CAULFIELD TO DANDENONG LEVEL CROSSING REMOVAL PROJECT

TREE RETENTION SUMMARY REPORT

LEVEL CROSSING REMOVAL AUTHORITY

VICTORIA State Government

TERMS AND DEFINITIONS

Term	Definition
Amenity Value	A measure of the importance of a tree to the aesthetic amenity of the area. For example while a tree may not be native to the area and of little biodiversity value, it may provide screening or aesthetic value.
Area 1	The project area between Caulfield and Hughesdale that includes the level crossing removals at Grange, Koornang, Murrumbeena and Poath Roads.
Area 2	The project area in Clayton that includes the level crossing removals at Clayton and Centre Roads.
Area 3	The project area in Noble Park that includes the level crossing removals at Corrigan, Heatherton and Chandler Roads.
Canopy	The part of the crown or foliage composed of leaves and small twigs.
CTD	Level Crossing Removal Project Caulfield to Dandenong Alliance, incorporating Lendlease, CPB Contractors, WSP | Parsons Brinckerhoff, Aurecon, MTM and LXRA.
COSEP	Community Open Space Expert Panel. A panel established by the Level Crossing Removal Authority to oversee plans for the 22.5 hectares of new open public space that will be created by the project.
Diameter Breast Height (DBH)	The diameter of a tree at approximately 1.4 meters above ground level.
Environmental Value	A measure of the importance of native, remnant or self-propagated trees and vegetation to an area and its biodiversity.
Form	The aesthetic qualities of a tree's live canopy. Good form is generally indicative of a symmetrical, well-balanced canopy.
LXRA	Level Crossing Removal Authority
Mature Tree	A tree that has reached at least 20-80% of its typical final height and spread.
Tree	A woody plant typically greater than five metres in height and/or with a diameter at breast height (DBH) of greater than 15 centimetres.
Useful Life Expetancy (ULE)	The span of time a tree might reasonably be expected to provide useful amenity value at an acceptable level of safety.
MTM	Metro Trains Melbourne
Retention Value	A measure of the value of retaining trees or vegetation with regard to environmental or community value. Influences if and how trees or vegetation are retained.

Caulfield to Dandenong Level Crossing Removal Project

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1 . INTRODUCTION

1.1 PROJECT SCOPE

The Caulfield to Dandenong Level Crossing Removal Project (the Project) will remove nine of Melbourne's most dangerous and congested level crossings along the Caulfield to Dandenong corridor and completely rebuild five stations on Melbourne's busiest rail line by late 2018.

The Project will extend station platforms, and upgrade rail systems, power and signalling along 72 kilometres of the rail line from Southern Cross to Cranbourne and Pakenham. This will support 65 new, longer, High Capacity Metro Trains which, when introduced from 2018, will afford a 42 per cent capacity increase on the line, equivalent to an extra 20,000 passengers a day.

The Level Crossing Removal Authority (LXRA) is overseeing the delivery of the Project and has identified the following Project Objectives:

- Maintain an acceptable level of service for road and rail users during delivery
- Improve the reliability and efficiency of the transport network to improve productivity
- Align with community and stakeholder expectations
- Provide early engagement with stakeholders to take them on the journey
- Promote appropriate land utilisation around rail corridors to facilitate value capture development rights opportunities
- Provide better connected, more vibrant activity centres and improved urban amenity for all users
- Create safer communities.

LXRA has awarded the Project to the Caulfield to Dandenong (CTD) Alliance. The Alliance consists of Lendlease, CPB Contractors, WSP|Parsons Brinckerhoff, Aurecon, metropolitan rail operator Metro Trains Melbourne (MTM) and LXRA.

The major elements of the Project include:

- Three sections of elevated structure to carry the rail over the existing level crossings of Grange Road, Koornang Road, Murrumbeena Road, Poath Road, Clayton Road, Centre Road, Corrigan Road, Heatherton Road and Chandler Road
- Removal of the level crossing infrastructure and refinement of the existing road alignments
- Five reconstructed stations at Carnegie, Murrumbeena, Hughesdale, Clayton and Noble Park
- Extended platforms at other stations along the line
- New rail systems and signalling along the greater alignment stretching from the City Loop out to Cranbourne and Pakenham
- A linear park beneath the elevated structures and a shared user path running along the full length of the alignment.

2. REPORT SUMMARY

Trees, vegetation and green space are important to local communities and support biodiversity along the Caulfield to Dandenong rail corridor.

The Project team has undertaken an assessment of over 6,000 trees in and immediately adjacent to the rail corridor to identify the existing conditions of trees and vegetation.

This document summarises measures undertaken by the Project team to retain trees in and around the rail corridor between Caulfield and Yarraman stations. It details research and assessments conducted during the design development phase and mitigation and management measures to be applied during Project construction and long-term operation.

PLANNING DESIGN AND CONSTRUCTION TO RETAIN MORE TREES

The Caulfield to Dandenong Level Crossing Removal Project is a major infrastructure project being built within an existing metropolitan rail corridor. Regardless of the design selected to remove the level crossings – whether rail-over, rail-under, road-over, or road-under – trees and vegetation adjacent to the corridor will be impacted.

Parts of the rail corridor, typically between Caulfield and Hughesdale, are no more than twenty metres wide. The area available for construction is restricted and removing level crossings by either rail-under or rail-over designs will involve unavoidable tree removal.

When compared to an open cut trench solution, the Project's elevated rail design provides more opportunities to retain trees and vegetation within the rail corridor. This is due to the Projects' significantly lower overall land footprint, and was a core consideration when selecting the elevated rail design. Additionally, the opportunities and space presented for revegetation works along the rail corridor increase considerably by elevating the rail line as it opens up the space underneath and alongside the rail line for further planning and consideration.

In recognising the community's desire to preserve trees when removing level crossings, the Project team has carefully considered how to minimise the extent of tree and vegetation removal both as part of overall project design and during construction.

A priority for the Project team is to retain larger, more mature trees and vegetation wherever possible. In areas where tree and vegetation removal is required to enable construction, every effort has been made to protect the trees and vegetation that currently exist.

Project tree retention plans have been developed using feedback received during community consultation undertaken in 2015 and early 2016, ongoing construction planning inputs and regular liaison with key project stakeholders.

This Tree Retention Summary Report should be considered in conjunction with the Project's plans to deliver 12 kilometres of new, community open space under the elevated rail structures. The Project's Community Open Space Expert Panel (COSEP) has been tasked with advising how that community open space is best developed.

3. TREE RETENTION

The elevated rail design allows for a significant number of trees to be retained when compared with an open cut trench. Although trees will need to be removed during the construction phase, the Project will deliver an overall net increase in tree numbers once the final landscaping and tree planting is undertaken along the rail corridor and in the new open spaces created by the elevated rail design.

With the elevated rail design, it is estimated that between 1,000-2,000 trees will be retained that would otherwise need to be removed. In addition to this over 4,000 trees will be planted as part of the revegetation of the rail corridor following completion of construction works.

3.1 LOCATION

The Project area extends along the Cranbourne-Pakenham rail corridor between Southern Cross Station in Melbourne's Central Business District, around the Melbourne Underground Rail Loop (City Loop), and to Cranbourne and Pakenham Stations.

Information contained in this report relates to the 'core' project area between Caulfield and Yarraman stations. The area incorporates the nine level crossings at:

- Area 1
  - Grange Road, Carnegie
  - Koornang Road, Carnegie
  - Murrumbeena Road, Murrumbeena
  - Poath Road, Hughesdale
- Area 2
  - Clayton Road, Clayton
  - Centre Road, Clayton
- Area 3
  - Corrigan Road, Noble Park
  - Heatherton Road, Noble Park
  - Chandler Road, Noble Park.

3.2 PROJECT AREAS

AREA 1

Most of the Project works required between Caulfield and Hughesdale (Area 1) will occur within the existing rail reserve on land zoned Public Use Zone 4 -Transport (PUZ4).

Area 1 also includes sections of road reserves and land owned by Glen Eira City Council and adjoining or adjacent land owned and managed by VicTrack.

Area 1 includes a number of open spaces that have high community value, as reflected in community feedback received. These include:

- Carnegie Station and Woorayl Street – around the station precinct, particularly the northern forecourt, where there are a number of mature trees including river red gums, cypress and the characteristic palm tree on the corner of Koornang Road and Woorayl Street.
- Murrumbeena Station – land around the station, including the southern car park, where there are a number of mature river red gum trees; the notable gardens lined by bluestone closer to the station building, and the characteristic oak and palm trees to the north of the station.
- Boyd Park – includes land currently used for public car parking and recreational purposes and a fenced section of Indigenous vegetation planted by community groups. This area is also home to a number of mature river red gums.
- Galbally Reserve - approximately 5,340 square metres of land used for recreational purposes. The area includes some mature vegetation.

AREA 2

Most of the Project works required east of Poath Road, including works at Clayton Road and Centre Road (Area 2) will occur within the existing rail reserve on land zoned Public Use Zone 4 -Transport (PUZ4).

Area 2 also includes sections of road reserves and land owned by Monash City Council and adjoining or adjacent land owned and managed by VicTrack.

Area 2 includes a station precinct of high community value, and includes:

- Clayton Station - this area is known to be of heritage significance and includes a number of mature pepper trees. To the north of the station are the last remaining World War I Avenue of Honour trees.

Caulfield to Dandenong Level Crossing Removal Project

AREA 3

Most of the Project works required between Corrigan and Chandler roads (Area 3) will occur within the existing rail reserve on land zoned Public Use Zone 4 -Transport (PUZ4).

Area 3 also includes sections of road reserves and land owned by the City of Greater Dandenong and adjoining or adjacent land owned and managed by VicTrack.

Area 3 includes:

- Between Noble Park and Yarraman stations – strands of mature river red gums, in and around the station precinct and rail reserve.

3.3 EXISTING CONDITIONS

Trees are recognised as fundamental to the character and identity of communities, as well as contributing to ecological, biodiversity and heritage values.

3.3.1 AREA 1

While some scattered trees and isolated patches of remnant indigenous vegetation exist within the Project area, the biodiversity and ecological value of the land within the rail corridor has been substantially modified as the area has developed. Trees are identified within the local heritage overlays at Carnegie and Murrumbeena stations (H0123 and H0132 respectively). In several locations within Area 1, trees have been planted to provide an amenity value, most notably for the purpose of screening the existing rail line from adjacent residential homes.

Boyd Park, also known as Kitmont Reserve, is home to some large and mature remnant trees and vegetation. The land is within the VicTrack boundary and includes a local vegetation protection overlay. The area closer to the rail line includes a gravel carpark including two large gum trees.

3.3.2 AREA 2

Area 2 is also highly modified. Whilst many of the sites in this area contain patches of native vegetation, only two were considered remnant patches. Clayton Station contains a remnant patch which includes species such as blackwood, acacia and bracken species. This area lacks the top storey layer of red gums, and contains numerous weed species.

The remainder of this area is made up of planted trees and vegetation that does not fall within a particular vegetation type or are contained within a maintained garden bed or landscaping environment. Much of the vegetation was also assessed to be under ten years old.

3.3.3 AREA 3

Area 3 falls between Springvale Station and Yarraman Station. In this area vegetation becomes more consistent with an increased frequency of remnant and other native patches of trees and vegetation. Through this area, there is a higher density of tree cover, scattered remnant trees and some regeneration of red gums.

3.4 PROJECT IMPACTS

While the Project team has made every effort to protect existing vegetation during early works and throughout project construction, tree removal will be unavoidable in some locations.

Key activities likely to impact existing trees include:

- the construction of temporary site offices and access tracks
- the permanent elevated rail structures
- new station buildings
- car parking
- laydown areas for the temporary storage of construction materials and spoil
- roadworks
- essential services and utilities relocations
- use of large machinery and equipment within the tightly constrained rail corridor.

3.5 RAIL SAFETY REQUIREMENTS

The Project has to comply with safety requirements applicable to Federal and State Legislation industry standards and with MTM's Safety Management System, Environment Management System, and Policies and Procedures.

Requirements and legislative considerations relating to vegetation clearing and pruning include, but are not limited to, the following:

- Rail Management Act, 1996 (Vic)
- Code of Practice: Safe Work Australia (2011)
- Occupational Health & Safety Act 2004 (Vic)
- Occupational Health and Safety Regulations 2007 (Vic)
- Transport Integration Act, Regulations and Codes of Practice (Vic)
- Environment Protection Act 1970 (Vic), Regulations and Codes of Practice
- Planning and Environment Act 1987 (Vic)
- Flora and Fauna Guarantee Act 1998 (Vic)
- Environment Protection and Biodiversity Conservation Act 1999 (Cth)
- Electricity Safety Act 1998 (Vic) (2009), Regulations and Codes of Practice
- Book of Rules and Operating Procedures and PTC Train Infrastructure Electrical Safety
- Rules (High Voltage Rules) 1997
- Rail Safety Act 2006 (Vic) and Regulations

4. EXISTING ASSESSMENT REPORTS

A number of investigations were undertaken to assess existing tree and vegetation conditions within the Project area. These reports were completed prior to, during, and post the Project's tender phase, and have been used to determine the potential impact to trees and vegetation of each design scenario considered. In addition to these existing condition and assessment reports, the Project team has undertaken further arborist and ecological assessments.

Approximately 6,000 trees within and immediately adjacent to the Project Area have been directly assessed to determine their:

- size, structural strength and location
- extent of root zones for each tree informing tree health and life expectancy
- amenity and environmental value
- species, identification number, and GPS location.

This information supports previous vegetation assessments completed for the Project and has been used to inform decision making around tree and vegetation retention. It also assists in the prioritisation of sensitive areas within the corridor and supports the development of control measures and alternative construction methods.

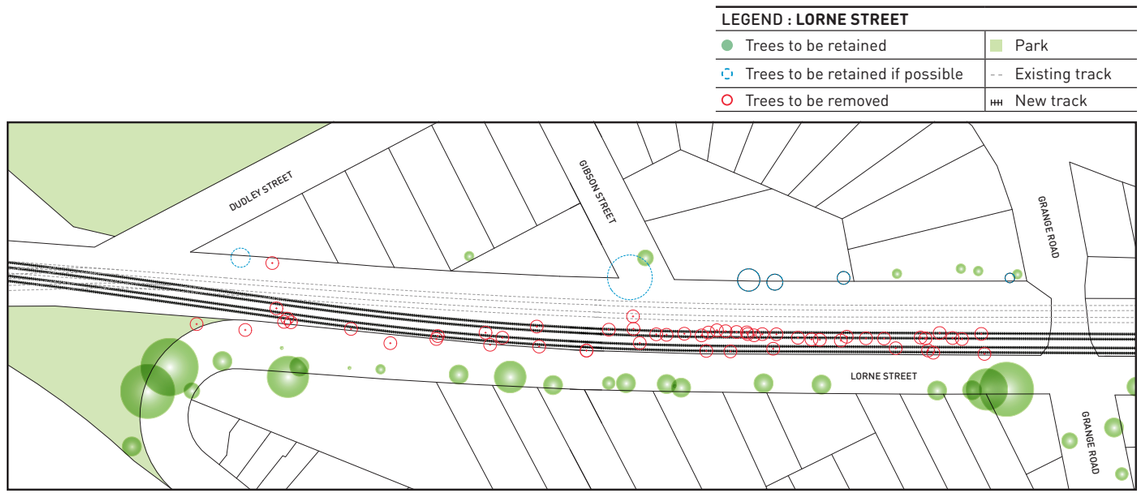
5. IDENTIFYING SENSITIVE AREAS

The Project team has identified several focus areas along the corridor where tree retention has been prioritised. This section provides an overview of each of these areas, along with site-specific maps detailing the trees to be retained and those to be removed.

Information regarding health, life expectancy and value of the vegetation has been obtained through specialist arborist assessments undertaken between April and August 2016.

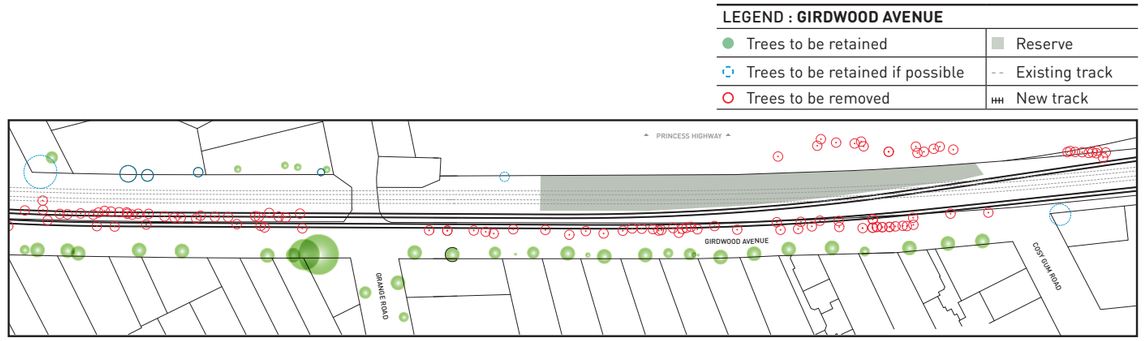
5.1 LORNE STREET, CAULFIELD EAST AND GIRDWOOD AVENUE, CARNEGIE

Item	Description
Location	**Lorne Street (between Leamington Crescent and Grange Road) and Girdwood Avenue (between Grange Road and Cosy Gum Road).**
Characteristics – Lorne Street	Vegetation on Lorne Street and Girdwood Avenue includes planted trees on Council and VicTrack land between the operating rail corridor, track and the local roads. There is also a high pressure gas main easement within this site approximately 1.1 –1.5 metres below ground surface. On Lorne Street, vegetation includes a number of large established exotic trees such as plane, elm and ash trees. In addition, some tea trees and sugar gums exist within this area. There are a number of planted ground covers and shrubs near the car parks on the northern side of the street.
Characteristics – Girdwood Avenue	On Girdwood Avenue, the vegetation present is, again, planted vegetation. This includes a number of roadside street trees. Toward the eastern end of Girdwood Avenue, there are a number of larger lemon scented gum trees.
Structural strength	Trees in this area have been assessed as being in fair to good structural condition. Some trees of poor structural health, dead wood and structural deficiencies have been identified.
Health and life expectancy	Trees have been assessed as having varying health and life expectancy. The existing large trees generally have between 25 and 50 years of useful life expectancy.
Amenity and environmental value	Within this area, trees and vegetation provide amenity and screening of the operating rail corridor for adjacent residential properties. This vegetation has little to no biodiversity value.
Removal required	Trees and vegetation in this area will be impacted by the permanent design footprint of the elevated rail structure. The removal of trees along Lorne Street and Girdwood Avenue is required to enable foundation piling works to occur.
Likelihood of removal with an open cut trench design	High to very high. It is almost certain that the design and construction of an open cut trench solution would require the removal of these trees. In an open cut solution, the high pressure gas transmission line would also require relocation which would generate further impact to trees in this area.
Retention initiatives	As the permanent infrastructure impacts the majority of vegetation in this area, retention opportunities are limited.
Seed harvesting opportunities	Limited seed harvesting opportunities exist in this area. The Project team is looking to salvage, and transplant, a number of the smaller existing kurrajong trees.
Wood reuse opportunities	Opportunities exist to donate wood to the City of Glen Eira and other stakeholders for potential use as street furniture and other such initiatives.
Replanting opportunities	Trees and vegetation will be replanted in the vicinity of the area. This will include species with small root zones and ground cover due to the close proximity of the gas transmission line to the rail corridor.



This map is indicative of tree retention plans at the time of publication

Figure 1.
Lorne Street, Caulfield East



This map is indicative of tree retention plans at the time of publication

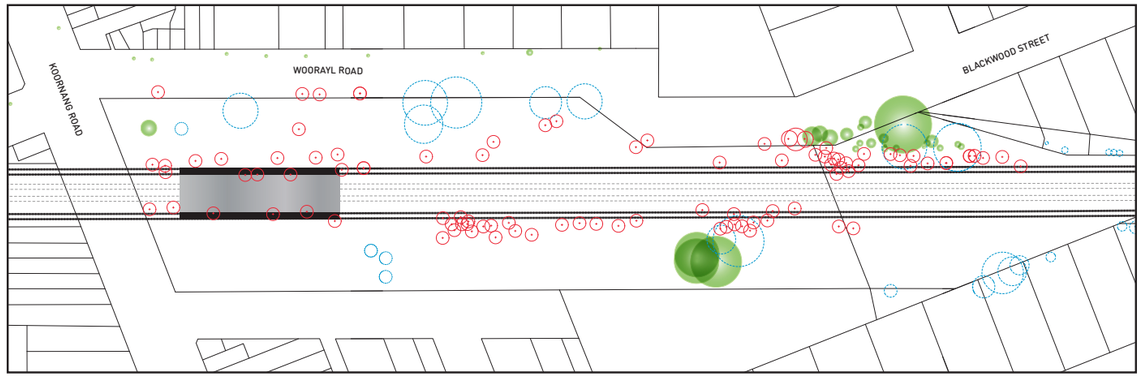
Figure 2.
Girdwood Avenue, Carnegie

5.2 CARNEGIE STATION

Item	Description
Location	**Koornang Road and Woorayl Street, Carnegie**
Characteristics	Carnegie Station includes a number of mature trees and plants of native and non-native (exotic) origin. To the northwest of the station there are a number of non-native trees including a palm tree, some ash trees and a number of large cedar and cypress trees. To the northeast of the station there are approximately six large, remnant scattered river red gum trees. Further along, toward Blackwood Street, is a very large river red gum tree and a number of smaller infill plantings of native species. On the southern side of the station precinct there are a number of eucalyptus and melaleuca trees. Further to the southeast, in the existing carpark, is a cluster of river red gum trees.
Structural strength	Trees in this area have been assessed as being in fair to good structural condition, with low to moderate retention value. The eucalyptus to the north east of the station precinct were assessed as being in notably good condition, with high retention value.
Health and life expectancy	The generally good condition of vegetation at the station precinct indicate a useful life expectancy of 25 to 50 years, particularly for the river red gums of higher retention value.
Amenity and environmental value	The trees and vegetation at Carnegie are recognised as part of the local character, sit within the local heritage overlay at the station, and provide positive amenity value. The scattered river red gums form a patch of native vegetation providing high environmental and amenity value.
Removal required	Vegetation removal will be required to allow for the construction of the new infrastructure. Priority will be given to protecting the larger river red gums to the north east and south east in the station precincts where possible.
Likelihood of removal with an open cut trench design	High to very high. It is highly likely that most, if not all, of the vegetation around Carnegie Station would be removed given an open cut trench solution. This is due to the level of excavation required as well as new station construction impacts.
Retention initiatives	Where there is sufficient and safe access for piling equipment, retention of the river red gums to the north of the station should occur. This will be monitored and reviewed during design and construction. Other potential retention initiatives include: > retaining the palm tree in the first instance, and if deemed impacted during construction, relocating the palm tree > retaining the large river red gum tree on Blackwood Street > designing car parks around river red gums on the southeast side of the station precinct.
Seed harvesting opportunities	Seeds will be harvested from the scattered river red gums, with seeds provided to a nursery for propagation and future replanting within the corridor.
Wood reuse opportunities	Limited reuse opportunities exist for the exotic species situated at this location. Some opportunities may exist to donate native tree wood to the City of Glen Eira and other stakeholders for use as street furniture and other such initiatives.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. The Community Open Space Expert Panel (COSEP) will consider appropriate treatments including the station precinct landscape planting included as part of overall project landscaping design.

LEGEND : **CARNEGIE STATION**

Trees to be retained	Existing track
Trees to be retained if possible	New track
Trees to be removed	



This map is indicative of tree retention plans at the time of publication

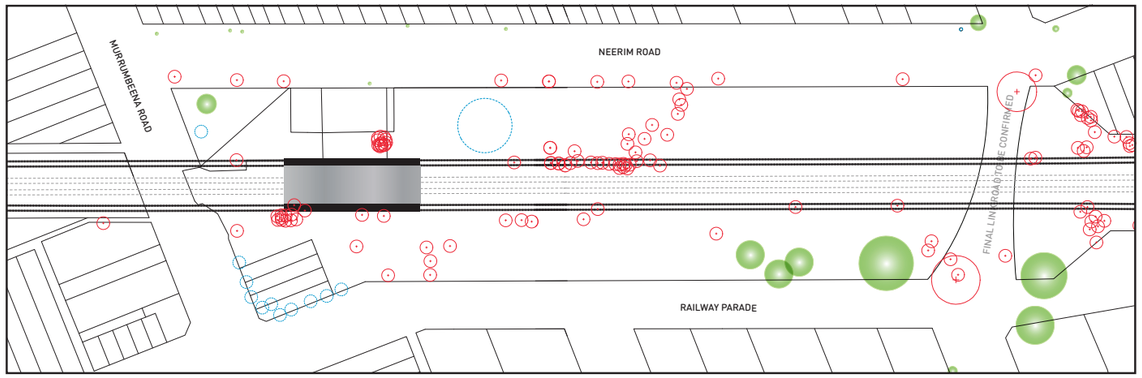
Figure 3.
Carnegie Station, Carnegie

5.3 MURRUMBEENA STATION

Item	Description
Location	**Corner of Neerim Road, Murrumbeena Road and Railway Parade, Murrumbeena.**
Characteristics	Similar to Carnegie Station, Murrumbeena Station features a combination of exotic and scattered large, remnant river red gum trees. To the north of the station there is a large oak tree, to the northeast a number of planted eucalyptus trees, and in the northwest corner exists a palm tree. On the southern side, a number of landscape plantings include mature pear and large elm trees. To the southeast, within the car park, there are a number of large river red gum trees.
Structural strength	Trees in this area have been assessed as being in fair to good condition with the southern-based river red gums as having moderate to high retention value. The row of water gums are considered to be in fair health with low retention value.
Health and life expectancy	The fair to good condition of vegetation in the station precinct indicates a good outcome for the useful life expectancy of these trees, particularly for the river red gums, the oak and the water gums, each of which have a high retention value.
Amenity and environmental value	The river red gums at Murrumbeena are recognised as part of the local character and sit within the local heritage overlay at the station. The large oak tree is a non-native tree, however, is recognised as having high amenity value. The water gums in the southwestern corner of the station form a row of native vegetation and provide both high environmental and amenity value.
Removal required	Murrumbeena is the centralised point from which all construction activities for Area 1 will occur. Tree and vegetation removal will be required to provide access for gantry cranes, delivery of pre-cast concrete segments and the overall safe access to, and operation of, this equipment. Retention priority has been given to the larger river red gums located in the southeast corner of the existing car park. Their viability will be monitored and assessed as construction progresses. Trees overhanging the rail corridor in this area will need to be pruned.
Likelihood of removal with an open cut trench design	High to very high. It is highly likely that most, if not all, of the vegetation around Murrumbeena Station would be removed given an open cut trench scenario. This is due to the level of excavation required as well as new station construction impacts.
Retention initiatives	The Project team is seeking to retain the oak tree to the north of Murrumbeena Station but foundation piling activities may impact this tree. The impact of these works on the tree will be monitored closely. If structural elements of the tree are impacted, its removal may be required to ensure safety of the train line, passengers and construction workers.
Seed harvesting opportunities	Seeds will be harvested from the scattered river red gums, with seeds provided to a nursery for propagation and future replanting within the corridor.
Wood reuse opportunities	Opportunities exist to use wood for habitat logs, street furniture and other such initiatives.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments including the station precinct landscape planting included as part of overall project landscaping design.

LEGEND : **MURRUMBEENA STATION**

Trees to be retained	Existing track
Trees to be retained if possible	New track
Trees to be removed	



This map is indicative of tree retention plans at the time of publication

Figure 4.
Murrumbeena Station, Murrumbeena

5.4 RILEY RESERVE

Item	Description
Location	**North of the rail corridor, west of Ella Street. Access from Neerim Road and Arthur Street, Murrumbeena.**
Characteristics	Riley Reserve includes a number of trees in proximity to the rail corridor, including a poplar and ficus tree. The vegetation between the reserve and the operating rail tracks mostly comprises exotic species including ash trees.
Structural strength	Trees within the rail corridor in proximity to Riley Reserve have been assessed as being in poor to good condition and with low retention value.
Health and life expectancy	The life expectancy of the trees is generally low and ranges widely from one to 15 years.
Amenity and environmental value	The ash trees within the corridor have low value although provide some screening of the operating rail corridor for adjacent residential properties.
Removal required	All trees within the rail corridor adjacent to Riley Reserve will need to be removed. Trees within Riley Reserve will largely remain unimpacted. Trees within private land overhanging the rail corridor and/or the worksite may need to be pruned, consistent with MTM maintenance requirements.
Likelihood of removal with an open cut trench design	It is highly likely that an open cut trench solution would require removal of the majority of trees in this area, including further impacts to trees in private property.
Retention initiatives	Construction planning indicates only the trees between the rail corridor and Riley Reserve will be impacted.
Seed harvesting opportunities	Limited seed harvesting opportunities exist in this area as the majority of species are exotic.
Wood reuse opportunities	Limited wood reuse opportunities exist due to the size and type of wood.
Replanting opportunities	There will be planting opportunities in this location, particularly at the interface between Riley Reserve and the newly developed linear park. The landscape design and planting schedule will be considered as part of overall project landscaping design.

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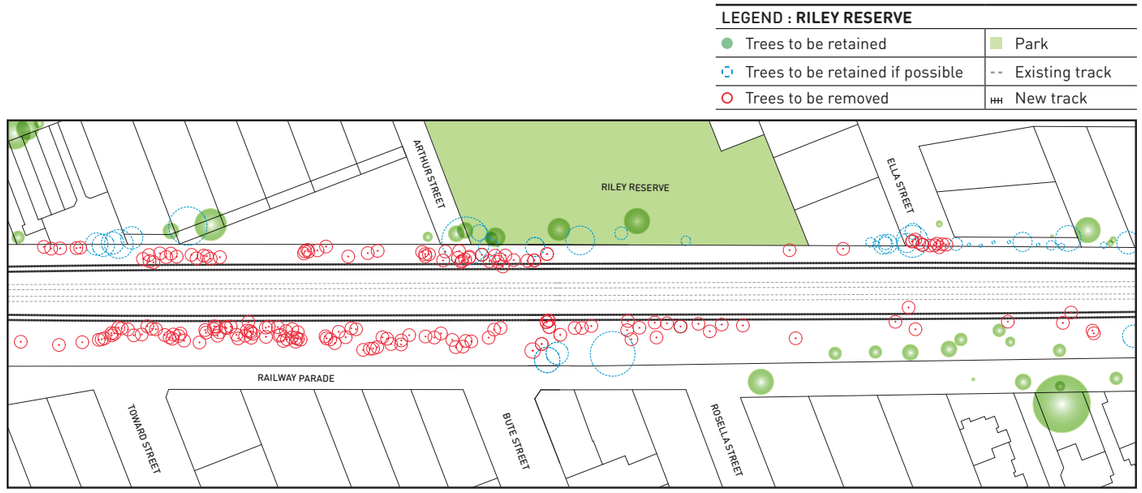

This map is indicative of tree retention plans at the time of publication

Figure 5.
Riley Reserve, Murrumbeena

5.5 BOYD PARK

Item	Description
Location	**Northwest of William Street near Poath Road. Access from Neerim Road and Ricourt Avenue, Murrumbeena.**
Characteristics	Boyd Park is a linear park stretching northwards from the western end of William Street, Hughesdale. It follows the route of the former outer circle rail line. Partly located on VicTrack land, Boyd Park features a large patch of remnant vegetation including a number of very large and mature river red gum trees. The part of the park closest to the rail corridor is used as an informal car park, primarily by rail commuters. A Scout Hall exists in the southwest corner of the park. Local groups have revegetated and fenced a small reserve adjacent to the Scout Hall.
Structural strength	Trees in this area have been assessed as being in fair to good structural condition and having high retention value.
Health and life expectancy	Some very large mature trees exist within this area. The life expectancy of some of these trees is good with some river red gums in this area expected to live for another 25 to 50 years.
Amenity and environmental value	Boyd Park has a high amenity and environmental value. The remnant patches of vegetation are of good condition, presenting a high environmental value, particularly given that good condition remnant vegetation is very limited within the wider Area 1 corridor. The planting and maintenance undertaken by local environmental groups signifies a level of high value to the community.
Removal required	By ruling out the use of Boyd Park as a major construction staging area, the Project team has largely avoided impacts to Boyd Park. To enable utilities to be relocated, and for construction of the rebuilt Hughesdale Station, some localised tree and vegetation pruning and removals will occurr. This will occurr primarily in those parts of the park which extend into the rail corridor. Trees from Boyd Park overhanging the rail corridor and/or the worksite will need to be pruned, consistent with MTM maintenance requirements.
Likelihood of removal with an open cut trench design	It is highly likely that vegetation within Boyd Park would be impacted in an open cut trench solution. As Boyd Park is within VicTrack land, and given its size and proximity to the rail corridor, this area would have possibly been used as a major construction staging point.
Retention initiatives	Project construction methods have been altered significantly to avoid impacting Boyd Park where practical. Initiatives include: > changing the location of the key construction activities from the original location at Boyd Park, to Murrumbeena Station > the use of under-boring to install a cable service route in the rail corridor adjacent to Boyd Park. This will allow for the retention of 8 - 12 trees directly adjacent to the rail corridor.
Seed harvesting opportunities	Seeds will be harvested from the scattered river red gums, with seeds provided to a nursery for propagation and future replanting within the corridor.
Wood reuse opportunities	As limited tree removal will occur, opportunities to reuse wood are also limited.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments in and around this area.

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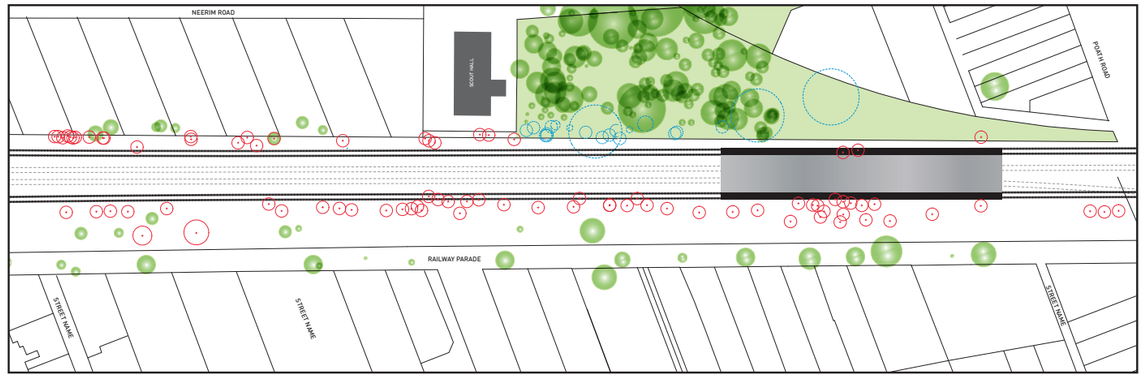
LEGEND : **BOYD PARK**

Trees to be retained	Park
Trees to be retained if possible	Existing track
Trees to be removed	New track



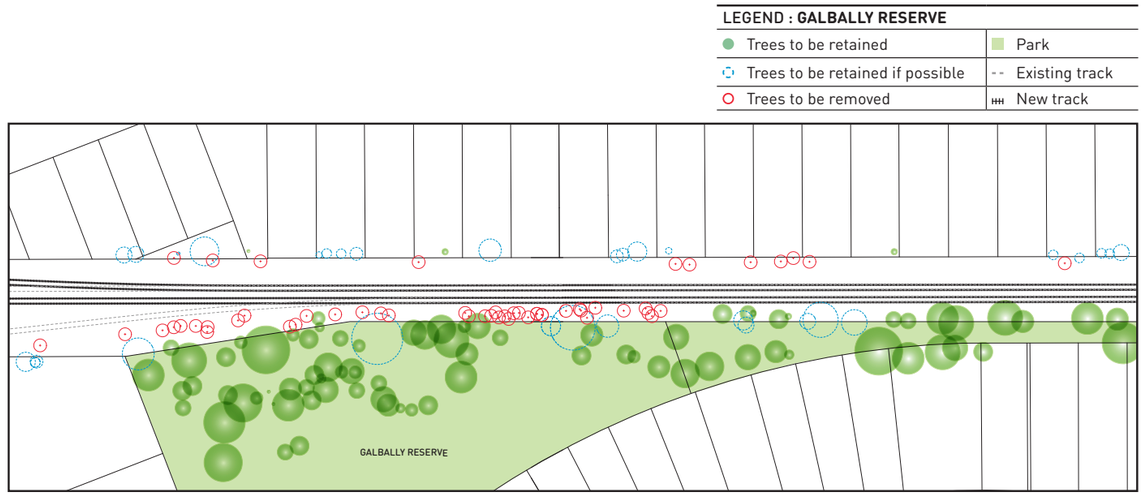
This map is indicative of tree retention plans at the time of publication

Figure 6.
Boyd Park, Hughesdale

5.6 GALBALLY RESERVE

Item	Description
Location	**Galbally Reserve is located southeast of Hughesdale Station. Access is from Arthur Street, Hughesdale.**
Characteristics	Galbally Reserve is a local recreational reserve. It includes a number of mature trees and planted vegetation, mostly exotic, non-native species. Scattered remnant, mature river red and spotted gum trees are also present.
Structural strength	Trees in this area have been assessed as being in good structural condition. One tree identified at immediate risk of fouling the rail track has been removed. Other trees will be monitored during the Project should weight reduction and minor deadwood removal be required.
Health and life expectancy	The life expectancy of the trees has been assessed as fair to good.
Amenity and environmental value	The reserve is mostly recognised for its amenity value. It includes a playground and shared use path which forms part of the Rosstown Rail Trail.
Removal required	To allow a retaining wall to be constructed, some localised tree removal will need to occur adjacent to the railway line. Utilities installations may also require localised tree removal. Trees within private land or the Reserve overhanging the rail corridor and/or the worksite may need to be pruned, consistent with MTM maintenance requirements.
Likelihood of removal with an open cut trench design	It is likely that the footprint in this area based on an open cut trench solution would require more vegetation removals when compared to removals required for a rail-over design solution. This is mainly due to the access requirements in and out of the rail corridor.
Retention initiatives	Some tree and vegetation removal may occur when establishing access to the corridor for construction activities. The extent of removals is still to be confirmed, but will be isolated to the western section closer to Arthur Street, and possibly adjacent to the rail corridor
Seed harvesting opportunities	Limited seed harvesting opportunities exist in this area as the majority of species are exotic.
Wood reuse opportunities	As limited tree removal will occur, opportunities to reuse wood are also limited. Where tree removal is required, opportunities for timber reuse will be explored.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments including the landscape adjacent to the corridor.

Caulfield to Dandenong Level Crossing Removal Project

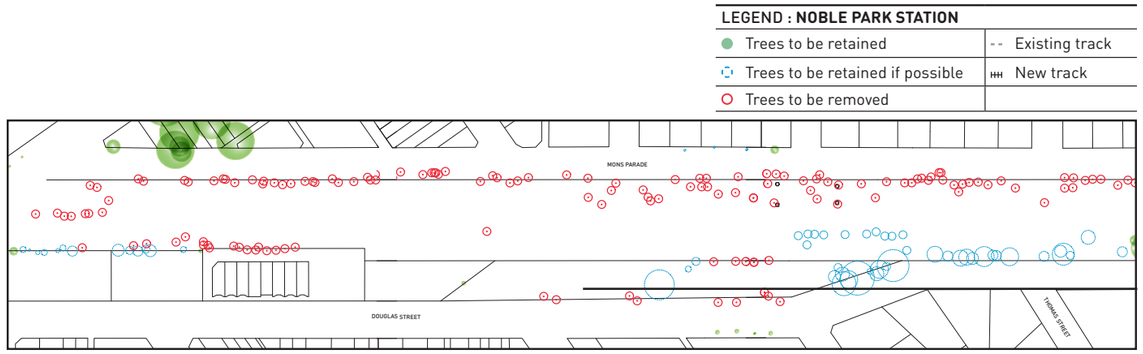


This map is indicative of tree retention plans at the time of publication

Figure 7.
Galbally Reserve, Hughesdale

5.7 NOBLE PARK STATION

Item	Description
Location	**Noble Park Station, east of Heatherton Road at Noble Park.**
Characteristics	The Noble Park project area comprises mostly scattered, medium to large and mature red gum trees. The trees are remnant and native species. In and around the station precinct and the car park there are a number of large river red gum trees. Further east of the station are remnant scattered trees and a level of weed and other exotic species at ground level.
Structural strength	Trees in this area have been assessed as being in good to very good structural condition.
Health and life expectancy	The life expectancy of the trees has been assessed as good with some minor deadwood present. Life expectancy of the river red gums varies across the site but is generally between 15 to 50 years.
Amenity and environmental value	The existing vegetation in this area provides both amenity and environmental values. It provides some screening of the operating rail corridor for adjacent residential properties and many of the existing trees house possums and some nesting birds.
Removal required	To allow for the permanent infrastructure including the new station building, trees to the north will need to be removed. This removal will also facilitate the access to the area for construction vehicles such as cranes and piling rigs.
Likelihood of removal with an open cut trench design	It is highly likely that the footprint in this area based on an open cut trench solution would require significantly more tree removals when compared with the removals required for the rail-over design solution.
Retention initiatives	'No go' zones will be established to protect those trees identified for retention.
Seed harvesting opportunities	Seeds will be harvested from the river red gums, with seeds provided to a nursery for propagation and future replanting within the corridor.
Wood reuse opportunities	Opportunities exist to use wood for habitat logs, street furniture and other such initiatives.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments including the station precinct landscape planting included as part of overall project landscaping design.



This map is indicative of tree retention plans at the time of publication

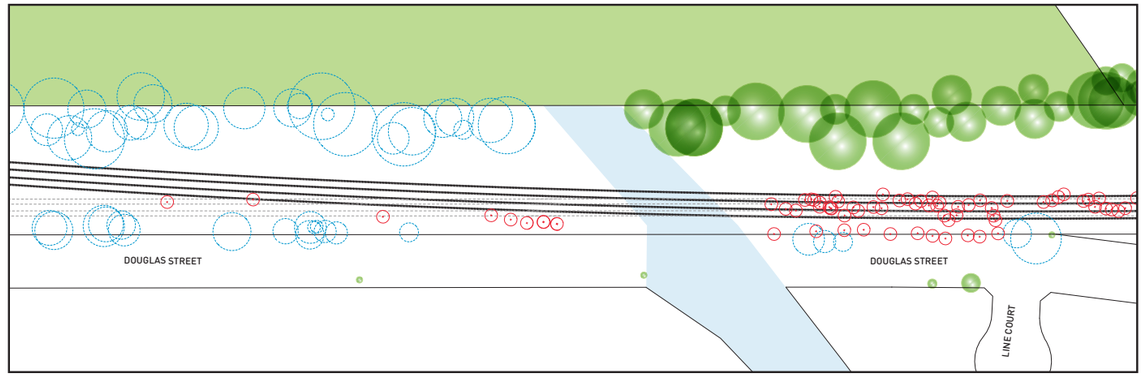
Figure 8.
Noble Park Station, Noble Park

5.8 MILE CREEK

Item	Description
Location	**Mile Creek, east of Heatherton Road and Noble Park Station .**
Characteristics	East of Noble Park Station the vegetation area comprises mostly scattered, medium to large mature trees. Vegetation classes through this area include swampy riparian woodlands and some remnants of grassy woodland. There are also a number of large planted garden beds which consist of a mixture of native and indigenous species on both sides of the rail.
Structural strength	Trees in this area have been assessed as being on average in fair to good condition.
Health and life expectancy	The life expectancy of the trees has been assessed as good. Life expectancy of the river red gums varies across the site but is generally between 15 and 50 years.
Amenity and environmental value	The existing vegetation in this area provides moderate amenity value by screening the rail corridor. It also provides habitat for fauna such as possums and birds.
Removal required	To allow for the permanent infrastructure trees to the north and some to the south will need to be removed. Permanent infrastructure also includes services and the shared user path. Safe construction access to the area for vehicles such as cranes and piling rigs will also be considered in tree retention and removals.
Likelihood of removal with an open cut trench design	It is highly likely that the footprint in this area based on an open cut trench solution would be require the removal of significantly more vegetation than the rail-over design solution.
Retention initiatives	The design over Mile Creek considers some of the mature remnant vegetation and trees to the north and switches to the south to avoid removals. 'No go' zones will also be established to protect those trees identified for retention.
Seed harvesting opportunities	Opportunities for seed harvesting will be investigated for some of the larger more significant vegetation.
Wood reuse opportunities	The Project team will explore opportunities for donation of wood.
Replanting opportunities	Significant landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments through this section.

Caulfield to Dandenong Level Crossing Removal Project

LEGEND : MILE CREEK	
Trees to be retained	Creek
Trees to be retained if possible	Existing track
Trees to be removed	New track

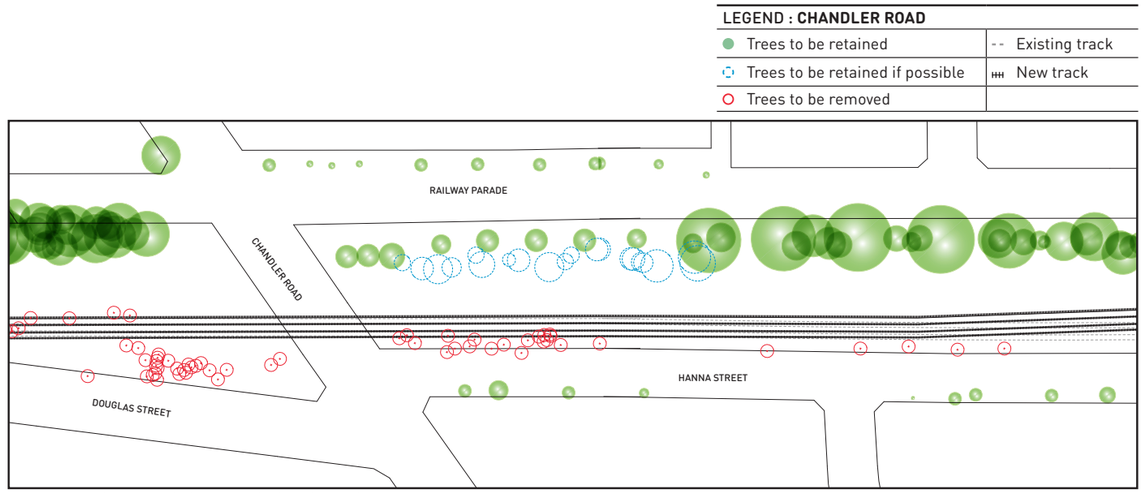


This map is indicative of tree retention plans at the time of publication

Figure 9.
Mile Creek

5.9 CHANDLER ROAD

Item	Description
Location	**Chandler Road, adjacent to Railway Parade and Hanna Street, Noble Park.**
Characteristics	Vegetation and trees around the Chandler Road area comprises mostly scattered, medium to large mature trees. The dominant species are river red gums. Vegetation classes through this area include remnants of grassy woodland. The northern side of the corridor has a higher value and to the southern side there are some planted garden beds which consist of a mixture of native and indigenous species on both sides of the rail.
Structural strength	Trees in this area have been assessed as being on average in fair to good condition.
Health and life expectancy	The life expectancy of the trees has been assessed as good with some minor deadwood present. Life expectancy of the river red gums varies across the site but is generally between 15 to 50 years.
Amenity and environmental value	The existing vegetation in this area provides moderate amenity value by screening the rail corridor, particularly on the northern side. It also provides potential for habitat of fauna such as possums and birds.
Removal required	The project design has prioritised the retention of trees on the northern side. Trees to the southern side along Hanna Street will need to be removed to allow for permanent infrastructure including the combined services route. Safe access to the area for construction vehicles such as cranes and piling rigs will also need to be considered in tree retention and removals.
Likelihood of removal with an open cut trench design	It is highly likely that based on an open cut trench solution the footprint in this area would require the removal of all trees in this section to allow for construction and safe access.
Retention initiatives	The design of the alignment and structures has prioritised the retention of trees on the northern side, largely avoiding the scattered eucalyptus trees along Railway Parade. Other construction initiatives such as 'no go' zones will be established to further minimise impacts to existing trees.
Seed harvesting opportunities	Opportunities for seed harvesting will be investigated for some of the larger more significant vegetation.
Wood reuse opportunities	The Project team will explore opportunities for donation of wood and the salvage and donation of smaller planted vegetation along Hanna Street where suitable.
Replanting opportunities	Landscaping and tree planting will be a key part of the landscape and urban design elements. COSEP will consider appropriate treatments through this section.



This map is indicative of tree retention plans at the time of publication

Figure 10.
Chandler Road, Noble Park

6. LANDSCAPING AND REVEGETATION

6.1 LANDSCAPE AND REVEGETATION

The elevated rail design opens up the existing rail corridor, providing additional community open space underneath. The design also provides the opportunity to plant new trees underneath and adjacent to the rail lines that will not impact the safe operation and maintenance of the rail lines.

Current plans allow for the planting of more than 4,000 new trees and vegetation of varying heights and species. New plantings will be mostly native with some exotic species used in appropriate locations. These trees and vegetation will provide screening benefits and help improve the visual amenity of the area and its surrounds.

6.1.1 LANDSCAPE DESIGN

Design of the new parklands, public open spaces and station forecourts will be undertaken by landscape architects, taking into consideration feedback gathered during community consultation in 2015 and early 2016. This feedback highlighted key community considerations such as the importance of the mature native trees near Carnegie, Murrumbeena and Hughesdale stations and the development of retention initiatives for these trees during the construction phase.

Native and exotic plant species will be selected for their hardiness and contribution to the existing local character and identity of the neighbourhood. As this vegetation establishes, it will create a new urban forest that will help to increase biodiversity by providing more habitat links for local fauna.

A variety of vegetation will be planted at different heights:

- Advanced trees (2.5 – 4 metres) will be planted in key locations such as the station forecourts and community spaces.
- Smaller trees (1.5 – 2.5 metres) will be planted as street trees at stations and in nearby car parks.
- Mass plantings of smaller vegetation will be used under the elevated structures. Small trees may also be planted here.

6.1.2 COMMUNITY OPEN SPACE EXPERT PANEL (COSEP)

The Level Crossing Removal Authority has established the Community Open Space Expert Panel (COSEP) to oversee plans for the community open space created by the elevated rail design. COSEP is chaired by the Chief Executive of the Royal Botanic Gardens, Professor Tim Entwisle and brings together local knowledge from community members, combined with expertise from urban and landscape designers, local councils, and organisations including Victoria Police, Bicycle Network Victoria and the Office of the Victorian Government Architect.

The panel will consider how community feedback is addressed in the development of the final design of the community open space, including advice on future tree and vegetation plantings.

6.2 NATIVE VEGETATION OFFSETS

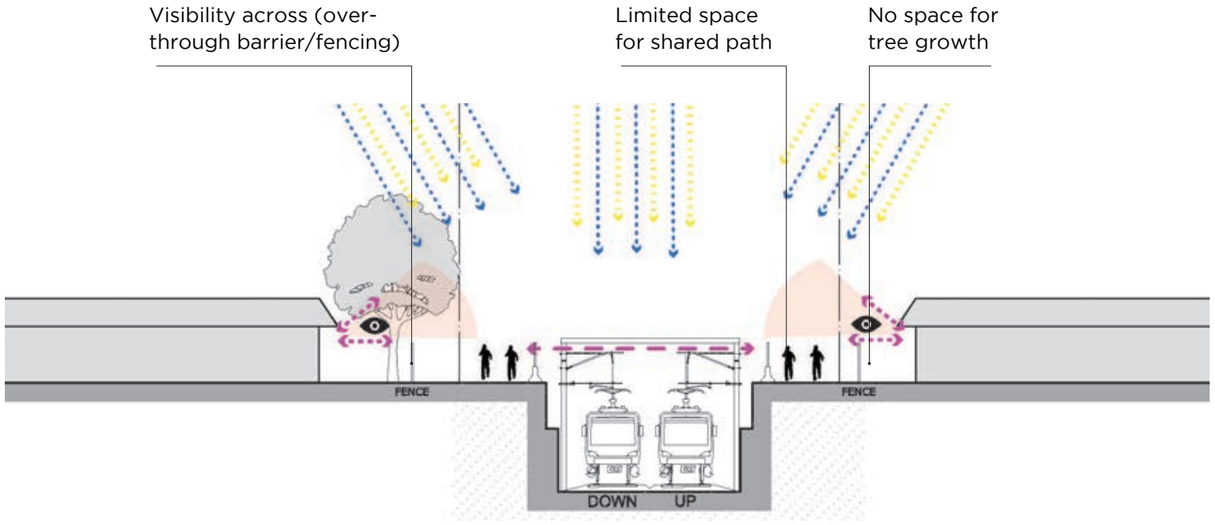
The Project team is working in accordance with all relevant legislation including Victoria's Biodiversity Assessment Guidelines for the permitted clearing of native vegetation. Under these guidelines whenever native vegetation is removed, an offset is required to make an equivalent contribution to Victoria's biodiversity. This means that any clearing has a neutral impact on Victoria's biodiversity.

Offsets can be achieved by an improvement in the condition of existing vegetation (either on or offsite) with ongoing management and protection of the vegetation using an appropriate security arrangement.

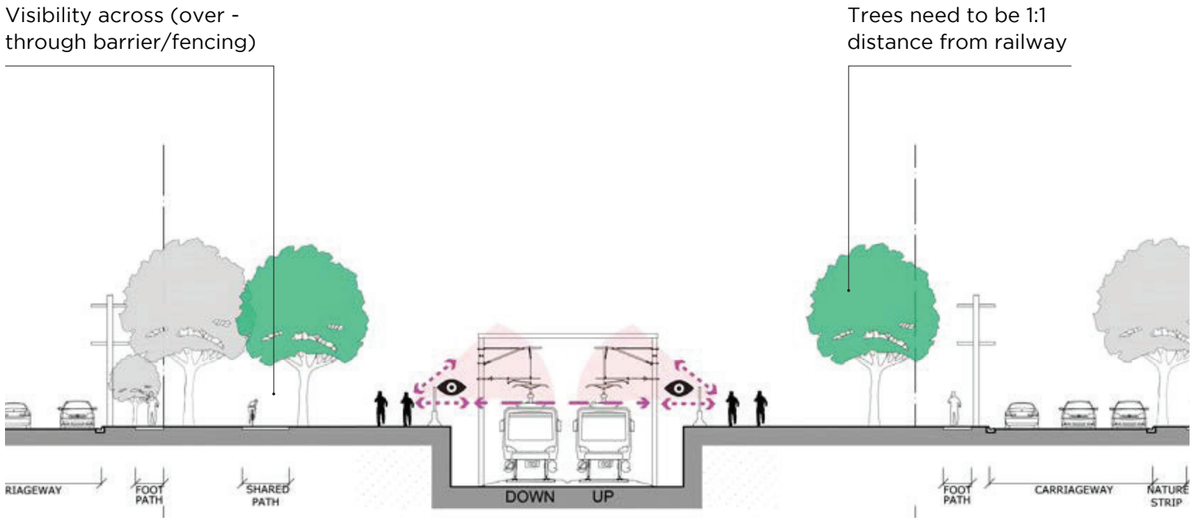
The Project team has assessed the extent of native vegetation through the rail corridor to assess the amount and condition of vegetation that is required to be offset. Within 12 months of project completion, the appropriate offsets will be sourced and secured to demonstrate no net loss of biodiversity value for the Project

7. APPENDICES LIST

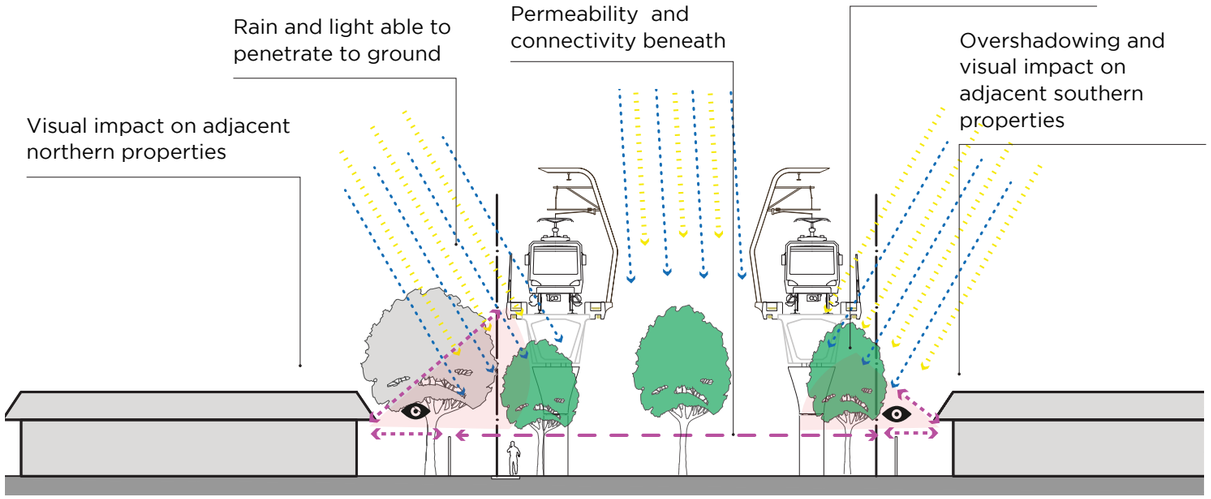
RAILWAY IN CUT - NARROW EASEMENT



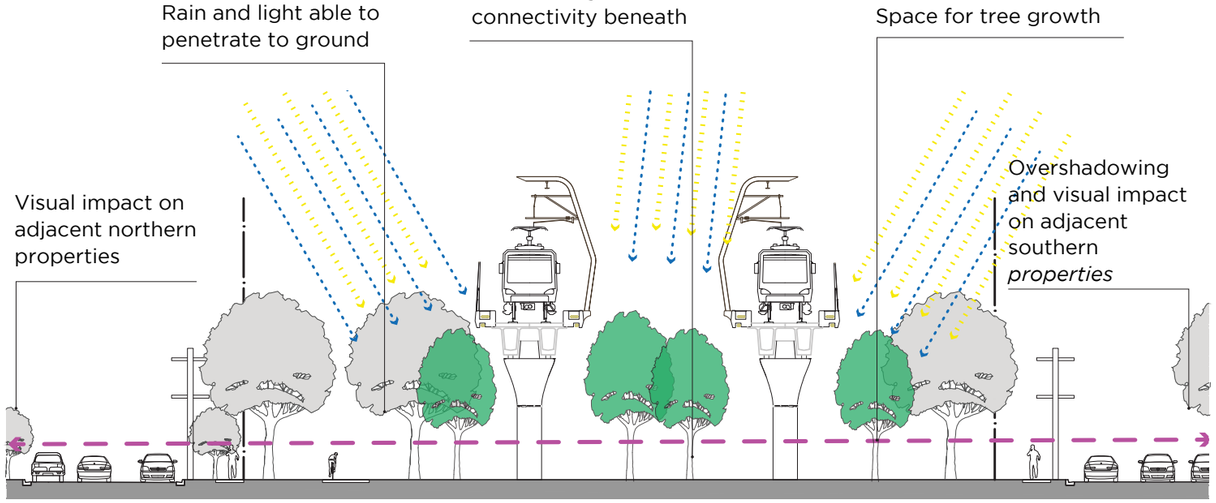
RAILWAY IN CUT - WIDE EASEMENT

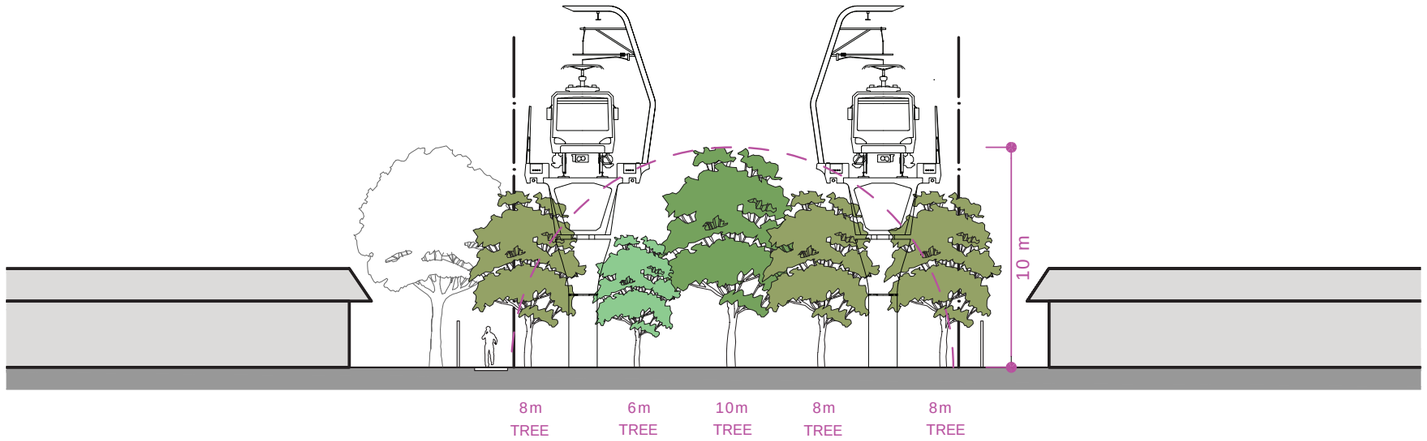


RAILWAY ELEVATED - NARROW EASEMENT

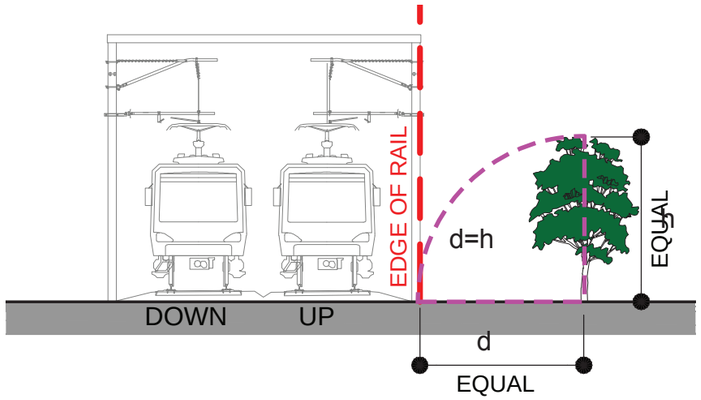


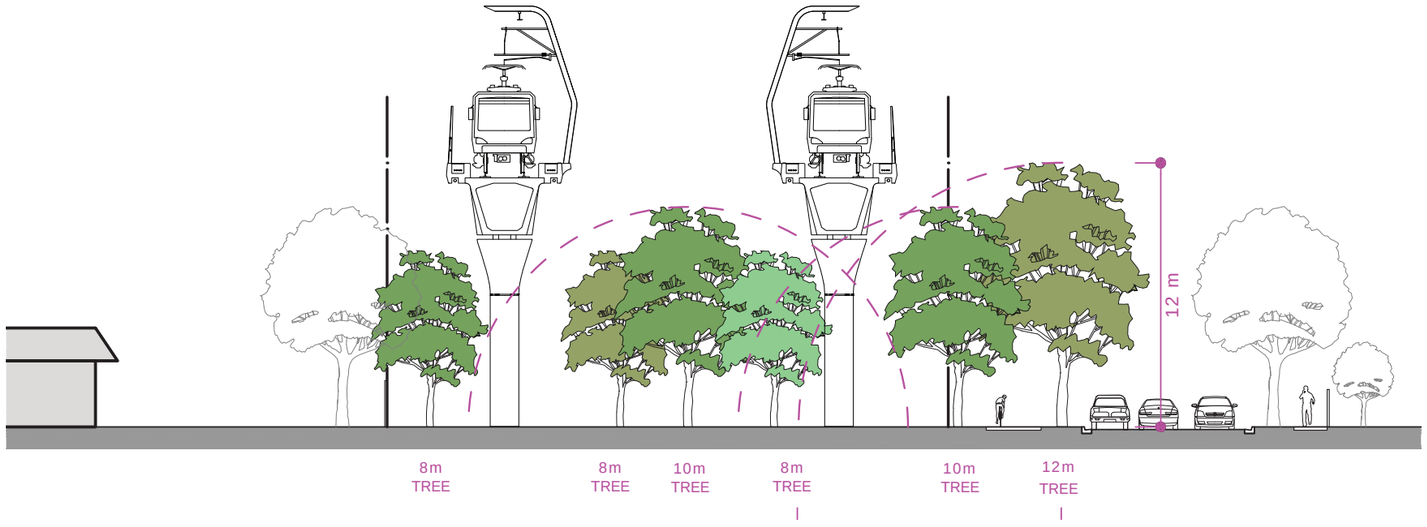
RAILWAY ELEVATED - WIDE EASEMENT





Area 1 Cross Section - Narrow Easement





Area 2 Cross Section - Wide Easement