbodies, wetlands, watercourses and other areas that contribute to flood management, water treatment, wildlife habitat and the health of indigenous plant communities
    - existing and potential sites for active and passive recreation, especially including links between related facilities as part of a regional network of permanent ‘green’ public open spaces
- To recognise and designate a limited opportunity to provide for urban residential development with strong 'environmental living' character in the vicinity of significant elements of the non-urban area
- To require, as a condition for residential development, that substantial contributions are made to such functions of adjacent non-urban land as may be defined by the relevant public authorities, including floodplain management, flora and fauna habitat creation and passive recreational facilities, by completion of specified works and by transfer of rights in land.

Relevance to project

These overlays reflect ongoing desire within the community for the protection and enhancement of landscape values.

Land Subject to Inundation Overlay (LSIO)

Purpose:

- To identify land in a flood storage or flood fringe area affected by the one in 100-year flood or any other area determined by the floodplain management authority
- To ensure that development maintains the free passage and temporary storage of floodwaters, minimises flood damage, is compatible with the flood hazard and local drainage conditions, and will not cause any significant rise in flood level or flow velocity
- To reflect any declaration under Division 4 of part 10 of the *Water Act 1989* where a declaration has been made
- To protect water quality in accordance with the provisions of relevant state environment protection policies, particularly in accordance with clauses 33 and 35 of the State Environment Protection Policy (Waters of Victoria)
- To ensure that development maintains or improves river and wetland health, waterway protection and floodplain health.

Relevance to project

The overlay highlights significant areas within the study area that require appropriate flood management, water quality management and wetland health management practices to be implemented.

Airport Environs Overlay (AEO1)

Purpose:

- To identify areas which are, or will be, subject to high levels of aircraft noise, including areas where the use of land for uses sensitive to aircraft noise will need to be restricted
- To ensure that land use and development are compatible with the operation of airports in accordance with the appropriate airport strategy or master plan and with safe air navigation for aircraft approaching and departing the airfield
- To assist in shielding people from the impact of aircraft noise by requiring appropriate noise attenuation measures in new dwellings and other noise sensitive buildings
- To limit the number of people residing in the area or likely to be subject to significant levels of aircraft noise.

Relevance to project

This overlay highlights areas that are subject to the impacts of aircrafts and need to consider impacts upon the aircrafts of the Moorabbin Airport. This may impact on the sensitivities within these areas and potential road design considerations in terms of lighting, etc.

Clause 21.10: Green Wedge Zone and Kingston Green Wedge Plan, 2012

Land use within Kingston's Green Wedge includes a complex mix of traditional agricultural production, land filling of former extraction sites, regional open space networks, active and passive recreation, protection of Moorabbin Airport's flight paths, nature conservation and the activities of a range of institutional and religious organisations.

These areas are under pressure to convert to more intensive urban development, due in part to their proximity to established urban areas, the availability of physical infrastructure and the decline in agricultural production.

The future management of Kingston's Green Wedge is one of the largest challenges facing the City. It is important that land use outcomes in the green wedge are resolved through structure planning, are not driven by short-term economic expediency, and achieve sustainable use and development.

The creation of a 'hard' edge between the urban and non-urban areas will be an important planning outcome of the structure planning process and will assist in the management of development pressures at the urban/green wedge interface.

Objective:

- To support and maintain the green wedge concept while ensuring activities in the Kingston Green Wedge are consistent with, and contribute to, optimal long-term planning solutions for the whole of the south east metropolitan green wedge
- To protect the use of high quality agricultural land for agricultural purposes
- To protect the economic and operational viability of Moorabbin Airport aviation activities
- To support the transition of landfill, recycling or transfer stations on appropriate land to new uses that are consistent with long-term strategies for the green wedge
- To protect and enhance environmental values, including wetlands, flora and fauna habitats, and drainage functions
- To protect the Port Phillip and Western Port catchments in accordance with the Port Phillip and Western Port Regional Catchment Strategy
- To ensure that use and development within the green wedge does not compromise metropolitan urban growth strategies
- To manage the edge of urban areas in a manner which ensures that the green wedge area is both stable and enduring
- To protect and further develop the scenic and landscape values of the green wedge
- To provide for open space links and opportunities for recreation.

Relevance to project

This local planning policy and associated strategic plan have been developed through extensive community engagement by consultants and local Council. It is essential in understanding the local community's values and vision for the area.

See Figure 10 for a key map identifying key elements of this plan.

Cycling and Walking Plan 2009–2013

The Kingston Cycling and Walking Plan 2009–2013 provides a snapshot of the current status of the Kingston cycling and walking network and raises opportunities for further enhancement. It details strategies and actions to ensure state and federal objectives for cycling and walking facilities are being met, as well as local needs and demand.

Relevance to project

This strategic plan highlights key movement and community connections that are desired by the local government and community to improve connectivity and sustainable and healthy forms of travel.

See Figure 14 for the key map illustrating existing and proposed movement networks in this plan.

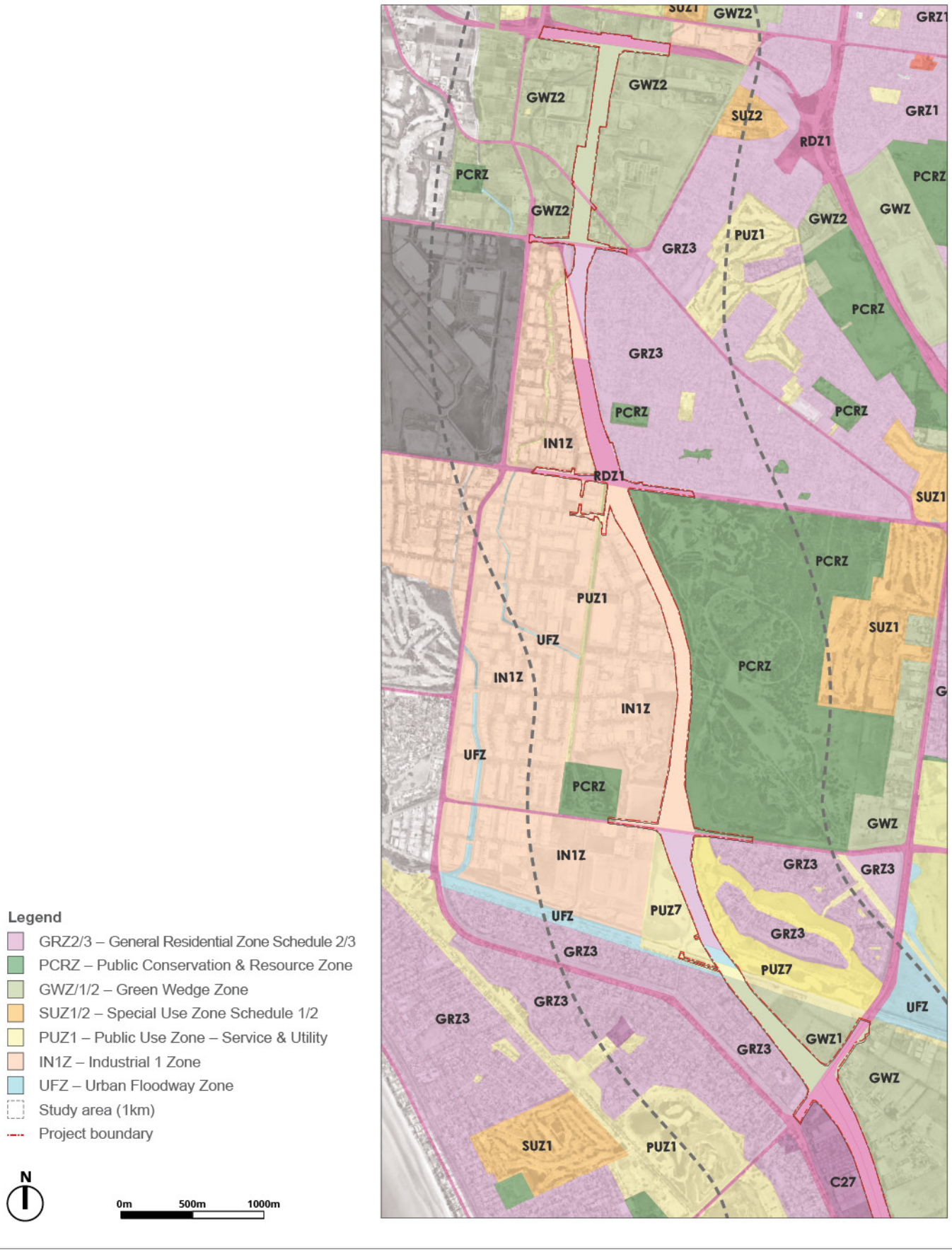


Figure 7. *City of Kingston planning zones*

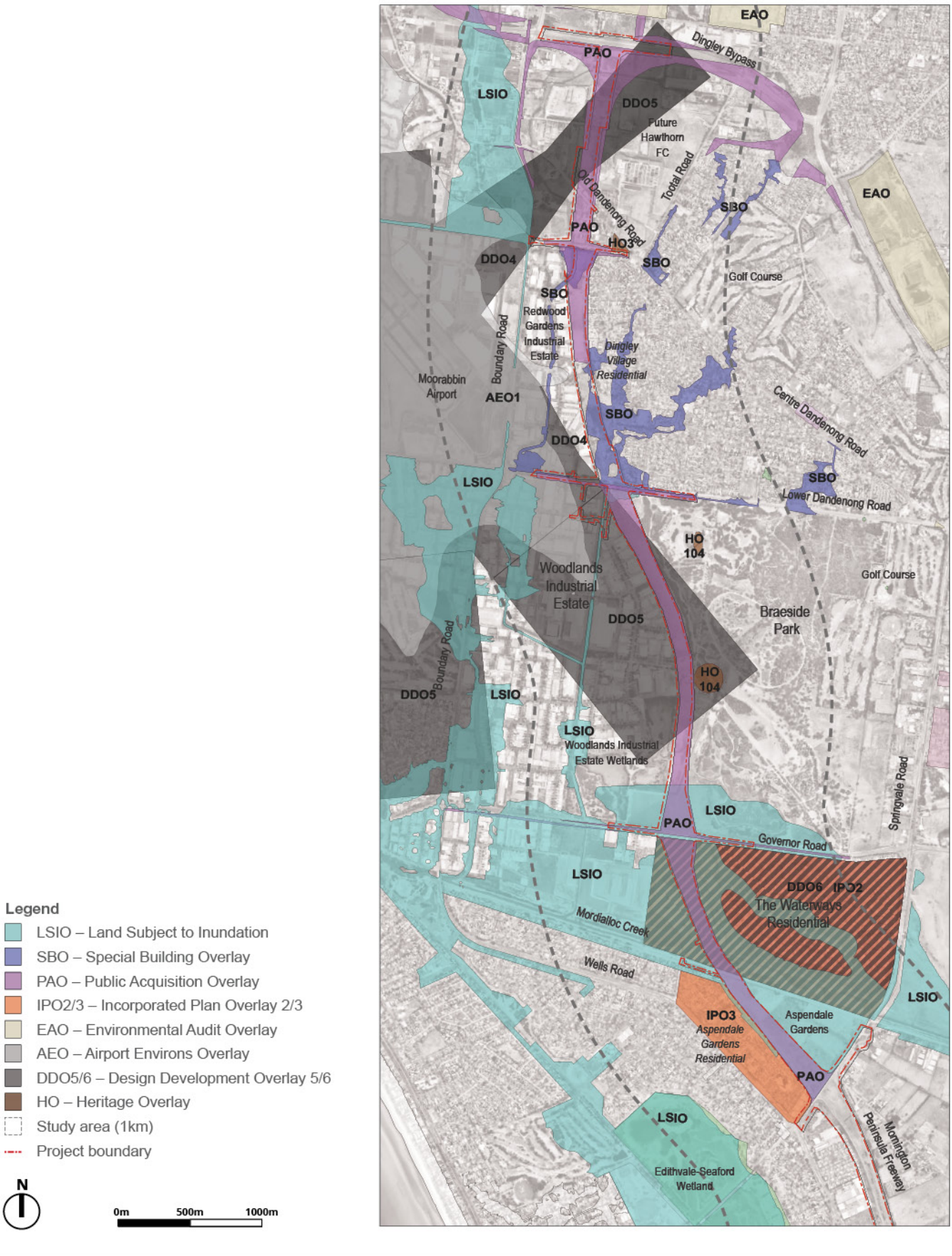


Figure 8. *City of Kingston planning overlays*

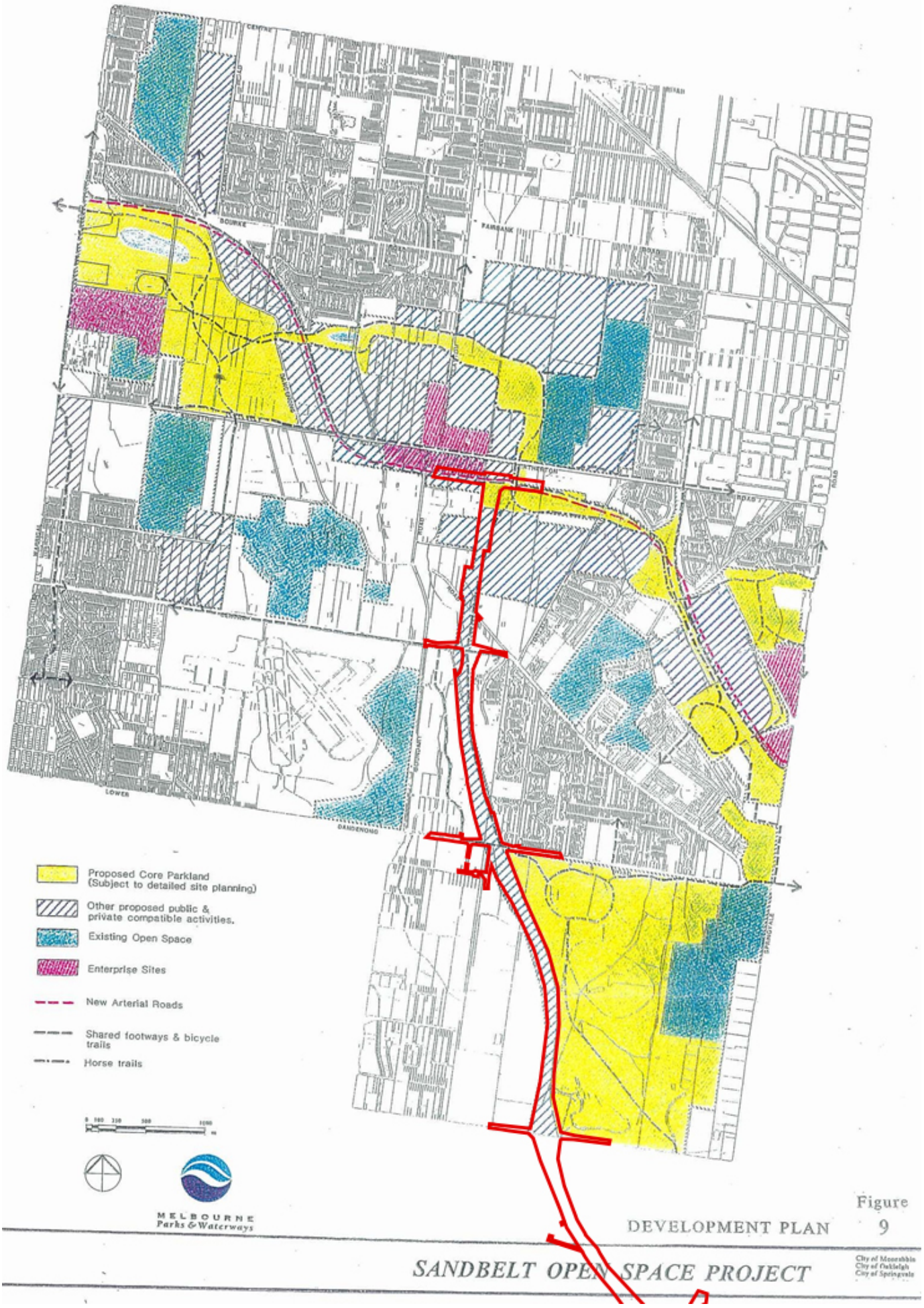


Figure 9. *Sandbelt Open Space Project Development Plan, with project area outlined in red*

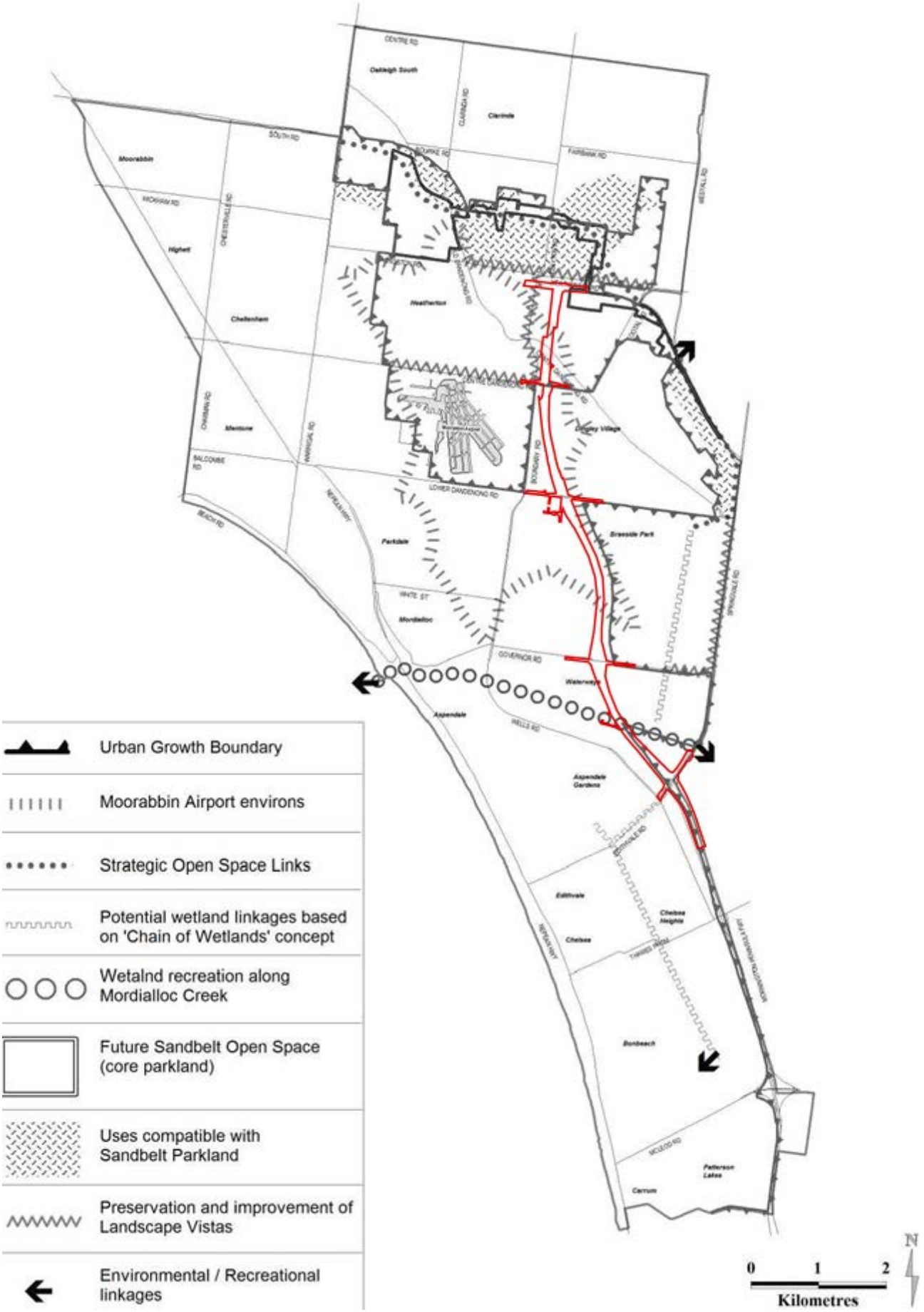


Figure 10. *City of Kingston Planning Scheme: Green Wedge Framework Plan, with project area outlined in red*

Map 2: Keysborough/Wetlands Framework Plan

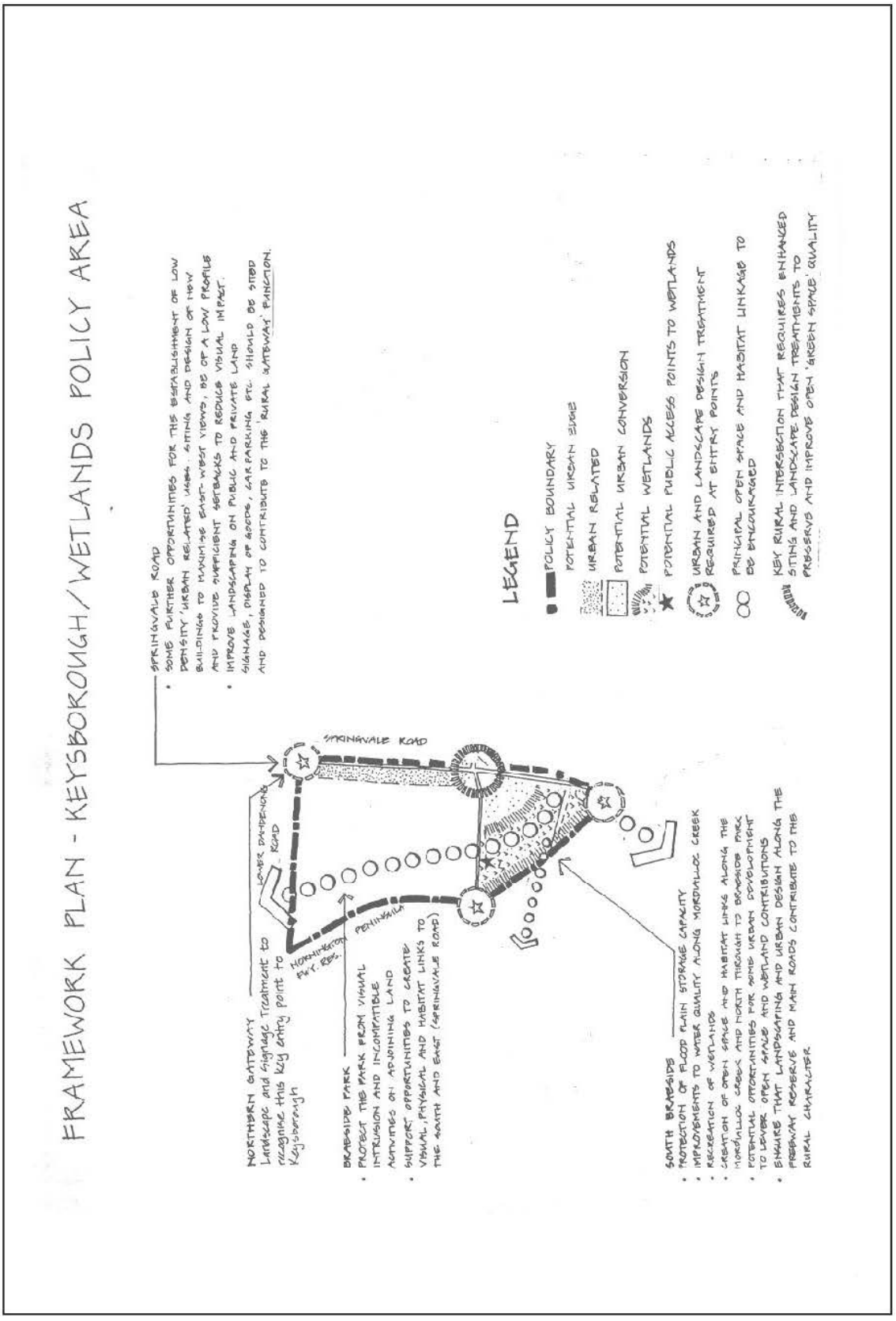


Figure 11. *Keysborough/Wetlands Framework Plan*

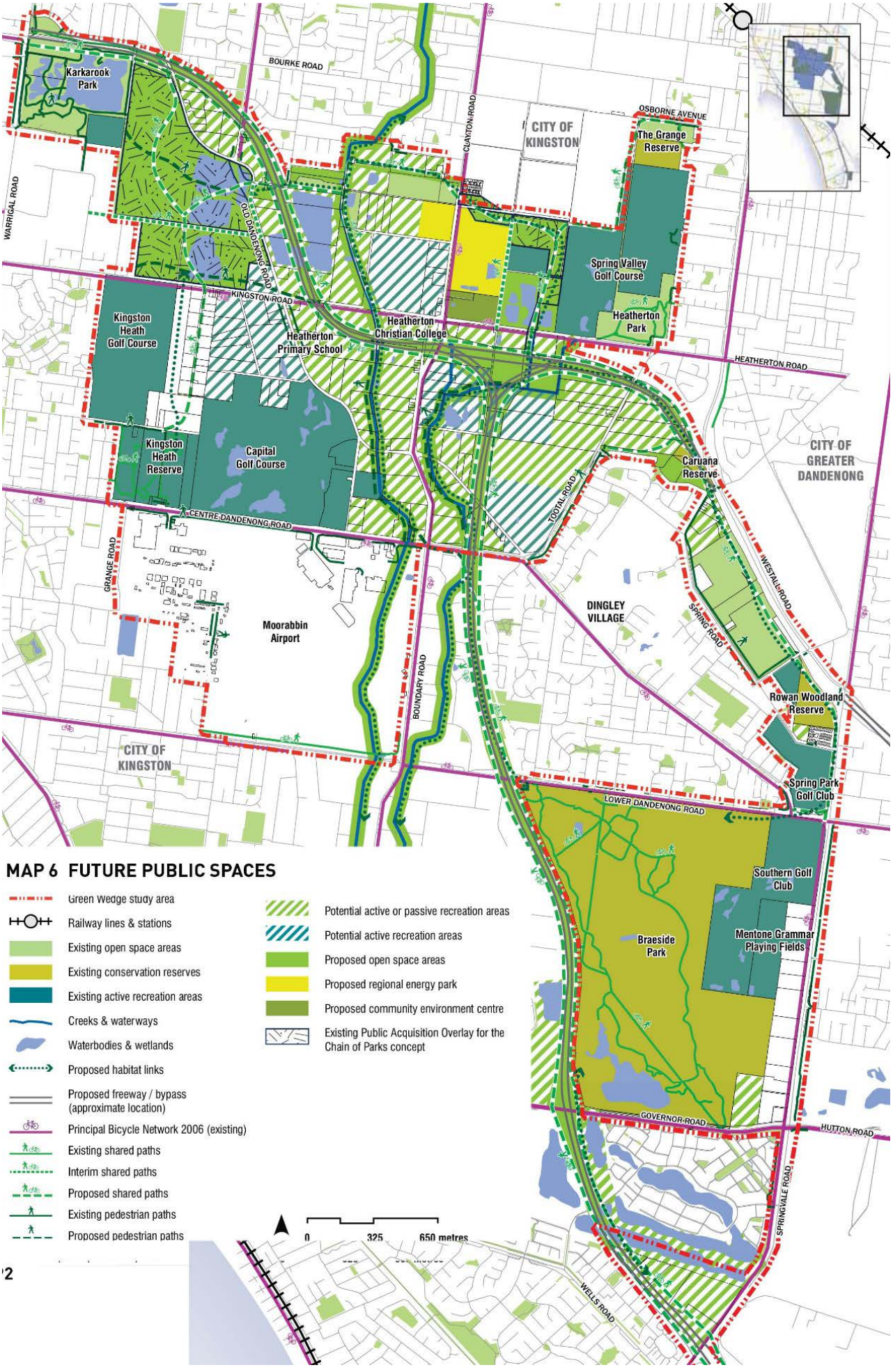


Figure 12. *Kingston Green Wedge Plan: future public spaces*

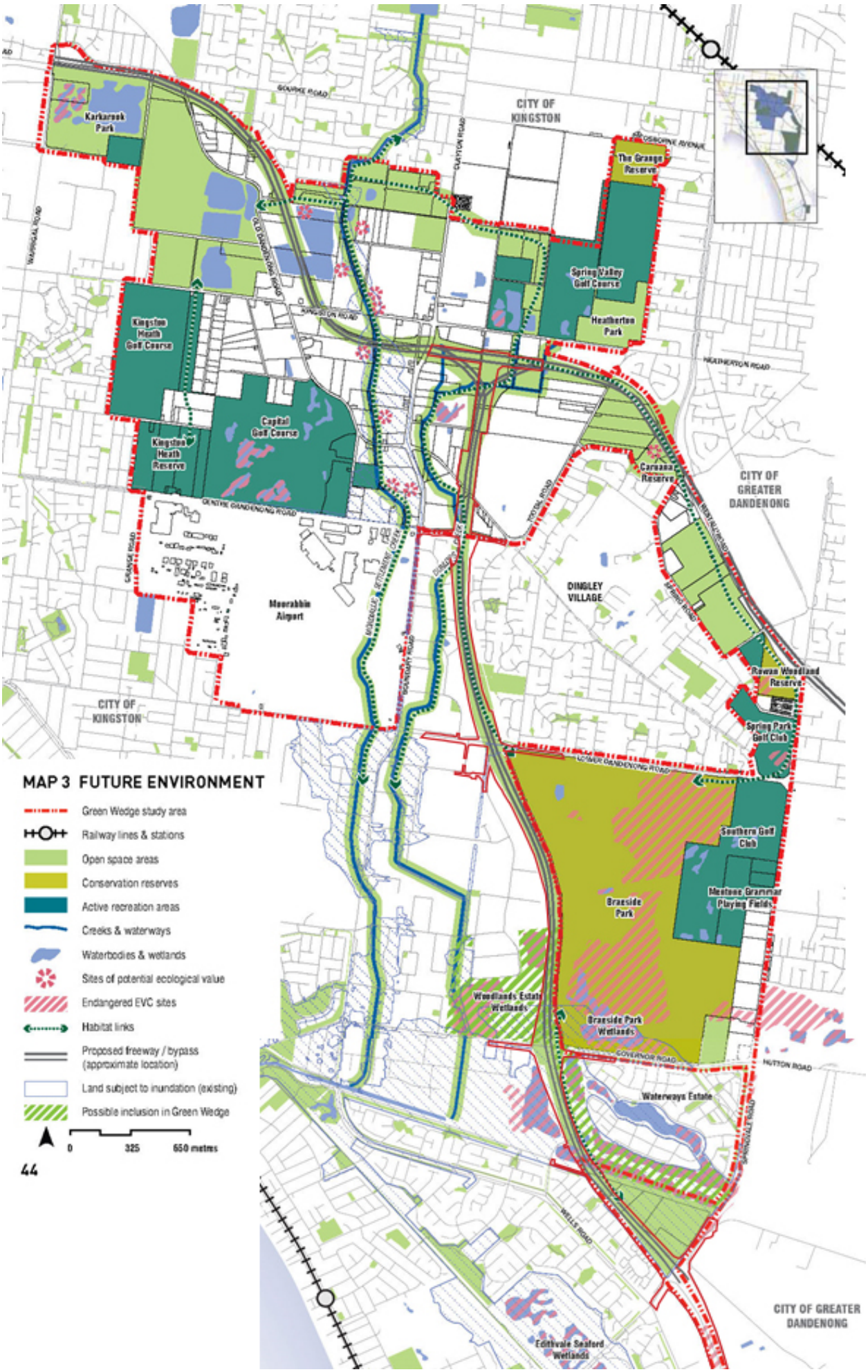


Figure 13. *Kingston Green Wedge Plan: future environment*

Figure 14. *Kingston Cycling and Walking Plan 2009–2013*

6.3.3 Summary of strategic directions

The overall project has complexities of land use within the green wedge and industrial zones. Also, the local councils' strategic vision is to develop more integrated open spaces, environmental linkages and pedestrian connectivity across the area.

There are a number of future projects and strategic directions that should be considered as part of the project assessment. They include, but are not limited to:

- the Hawthorn Football Club training facility and community space on Tootal Road
- the green wedge boundary, vision and values from both City of Kingston and City of Greater Dandenong
- the public spaces and open space links, as a part of the Sandbelt Open Space Project – 'Chain of Parks' and Living Links
- the habitat and open space links, as part of the Kingston and Greater Dandenong Green Wedge Plans
- the pedestrian and cycle links, as part of the Kingston and Greater Dandenong Green Wedge Plans and Cycling and Walking Plan
- the existing and future land use, planning zones and overlays.

0 illustrates these key directions.

Figure 15. *Strategic direction summary*

6.3.4 Industry guidelines

Landscape and visual impact assessment industry guidelines

There are no Victorian Government guidelines or legislation directly relating to the manner in which landscape and visual assessment is to be undertaken. To ensure sound methodology, principles and elements are adhered to and included in the development of this Report, we have:

- referred to the highly regarded publication *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute & IEMA, 2013)
- thoroughly reviewed many EES LVIA reports undertaken for VicRoads and other federal, state and local organisations, including those for both urban and regional contexts.

Relevant industry guidelines

Urban Design Guidelines for Victoria (2017)

The Victorian State Government developed the Urban Design Guidelines for Victoria to support state agencies, local government and the urban development sector to deliver functional and enjoyable places for people to live, work and spend leisure time. The guidelines aim to create neighbourhoods that foster community interaction and make it easy for people of all ages and abilities to live healthy lifestyles and engage in regular physical activity. These places may be urban areas in metropolitan Melbourne or in regional cities and towns.

The Urban Design Guidelines for Victoria are policy guidelines within the State Planning Policy Framework of the Victoria Planning Provisions. The guidelines must be considered when assessing the design and built form of new development where relevant. The guidelines use best practice knowledge and advice underpinned by sound evidence.

The guidelines assist decision making and are intended for use by those initiating urban development and public realm works; by those assessing or reviewing development proposals for planning that affect the public realm; and by members of the public who have an interest in urban development and public realm design.

In applying the guidelines, designers and decision makers need to determine the relevance of the specific guideline in the context of the proposed development. However, there may be ways to achieve the objectives other than through the responses described in these guidelines. Where designers believe that a guideline should not apply, they should be able to express clear reasons why this is so and put forward an alternative way to meet the objective.

Relevance to project

This LVIA has explicit aims to identify areas that are valuable to people, as well as areas of high natural worth. These guidelines seek to facilitate delivering places in which people can enjoy living, working and spending time.

Fauna Sensitive Road Design Guidelines (VicRoads, 2012)

These guidelines aim to promote the movement of wildlife across roads, while helping to find solutions to ongoing public concerns about fauna mortality (i.e. roadkill). The treatments outlined are intended to connect local wildlife linkages and keep fauna away from high risk areas. Fauna sensitive road design will enable animals to move between habitats and discourage them from setting up home ranges within road reserves where they would be at risk.

Relevance to project

The proposed bypass runs through, and nearby to, multiple significant and sensitive ecological areas, for more detailed information on these areas, refer to the Mordialloc Bypass EES Flora and Fauna Impact Assessment. These VicRoads guidelines provide ecological considerations and potential mitigation options that may be applicable to the more ecologically sensitive areas across the study area.

Roadside Management Strategy (VicRoads, 2011)

This strategy provides a framework for the balanced consideration of four key roadside management objectives. It uses an asset management approach to identify priority treatments to preserve roadside functions. Each objective relies on both input from the community and expert analysis to ensure that resources are directed to the locations where they are most required.

Priorities for roadside management depend on the location and nature of a roadside. For example, an urban freeway may have a strong focus on urban and landscape design, whereas a rural arterial may be important for strategic fire management or environmental protection. Regardless of the nature of the roadside, all objectives will be considered to a greater or lesser extent.

Relevance to project

The four roadside objectives of this strategy are: enhancing road safety and vehicle movement; protecting environmental and cultural heritage values; managing fire risk; and preserving and enhancing roadside amenity. The last objective is of significant relevance to LVIAs. The amenity of roadside areas can be particularly important to many communities.

Integrated Water Management Guidelines (VicRoads, 2013)

These guidelines set the direction for the management of water resources during road construction, operation and maintenance activities, in order to:

- reduce the use of non-potable water on construction projects
- reduce the use of non-potable water during maintenance activities
- implement water sensitive road design (WSRD) on projects, where feasible
- support the Victorian Government’s target of recycling wastewater
- reduce the impact of road projects on receiving waterways and groundwater.

Relevance to project

As the study area has historically been wetlands and the bypass will run through existing wetlands, water management guidelines are of great importance to consider in landscape functionality and visual impacts. These guidelines can also provide direction and guidance on potential impact mitigation methods.

7. Impact assessment methodology

There are two key ways in which the impact of the project on the landscape and visual amenity of the community is assessed: firstly, by looking at the overall landscape character of the area and its ability to accommodate the project; secondly, by looking at the views and residential visual amenity of the area and how the project will affect them. In order to identify potential impacts, a risk assessment is undertaken.

7.1 Landscape character impact assessment methodology

Landscape character areas

The landscape impact assessment is based on identifying landscape character areas and their values, identifying the main sites of visual sensitivity and ascertaining the effects of the project on these areas and sites.

'A landscape character area is a broad scale area of land with common distinguishing visual characteristics.' (Leonard & Hammond R, 1983).

A landscape character area provide a picture or sense of the landscape and is defined by an area of visually distinct common features. Additionally, cultural elements and aesthetic, perceptual and experiential aspects can make different places distinctive (*Guidelines for Landscape and Visual Impact Assessment*, United Kingdom Landscape Institute and the Institute of Environmental Management and Assessment, third edition 2013). Landscape character areas are the product of a combination of multiple elements that impact how a landscape appears and is utilised, which *Guidelines for Landscape and Visual Impact Assessment* categorises as: geomorphology, waterways, vegetation, land uses, and visual and sensory aspects. The experience in, to and from landscapes can also influence their character. Through defining landscape character areas, the values of the landscape can be clearly identified, which in turn aids in determining the capacity for the landscape to accommodate and absorb the proposed Mordialloc Bypass.

Landscape character value

Landscape character value provides an indication of whether the landscape, or elements within the landscape, is of significance to the local or wider community, residents and other parties. The values assigned to the landscape character areas depend in part on their prominence and also the extent to which they are present within the landscape context.

A landscape may have value in terms of its usability and usefulness to society, ecological and hydrological importance and functionality, social and wellbeing benefits, and economic worth. Different layers contribute to making an accurate characterisation of landscape and its associated value. For example:

- **Policy** may provide an understanding of the government and community's value of a landscape or visual resource. For instance, legislation and policies may protect an important visual resource, and so identify it as being of value to the general public or important to the landscape's function.
- **Community value** is based upon an estimate of a landscape's value to the community. The community value ratings are based upon professional judgment, community engagement on the project which was conducted by VicRoads, and review of council reports and strategies.
- **Culturally valued** sites or areas may be of varying levels of value, depending on different cultures.

- **Ecologically valued** environments, including protected environment vegetation classes, flora, fauna, habitat, areas of ecological function, etc. can have significant values.
- **Historical** sites or areas may be highly valued.
- **Geologically valued** elements such as soil types or natural structures and formations can influence a landscape's value.
- **Public open space** is generally considered of value, with views to and from these areas considered as standard in LVIA reporting because these are utilised by society as a whole.
- **Land use** can influence a landscape's character and how it is perceived, which impacts value.
- **Rarity of landscape** character, type or use can be of significance in determining value.

Additional information received from other relevant EES specialist reports may also influence landscape value, key sites and views.

7.1.1 Landscape character areas and associated visual impacts

Considering the key impacts, the overall impacts to landscape characters and their associated views are identified. Victoria does not have specific standards, guidelines or rules on defining landscape and visual impact assessment reports. Therefore, experienced professional judgment is relied upon to assess the significance of the level of change and sensitivity. Impact ratings are specific to each location and based on the landscape character value, the sensitivity of the site, the view or the movement network, then assessed against the proposed level of geographical and visual change the project will create. The matrix below is used to determine an overall rating of landscape and visual impacts based on the two key factors, sensitivity of site, and the magnitude of change.

Sensitivity of site	**Magnitude of change**			
	Very high	**High**	**Moderate**	**Low**
Very high	Very high	High	Moderate	Low
High	High	High	Moderate	Low
Moderate	Moderate	Moderate	Moderate	Low
Low	Low	Low	Low	Low

Figure 16. Landscape character areas impact rating table

Level of sensitivity and ability to absorb change

Landscape sensitivity provides an indication of the landscape's ability to absorb change without dramatically altering its character. This is typically dependent on the anticipated level of physical and visual impact (magnitude of change) the development proposal has upon the existing qualities of the landscape character area.

This assessment identifies the landscape character areas that:

- cannot absorb any physical change
- can absorb change with sensitive mitigation
- can absorb change with limited mitigation.

Magnitude of change

The magnitude of change to the landscape depends on the scale and duration of the proposed change. Roads at grade, roads that are elevated and overpasses all affect the surrounding landscapes and views in different ways and magnitudes. Below some of the different scales of change across the project are depicted. Typically, the taller the change, the more visible it may be to surrounding areas.

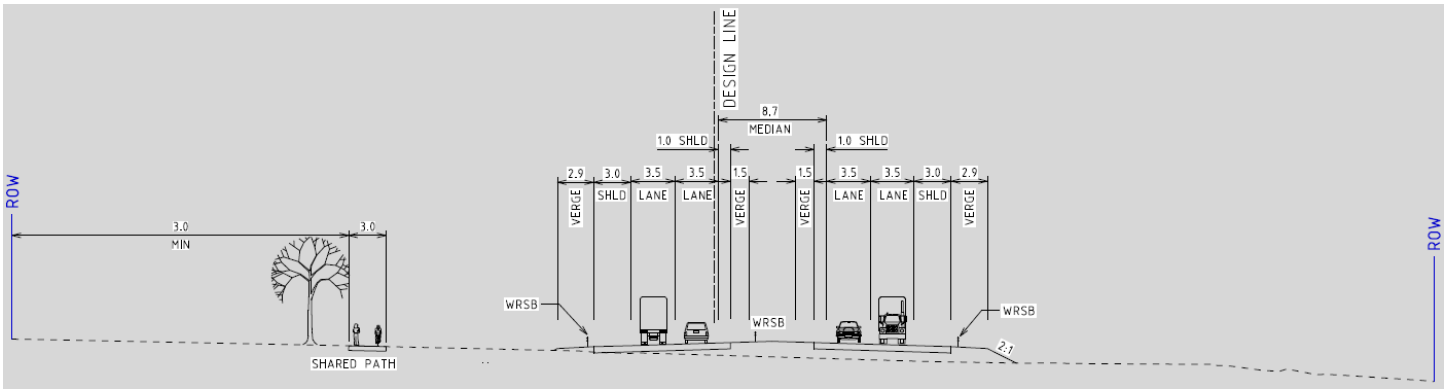


Figure 17. *Example of a road at ground level*

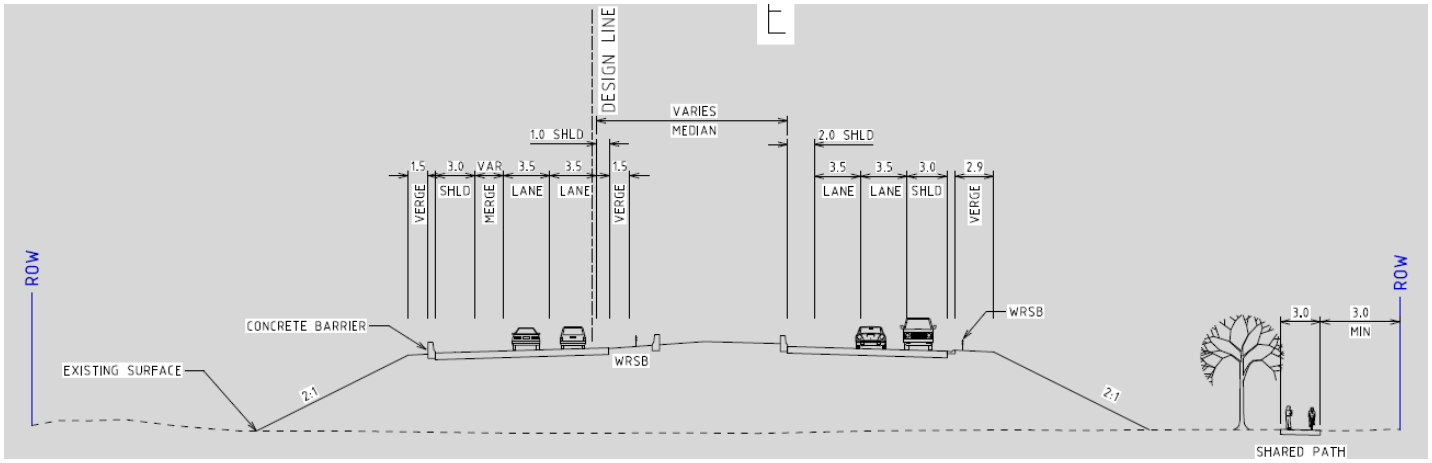


Figure 18. *Example of a road raised above ground level*

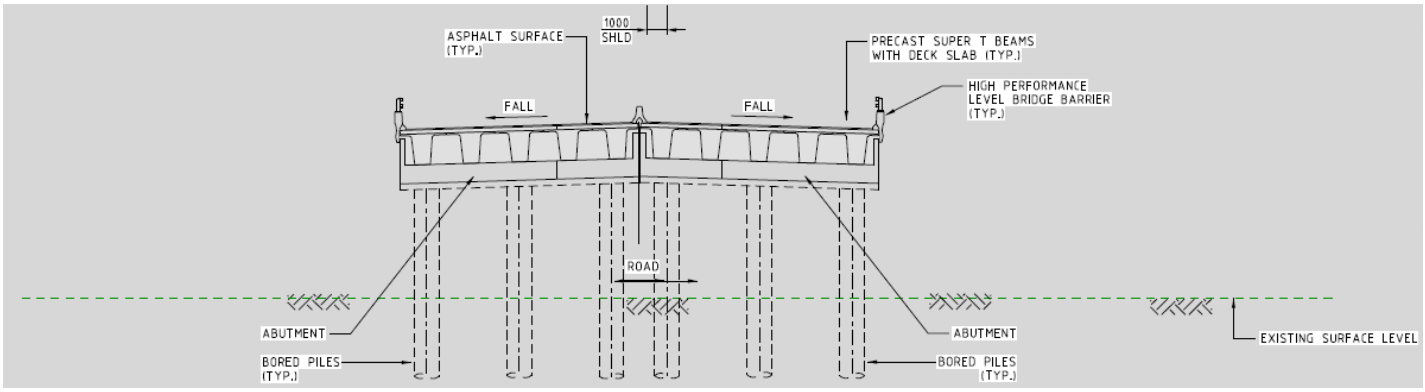


Figure 19. *Example of a road as a bridge or elevated structure*

Impact rating

The impact rating is the overall evaluation of the project's likely effects on the landscape character area.

Landscape character area impact rating	Evaluation
Very high	The landscape character is unable to absorb development without significant detrimental effect upon it. The proposed project will result in a very high level of change to the existing landscape character. There is limited ability for mitigation measures to reduce impact.
High	The landscape character is unable to absorb development without detrimental effect upon it. The proposed project will result in a high level of change to the existing landscape character. There is some ability for mitigation measures to reduce impact.
Moderate	The landscape character is able to absorb some of the development without detrimental effect upon it. The proposed project will result in a moderate level of change to the existing landscape character. There is ability for mitigation measures to reduce impact.
Low	The landscape character is able to absorb development without detrimental effect upon it. The proposed project will result in a low level of change to the existing landscape character qualities. There is high ability for mitigation measures to reduce impact.
Negligible	The landscape character is able to absorb development without detrimental effect upon it. The proposed project will result in a negligible change upon the landscape character. No mitigation measures will be required.

7.2 Visual amenity impact assessment methodology

The visual impact assessment involves the analysis of visual change (in views or in the visual amenity) experienced by individuals and groups of people, both in public places and private residential areas. This Report assesses visual impact in two ways.

1. Public places visual amenity

- It identifies places and sites that are valued by the public and are within proximity of the project (i.e. sensitive sites).
- It assesses the sensitivity of their users (i.e. the sensitivity of the visual audience).
- It assesses the potential visual impact on users.

2. Residential visual amenity

- It identifies residential areas that are within proximity to the project (i.e. the visual audience).
- It assesses the potential visual impact on the visual audience.

7.2.1 Public places visual amenity

Key sensitive sites

Key sensitive sites have been identified throughout the study area based on their proximity to the project, their cultural or community value, and their level and type of public usage.

These sites are sensitive to change in their visual amenity.

These sites typically include public open space, shared user paths, trails, local activity nodes (e.g. cluster of cafes, shops and restaurants), recreational spaces, cultural heritage sites, wetlands, and associated lookouts and viewing areas.

Level of sensitivity of the visual audience

The visual audiences were assessed as people within the project area who may potentially have their views impacted upon by the project.

The level of sensitivity of the audience is based on:

- the distance of the audience to the project
- the type of audience (e.g. residents, those passing through the area by vehicle, public space users and workers); different viewer types may be impacted to varying degrees depending on their experiences of the area and concerns about the change
- the expectations of an experience in a given setting (e.g. the expectation of a high level of visual amenity in a national park or from a scenic lookout).

7.2.2 Residential visual amenity

The visual impact on residential areas is assessed using the same techniques as for the public space visual amenity. It is important to note that assessments are not made for each individual residence, but rather for residential areas as a larger group or geographic area.

The impact on residential visual amenity is assessed by firstly identifying those residential areas that are within proximity to the project and that have the potential to be able to see the project and its associated infrastructure (either day or night).

Initially, all residential areas within 500m of the project are considered to be visually impacted by the project. Then a more detailed viewshed analysis (using a 3D model of the project and context) is used to ascertain from where and to what extent residents may be able to see the project.

Distance from project

Sites that are within 500m of the project area have been identified as having a higher level of sensitivity of the visual audience than sites further away.

As a viewer's distance from the project increases, the field of view the project occupies decreases; the project's components diminish in scale and are more readily absorbed into the landscape. Thus, the further from the project, the less the level of sensitivity.

There are no standards that fix appropriate assessment distances because visibility is affected by a broad range of factors, including elevation, slope, land cover and the nature of the project (e.g. road at grade, overpass, noise wall or fill).

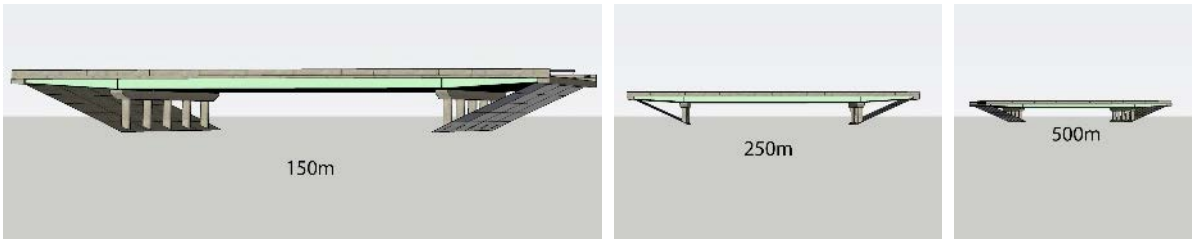


Figure 20. *An object (in this case, a bridge) reduces in scale when it is viewed from increasing distances.*

Typically, three viewing thresholds are used: the foreground (0–500m), the midground (500–2000m) and the background (>2000m). Because the project area is relatively flat and within an urban context, where vegetation and buildings are regular occurrences, in this Report these distances are:

- 0–200 metres for the foreground
- 200–500 metres for the midground
- 500–1000 metres for the background.

This Report identifies typical types of sites, their sensitivity and the potential visual impact on them assessed by distance from the project area. Figure 21 outlines the Visual sensitivity by distance assessed for high, moderate and low sensitivity sites.

Type of sensitive sites in project area	**Foreground (0–200m)**	**Midground (200–500m)**	**Background (500–1000m)**
High value (e.g. parks, open spaces, trails, residents)	very high	high	low
Moderate value (e.g. churches, cafes, healthcare facilities)	high	moderate	low
Low value (e.g. commercial, industrial)	moderate	low	low

Figure 21. *Levels of visual sensitivity*

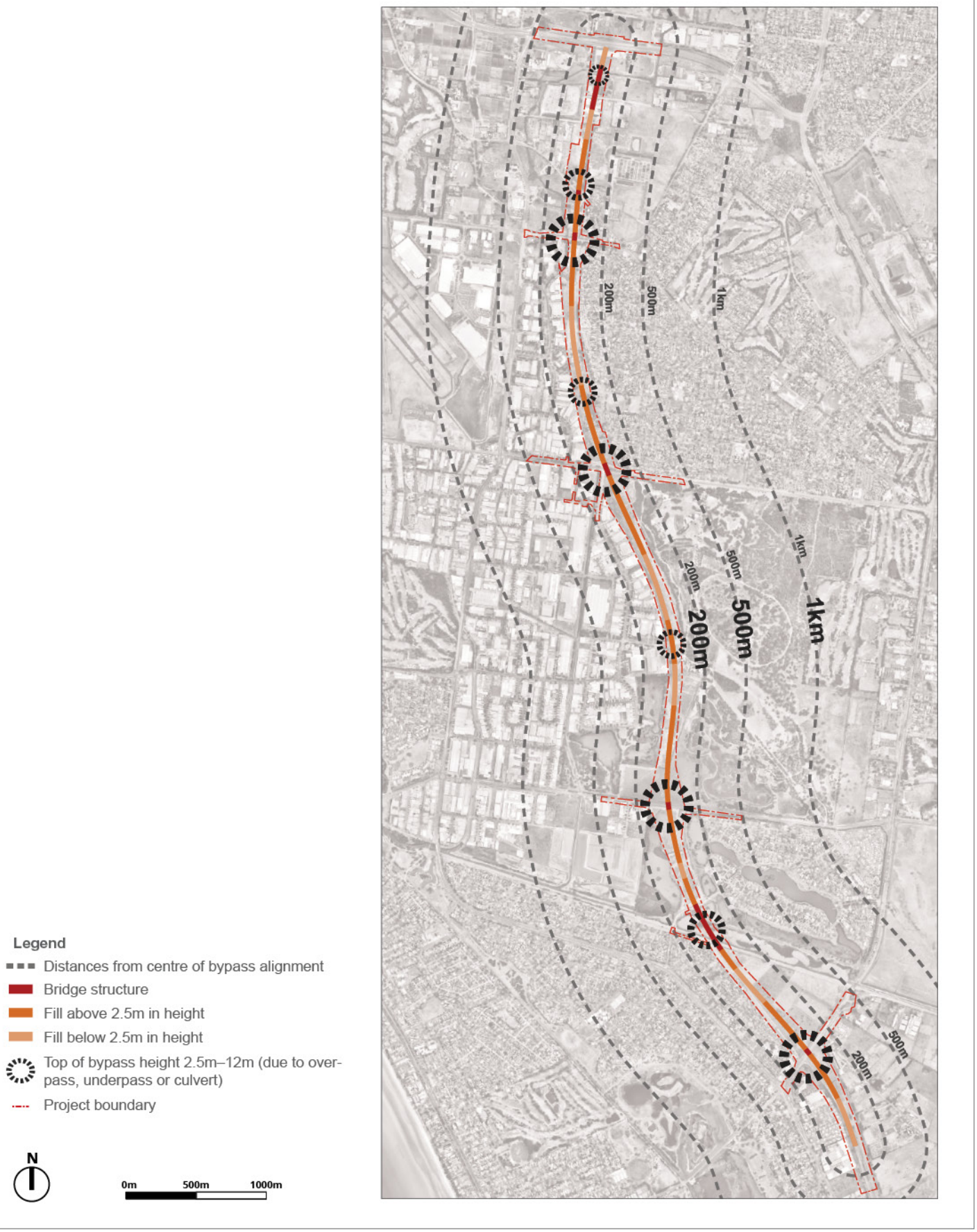


Figure 22. *Distances from the centre of bypass alignment and increase in bypass height due to overpass or fill (the size of the circle indicates the level of height change from 2.5m to 12m)*

Level of visual modification

The level of visual modification (or magnitude of change) reflects the degree to which the view will be changed by the introduction of the project. This is assessed through a combination of the distance from the project, changes in heights of topography or structural elements generated by the project (e.g. overpasses, noise walls or fill), cross section drawings and the use of photomontages that position the project within the landscape and associated views.

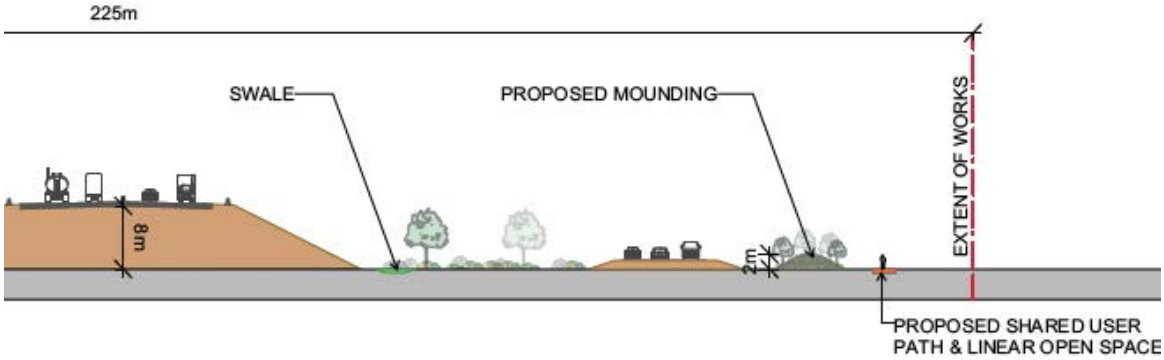


Figure 23. *Example of a cross section, these are a useful visual assessment tool to better understand the impacts upon the landscape and views*

Final visual impact rating

The final visual impact rating for each site is developed through a combination of the assessment tools. Figure 24 shows a table system that will be used to communicate the overall impact assessment of the project on sensitive sites. It outlines how the visual impact rating is determined by site sensitivity, the degree of modification to the view and the ability to mitigate impact.

Level of sensitivity of site	Degree of modification to the view	Ability to mitigate impact	Visual impact rating
very high, high, moderate, low, negligible	very high, high, moderate, low, negligible	very high, high, moderate, low, negligible	very high, high, moderate, low, negligible

Figure 24. *Visual impact rating assessment tools*

Viewshed analysis

A viewshed visualisation identifies areas within the landscape that have visual exposure to, or a view towards, the project, such as an overpass. This assists in identifying areas or views that may incur a visual impact by the project. Refer to Appendix item 15.1.1 for the viewshed analysis used in conjunction with 3D modelling and photomontages to assess visual impacts.

The following is a description of the viewshed analysis methodology.

- This Report utilised 3D modelling and 3D visualisation techniques to construct conceptual 3D images of the project in the existing context.
- A top-orthographic / bird's-eye camera was placed above key points of interest (or significant impacts) and a series of high intensity light sources were placed approximately 2m high above the road alignments, between points of interest (i.e. over an overpass).
- The shadows generated by these light sources when rendered are represented in a semi-opaque green. When placed over a render of the terrain, the shadows indicate the areas of the terrain (along the length specified) that are not visible from the overpass and road. The specified lengths of road are indicated by red lines.

Limitations of viewshed analysis

The viewshed analysis has some limitations in that, throughout the site, there may be elements that are blocking or screening potential visual impacts on surrounding or more distant areas. Some common elements found in urban settings that create barriers to views from the surrounding area are trees and vegetation, buildings, raised topography and fences.

The viewshed analysis is used broadly across the site, potential impacts identified can be highlighted in tree tops or roof tops, professional judgment and assessment is utilised to decipher whether this is a visual impact upon a visual audience or not.

7.2.3 Description of photomontage visualisation process

Photomontages digitally introduce the proposed project into an existing view or photograph to assist in the assessment of visual impact. The methods used to construct these images are professionally agreed to and are accurate to a level accepted by Planning Panels Victoria and the Victorian Civil and Administrative Tribunal.

The process is as follows:

- The 3D modelling of the alignment on 3D topography.
- High resolution renders of the model are taken without the terrain and other contextual elements.
- The render of the alignment is then photo matched to high resolution digital photographs taken on site. Photographs are taken using a Canon EF 24–105mm f/4L IS USM.
- A GPS reading and manual survey information are taken for each photograph location. This information is then used to position a camera in the model with the same location, rotation and focal length characteristics as the real camera.
- Renders are created from each of these cameras, and the resulting image is composited into the photograph.

There are two types of renders utilised within this report being;

- **Wireframe render;** wireframe renders are basic geometries of the 3D model outlined and non-textured surfaces. These are then made transparent, so that the viewer of the images can see through the wireframe render and get an understanding of where the project is placed within the view and landscape. This aids in highlighting potential impacts and an understanding of the project. None of the wireframe models however highlight the impacts of noise walls. An example image of a wireframe render is provided below.

Figure 25. *Example of wireframe render*

- **Photomontage** – these renders utilise the 3D model and add textured surfaces to depict different materials of the project within the existing photos. These models are placed within the existing landscape, and are placed behind existing objects within the view to give a representation of what the project may be hidden or covered by that is existing within the landscape and associated view. An example image of a basic textured model is provided below.

Figure 26. *Example of a photomontage*

As visual impact assessments of major development projects rely on onsite GPS readings to inform the photomontage process, it is necessary to understand their limitations. Although GPS readings have a certain error margin, the process of using a GPS is regarded as ‘best practice’ and is more reliable than onsite measurements or other estimations.

It is widely accepted in the industry and by planning panels that minor adjustments occasionally need to be made to bring the origins of images into line with the 3D model to rectify any inaccuracies. Where this has occurred, survey information, matching photographic points, aerial photography and other base material has been used as a reference.

7.2.4 Construction impacts

Major Road Projects Authority would require the construction contractor to develop and implement a Construction Environmental Management Plan (CEMP) for the Project. VicRoads standard environmental protection measures and some additional Project specific controls identified in this report would be incorporated into the Environment Management Framework for the Project. Major Road Projects Authority would require the construction contractor to incorporate these measures into the CEMP.

7.3 Assessment limitations

Assessment limitations associated with this project include:

- limited access to detailed topographic data and detailed locations of vegetation and buildings within 2km radius of the project; the project area has developed significantly in the past 15 years so relevant GIS data is limited to LIDAR data
- limited access to assess impact on private property; all views and photographs were assessed from publicly accessible locations.
- limited information on noise wall design, height and location when this report was developed, this report is based on a draft design by noise specialists also working on this project
- limited information on bridge design and structural details of abutments and piers when this report was developed

8. Existing conditions

8.1 Landscape features

8.1.1 Landscape history

The overall landscape character of the area has developed from a natural landscape to one highly modified by urban development. The landscape is highly eclectic in character, and includes residential estates, industrial areas, regional parks, waterways and agriculture.

Ecological vegetation

Modelling that represents the ecological vegetation classes (EVCs) that were present in 1750 highlights what the landscape may have been like pre-colonisation and for the past 40,000 years under Aboriginal land management practices (Figure 27). It also highlights now endangered and vulnerable EVCs within the study area (Figure 28). According to this modelling, the site's landscape prior to colonisation was a mosaic of Plains Grassy Wetland, Plains grassy Woodland, Swamp Scrub, Damp Sands Herb-rich Woodland and Creekline Grassy Woodland (Figure 28).

Plains Grassy Wetland

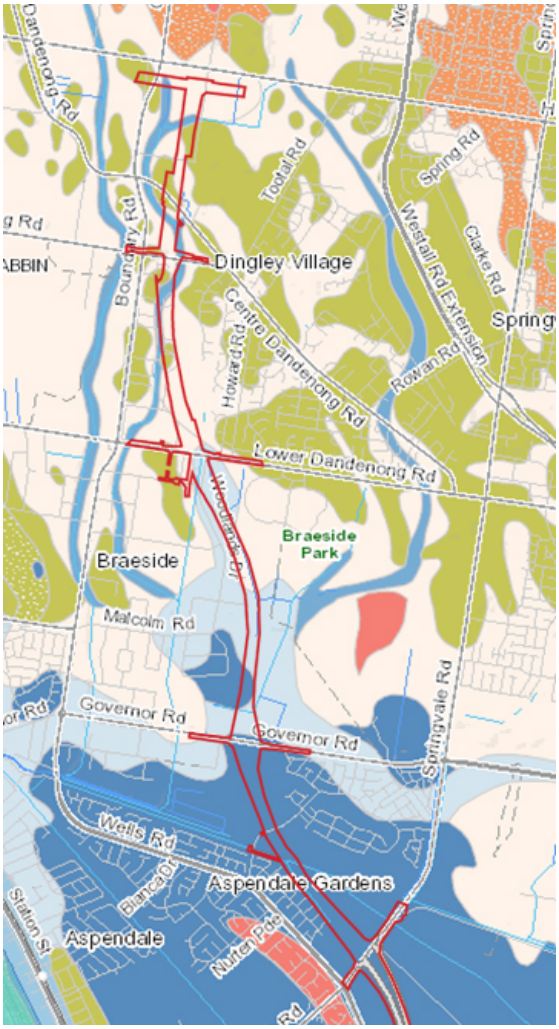
Plains Grassy Woodland

Swamp Scrub

Damp Sands Herb-rich Woodland

Figure 27. *Examples of ecological vegetation classes in the project area (Images: http://vicveg.net.au)*

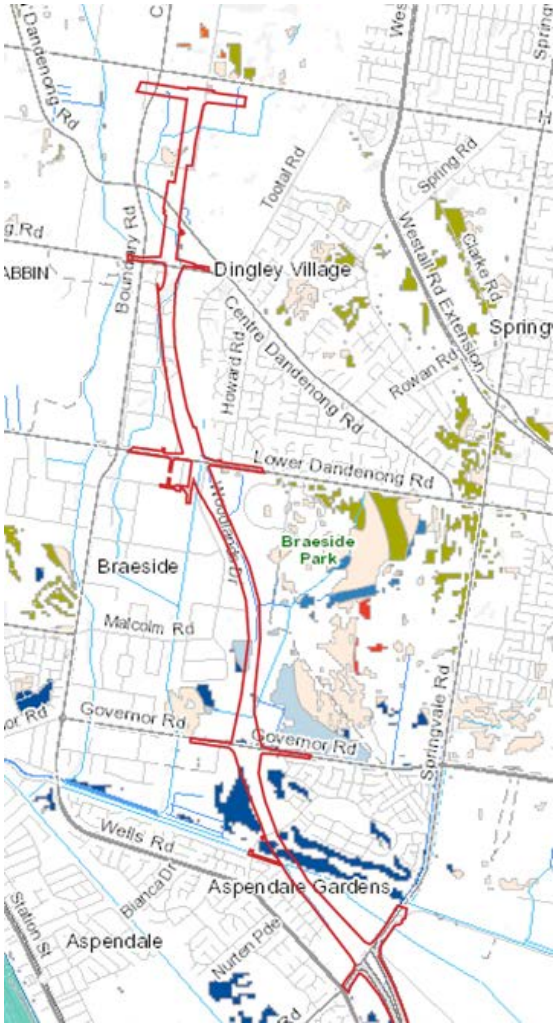
Modelled 1750 EVCs



Legend

- Plains Grassy Wetland
- Swamp Scrub
- Plains Grassy Woodland/Swamp Scrub/Plains Grassy Wetland mosaic
- Damp Sands Herb-rich Woodland/Heathy Woodland mosaic
- Creekline Grassy Woodland
- Heathy Woodland

2005 EVCs



Legend

- Plains Grassy Wetland (endangered)
- Swamp Scrub (endangered)
- Plains Grassy Woodland (endangered)
- Damp Sands Herb-rich Woodland/Heathy Woodland mosaic (vulnerable)

Figure 28. *Comparison of 1750s and 2005 EVC distributions (Images: http://maps.biodiversity.vic.gov.au)*

Urban development

Aerial photography is useful in illustrating the significant land changes that have occurred over time. Figure 29 and Figure 30 compare aerial imagery from 1945 and 2017 respectively. They show the construction of significant residential, industrial and commercial areas over that period, with the associated loss of agricultural land and remnant vegetation.

1945

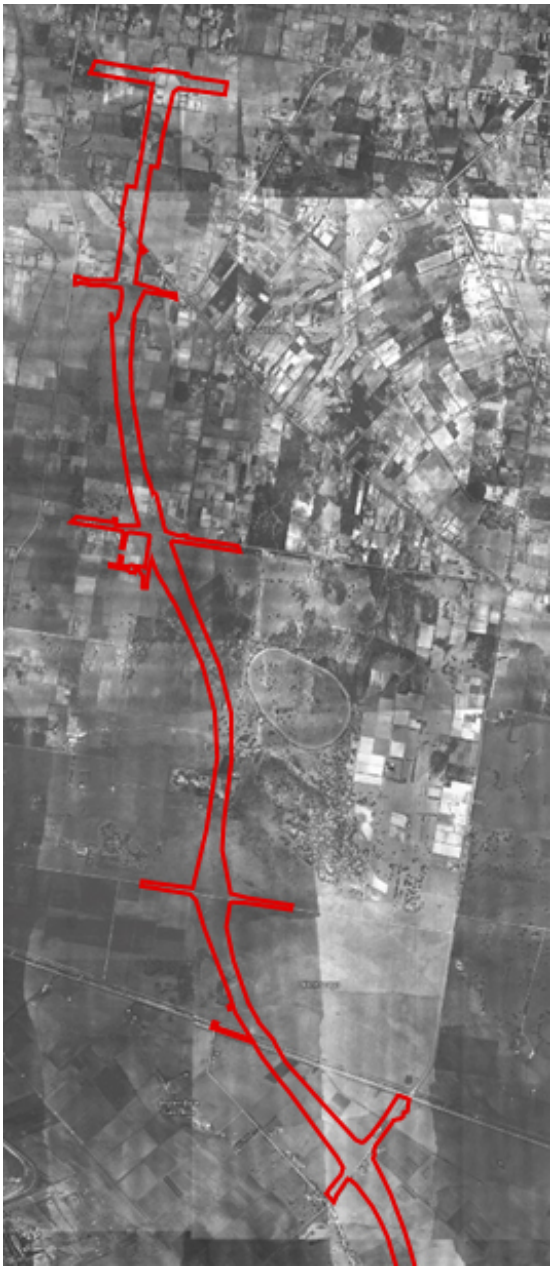


Figure 29. *Aerial image of general site area in 1945, with project area outlined in red (Image: http://1945.melbourne)*

2017

Figure 30. *Aerial image of general site area in 2017, with project area outlined in red (Image: http://nearmap.com)*

8.1.2 Existing landform and waterways

The topography of the project area is relatively flat, with only gentle rises in the landscape (as shown in Figure 31). The lowest lying section of the project area is in the south, around the Waterways estate wetlands, at approximately 4m above sea level. The topography rises gradually to the north, to around a 30m elevation.

The pre-colonisation landscape mosaic of wetlands and woodlands indicates a landscape that is low and flat lying within a broader region.

The EES Groundwater Existing Conditions Report identifies the project area as part of the Carrum Carrum Swamp. Extensive alterations to the Carrum Carrum Swamp began in the 1870s, with drains excavated to prevent flooding of the Eumemmering Creek. Edithvale–Seaford Wetland is the last remnant of the Carrum Carrum Swamp, adding significant cultural and historical value to the wetland character within the study area.

The project will occur partly within the designated Braeside Park and Mordialloc Creek wetlands (also known as 'the Waterways') catchment areas. Both these catchments contribute tributary runoff flow to the larger Mordialloc Creek drainage system.

The Waterways is a 48ha estate revegetated by Australian Ecosystems. It was established in 2000 and is now known for its significant ecological and hydrological value. The Waterways development was partly funded by Melbourne Water. Recently, the Waterways was the recipient of the Award for Excellence in Restoration Practice by the Society for Ecological Restoration Australasia (see http://www.seraustralasia.com/pages/SERAawards.html).

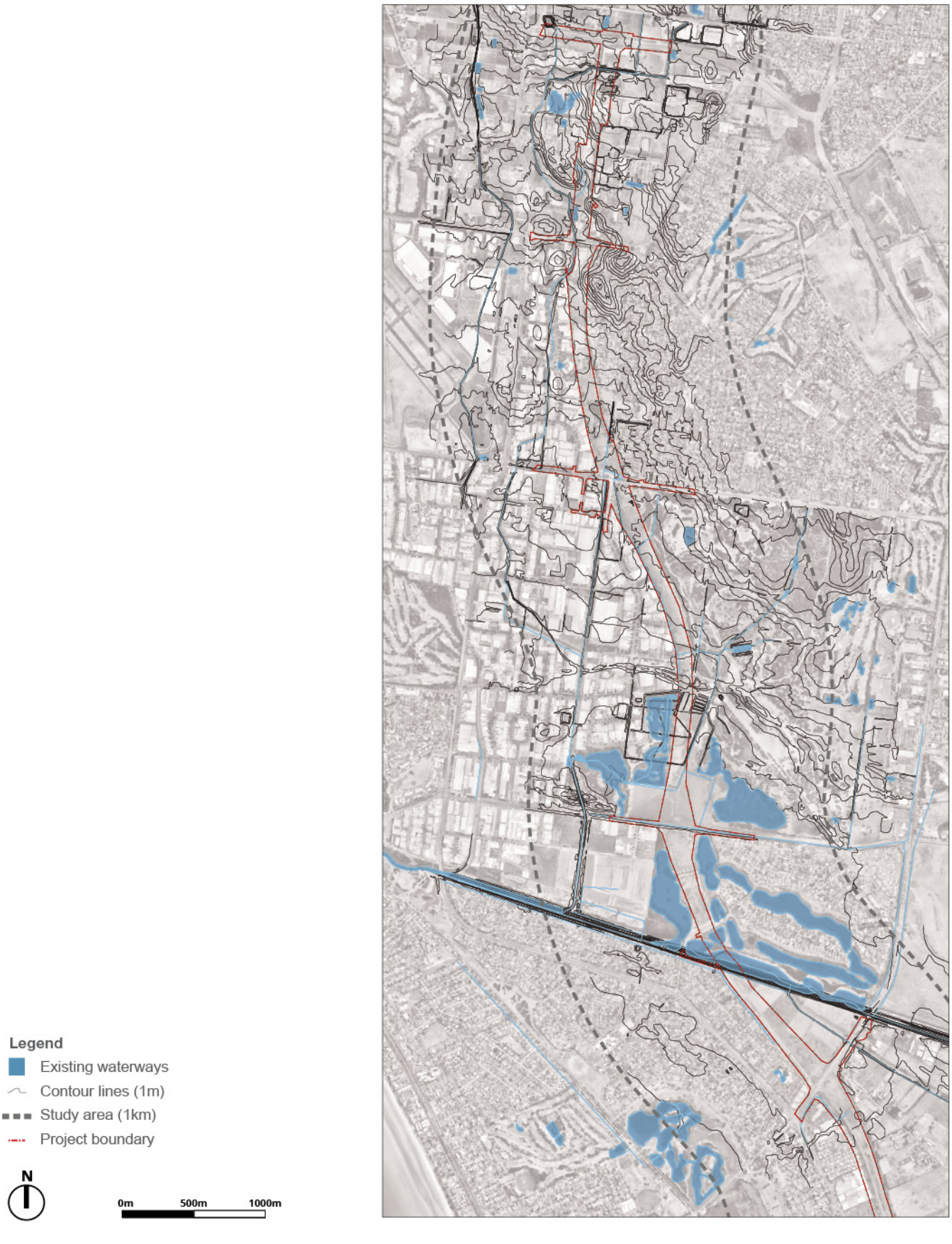


Figure 31. *General site area height above sea level, watercourses and waterbodies, with project area outlined in red*

8.1.3 Existing open spaces

A diverse range of public open spaces occur within 500m of the project area as shown in Figure 32. While some are formal public open spaces, such as Braeside Park and Chadwick Reserve, many are also areas that perform important hydrological functions, such as the Waterways estate wetlands, Mordialloc Creek and the Redwoods Garden Estate drainage reserve.

The northern, middle and southern open spaces of the project area are described as follows and identified in Figure 32:

Northern open spaces: limited formal open spaces; mostly associated with residential areas

- Riddler Court Reserve (neighbourhood area open space, Kingston City Council)
- Albert Place Reserve (neighbourhood area open space, Kingston City Council)
- William J Bardoel Park (neighbourhood area open space, Kingston City Council)
- Chadwick Reserve (local area open space, Kingston City Council)
- Redwood Gardens Estate drainage reserve (Melbourne Water)

Middle open spaces: primarily environmental and open spaces for nature-based recreation

- Braeside Park (regional open space, Parks Victoria)
- Woodland estate wetlands (Melbourne Water)
- Malcolm Road Reserve – pedestrian/bike pathway (Melbourne Water)

Southern open spaces: a diverse mix of traditional open spaces and wetland environmental open spaces

- Waterways estate wetlands and open spaces (Body Corporate and Melbourne Water)
- Mordialloc Creek Trail (district open space, Melbourne Water)
- Palm Grove Boulevard Reserve (neighbourhood area open space, Kingston City Council)
- Jackie Court open space (neighbourhood area open space, Kingston City Council)
- Royal Palms Park (neighbourhood area open space, Kingston City Council)
- Pacific Drive Reserve (neighbourhood area open space, Kingston City Council)
- Edithvale–Seaford Wetland environmental area (Regional, Dandenong Valley Water)

Notes:

The size of user catchment is identified by the City of Kingston's Open Space Strategy 2012 and the Victorian Planning Authority's metropolitan open space network map.

Figure 32. *Open spaces in the project study area*

8.1.4 Public movement networks

Public movement networks include pedestrian paths, cycle paths, informal trails and public transport routes. They provide a picture of public access throughout the study area and identify routes that may be affected by the project or potentially augmented through the project.

Pedestrian and cycle links

The Kingston Cycling and Walking Plan 2009–2013 and the Kingston Green Wedge Plan 2012 identify a number of pedestrian and bicycle networks, some of which will be affected by the project (see Figure 14). As part of this Report's development process, the City of Kingston identified specific community connections that are used more informally by the community, including informal links across the project area between the Redwood Gardens Industrial Estate and the eastern part of Chadwick Reserve.

In the broader context of the bicycle and shared path network, further east of the project site (following Mordialloc Creek's alignment and Pillars Road) is the existing EastLink Trail.

Public transport network

The public transport network is important to communities and their access to broader networks. This Report includes information on public transport as an important element of the existing conditions.

Figure 33. *Existing public transport network*

Figure 34. *Existing and propsed pedestrain and cycle paths*

8.1.5 Ecological values

Ecological considerations are of high value to the community within the study area. Flora and fauna are an integral component of the landscape character and views, and as such need to be considered in this Report.

The main ecological elements for consideration are threatened and endangered species of flora and fauna, including their desired habitat, and the environmental conditions and movement patterns that enable their survival.

Areas of ecological character (such as regional parks, wetlands and waterways) are identified in Figure 35 to highlight potential areas where more significant numbers and types of flora and fauna may exist or have been identified through planning policy.

A more detailed explanation of threatened flora and fauna and their associated habitats can be found in the Mordialloc Bypass EES Flora and Fauna Impact Assessment.

These ecological values will also inform the recommended landscape mitigation treatments and design opportunities to reduce the landscape and visual impacts of the project.

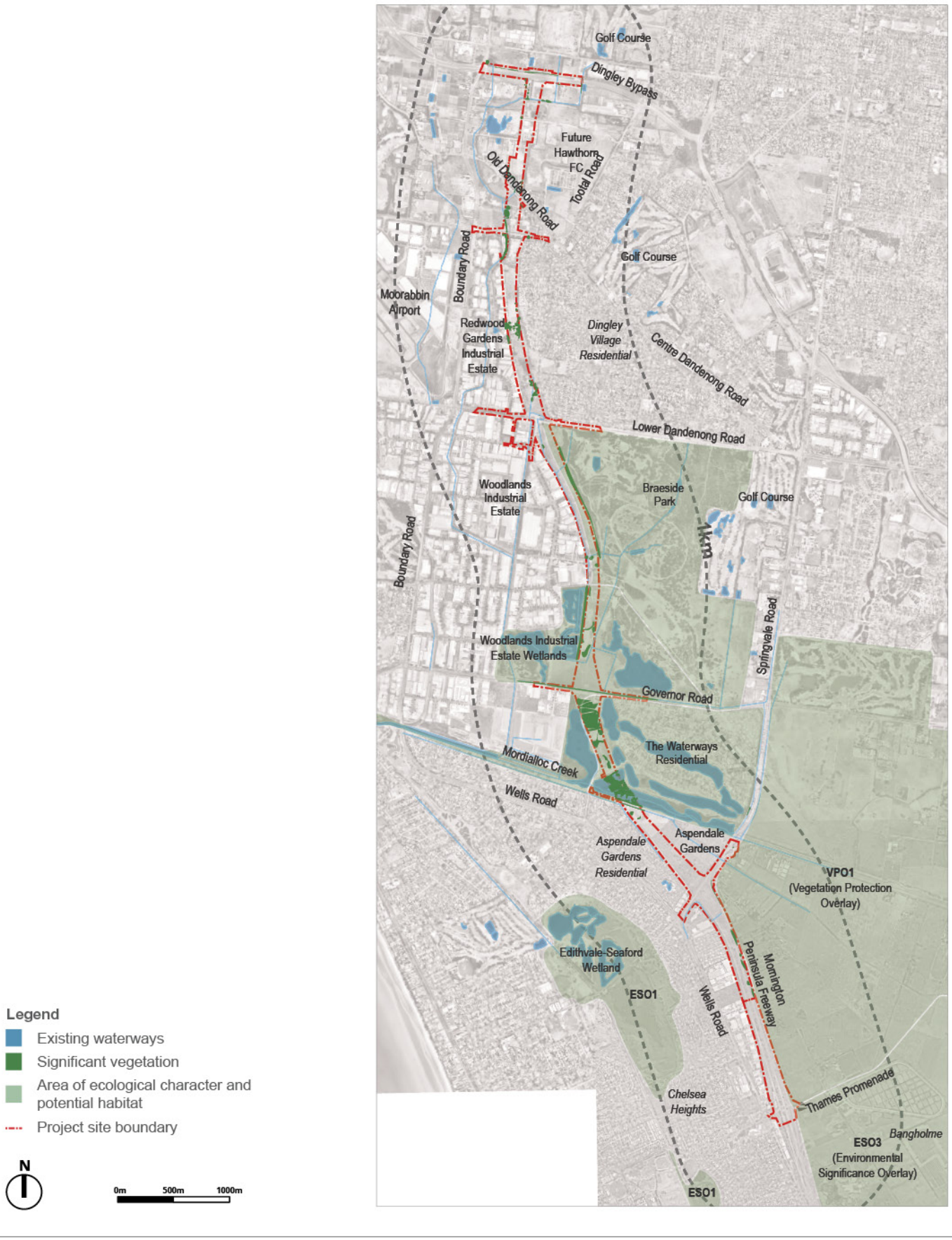


Figure 35. *Areas of significant vegetation and ecological character*

8.2 Landscape character areas

This Report identifies nine distinctive landscape character areas within the Mordialloc Bypass study site:

1. Green wedge north
2. Dingley Village residential
3. Industrial business park
4. Braeside woodlands
5. Central wetlands
6. Waterways neighbourhood
7. Aspendale / Chelsea Heights residential
8. Aspendale / Chelsea Heights commercial
9. Green wedge south

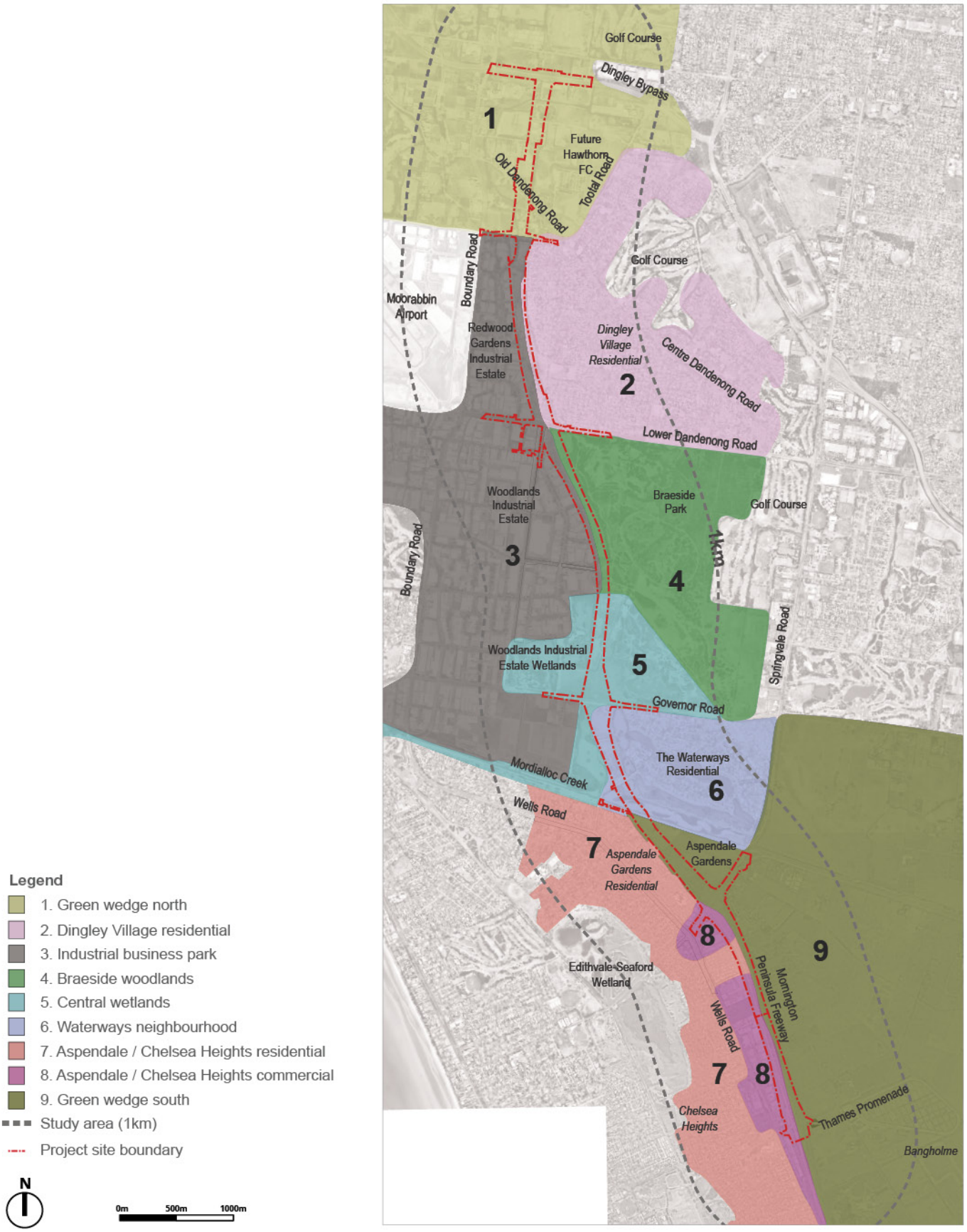


Figure 36. *Landscape character areas*

8.2.1 Green wedge north

Figure 37. *Typical view along Grange Road*

Figure 38. *View along Centre Dandenong Road (Image: Google Street View, 2018)*

Description

- This is a flat area with an agricultural and industrial character; undulating and modified earth mounds of varying scales are common.
- The roads are typically unsealed and lined with mature trees; fencing occasionally obscures views across the site.
- The vegetation character is highly dispersed and individual to each land parcel.

Landscape values

- The values of this area come from the overall conglomerate of less urban land uses in contrast to typical urban development, as per the objectives of green wedge zone land use planning.
- There are areas of highly urbanised or industrialised character, which are of low visual value. However, some views from major roads are more agricultural in nature, which are of higher visual value.
- The stands of vegetation throughout the area are of moderate value because they provide visual buffers to land uses for adjacent residential areas and those travelling through.

Landscape value: low to moderate

8.2.2 Dingley Village residential

Figure 39. *Typical view of streetscape*

Figure 40. *Typical view of public open space*

Description

- Overall, this is flat topography with a mixture of native and exotic planted vegetation.
- There is suburban low density residential character comprising mostly brick houses that are one- to two-storeys high.
- There are wide streets with footpaths, street trees and nature strips.
- A high proportion of dwellings are close to the project. Most residential properties adjacent to the project have back fences edging the project area.
- Several public open spaces are dispersed across the landscape type – typically, local area playgrounds, recreation areas and sports fields.

Landscape values

- Private residential landscapes, the streetscapes and treed open spaces are valued by the community.
- The area is predominantly an internalised urban area, with limited long-distance views to surrounding areas from streets and open spaces.
- The character is fairly typical of the south-eastern suburbs of Melbourne.

Landscape value: moderate

8.2.3 Industrial business park

Figure 41. *Typical view of streetscape*

Figure 42. *View of central drainage line and open space of the Redwood Gardens Industrial Estate*

Description

- The industrial character comprises warehouses, factories and office buildings, with a scattering of drainage reserves and small pockets of open spaces.
- The streets are sealed and wide for truck access. There are scattered lines of mature native and exotic planted trees on nature strips.
- Typically, buildings are detached and two storeys or more in height on small to medium sized blocks. They may serve as a visual barrier to the proposed project.

Landscape values

- Woodlands Industrial Estate integrates landscaping and vegetation with wide nature strips within its boundaries. This is not always typical of an industrial estate, increasing its landscape character value.
- City of Kingston has identified that Woodlands Industrial Estate also provides cafes, microbreweries and other commercial activity that enhances community use of the site.
- Vegetated and concrete drainage channels run throughout areas of this landscape character and are valued for their recreational, ecological and hydrological functions.

Landscape value: low to moderate

8.2.4 **Braeside woodlands**

Figure 43. *View along walking path in the north of the park*

Description

- Braeside Park is a regional park managed by Parks Victoria that services both the local population and the broader south-eastern population of Melbourne.
- It consists of interspersed areas of richer ecology and areas for public activities such as picnicking and walking.
- The park contains remnant heathland, grassy woodland and wetland environments, as well as a significant amount of planting for revegetation.

Landscape values

- It has significant historical, ecological, recreation and scenic values.
- The park contains remnant vegetation.
- The area is valued for its naturalistic character.
- Fine parkland views are present throughout the park, and its edges are not dominated by urban form.

Landscape value: very high

8.2.5 Central wetlands

Figure 44. *Woodlands Industrial Estate wetlands*

Description

- This is a low and open landscape of interconnected wetlands, waterlines and waterbodies. It includes both constructed urban water channels and natural water bodies.
- A large proportion of the area is a mosaic of shallow, grassy wetland and woodland.
- Wildlife, especially birds, can be readily seen and heard within these areas.
- There are three wetlands in and around the study area:

1. Woodlands Industrial Estate wetlands
2. Braeside Park wetlands
3. the Waterways estate wetlands.

Landscape values

- The wetlands and associated open spaces form an important part of the overall open space, habitat, hydraulic and recreational linkages across the area.
- They provide a complex series of views of the landscape: long, broad views across water bodies, distant views to the broader landscape and intimate, short views.
- Although industrial and residential estates border this landscape type, they do not dominate the overall character of the place.

Landscape value: very high

8.2.6 **Waterways neighbourhood**

Figure 45. *View of southern wetlands and open space*

Figure 46. *View of pedestrian boardwalks with residential neighbourhood in the background*

Figure 47. *Typical street view of neighbourhood*

Description

- The Waterways neighbourhood is an integration of a low density residential neighboured with a large scale designed waterways system.
- The landscape is generally flat with maturing planted vegetation of indigenous and native character.

- The waterways system is part of the broader Mordialloc Creek, which is channelled to the east and west.
- Built form consists of low density, one- or two-storey residential developments in earthy tones that are visually sympathetic to the existing context.
- The overall character of the Waterways and associated open spaces is naturalistic 'wetland' landscape, with broad open waterways, maturing indigenous vegetation and wildlife. The landscape is formalised by the extensive water bodies.
- Trails, boardwalks and lookouts afford an above-standard level of pedestrian connection and recreational use of the area.
- Streets are designed to provide views to the water and wrap around the waterbodies, limiting housing to the side away from the water.

Landscape values

- The landscape character area is a unique integration of residential development, wetland and open space landscape.
- The area provides a large open space and recreational asset for the community.
- The area has significant environmental benefits for the local area and the broader Mordialloc Creek system.
- The wetlands, their vegetation and associated natural character and fauna are highly valued by the community.
- Strict local planning regulations that require planting and gardens to be native or indigenous highlights the community value placed on native and indigenous vegetation and character.
- A high level of value is placed on birdlife, general wildlife and the ecological value of the area, as evidenced by the strict regulation of domestic animal management zoning.

Landscape value: very high

8.2.7 Aspendale / Chelsea Heights residential

Figure 48. *Typical view of streetscape*

Figure 49. *View of public open space*

Description

- There is suburban low density residential character comprising mostly brick houses that are one- to two-storeys high.
- There are wide streets with footpaths, street trees and nature strips.
- It has a predominantly exotic streetscape character.
- Open spaces on the northern edge are connected through to Mordialloc Creek and trail.

Landscape values

- Private residential landscapes, the streetscapes and treed open spaces are valued by the community.
- The area is predominantly an internalised urban area, with some distant views to the north through open spaces and connections to the Mordialloc Creek.
- The character is fairly typical of the south-eastern suburbs of Melbourne.

Landscape value: moderate

8.2.8 Aspendale / Chelsea Heights commercial

Figure 50. *View of commercial development on the southern side of Springvale Road*

Figure 51. *View looking north along Springvale Road towards the project area*

Description

- This is a broad, open landscape with a large road and service roads, car parking areas and setback commercial buildings.
- There is limited street tree planting, offset to a small extent by some low-lying garden beds to buildings.

Landscape values

- The area is dominated by a wide road, car parking infrastructure and low-lying buildings, with limited tree planting.

Landscape value: low

8.2.9 Green wedge south

Figure 52. *View looking north toward the project area, adjacent to Springvale Road*

Description

- This is an area of broad, open and rural landscape character.
- The landscape is flat with a mixture of agriculture and diverse land uses.
- Trees are limited to roads and property boundaries.
- Typically, there are large plots of land utilised for agriculture.

Landscape value

- The value of this area comes from the overall rural and agricultural urban land uses which are in contrast to typical urban development, as highlighted in the objectives in the green wedge zone land use planning in Section 6.3.2.
- Green wedge zones are valued for their productive and unique land uses.
- This area has rural landscape qualities and allows views to the broader distant landscapes.

Landscape value: low to moderate

8.2.10 Summary of landscape character areas and value rating

The value rating of the landscape character areas (LCAs) is presented within the framework of the project study area, rather than comparing the landscape character value to other broader Victorian landscape characters types, such as natural landscapes. The comparative values developed here are positioned within an urban and suburban framework of Melbourne and are relative to that context only.

The value ratings identified below better enable an understanding of the associated risks and cumulative risks with the project, as identified in Chapter 10 Environmental Risk Assessment.

LCA no.	LCA	Value rating
1	Green wedge north	Low to moderate
2	Dingley Village residential	Moderate
3	Industrial business park	Low to moderate
4	Braeside parklands	Very high
5	Central wetlands	Very high
6	Waterways neighbourhood	Very high
7	Aspendale / Chelsea Heights residential	Moderate
8	Aspendale / Chelsea Heights commercial	Low
9	Green wedge south	Low to moderate

Figure 53. *Landscape character area and value rating table*

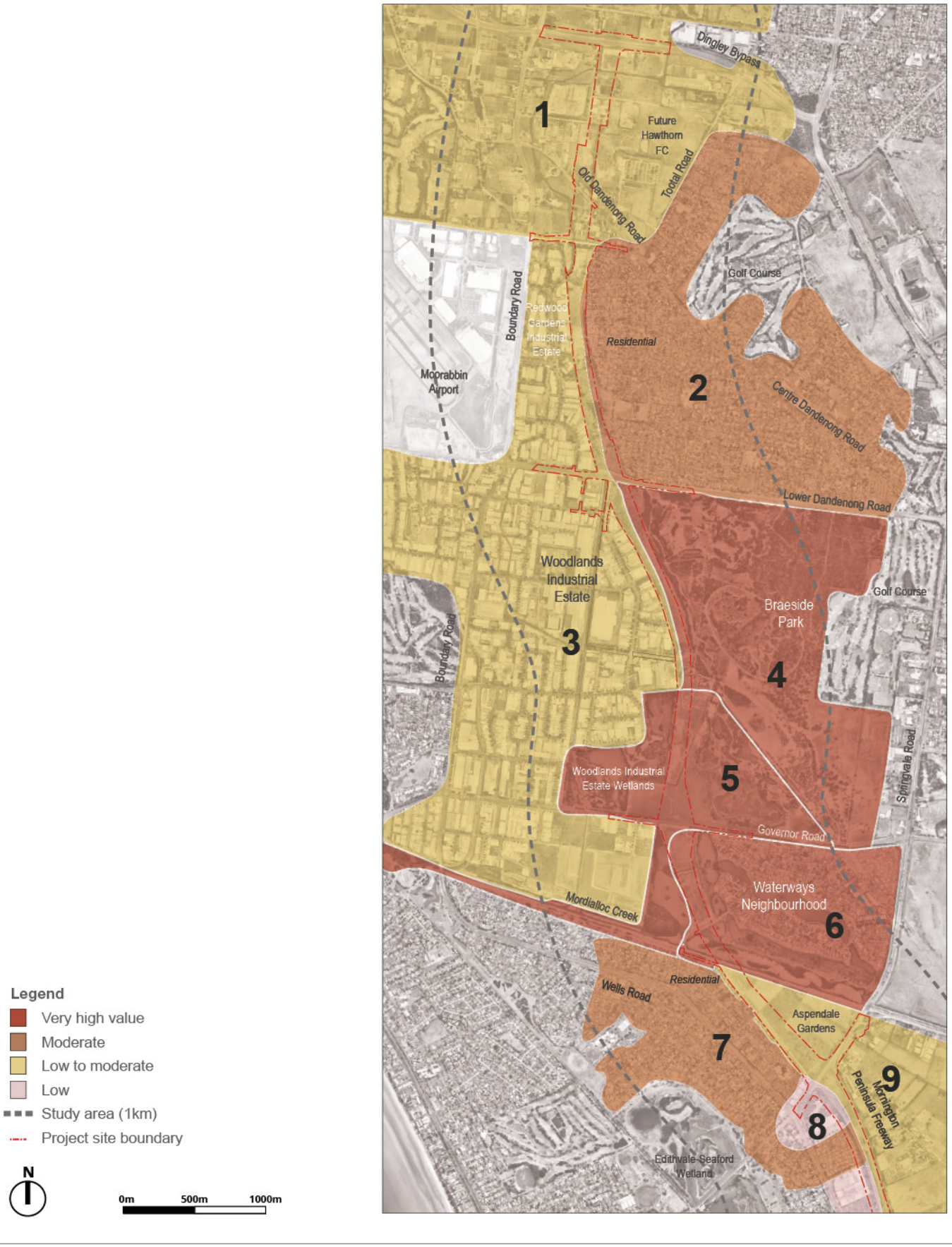


Figure 54. *Landscape character value map*

8.3 Visual amenity

8.3.1 Public places visual amenity

This Report has identified key sites throughout the study area based on their proximity to the project, identified cultural or community value, and their level and type of public usage.

These sites are sensitive to change in their visual amenity.

These sites typically include public open space, shared user paths, trails, local activity nodes (e.g. local cluster of cafés, local shops, restaurants etc.), recreational spaces, cultural heritage sites, parks and wetlands and associated lookouts or viewing areas. As there are scenic views of paddocks, wetlands and parklands from the roads which are a part of the community's daily experience, key public road views have also been considered. These sites have helped in identifying key sites and views identified in Chapter 10 Environmental Risk Assessment and further specified in 11 Landscape and visual impact assessment that may be impacted by the proposed project.

While there are many sites within the broader study area that are places of community significance, key sites are located within 500 m of the project area and have been identified in particular as having a higher level of sensitivity for the visual audience.

Type of sensitive site in project area	**Foreground (0–200m)**	**Middle ground (200–500m)**	**Background (500–1000m)**
High value (e.g. parks, open spaces, trails)	very high	high	low
Moderate value (e.g. churches, cafes, healthcare facilities)	high	moderate	low
Low value (e.g. commercial)	moderate	low	low

Figure 55. *Visual sensitivity by distance assessed for high, moderate and low sensitivity sites*

Key sensitive community sites

Potentially sensitive sites identified through the Existing Conditions Analysis process assist in identifying key risks, cumulative risks and landscape and visual impacts by the proposed project which are further identified in Chapters 10 and 11. A base line sensitivity rating is identified in Section 8.3.3-8.3.5 through the measurement of the projects proximity to the project, site visits and photographic documentation. Sites identified as moderate sensitivity and above are then further investigated through Chapter 10 Environmental Risk Assessment and Chapter 11 Landscape and visual impact assessment.

North

East side of project

- the future Hawthorn Football Club training facility
- Tootal Road green wedge residents

- Christ Church Dingley
- Riddler Court Reserve
- Bardoe Park
- Chadwick Reserve

West side of project

- Green wedge residential cluster
- Redwood Gardens Industrial Estate activity node

Middle

East side of project

- Braeside Park
  - Braeside Park trail
  - Braeside Park park rangers' office
  - Braeside Park bird hide lookout
  - Braeside Park wetlands lookout

West side of project

- Park Way shared path trail
- Woodlands Industrial Estate wetlands bushwalking trail

South

East side of project

- The Waterways
  - Waterways Barmah Place trail
  - Waterways Sunset Lagoon lookout
  - Nest Cafe
  - Waterways Outlook

West Side of Project

- Bowen Parkway at Mordialloc Creek
- Mordialloc Creek Trail
- Jackie Court and Mordialloc Creek Trail entrance
- Bangalow Way open space
- Aspendale Gardens at Springvale Road
- Edithvale Wetlands Discovery Centre
- Governor Road wetlands views

Notes:

- All views are from the location of the identified sensitive site and face towards the project area and potential high impact elements within the project (e.g. an overpass).
- All photos are a combination of onsite photography and Google Street View.
- Edithvale–Seaford Wetlands was identified within the EES Scoping Requirements however, is not considered sensitive within this LVIA as highlighted above based on it's distance from the project.

Thames Promenade

East side of project

- Chelsea Heights Commercial and Industrial Park
- Chelsea Heights Primary School

Thames Promenade sites of sensitivity are considered of low to negligible sensitivity as freeway infrastructure already exists within the area.

8.3.2 Residential sensitive areas and visual amenity

There are three residential areas identified as having a level of high sensitivity to change, because of their proximity to the project. These are:

- Dingley Village, between Lower Dandenong Road and Centre Dandenong Road
- Waterways Estate, between Governor Road and Springvale Road
- Aspendale Gardens, between Springvale Road and Sutherland Avenue.

8.3.3 Sensitive sites: northern portion of study area

Community site	Value descriptor	Value	Distance from project	Base level of sensitivity
Future Hawthorn Football Club	Future land use. Hawthorn is a popular football club within the Australian Football League. This site is considered to become a destination and will be regularly used by the Hawthorn Football Club for training and administration. The main ovals are set to be open to the community for watching training, football programs and clinics, and additional ovals will be available for community use. Other uses include cafes, retail and a museum. Community engagement for this EES has identified the developers view the bypass as a benefit in terms of access. References: http://www.heraldsun.com.au/leader/inner-south/news-story/ed9005ae5ec828cd5ce985abdcea1248 , http://www.kingston.vic.gov.au/About-Us/Media/Media-Releases/Hawthorn-FC-dingley-plans, http://www.hawthornfc.com.au/news/2015-12-03/hawthorn-lodge-their-planning-application-for-dingley  Figure 56. *An artist's impression of future club facilities (Source: http://www.hawthornfc.com.au)*  Figure 57. *Hawthorn Football Club Master Plan, submitted to City of Kingston in 2016 (Source: http://www.hawthornfc.com.au)*	very high	0–200m	moderate
Green wedge north resident cluster	A small cluster of green wedge residents exists on Old Centre Dandenong Road to the west of the project alignment. These residents may have views to the project; however, as existing industrial and mixed uses already occur here, it's anticipated to be of moderate sensitivity.	moderate	0–200m	moderate

Tootal Road green wedge	Tootal Road offers some scenic views across the green wedge zone onto open paddocks. Residential dwellings also run along the eastern edge of Tootal Road, and residents may have distant views of the project.  Figure 58. *View from Tootal Road towards the project area*	moderate	500–1000m	low
Christ Church Dingley	This church appears to be well used by the public, considering the large car park and childcare centre adjacent. Due to the distance from the project, it's sensitivity is considered moderate.  Figure 59. *View from Christ Church Dingley towards the project area*	moderate	200–500m	moderate
Riddler Court Reserve	Due to the location of this small public reserve within the Dingley Village residential area (i.e. off a local road and within a court, and with a local of community facilities), it is assumed its level of use is very local, reducing its assumed use and associated value. Existing buildings and vegetation are anticipated to visibly screen the project.  Figure 60. *View from Riddler Court towards the project area*	moderate	0–200m	low
Bardoe Park	This medium sized public park adjoins two local roads and offers a variety of community infrastructure. It is assumed its use is of a local nature and its projected use is moderate. Existing buildings and vegetation are anticipated to visibly screen the project.  Figure 61. *View from Kingston Drive (adjacent to Bardoe Park) looking towards the project area*	high	200–500m	low

Chadwick Reserve	This recreational public space is utilised for local football teams and provides a large amount of public space and community infrastructure. It is assumed its use is of a local to regional nature and its projected use is high. The City of Kingston is planning to expand the facilities and space of Chadwick Reserve in the near future. This will include moving local football teams to this location, with potentially 500–700 additional users per week, with it being used every night of the week.  Figure 62. *View from basketball court in Chadwick Reserve looking north west towards the project alignment.*  Figure 63. *School students and recreational users using informal paths*	very high	0–200m	high
Redwood Gardens Industrial Estate activity node	This is a small cluster of restaurants and cafes, an autism centre and other services. It also has an informal connection from Torquay Close and Chadwick Reserve. Sensitivity is increased due to informal community connection, local community node and specialist autism services provided to the community.  Figure 64. *View from Black Pepper Cafe looking east towards the project area*	high	0–200m	high

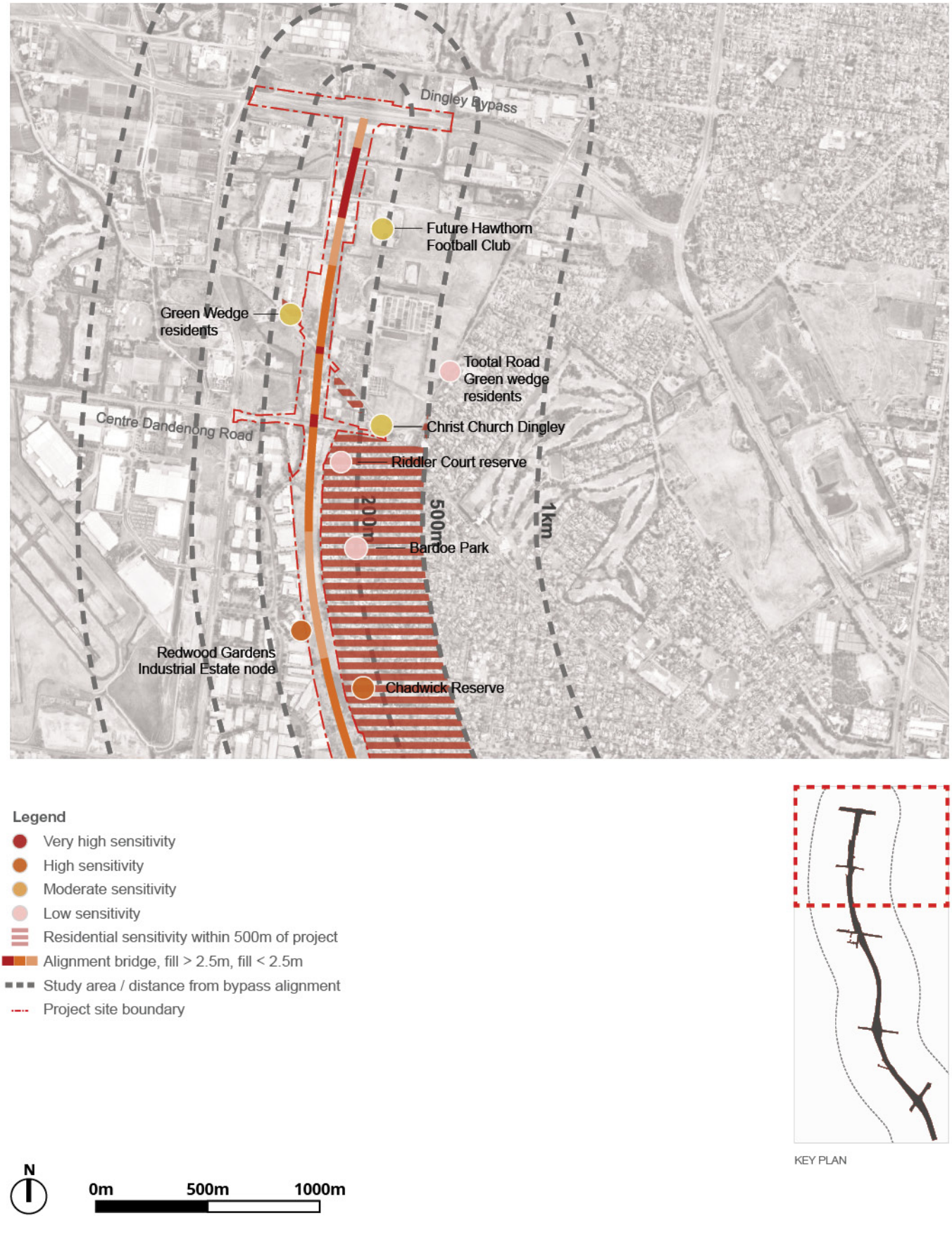


Figure 65. *Sensitive sites in the northern portion of the study area*

8.3.4 Sensitive sites: middle portion of study area

Community site	Value descriptor	Value	Distance from project	Level of Sensitivity
Woodlands Industrial Estate north entrance	The Woodlands Industrial Estate entrance on Lower Dandenong Road is one edge of Dingley Village. It utilises landscaping and signage to welcome users into the estate, with native tree planting and wide nature strips.  Figure 66. *View from the north side of Lower Dandenong Road looking south east towards Woodlands Industrial Estate and the project area*  Figure 67. *View from Lower Dandenong Road looking east towards the project area and Bell Grove*	moderate	0–200m	moderate
Braeside Park trail	This offers public space to a regional catchment and provides a reserve for flora and fauna. There are community groups focused on protecting its ecological, amenity and community values. This particular section of the trail has very little vegetation coverage and the project will potentially be clearly visible within the park; therefore, its sensitivity is significantly increased.  Figure 68. *View from Braeside Park trail looking west towards the project area*	high	0–200m	high

Braeside Park park rangers' building	Braeside Park offers public space to a regional catchment and provides a reserve for flora and fauna. The park rangers building serves as the park rangers' office, provides information to park visitors and has a heritage listing; therefore, its value is increased.  Figure 69. *View from the park rangers' building entrance looking west towards the project area*  Figure 70. *View from the park rangers building looking north towards the project area and Braeside Park trail*	high	0–200m	high
Braeside Park bird hide lookout	A bird hide within Braeside Park is provided for bird watching, and the expectation of users is to enjoy a scenic view and watch birds. This expectation and experience may be impacted by the project.  Figure 71. *View from within the bird hide, looking south west toward the project area*	high	0–200m	high

Braeside Park wetlands lookout	A lookout point is provided within Braeside Park to offer scenic views across the wetlands. The expectation of users is to enjoy the amenity and views across the wetlands. This expectation and experience may be impacted by the project. Because views are relatively clear of obstruction, there may be some minor impacts to views.  Figure 72. *View from Braeside Park wetlands lookout towards the project area*	high	500–1000m	moderate

Park Way shared path trail	A shared path is provided within Woodlands Industrial Estate to connect cyclists and pedestrians to Braeside Park. This shared path is recognised in City of Kingston's Cycling and Walking Plan 2009–2013, has been observed to be utilised by cyclists and pedestrians, and appears to be used by workers within the industrial estate for recreation over lunch. It is the only western access point for Braeside Park.  Figure 73. *View from Park Way towards the project area, with cyclist use observed*  Figure 74. *View from Braeside Park towards the project area, with worker use observed*  Figure 75. *Western entrance into Braeside Park from the Park Way shared user trail*	high	0–200m	high

Woodlands Industrial Estate wetlands bushwalking trail	Within Woodlands Industrial Estate, there are informal bushwalking trails, which have public access points and have been observed to be utilised by the community. There are clear 'goat tracks' (informal dirt paths, worn out by use) throughout the area.  Figure 76. *View of the grassy fields, looking south east towards the project area*  Figure 77. *Community using Woodlands Industrial Estate wetlands for bushwalking* Governor Road offers scenic views into Braeside Park, Woodland Industrial Estate wetlands and Waterways wetlands. These wide views across the landscape offer a rural character and experience that is unique for the area.  Figure 78. *View from Governor Road and Bate Drive looking west towards the project area*	high	200–500m	high

Figure 79. *Sensitive sites in the middle portion of the study area*

8.3.5 Sensitive sites: southern portion of study area

Community site	Value descriptor	Value	Distance from project	Level of Sensitivity
Waterways Barmah Place trail	The Waterways neighbourhood has a series of trails that provide community access to the surrounding wetlands for recreation and leisure. The northern access point is through Barmah Place and provides an indication of similar views from nearby residents.  Figure 80. *View from Barmah Place near Governor Road looking south west towards the project area*	high	0–200m	high
Waterways Sunset Lagoon lookout	This lookout provides scenic views across the Waterways wetlands and is indicative of nearby residents' views. As expectations of views from lookouts is high, this site has increased value to the community.  Figure 81. *View from Sunset Lagoon lookout looking north towards Governor Road and the project area*	high	0–200m	very high

Nest Cafe	This is a valued local community cafe with scenic views across the Waterways neighbourhood. This site was highlighted in VicRoads online community engagement portal as a point of local interest and visitation.  Figure 82. *View from Nest Cafe looking west towards the proposed Waterways overpass*  Figure 83. *View from Nest Cafe looking south east towards the proposed Springvale Road overpass*	high	500–1000m	low
Waterways Outlook	This local road provides scenic views across the wetlands. These views are also representative of the views of residents living along this southern section of the Waterways neighbourhood.  Figure 84. *View looking south east towards the proposed Springvale Road overpass*  Figure 85. *View looking west towards the proposed Waterways overpass*	high	200–500m	low

Bowen Parkway at Mordialloc Creek	Mordialloc Creek is, within the EES scoping requirements, significantly valued in policy and strategic direction, and by the community, as a recreational link. It is also a significant gateway into the Waterways neighbourhood.  Figure 86. *View from Bowen Parkway looking east towards the Mordialloc Creek Trail*  Figure 87. *Scenic views across the Waterways wetlands and Mordialloc Creek*	high	0–200m	very high
Jackie Court and Mordialloc Creek Trail informal entrance	Jackie Court open space is a small reserve of grassed area that allows informal access to Mordialloc Creek, the wetlands and Mordialloc Creek Trail. The view from Jackie Court open space is indicative of views from the Aspendale residential area in terms of the wetlands overpass and associated road infrastructure.  Figure 88. *View looking east towards the proposed Springvale Road overpass*	moderate	0–200m	moderate

Bangalow Way open space at Mordialloc Creek	This medium sized reserve has a playground, open grassed areas and native tree plantings. It also provides direct access to Mordialloc Creek, wetlands and the informal section of the Mordialloc Creek Trail; thus its value increases.  Figure 89. *View from within Bangalow Way open space*  Figure 90. *View from edge of Bangalow Way open space looking across green wedge grassy fields and residents' backyards*	high	0–200m	high
Aspendale Gardens at Springvale Road	This provides a commercial strip of shops on both sides of Springvale Road, offset with slip lanes. As identified in the landscape character description of this area, this is of low value. However, as many local community members are estimated to visit this area for doctors, the living and learning centre and general goods and services, its sensitivity slightly increases.  Figure 91. *View from medical centre looking towards proposed Springvale Road overpass*  Figure 92. *View from Springvale Road and Wells Road intersection*	moderate	0–200m	moderate

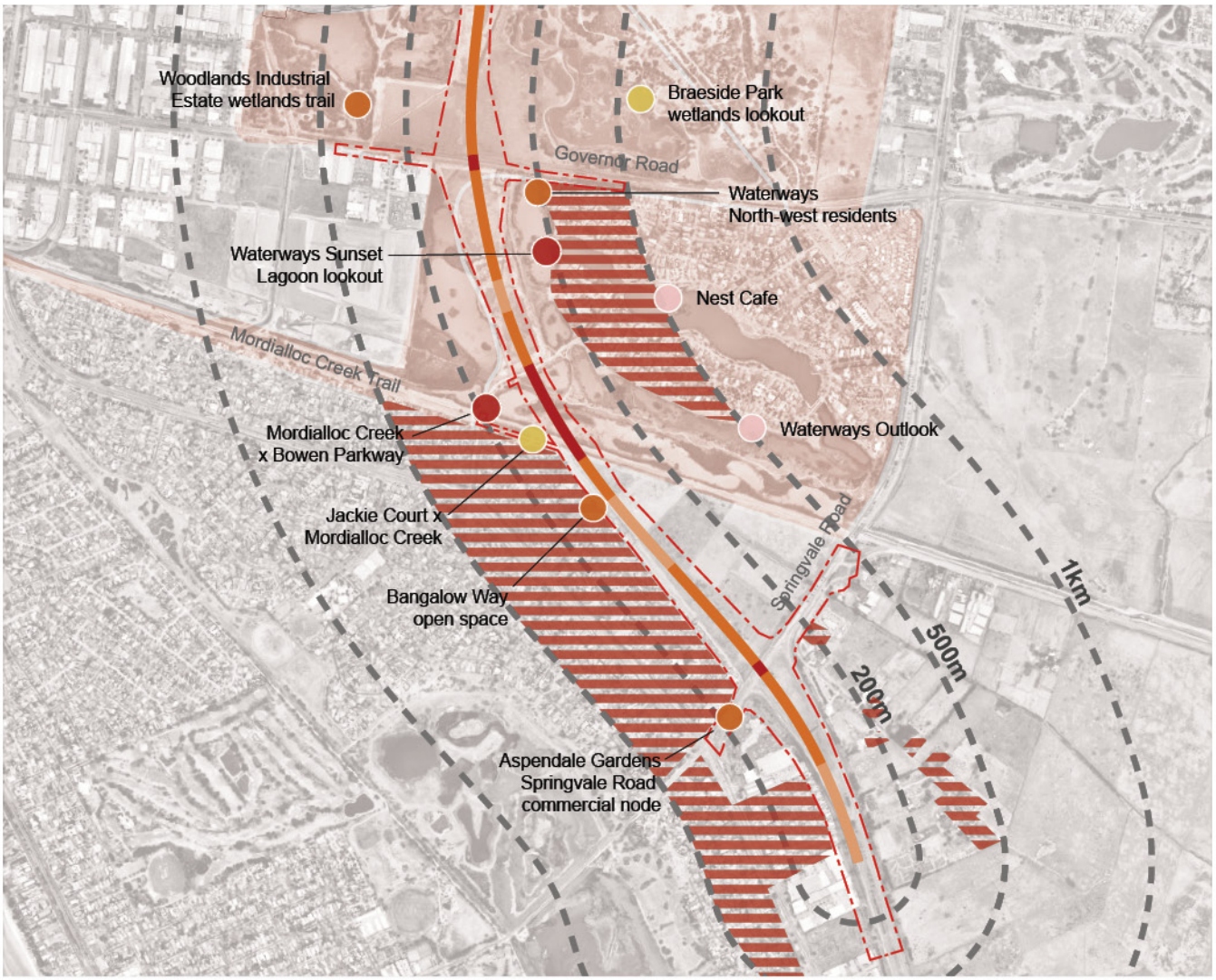


Figure 93. *Sensitive sites in the southern portion of the study area*

9. Summary of high sensitivity areas

In summary, the following key sites and areas of sensitivity have been identified as having potential landscape and visual impact effects:

- valued existing landscape characters areas
- valued community and public sites (visual audiences)
- valued open spaces, and pedestrian and community connections
- valued ecological and natural features
- residential areas in close proximity to the proposed project.

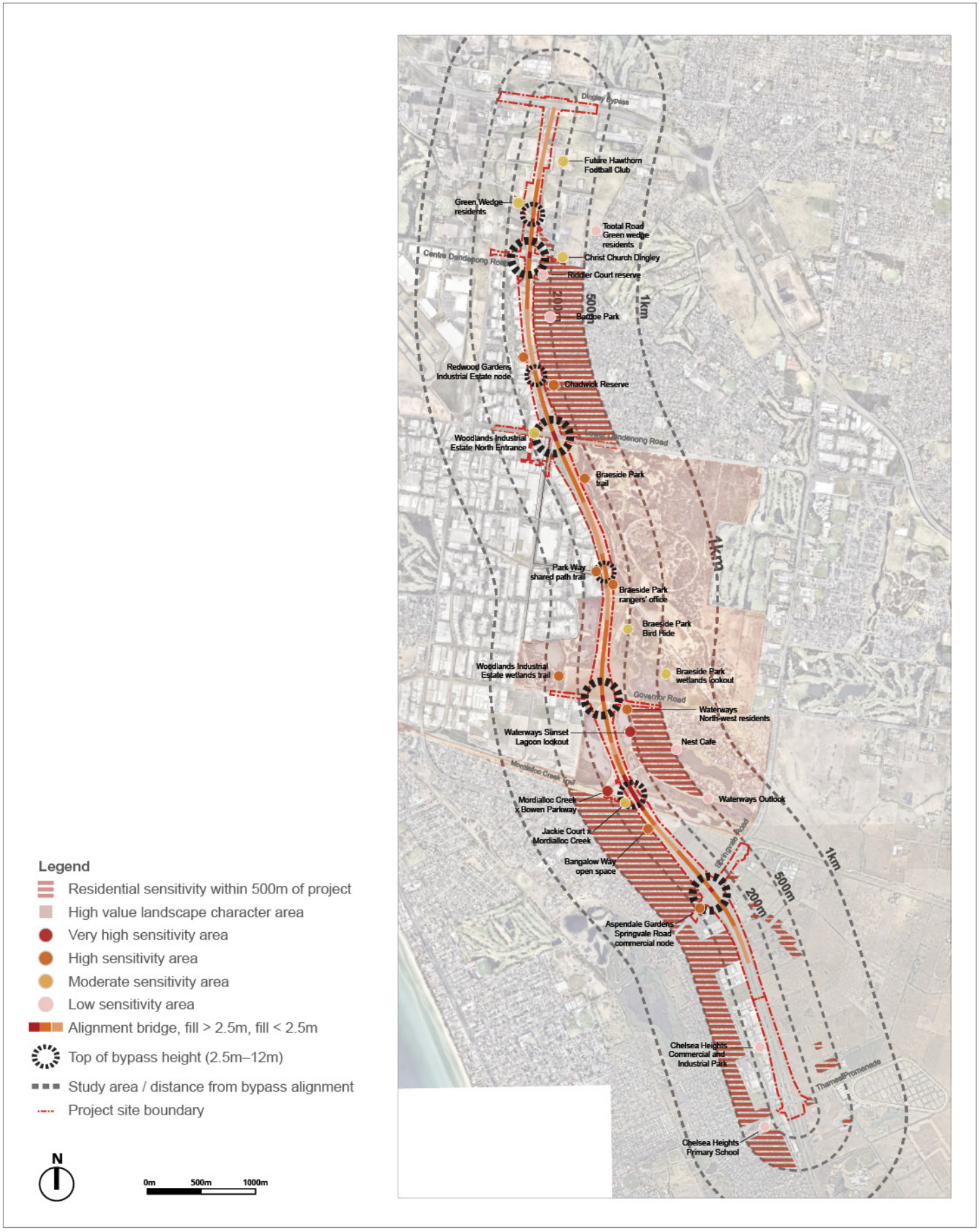


Figure 94. *Summary of high sensitivity areas and road design elements and heights*

10. Environmental Risk Assessment

10.1 Methodology

As outlined in the Ministerial Guidelines for Assessment of Environmental Effects (2006) and the Scoping Requirements for the Mordialloc Bypass Project EES (2018), a risk-based approach was adopted for the EES studies to direct a greater level of effort at investigating matters that pose relatively higher risk of adverse environmental effects. The following definitions were adopted for the assessment:

- *Environmental impact:* is described as any change to the environment as a result of a project activities.
- *Environmental risk:* As defined by the Ministerial Guidelines for Assessment of Environmental Effects Under the Environment Effects Act 1978 (DSE, 2006), *"Environmental risk reflects the potential for negative change, injury or loss with respect to environmental assets".*

The purpose of the risk assessment was to provide a systematic approach to identifying and assessing the environmental risks, including heritage, cultural, social, health, safety and economic aspects as a result of the project. It articulates the likelihood of an incident with environmental effects occurring and the consequential impact to the environment.

The impact assessment and risk assessment processes were integrated throughout the development of the EES. The environmental risk assessment (ERA) process allowed the project team to identify as many environmental risks as a result of the project as possible and refine and target impact assessments accordingly. The impact assessments ensured the project team has a robust understanding of the nature and significance of impacts and the mitigation measures developed to minimise and control those impacts.

The risk and impact assessment processes were essential components of the project design process and in the formulation of construction and additional mitigation measures to minimise environmental impacts. These assessments also underpin the establishment of the Environmental Performance Requirements (EPRs), which set out the desired environmental outcomes for the project.

The below methodology was developed to assess the potential impacts of the Mordialloc Bypass on landscape and visual and sets out the process, methods and tools used to complete the impact and risk assessments.

10.1.1 Risk assessment methodology

The risk assessment is a critical part of the EES process as it guided the level and extent of impact assessment work required and facilitated a consistent approach to risk assessment across the various technical disciplines. The risk assessment process was based on the approach defined in *ISO 31000:2018 Risk Management – Principles and Guidelines*, which describes an environmental risk management process which is iterative and supported by ongoing communication and consultation with project stakeholders. The ERA process incorporated VicRoads key risk management requirements, specifically from the VicRoads *Environmental Risk Management Guidelines (2012)* and the *VicRoads Environmental Sustainability Toolkit (2017).*

10.1.2 Scope and boundaries

The ERA assessed all project phases, namely: Initial Phase (the current approvals and concept design stage); Construction Phase; and Operations and maintenance Phase. The risk process evaluated environmental risks that would result from the development of the project based on the concept designs for the project, the draft construction methodology and the existing conditions of the study area, as well as the draft environmental impact assessment reports which were in development during the ERA.

10.1.3 Risk Identification

To effectively and comprehensively recognise all potential environmental risks that may result from the project, it was necessary to identify impact pathways for all project activities during all its project phases. An impact pathway is the cause and effect pathway or causal relationship that exists between a project activity and an asset, value or use of the environment

Environmental impact pathways were identified under two categories:

- Primary environmental impacts: The impacts to environmental values that are directly attributable to project activities within a cause and effect paradigm. Project activities cause environmental impacts (effects) on environmental values through an environmental impact pathway such as construction activities. The assessment of these impacts and their associated risks assumes that all standard mitigation measures are in place and working as intended.
- Cumulative impacts: The potential cumulative impacts to environmental values that may result from the implementation of the project. This allowed for the identification of:
    - Secondary environmental risks which may result from the implementation of a risk response in mitigating a primary environmental risk;
    - On-site aggregate risks resulting from multiple on-site project activities on an environmental asset (risks were assessed in two ways, as a single project phase and as a whole project risk);
    - Off-site cumulative environmental risks which accounted for potential off-site cumulative impacts of the Mordialloc Bypass project in conjunction with surrounding off-site projects in the local area.

10.1.4 Risk Analysis

With risks identified for each discipline, VicRoads and industry best practice and standard mitigation controls that are considered intrinsic to a project of this nature were identified, including requirements under relevant

sections of the VicRoads Standard Specifications, EPA guidelines and Government environmental management policies.

10.1.5 Risk Evaluation

The ERA process developed for the project is based on the risk analysis matrix used on recent and similar VicRoads projects, as presented in Figure 95. It follows the standard industry semi-quantitative risk analysis methodology that utilises pre-defined consequence and likelihood criteria as the factors to arrive at a risk rating.

			LIKELIHOOD				
CONSEQUENCE	Risk Categories		Rare	Unlikely	Possible	Likely	Almost Certain
			A	B	C	D	E
	Catastrophic	5	Medium	High	High	Extreme	Extreme
	Major	4	Medium	Medium	High	High	Extreme
	Moderate	3	Low	Medium	Medium	High	High
	Minor	2	Negligible	Low	Low	Medium	Medium
	Insignificant	1	Negligible	Negligible	Negligible	Low	Low

Figure 95. *Risk Assessment Likelihood Categories Table*

Based on the project objectives and context, a set of project-specific and appropriate likelihood and consequence criteria were developed in consultation with VicRoads, the TRG and technical specialists Figure 96.

LIKELIHOOD				
Less than once in 12 months OR 5% chance of recurrence during course of the contract	Once to twice in 12 months OR 10% chance of recurrence during course of the contract	3 to 4 times in 12 months OR 30% chance of recurrence during course of the contract	5 to 6 times in 12 months OR 50% chance of recurrence during course of the contract	More than 6 times in 12 months OR 100% chance of recurrence during course of the contract
The event may occur only in exceptional circumstances	The event could occur but is not expected	The event could occur	The event will probably occur in most circumstances	The event is expected to occur in most circumstances
It has not happened in Victoria but has occurred on other road projects in Australia.	It has not happened in the greater Melbourne region but has occurred on other road projects in Victoria	It has happened in the greater Melbourne region	It has happened on an road project in the region in the last 5 years	It has happened on a road project of similar size and nature in the region within the last 2 years. OR It has happened multiple times on a road project in the region within the last 5 years.
Rare	Unlikely	Possible	Likely	Almost Certain
A	B	C	D	E

Figure 96. *Landscape and visual Environmental Risk Assessment Consequences Descriptors Table*

Aspects	Insignificant	Minor	Moderate	Major	Catastrophic
Construction impacts on Landscape values	An imperceptible or barely perceptible change in a particular view or landscape characteristic within a restricted area.	A barely perceptible change in landscape characteristics over a wide area or a noticeable change over a restricted area, which will not fundamentally change the character of the landscape.	A noticeable change to landscape characteristics over a wide area or a considerable change over a restricted area, which will result in changes to the character of a landscape.	A considerable change to landscape characteristics, frequent or continuous and over a wide area or a clearly evident change, but over a restricted area, which will fundamentally change the character of a landscape.	A dominant and frequent change to landscape characteristics affecting an extensive area, which will fundamentally change the character of a landscape or view considered to be of at least regional importance.
Construction impacts on Visual amenity	Change which is barely visible, typically at a very long distance and/or visible for a very short duration, and/or are expected to blend with the existing view.	Minor changes in views typically at longer distances or visible for a short duration, and/or are expected to blend in with the existing view to a moderate extent.	Clearly perceptible changes in views, typically at intermediate distances and/or resulting in either a distinct new element in a significant part of the view, or a wider ranging, less concentrated change across a wider area.	Major changes in view, typically at close distances and/or affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of a view considered to be of at least regional importance.	Major changes in view, typically at close distances and/or affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of a view considered to be of at least regional importance.
Cumulative effects	Scope and Boundaries: Scope of cumulative effects is predominantly focussed on current and the last decade of local community perception of existing landscape character and views. Historical land use change and development is considered to quantify the value and permanence of existing landscape characters, views and uses and influence mitigation options. Future projects, land use changes and desired strategic outcomes identified by local Council and other bodies (e.g. Living Links) are considered to ensure the project is strategically considered and to minimise future negative residual impacts. Cumulative effects boundaries are considered 1km radius from the project.				

Figure 97. *Landscape and visual consequence categories*

For all risks rated medium, high or extreme in the initial risk rating, technical specialists were required to identify additional controls which could be implemented to further reduce risk and to perform the residual risk rating. Additional controls specify management measures over and above those considered as Standard Controls to ensure the residual risk has been effectively avoided or mitigated to as low as reasonably practicable.

Where risks could not be eliminated or sufficiently reduced (e.g. by engineering controls or re-design), these will typically be addressed by specific conditions in a site Environmental Management Plan (EMP), or be the subject of a separate management plan, including adaptive management plans based on ongoing studies or monitoring.

10.1.6 Environmental performance requirements

Following the evaluation of risk and through consultation with VicRoads, EPR's were developed to define, relevant, achievable and measurable environmental outcomes for the project. The mitigation measures identified during the risk assessment process were used to inform the EPRs and also specify the means by which the EPRs are to be satisfied. The EPRs to landscape and visual impacts are referenced in Chapter 13.1.1 Environmental Performance Requirements and outlined in Figure 194.

10.1.7 **Key Findings**

Impacts to landscape and visual can be summarised into five categories:

- Land access issues for local land users
- Visual or physical impact upon key sites
- Impacts upon landscape character types
- Does not support revegetation
- Visual or physical impact upon key views

The primary environmental risks identified for landscape and visual are provided in Figure 98. The initial risk ratings presented below for both project and cumulative impacts consider standard inherent controls as listed in the Environmental Risk Assessment Report. The additional controls listed in the tables below are those recommended to further mitigate and minimise the primary environmental risks which were risk rated as medium or above. Primary environmental risks which were scored as low did not require additional controls to be applied.

Also included in the table below are any identified on-site project related cumulative risks, including: secondary risks (resulting from the implementation of a risk response in mitigating a primary environmental risk) and on-site aggregate cumulative risks (the aggregate / combined primary environmental risks resulting from diverse project activities having an impact on the same environmental asset.

Key projects that may contribute to cumulative impacts are investigated in Figure 99. Cumulative risk rating table and referenced to in their associated landscape and visual impacts in Chapter 11 Landscape and visual impact assessment where required. These projects include;

- City of Kingston development of Chadwick Reserve
- City of Kingston development of projects identified in Green Wedge Plan
- Living Links Projects
- Hawthorn Football Club development
- Moorabbin Airport Development - implementation of Master Plan, including commercial developments.

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	Likelihood	Rating			Consequence	Likelihood	Rating
R-VL1	Land access issues for local land users	Poor sightlines and low passive surveillance levels impact on pedestrian / bicycle safety and personal security	Social	Moderate	Almost Certain	High	Engage a Crime Prevention Through Environment Design auditor during design stages for key areas where passive surveillance is anticipated to be low. Implement mitigation measures identified in the LVIA as far as practicable. Integrate additional publicly accessible community infrastructure and amenity in line with local Council strategies and direction.	LV1, LV2, S1	Moderate	Possible	Medium
R-VL2	Visual or physical impact upon key sites	Lighting of public places being compromised by tree planting	Social, Ecology	Minor	Possible	Low	Impacts anticipated to be minimised through standard controls.	LV1, LV2, LV3	Minor	Possible	Low
R-VL3	Visual or physical impact upon key sites	Visual impact of new structures, including overpasses and noise walls	Social, ecology	Major	Almost Certain	Extreme	Undertake bridge design and bypass design (including noise walls) to minimise visual impacts as far as practicable. Utilise landscape planting to reduce visual impacts of structures on sensitive areas and audiences. Implement mitigation measures identified in the LVIA and LUDS as far as practicable.	LV1, LV7, NV1, S1	Major	Likely	High

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	Likelihood	Rating			Consequence	Likelihood	Rating
R-VL4	Land access issues for local land users	Road alignment and design changes established patterns of movement & recreational use (including informal networks)	Social	Moderate	Almost Certain	High	Include landscape and trail design in consultation process and establish connections based on community use and feedback. Where practicable, provide additional cycling and pedestrian overpasses and underpasses at regular intervals for enhanced connection - especially east to west connections. Integrate additional publicly accessible community infrastructure and amenity where practicable, this should be in line with local Council strategies and direction. Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV2, LV3, LV7, S1, S2	Moderate	Rare	Low
R-VL5	Visual or physical impact upon key sites	Visual and experiential impact of project on highly sensitive sites	Social, ecology	Major	Likely	High	Work with ecologists and hydrologists to enhance amenity, ecological and hydrological benefits of other areas of project Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV7, S1, NV1	Major	Possible	High

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	Likelihood	Rating			Consequence	Likelihood	Rating
R-VL6	Impacts upon landscape character types	Direct loss of woodland and wetland landscapes that are critical to the regional landscape character and quality	Ecology	Major	Likely	High	Minimise removal of trees and other vegetation and undertake revegetation where practicable and appropriate. Design the road corridor landscape to connect existing landscape areas. Implement mitigation measures identified in the LVIA and Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Major	Possible	High
R-VL7	Impacts upon landscape character types	Tree removal resulting from construction causes the physical disconnection of existing landscapes and the loss of landscape character values	Ecology	Moderate	Possible	Medium	Implement mitigation measures identified in the LVIA and Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Moderate	Unlikely	Medium

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	Likelihood	Rating			Consequence	Likelihood	Rating
R-VL8	Does not support revegetation	Soil instability and steep batter slopes lead to a loss of plants and situations that cannot be fully remediated resulting in a failure of landscaping.	Ecology	Minor	Unlikely	Low	Work with ecologists and hydrologists to enhance amenity, ecological and hydrological benefits of other areas of project where practicable. Implement mitigation measures identified in the LVIA and Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV7	Minor	Unlikely	Low
R-VL9	Impacts upon landscape character types	Loss of habitat or habitat connectivity that is critical to ecological sustainability and overall landscape character	Ecology	Moderate	Likely	High	Undertake landscape design to maximise appropriate vegetation and provision of habitat where practicable. Implement mitigation measures identified in the LVIA Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Moderate	Possible	Medium
R-VL10	Visual or physical impact upon key Views	New works expose views of industrial land uses or other low quality land uses		Minor	Likely	Medium	Refine landscape design to enhance amenity and maximise appropriate vegetation where practicable in low quality visual amenity areas. Implement mitigation measures identified in the LVIA as far as practicable. Staging of project activities to minimise visual impacts where practicable and appropriate.	LV1, LV3, LV7	Minor	Possible	Low

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	Likelihood	Rating			Consequence	Likelihood	Rating
R-VL11	Visual or physical impact upon key Views	Disconnection between residents and established landscape views	Social	Moderate	Almost Certain	High	Refine landscape planting to reduce visual impacts. Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV6, LV7	Moderate	Possible	Medium
R-VL12	Visual or physical impact upon key Views	Impacts on visual connection between related landscape elements	Social	Moderate	Almost Certain	High	Ensure bridge design and bypass design (including noise walls) minimises visual impacts as far as practicable. Work with ecologists and hydrologists to enhance amenity and experience of impacted sensitive sites where practicable. Implement mitigation measures identified in the LVIA as far as practicable. Design stage audit.	LV1, LV3, LV6, LV7, B1, B3	Moderate	Possible	Medium

Risk assessment register table												
Risk ID	**Impact Pathway**	**Primary Environmental Risk Description**	**Secondary Env. Risk**	**Initial risk**			**Additional Mitigation / Controls**	**EPR**	**Residual risk**		
				Consequence	**Likelihood**	**Rating**			**Consequence**	**Likelihood**	**Rating**
R-VL13	**Aggregate cumulative effect** Visual or physical impact upon key Views	Project activities such as clearing, earthworks and construction, cause dust and other air quality impacts that limit visibility, compounding impact on key views.		Major	Likely	High	Undertake bridge design and bypass design (including noise walls) to minimise visual impacts as far as practicable. Work with ecologists and hydrologists to enhance amenity and experience of impacted sensitive sites. Implement mitigation measures identified in the LVIA as far as practicable. Refine landscape design to enhance amenity and maximise appropriate vegetation where practicable in low quality visual amenity areas. Appropriate staging of project activities.	LV1, AQ1, AQ2, B3	Major	Unlikely	Medium

Figure 98. *Risk assessment register table*

CUMULATIVE RISK RATING TABLE								
RISK ID	IMPACT PATHWAY	PROJECTS CONSIDERED	CUMULATIVE RISK DESCRIPTION	ADDITIONAL MITIGATION / CONTROLS	EPR	CUMULATIVE RISK RATING		
						CONSEQUENCE	LIKELIHOOD	RATING
R-VL1	Poor sightlines and low passive surveillance levels impact on pedestrian / bicycle safety and personal security	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and non of them have been identified as significantly increasing the risk. The development of the Hawthorn football club project may have impacts on this depending on final design.	Engage a Crime Prevention Through Environment Design auditor during design stages for key areas where passive surveillance is anticipated to be low. Implement mitigation measures identified in the LVIA as far as practicable. Integrate additional publicly accessible community infrastructure and amenity in line with local Council strategies and direction.	LV1, LV2, S1	Moderate	Possible	Medium
R-VL3	Visual impact of new structures, including overpasses and noise walls	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and none of them have been identified as significantly increasing the risk. However each project may increase the number of public users in the areas adjacent to the Project which may increase the number of sensitive receptors, therefor the level of perceived impact.	Undertake bridge design and bypass design (including noise walls) to minimise visual impacts as far as practicable. Utilise landscape planting to reduce visual impacts of structures on sensitive areas and audiences. Implement mitigation measures identified in the LVIA and LUDS as far as practicable.	LV1, LV7, NV1, S1	Major	Likely	High

CUMULATIVE RISK RATING TABLE								
RISK ID	IMPACT PATHWAY	PROJECTS CONSIDERED	CUMULATIVE RISK DESCRIPTION	ADDITIONAL MITIGATION / CONTROLS	EPR	CUMULATIVE RISK RATING		
						CONSEQUENCE	LIKELIHOOD	RATING
R-VL4	Road alignment and design changes established patterns of movement & recreational use (including informal networks)	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and none of them have been identified as significantly increasing the risk. If anything they will improve upon connection.	Include landscape and trail design in consultation process and establish connections based on community use and feedback. Where practicable, provide additional cycling and pedestrian overpasses and underpasses at regular intervals for enhanced connection - especially east to west connections. Integrate additional publicly accessible community infrastructure and amenity where practicable, this should be in line with local Council strategies and direction. Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV2, LV3, S1, S2	Moderate	Rare	Low
R-VL5	Visual and experiential impact of project on highly sensitive sites	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and none of them have been identified as significantly increasing the risk.	Work with ecologists and hydrologists to enhance amenity, ecological and hydrological benefits of other areas of project Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV7, S1, NV1	Major	Possible	High

CUMULATIVE RISK RATING TABLE								
RISK ID	IMPACT PATHWAY	PROJECTS CONSIDERED	CUMULATIVE RISK DESCRIPTION	ADDITIONAL MITIGATION / CONTROLS	EPR	CUMULATIVE RISK RATING		
						CONSEQUENCE	LIKELIHOOD	RATING
R-VL6	Direct loss of woodland and wetland landscapes that are critical to the regional landscape character and quality	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and none of them have been identified as significantly increasing the risk.	Minimise removal of trees and other vegetation and undertake revegetation where practicable and appropriate. Design the road corridor landscape to connect existing landscape areas. Implement mitigation measures identified in the LVIA and Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Major	Possible	High
R-VL7	Tree removal resulting from construction causes the physical disconnection of existing landscapes and the loss of landscape character values	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	There is no anticipated cumulative effects on this risk and impact.	Implement mitigation measures identified in the LVIA and Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Moderate	Unlikely	Medium

CUMULATIVE RISK RATING TABLE								
RISK ID	IMPACT PATHWAY	PROJECTS CONSIDERED	CUMULATIVE RISK DESCRIPTION	ADDITIONAL MITIGATION / CONTROLS	EPR	CUMULATIVE RISK RATING		
						CONSEQUENCE	LIKELIHOOD	RATING
R-VL9	Loss of habitat or habitat connectivity that is critical to ecological sustainability and overall landscape character	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed, if construction of these projects is happening at the same time, this may increase this risk.	Undertake landscape design to maximise appropriate vegetation and provision of habitat where practicable. Implement mitigation measures identified in the LVIA Mordialloc Bypass EES Flora and Fauna Impact Assessment report as far as practicable.	LV1, LV6, LV7, B1, B3, B6	Moderate	Possible	Medium
R-VL10	New works expose views of industrial land uses or other low quality land uses	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	There is no anticipated cumulative effects on this risk and impact.	Refine landscape design to enhance amenity and maximise appropriate vegetation where practicable in low quality visual amenity areas. Implement mitigation measures identified in the LVIA as far as practicable. Staging of project activities to minimise visual impacts where practicable and appropriate.	LV1, LV3, LV7	Minor	Possible	Low

CUMULATIVE RISK RATING TABLE								
RISK ID	IMPACT PATHWAY	PROJECTS CONSIDERED	CUMULATIVE RISK DESCRIPTION	ADDITIONAL MITIGATION / CONTROLS	EPR	CUMULATIVE RISK RATING		
						CONSEQUENCE	LIKELIHOOD	RATING
R-VL11	Disconnection between residents and established landscape views	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed, besides Chadwick Reserve, which may impact views during construction, none of them have been identified as significantly increasing the risk.	Refine landscape planting to reduce visual impacts. Implement mitigation measures identified in the LVIA as far as practicable.	LV1, LV6, LV7	Moderate	Possible	Medium
R-VL12	Impacts on visual connection between related landscape elements	City of Kingston development of Chadwick Reserve City of Kingston development of projects identified in Green Wedge Plan Living Links Projects Hawthorn Football Club development Moorabbin Airport Development - implementation of Master Plan, including commercial developments.	Identified projects have been assessed and none of them have been identified as significantly increasing the risk.	Ensure bridge design and bypass design (including noise walls) minimises visual impacts as far as practicable. Work with ecologists and hydrologists to enhance amenity and experience of impacted sensitive sites where practicable. Implement mitigation measures identified in the LVIA as far as practicable. Design stage audit.	LV1, LV3, LV6, LV7, B1, B3	Moderate	Possible	Medium

Figure 99. *Cumulative risk rating table*

11. Landscape and visual impact assessment

Landscape and visual impacts

All impacts identified here assume that the VicRoads standard mitigation measures (specified in Section 11.1) are in place and performing well. The following landscape and visual impacts have been identified and specified in more detail, they build on the risks and cumulative risks identified in Chapter 10 Environmental Risk Assessment and corresponding risk rating tables.

Some typical impacts are discussed below.

Landscape character and ecological impacts

- **Significant change in character** – the accumulative effects of varying changes to topography, vegetation and general views can alter the overall character of an area.
- **Loss of vegetation** – loss of vegetation can have impacts upon the existing landscape character.
- **Change in general visual amenit**y – changes in topography and vegetation and the introduction of a new large-scale infrastructure element can change the overall views and visual amenity within a landscape character area.
- **Ecological impact** – ecological habitat and naturally perceived visual amenity is a large part of the study area's value, so the key ecological impacts identified in the Mordialloc Bypass EES Flora and Fauna Impact Assessment will be referred to.

Visual impacts on public spaces, sites of sensitivity and adjacent areas

- **Overpasses** – overpasses and their associated structural fill are considered large-scale changes in the landscape; as this is a flat landscape, any new structure over 8m high may be visible from adjacent areas.
- **Fill** – earth fill above 2m causes a change in topography, and generally impacts existing immediate views, as this site is relatively flat.
- **Noise walls** – noise walls may be 3–7m high depending on the location; they will impact existing views and experiences of some public accessible spaces.

Public safety impacts

- **Pedestrian safety concern** – some areas (such as the shared user path and pedestrian underpasses) pose pedestrian safety risks in terms of feeling safe in a public space, poor levels of passive surveillance and being able to escape a threatening situation. A sense of openness, clear sight lines, high levels of passive surveillance and accessible entry and exit points can improve actual and perceived risks to the public.

Movement impacts

- **Community movement severance or alteration** – existing community movement patterns to public transport, community spaces and places of employment, may be altered or severed by the project alignment.

Lighting impacts

- **Light spillage from street lights** – across the length of the project site, light spillage will contribute to visual impacts at varying degrees during night time. This is dependent on the height of lamp posts, their design and location. Typically, the impacts of light spillage are more concentrated at intersections and underpasses due to standard road lighting requirements at these junctures.

- **Lighting infrastructure** – during the day light pole infrastructure will contribute to visual impacts at varying degrees. This is dependent on the height of the lamp posts, their structural design and location.
- **Transitory light spillage from traffic headlights** – light spillage from vehicular traffic's headlights utilising the bypass at night time will contribute to visual impacts across the length of the project site to varying degrees. This is dependent on all aspects of the road design, predominantly to road height, noise wall height, materials used and their transparency and vegetation and other materials which border and/or screen views of the bypass.

Note: It is advised a lighting specialist is included at design development stage to ensure light spillage is reduced as far as practicable and appropriate.

These impacts respond to the main relevant EES evaluation objectives for this Report:

- Amenity and environmental quality – minimise adverse noise and other amenity effects on nearby residents and land uses, having regard to relevant limits, targets or standards.
- Biodiversity – avoid or minimise potential adverse effects on native vegetation, protected and listed threatened and migratory species and ecological communities, and habitat for these species, and the Ramsar-listed Edithvale–Seaford Wetland, as well as address offset requirements for residual environmental effects consistent with state and Commonwealth policies.
- Social, land use and infrastructure – minimise potential adverse social and land use effects, including impacts on existing infrastructure and open space.
- Transport efficiency, capacity and safety – to provide for an effective connection between the Mornington Peninsula Freeway and the Dingley Bypass, to improve travel efficiency, road safety, and network capacity, as well as improve amenity and local transport networks in the Aspendale/Dingley area.

All impacts are investigated through their associated sub-study areas.

11.1 Mitigation measures

11.1.1 Standard mitigation measures

The impacts of the project are assessed after the application of standard mitigation seven years post-construction, rather than pre-mitigation. These mitigation measures provide more detail on standard controls identified in Chapter 10 Environmental Risk Assessment.

The standard mitigation measures are the standard landscape and design treatments that VicRoads undertakes, as far as practicable, as part of any major road project. They are described in VicRoads Contract Shell DC1: Design and Construct, April 2012. They provide a level of mitigation that is required to minimise typical physical impacts on the environment and the community.

The VicRoads standard environmental protection measures that would be adopted for this Project include:

- planting within the right of way (ROW)
- the use of a combination of landform and planting within the ROW to screen the road from adjacent residences and sensitive areas, this is also referred to as “planted earth mounds” within the Landscape and Urban Design Strategy mapping in the appendix. These should only be utilised where practicable, where physical space allows and need to consider surface water run-off and flood storage effects.

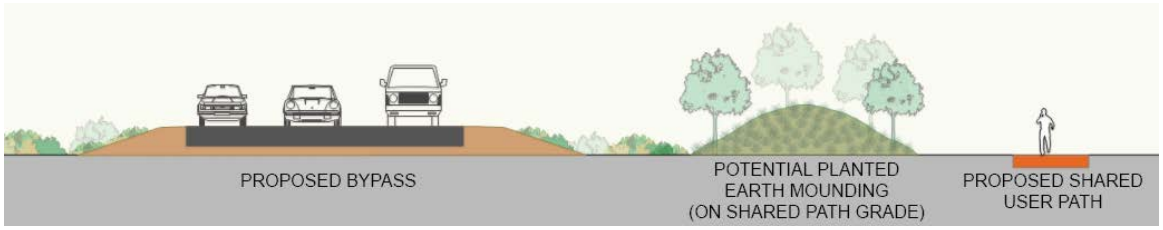


Figure 100. *An example of planted earth mounding at grade with the proposed shared user path*

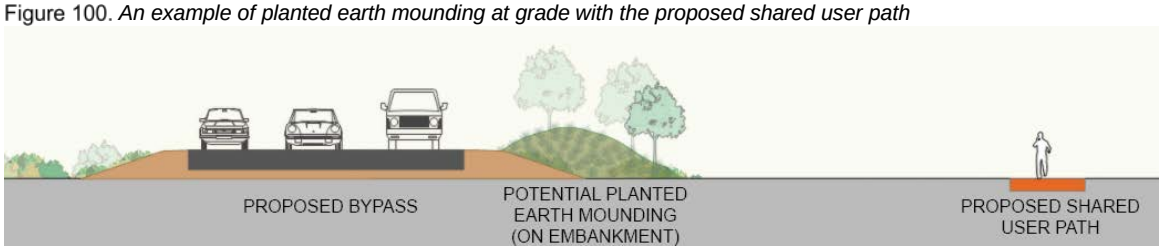


Figure 101. *An example of planted earth mounding on the proposed road embankment*

- locating and designing bridges/culverts to complement and accommodate wildlife links, revegetation and creek systems
- considering fencing and potential safety issues with wildlife culverts
- minimising visual noise in wetland zones
- revegetating wetland areas with appropriate riparian species
- locating and designing watercourse crossings to minimise loss of riparian vegetation and to accommodate erosion control methods
- planting and mulching of unstable batters to reduce the risk of erosion
- encouraging indigenous planting to the ROW boundary to strengthen the extent of the landscape character, where relevant
- using bioretention swale treatment for the stormwater drainage design

- installing hoardings during construction to minimise visual construction impacts on sensitive sites and residential areas
- considering appropriate size, visual amenity and ease of maintenance of the roadside landscape
- modifying the shared user path alignment, landscape planting and design to maximise the distance of pedestrians' and cyclists' line of sight for increased passive surveillance and safety in identified safety risk areas. (See the Austroads guidelines and the Urban Design Guidelines objectives, specifically 2.2.3 "To ensure pedestrian and bicycle paths maximise pedestrian and cyclist safety, amenity and security" and 2.2.5 "To minimise hazards to pedestrians and cyclists from path edges".)

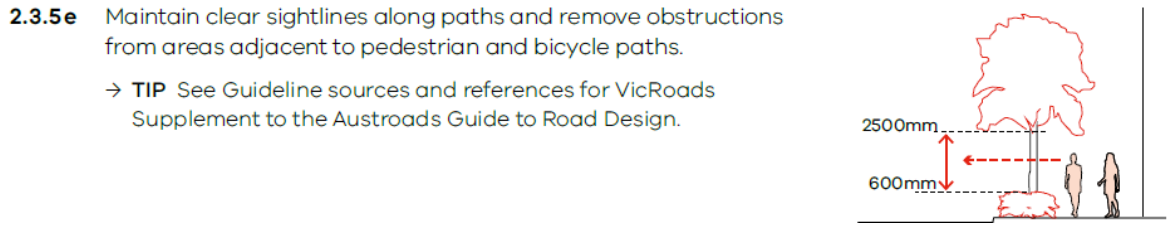


Figure 102. *Urban Design Guidelines objective 2.3.5e (Source: Urban Design Guidelines for Victoria)*

11.1.2 Non-standard mitigation measures and priority

As a result of the risk assessment process outlined in Chapter 10 Environmental Risk Assessment and the development of this LVIA, additional project-specific controls have been proposed to reduce the landscape and visual impact of the project. These also identify potential opportunities to enhance overall project outcomes. These are referred to as non-standard mitigation measures and add more detail to the additional controls identified in Figure 98 Risk assessment register table.

Appendix item 15 Landscape and Urban Design Strategy summarises these measures and provides specified locations of these measures and associated opportunities. Where there is further detailed information required due to site specific responses, see corresponding individual impact assessment sections. To assist in detailed design and construction phases of the project, key priority sites for non-standard mitigation measures have been highlighted in aims to improve the overall project outcomes and minimise visual and landscape impacts as far as practicable.

Non-standard mitigation is assessed after seven years post-construction and include;

Ensure bridge design minimises visual and landscape impacts and enhance amenity, public use, passive surveillance levels and recreational offer to the extents practicable

This includes all aspects of the bridge design including, materials, noise walls, abutments and embankments. Bridge design must respond to sensitive areas, existing character and/or key gateway sites.

Objective:

Minimise visual impact and overshadowing of bridges, noise walls and associated fill as far as practicable by considering the following;

- Reduce visual bulk and scale of the structure
- Consider integrated bridge design and key elements such as span, height, deck depth and crossheads
- Minimise bridge piers

- Separate bridge decks or incorporate light wells to increase natural light filtration to associated underpasses
- Incorporate recessive vertical abutments
- Noise walls and bridge structures to be considered and designed together as one structure, rather than two separate structures/elements
- Colour and materials to blend in with existing character of the area
- Enhance usability in bridge underpasses for recreation and leisure, to encourage use and increase safety under bridges

Where to apply:

Key sensitive bridges that require non-standard mitigation measures include the Waterways wetlands overpass, Governor Road overpass and Lower Dandenong Road overpass.

All underpasses (both bridge and culvert design) should aim to maximise passive surveillance levels for pedestrians and cyclists as far as practicable.

Priority sites:

Waterways wetlands overpass is of very high sensitivity and a significant ecological area.

Governor Road overpass is considered a key gateway and landscape due to the wetlands character surrounding, access to Braeside Park and the Waterways neighbourhood.

Lower Dandenong Road overpass is considered a key gateway and landscape due to the awareness of previous community engagement by City of Kingston with the Dingley Village community, traffic levels, adjacency to Braeside Park, residents and proposed alteration of Woodlands Industrial Estate key entrance.

Ensure design of structural elements minimises visual and landscape impacts and enhances amenity, public use, passive surveillance levels and recreational offer to the extents practicable

Seek opportunities for new structural elements (e.g. noise walls, abutments, embankments and piers) and design to provide multiple functions where practicable and appropriate. Adding another layer of functionality and visual interest to spaces associated with noise walls, bridges and abutments.

Objective:

Minimise visual impact and enhance visual amenity, public use and passive surveillance in and around bridges, underpasses, noise walls and fill for increased public safety and recreational offer along pedestrian/cyclist movement networks by considering the following;

- Provide LCA appropriate planting in front of noise walls or as a part of noise wall design where practicable to minimise visual impacts
- Incorporate architectural detail into noise wall design and patterns to improve amenity of noise walls and blend in with or compliment surrounding landscape character
- Utilise colours and materials for structural elements which blend in with or compliment surrounding landscape character
- Plant out embankments with LCA appropriate planting
- Provide habitat and planting at base of bridge piers where appropriate

Where to apply and potential site-specific measures to reduce visual impacts, or enhance public use:

- For ecologically sensitive areas, seek planting or habitat enhancement opportunities e.g. encourage climbing plant growth on noise walls, provide tiered planting areas or plant out embankments.
- For neighbourhood park areas, seek recreational enhancements e.g. bouldering walls, ball sports, open recreation areas, skate or cultural amenity (art, sculptural elements etc).
- For residential sensitive areas, utilise custom-designed noise walls which aim to provide improved amenity. Key sensitive areas for specialist noise wall designs include areas closest to residents in Aspendale Gardens residential LCA, the Waterways neighbourhood LCA and Dingley Village residential LCA.
- For key gateway locations, seek improved visual amenity, wayfinding and design, and enhanced open space opportunity and use for increased passive surveillance and safety.

Refer to Appendix items 15.1.6, 15.1.7, 15.1.8 Landscape and Urban Design Strategy for locations and Section 12.2 for explanations of landscape treatment typologies and design principles.

Priority sites:

Park Way trail to Braeside Park underpass is a key gateway and path connection into Woodlands Industrial Estate and Braeside Park. The design of this underpass requires best practice design as passive surveillance is limited within this area and without best practice design, natural light filtration, wayfinding and recreational offer nearby it may have a negative impact on public use and safety within this area. There may also be opportunity to enable hydrological and ecological movements through an expanded underpass width and bridge deck structure as opposed to box culvert design.

Lower Dandenong Road underpass is a key gateway into Woodlands Industrial Estate and Braeside Park. Enhanced width of the underpass has potential to accommodate new recreational and leisure activities, which links with nearby Braeside Park use and Chadwick Reserve open spaces which are regularly used for recreation and leisure and has opportunity to increase public use of the site and passive surveillance levels. There may also be opportunity to enable hydrological and ecological movements through an expanded underpass width.

Figure 103. *The Level Crossing Removals projects by Level Crossing Removals Authority and the Victorian State Government is a current example of how underpasses can provide more leisure and recreational infrastructure to increase public use and passive surveillance levels*

Implement proposed landscape treatments and associated design principles

Objective:

Minimise visual impact of project, enhance shared user path experience, community use and passive surveillance, improve upon open space offer of the project to the surrounding community

Where to apply:

Areas of land through which the shared user path runs should aim to incorporate the proposed landscape treatments, associated design principles and character precedents presented in Section 12 and Appendix Item 15.1.3-15.1.8 Landscape and Urban Design Strategy mappings.

Develop and integrate Traditional Owners culture and indigenous landscape characters in an appropriate and meaningful design approach for the project in the design development phase where practicable

Objective:

In consultation with local Traditional Owners, embody and express Traditional Owner culture and values into the landscape design development, construction and principles of the landscape's design and treatments.

Where appropriate, respect and reflect local pre-colonialist history of the landscape and associated character across the site.

Where to apply:

Throughout the site, where practicable and appropriate.

Where Aboriginal artefacts, stories or indigenous vegetation are known of or found through project development and associated EES studies.

How to apply:

It is critical this is done in consultation with local Traditional Owners.

Ensure pedestrian underpass design minimises impacts on visual and enhances passive surveillance to the extents practicable

All underpasses proposed within the project should apply best practice design measures, maximising pedestrian safety and performing multiple functions.

Objective: Ensure the design of underpasses are as safe and welcoming to pedestrians and cyclists as far as practicable, in order to enhance use, improve levels of passive surveillance and public safety.

Industry guidelines on best practice underpass design: Planning and Designing for Pedestrians: Guidelines of the Department of Transport Western Australia provides some guiding principles as follows;

"10.1.14 Underpasses and tunnels

AS/NZS1158.3.1 – 2005 includes the lighting requirements for pedestrian connections such as underpasses and tunnels. Lighting is to be provided at a P10 level.

If longer than 20m, lighting will need to be provided both day and night. Illumination levels should be higher during the day as those with low vision and seniors may have problems adjusting to varying light intensities and contrasts.

The walls of a subway are recommended to be finished with a light colour to facilitate interreflection of light within the space.

Design and performance requirements of the underpass or tunnel are dependent on the structural and traffic characteristics of the infrastructure."

Urban Design Guidelines for Victoria offers additional measures, including;

- Locate adjacent to active uses
- Provide straight paths with clear sightlines and adequate lighting
- Provide exit splays of 45 degrees, and clear sightlines for 15m

For additional guidelines and references to underpass design see *Objective 2.4.3. of the Urban Design Guidelines for Victoria*.

A standard box culvert design of 2.6m high x 4m wide can make an underpass feel unsafe and unwelcoming to pedestrians and cyclists, negatively impacting use and safety. By ensuring underpasses are designed to best practice standards, the following benefits can be achieved;

The cost benefits of a best practice approach include:

- There is no daytime lighting cost due to a light wells or separated bridge structures.
- Combining pedestrian, fauna and hydrology movement into one area and one structure, potentially saves costs and the height of required fill in adjacent areas.
- There is the potential to reduce the height of the structure and the associated fill required.

Other benefits of a best practice approach include increased:

- safety and clear sightlines for pedestrians, cyclists and adjacent park users, increasing users in future
- area for flora and fauna
- access for maintenance.

Standard underpass design	Pedestrian and drainage underpass
Underpass with wing walls provides increased passive surveillance  Figure 104. *David Carr Park underpass, Perth Esplanade, Department of Transport, WA*	Underpass with drainage and light reflective surfaces to refract light throughout the underpass  Figure 105. *Pedestrian and drainage underpass, Plain Street, East Perth (Source: Department of Transport, WA)*
Best practice underpass design	**Best practice underpass design**
Wide and naturally lit pedestrian and cycling underpass reduces the expense of powered lighting during the day  Figure 106. *Light filled bridge underpass in Tilburg, Netherlands (Source:* http://designboom.com)	Wide and naturally lit fauna and hydrology underpass provides multiple functions, improves amenity and safety  Figure 107. *Fauna underpass at Calder Freeway (Source: VicRoads Fauna Sensitive Road Design Guidelines)*

Where to apply:

All bridge and culvert underpasses which provide pedestrian and cyclist access and movement through them.

Priority sites:

Chadwick Reserve to Redwood Gardens Industrial Estate pedestrian underpass is a non-standard mitigation measure of high priority. The existing informal pedestrian access from Chadwick Reserve to Redwood Gardens Industrial Estate will be severed by the project. This is the only location within the project site where no east-west pedestrian connection will be provided for more than 1.5km. It is anticipated to be expensive and difficult to provide a pedestrian or cyclist crossing at this site post-construction of the project, therefor an underpass in this area is identified as an opportunity to minimise impacts of the project on local movement patterns. There is potential for hydrological and ecological connections to be combined with the underpass by making it wider than a typical culvert underpass and enable multiple benefits overall for the project.

Park Way trail to Braeside Park underpass is a key gateway and path connection into Woodlands Industrial Estate and Braeside Park. The design of this underpass requires best practice design as passive surveillance is limited within this area and without best practice design, natural light filtration, wayfinding and recreational offer nearby it may have a negative impact on public use and safety within this area. There may

also be opportunity to enable hydrological and ecological movements through an expanded underpass width and bridge deck structure as opposed to box culvert design.

Lower Dandenong Road underpass is a key gateway into Woodlands Industrial Estate and Braeside Park. Enhanced width of the underpass has potential to accommodate new recreational and leisure activities, which links with nearby Braeside Park use and Chadwick Reserve open spaces which are regularly used for recreation and leisure and has opportunity to increase public use of the site and passive surveillance levels. There may also be opportunity to enable hydrological and ecological movements through an expanded underpass width.

Enhance street design of key gateways

Objective:

Enhance amenity of key gateway sites by improving upon street amenity, wayfinding and street tree planting.

Where to apply:

Key gateway sites include Lower Dandenong Road overpass, Governor Road overpass, Park Way Trail pedestrian underpass into Braeside Park and Bell Grove, as through the removal of Woodlands Drive as the key gateway into Woodlands Industrial Estate, Bell Grove will become the key gateway into Woodlands Industrial Estate from Lower Dandenong Road.

Priority sites:

Lower Dandenong Road overpass is a key gateway identified by the local community.

Bell Grove is of key priority to have its street design, entry experience and wayfinding improved upon, as this will be a new key gateway for the Woodlands Industrial Estate. The existing gateway on Woodlands Drive will be removed and replaced with Bell Grove by the proposed project.

Utilise and trial sustainable or recycled waste materials for construction

Where possible, use sustainable and non-toxic building materials or recycled waste materials as construction materials to maximise the sustainable and environmental outcomes of the project as far as practicable. (References: Statewide Waste and Resource Recovery Infrastructure Plan, 2018, Sustainability Victoria; Rethinking Cement, 2018, Beyond Zero Emissions)

Objective:

- Minimise environmental and sustainability impact of project and lead in best practice sustainable construction methods
- Test new and more sustainable materials (e.g. rammed earth, hempcrete, recycled plastics) or composites of typically used materials for road projects (e.g. concrete or asphalt) and specific objects (e.g. noise walls, retaining walls)
- To encourage, normalise and broaden awareness and education on the use of more sustainable and environmentally friendly materials by the broader construction and major infrastructure industry.

Where to apply:

This can be applied across the entire project where practicable to minimise CO_2 emissions, the use of toxic materials and enhance the benefits and sustainability of the project and influence future projects.

Priority elements:

- Road barriers
- Noise walls
- Retaining walls
- Road surface and fill

Work with key stakeholders to provide increased public open space, improved amenity and usability outcomes as far as practicable

Work with key stakeholders to identify strategic open space partnership opportunities.

Objective:

Ensure the project is strategically implemented and integrated into the surrounding context, providing as much benefit and opportunity to surrounding community to the extents practicable.

Where to apply:

Typically, these locations occur where existing open space is located adjacent to the project site or large amounts of publicly accessible space exists within the project site. These opportunities exist throughout the entire site; key locations have been identified in Appendix item 15 Landscape and Urban Design Strategy.

Priority sites:

- Chadwick Reserve
- Green Wedge North LCA
- Bangalow Way Open Space
- Jackie Court Open Space

Increase pedestrian and cyclist connection opportunities, experience and safety as far as practicable, develop with key stakeholders where required

Objective:

Enhance pedestrian/cyclist movement, recreational offer, passive surveillance and public safety.

Work with key stakeholders to develop these connections outside of the ROW.

Where to apply:

- Connect the proposed shared user path with existing local path networks within a 100m radius of the project site and regional strategic links within a 250m radius of the project.
- New path connections should be as direct to existing paths as possible.
- Shared user path alignment and associated landscape design should aim to enhance sight lines to the extents practicable and appropriate.
- Provide park infrastructure, including seating, bike maintenance stations, recreational infrastructure and wayfinding at regular intervals, key intersections and underpasses.
- Enhance amenity and user experience by providing appropriate colour, graphics and art where appropriate and practicable.
- At key intersections with other paths, roads and nodes provide lighting for increased safety at night.

Priority sites:

- Direct and clear sight line connection and integration of clear wayfinding and park infrastructure for Braeside Park to Park Way trail proposed underpass.
- Direct and clear sight lines along shared user path from Lower Dandenong Road to Centre Dandenong Road.
- Direct and clear sight lines along shared user path from Springvale Road to Bowen Parkway.
- Path connection opportunity from Chadwick Reserve to Redwood Gardens Industrial Estate via underpass.
- Path connection opportunity from Torquay Close in Dingley Village to proposed shared user path adjacent to Chadwick Reserve.
- Path connection opportunity from Chelsea Heights Hotel to Soden Road connection along east side of Springvale Road.

Passive surveillance additional measures:

It is highly recommended an accredited Criminal Prevention Through Environmental Design officer is engaged during the design development phase to provide guidance and feedback on areas highlighted within the LVIA maps as having low levels of passive surveillance and posing potential safety risks.

Note: During stakeholder consultation on this LVIA, Melbourne Water advised they desire to be involved in the review and approval processes for design development phase.

11.2 North sub-study area

Description of alignment and key bypass features

This sub-study area runs from Dingley Bypass to Lower Dandenong Road (Chainage (CH.) 22800–25900). The following key landscape and visual impacts should be read in conjunction with Appendix item 15.1.2 Landscape and Visual Impact Assessment map: North sub-study area and mitigation measures and Appendix item 15.1.6 Landscape and Urban Design Strategy map: North sub-study area.

Overpasses and associated fill

- Two 10m high four-lane overpasses with two service lanes and associated structural fill above 1.5m will be constructed over Centre Dandenong Road (CH. 24200–24300) and Old Dandenong Road (CH. 23900).
- These overpasses are near each other; earth fill is maintained at a height of 8m between both overpasses. Fill associated with these overpasses runs from CH. 23800–24500.
- The landfill area will be traversed via road on fill embankment, supported by driven piles directly beneath to limit the settlement of pavement.

Fill

- Apart from the fill associated with the two overpasses, there is no other significant fill across this section. In very limited areas, projected heights may reach a maximum of 2.5m in fill.

Noise walls

- Noise walls of heights between 0.5 and 6m above the new road grade levels will be in two areas of the alignment: on the western edge of the bypass from Old Dandenong Road overpass bridge structure and continuing south until Lower Dandenong Road, 2000m in length (CH. 23900–25900).

Pedestrian safety

- The proposed shared user path will run through a linear space (varying between 10 and 35m wide) between the bypass noise walls and Dingley Village residential back fences, from CH. 24200–25300 and CH. 25600–25900. These spaces are anticipated to have poor levels of passive surveillance, as such, they should be designed to enhance activity and provide clear sightlines.

Ecologically sensitive areas

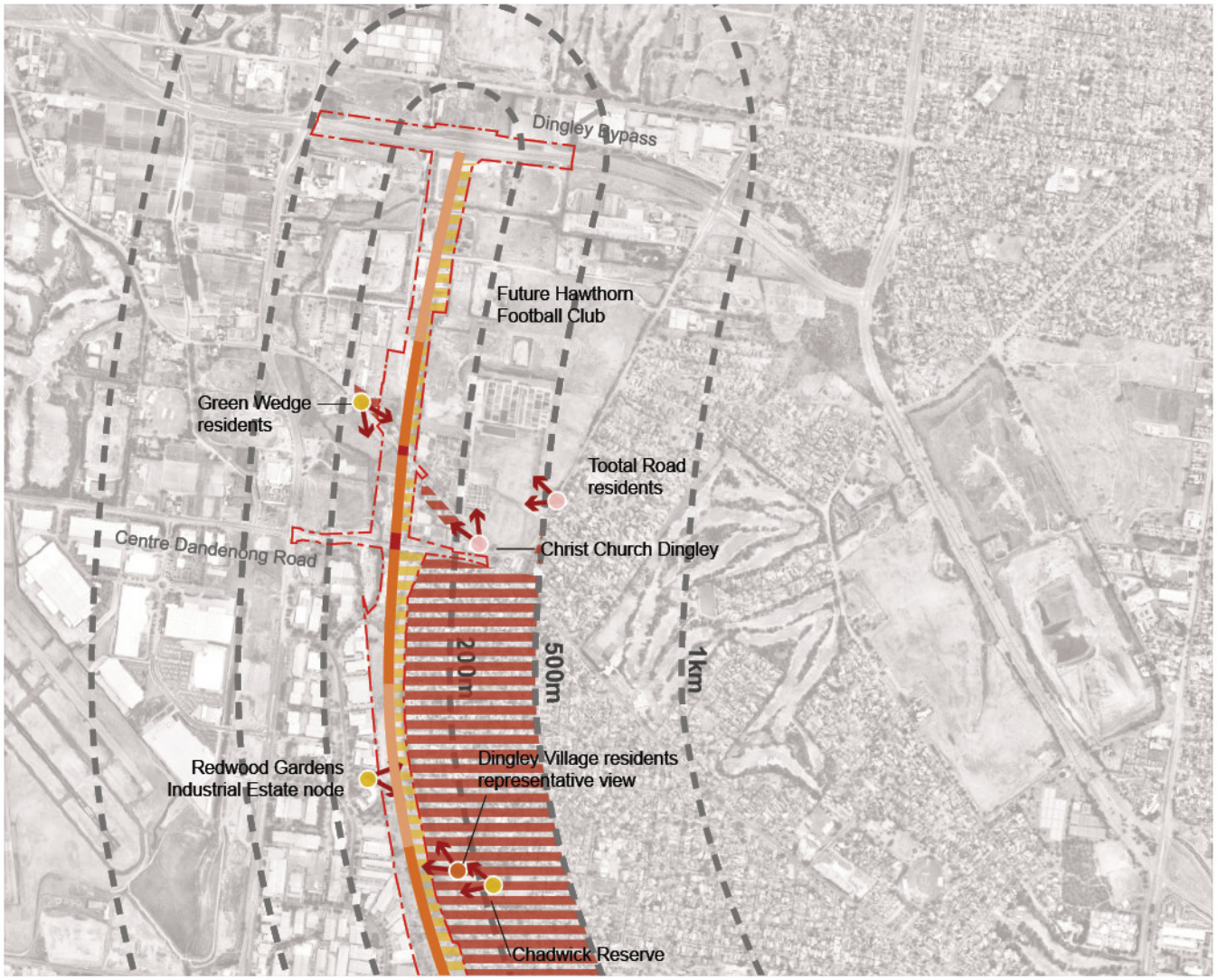
- Apart from some scattered trees along the project site, there are limited ecologically sensitive areas within this area.

Dwellings

- Dingley Village residential cluster runs along the east side of the project site and is within 100m of the bypass alignment centre.

Movement network impacts

- The existing movement network from Chadwick Reserve north towards Centre Dandenong Road (CH. 24400–25300) is anticipated to be impacted by the project.
- The existing movement network from Chadwick Reserve west to Redwood Gardens Industrial Estate (CH. 24400–25000) is anticipated to be severed by the project.



Legend

- Very high visual impact
- High visual impact
- Moderate visual impact
- Low to negligible visual impact
- View direction
- Residential sensitive areas
- Low levels of passive surveillance (estimated)
- High value landscape character area
- Key gateway
- Alignment bridge, fill > 2.5m, fill < 2.5m
- Study area / distance from bypass alignment
- Project site boundary

All impacts consider standard mitigation measures

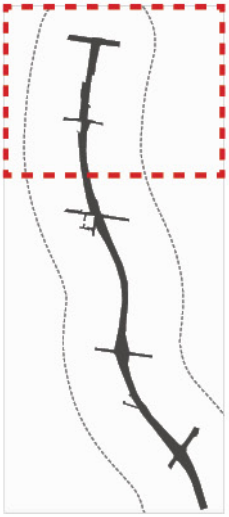


Figure 108. *North sub-study area visual impacts, residential clusters and LCAs of high value*

Landscape character area impacts

The area consists of three landscape character areas (LCAs) of varying value and sensitivities that are immediately impacted:

- LCA 1 – Green wedge north
- LCA 2 – Dingley Village residential
- LCA 3 – Western industrial

11.2.1 LCA 1 – Green wedge north

Landscape character impact

Landscape character value: low to moderate

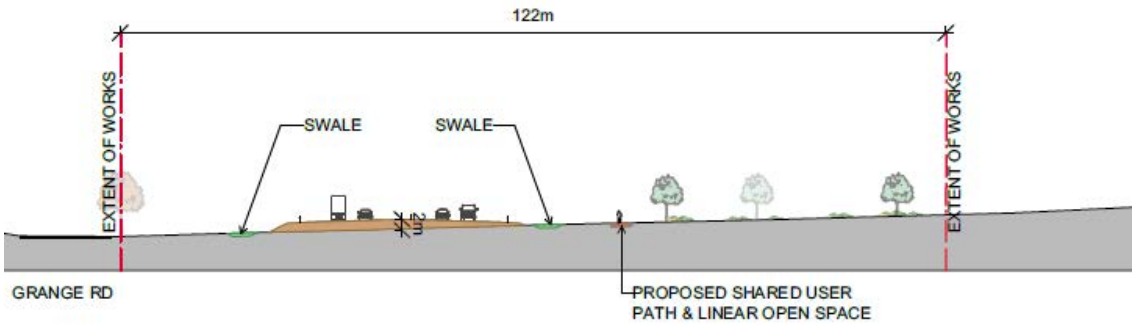


Figure 109. *Cross section L with standard mitigation, looking north*

Sensitivity to change: low

LCA 1 runs from the Dingley Bypass to Centre Dandenong Road (CH. 22800–24200) and is considered of low to moderate value, predominantly due to its productive and mixed-use land uses. The project runs directly through this LCA with minimal sensitive sites identified other than small clusters of green wedge residents, Christ Church Dingley and the future Hawthorn Football Club headquarters. Its overall sensitivity is considered low.

Magnitude of change: low

As the existing landform in this area is heavily modified, with some existing earth mounding, the magnitude of change is considered low. Standard mitigation of tree planting is anticipated to help reduce any visual impacts upon nearby residents and the future Hawthorn Football Club headquarters.

Impact summary with standard mitigation: low

Impact summary with non-standard mitigation: Low

Site specific non-standard mitigation measures

Pedestrian cyclist overpass at Dingley Bypass - City of Kingston identified the desire for a pedestrian and cyclist overpass over Dingley Bypass in order to ensure un-interrupted connections to Dingley Bypass shared user path and reduce traffic impacts.

Linear green wedge park – there is a significant opportunity to develop strategic partnerships in the management and development of the open spaces associated with this section of the bypass. Opportunities should be sought after with City of Kingston, surrounding industry and educational organisations (e.g. Monash University) to develop a new landscape character that celebrates existing green wedge functions, productivity and diversity. Refer to Appendix item 15.1.3-15.1.8 Landscape and Urban Design Strategy and Section 12.2 Landscape Treatments for more information.

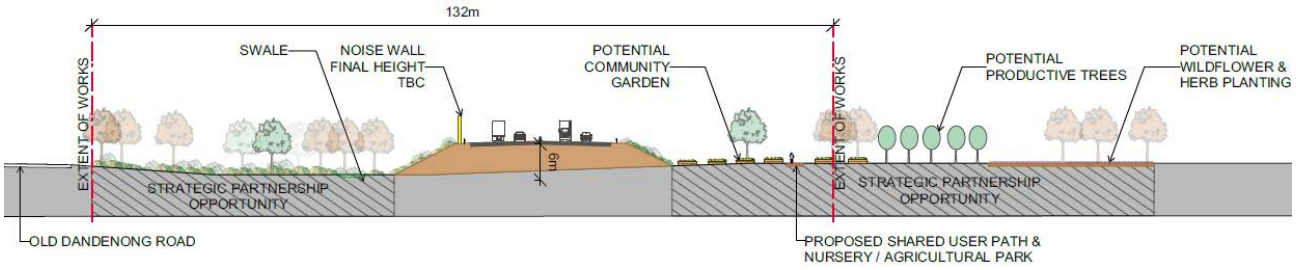


Figure 110. *Cross section L looking north with potential non-standard mitigation measures*

Key views and sites of sensitivity impact

Sensitive site view: Christ Church Dingley

This view captures views from Christ Church Dingley, a valued community location and building. The view is looking towards the bypass, north west along Old Dandenong Road and across the green wedge area.

Sensitivity to change: high

Christ Church Dingley was identified in VicRoads community engagement process as a valued location.

Figure 111. *Existing view looking north west from Christ Church Dingley*

Figure 112. *Wireframe 3D view looking north west from Christ Church Dingley*

Magnitude of change: low

The bypass is approximately 400m away from Christ Church Dingley. Existing vegetation, buildings and topography between the bypass and the church indicates that the bypass will be hidden from view and is not anticipated to impact the overall amenity around the church.

Impact summary with standard mitigation: low

Sensitive site view: Green wedge residents cluster

This image captures the view from the driveway of the closest resident to the bypass. It looks south east across the green wedge area.

Sensitivity to change: moderate

This is a small residential cluster that has existing vegetation and green wedge industrial activities happening nearby. Its sensitivity to change is considered moderate.

Figure 113. *Existing view looking south west from green wedge residential cluster*

Figure 114. *Wireframe 3D view looking south west from green wedge residential cluster*

Magnitude of change: moderate

The bypass will run in close proximity to these residents and an overpass bridge with noise walls is proposed to cross over Old Dandenong Road. This overpass will introduce a large structural element into this view, but its height is reduced due to an existing drop in grade. Standard mitigation measures of planting and earth mounds are considered to soften the impacts of the structure. However, these measures will not be able to mitigate the topographic and changes to horizon lines in the existing view.

Impact summary with standard mitigation: low to moderate

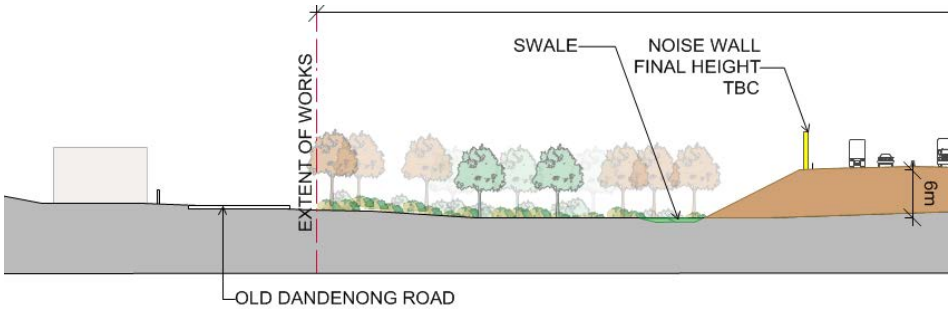


Figure 115. *Cross section K with standard mitigation, looking north*

Sensitive site view: Tootal Road residential cluster

This view captures the view from Tootal Road and the closest resident to the bypass. It looks west across the green wedge area.

Sensitivity to change: low

This residential cluster is located approximately 600m from the centre of the bypass alignment. Their sensitivity to change is considered low.

Figure 116. *Existing view looking west from Tootal Road residential cluster*

Figure 117. *Wireframe 3D view looking west across the green wedge area towards the proposed bypass*

Magnitude of change: negligible

Due to the distance from the proposed bypass and existing vegetation within the green wedge area, the impact upon these views are considered negligible.

Impact summary with standard mitigation: negligible

11.2.2 LCA 2 – Dingley Village residential

Landscape character impact

Landscape character value: moderate

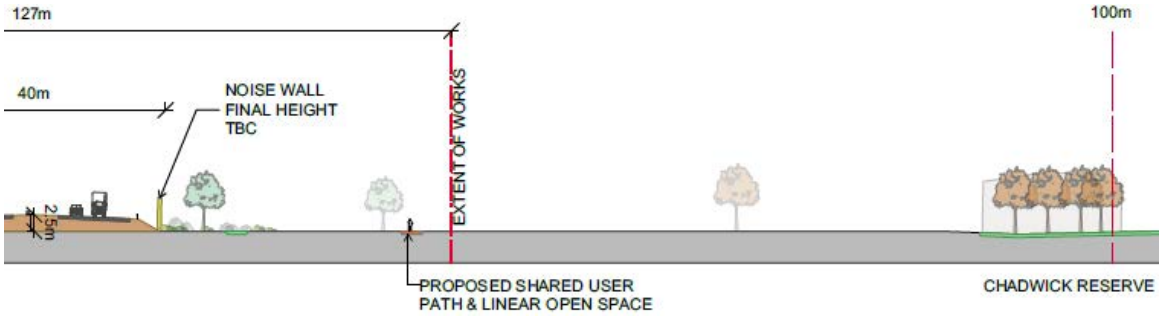


Figure 118. *Section I: looking north*

Sensitivity to change: very high

LCA 2 runs from CH. 24200–2590 and is considered of very high sensitivity as it is a residential cluster within 100m of the project. This LCA has numerous sensitive sites and existing movement networks that are anticipated to be impacted by the project. Chadwick Reserve is a large recreational reserve open to public use and surrounded by residences. Site visits observed dog walkers and students walking home through the reserve and along the eastern edge of the project site on the back fence of Dingley residential dwellings. Informal movement networks have been created over the years by the community, causing clearly visible tracks, worn down from use. These are located on the eastern edge of the project site, adjacent to Dingley residents' back fences. They connect local community to Centre Dandenong Road and Redwood Gardens Industrial Estate.

Magnitude of change: high

The magnitude of change across this LCA is considered high as the bypass and associated noise walls will create a tall visual and physical barrier along the entire western edge of the LCA. Residents' views are anticipated to be impacted on the entire western edge of this LCA. Chadwick Reserve will be visually and spatially impacted. Informal movement networks across to Redwood Gardens Industrial Estate activity node and other informal paths along the western edge of this LCA will also be impacted.

Impact summary with standard mitigation: high

Impact summary with non-standard mitigation: moderate

Site-specific non-standard mitigation measures

The informal path in this area appears to be used on a regular basis by the local community for recreation and to access the Redwood Gardens Industrial Estate activity node. Indicative pedestrian counts over a week have highlighted an average of around 15 to 19 crossings to and from Redwood Gardens on weekdays currently (these studies were done as a part of this EES' Transport Impact Assessment by WSP.). Non-standard mitigation measures to improve upon this existing connection and to mitigate severance are discussed below. This should be read in conjunction with Appendix item 15.1.3

Landscape and Urban Design Strategy map: North sub-study area.

- Maintain and improve upon existing community and economic connection via underpass or overpass, providing increased east–west connection, passive surveillance and use, as per the Urban Design Guidelines for Victoria.
- As this section of the bypass is already on 2.5m of fill, consider combining hydrological, ecological and pedestrian movement functions in one larger culvert or bridge structure for increased multifunctional connectivity and cost benefit. (See Figure 104 orFigure 105 for best practice underpass examples.)
- Minimise underpass length, as far as practicable.
- If an underpass is not practicable, consider a pedestrian overpass.
- Prioritise pedestrian safety; the design should provide clear sightlines and maximum light penetration.
- Recreational uses (e.g. ball sports areas) should be integrated near the underpass to increase passive surveillance and safety.
- Seek opportunity to introduce integrated water management landscape treatment to the area in coordination and partnership with City of Kingston to offer water storage and irrigation needs for nearby sports fields. The Landscape and Urban Design Strategy (see Appendix item 15.1.3) highlights this could be of a wetland character similar to the Central wetlands LCA.

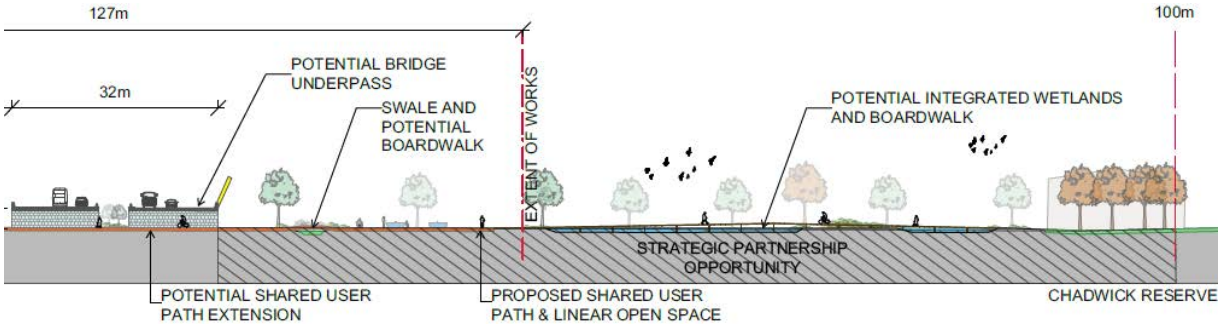


Figure 119. *Cross section I looking north highlighting potential non-standard mitigation measures*

Key views and sites of sensitivity impact

Sensitive site view: Chadwick reserve

This view looks west towards the bypass from within Chadwick Reserve's carparking area. It captures the landscape character of Chadwick Reserve oval, the existing grassed corridor of the project site and the industrial buildings in the background.

Sensitivity to change: high

Chadwick Reserve has regular use from surrounding community and will soon have significantly more usership with proposed the future upgrades to the oval and junior football teams moving in. Approximately 500–700 junior footballers, as well as local residents, will use this site on a daily and weekly basis. As such, this site and its associated views are considered to be of high sensitivity.

Figure 120. *Existing view looking west from Chadwick Reserve carparking area*

Figure 121. *Wireframe 3D view looking west from Chadwick Reserve carparking area*

Magnitude of change: moderate

This view from Chadwick Reserve carpark is approximately 300m from the centre of the bypass alignment. Noise walls are anticipated to be a large and consistent structure introduced into the site and will slightly shorten existing limited views of Redwood Gardens Industrial Estate. Existing advanced vegetation will screen a majority of the noise walls; however, standard mitigation will increase visual screening and soften the visual impact of the noise walls.

Impact summary with standard mitigation: low to moderate

Impact summary with non-standard mitigation: low

Representative view: Dingley Village residents

This view looks west south west towards the bypass from within Chadwick Reserve and is a representative view of surrounding residents. The view captures the landscape character of Chadwick Reserve and existing grassy field of the project site, which have become informal recreational areas. The industrial buildings of Redwood Gardens Industrial Estate can be seen in the background.

Sensitivity to change: high

Existing residents within close proximity to the project site are anticipated to be highly sensitive to the proposed project, given the noise walls' height and fill in this section of road is approximately 2.5m.

Figure 122. *Existing view looking north west from Chadwick Reserve and western edge of residential cluster*

Figure 123. *Photomontage view looking north west from Chadwick Reserve and western edge of residential cluster*

Magnitude of change: high

This view is approximately 100m from the centre of the bypass alignment. Noise walls may be up to 7m high in some instances, due to 2m of fill for the road. Where the project proposes overpasses, the height of the structure is anticipated to be up to 15m high, which will create a large visual and amenity impact upon residents in these areas. From CH. 24300–25000 and 25800–25900, residential dwellings are located 15 to 35m within the proposed location of noise walls and the bypass. The proximity of the project and the height of the noise walls and overpasses will create substantial impacts upon the Dingley Village residents. Standard mitigation techniques can only potentially soften these impacts.

Impact summary with standard mitigation: moderate to high

Impact summary with non-standard mitigation: moderate

11.2.3 LCA 3 – Western industrial

Landscape character impact

Landscape character value: low to moderate

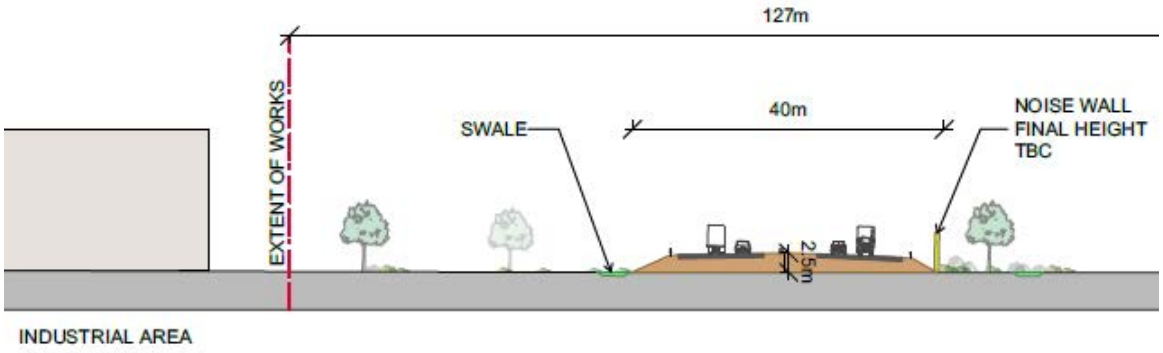


Figure 124. *Cross section G with standard mitigation looking north*

Sensitivity to change: low to moderate

LCA 3 runs from CH. 24200–2590 within the north sub-study area. It is considered of moderate sensitivity due to the industrial land use and character. This section of the LCA has one sensitive site identified in Section 8.3.3 as the Redwood Gardens Industrial Estate activity node. Informal movement networks connect it to Chadwick Reserve; the impacts and potential non-standard mitigation measures of this have been described in Appendix item 15.1.7 and associated cross sections.

Magnitude of change: moderate

The magnitude of change across this LCA is considered moderate. The majority of this LCA is the industrial estate's back of house. However, the activity node present within this LCA offers access to commercial stores, play space and an autism centre, which is identified as highly sensitive. This node offers some of the only publicly visual connections across the project site's grassy fields and towards Chadwick Reserve, which are anticipated to be severed by the project.

Impact summary with standard mitigation: moderate

Impact summary with non-standard mitigation: low to moderate

Refer to site specific non-standard mitigation highlighted in Appendix item 15.1.6 and 15.1.7.

Key views and sites of sensitivity impact

Sensitive site view: Redwood Gardens Industrial Estate node

This view looks west south west towards the bypass from within Redwood Gardens Industrial node, specifically the Black Pepper Cafe. It is a representative view of this activity node. It captures the landscape character of the activity node and existing grassy field of the project site, which is an informal connection to Dingley Village residential area and Chadwick Reserve.

Sensitivity to change: moderate

This view's sensitivity to change is considered moderate. While it is an industrial node, it offers goods and services to the surrounding workers and residents who are assumed to regularly visit this area based on existing goat tracks within the area and advice from City of Kingston. The autism centre within this node is of high sensitivity due to its members regularly using this service and staying overnight.

Figure 125. *Existing view looking east from Black Pepper Café*

Figure 126. *Wireframe 3D view looking east from Black Pepper Café toward the project*

Magnitude of change: moderate

This view is approximately 100m from the centre of the bypass alignment. Noise walls may be up to 7m high in some instances due to 2m of fill for the road. The proximity of the project and the height of the noise walls will significantly alter the open grassy fields of the project site area, which provide clear views across to trees lining the Dingley Village residential back fences. Standard mitigation (e.g. tree planting) provides potential to mitigate the visual impacts of the noise walls.

Impact summary with standard mitigation: low to moderate

Impact summary with non-standard mitigation: low

11.3 Middle sub-study area

Description of alignment and key bypass features

This sub-study area runs from Lower Dandenong Road to Governor Road (CH. 25900–28400). The following key landscape and visual impacts should be read in conjunction with Appendix item 15.1.3

Landscape and Visual Impact Assessment map: Middle sub-study area and mitigation measures with 15.1.6

Landscape and Urban Design Strategy map: Middle sub-study area.

Overpasses and associated fill

- Two 10m high four-lane overpasses with two service lanes and associated structural fill above 1.5m will be constructed over Governor Road 1000m in length (CH. 27800–28800) and Lower Dandenong Road 1100m in length (CH. 25500–26600).
- One pedestrian underpass culvert of 2.6m x 4.6m under a 7m high elevated bypass on structural fill and associated fill above 1.5m will be constructed over the Park Way shared user trail and Braeside Park entry point, 800m in length (CH. 27000-27500).

Fill

- Apart from the fill associated with the two overpasses and the pedestrian underpass, there is no other significant fill across this section.

Noise walls

- Noise walls of heights between 5 and 7m above the new road grade levels will be in one section of the alignment: on the western edge of the bypass on Lower Dandenong Road overpass bridge structure and associated fill running south towards Braeside Park, 400m in length (CH. 25800–26200).

Pedestrian safety risks

- The proposed shared user path will run through a box culvert underpass (CH. 27200). Underpasses are generally not the preferred pedestrian crossing type so ensure the underpass is considerably wide and tall to increase sightlines and safety.
- Between Lower Dandenong Road overpass and Dingley Village residential back fences (CH. 25900), there is a narrow 22m wide corridor where the shared user path runs.

Ecologically sensitive areas

- The proposed bypass and shared user path will run through ecologically sensitive areas (as highlighted in Mordialloc Bypass EES Flora and Fauna Impact Assessment), predominantly from CH. 28400–27450. This includes significant wetland habitat surrounding the proposed Governor Road overpass and in close proximity to Braeside Park throughout the entire western edge of the bypass.

Dwellings

- There are no residents directly adjacent to this sub-study area of the alignment. However, small areas on adjacent corners of the Waterways neighbourhood LCA and Dingley Village residential LCA consist of residents.

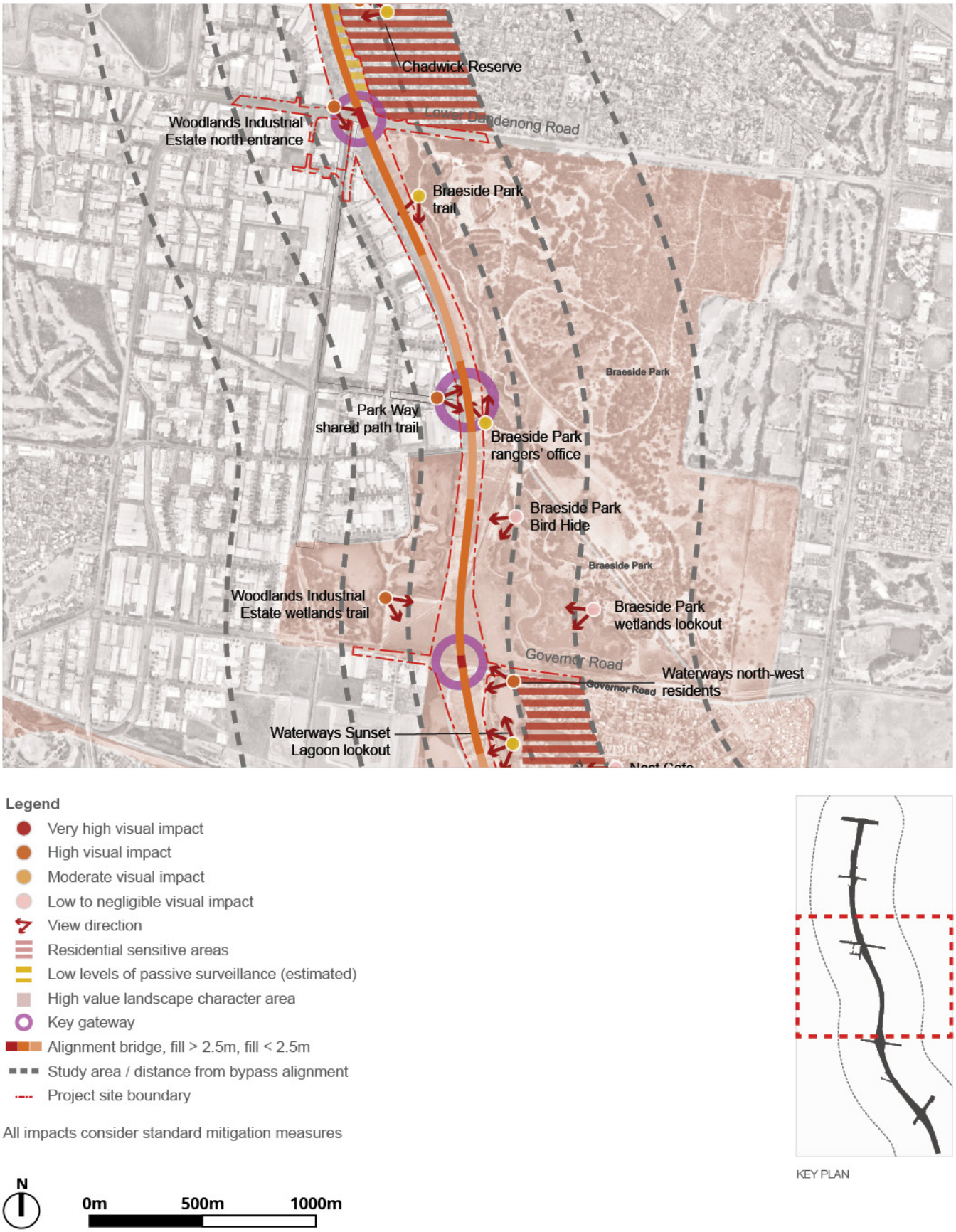


Figure 127. *Middle sub-study area visual impacts, residential clusters and LCAs of high value*

Landscape character area impacts

The area consists of three landscape character areas (LCAs) of varying value and sensitivity that are immediately impacted. Two additional LCA's border this sub-study area, which are captured in other sub-study areas. Impacted LCAs include:

- LCA 3 – Western industrial
- LCA 4 – Braeside Park (north woodlands)
- LCA 5 – Central wetlands

Adjacent LCA's impacted:

- LCA 2 – Dingley Village residential (Impacts upon this LCA are identified in Section 11.2 North sub-study area; however, a key view from Lower Dandenong Road that impacts this community is considered in this section.)
- LCA 6 – Waterways neighbourhood (Impacts upon this LCA are considered in the 11.4 South sub-study area)

11.3.1 LCA 3 – Western industrial

Landscape character impact

Landscape character value: low to moderate

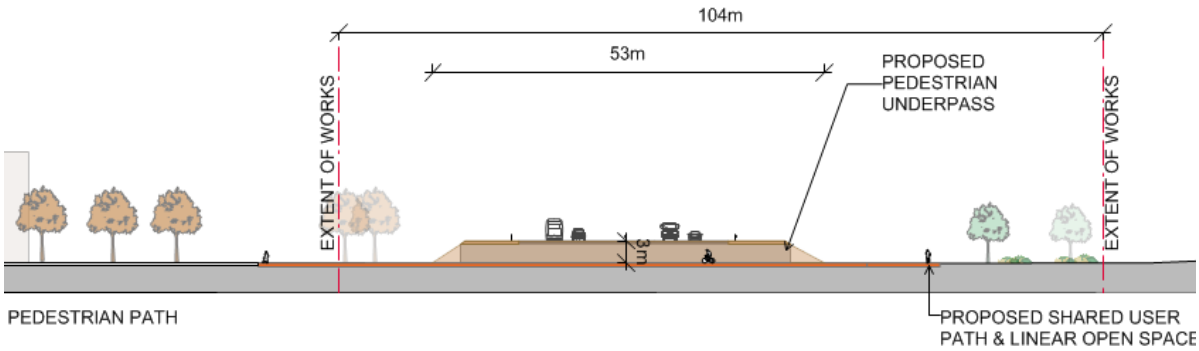


Figure 128. *Cross section F with proposed standard mitigation culvert underpass at Park Way shared user trail and Braeside Park western entry, looking north*

Sensitivity to change: low

LCA 3 runs from CH. 25900–27500 and is considered of low value due to its industrial nature. The project runs along the back of houses in the Woodlands Industrial Estate, which is rarely utilised or visible from publicly accessible areas. Its sensitivity to change is therefore considered low.

Magnitude of change: high

The overall level of sensitivity of this LCA is considered low to moderate due to its industrial character. However, the level of change to this LCA in this area is considered high due to significant alterations at Park Way shared user trail and the access into Woodlands Industrial Estate from Lower Dandenong Road. Both gateways into this LCA will be modified in terms of access and character. The Park Way shared user trail

shared user path is designed to run through a pedestrian underpass, altering the existing open grassy fields character of the project site. Lower Dandenong Road access to the Woodlands Industrial Estate via Woodlands Drive and key gateway will be closed and redirected through Bell Grove and Tarnard Drive.

Impact summary with standard mitigation: moderate

Impact summary with non-standard mitigation: low to moderate

Site-specific non-standard mitigation measures

Park Way shared user trail underpass and pathway design

- Consider modifying the bypass design to provide a best practice underpass design (see Figure 105) that includes separated bridge structures with central open-air light wells and expanded width to combine drainage and ecological crossings and enable multiple functions. This is anticipated to reduce the length of the proposed standard mitigation culvert underpass, enhance public safety and reduce need for daytime lighting during operation.
- Modify the shared user path to provide a direct and straight connection from Park Way shared user trail to Braeside Park trail, providing clear sightlines through to each path and wayfinding signage at the entrance and exit of the underpass.

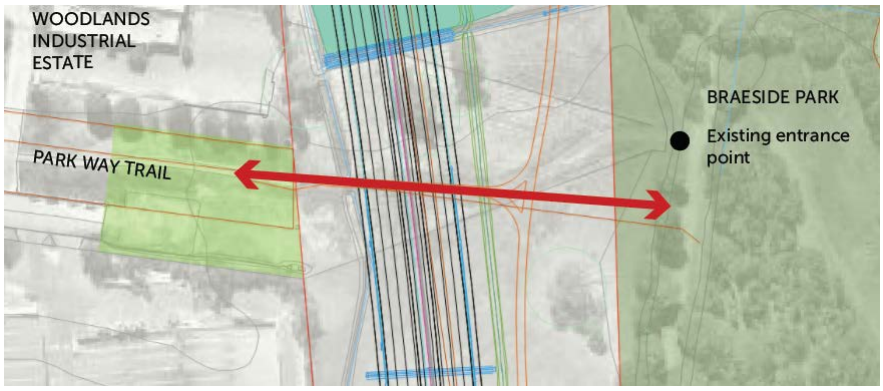


Figure 129. *Proposed changes to shared user path alignment pedestrian underpass between Woodlands Industrial Estate and Braeside Park*

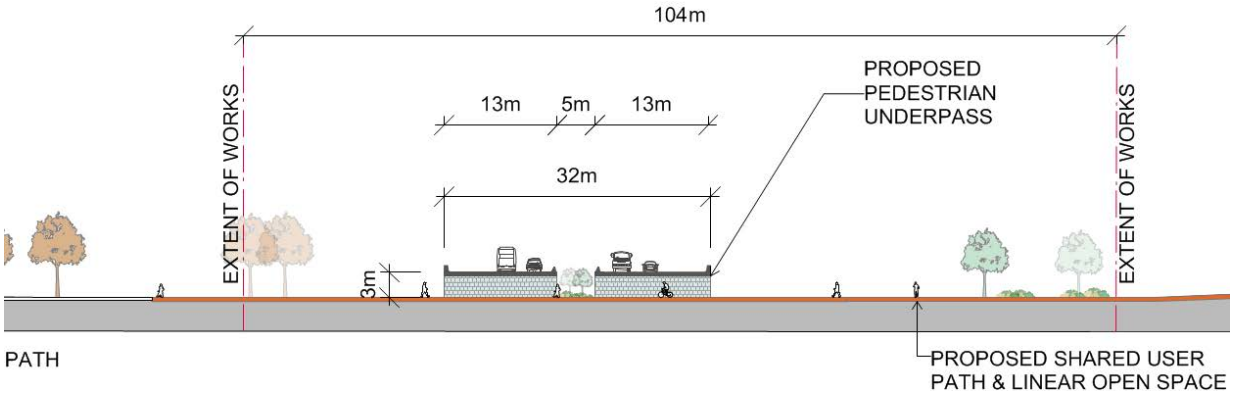


Figure 130. *Cross section F with proposed non-standard best practice underpass with dual bridge structure at Park Way shared user trail and Braeside Park western entry, looking north*

Woodlands Industrial Estate gateway enhancements

- Enhance Bell Grove and Tarnard Drive's urban design and street treatment, tree planting and updated wayfinding entrance from Lower Dandenong Road in conjunction with key Woodlands Industrial Estate stakeholders.

Lower Dandenong Road overpass and underpass

- Create a custom-designed architectural overpass and integrate boulevard style treatment to this section of road with trees planted in rows on roadside and in centre median. Refer to previous community engagement with Dingley Village residents and City of Kingston when considering tree species. The pedestrian underpass area of this bridge could potentially be widened to enable more natural light, open space and activation opportunity, increasing public safety. Widening of the bridge underpass could also facilitate open drainage as there is a large culvert already proposed in the bypass design.

Pedestrian safety: Lower Dandenong Road overpass and Dingley Village residential cluster

- Landscape design and shared user path alignment beside Dingley Village residential needs to be carefully considered. Pedestrian safety and clear sightlines are of key priority in this area due to the narrow (15–35m wide) spaces between proposed noise walls and existing residential fences.

Key views and sites of sensitivity impact

Sensitive site view: Park Way shared user trail

This view is from the shared user path on the Park Way shared user trail within the Woodlands Industrial Estate, which has been identified as a site of sensitivity as it connects directly to Braeside Park and is the only western connection for the regional park.

Sensitivity to change: high

The shared user path is sensitive due to its function of providing western access to Braeside Park. At present, users can clearly see Braeside Park and a grassy field in the foreground, which is open and accessible.

Figure 131. *Existing view looking east from the Park Way shared user trail shared user path towards Braeside Park*

Figure 132. *Wireframe 3D view (with no transparency) looking east from the Park Way shared user trail shared user path towards Braeside Park*

Magnitude of change: moderate to high

The bypass will be raised by 3m and visibly block the views of Braeside Park environs. A box-shaped culvert 4m wide, 2.6m high and 35m long is proposed for a pedestrian underpass. According to the Western Australian Department of Transport's Planning and Designing for Pedestrians: Guidelines: "For tunnels longer than 20 metres, lighting is to be provided both day and night."

The proposed type of culvert design can make a space feel unsafe and unwelcoming. As the purpose of this shared path is to connect people to Braeside Park and it currently feels welcoming, this view will be impacted.

Impact summary with standard mitigation: moderate to high

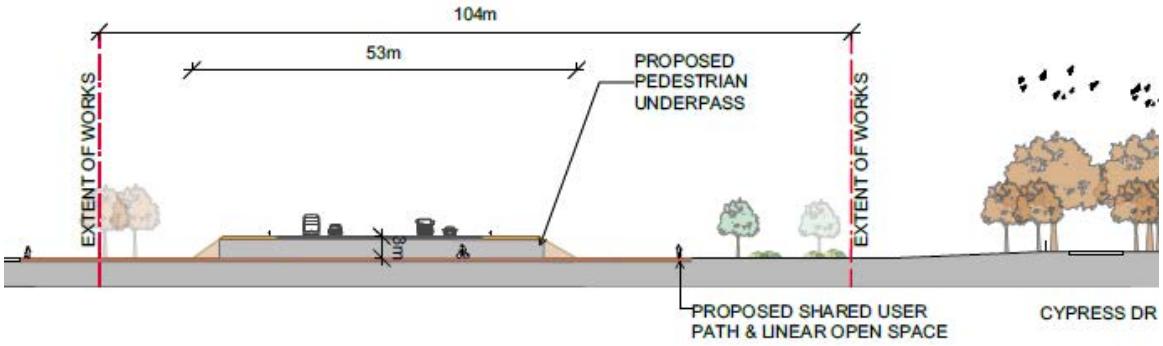


Figure 133. *Cross section F: looking north, with standard mitigation measures*

Impact summary with non-standard mitigation of pedestrian underpass: low to moderate

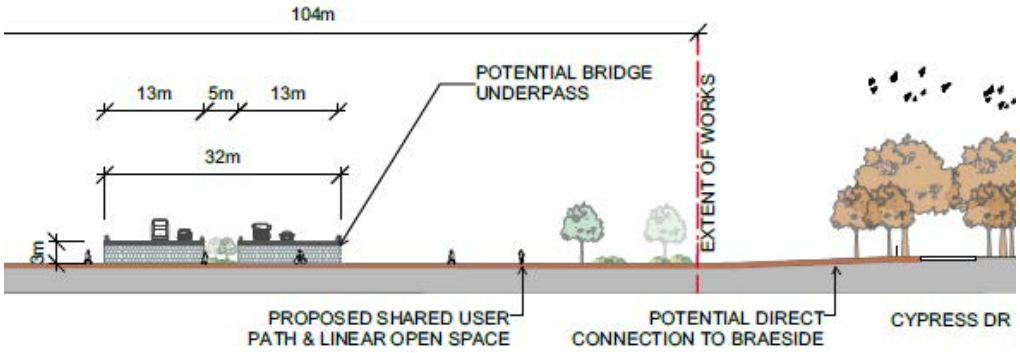


Figure 134. *Cross section F: looking north, with non-standard mitigation measures*

Sensitive site view: Lower Dandenong Road/representative view for Dingley Village residents

This view is from the existing pedestrian path on Lower Dandenong Road, which has been identified as a site of sensitivity as it is a key gateway for both Dingley Village residents and the Woodlands Industrial Estate. It's also a representative view for Dingley Village residents on the eastern side of the project alignment as it's a similar distance from the proposed Lower Dandenong Road overpass.

Sensitivity to change: high

This site is a key gateway for Dingley Village residents and the Woodlands Industrial Estate. Existing trees lining Lower Dandenong Road in this area have been identified in previous community engagement by the City of Kingston as requiring a change of species. The community also highlighted they would like this stretch of Lower Dandenong Road designed like a boulevard, with trees lining the street and the centre median. The Dingley Village resident cluster is within 50m of the overpass.

Figure 135. *Existing view looking south-east from Lower Dandenong Road northern footpath*

Figure 136. *Wireframe 3D view looking south-east from Lower Dandenong Road northern footpath*

Magnitude of change: very high

The existing entrance to Woodlands Industrial Estate will be physically altered by the project, moving the main entrance to Bell Grove instead of Woodlands Drive. An 8 to 14m high bridge with noise walls on the eastern edge will be constructed to overpass Lower Dandenong Road. This large structure is anticipated to block views to Braeside Park environs from the west and will be highly visible and alter views from Dingley Village residents and Lower Dandenong Road motorists. Standard mitigation of tree planting is anticipated to only soften the bridge structure slightly but will only minimally mitigate the physical and visual change in this area.

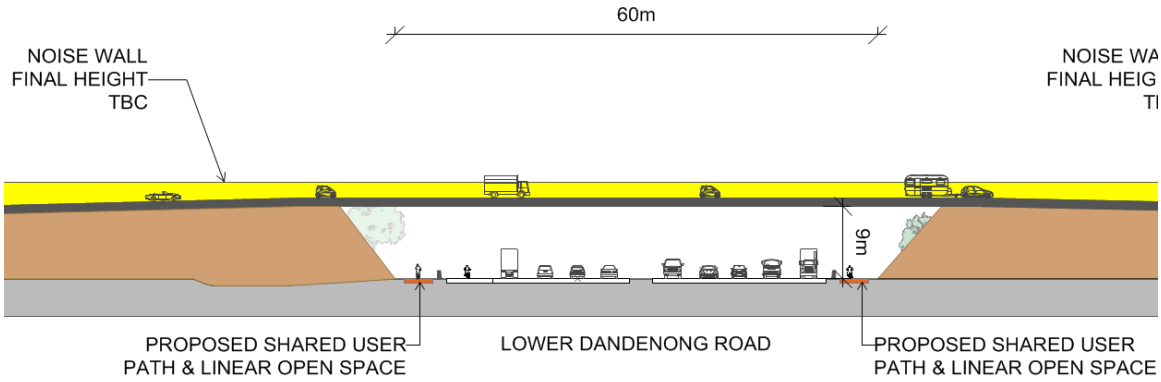


Figure 137. *Cross section N Lower Dandenong Road overpass with standard mitigation*

Impact summary with standard mitigation: high

Impact summary with non-standard mitigation: moderate to high

Site-specific non-standard mitigation measures

Create architecturally custom bridge design, materials, noise walls, abutments and embankments that respond to sensitive areas or key gateway sites.

Unlike other overpasses, this bridge utilises walls instead of berm embankment. Custom architectural treatment should be applied to all aspects of this overpass, in line with a suitable gateway to Dingley Village, Braeside Park and the Woodlands Industrial Estate. In developing this Report, conversations with the City of Kingston highlighted that communities desire a boulevard-style treatment. This should integrate a wide and light-filled underpass for increased pedestrian safety, open space/activation opportunities and trees lining the road and median.

Previous community engagement between Dingley Village community and the City of Kingston should be considered in the selection of tree species. The overpass could integrate wayfinding and/or gateway treatment to celebrate local community and the Woodlands Industrial Estate. City of Kingston has highlighted the desire to integrate an overpass for pedestrians and cyclists in order to enable un-interrupted connection across Lower Dandenong Road and reduce traffic impacts.

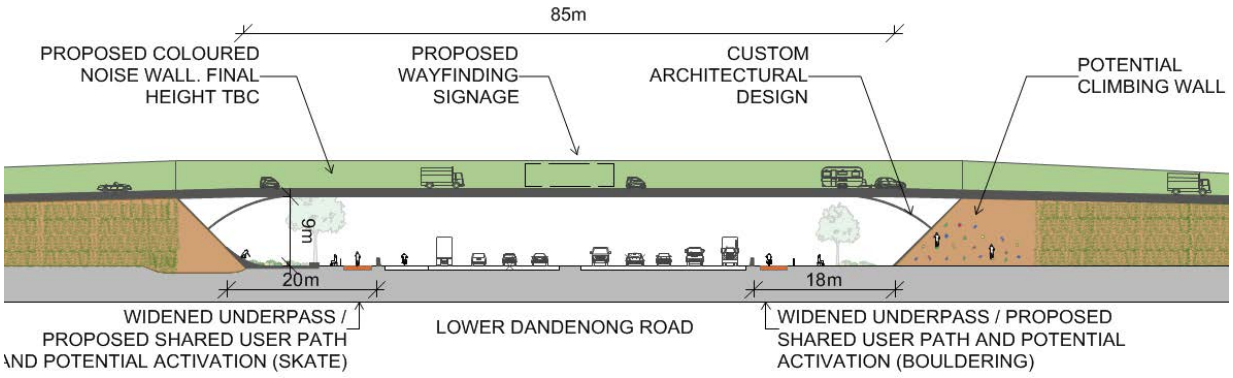


Figure 138. *Cross section N Lower Dandenong Road looking east with non-standard mitigation measures*

11.3.2 LCA 4 – Braeside Park (north woodlands)

Landscape character impact

Landscape character value: very high

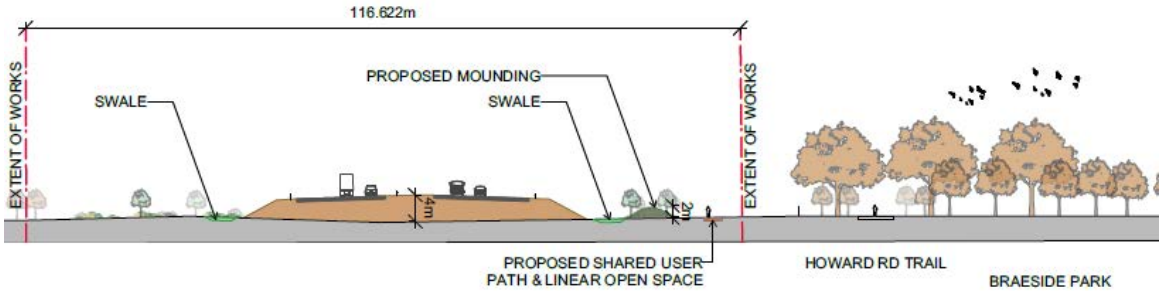


Figure 139. *Cross section G: looking north*

Sensitivity to change: high

LCA 4 runs from CH. 26000–27700 and is considered of very high value, predominantly due to its regional park catchment and parkland amenity. The project runs along the western edge of Braeside Park and in parts is in close proximity to identified sensitive sites such as the path trails, the park rangers' office and the bird hide, which increases its sensitivity. However, extensive vegetation throughout this area is anticipated to provide moderate levels of visual screening of the bypass from inside Braeside Park.

Magnitude of change: high

The level of change to this LCA is considered high due to the large structure of the bypass running in close proximity to the western edge. Where overpasses will be constructed, and the bypass is on fill of more than 2.5m, the impact is considered very high due to raised topography and existing views being impacted. The presence of vehicular traffic during operation of this bypass will significantly alter the parkland experience on the western edge of Braeside Park. The western entrance into Braeside Park from Park Way shared user trail will be altered to a pedestrian underpass, which is a change from the existing open grassy fields.

Impact summary with standard mitigation: moderate

Planted earth mounds and planting areas as a part of standard mitigation should be utilised in areas where Braeside Park trails are in close proximity to the bypass and the park rangers' office, minimising visual and noise impacts upon Braeside Park users.

See Appendix item 15.1.10 and 15.1.11 Cross sections E, F and G and Appendix item 15.1.6 Landscape and Urban Design Strategy which highlights locations of planted earth mounds.

Key views and sites of sensitivity impact

Sensitive site view: Park rangers' office

This image captures the view of the proposed bypass from the park rangers' office in Braeside Park, looking north across the open grassy fields of the project site area, the Woodlands Industrial Estate in the distance and heritage structure in the foreground on the left. The wireframe 3D view depicts the proposed bypass on 3m of fill.

Sensitivity to change: High

The park rangers' office is of high sensitivity due to its heritage listing, its use by park rangers and it being a visitor location. Existing industrial infrastructure in the background of the view reduces the sensitivity of this site in terms of large infrastructure being introduced into the view.

Figure 140. *Existing view looking north from the park rangers' office*

Figure 141. *Wireframe 3D montage view looking north from Park Rangers Office with no mitigation measures*

Magnitude of change: moderate

The bypass will run in close proximity to the park rangers' office and will be clearly visible. However, it is anticipated standard mitigation (e.g. planted earth mounds and trees) can reduce these impacts if it is of similar vegetation character to the surrounding parklands.

Impact summary with standard mitigation: low to moderate

Sensitive site view: Braeside Park trail

This view captures one of the key views within the Braeside Park's trail network that currently has clear views across the project site.

Sensitivity to change: high

The Braeside Park trail is considered of high sensitivity due to it being a valued regional catchment park that currently provides a parkland experience for the community. However, existing vegetation within the park is quite dense and will screen a large amount of the bypass, which reduces its sensitivity.

Figure 142. *Existing view looking south west from the Braeside Park trail*

Figure 143. *Photomontage view looking south west from the Braeside Park trail with no mitigation measures*

Magnitude of change: low to moderate

The bypass will run in close proximity to Braeside Park at particular points and may be clearly visible. However, it is anticipated that standard mitigation (e.g. planted earth mounds and trees) can reduce these impacts if it is of similar vegetation character to the surrounding parklands.

Impact summary with standard mitigation: low to moderate

11.3.3 LCA 5 – Central wetlands

Landscape character impact

Landscape character value: very high

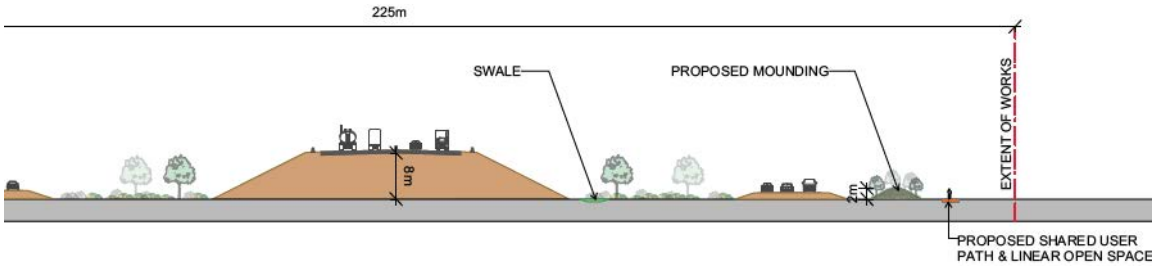


Figure 144. *Cross section E, looking north west*

Sensitivity to change: very high

LCA 5 runs from CH. 27450–28500 and is of very high value in terms of visual amenity, recreational and cultural value, ecological significance and habitat provision. The portion of the LCA that this section of the bypass runs through is connected to the Waterways and Woodlands Industrial Estate wetlands, therefore any significant topographical or visual change is considered of high impact.

Scenic and distant views are available from Braeside Park lookouts and trails and for Governor Road motorists.

Magnitude of change: high

Within this section of the bypass, the overpass at Governor Road is a large structure that will run straight through this LCA and the adjacent wetlands of the Waterways neighbourhood LCA. These wetlands are visually and ecologically connected. The proposed project will shorten existing distant views from the Woodlands Industrial Estate wetlands trails, Braeside Park trails and lookouts, and for Governor Road motorists across the wetlands; alter the landscape topography; and remove existing vegetation. The overall landscape character of the central wetlands and the Waterways wetlands is expected to be visually and physically seperated by the bypass, especially so by the Governor Road overpass, fill and noise walls.

Impact summary with standard mitigation: high

Impact summary with non-standard mitigation: moderate

Key views and sites of sensitivity impact

Sensitive site view: Braeside Park bird hide

Braeside Park's bird hide is identified as a sensitive site There is potential for the bypass to be visible from this point.

Sensitivity to change: high

The bird hide is of high sensitivity due to it being a lookout point for birds and of naturally perceived amenity.

Figure 145. *Existing view looking south west from the Braeside Park bird hide*

Figure 146. *Wireframe 3D view looking south west from the Braeside Park bird hide*

Magnitude of change: low to moderate

The bypass will run near the bird hide; however, views are controlled to look directly south and south west due to the enclosed structural design of the bird hide. Due to the existing vegetation and the flat nature of the site, the bypass is anticipated to be slightly visible in the background view. Standard mitigation of planting is anticipated to screen the majority of potential views of the bypass.

Impact summary with standard mitigation: low

Sensitive site view: Braeside Park wetlands lookout

Braeside Park's wetlands lookout is identified earlier in this report as a sensitive site. There is potential for the bypass to be visible from a distance at this lookout point.

Sensitivity to change: moderate

The wetlands lookout point is of high sensitivity due to it providing distant views out and across the wetlands and landscape. However, due to the distance from the project, it's sensitivity is anticipated to be lowered.

Figure 147. *Existing view looking south west from the Braeside Park wetlands lookout*

Figure 148. *Photomontage looking south west from the Braeside Park wetlands lookout toward the Governor Road overpass*

Magnitude of change: low to moderate

The Governor Road overpass is anticipated to be visible from this lookout point through breaks in vegetation. The bypass is anticipated to be a large structure in the distance that will impact existing horizon lines and create a significant landform change from this view. Standard mitigation of strategically located planting and planted mounds is considered to effectively reduce direct views of the structure and reduce the impact of this significant structure in the landscape.

Impact summary with standard mitigation: low

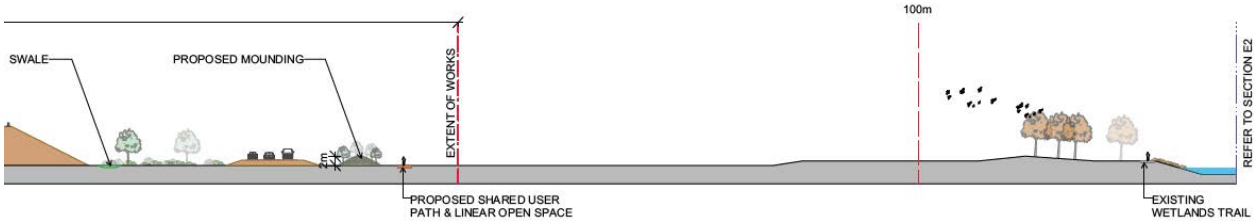


Figure 149. *Cross section E: looking north west*

Sensitive site view and representative view: Woodlands Industrial Estate wetlands trail and representative view from Governor Road

The trail network within the Woodlands Industrial Estate is identified earlier in this report as a sensitive site of high value. This view is also representative of distant views driving along Governor Road, and so assists in identifying the visual impact of the Governor Road overpass on associated road users.

Sensitivity to change: high

The views from these trails are considered of moderate to high sensitivity. Despite their proximity to the bypass and their open views towards the Governor Road overpass, use of the site is informal and will impact what is estimated to be a limited user group. Impacts to motorists on Governor Road may be sensitive due to the existing natural amenity of this area (i.e. open grassy fields and wetlands).

Figure 150. *Existing view looking south east from Woodlands Industrial Estate wetlands trail*

Figure 151. *Wireframe 3D view looking south east from Woodlands Industrial Estate wetlands trail*

Magnitude of change: very high

The Governor Road overpass is anticipated to be clearly visible from this open grassy fields section of the trails throughout the Woodlands Industrial Estate wetlands. Standard mitigation of planting within the project site is anticipated to reduce the visual impact of the bypass structure from the trails.

Impact summary with standard mitigation: high

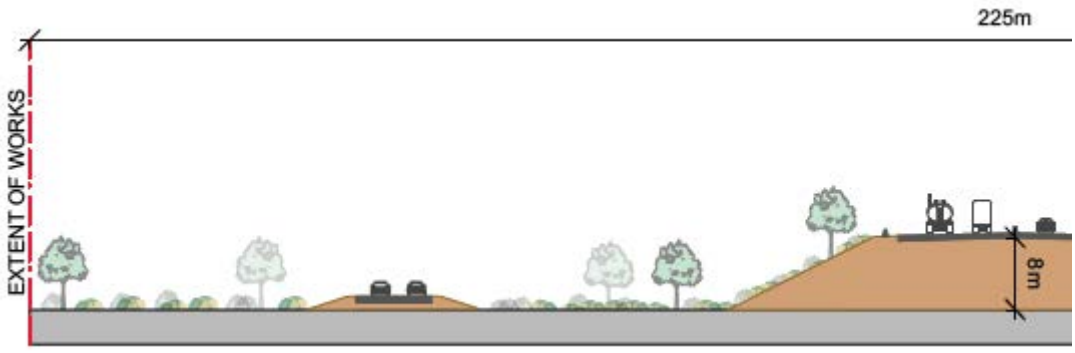


Figure 152. *Cross section E with standard mitigation looking north*

Impact summary with non-standard mitigation: moderate to high

11.4 South sub-study area

Description of alignment and key bypass features

This sub-study area runs from Governor Road to the Lifestyle Chelsea Heights retirement village on Wells Road (CH. 28400–31100). The following key landscape and visual impacts should be read in conjunction with Appendix item 15.1.4

Landscape and Visual Impact Assessment map: South sub-study area and mitigation measures with Appendix item 15.1.7

Landscape and Urban Design Strategy map: South sub-study area.

Overpasses and associated fill

- Two 10m high four-lane overpasses with two service lanes and associated structural fill above 1.5m will be constructed over Springvale Road, 1000m in length (CH.29900–30900); and Governor Road, 1200m in length (CH. 27600–28800).
- One 8m high six-lane dual bridge overpass and associated structural fill above 1.5m will be constructed over Mordialloc Creek, the Waterways wetlands and Bowen Parkway, 800m in length (CH. 28900–29700).

Fill

- There will be consistent fill above 1.5m with a peak of 5m (between CH28900–29100 and CH.29900–29500).

Noise walls

Noise walls of heights between 5 and 7m above the new road grade levels will be in different sections of the alignment:

- on the south-western edge of the bypass from the Springvale Road overpass bridge structure and associated fill to the Waterways overpass and associated fill, 1500m in length (CH. 30500–29000)
- on the north-eastern edge of the bypass from the Waterways overpass and associated fill to Springvale Road overpass, 1300m in length (CH. 29700–28400).

Pedestrian safety risks

- At some points the proposed shared user path will be located within long linear spaces 25 to 35m wide, and between a noise wall over 3m in height and 1.8m high back fences of residential dwellings. As such, passive surveillance and immediate access routes are limited in these areas. These path areas are located adjacent to the Aspendale Gardens residential LCA (CH. 30400–29800 and 29600–29500).
- Access points are located at Springvale Road, the open space on Bangalow Way and Jackie Court.

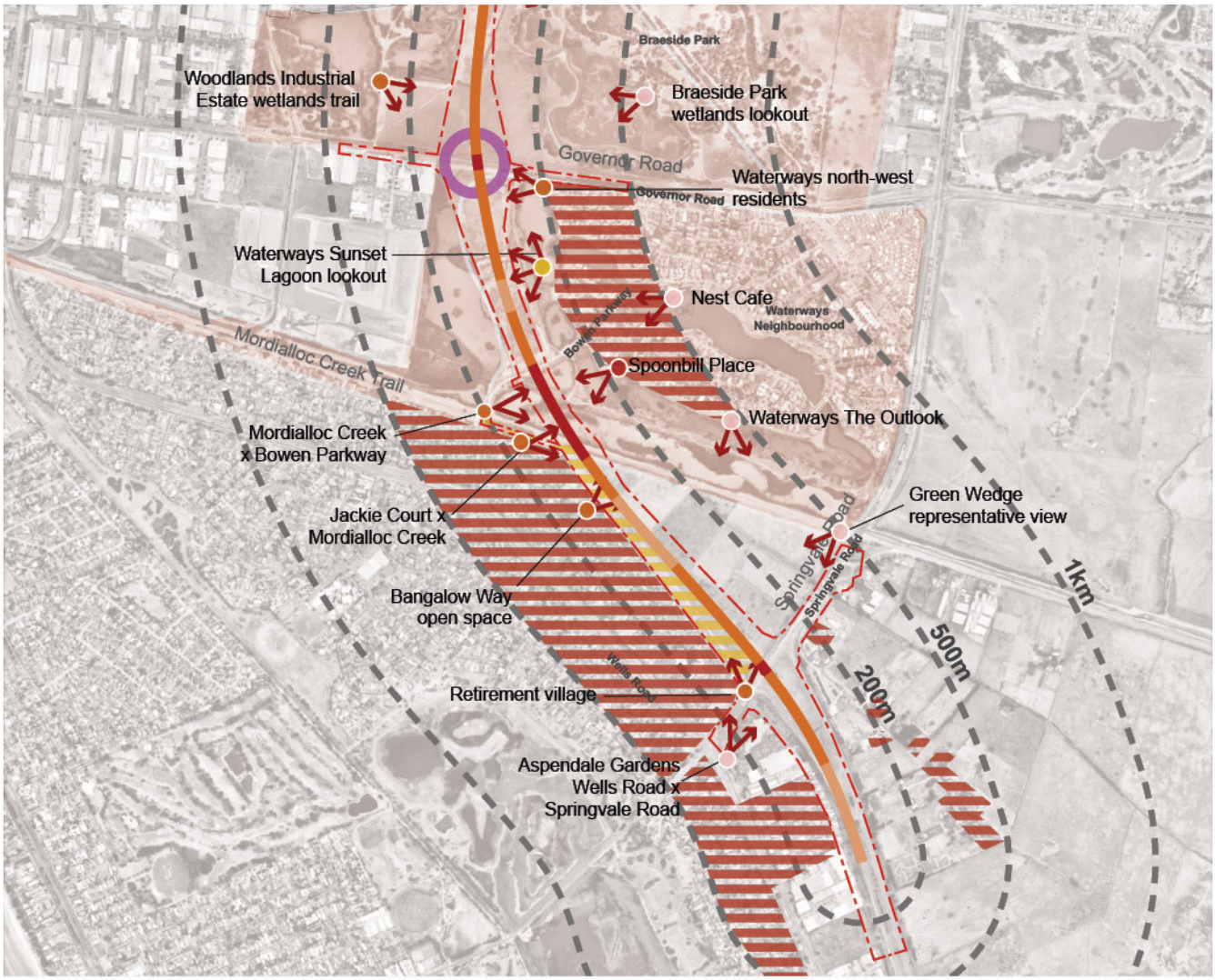
Ecologically sensitive areas

- The proposed bypass and shared user path will run through ecologically sensitive areas as highlighted in the Mordialloc Bypass EES Flora and Fauna Impact Assessment, predominantly from CH. 29500–28500. These include Mordialloc Creek, significant habitat surrounding the proposed Waterways overpass and south of Governor Road within the project site boundary. The bypass also runs through sensitive wetland areas.

- Vegetation and wetland planting will be lost within this area due to the construction and operation of the proposed bypass (CH. 29500–28500). More detail on vegetation and wetland impacts is described in the Mordialloc Bypass EES Flora and Fauna Impact Assessment.

Dwellings

- Aspendale Gardens residential LCA and the Waterways neighbourhood LCA consist of residential clusters and have associated sensitive sites throughout, including open spaces and trails.



Legend

- Very high visual impact
- High visual impact
- Moderate visual impact
- Low to negligible visual impact
- View direction
- Residential sensitive areas
- Low levels of passive surveillance (estimated)
- High value landscape character area
- Key gateway
- Alignment bridge, fill > 2.5m, fill < 2.5m
- Study area / distance from bypass alignment
- Project site boundary

All impacts consider standard mitigation measures

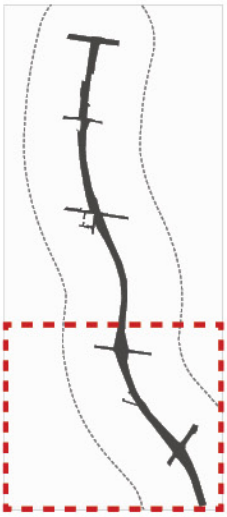


Figure 153. *South sub-study area visual impacts, residential clusters and LCAs of high value*

Landscape character area impacts

The area consists of six landscape character areas (LCAs) of varying value and sensitivities:

- LCA 3 – Western industrial
- LCA 5 – Central wetlands
- LCA 6 – Waterways neighbourhood
- LCA 7 – Aspendale / Chelsea Heights residential
- LCA 8 – Aspendale / Chelsea Heights commercial
- LCA 9 – South green wedge

11.4.1 LCA 3 – Western industrial

Landscape character impact

Landscape character value: low to moderate

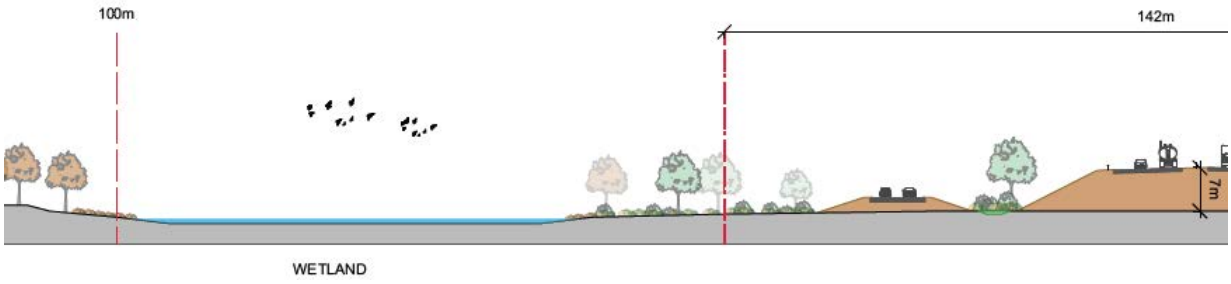


Figure 154. *Cross section D: looking north*

Sensitivity to change: negligible

This LCA runs from CH. 28400–28900 and is considered of low to moderate value. As the bypass does not physically impact this site, and no sensitive audiences reside within this area, its sensitivity to change is considered very low.

Magnitude of change: negligible

The level of change to the LCA in this area is considered very low as the bypass does not physically alter the area, and there aren't any sensitive audiences or views.

Impact summary with standard mitigation: negligible

11.4.2 LCA 5 – Central wetlands

Landscape character impact

Landscape character value: very high

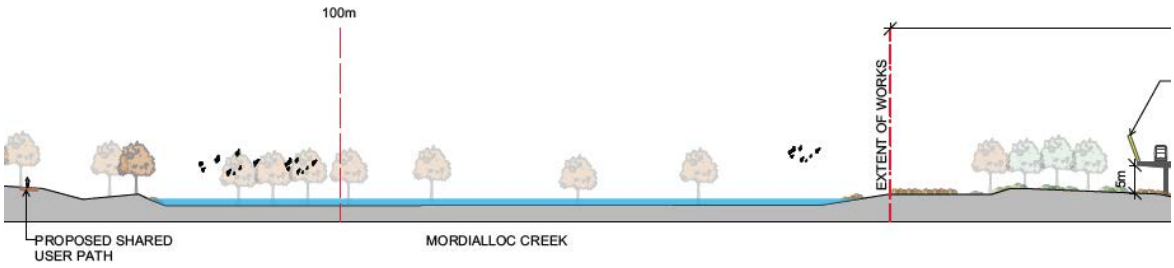


Figure 155. *Cross section C1: looking north west*

Sensitivity to change: very high

This LCA runs from CH. 28400–29200 and is of very high value in terms of visual amenity, recreational and cultural value, ecological significance and habitat provision. The portion of the LCA that this section of the bypass runs through is connected to the Braeside Park and Woodlands Industrial Estate wetlands, so any significant geographical or visual change is considered of high impact.

The character unit forms a significant part of the scenic and distant views from surrounding Aspendale Gardens, the Waterways residential areas and motorists along Governor Road, therefore its sensitivity to change is considered very high.

Magnitude of change: very high

Within this section of the bypass, two large overpass structures at Bowen Parkway and Governor Road will run directly adjacent to this LCA and the adjacent wetlands of the Waterways neighbourhood LCA. The proposed project will shorten existing distant views from the Waterways neighbourhood LCA and Aspendale Gardens residential LCA across the wetlands, alter the landscape topography and remove existing vegetation. The overall landscape character area will be severed visually and physically by the bypass; especially by the Governor Road overpass, fill and noise walls.

Impact summary with standard mitigation: very high

Impact summary with non-standard mitigation: high

Key views and sites of sensitivity impact

View: Bowen Parkway/the Waterways wetlands/Mordialloc Creek

This view was selected as it's a scenic view across the wetlands from Bowen Parkway and a key existing pedestrian and cyclist connection to the Mordialloc Creek Trail. It's also a vantage point to highlight the overpass structure over the wetlands.

Sensitivity to change: very high

Close views (250m from bypass alignment centre) from Bowen Parkway and nearby Mordialloc Creek Trail are anticipated to be impacted by the project, predominantly by the overpass over the Waterways wetlands and Bowen Parkway.

Figure 156. *Before view from Bowen Parkway shared path looking east across the Waterways wetlands; a scenic view for existing motorists and shared path users*

Figure 157. *Photomontage view from Bowen Parkway shared path looking east across the Waterways wetlands and Mordialloc Creek and toward the proposed Waterways overpass*

Magnitude of change: very high

The overpass is anticipated to be a substantial new structure within this naturally perceived landscape.

Impact summary with standard mitigation: very high

Impact summary with non-standard mitigation: high

Site-specific recommended non-standard mitigation

- Use architecturally custom-designed bridge, materials, noise walls, abutments and embankments that respond to sensitive areas or key gateway sites and minimise visual impacts as far as practicable
- Utilise sustainable and minimally toxic building materials for construction (Reference: 2018, Sustainability Victoria; Rethinking Cement, 2018, Beyond Zero Emissions)

- Seek opportunities for new structural elements (e.g. noise walls, abutments, embankments and piers) design to provide multiple functions where appropriate. Adding another layer of functionality and visual interest can increase visual amenity, public use and passive surveillance.
- For ecologically sensitive areas, seek planting or habitat enhancement opportunities (e.g. encourage climbing plant growth on noise walls, provide tiered planting areas or plant out embankments and piers).
- Increase pedestrian and cyclist connection opportunities, experience and safety where identified in Appendix 15 Landscape and Urban Design Strategy mapping.

11.4.3 LCA 6 – Waterways neighbourhood

Landscape character impact

Landscape character value: very high

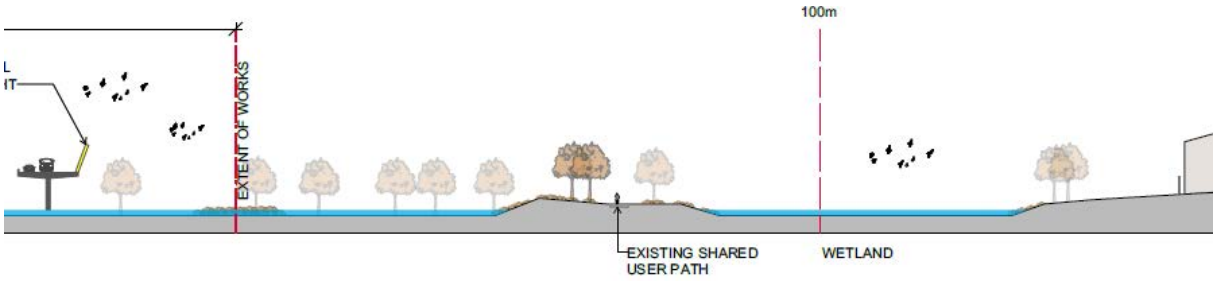


Figure 158. *Cross section C2: Waterways wetlands and Spoonbill Place, looking north west with standard mitigation*

Sensitivity to change: very high

This LCA runs from CH. 28500–29900 and is of very high value due to its scenic and recreational value, ecological sensitivity and bird life. Additionally, there is a residential cluster within 200m of the proposed bypass with associated open spaces and sensitive sites, such as the various lookout points and recreation trails. Its sensitivity to change is considered very high.

Magnitude of change: very high

All three overpasses, associated fill and noise walls in this area are anticipated to significantly change the overall landscape character and visual amenity of the area. Close and distant views of residents, and views from open spaces, trails and lookouts in this LCA are affected. While proposed mitigation planting and existing vegetation may provide visual screening of the bypass in some areas, the large scale of the bypass in such a typically low and flat landscape will make it a visual barrier along the entire southern and western edges of the neighbourhood. The overall experience across this LCA will be significantly altered; it will no longer provide the experience of being in an open, expansive landscape and wetlands.

Non-standard mitigation measures (including custom-designed bridge structures, noise walls and embankments) may reduce visual impacts and, over time, standard mitigation from tree planting may reduce overall visual impacts across the LCA.

Impact summary with standard mitigation: very high

Impact summary with non-standard mitigation: high

Note: Regarding planting, Melbourne Water advises local provenance species should be used for any planting within Waterways Estate and/or along the bridge within this vicinity. Melbourne Water requests review and approval of any landscapes design prior to planting taking place.

Key views and sites of sensitivity impact

View: Spoonbill Place/south-facing Waterways residents

This view is representative of south-facing Waterways residents and open space users within this area. It also highlights the structural design of the overpass.

Sensitivity to change: very high

Close views (200m from bypass alignment centre) from south-facing Waterways residents towards the bypass are anticipated to be significantly impacted by the Waterways wetlands/Bowen Parkway overpass.

Figure 159. *Existing view from Spoonbill Place looking south across the Waterways wetlands; a scenic view from existing south-facing Waterways residents*

Figure 160. *Photomontage view from Spoonbill Place looking south across the Waterways wetlands toward the Waterways overpass*

Magnitude of change: very high

The overpass is anticipated to be a highly visible structure within the skyline and the naturally perceived landscape, which is made up of vegetation, wetlands and grasslands.

Non-standard mitigation in the form of a custom-designed bridge may reduce the visual impact to some degree; however, it cannot change the significant impact upon horizon lines and the structure of the bridge within the wetlands scenery. In time, standard mitigation and non-standard mitigation locations of tree plantings outside of the ROW may grow higher to reduce the higher visual impacts of the bridge; however, these will not reduce the shortening of existing views.

Impact summary with standard mitigation: very high

Impact summary with non-standard mitigation: high

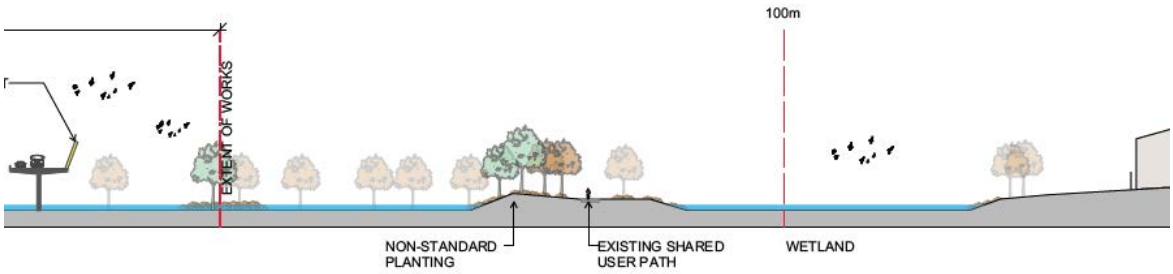


Figure 161. *Cross section C2: Waterways wetlands and Spoonbill Place, looking north west with non-standard mitigation*

View: Sunset Lagoon lookout/representative view of west-facing Waterways residents

These are representative views of west-facing Waterways residents and the open space trails and lookouts provided in this area. It highlights one of the lower points of the bypass road design.

Sensitivity to change: high

Close views from Sunset Lagoon lookout across the scenic wetlands will be impacted by the combination of the project's fill and noise walls. Vegetation may reduce the impact upon views.

Figure 162. *Existing view from the Waterways Sunset Lagoon lookout, looking south west over the Waterways wetlands and central wetlands; these wetlands provide long-distance open views of scenic quality*

Figure 163. *Wireframe 3D view from the Waterways Sunset Lagoon lookout, looking south west; majority of the bypass will be behind existing vegetation, so the magnitude of change is lowered*

Figure 164. *Existing view from the Waterways Sunset Lagoon lookout, looking north*

Figure 165. *Photomontage from the Waterways Sunset Lagoon lookout looking north; majority of the bypass will be behind existing vegetation, so the magnitude of change is lowered*

Magnitude of change: low to moderate

The level of visual change upon this view is considered moderate to high due to the existing vegetation screening potential views and the topography of this section of the alignment being lower than other areas within this sub-study area. However, standard noise walls may be visible within this naturally perceived scenic view.

Impact summary with standard mitigation: low to moderate

View: Waterways north-west residents

This view is representative of the Waterways north-west residents and Barmah Place.

Sensitivity to change: high

Close views (200m from bypass alignment centre) from north-west Waterways residents and Barmah Place will be impacted by the Governor Road overpass and associated fill. As there is existing road infrastructure in the area at Governor Road, these residents may be more used to nearby road infrastructure than other Waterways residents. However, views across the wetlands and vegetation are currently of scenic quality.

Figure 166. *Existing view from north-west corner of the Waterways residential area; this is looking from Barmah Place towards the proposed overpass at Governor Road*

Figure 167. *Wireframe 3D view (with no noise walls) from north-west corner of the Waterways residential area; this is looking from Barmah Place towards the proposed overpass at Governor Road*

Magnitude of change: high

The magnitude of change to these views may be reduced by existing vegetation in the area; however, the Governor Road overpass will be 14m above existing grade, including associated noise wall. This is anticipated to be clearly visible from nearby residents and surrounding areas, and impact upon the feeling of the existing open wetlands and grassy fields.

<u>Impact summary with standard mitigation: moderate</u>

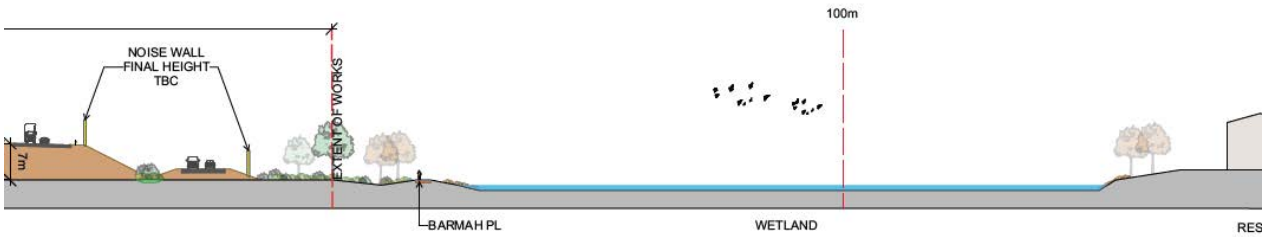


Figure 168. *Cross section D with standard mitigation, looking north*

<u>Impact summary with non-standard mitigation: moderate</u>

Negligibly impacted views

The following views were identified as key views at risk; however, after considering Wireframe 3D models and their distance from the project, it is apparent that the impacts upon these sites are negligible.

View: Waterways - Nest Cafe

Figure 169. *3D Wireframe (no transparency) view from the Nest Cafe looking south west towards the proposed Bowen Parkway overpass; it appears to be small in the distance and hidden behind existing vegetation and housing*

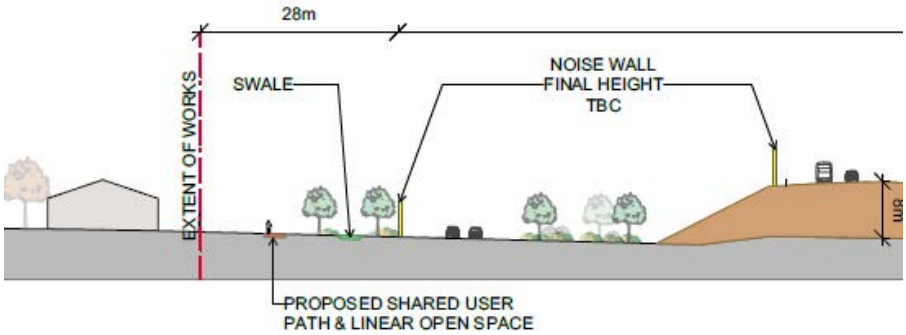
View: Waterways - The Outlook

Figure 170. *3D Wireframe (no transparency) view from The Outlook looking south east towards the proposed Springvale Road overpass; it appears to be small in the distance and hidden behind existing vegetation*

11.4.4 LCA 7 – Aspendale / Chelsea Heights residential

Landscape character impact

Landscape character value: moderate



Cross section A: Aspendale Gardens retirement village, looking west

Sensitivity to change: high

This LCA runs from CH.30400–29100 and is considered to be of moderate value. However, as it is a residential cluster within 200m of the proposed bypass and with associated open spaces/sensitive sites at Bangalow Way and Jackie Court, its sensitivity to change is considered high.

Magnitude of change: high

Existing residential and open space users' expansive views bordering the project site area looking north towards the Waterways wetlands and east across current green wedge grassy fields are anticipated to be significantly shortened by the project's noise walls, fill and overpasses. This will significantly change the character of the northern edge of this LCA; the experience of this space will shift from a feeling of openness to one of enclosure.

Non-standard mitigation measures are not anticipated to significantly reduce the view shortening and landscape character impacts upon this LCA due to its proximity to the project and the proposed physical alterations along a significant length of its northern edge.

Impact summary with standard mitigation: high

Impact summary with non-standard mitigation: moderate to high

Key views and sites of sensitivity impact

Sensitive site and representative view: Jackie Court / Aspendale residential representative view

Jackie Court is a moderately sensitive site as it's an informal open space and connection point to the Mordialloc Creek Trail. However, this view is also a representative view from the northern most Aspendale Gardens residents, where the bypass starts to rise on fill and transition into the overpass over the Waterways wetlands and Bowen Parkway.

Sensitivity to change: high

Close views (150m from the bypass alignment centre) from Jackie Court and north bordering Aspendale Gardens residential dwellings are anticipated to be impacted by the project and the overpass over the Waterways wetlands and Bowen Parkway.

Figure 171. *Before view from Jackie Court open space (within Aspendale Gardens residential area), looking east towards Springvale Road and Mordialloc Creek*

Figure 172. *Photomontage view from Jackie Court open space (within Aspendale Gardens residential area), looking east towards Springvale Road and Mordialloc Creek*

Magnitude of change: high

The overpass structure will have a considerable visual impact upon the skyline and existing vegetation of the Mordialloc Creek and Waterways wetlands. Distant views from Aspendale Gardens residents towards Mordialloc Creek and the Waterways are anticipated to be shortened.

Non-standard mitigation measures are not anticipated to significantly reduce the visual impacts of the bypass any more than the standard mitigation of planting can achieve.

Impact summary with standard mitigation: moderate to high

Impact summary with non-standard mitigation: moderate to high

Sensitive site view: Bangalow Way open space

This image is a representative view of open space users' and residents' rare expansive view across the grassy fields of the South green wedge LCA and wetlands environs. It's also one of the lower points of the proposed bypass's fill.

Sensitivity to change: high

Close views from within Bangalow Way towards the bypass (120m from the bypass alignment centre) are anticipated to be impacted by the project. The existing trees in the area are mature, with majority of foliage above eye height, as such, the bypass is anticipated to be clearly visible.

Figure 173. *Existing view from within Bangalow Way open space, looking north towards the bypass, the Waterways and the grassy fields within the green wedge*

Figure 174. *3D Wireframe view (with no noise walls) from within Bangalow Way open space, looking north towards the bypass, the Waterways and the grassy fields within the green wedge*

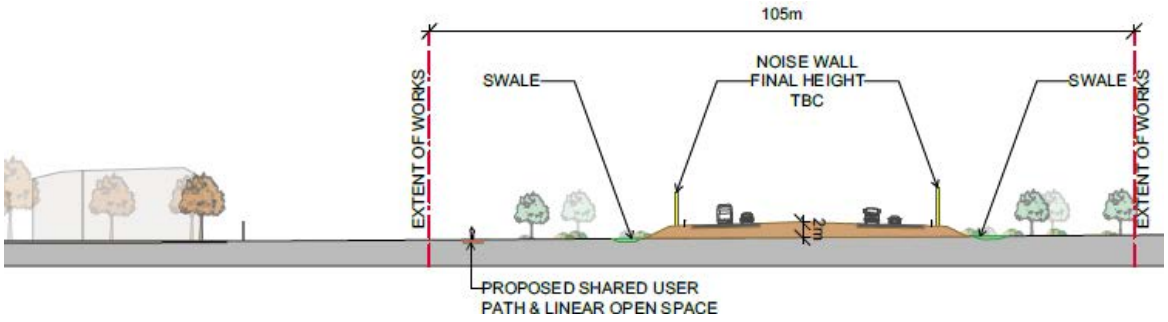


Figure 175. *Cross section B1: Bangalow Way open space, looking north west*

Magnitude of change: moderate to high

The views across the open space and distant views across the grassy fields are anticipated to be shortened, and distant views of the Mordialloc Creek and Waterways environs severed, by the combination of fill and noise walls.

Non-standard mitigation measures may offer opportunity to improve upon this existing open space and its offer to the community.

Impact summary with standard mitigation: moderate

Impact summary with standard mitigation: low to moderate

Representative view: Retirement village and Springvale Road commercial node

This is a representative view from the medical centre and other service centres on Springvale Road and the retirement village. It highlights the height of existing fences and views across the grassy fields of the South green wedge LCA afforded by residents in this character area.

Sensitivity to change: moderate

Close views from the medical centre and adjacent retirement village (100m from alignment centre) highlight that visual impacts of the proposed 10m high overpasses is substantial and will block distant views towards Waterways wetlands and Mordialloc Creek.

Figure 176. *Existing view looking north from the bus stop and medical centre at the Springvale Road and Wells Road intersection*

Figure 177. *Photomontage view showing bypass bridge, embankment and noise walls, without standard mitigation*

Magnitude of change: high

The views across the open space and distant views across the grassy fields are anticipated to be shortened, and distant views of the Mordialloc Creek and Waterways environs severed, by the combination of fill and noise walls. This will impact views from the retirement village, Springvale Road commercial node and Springvale Road motorists.

Non-standard mitigation measures may reduce the structural features' impacts upon views.

Impact summary with standard mitigation: high

Impact summary with non-standard mitigation: moderate to high

11.4.5 LCA 8 – Aspendale / Chelsea Heights commercial

Landscape character impact

Landscape character value: low

Sensitivity to change: low

This LCA runs from CH. 30900–30400 and is considered of low value. Large road infrastructure corridors (i.e. Mornington Peninsula Freeway and Springvale Road) currently run through this area. Existing buildings, service and advertisement infrastructure associated with the commercial area and main roads provide tall visual obstructions, which minimises the level of change from the proposed overpass at Springvale Road.

Magnitude of change: low to moderate

While the overpass, with associated fill batters and noise walls, will cross Springvale Road and be visually prominent in the area, it will not detrimentally change the overall character of the area.

Impact summary with standard mitigation: low

Key views and sites of sensitivity Impact

Sensitive site view: Wells Road and Springvale Road intersection

This view is representative of motorists and pedestrians using Springvale Road and Wells Road. Pedestrian crossings are located here and a number of commercial shops and activity. This view captures the existing infrastructure and character of the area.

Sensitivity to change: negligible

Middle-ground views of the bypass from Wells Road (300m from alignment centre) will be barely visible due to existing infrastructure within the Aspendale / Chelsea Heights commercial LCA.

Figure 178. *Existing view from the Springvale Road and Wells Road intersection, looking north towards the proposed Springvale Road overpass*

Figure 179. *Photomontage view from the Springvale Road and Wells Road intersection*

Magnitude of change: negligible

Impact summary with standard mitigation: negligible

11.4.6 South green wedge LCA 9

Landscape character impact

Landscape character value: low to moderate

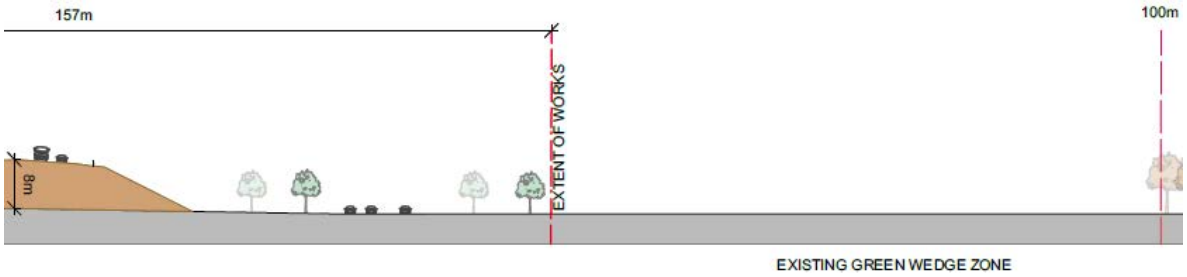


Figure 180. *Cross section A: Aspendale Gardens retirement village, looking west*

Sensitivity to change: low

This LCA is considered of low to moderate value. The Mornington Peninsula Freeway and Springvale Road are large road infrastructure corridors that currently run through this LCA, so its sensitivity to change is considered low.

Magnitude of change: low

Existing major road infrastructure runs through this LCA. However, as the area is relatively flat and consists predominantly of open grass lands, and some scattered trees and hobby farms, impacts from the Springvale Road overpass on the southern edge of the LCA will not significantly alter the landscape character and existing visual amenity.

Impact summary with standard mitigation: low

Key views and sites of sensitivity impact

Representative view: Green wedge south from Mordialloc Creek and Springvale Road

This view captures the existing open grassy fields of the South Green Wedge LCA. It also provides a clear depiction of the proposed Springvale Road overpass and associated fill.

Sensitivity to change: low

The Green wedge south LCA has many large road infrastructures running through and bordering its landscape (i.e. Springvale Road and the Mornington Peninsula Freeway).

Figure 181. *Existing view looking south from Mordialloc Creek and Springvale Road*

Figure 182. *Proposed view looking south from Mordialloc Creek and Springvale Road*

Magnitude of change: moderate

The Springvale Road overpass will be a substantial new structure in the southern edge of the Green wedge south LCA and it is anticipated to be visible from distant views (500m from bypass alignment centre). Standard mitigation techniques of planting and earth mounds can be integrated on the northern side of the bypass to reduce the visual impact.

Impact summary with standard mitigation: low to moderate

11.5 Thames Promenade sub-study area

11.5.1 Desktop assessment of landscape and visual impacts

Within the Thames Promenade sub-study area, the Mornington Peninsula Freeway and an associated overpass already exist within the study area. This sub-study area is different from the rest of the sub-study areas as a freeway is already operating within the project site and study area and therefore it's assessment chapter has been treated differently.

The change to the existing sub-study area is the addition of on and off ramps on the northern edge of Thames Promenade. A desktop assessment of landscape and visual impacts associated with Thames Promenade's on and off ramps on the existing landscape character and visual amenity is anticipated to be low with standard mitigation measures identified in this LVIA being applied.

Nearby residents within LCA 9 - Green wedge south and identified Suburban residential cluster on Wells Road and associated motorists utilising Wells Road and Thames Promenade are anticipated to be the most impacted by the project. However, incorporating standard planting and planted earth mounds that provide visual screening of these impacts are considered to be minimised and potentially improve upon existing amenity.

Figure 183. *Potential view from Suburban residential cluster on Wells Road and Wells Road/Thames Promenade motorists. Source: Google Maps*

Figure 184. *Potential view from LCA 9 - Green wedge south residents and Thames Promenade motorists. Source: Google Maps*

= Approximate on/off ramp location

Desktop impact assessment summary with standard mitigation: Low

Desktop impact assessment summary with non-standard mitigation: Very low

Design stage and operational mitigation measures include;

- Planting and planted earth mounds within the ROW (this should be of similar character to existing landscape character)
- The use of a combination of landform and planting to screen the road from adjacent residences within the ROW.
- Encouragement of indigenous planting to the ROW boundary to strengthen the extent of the landscape character where relevant.
- Road side landscape to consider appropriate size and visual amenity and ease of maintenance.

Construction mitigation measures include;

- Visual impacts upon nearby residents should be minimised as far as practicable.

Non-standard mitigation measures could include;

- Implement proposed landscape treatments and associated design principles identified of Linear green wedge park identified in Chapter 12.2. This non-standard mitigation measure could add benefit to the existing area.

As Thames Promenade is a smaller area with less impacts anticipated than the other sub-study areas, the following panoramic aerial diagrams (see Figure 184 and Figure 185) are utilised to highlight potential impacts and mitigation measures of this sub-study area.

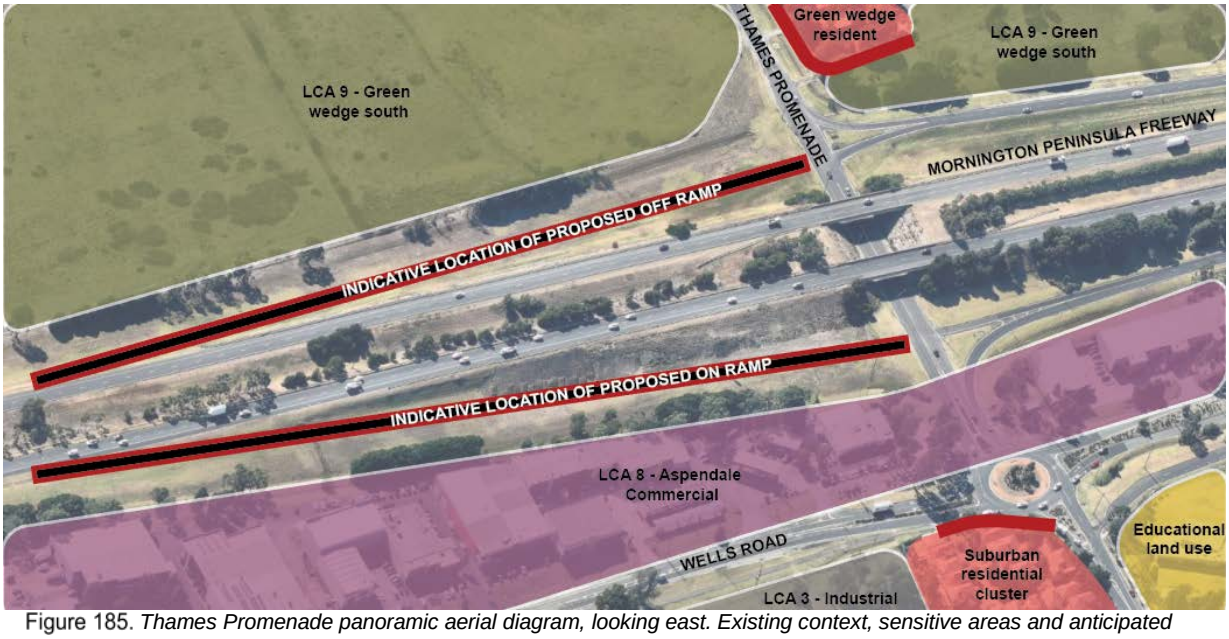


Figure 185. *Thames Promenade panoramic aerial diagram, looking east. Existing context, sensitive areas and anticipated project impacts*

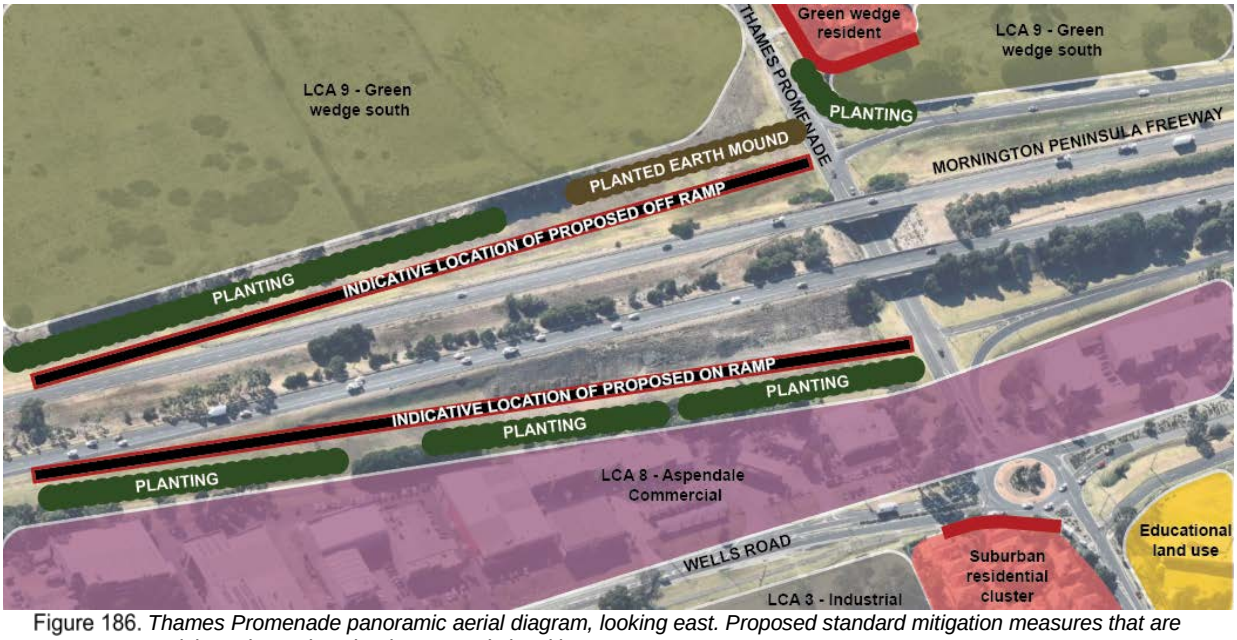


Figure 186. *Thames Promenade panoramic aerial diagram, looking east. Proposed standard mitigation measures that are anticipated to reduce landscape and visual impacts.*

LEGEND

- Residential cluster and high risk area of visual impact
- Indicative location of proposed on and off ramps
- Standard planting
- Standard planted earth mound

11.6 Summary of impacts

The tables below summarise the anticipated impacts to landscape characters, identified sensitive sites and their associated views. These characters and views are anticipated to be the most severely impacted by the project. Landscape characters of high value, residential areas and sensitive sites are anticipated to have a higher level of sensitivity than the broader community would experience. Construction impacts can be mitigated through VicRoads and Major Road Projects Authority standard CEMP process and the installation of hoardings during construction will minimise visual impacts upon sensitive sites and residential areas.

Non-standard mitigation measures have been considered for some specific moderate impacts and for all high to very high impacts. These are utilised to reduce anticipated impacts or enhance the project's outcomes and goals. Some non-standard mitigation measures (e.g. landscape treatments) apply to the entire length of the project in order to improve the overall project and the new open spaces and landscape characters it will create.

Refer to Appendix items 15.1.3-15.1.8 for the Landscape and Visual Impact mapping and Landscape and Urban Design Strategy mapping.

11.6.1 Summary of landscape character impacts: North sub-study area

LCA	LCA value	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
1 – Green wedge north	low to moderate	low	low	**low**	**low**
2 – Dingley Village residential	moderate	very high	high	**high**	**moderate**
3 – Industrial business park	low to moderate	low to moderate	moderate	**low to moderate**	**low to moderate**

11.6.2 Summary of visual impacts to key views and sites of sensitivity: North sub-study area

LCA no.	View	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
1	**Christ Church Dingley**	high	low	**low**	**n/a**
1	**Green wedge residents cluster**	moderate	moderate	**low to moderate**	**n/a**
1	**Tootal Road residential cluster**	low	negligible	**negligible**	**n/a**
2	**Chadwick Reserve**	high	moderate	**moderate**	**low**
2	**Dingley Village residents**	high	high	**moderate to high**	**moderate**
3	**Redwood Gardens Industrial Estate node**	moderate	low to moderate	**moderate**	**low**

11.6.3 Summary of landscape character impacts: Middle sub-study area

LCA	LCA value	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
3 – Industrial business park	low to moderate	low	high	**moderate**	**low to moderate**
4 – Braeside Park	very high	high	high	**moderate**	**n/a**
5 – Central wetlands	very high	very high	high	**high**	**moderate**

11.6.4 Summary of visual impacts to key views and sites of sensitivity: Middle sub-study area

LCA no.	View	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
3	**Park Way shared user trail**	high	moderate	**moderate to high**	**low to moderate**
3	**Lower Dandenong Road/representative view for Dingley Village residents**	high	very high	**high**	**moderate to high**
4	**Park rangers' office**	high	moderate	**low to moderate**	**n/a**
4	**Braeside Park trail**	high	low	**low to moderate**	**n/a**
5	**Braeside Park bird hide**	high	low to moderate	**low**	**n/a**
5	**Braeside Park wetlands lookout**	moderate	low to moderate	**low**	**n/a**
5	**Woodlands Industrial Estate wetlands trail and representative view from Governor Road**	high	very high	**high**	**moderate to high**

11.6.5 Summary of landscape character impacts: South sub-study area

LCA	LCA value	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
3 – Industrial business park	low to moderate	negligible	negligible	**negligible**	**n/a**
5 – Central wetlands	very high	very high	very high	**very high**	**high**
6 – Waterways neighbourhood	very high	very high	very high	**very high**	**high**
7 – Aspendale / Chelsea Heights residential	moderate	high	high	**high**	**moderate to high**
8 – Aspendale / Chelsea Heights commercial	low	low	low to moderate	**low**	**n/a**
9 – Green wedge south	low to moderate	low	low	**low**	**n/a**

11.6.6 Summary of visual impacts to key views and sites of sensitivity: South sub-study area

LCA no.	View	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
5	**Bowen Parkway / Waterways wetlands / Mordialloc Creek**	very high	very high	**very high**	**high**
6	**Spoonbill Place / south-facing Waterways residents**	very high	very high	**very high**	**high**
6	**Sunset Lagoon lookout / representative view of west-facing Waterways residents**	high	low to moderate	**low**	**n/a**
6	**Waterways north-west residents**	high	high	**moderate to high**	**moderate**
6	**Nest Cafe**	negligible	negligible	**negligible**	**n/a**
6	**The Outlook**	negligible	negligible	**negligible**	**n/a**
7	**Jackie Court / Aspendale residential representative view**	high	high	**moderate to high**	**moderate to high**
7	**Bangalow Way open space**	high	moderate	**moderate to high**	**low to moderate**

LCA no.	View	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
7	**Retirement village and Springvale Road commercial activity node**	moderate	high	**high**	**moderate to high**
8	**Wells Road and Springvale Road intersection**	negligible	negligible	**negligible**	**n/a**
9	**Green wedge south from Mordialloc Creek and Springvale Road**	low	moderate	**low to moderate**	**n/a**

11.6.7 Summary of landscape character impacts: Thames Promenade sub-study area

LCA	LCA value	Sensitivity to change	Magnitude of change	Impact summary with standard mitigation	Impact summary with non-standard mitigation
8 – Aspendale / Chelsea Heights commercial	low	low	low	**low**	**n/a**
9 – Green wedge south	low to moderate	low	low	**low**	**very low**

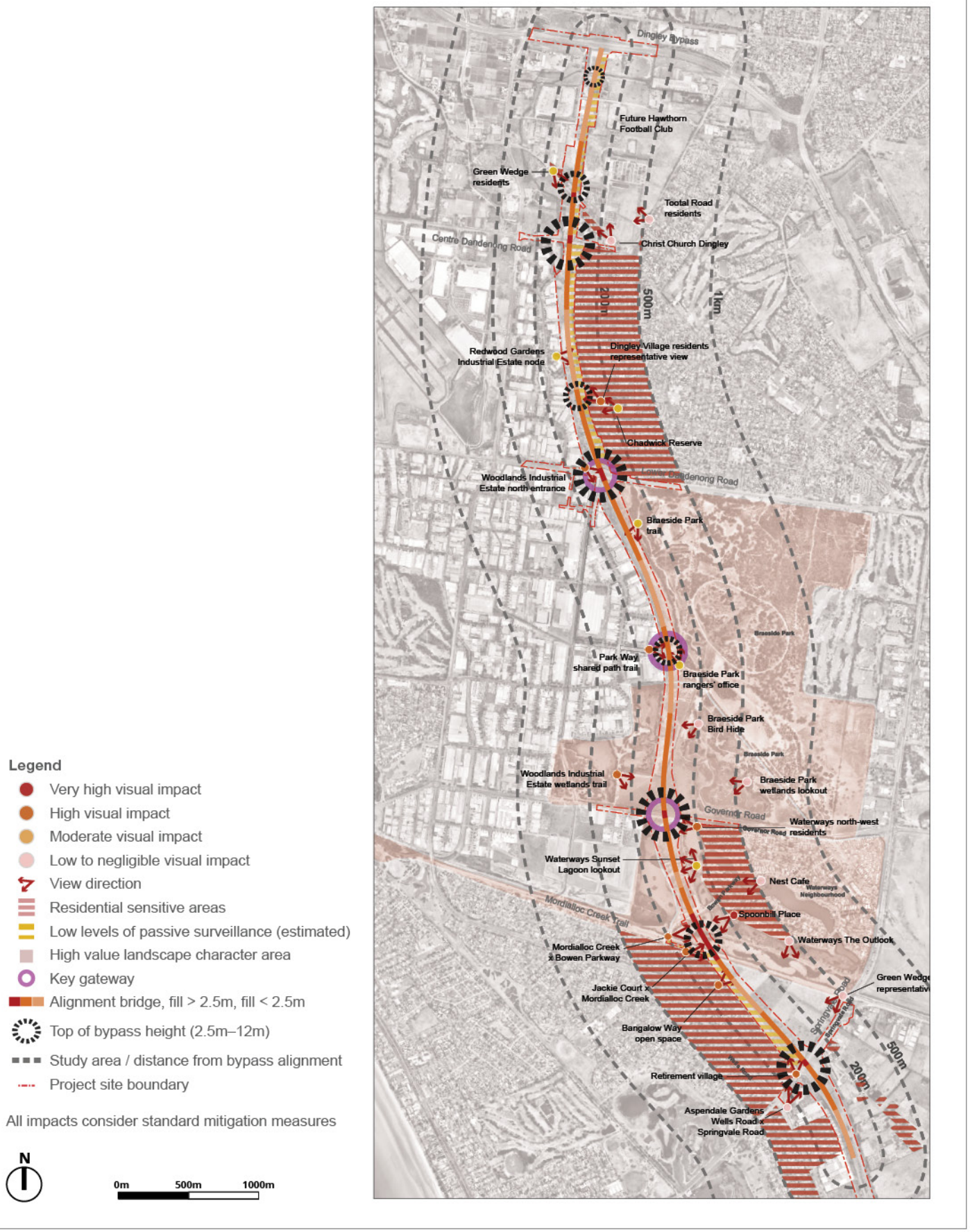


Figure 187. *Summary of visual impacts and bypass road design features*

12. Landscape and Urban Design Strategy

The Landscape and Urban Design Strategy is a visual summary of mitigation measures (both standard and non-standard) in response to the identified landscape and visual impacts in this Report and the Landscape and Visual Impact Maps in the Appendix. See Appendix items 15.1.6, 15.1.7 and 15.1.8, Landscape and Urban Design Strategy mapping for a visual summary of mitigation recommendations for each sub-study area identified in this report.

Level Crossing Removal Authority (LXRA) Urban Design Guidelines and Principles for Edithvale Road Level Crossing Removal (Edithvale Road, Edithvale, Level Crossing Removal Authority, 2018) have been workshopped and developed rigorously with Victorian State Government, VicRoads and DELWP and are considered as an industry standard and of relevance to this project. These guidelines and principles have been used to ensure a consistency of urban landscape design between the two projects as identified in the Cumulative Risk Assessment. The guiding principles include:

Principle 1. Identity

A well-defined identity and sense of place are key to creating strong and vibrant communities.

Principle 2. Connectivity and wayfinding

Well-connected and legible places contribute significantly to strong economies and healthy, inclusive communities.

Principle 3. Urban integration

Well-integrated environments provide a sound framework for the successful development of great places.

Principle 4. Resilience and sustainability

Places must be sustainable, enduring and resilient to support and nurture current and future generations.

Principle 5. Amenity

High quality urban amenity associated with access to services and the experience of great public places contributes to successful, equitable and prosperous communities.

Principle 6. Vibrancy

Animation of key civic spaces, and diversity in the experience of urban places support prosperous and healthy communities.

Principle 7. Safety

Safe environments are essential for strong, connected and happy communities

Principle 8. Accessibility

Highly accessible and inclusive environments encourage positive activation and contribute to prosperity, wellbeing and the perception of care within communities.

12.1 Project opportunities and benefits

Overall the proposed project will provide increased accessibility across the project study area and to open spaces through active modes of transport (walking and cycling). However, as identified, standard and non-standard mitigation measures should be applied within the design development and construction phase to further minimise anticipated impacts and enhance the projects overall benefit to the community.

The Landscape and Urban Design Strategy maps in the appendix provides a summary of potential:

- strategic partnership opportunities
- shared user path connection opportunities
- landscape treatment areas
- standard and non-standard mitigation measures and design responses that may minimise impacts of the project, encourage more public use of the site, enhance open space opportunity, recreational benefits and increase passive surveillance levels.

Section 11.1.2 identifies and locates the priority non-standard mitigation measures which have been identified in the Landscape and Urban Design Strategy maps. This does not mean that other mitigation measures should not be employed where practicable and appropriate.

12.2 Proposed landscape treatments

The following precedents illustrate the proposed landscape character and experience of each stretch of the shared user path along the length of the bypass. These precedents are influenced by existing characters in the local area and respond to the potential impacts of the bypass. Design principles have been developed to minimise visual impacts and public safety concerns, enhance opportunities and benefits of the project, and blend with existing landscape characters. All landscape treatments across the project should aim to reflect existing landscape characters surrounding them and enhance amenity where practicable.

Linear neighbourhood park

Figure 188. *Bungalow Way reserve in Aspendale Gardens is an example of a neighbourhood park.*

Design principles

- Prioritise clear sightlines across the park to improve public safety.
- Guarantee designed character complements the surrounding context.
- Ensure ease of maintenance.
- Encourage more park use. Consider integrating leisure and recreation infrastructure.

Integrated water management landscape/park

Figure 189. *A view of Mordialloc Creek and the Waterways wetlands character*

Design principles

- Work with ecologists to identify an appropriate remediation approach.
- Prioritise ecological enhancement.
- Integrate best practice water sensitive urban design.
- Investigate opportunities for water storage for the City of Kingston's open spaces that adjoin the project.

Linear ecological park

Figure 190. *Existing path along the Waterways wetlands and Bowen Parkway*

Design principles

- Ensure clear sightlines across the park to improve public safety.
- Work with ecologists to identify an appropriate remediation approach.
- Ensure the design prioritises ecological enhancement.
- Integrate water sensitive urban design.

Linear green wedge park

Figure 191. *RJ Hamer Arboretum in Olinda, Victoria is an arboretum that attracts thousands of visitors annually to experience the unique and diverse landscapes created by simple planting of an extensive diversity of species.*

Figure 192. *Slottstradgarden in Malmo, Sweden is a public open space that has community gardens, nurseries, agricultural businesses, and that provides fruit and herbs for the public to pick. Similar examples can be found in Perth, Queensland, New Zealand, London and Berlin.*

Figure 193. *Alnarp Landscape Laboratory in Sweden is a large test site for universities, scientists and industry (e.g. agroforestry).*

Design principles

- An opportunity exists to work with local stakeholders to create a landscape that draws on the experience of the local nurseries and agricultural industries within the green wedge zone.
- The park design and plants in these areas could integrate educational aspects, edible plant species, productive species, experimental species for scientific research, an arboretum, community gardens or a nursery depot for local councils.
- Clear sightlines and safety are a key priority in areas that the shared user path runs through.

13. Environmental Performance Requirements

The EPR's outlined in the table below set out the desired environmental outcomes for the project. The EPRs are applicable to all project phases and provided certainty regarding the projects environmental performance.

13.1.1 Landscape and visual Environmental Performance Requirements.

EPR NUMBER	ENVIRONMENTAL PERFORMANCE REQUIREMENTS	PROJECT PHASE
LV1	**Landscape design** Landscape design plans must be developed prior to the commencement of works (other than preparatory works referred to in the Incorporated Document) and must be based on relevant standards and the best practice principles of the Urban Design Charter for Victoria and the *Urban Design Guidelines for Victoria (DELWP 2017)*. The landscape design plans must incorporate, where practicable, mitigation measures to minimise the landscape and visual impact associated with the project, including in respect of: ◗ open spaces and recreational spaces ◗ community facilities ◗ residential interfaces ◗ industrial interfaces, and ◗ heritage assets. The landscape design plans must: ◗ make use of appropriate ecologically sensitive planting ◗ consider existing landscape character and sensitivities ◗ enhance key gateway streetscapes ◗ maintain and enhance existing pedestrian connections, where practicable ◗ be developed in consultation with appropriate Traditional Owner groups to provide direction on appropriate landscape typologies, land management practices and principles ◗ incorporate requirements of EPR LV2, and ◗ make use of advance tree plantings, where appropriate, to reduce the initial visual impact. In consultation with relevant stakeholders, the landscape design plans must include vegetation screening appropriate for visually impacted community spaces, including residential areas and public open spaces, must be designed and implemented. Landscaping in accordance with the landscape design plans must be implemented and maintained (EPR R-LV7).	All
LV2	**Crime prevention through environmental design** Landscape design plans must protect and, where practicable, improve access to, and amenity for, potentially affected residents, open spaces, pedestrian and cyclist	All

	networks, social and community infrastructure and commercial facilities, whilst meeting the requirements of EPR B2. This includes implementing the principles and guidelines of *Crime Prevention Through Environmental Design* (CPTED) and *Urban Design Guidelines for Victoria* (DELWP 2017) and maximising passive surveillance levels as far as practicable.	
LV3	**Reinstatement works** Within 12 months of the commencement of operation, the public open spaces, vegetation cover and facilities disturbed by temporary works must be reinstated to the reasonable satisfaction of the relevant land manager.	Operation
LV4	**Lighting (operation)** All lighting of permanent structures must be designed to minimise light spillage and protect the amenity of adjacent land uses to the extent practicable. Lighting in sensitive areas around wetlands and Braeside Park must also comply with EPR B2.	All
LV5	**Light spillage (construction)** All lighting during construction must be managed in such a way as to minimise light spill to surrounding residential land uses, sensitive areas including wetlands and Braeside Park, and neighbourhoods. The strategies and techniques to do so must be included in the CEMP.	Construction
LV6	**Tree removal** Minimise the removal of mature trees, particularly large amenity trees and those within or connected to public open spaces, that are not currently protected by no-go zones as described in EPR B3.	Construction
LV7	**Landscape management strategy** A landscape management strategy must be developed and implemented to ensure healthy growth of planted vegetation. The strategy will include weed management.	Construction, Operation

Figure 194. *Environmental Performance Requirements table*

14. Conclusion

This landscape and visual impact assessment has been conducted in order to determine the potential landscape character, visual and urban design impacts of the Mordialloc Bypass upon the existing area surrounding the project site within a 1km radius.

It is a standalone technical assessment utilising a methodology specific for landscape and visual impact assessment, based on and building upon existing industry guidelines and precedents and professional judgment, as there are no existing government or industry endorsed standards for LVIAs. This methodology is utilised to identify potential risks, impacts and sites of sensitivity to the proposed project.

Existing conditions

Legislation, policy, site visits and desktop analysis have all been utilised in correlation to assess the existing conditions of the study area (its overall landscape character and associated value) and to identify potential sensitive sites.

Nine landscape character areas have been identified within the study area as having potential to be impacted by the project. The LCAs combine landscape features, land use, and development and history to identify distinctive spatial qualities and their anticipated value to society.

Nineteen sensitive sites and associated views were identified as having potential to be impacted by the project.

Impact assessment

The impact assessment identified five low to moderate impacts and three high impacts on LCAs, even with best practice non-standard mitigation measures being implemented. A total of eight views were identified as having moderate to high impacts even if non-standard mitigation measures are applied.

A total of eight views have been identified to have moderate to high impacts even if non-standard mitigation measures are applied.

Impacts are predominantly due to the project running in close proximity to residential areas and other identified sensitive sites. Impacts are amplified when the project's road design is a bridge, noise wall or utilises land fill over 2.5m in height.

As the project is currently in the design and planning phase, non-standard mitigation measures still have potential to be integrated and further developed to minimise these potential impacts. Non-standard measures and opportunities have been identified in each sub-study area's associated chapter and in the Landscape and Urban Design Strategy mapping and the associated landscape treatments and guiding principles. These measures and correlating guidelines encourage a high quality urban design and landscape outcome for the sensitive sites, the areas surrounding residents and the community generally.

The identified Environmental Performance Requirements in this report are applicable to all project phases and aim to provide a desired environmental outcome and level of certainty regarding the project's environmental performance.