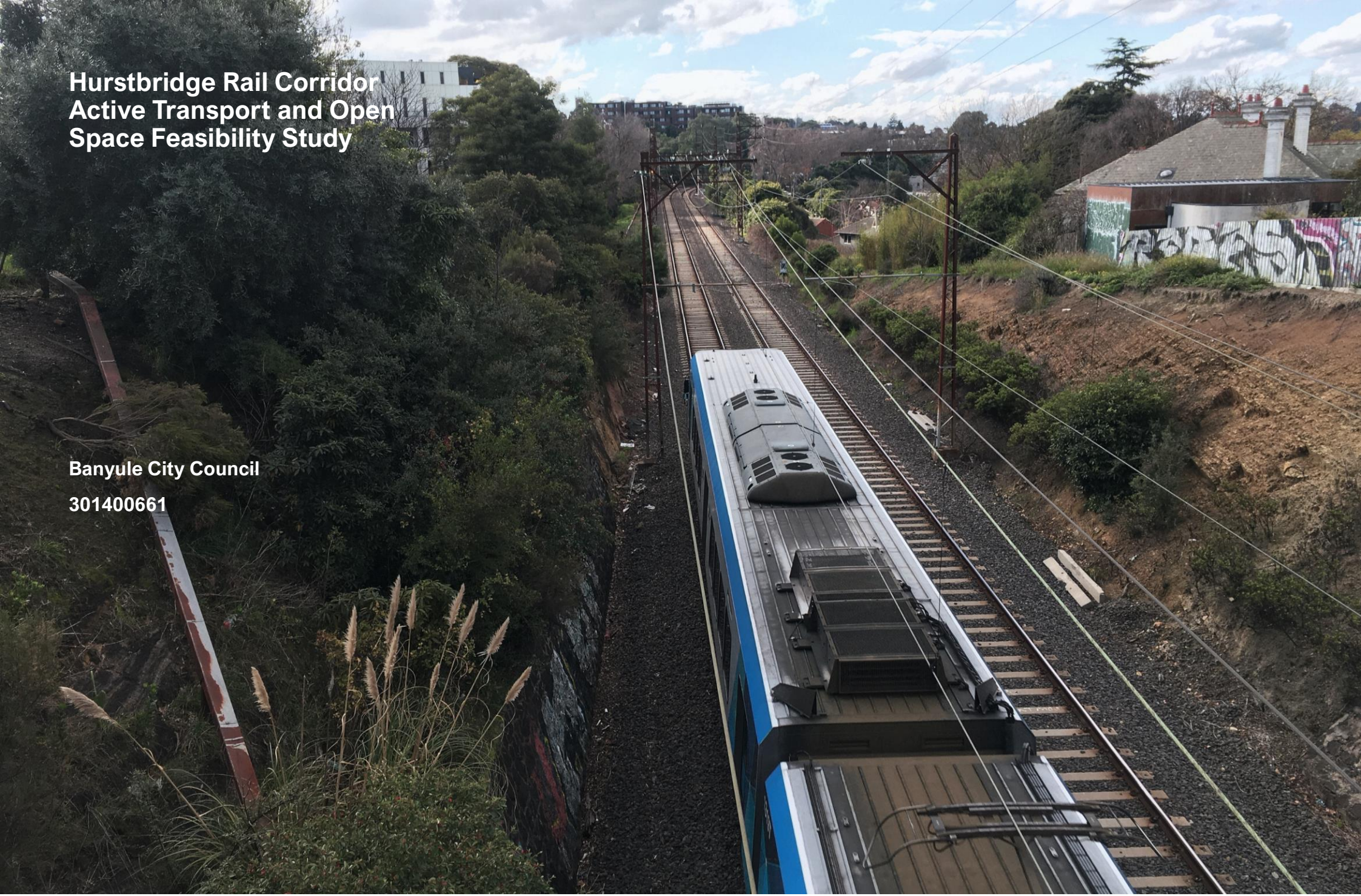
Hurstbridge Rail Corridor Active Transport and Open Space Feasibility Study



Banyule City Council

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“We acknowledge the Traditional Custodians of the land and pay respect to Elders past, present and future. We honour Australian Aboriginal and Torres Strait Islander peoples’ unique cultural and spiritual relationships to place and their rich contribution to our society. To that end, all our work seeks to uphold the idea that if we care for Country, it will care for us.”

Contents

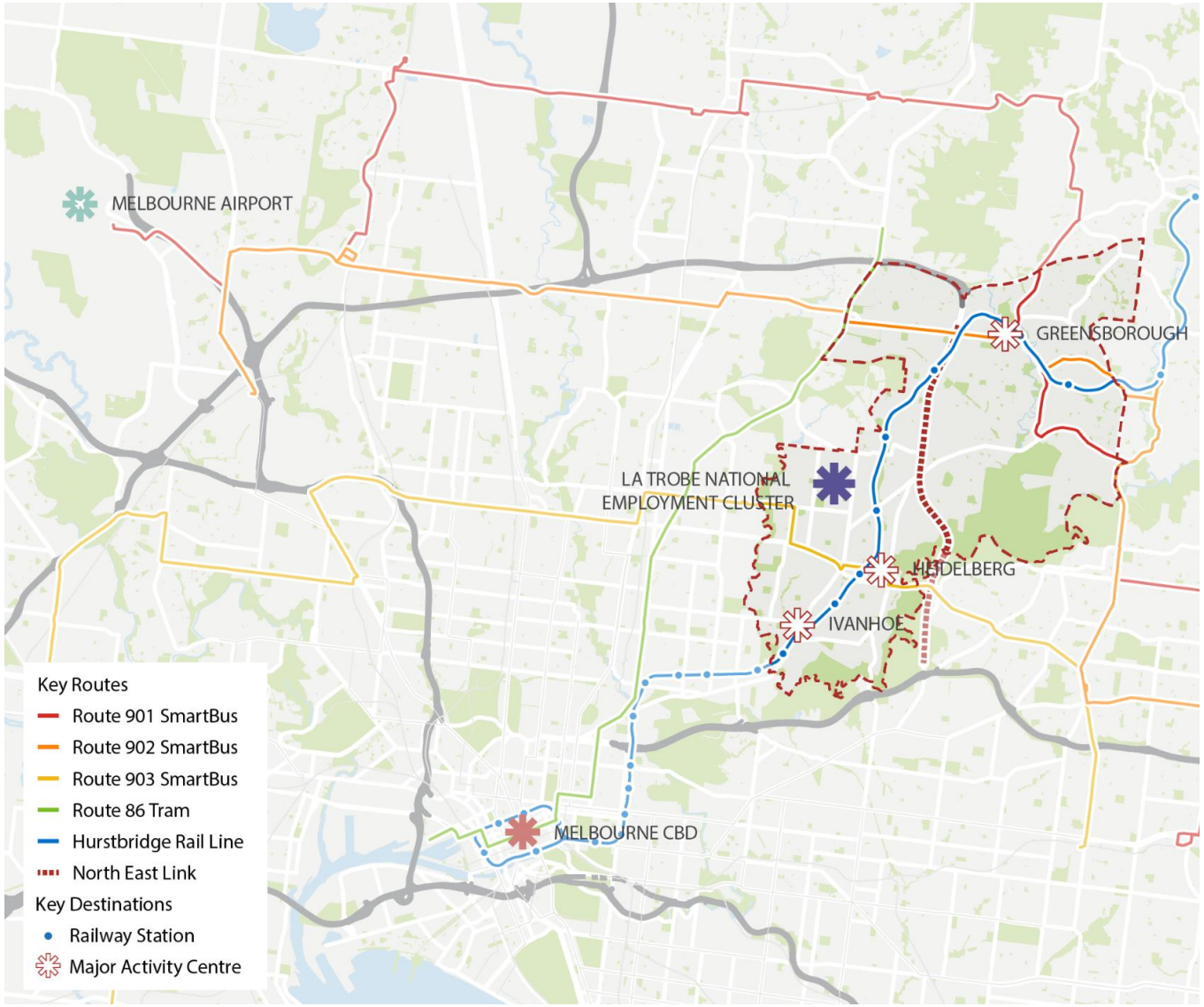
Part One
Introduction

Introduction
Background

The Banyule local government area (LGA) is located approximately 7 km to 21 km northeast of central Melbourne. Three Major Activity Centres (MACs) are located within this area: Heidelberg, Ivanhoe and Greensborough.

The Hurstbridge Rail Corridor within the LGA is an approximately 17 km long linear transport corridor that extends from the southwest through to the northeast. Along the corridor there are various significant centres of activity and employment, including in Greensborough and Ivanhoe and the commercial and health precincts in Heidelberg. Furthermore, local retail centres surround many of the stations, including at Watsonia, where the Watsonia Town Square redevelopment will take place following the receipt of State funding from the North East Link project.

Banyule City Council has commissioned GTA, now Stantec and Outlines to undertake a feasibility study to outline opportunities to improve active transport and open space arrangements along and for connecting land near the Hurstbridge rail line within Banyule.



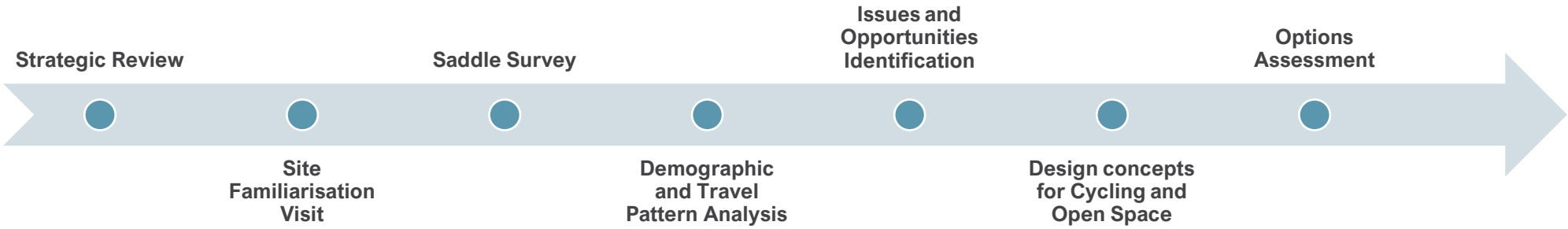
Introduction
Purpose of the Feasibility Study

The overall purpose of the feasibility study is to achieve a high-level understanding of options and opportunities to improve walking, cycling and urban place near the Hurstbridge rail line within Banyule. The study will provide the background and basis for Council's advocacy direction regarding future improvements, and assist with understanding relative priorities for, active transport and open space interventions along the Hurstbridge rail line.

The key activities of the feasibility study included:

- Understand Council's strategic direction and priorities for walking, cycling and provision of open space along the Hurstbridge rail corridor.
- Understand who, where and why people currently walk and/or ride in the LGA, with a focus on those that move to, from and through the rail corridor.
- Identify potential issues and opportunities for active transport and open space along the Hurstbridge rail corridor.
- Idenitfy feasible active transport and open space improvements along the Hurstbridge rail corridor to improve its accessibility and sense of place for the local community.
- Assessment of options using an assessment framework agreed with Council, based on Council's strategic direction and priorities for active transport and open space facilities.

Approach to this Feasibility Study



Strategic Review

A review of background documents and data provided by Council, including any other complementary information as identified by the Project Team

Site Familiarisation Visit

A higher-level site familiarisation visit attended by the Project Team's senior staff and Council officers to better understand the local context.

Saddle Survey

These are additional detailed site surveys of the corridor and surrounds to observe and record current transport facility conditions, user amenity, as well as other local factors.

Demographic and Travel Pattern Analysis

A deeper investigation to better understand who, where and how people move to, from and through the rail corridor.

Issues and Opportunities Identification

A series of maps highlighting route options and their potential issues and opportunities along the entire rail corridor based on the information collated by the project team.

Design Concepts for Cycling and Open Space

Design concepts were identified for and along the route options based on available space, traffic speeds and volumes, and intended users.

Options Assessment

The route options were assessed using a framework developed in agreement with Council.

Study Area

The study area for this project is within and abutting the Hurstbridge rail corridor. Consideration is also being given to nearby destinations and road networks, especially where the rail corridor is inaccessible and/or doesn't align with key movement patterns, i.e. the northern end as the corridor bends round from a northerly direction to an easterly one.

Topography

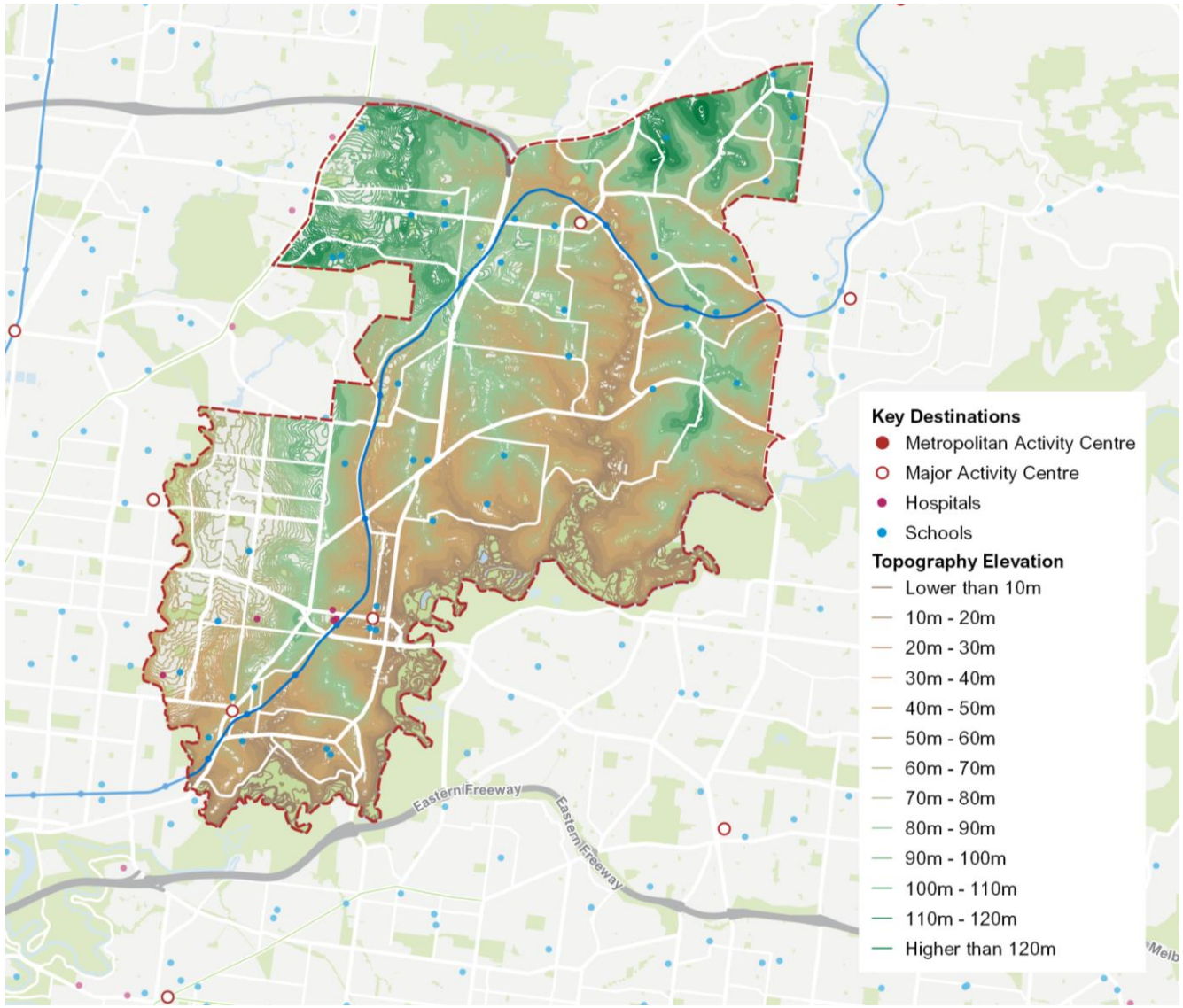
The topography across Banyule consists of steep and hilly terrain with a variation of more than 110m from the lowest to highest points. The railway corridor broadly follows a path that is parallel to contours between 60-80m to maintain a relatively level corridor.

As rail lines have to be relatively flat, where there are steep changes in elevation, the rail corridor has been cut into or elevated over the terrain. These cuttings or elevations are significant in places such as Heidelberg, Greensborough and Montmorency.

Key Destinations

The Ivanhoe, Heidelberg and Greensborough Activity Centres are located along the Hurstbridge rail line and have stations with the same name.

Other key locations near the railway corridor include La Trobe University, Heidelberg Medical Precinct, schools and numerous parkland areas with community sports centres.



Activity Centres

These places provide a suburban focal point for various services, employment and housing. In the context of this study, they form one of the major employment drivers of Banyule and are generally located along the railway corridor.

Neighbourhood Centres

These centres form part of the “20-minute Neighbourhood” strategy and provide access to local services and employment within a 20-minute walk, cycle or public transport trip from home. These areas of activity are major points of opportunity to increase walking and cycling trips.

Hospitals

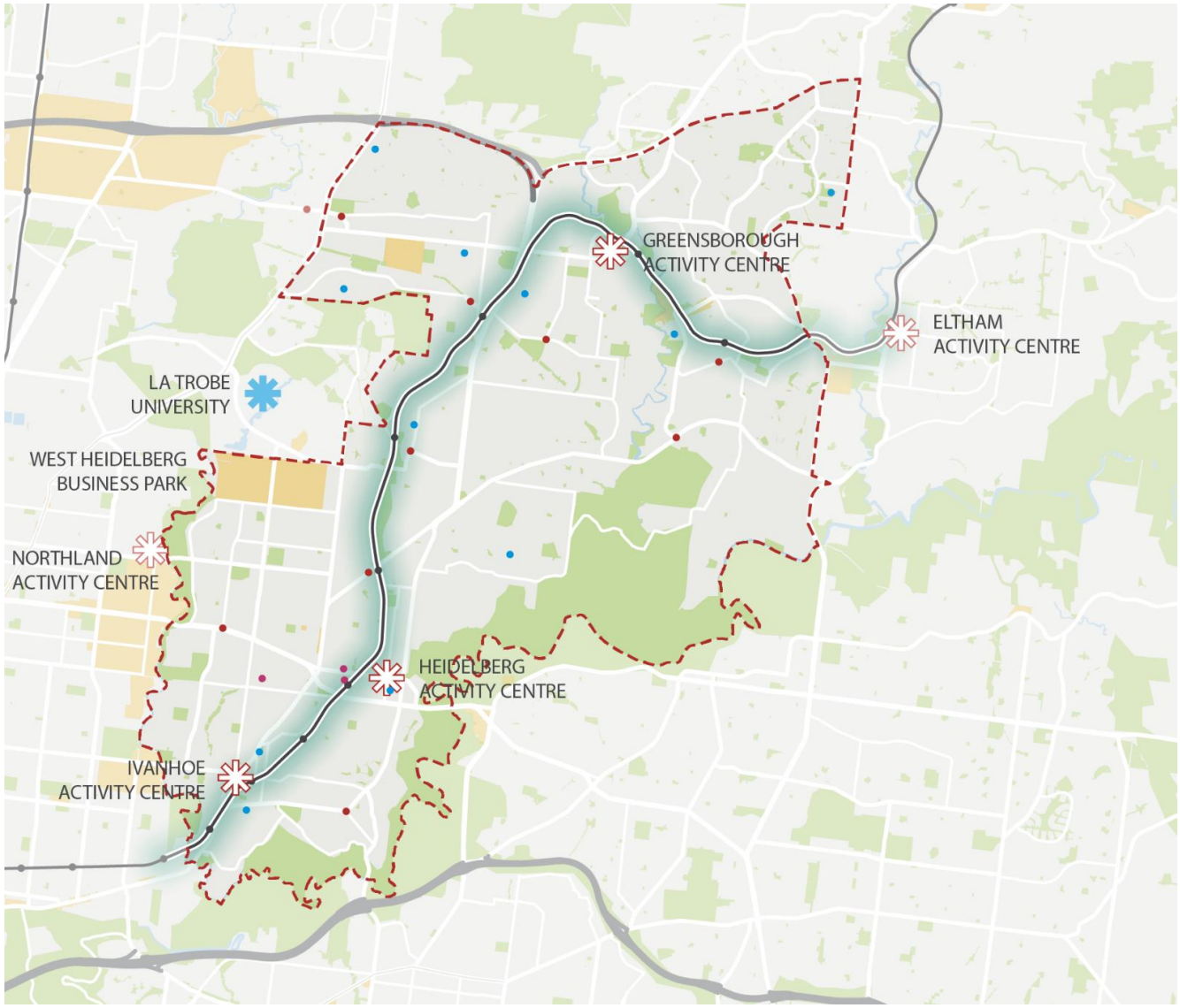
Several hospitals exist along the Bell Street corridor near Heidelberg and are key drivers of employment in Banyule. Staff provide the best opportunity for increased active transport use.

Industrial Areas

Many jobs in Banyule are found in these areas. Trips for commuting and logistics (e.g., deliveries by cargo bikes) could be undertaken by cycling.

Education Precincts

Macleod Station is the closest major public transport service to La Trobe University. Active transport can play a key role in linking them.



Part Two

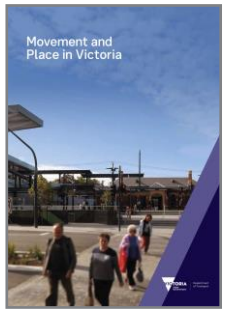
Policy Review and Key Themes

Policy Review and Key Themes
Transport

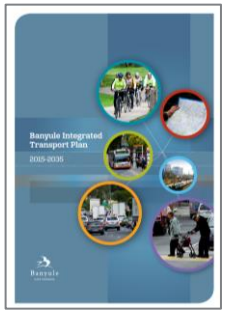
Several key policy documents relating to transport were reviewed to develop an understanding of key themes relating to active transport in Banyule

Council Plan 2017-2021

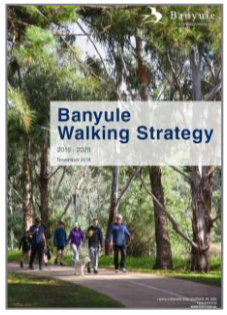
Draft Bicycle Strategy 2021



Movement and Place in Victoria



Integrated Transport Plan 2015-2035

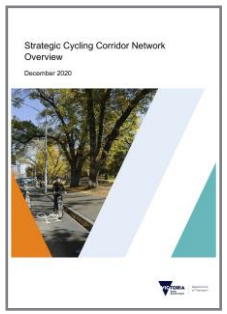


Walking Strategy 2018-2028

Victorian Cycling Strategy 2018-28

Greensborough North-East Gateway Integrated Strategic Plan - 2021

Greensborough Activity Centre Transport Masterplan 2017

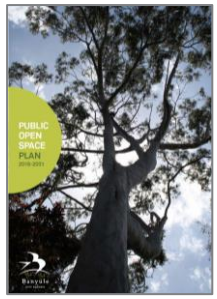


Strategic Cycling Corridor (SCC) Network Overview

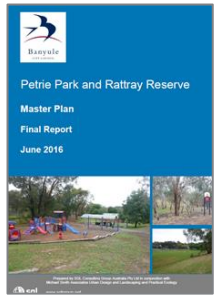
Policy Review and Key Themes
Open Space

Several key policy documents relating to open space were reviewed to develop an understanding of key themes relating to open space in Banyule.

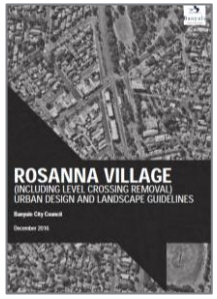
Council Plan 2017-2021



Public Open Space Plan 2016-2031

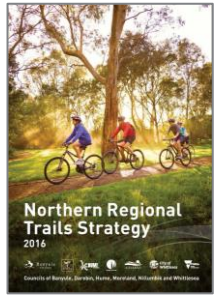


Petrie Park and Rattray Reserve Master Plan 2016

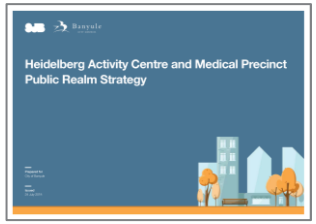


Rosanna Urban Design & Landscape Guidelines 2016

Watsonia Neighbourhood Centre Concept Plan 2019

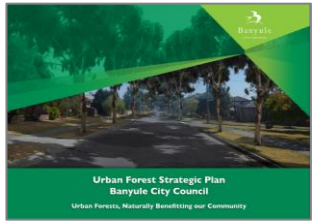


Northern Regional Trails Strategy 2016



Heidelberg Activity Centre and Medical Precinct Public Realm Strategy 2018

Kalparrin Gardens Master Plan 2016



Urban Forest Strategic Plan

Burgundy and Powlett Street Reserves Master Plan

Existing and Proposed Strategic Cycling Corridors

Existing Routes

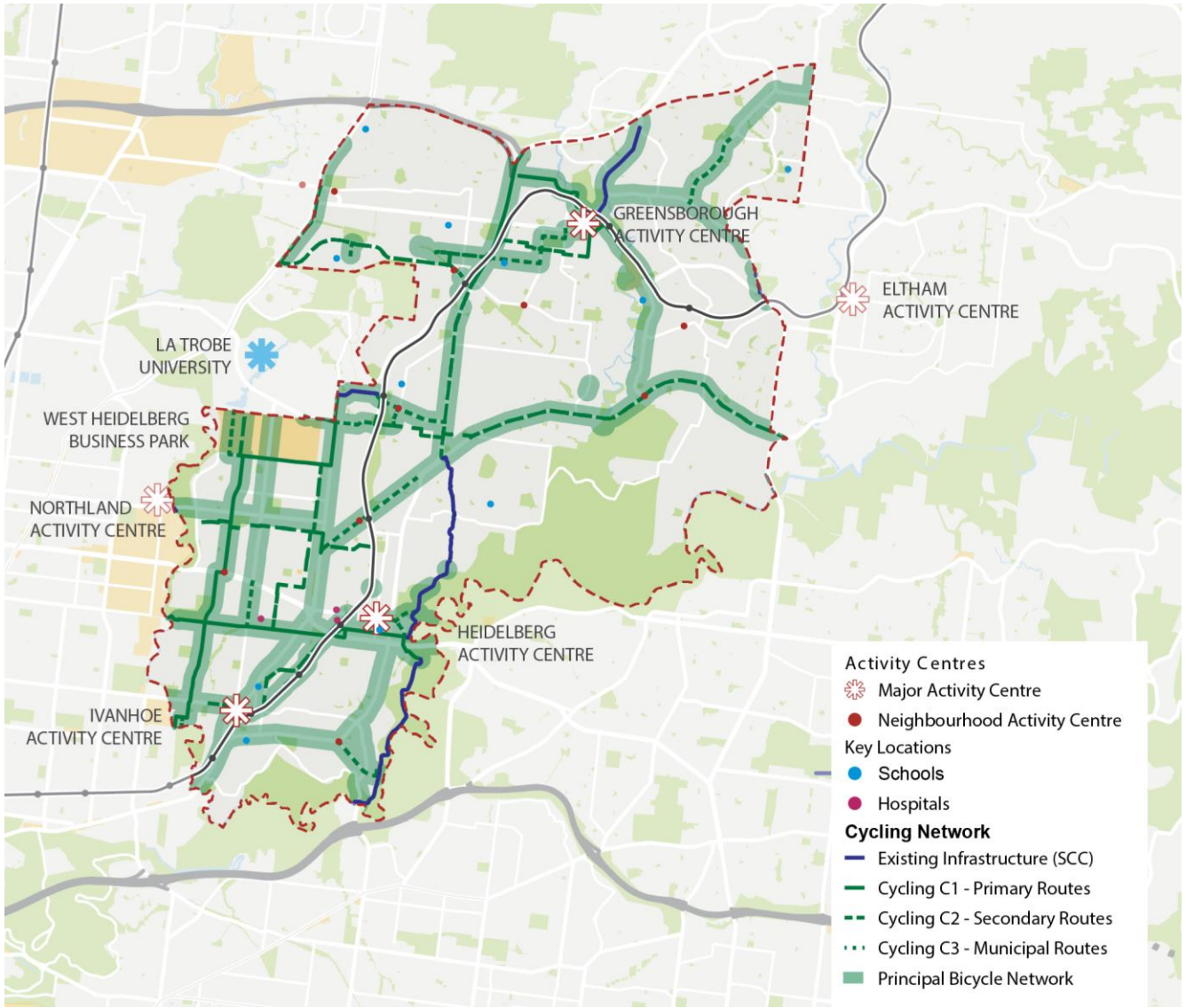
Strategic Cycling Corridor (SCC) routes that are in place within Banyule consist of on-road cycle lanes along Main Street / Diamond Creek Road / Greenwood Drive / Oriel Road, shared use streets on Joynt Street / Porter Street / Edwin Street, and shared use paths on the Main Yarra Trail / Banyule Trail / River Gum Walk / Greensborough Highway and along the rail corridor at Rosanna.

A review of the existing network as part of the Banyule Bicycle Strategy reveals a disconnected collection of cycling routes along most of the railway alignment in Banyule, from Darebin to Montmorency.

Proposed Routes

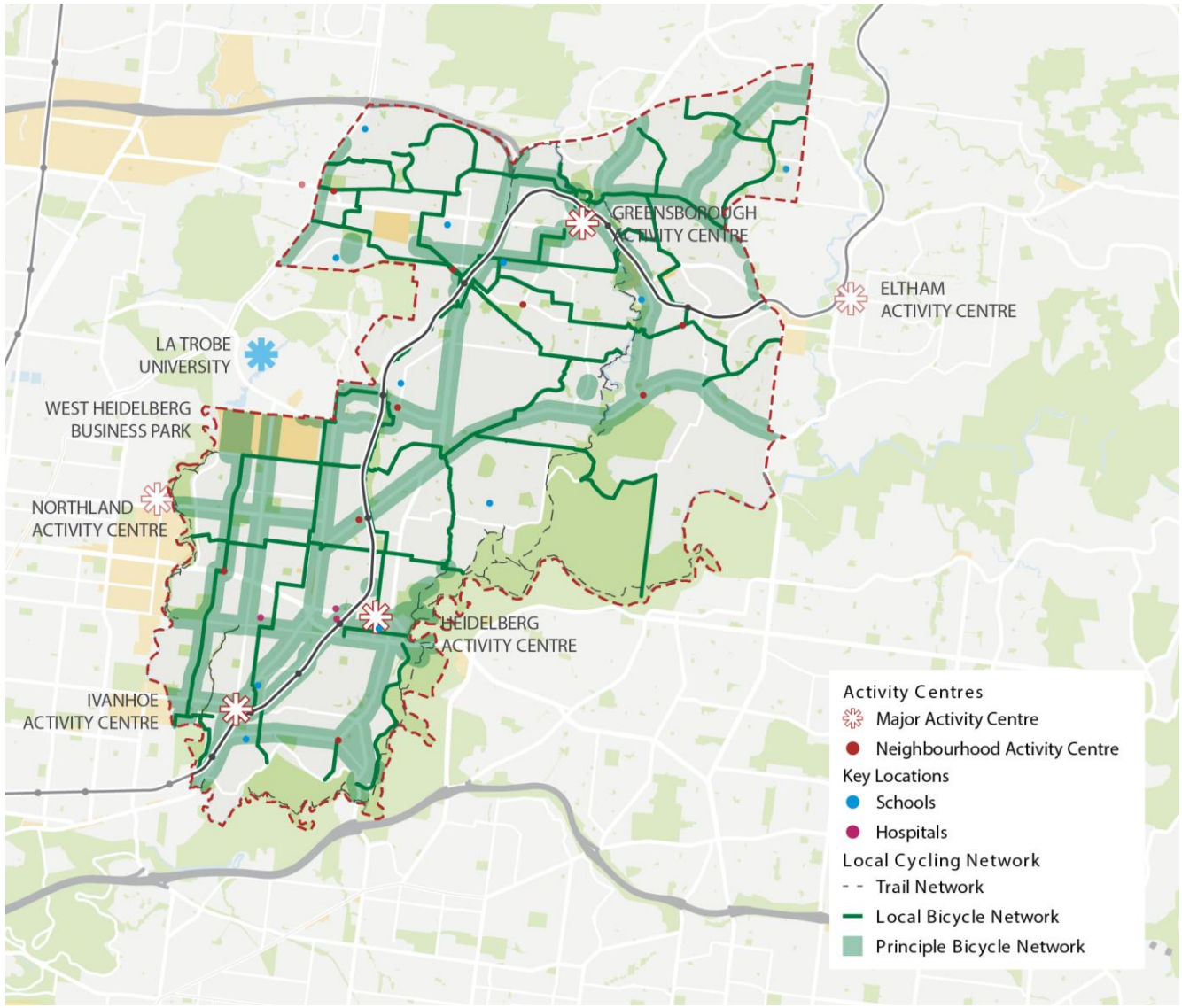
DoT has recently adopted a revised SCC network that includes an indicative alignment along much of the Hurstbridge rail line. The overall network proposed a hub and spoke network to connect activity centres in Banyule.

The SCC network is a subset of the Principal Bicycle Network, which is also shown on this map. For the purpose of this study, the Local Bicycle Network forms a complementary network to the SCC.



Policy Review and Key Themes
Banyule Local Bicycle Network (LBN)

As part of its Bicycle Strategy, Council has a Local Bicycle Network, comprising 12 local on-road cycling routes promoted by Council as an alternative to the more direct but highly trafficked arterial roads. The LBN complements the Principal Bicycle Network (PBN), Strategic Cycling Corridors (SCC) and off-road trails in the LGA. The aim of the LBN is to provide connections to facilities such as shopping centres, community facilities, schools and links to off road trails and the PBN.



Key Themes

The document and policy review revealed key themes that emphasise the social value of active travel in the community

Transport

- Safe and universally accessible walking and cycling for all ages and abilities that stimulates economic and tourism activity by attracting people to the area
- Reduce car reliance, especially for shorter trips
- Promote a culture of walking and cycling that promotes community participation and social connection
- Improve connections to public transport, activity centres, schools and other walking and cycling routes
- Prioritise road space for sustainable transport including zero emission modes (walking and cycling) and lower emission modes (public transport).

Open Space

- Improve access and equity of access to open space
- Open space to improve health and well-being
- Reimagine road reserve and transport infrastructure as public open space
- Enhance quantity, quality and diversity of public open space
- Six ‘pillars’ underpinning Open Space provision in Banyule, including:
  - Quantity
  - Quality
  - Accessibility and connectivity
  - Equitable distribution
  - Diversity
  - Sustainability

Part Three
Baseline Conditions

Existing Active Transport Infrastructure

Strategic Cycling Corridor and Principal Bicycle Network

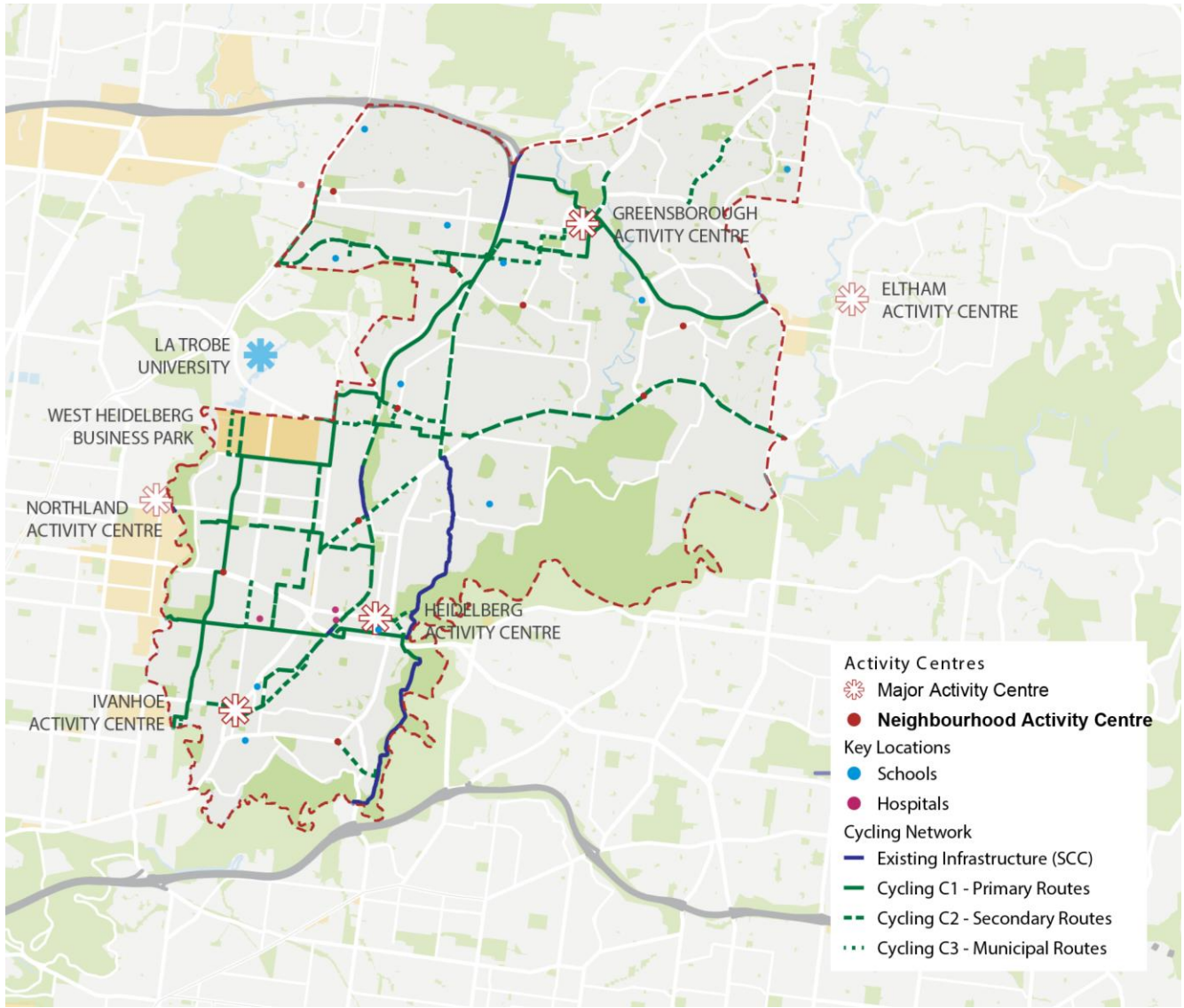
While there is a broad proposed network in Banyule, much of the SCC and PBN is yet to be built to an acceptable level of cyclist safety. The majority of what has been built as part of the SCC consists of connections along the Yarra River and a recently completed section at Rosanna Station.

The PBN comprises some on-road cycle lanes along Studley Road in Heidelberg, Wungan Street in Macleod and an existing trail adjacent to the rail corridor between Darebin Street and Burgundy Street. However, their suitability for the purposes of this study may not be sufficient.

Other Routes and Trails

Other recreational trails not part of the SCC/ PBN have been built near the rail corridor and mainly consist of ad-hoc paths along easements, open space reserves and paths along the rail corridor.

For example, the trail through Rosanna Parklands does not form part of the SCC network but provides a connection through an important green space.



Baseline Conditions
Proposed Infrastructure

Several major infrastructure projects are underway and have implications for the immediate corridor and its surrounds.

North East Link

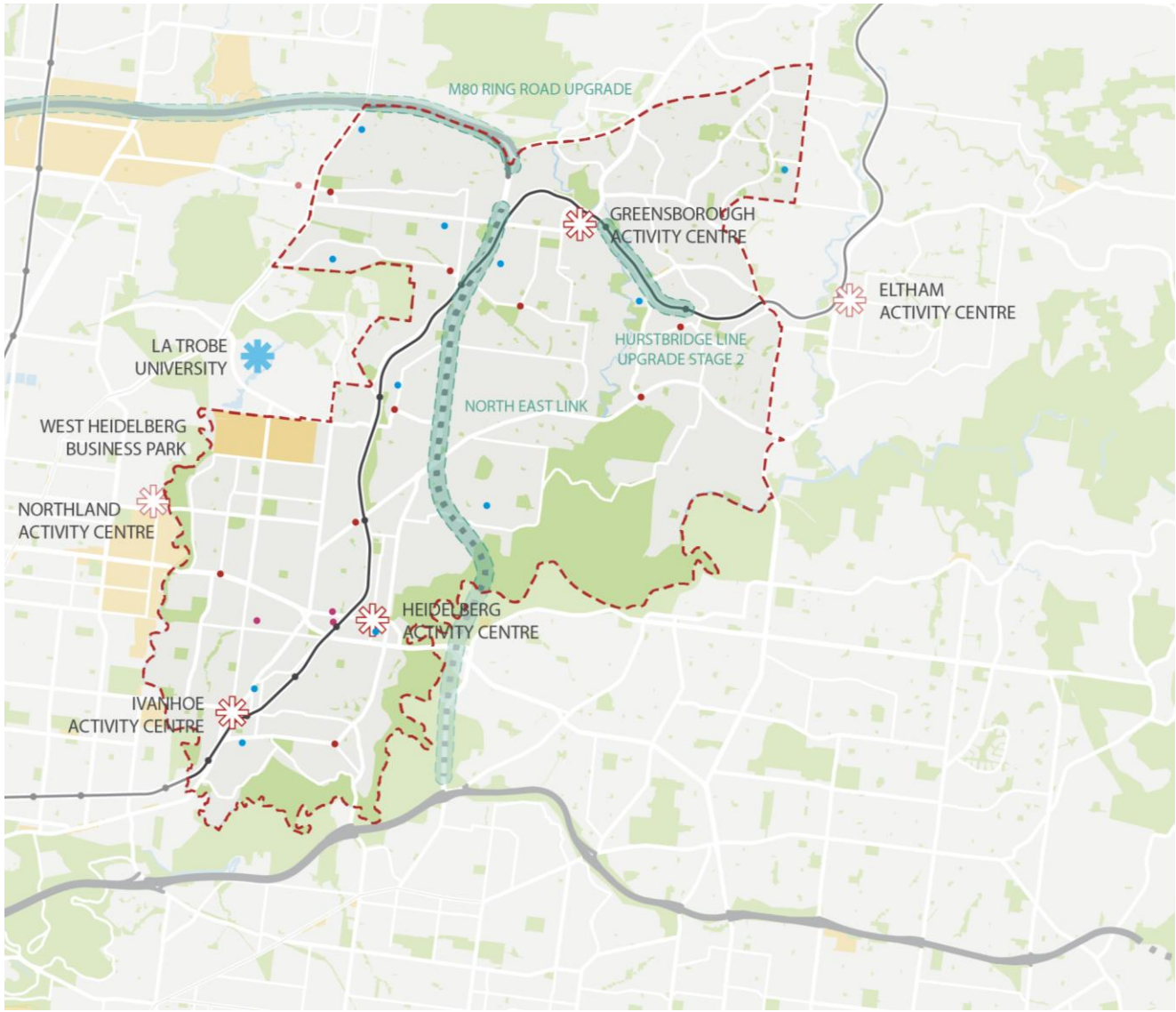
The North East Link is a toll road project connecting the M80 Ring Road with the Eastern Freeway and will mainly follow the alignment of the Greensborough Bypass through Banyule. Several at-grade shared paths have been proposed as part of this project.

Hurstbridge Line Upgrade Stage 2

This project will duplicate portions of track and stations between Greensborough and Diamond Creek Stations. As part of this project, additional crossing points for pedestrians and cyclists have been proposed.

M80 Ring Road Upgrade

The project is related to the North East Link project and will include the construction of missing links within the shared path network within the corridor alongside additional crossings over the freeway for pedestrians and cyclists.



Baseline Conditions

Space Syntax – Network integration and Connectivity

What is It

Space syntax is an approach to measuring network connectivity. This shows where connectivity on the existing road network is high or low, giving insight into where people will likely access and/or cross residential areas, activity centres, or the rail line.

What does it show

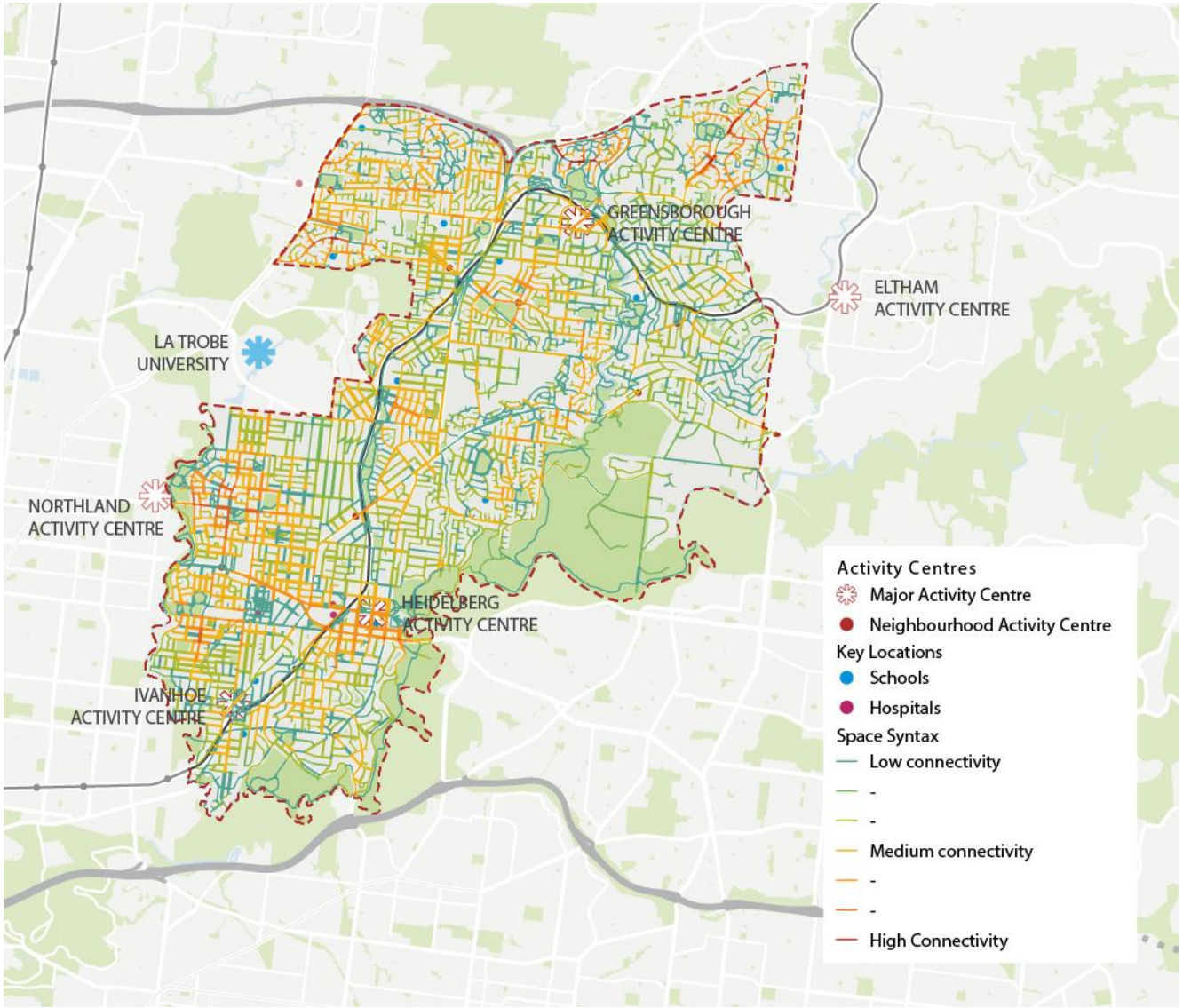
Where there are large street blocks, such as the Greensborough Activity Centre, there are lower levels of connectivity for walking and cycling. Conversely, where there are small street blocks, such as the Heidelberg Activity Centre, there are higher levels of connectivity for walking and cycling.

The immediate surrounds of the rail corridor also have low connectivity. This is the result of a lack of crossing points across the rail corridor.

What can we do about it

Where there is high connectivity there is generally a higher potential for walking and cycling. As such, we can promote areas with existing high accessibility and focus on improving accessibility where it is low, especially between trip destinations and catchments.

It also highlights the need to ensure there are regular and high quality crossing opportunities of major transport infrastructure to minimise segregation.



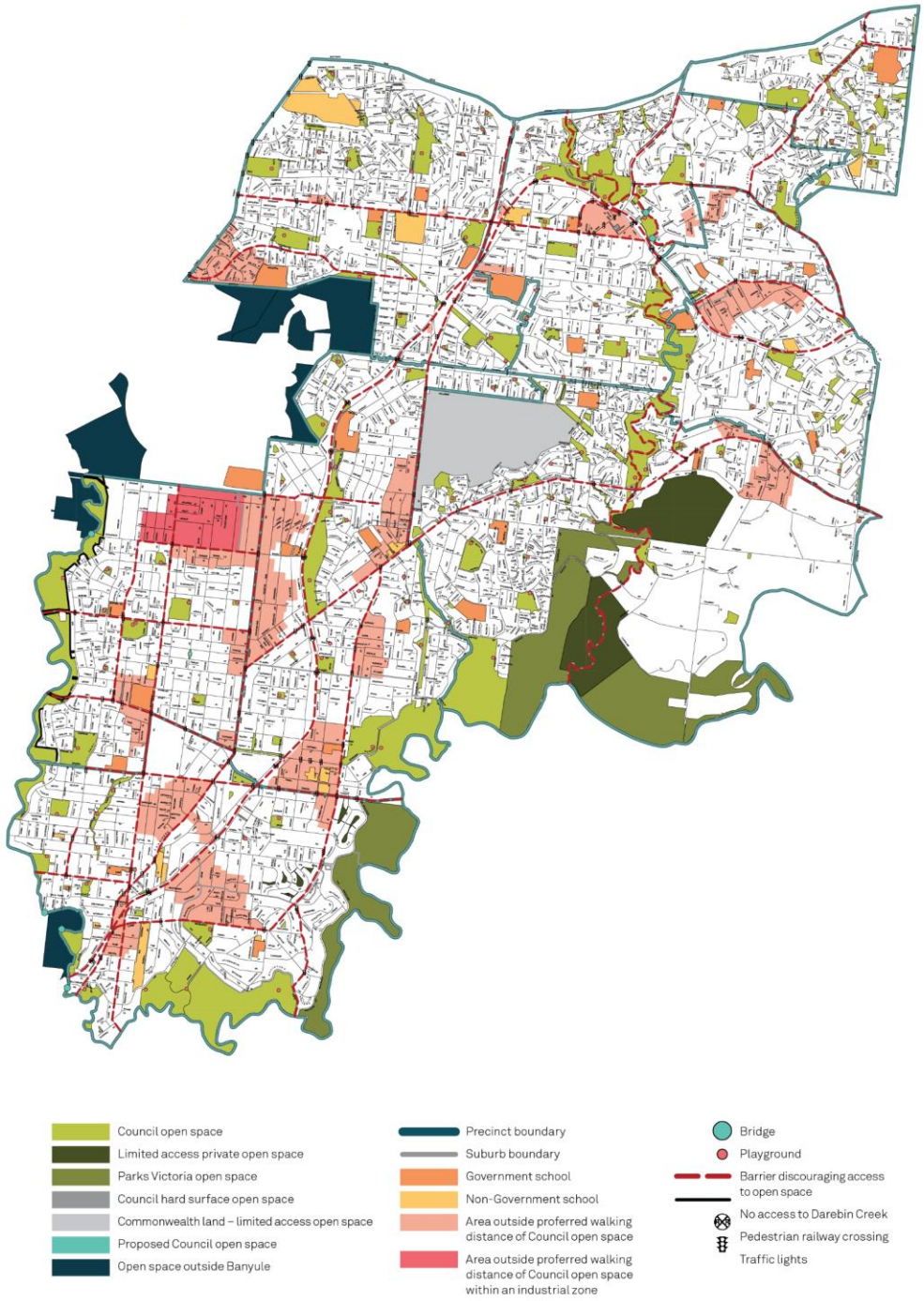
Baseline Conditions
Open Space

Existing open space and amenities such as schools and playgrounds (as informed by the Banyule Public Open Space Plan Technical Report) in the LGA have been mapped. Most of these facilities are located along the rail corridor and the creek system.

Providing shared use pathways along the rail corridor could provide active, cultural and ecological connections between community members and the surrounding environment, and when combined with those already in the creek system, would put most residents within 400m of open space.

Areas outside the preferred 400m walking distance of Council open space would benefit most from improved active transport accessibility to increase community use of the existing open space.

Image is from Banyule City Council's Public Open Space Plan Technical Report.



An assessment of the baseline conditions shows that there are the ingredients for a well-connected and legible active transport network. The key is to leverage off these developments to create wider benefits for the community

Parks and Recreation

Shared use pathways along the corridor could provide active, cultural and ecological connections for community members and the surrounding environment. This type of facility could be used to improve and create more direct walking connections to existing Council open space, especially from areas currently identified as being too far away from this open space.

Existing Active Transport Infrastructure

It is clear that there is an identified network proposed for the entire Banyule LGA with very little implemented thus far. The SCC proposes a ”grid-style” network for cyclists through the southern portion of the region, with a “point-to-point” network for the northern half.

It is important to note that while the network does not consider the rail corridor to be part of these plans, the Hurstbridge Rail corridor through Banyule has the potential to form a trunk route for routes both in and out of Banyule.

Proposed Infrastructure

The proposed major infrastructure projects that are underway in Banyule include a number of shared paths being built along their affected corridors. However, these projects do not necessarily consider their interfaces with the broader network.

To extract maximum value from these projects and ensure a sustained legacy for the community, any proposals from this study should consider how they could integrate with these projects.

Accessibility

Space syntax analysis revealed that older, more established suburbs in Banyule have fine-grain and well-connected block permeability as compared to newer areas in the north. However, the greatest impedance on accessibility was the rail corridor itself, which creates a severance between east and west.

This is the result of crossing points along the corridor being placed far apart. This has a larger impact on cyclists and pedestrians as compared to car drivers. Providing regularly spaced and logical crossing points where possible will be critical in alleviating this issue.

Part Four

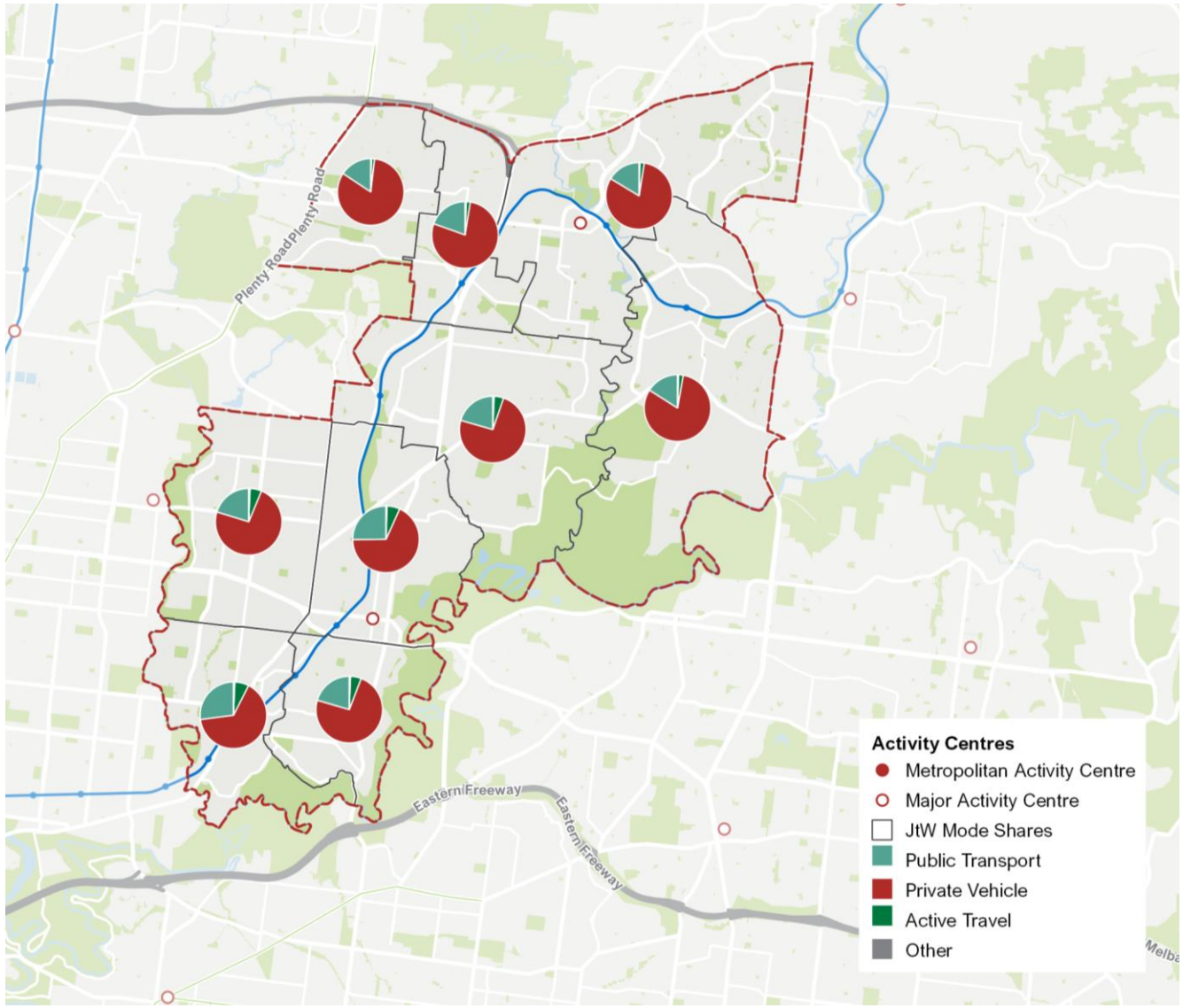
Travel Behaviours and Demographics

Travel Behaviours and Demographics

ABS Census 2016 Journey to Work – Trips from Home Mode Splits (SA2)

Driving to work remains the predominant transport mode, with public transport use ranging from 20 to 25 percent of trips depending on location within the LGA.

Walking and cycling to work is more common in the southern portion of the LGA, which correlates with an area with higher income compared to other parts of the LGA.



Travel Behaviours and Demographics
Journey to Work – All Users

The activity centres of Greensborough, Heidelberg and Ivanhoe are key employment attractors, drawing workers from all parts of the LGA.

Major commuting flows also exist between activity centres and other neighbourhood centres such as Watsonia and Montmorency.

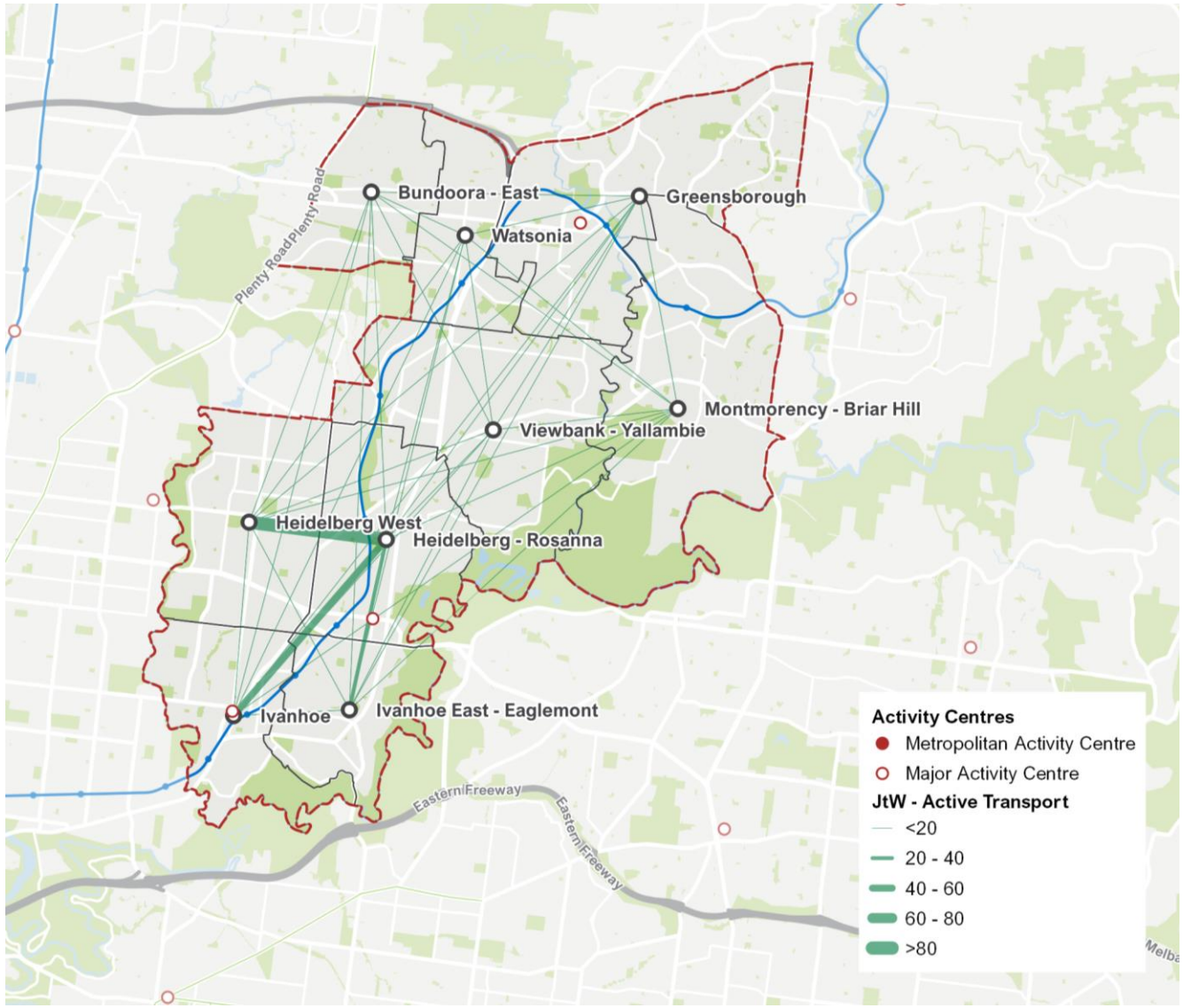
It is noted that commuting patterns by private vehicles and public transport follow a similar pattern.

Travel Behaviours and Demographics
Journey to Work – Active Transport

Active transport commuting occurs much more in the southern portion of the LGA, between Ivanhoe, Heidelberg, Heidelberg West and Rosanna, reflecting the concentration of major employers such as hospitals and tertiary education institutions in this area. Smaller commuting flows are also observed between Greensborough and Montmorency.

Of those that cycled to work on Census day in 2016, 85 per cent of those were male and most of them were between 30 and 49 years of age. The average trip distance for cyclists going to work is 8 km with a duration of 36 minutes.

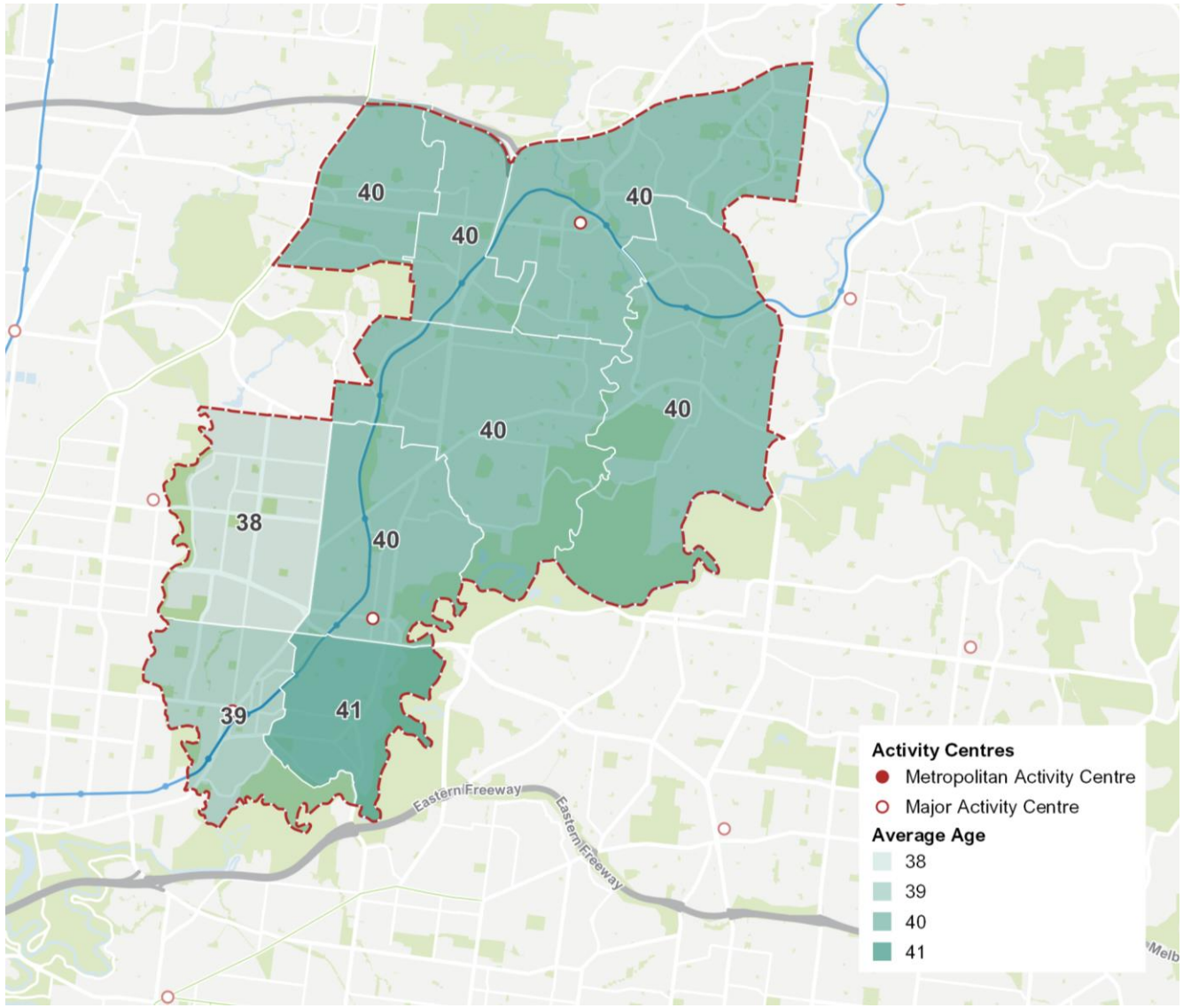
Active transport as a mode choice for trips to the Melbourne CBD is substantially higher in the southern area of Banyule as compared to the northern area (greater than 3% vs circa 1% or less). This becomes important to note when comparing car ownership rates between the south and north of the LGA.



Travel Behaviours and Demographics
ABS Census 2016 – Average Age (SA2)

No major variances in age exist within the LGA, with the average age slightly older than the average age of 36 across Greater Melbourne.

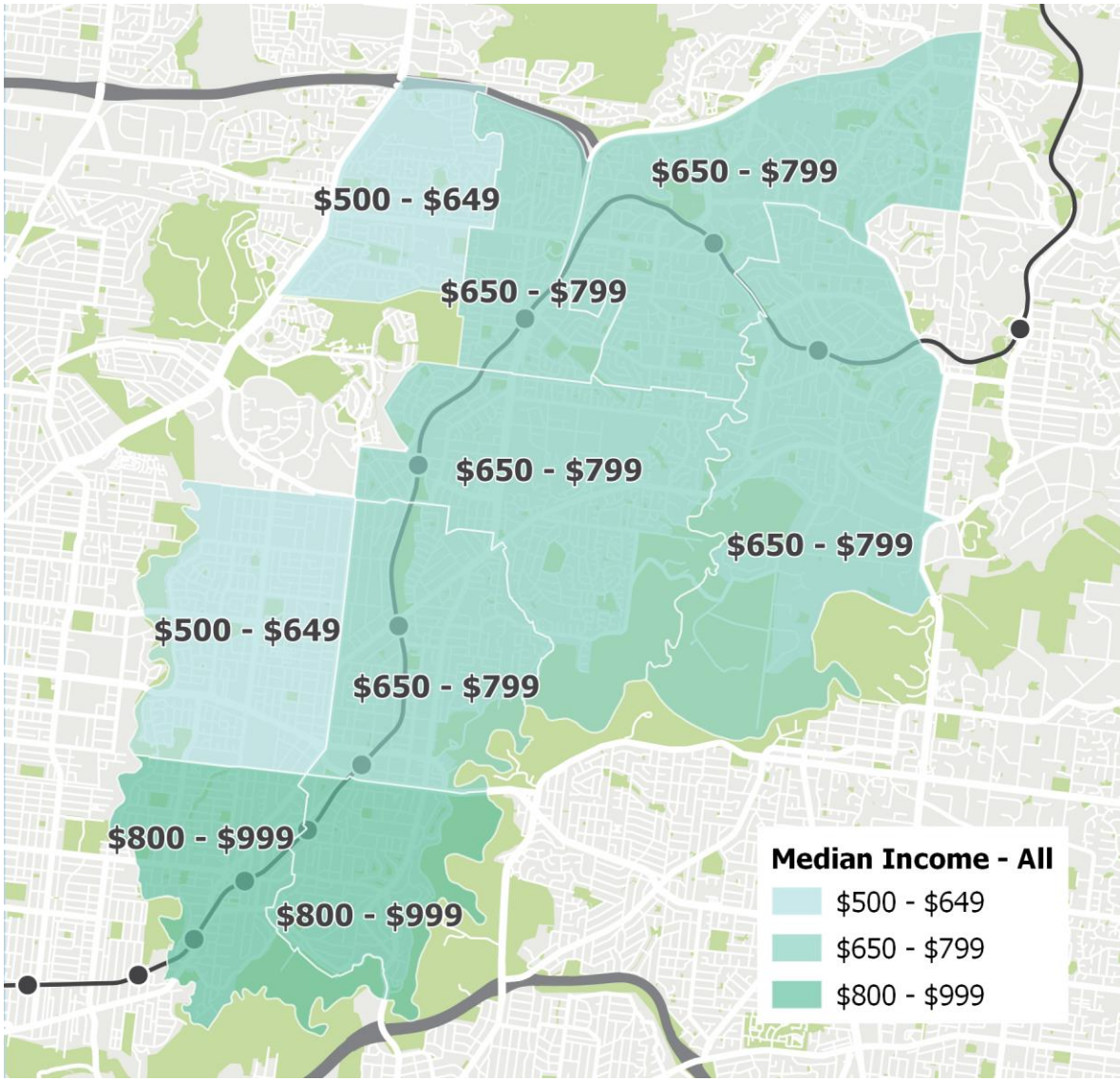
Based on the 2016 Census Data, the population of Banyule is increasing at a 0.6% growth rate per annum with a median age of 39 years across the LGA, higher than the median for both Victoria and Australia. Banyule is identified as having an ageing population which is forecast to continue over the next 30 years.



Travel Behaviours and Demographics

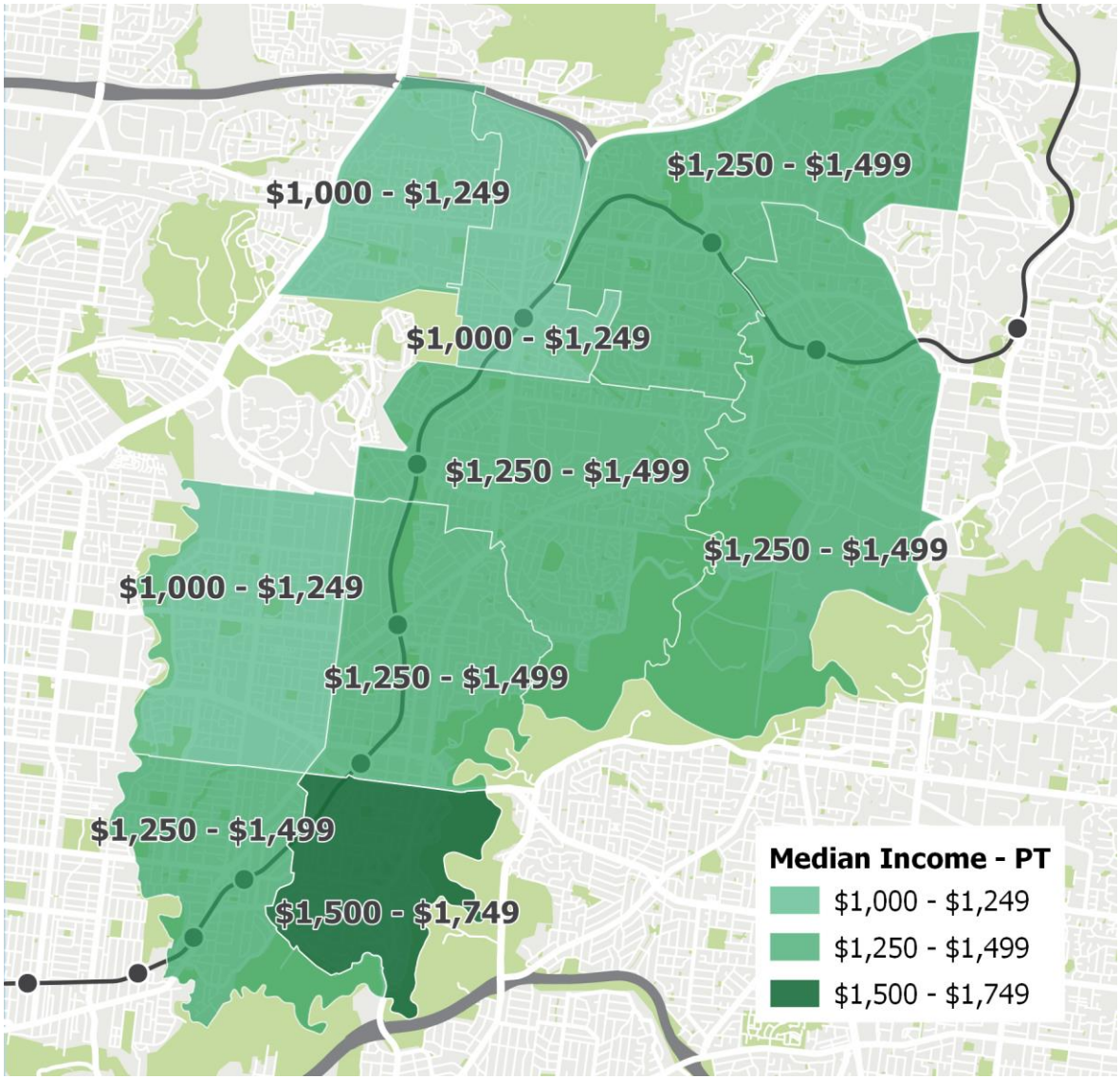
ABS Census 2016 – Median Income (SA2)

Median incomes are highest in the southern portion of the LGA and this also correlates to areas of the highest active transport commuting activity.



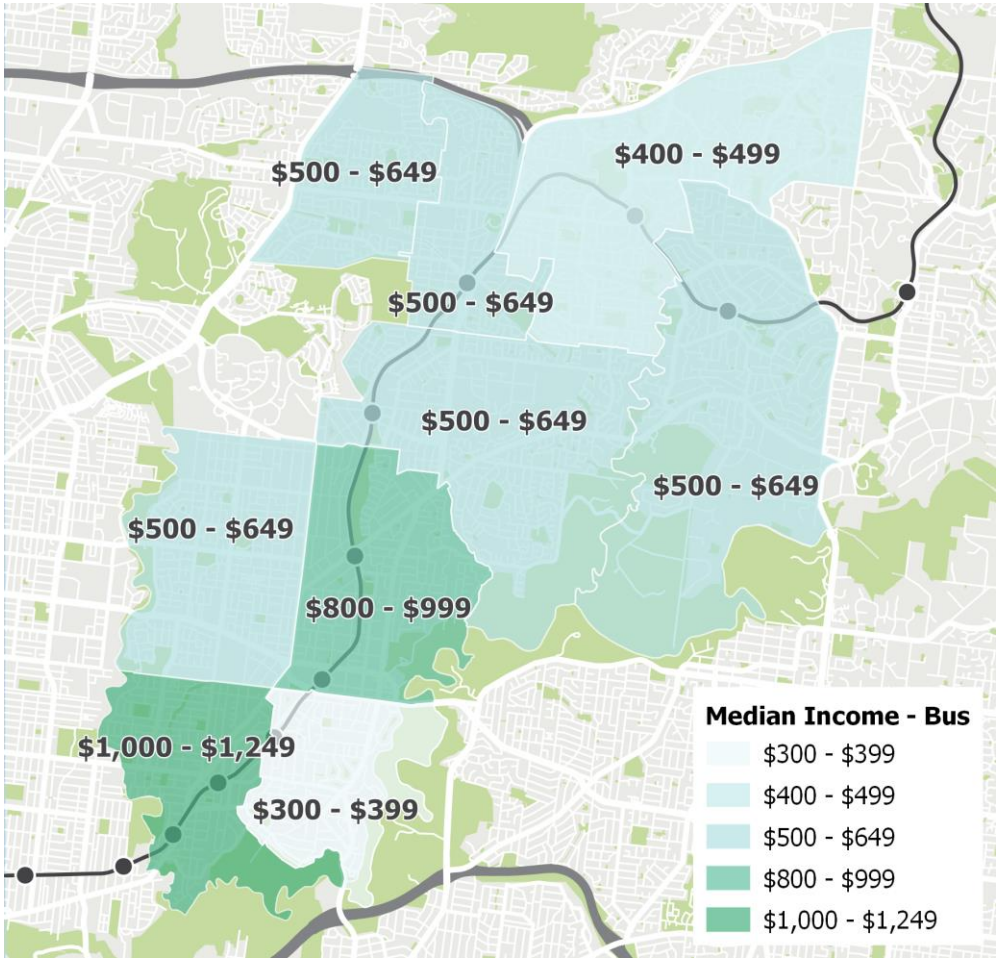
ABS Census 2016 – Median Income of people who use Public Transport to Work (SA2)

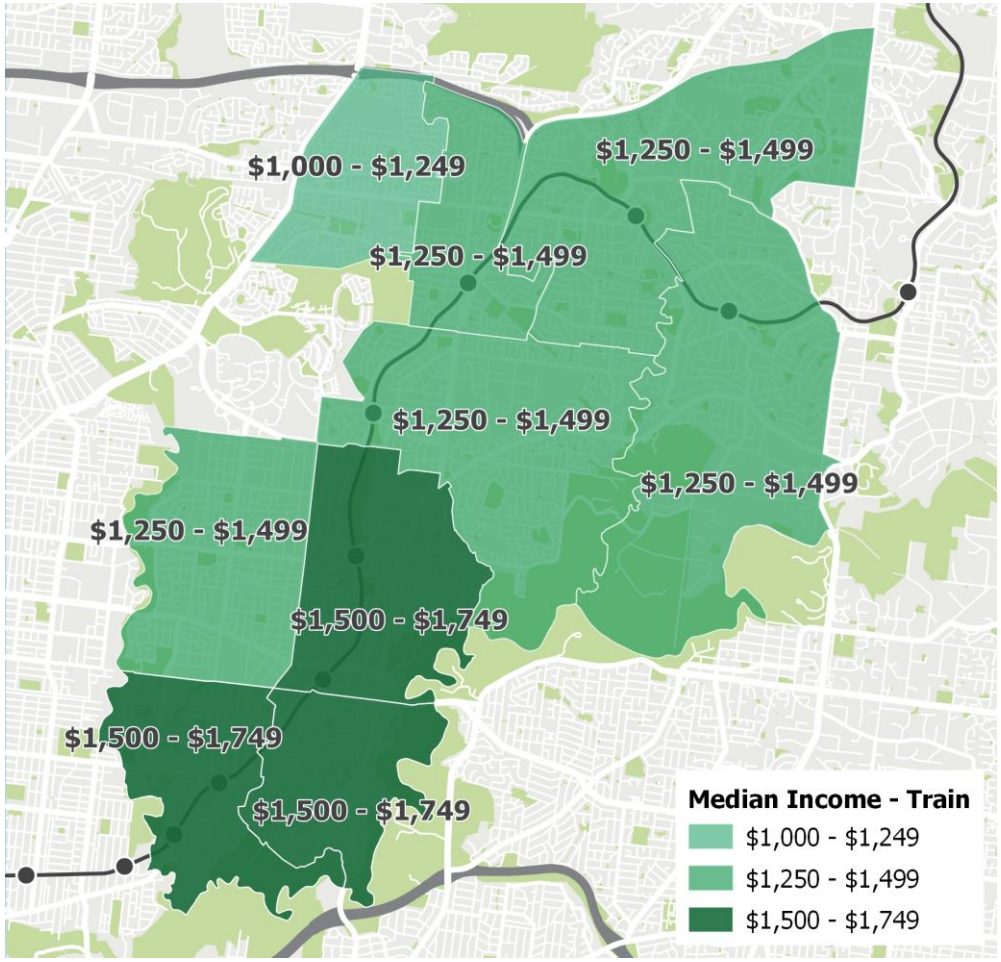
Those who use public transport to go to work have higher median incomes than the general population, as evident when comparing incomes in the map to the right with median incomes for all residents on page 27. There is a significant difference in the income of people who travel by bus and people who travel by train, as shown on the next page.



ABS Census 2016 – Comparison of Median Income of people who use Bus and Train (SA2)

Those who travel to work by bus generally have lower incomes than those who travel by train. This applies across the LGA. Note that the same colour scale is used across both maps, and that the low median income of bus users in Ivanhoe East – Eaglemont may be skewed by a low number of people using this mode in this SA2.





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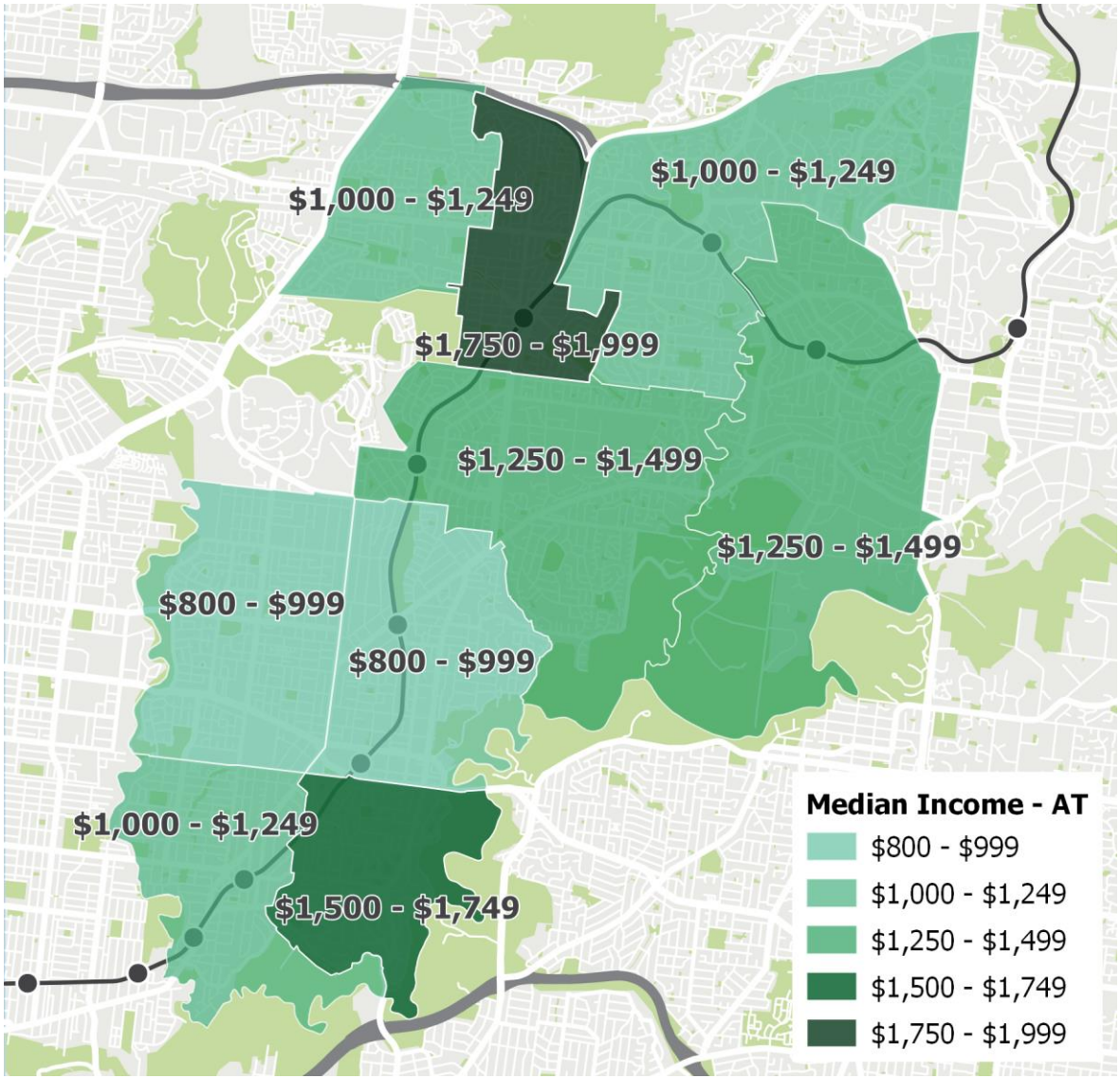


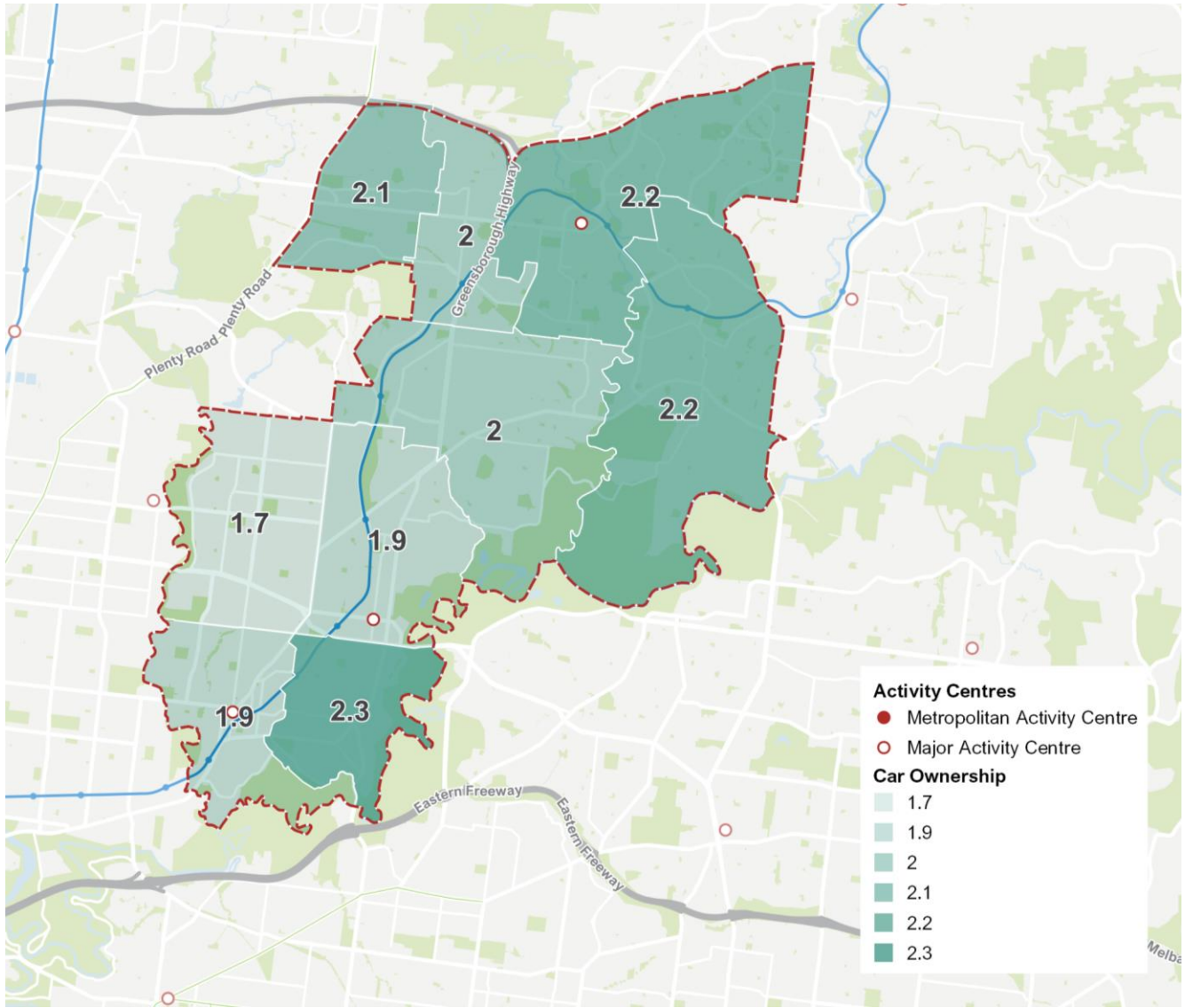
ABS Census 2016 – Average Car Ownership (SA2)

Banyule has an average rate of car ownership of 1.9 cars per household, which is higher than the average of 1.7 cars per household in Greater Melbourne.

Ivanhoe East SA2 has a higher car ownership rate (2.3) compared to adjacent regions. However, trips to work from this SA2 by active transport to the Melbourne CBD is higher than adjacent SA2 areas (4% vs 3%). On the other hand, when considering overall trips to all places of work both inside and outside of the LGA, this mode share drops somewhat.

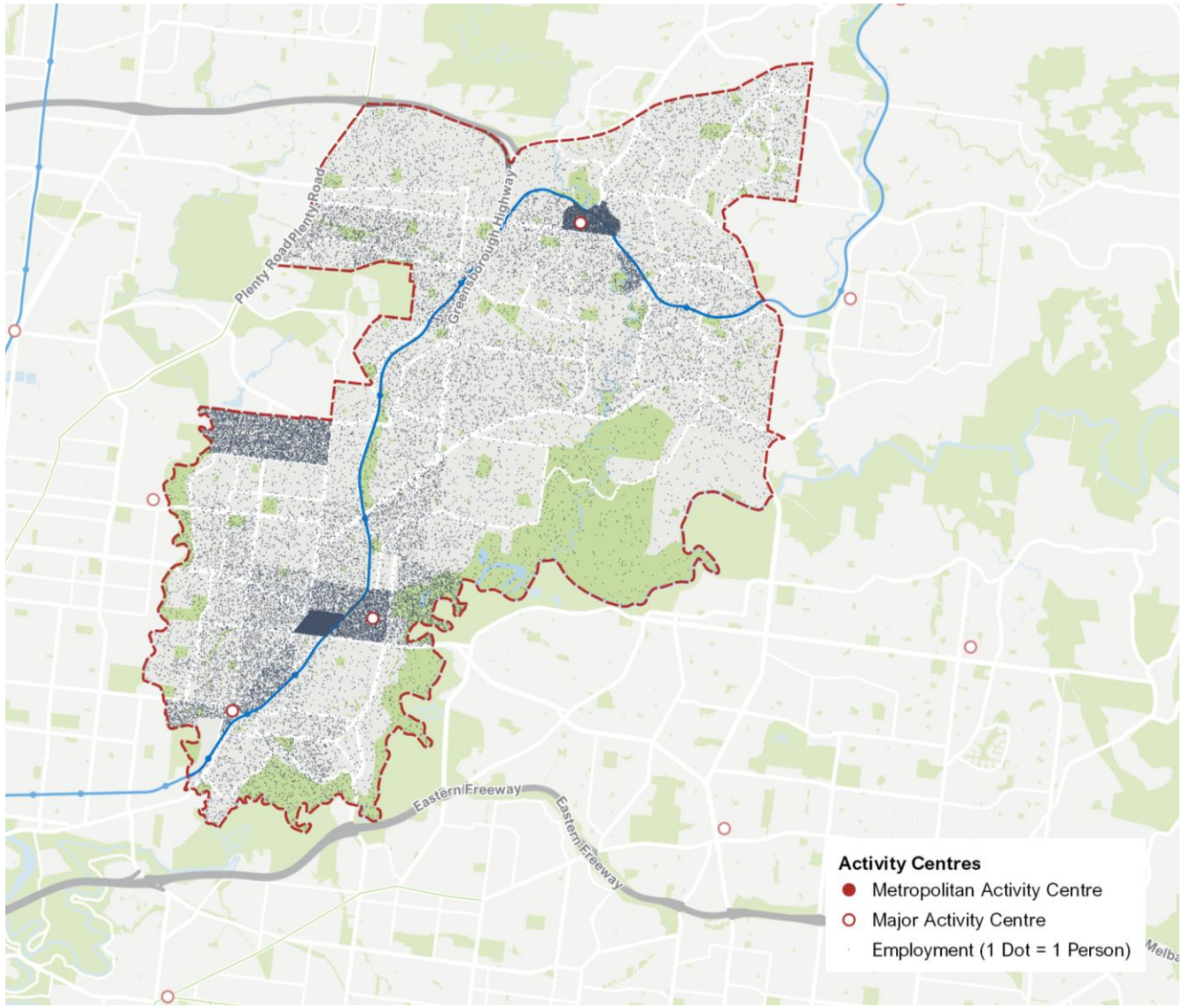
When considering the lower than average public transport mode share in Ivanhoe East alongside higher median income, this is potentially representative of a user group with a higher disposable income that owns multiple cars, but may use them for leisure purposes rather than for trips to work.

This pattern has been observed in other affluent suburbs in Melbourne such as Toorak, Kew and Albert Park. In these cases, despite having highly accessible public transport networks, car ownership remains above the Greater Melbourne or LGA average.



Travel Behaviours and Demographics
ABS Census 2016 – Employment Density (DZN)

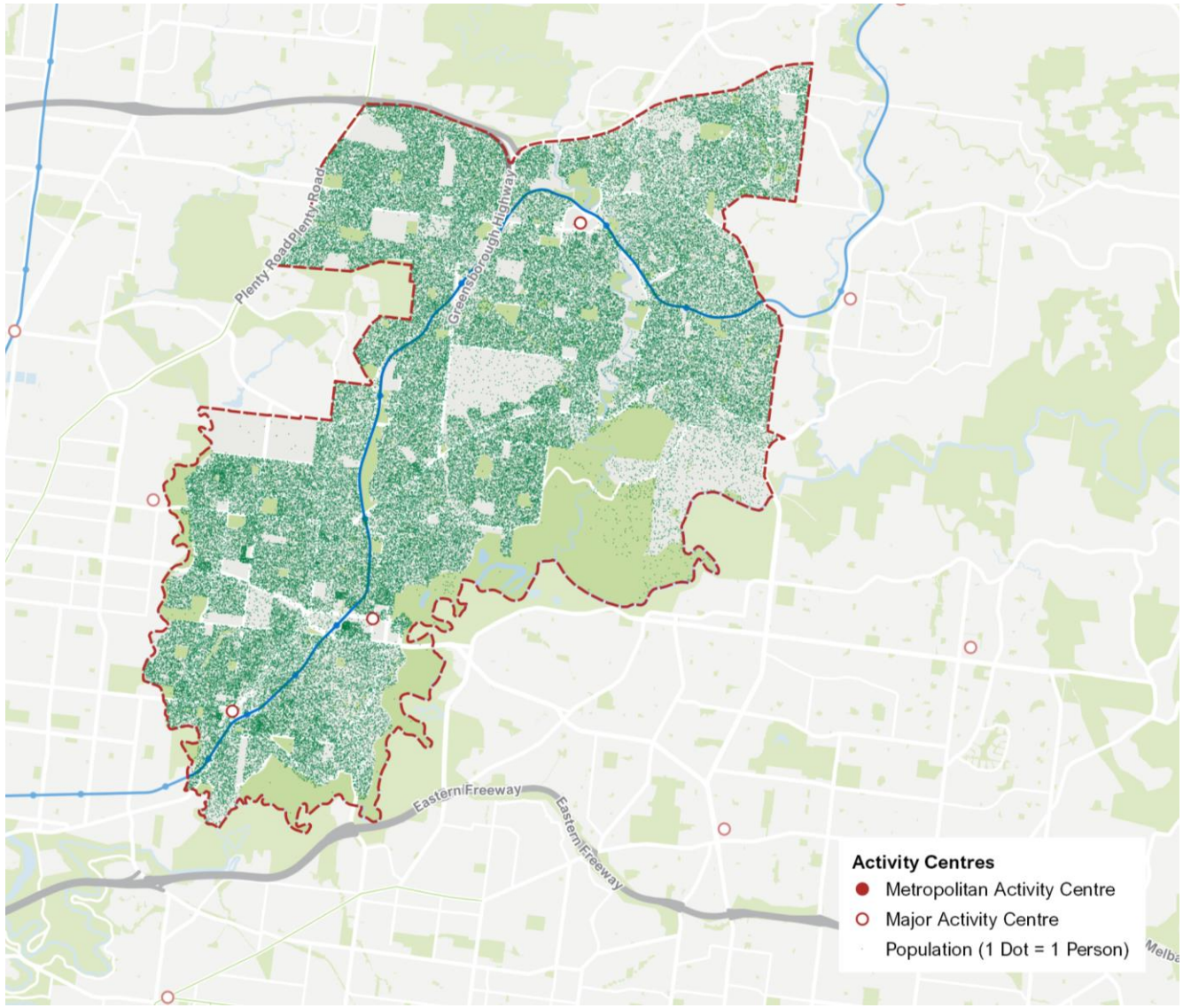
Jobs are heavily concentrated around the activity centres of Heidelberg and Greensborough, as well as in the Heidelberg West industrial precinct, with jobs relatively sparse elsewhere due to the predominance of residential land uses.



Travel Behaviours and Demographics
ABS Census 2016 – Population Density (MB)

The total population of Banyule was 121,865 in the Census population data in 2016, living in 50,223 dwellings with an average household size of 2.54.

Population densities are relatively even across the built-up areas in Banyule, except for higher densities observed near Heidelberg and Ivanhoe, and low densities in the Lower Plenty rural-residential area and at the Simpson Barracks.



Travel Behaviours and Demographics
Summary of Findings

The demographic patterns of Banyule reveal a user profile that deviates slightly from the baseline of Metropolitan Melbourne and also varies between its northern and southern halves of the LGA

Mode Shares for Trips to Work

While private vehicle trips remain the predominant mode in Banyule (75%), public transport and active transport trips are higher in the southern portion of the LGA compared to the northern portion (30% vs 20%).

For comparison, Metropolitan Melbourne's mode share for private vehicle trips to work is also 75%, with 19% being achieved by public transport. This puts Banyule in a comparable range with the broader metropolitan area.

Intra-LGA Trips

Trips within Banyule show a significant variation between various segments of the rail corridor.

Private vehicle trips are concentrated towards the Heidelberg and Greensborough Activity Centres. Opportunity exists to encourage active travel trips between these areas along the rail corridor.

Public transport trips on the other hand are centred around the Heidelberg Activity Centre as a result of Heidelberg Station being the confluence of multiple bus routes. Opportunity exists to use active transport to facilitate last mile journeys from points of access to public transport.

Active travel trips are concentrated within the southern portion of the LGA with a strong east-west movement between Heidelberg West and Heidelberg. The opportunity for these trips is to increase mode share through better cycling facilities.

Household Demographics

The household profile in Banyule is one of marginally higher car ownership (1.9) as compared to Metropolitan Melbourne's average (1.7) as well as one that is older (39 vs 36). Additionally, median incomes of people who take alternative modes of transport have double the median income in Banyule.

The overall profile of Banyule indicates a user profile that has an interest in cycling, but may require more attention in providing safe and convenient access where possible.

Population and Employment

Population density across the LGA is largely even throughout with some higher density areas adjacent to railway stations. On the other hand, employment is concentrated to the Greensborough and Heidelberg Activity Centres, and the West Heidelberg Business Park directly south of La Trobe University.

Given this, it is important to consider providing an appropriate east-west connection between the railway corridor and the university.

Part Five
Issues and Opportunities

Baseline Conditions

Darebin Station to Ivanhoe Station

Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

- **A** Level difference along Darebin Creek and trail
- **B** Existing non-DDA compliant stair access to station
- **C** Heidelberg Road is very busy with no cycle lanes south of Lower Heidelberg Road
- **D** While there is space here for a potential SUP, there is an elevation difference between Quest service road and Upper Heidelberg Road
- **E** Difficult to cross/turn across Lower Heidelberg Road

Opportunities

- **1** A new crossing of Darebin Creek would connect to the Darebin Creek Trail and the new SUP north of the railway line at Alphington
- **2** Existing creek crossing and connection to Darebin Creek trails
- **3** Space between railway corridor and property boundary is potentially wide enough for a SUP
- **4** Existing playground connection
- **5** Existing underpass with long ramp on western side could be reconfigured to be more accessible for cycling
- **6** Salisbury Avenue is quiet with some existing traffic calming measures
- **7** Proposed public square as part of Ivanhoe Structure Plan
- **8** Verge is wide enough along Salisbury Avenue to widen to SUP
- **9** Existing vegetation frames view of rail and heritage bridge, enhancing gateway to commercial area
- **10** There is potentially space between the Quest Hotel and the railway for a SUP
- **11** Landscape character is enhanced by existing trees
- **12** Space could be reallocated from station parking for new route
- **13** Car park access road connects entire length between Marshall Street and Waterdale Road
- **14** Cycle parking required outside of Ivanhoe Station
- **15** Proposed boulevard treatment as part of Ivanhoe Structure Plan

Baseline Conditions

Ivanhoe Station to Eaglemont Station

Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

F Cars travel at high speeds along Norman Stree so traffic calming and reduction would be required for a quietway-style route

G Marshall Street / Maltravers Road / Station access intersection is awkward and unsafe to cross as a cyclist (note improvements here are currently being advocated for by council)

Opportunities

16 The corner of Marshall Street and the rail corridor could be a potential open space

17 The Kitchener Reserve has the potential to be a public open space

18 Opportunity to connect to school

19 Verge on railway side of Sherwood Road has large mature trees and understory contributes to landscape character.

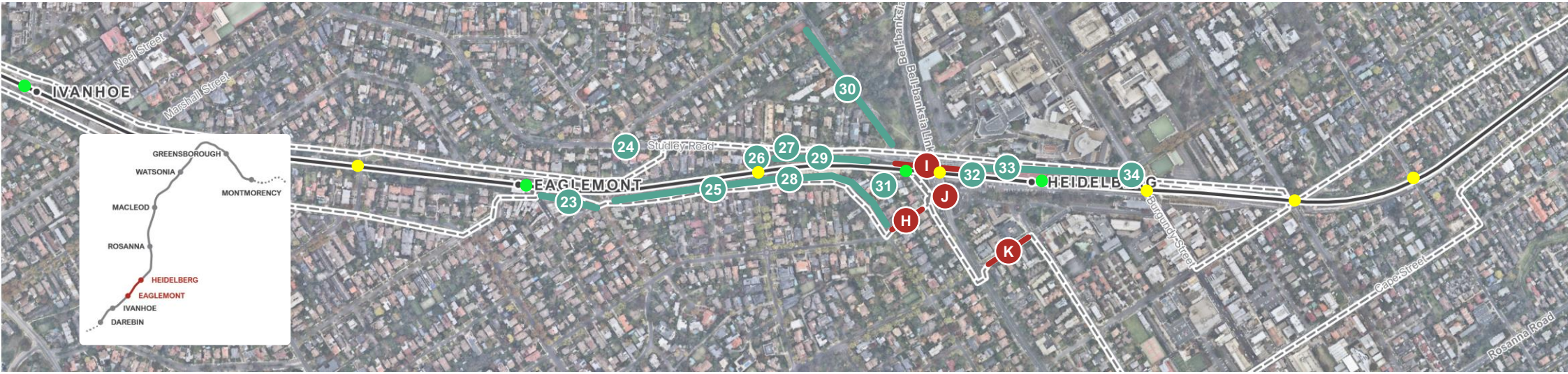
20 A quietway-style route would be feasible along Sherwood Road if through traffic was redirected to Upper Heidelberg Road and Studley Road

21 Quiet residential roads here are suitable for quietway-style route. However, this route is not very direct.

22 There is a wide verge along Sherwood Road beside the railway line

Baseline Conditions

Eaglemont Station to Heidelberg Station



Railway crossing (all) Railway crossing (walking/cycling only)

Issues

H Very steep connection

I The two consecutive left-turn lanes (one a slip lane) make for a hostile cycling environment at this intersection. Banksia Street could be filtered here to reduce conflicts. A bike box with a filter lane could also improve safety

J This is a challenging area to determine a suitable alignment due to differences in elevation and a busy road environment

K Mount Street has steep grades and unprotected cycle lanes. The transition to a signalised crossing of Banksia Street is awkward

Opportunities

23 Connection to station via car park access

24 Unprotected cycle lanes on Studley Road, which is around 10m wide. All properties have off-street parking

25 There is a wide verge along Alandale Road beside the railway line

26 There are plans to improve Odenwald Road bridge as there are no footpaths on the bridge

27 Heritage value and landscape character of rail bridge

28 Quiet residential streets are suitable for quietway treatment. Eastern end connects to Eaglemont Activity Centre and Station

29 Verge is wide enough for existing footpath to be widened to SUP standards

30 Opportunity to link with proposed PBN route west towards Austin Repatriation Hospital

31 Pedestrian bridge from previous Banksia Street alignment

32 Key gateway location in Heidelberg Structure Plan

33 Car parking and centre median hatching could be removed to facilitate widening of existing footpath to SUP standards

34 Key gateway location in Heidelberg Structure Plan

Baseline Conditions

Heidelberg Station to Rosanna Station

Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

L Burgundy Street is a busy shopping precinct however there is no cycle parking provision

M Stradbroke Avenue is very steep

N Cape Street is busier than adjacent parallel streets but is also less steep

O Hawdon Street has steep road grades

P Beetham Parade is a busy shopping precinct with significant traffic access to the railway station as well

Q Transition from Beetham Parade to SUP on Ellesmere Parade is awkward and indirect

Opportunities

35 Existing mature trees enhance character

36 Yarra Street is a local cycle route from station to Main Yarra Trail

37 Open space is planned here as part of the Burgundy and Powlett Street Reserves

38 Path along railway is less steep than other parallel routes. Transition to road requires changes

39 Existing mature trees enhance character

40 Heidelberg heritage and viewlines to surrounding areas at top of hill

41 Maintenance tracks between railway cutting and houses

42 Verge between houses and railway cutting

43 Verge continues north to Rosanna Station

44 Manton Street is a quiet residential area but is not as direct as other options

45 Options and funding exist for a SUP on the western side of the railway, however this relies on rail infrastructure being relocated

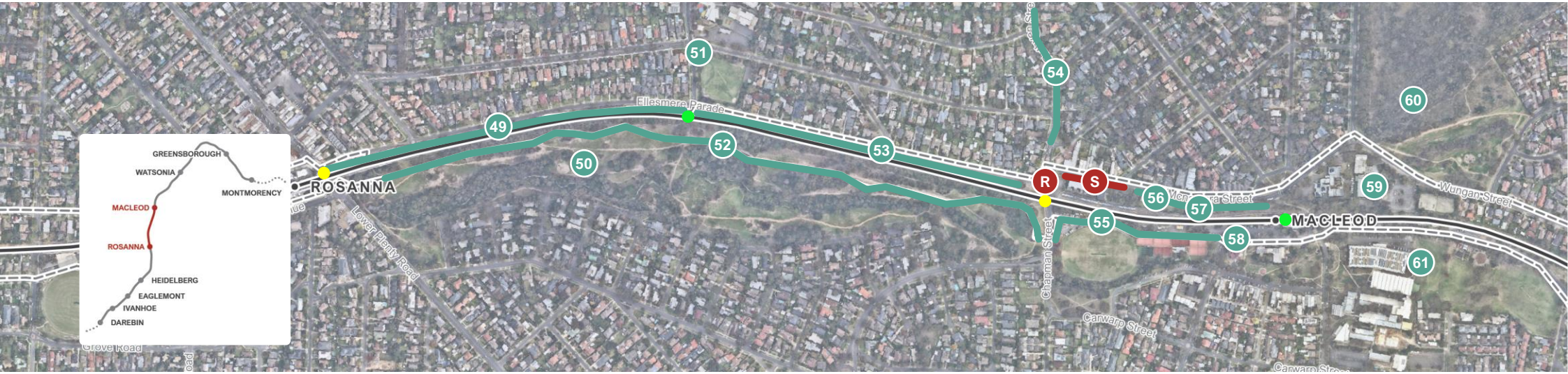
46 Routing via the footpath by the tennis club and De Winton Park is more direct than local roads

47 Potential to cross under station to join path on the eastern side of the railway

48 SUP from the Lower Plenty Road level crossing removal is on the eastern side of the railway corridor. Transitions to on-road section south of the station

Baseline Conditions

Rosanna Station to Macleod Station



Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

R Visibility of westbound traffic is hindered by level crossing, making it difficult to traverse this dog leg. A crossing will be built here as part of the SUP extension

S Some space constraints outside the new townhouse development and on-street car parking – a shared path will be delivered along here

Opportunities

49 Existing high-quality SUP along Ellesmere Parade that finishes at Davies Street and will be extended to Macleod Station

50 Opportunity to connect to Rosanna parklands and playground

51 Opportunity to connect to Rosanna Primary School

52 Unpaved path through Rosanna Parklands makes for a safe, direct and attractive route through a highly valued green space

53 Proposed extension of shared path from Davies Street to Macleod Station

54 Opportunity for active transport linkage to connect to SUP on Kingsbury Drive further west to La Trobe Uni via Ruthven Street.

55 Off-road path through Macleod Park at football club could be modified to accommodate cyclists

56 Desire lines indicate verge is well used as a path with enough space for a SUP and this is being delivered as part of the SUP extension

57 Large mature eucalypts are attractive and provide shade

58 Key community facilities along Birdwood Avenue

59 Key activity point at Macleod Recreation and Fitness Centre

60 Opportunity to enhance path links to Harry Pottage Reserve and Cherry Street Grassland Reserve

61 Opportunity for Macleod Community Garden and rail corridor 'beautification' collaboration

Baseline Conditions

Macleod Station to Watsonia Station

Issues

T Wungan Street has unprotected cycle lanes and higher traffic volumes and speeds compared to other parallel streets

U Existing at-grade walking and cycling crossing has poor visibility with no safety gates or alarms

V Devonshire Road has no cycle lanes and constant traffic at higher speeds

W Busy and wide section of road

X Road through/near Watsonia is challenging because of severance caused by railway cutting, railway parking, Greensborough Highway and future North East Link

Y Elder Street / Greensborough Highway intersection is busy and awkward to cross when cycling. It could be better integrated with existing paths along old Greensborough Road alignment and transmission line corridor

Opportunities

62 Joynt Street is the main cycling and walking route to La Trobe University

63 Somers Avenue is a low traffic street

64 Existing walking and cycling underpass could be linked to the network better

65 There is potentially enough space between the railway corridor and houses for a SUP

66 Opportunity to improve street tree character with infill trees and native plantings along Somers Avenue

67 Quiet residential streets are suitable for quietway treatment. Reasonably direct and legible route

68 Wattle Drive is unpaved and continues to Gresswell Forest Reserve

69 Vegetation along Devonshire Rd is approximately 10m wide. If loss of vegetation is acceptable, there is space for a SUP on the southeastern side

70 Simplify Watsonia Road / Devonshire Road intersection

Busy high street with on-street parking. Making parking parallel instead of 90° would make cycling safer

Baseline Conditions

Watsonia Station to Kalparrin Gardens

Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

- **Z** Dennet Street / Greensborough Highway interface is a low timber fence
- **AA** Lack of lighting and passive surveillance
- **AB** Grimshaw Street is a very busy street and is difficult to cross without signals
- **AC** Pedestrian overpass has stairs only and is inaccessible to cyclists
- **AD** Crossing Grimshaw Street is not safe or attractive away from signalised crossings
- **AE** Awkward transition from Kempston Street to Kalparrin Gardens SUP. Blind corner around Kempston Street and fast-moving traffic

Opportunities

- **71** Opportunity for green link between Gresswell forest and Plenty River in powerline easement.
- **72** Off Map – Proposal to simplify Watsonia Road / Devonshire Road intersection
- **73** Old Greensborough Road is now a low traffic road with signed cycle route and sections of walking and cycling only
- **74** Opportunity for improved landscape character with new street planting
- **75** Quiet residential streets
- **76** Nell Street will have cycle lanes as part of North East Link
- **77** Proposed community hub site
- **78** Existing informal path behind school and reserve could be converted to a SUP
- **79** Many changes have been proposed as part of North East Link, including a grade separated intersection at Grimshaw Street
- **80** Quiet residential streets
- **81** Hailes Street and William Street are relatively quiet with some inclines and a pedestrian bridge over rail line
- **82** Existing high-quality SUP through Kalparrin Gardens
- **83** Coordinate future proposals with Kalparrin Gardens masterplan including formalised rail crossing at Jessop Street and access to skate park
- **84** There is potentially enough space to continue the SUP alongside the footpath on the southern side of Yando Street

Baseline Conditions
Kalparrin Gardens to Greensborough Station

Railway crossing (all)

Railway crossing (walking/cycling only)

Issues

AF Off Map – Henry Street has some steep sections with no cycle lanes

AG Off Map – Approximately 40m of cycle lanes along Henry Street south of Vermont Parade

AH Intersection of Grimshaw Street / Henry Street is wide and busy. Not attractive or safe for walking or cycling

AI Connection to the Plenty River Trail could be improved around stadium

AJ Grimshaw Street / Main Street could be improved for cycling by directing traffic to use The Circuit. Given the availability of off-street parking, on-street parking could be reduced as well

Opportunities

85 The LBN 12 cycling route connects to Greensborough Major Activity Centre using quiet residential streets

86 Footpath along The Circuit could be widened to be a SUP that connects to the north side of the rail line via underpass

87 Connection to Plenty River Trail and Greensborough Station

88 Opportunity to enhance key connections to Poulter Reserve path network, playground and oval picnic shelters from Poulter Street

89 Steep embankment on north side of rail corridor along Poulter Avenue an opportunity for indigenous infill planting and biodiversity corridor

Baseline Conditions

Greensborough Station to Montmorency Station

Issues

AK Trail continues to Montmorency Station but is indirect

AL Residential roads are quiet but very steep and indirect

AM Steep embankments to Plenty River

AN Off Map – Nell Street is direct but hilly. Cycle lanes are proposed as part of North East Link

AO Off Map – Steep climb along athletic club driveway

AP Stairs to Nell Street

AQ Minimal lighting and passive surveillance

AR Plenty River Trail is an alternative to Para Road but is indirect

AS Transition to Plenty River Trail is via an industrial road and a narrow, steep footpath

AT Para Road is very busy and has high vehicle speeds. There is also a steep incline with unprotected cycle lanes. This makes it difficult to cross from Station Road

AU Sherbourne Road is very busy and difficult to cross without signals or some form of priority

AV Access to Montmorency Station could be improved with more accessible entrance, wider path across railway and signage

AW Binns Street is quite steep towards the station

AX Crossing Mountain View bridge and road may be a challenge due to narrow cutting and level difference

Opportunities

90 There is potentially a space for a walking and cycling bridge to the north of the rail bridge to connect to existing underpass on Plenty River Trail

91 Railway Road is a quiet residential street. There is potentially space for a SUP along the verge

92 Mature trees along streets provide significant habitat value and landscape character

93 Quiet residential streets to Montmorency Station

94 Binns Street and Station Road proposed as route

95 SUP along south side of the railway corridor proposed as part of Hurstbridge Rail Duplication Project (Stage 2)

96 Key connection to Petrie Park

Part Six
User Needs and Facilities

User Needs and Facilities
Facility Considerations for Pedestrians

As many of Banyule's Activity Centres are clustered around the rail corridor, walking as a means of last-mile journeys and complete journeys is critical. Improving the walking experience for pedestrians forms another aspect of increased connectivity for the network in Banyule. As part of this project, pedestrian facilities should:

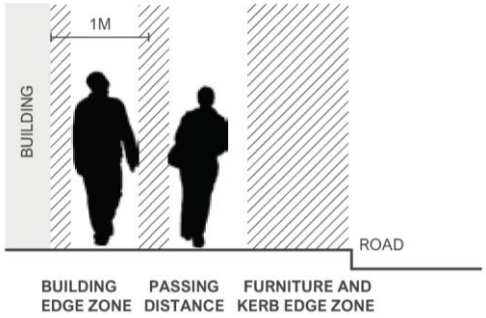
- Make walking quick, convenient and easy, increasing connectivity and reducing delays
- Connect key links to develop a complete network
- Provide an attractive experience to make walking inviting and interesting
- Consider pedestrian and personal security in order to facilitate a safe and comfortable environment
- Be legible for pedestrians through wayfinding

This section sets out broad level design directives and criteria for the development of the walking facilities.

User Needs and Facilities

Facility Considerations for Pedestrians

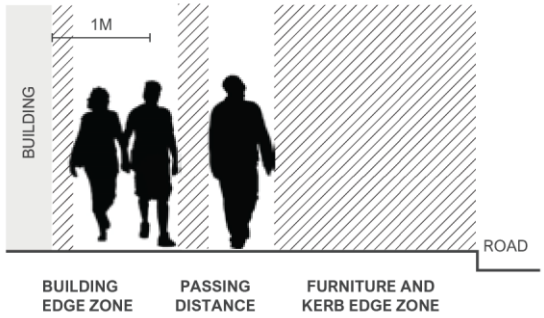
Low Flow (<600pph)



Transport for London's Pedestrian Comfort Guide recommends a series of different scales of footpath widths. These examples consider the role of paths as not only a link to move through, but also as a place to dwell in. For that reason, the configurations presented here show a larger than expected profile to provide opportunities for place-making.

In low traffic volumes areas, the minimum for footpaths for solely pedestrians is 2.9m including ancillary uses. This is enough for space to be comfortable for both movement and a street furniture such as a guard rail, cycle parking, a bus stop or a busy pedestrian crossing. In other areas where ancillary uses are largely not required, footpaths can be 2m wide such that two pedestrians can cross easily.

Active Flow (600 - 1,200pph)



For a higher flow of pedestrians, this increases to 4.2m. In this configuration there is enough space for people to move through comfortably as well as for street furniture that facilitates dwelling. In other areas where ancillary uses and places to dwell are not required, footpaths can be 2.2m wide.

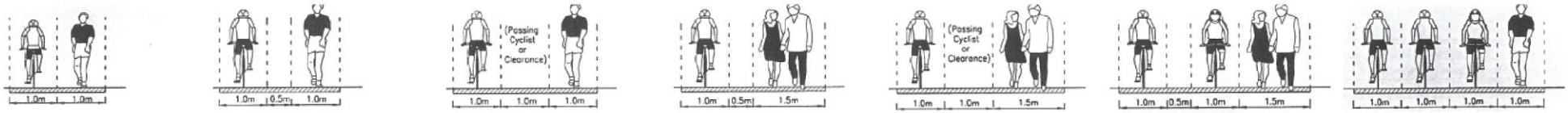
In the busiest of precincts or street, the minimum recommended width for a footpath is 5.3m. In this instance, it is intended that the footpath can handle both high levels of pedestrian movement alongside places where dwelling would occur such as pedestrian crossings, bus stops and seating areas. In other areas where ancillary uses and places to dwell are not required, footpaths can be 3.3m wide.

High Flow (>1,200pph)

The key takeaway from this research is that the effective width of paths is less than what is physically present for a range of factors. Walking paths in the study area should consider the land uses interfacing with the corridor and provide a range of configurations as needed.

User Needs and Facilities

Facility Considerations for Pedestrians (Shared Paths)



A shared path is designed for walking and cycling and is commonly used where space is not available to support each mode separately. Its configuration can vary depending on the location, surrounds and proximity to attractors. A shared path can take on multiple functions (e.g. recreation, commuting and local access) and these functions should be considered when designing a shared path.

Recreation and Tourism

The primary use here is for travel to and from recreational facilities such as sporting grounds and parks. Alternatively, the primary role of a path here can be for recreational activity itself.

Commuting

In this instance, commuting between home and a user's place of work or study is the primary function.

Local Access

Travel to local attractors including retail high streets, recreational facilities (e.g. parks) and larger transport interchanges for last mile journeys.

Why this Matters

Movement patterns, trip purposes and land uses along the Hurstbridge Rail Corridor vary significantly. When combined with considerations from Transport for London's Pedestrian Comfort Guide, there are a range of responses and configurations that could be considered for different sections of the corridor (e.g. deciding between a dedicated cycleway vs a shared path, and the width of a path).

User Needs and Facilities
Facility Considerations for Cyclists

Given the severing nature of the rail corridor in its current configuration, there is an opportunity to increase the overall connectivity for active transport across the entire Banyule LGA. In this regard, the broad level design considerations that have been considered as part of this project are that the bicycle facilities should:

- Use best practices and leading innovations in bicycle facility design
- Be safe and enable users of all abilities to use them
- Provide competitive travel times compared to other potential routes in the area
- Be able to accommodate current and future bicycle volumes
- Connect with existing facilities and local trip generators/destinations
- Be intuitive to cyclists

This section sets out broad level design directives and criteria for the development of the bicycle facilities.

Facility Considerations for Cyclists

People can be categorised into four groups based on their level of comfort when cycling and their interest in or intent to cycle for transport.

Group 1 - Strong and Fearless

These users will cycle regardless of road conditions and are ready to mix with traffic.

Group 2 - Enthused and Confident

These users are already riding, but they could ride more and their riding experience could be better.

Group 3 - Interested but Concerned

These users are curious about cycling and like to ride but are put off by conditions where conflicts are more likely.

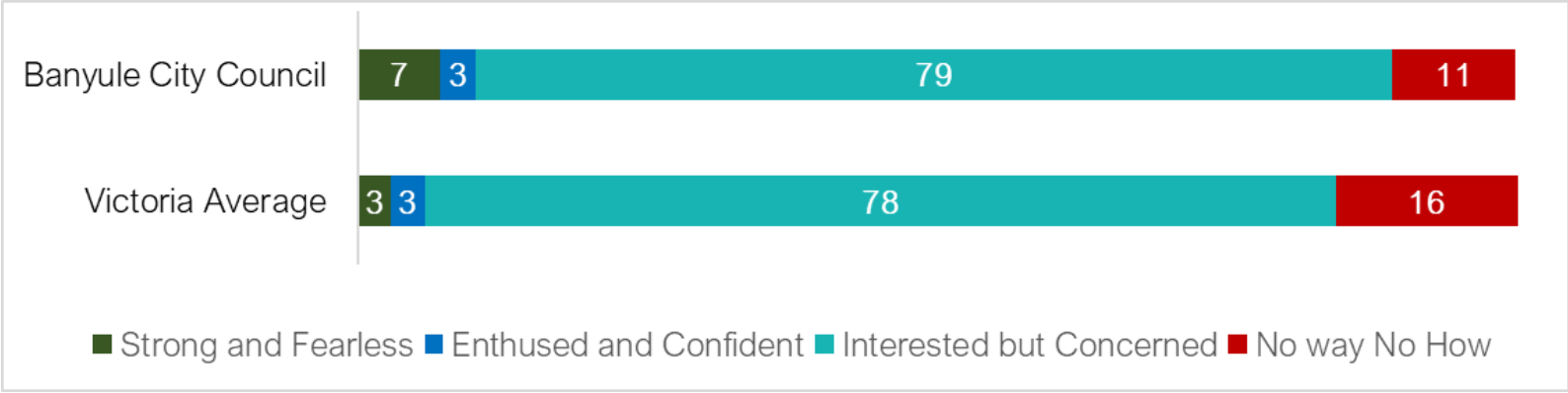
Group 4 - No way no how

This group of users consist of those who either cannot cycle, because of unsuitable terrain or they have no interest in cycling.

Why this Matters

Group 1 will cycle no matter the condition and need no persuasion. Group 4 is unlikely to cycle no matter the level of incentive provided. Groups 2 and 3 is where opportunity is greatest to enable more cycling.

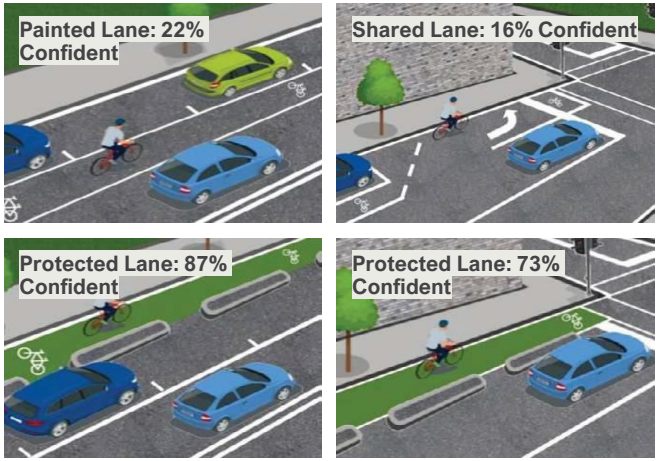
As part of a research project[1] in Victoria, residents were surveyed about their attitude and interest in cycling. The results of this survey are available by LGA. Around 82% of Banyule residents fall into Groups 2 and 3.



1. Pearson et al (2021) The potential for bike riding across entire cities: quantifying spatial variation in interest in bike riding. medRxi.v https://doi.org/10.1101/2021.03.14.21253340

Facility Considerations for Cyclists

Confidence at Different Treatments

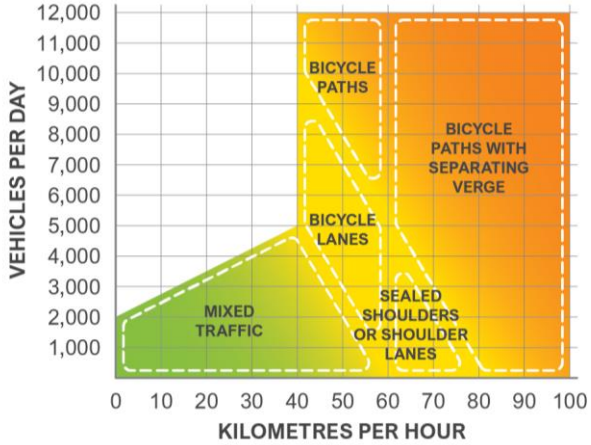


City of Melbourne research has shown that a significant number of people living within cycling distance of the CBD can ride bikes to work but choose not to – much like the "interested but concerned" group.

They are generally not confident that the existing infrastructure is safe. Many own or have access to a bicycle. The majority (77 %) consider themselves to be cautious riders, preferring off-road low-stress routes, and are willing to take a longer route to get to their destination. Only 8 per cent consider themselves to be confident riders.

Concern for safety is the most significant barrier preventing this group from cycling. The type of on-road cycling facilities on which they would feel confident are physically protected lanes.

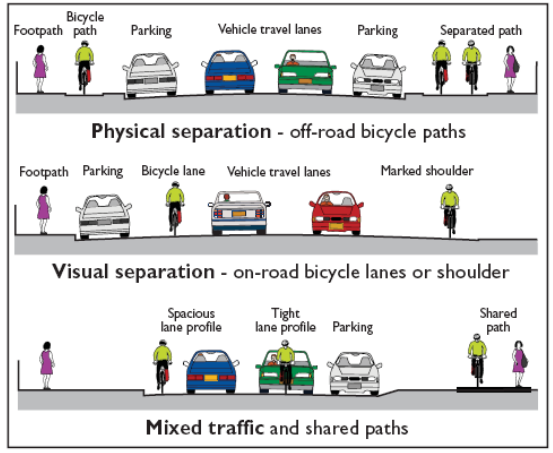
Minimum Levels of Separation



There are degrees of minimum separation recommended based on the volume and speed of traffic on urban roads. A shared road environment is considered appropriate in low traffic and low speed routes while full separation is necessary for the inverse.

This relationship between traffic volumes and traffic speed is considered appropriate for what is needed to support users who are "interested and concerned" or "enthused and confident". These users make up over 80% of all potential and current users in the Banyule LGA.

Methods of Separation



Physical separation: Paths, shared or exclusive-use, separated from the roadway.

Visual separation: Line marked space on roads, bicycle lanes or shoulders.

Mixed traffic: Riders share road lanes with motor vehicles. There are two categories of shared space:

- Spacious profile: with a consistently wide kerb lane to allow riders and drivers to share space according to the prevailing road speed.
- Tight profile: used in low-speed, low motor vehicle volume environments. In this case the lane width is restricted so that vehicles cannot pass riders.

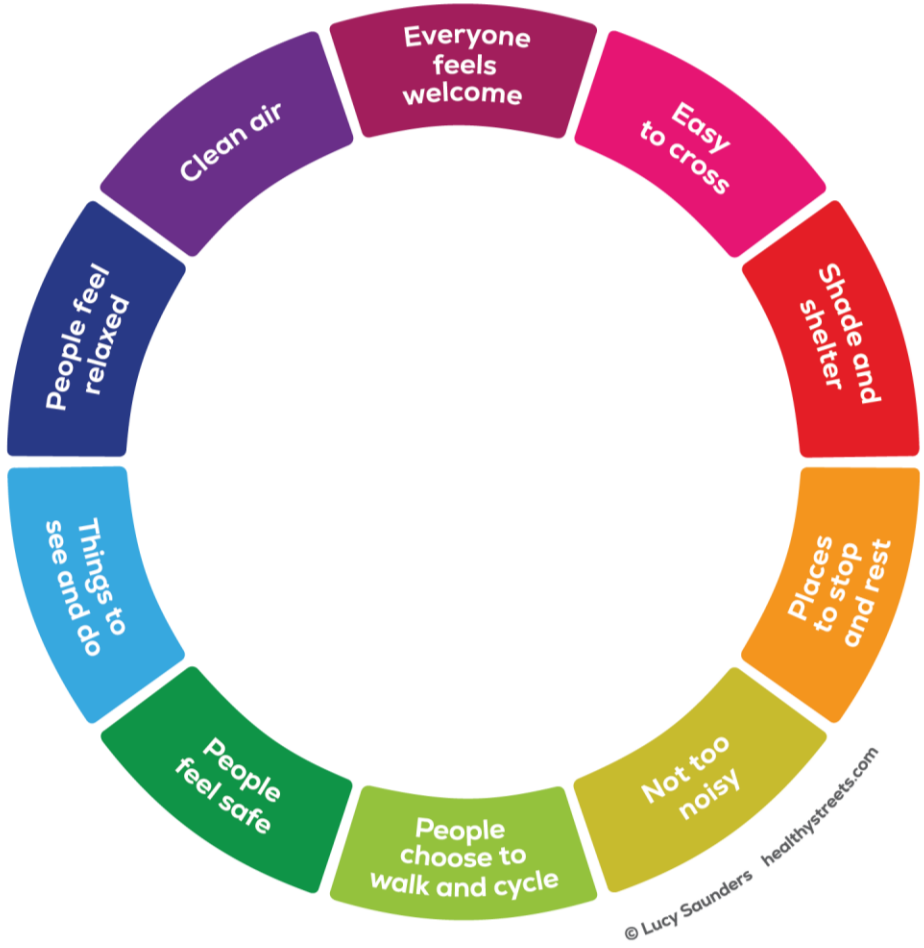
Facilities for Place Making – Healthy Streets

The Healthy Streets Framework was developed to facilitate a holistic approach to improving streets for people. The Healthy Streets Approach has been adopted by Greater London and other places where a similar outcome is sought.

There are several reasons why communities would like to make streets more welcoming and pleasant for walking and cycling. This can include climate change mitigation, place-making, encouraging alternative modes of transport, public health outcomes and more. The Framework offers a step-by-step guide to creating these environments.

The figure to the right highlights factors that make for an attractive environment for walking and cycling on our streets. Ultimately, these are urban design factors that are qualitative and most often the most tangible considerations for users .

In the context of Banyule and the rail corridor, the Healthy Streets Framework provides guidance on developing facilities and building amenity along the corridor to encourage walking and cycling as a choice mode for potential users in the community. This comes back to enticing the “interested but concerned” and ”enthused and confident” groups of cyclists into accessing the corridor.



Facilities for Place Making – Movement and Place: Urban Road and Street Design Guide (DoT)

Overview

The figure on the right illustrates the strategies to design streets that benefit current and future road users, as part of the Victorian Department of Transport's Urban Road and Street Design Guide (draft, 2020). These are relevant to the aspirations and outcomes sought for Banyule.

Movement

Roads and streets must move more people and reduce reliance on private vehicles. Enabling a variety of modes, increases accessibility and economic activity.

Place

Places can be enhanced by centering human-scaled experiences and emphasising inclusion, social interaction and personal and collective meaning.

Safety

Our roads and streets should be safe for all users. This strategy aligns with Towards Zero principles and emphasises safe speeds and safe roads.

Ecology

Streets can protect and enhance the natural environment by enabling sustainable transport, incorporating green infrastructure, and using recycled and low impact materials.

Health

Roads and streets can support the physical and mental health of all users by improving air quality, reducing physical inactivity, and enabling social interaction.

Why this Matters

Applying these strategies means incorporating green infrastructure into active travel routes, ensuring these routes connect to places people want to visit, ensuring safety for all users by separating modes where needed, and ensuring comfort for users by including places to dwell and essential facilities (e.g., benches, drinking fountains, public toilets).

Part Seven
Corridor Arrangements

Summary of Cycle Treatment Types

Quietway / mixed traffic street

- No physical infrastructure, just painted cycle lanes or sharrows
- Suitable for streets with speeds of 40km/h or less and with traffic volumes of less than 2000 motor vehicles per day
- Due to the lower speeds and motor traffic volumes, people cycling can safely and comfortably mix with motor traffic
- To ensure low speeds and motor vehicle volumes, these streets should include traffic calming and modal filters

Protected Cycle Lane

- Suitable for streets with speeds over 40km/h and with traffic volumes of more than 2000 motor vehicles per day
- Protection can be in the form of parked cars and/or kerbed buffers
- These can be built on a “pop up” or trial basis using flexible bollards and bolt-down kerbs

Shared Use Path (SUP)

- When well designed with adequate width, shared paths provide safe, direct and attractive routes for walking and cycling
- While separated facilities for walking and cycling should be provided where possible, in some cases space constraints mean that a shared path is the only solution
- For this study, shared paths have been defined as “on-road” (alongside a road by widening an existing footpath or building a new path) or “off-road” (separate from the road, e.g. through parkland or along the railway line)

Corridor Arrangements

Cycling Treatments - Quietway

A Quietway is a traffic calmed street with reduced access movements for motor vehicles. The slower speeds and lower volumes of motor vehicles means it is safe to cycle with motor traffic.

Access restrictions: turn bans or modal filters

Traffic calming: buildouts with cycle bypasses

Sharrows: show it's safe to 'take the lane'

Corridor Arrangements

Cycling Treatments - Midblock

Bus stop bypass

Two-way cycleway

Stepped cycleway

Modal filter

Contraflow cycle lane

Give way slow point under bridge for cars

Corridor Arrangements

Cycling Treatments – Intersections & Space Activation

Entrance only street

Raised intersection

Space activation

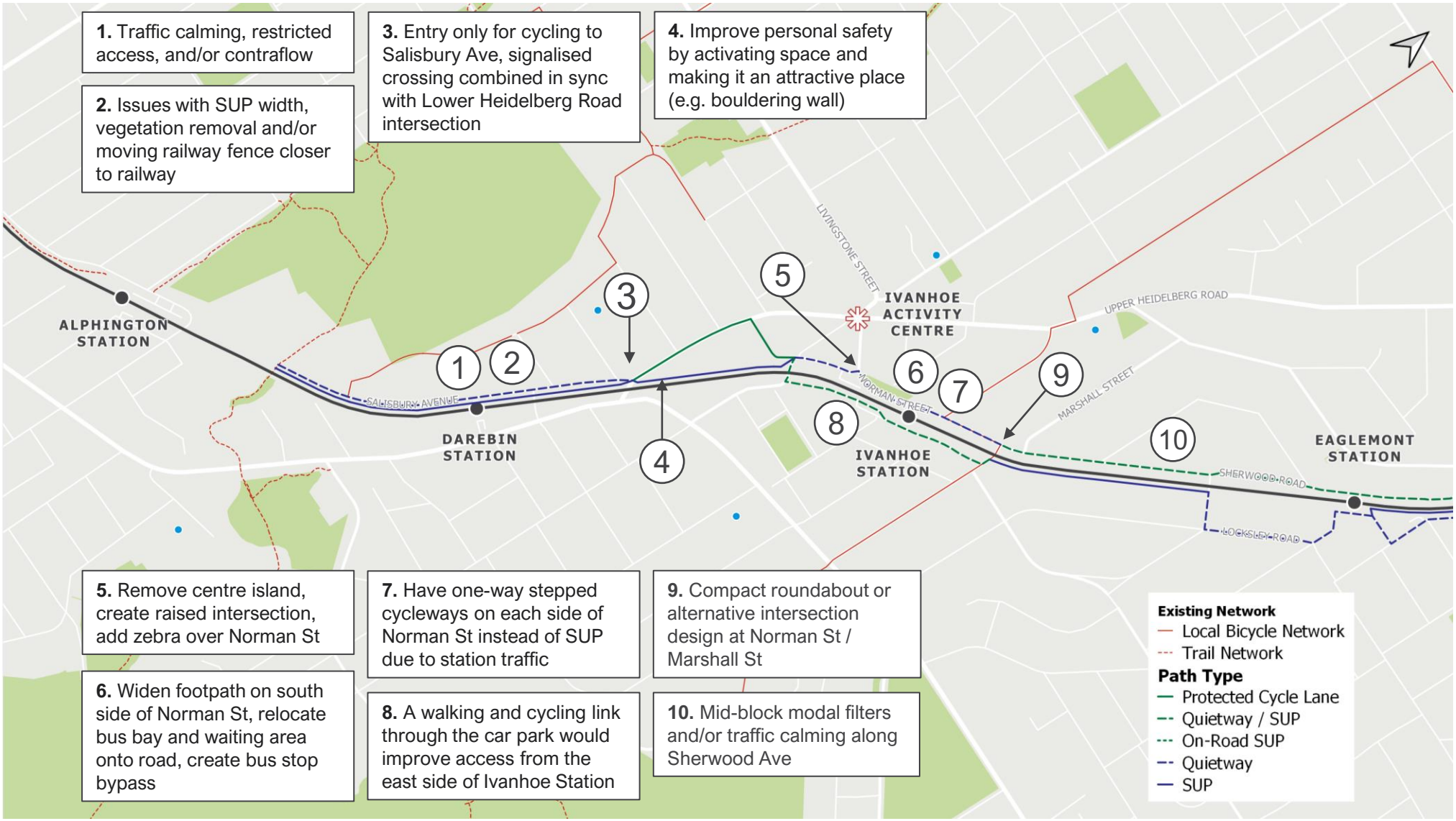
Diagonal filter

Left in, left out

Compact roundabout

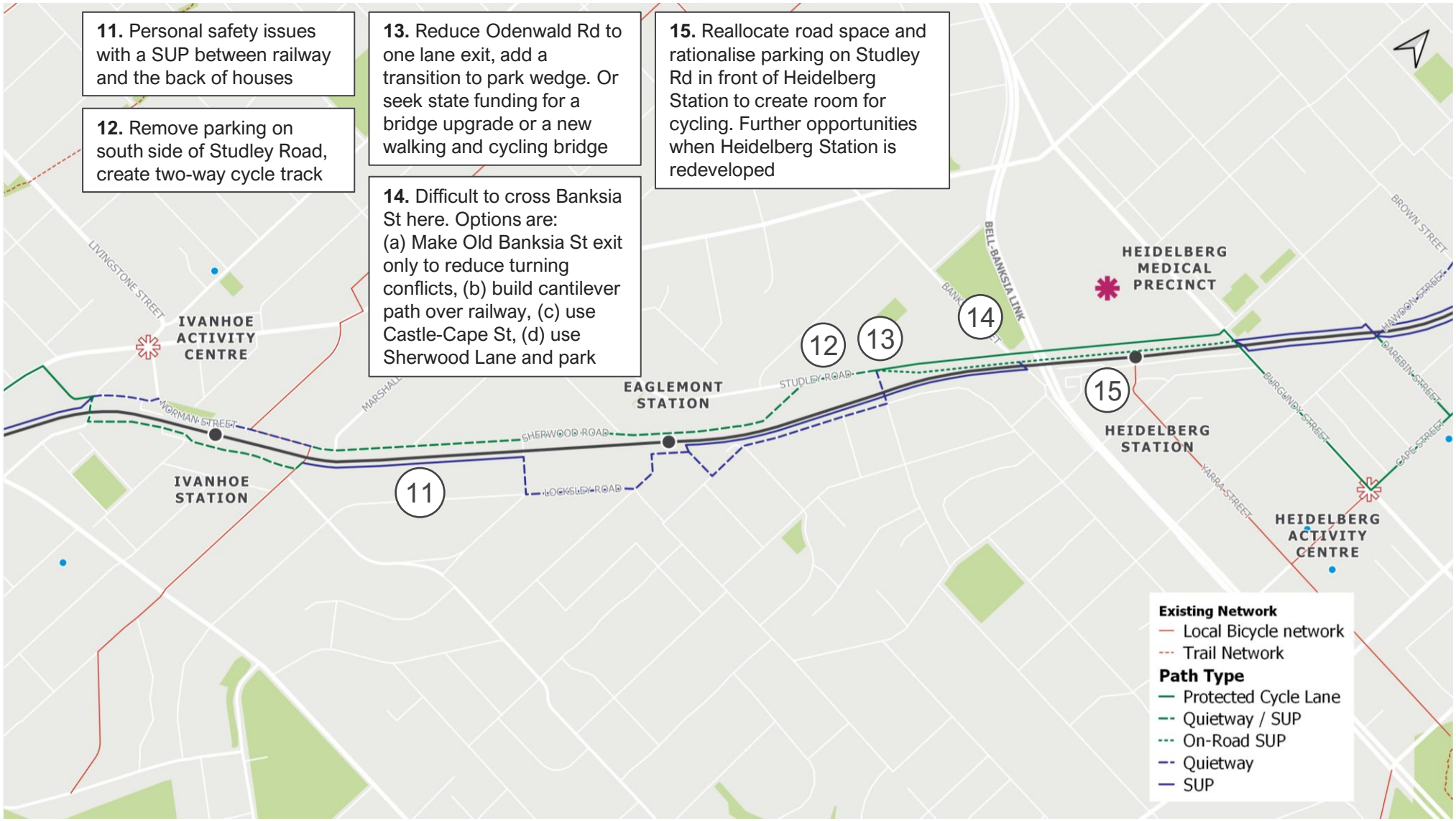
Corridor Arrangements

Darebin to Ivanhoe - Cycling Treatments



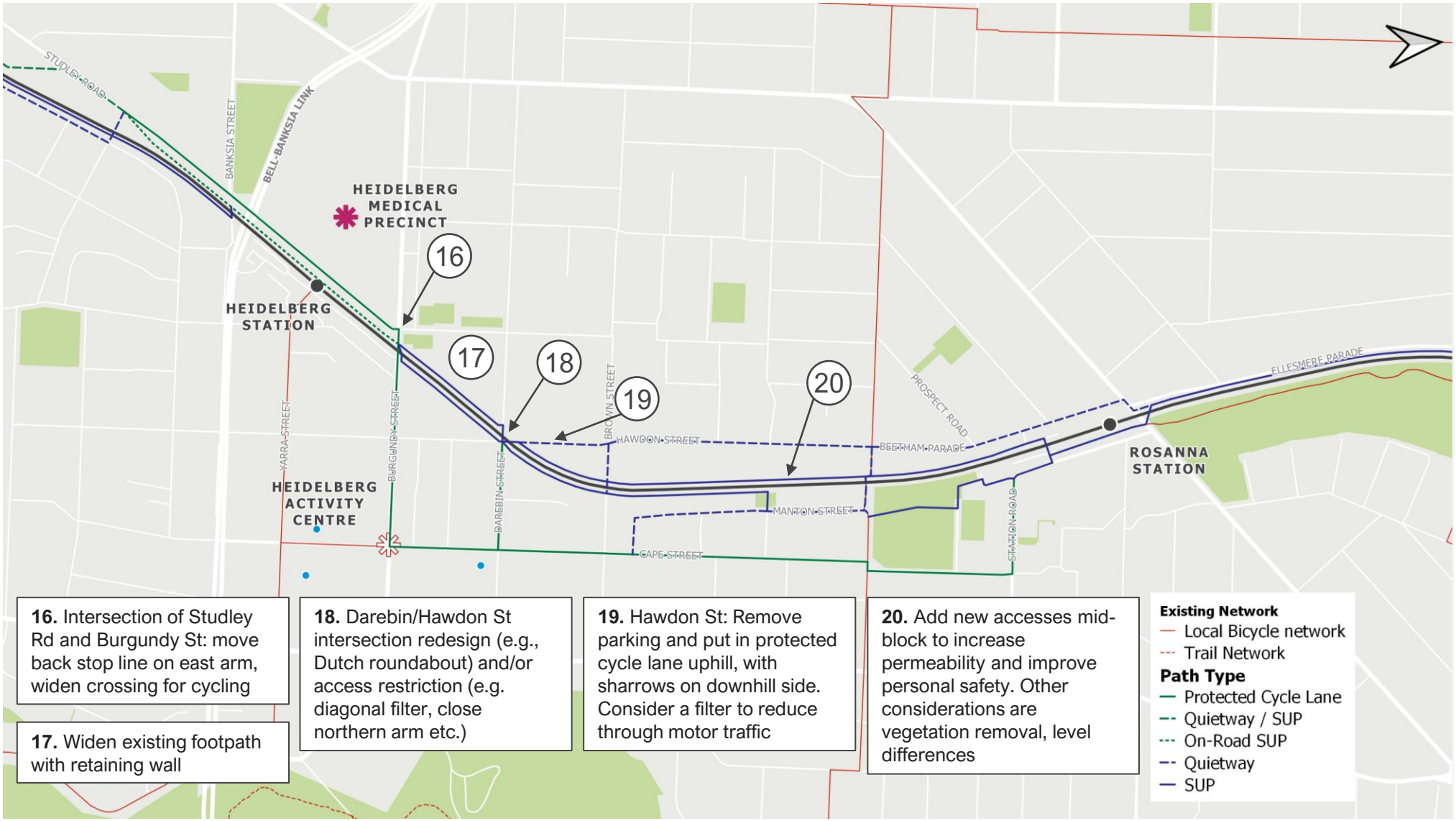
Corridor Arrangements

Ivanhoe to Heidelberg - Cycling Treatments



Corridor Arrangements

Heidelberg to Rosanna - Cycling Treatments



16. Intersection of Studley Rd and Burgundy St: move back stop line on east arm, widen crossing for cycling

17. Widen existing footpath with retaining wall

18. Darebin/Hawdon St intersection redesign (e.g., Dutch roundabout) and/or access restriction (e.g. diagonal filter, close northern arm etc.)

19. Hawdon St: Remove parking and put in protected cycle lane uphill, with sharrows on downhill side. Consider a filter to reduce through motor traffic

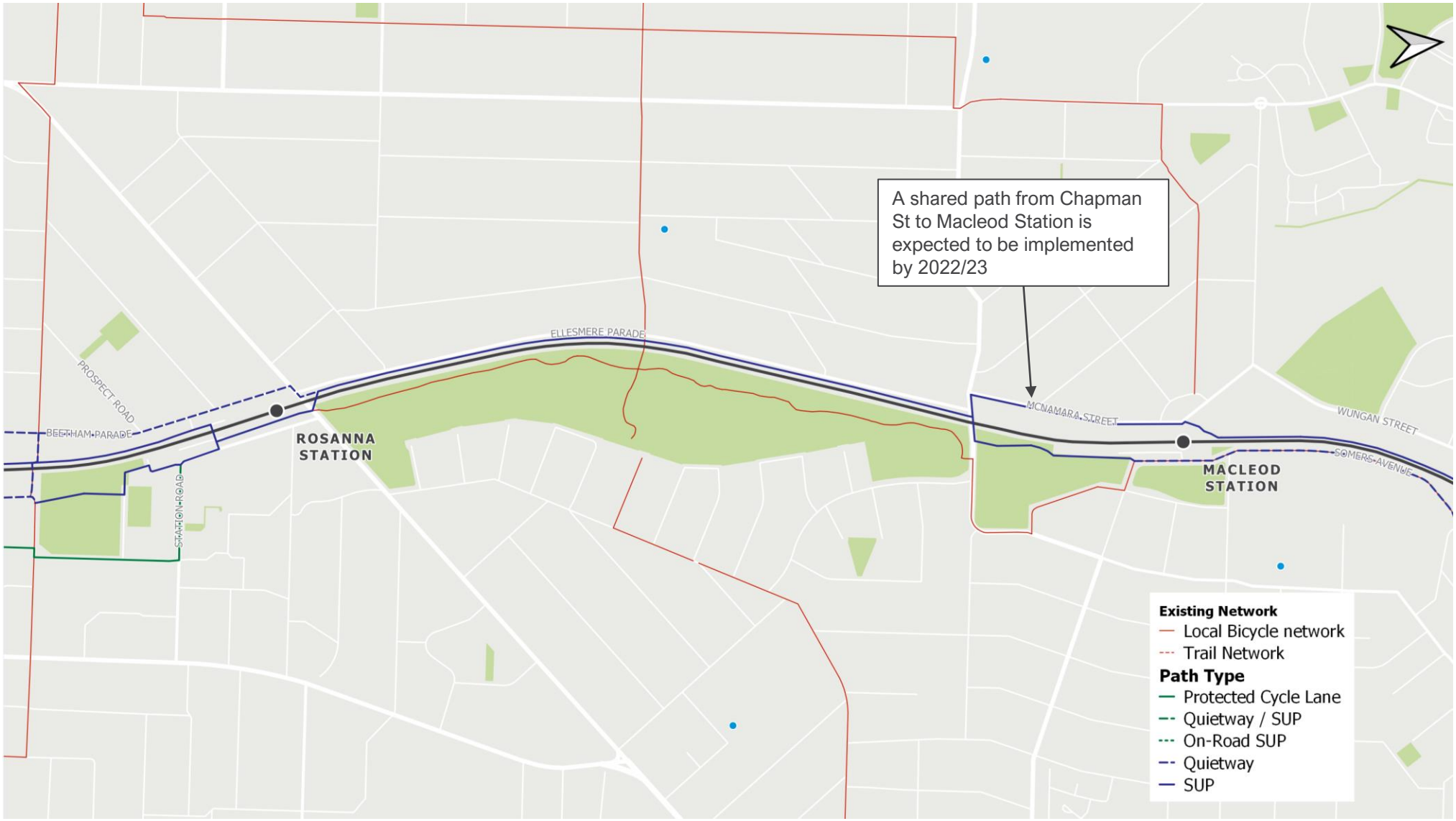
20. Add new accesses mid-block to increase permeability and improve personal safety. Other considerations are vegetation removal, level differences

Existing Network
- Local Bicycle network
- Trail Network

Path Type
- Protected Cycle Lane
- Quietway / SUP
- On-Road SUP
- Quietway
- SUP

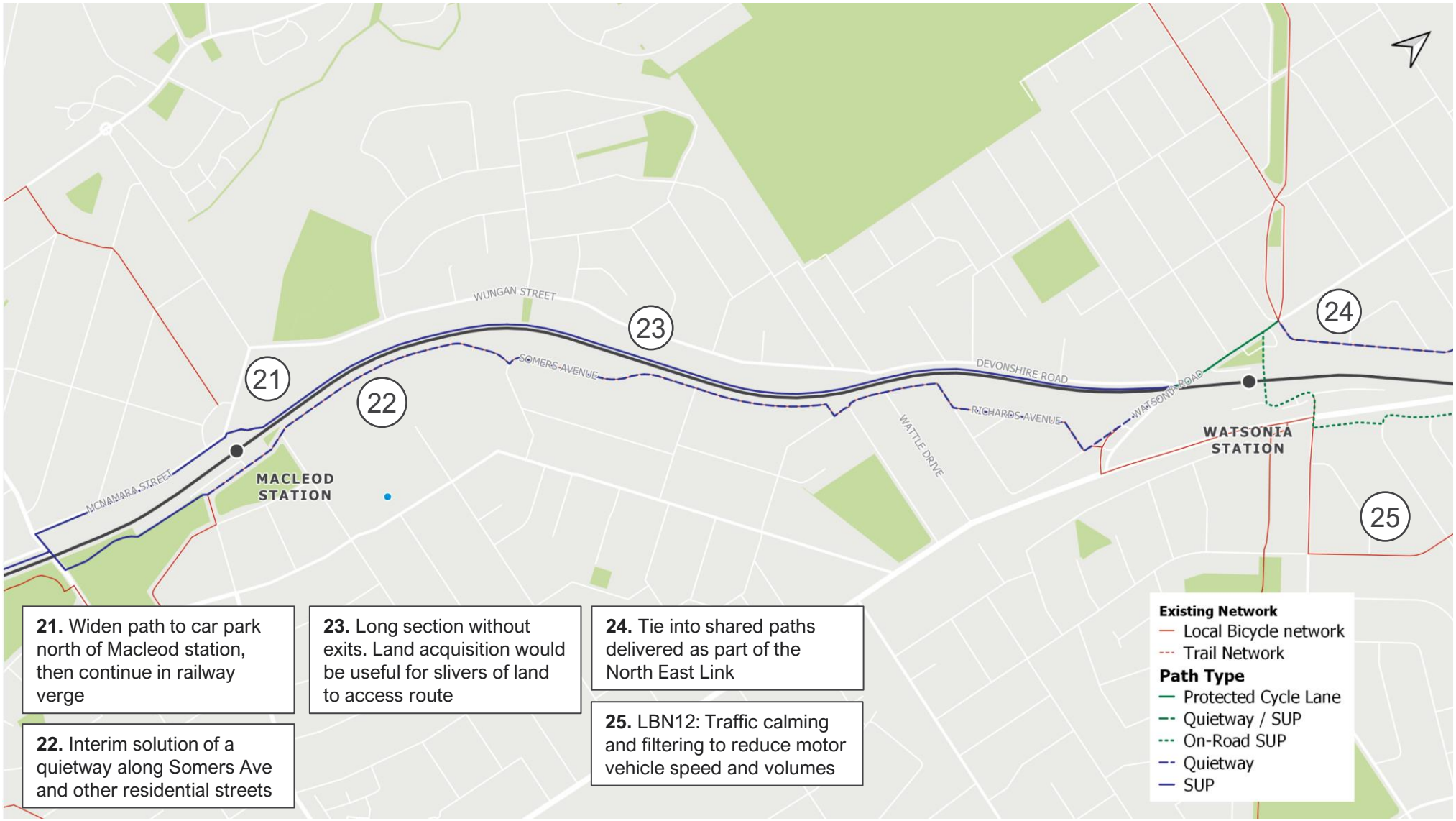
Corridor Arrangements

Rosanna to Macleod - Cycling Treatments



Corridor Arrangements

Macleod to Watsonia - Cycling Treatments



21. Widen path to car park north of Macleod station, then continue in railway verge

22. Interim solution of a quietway along Somers Ave and other residential streets

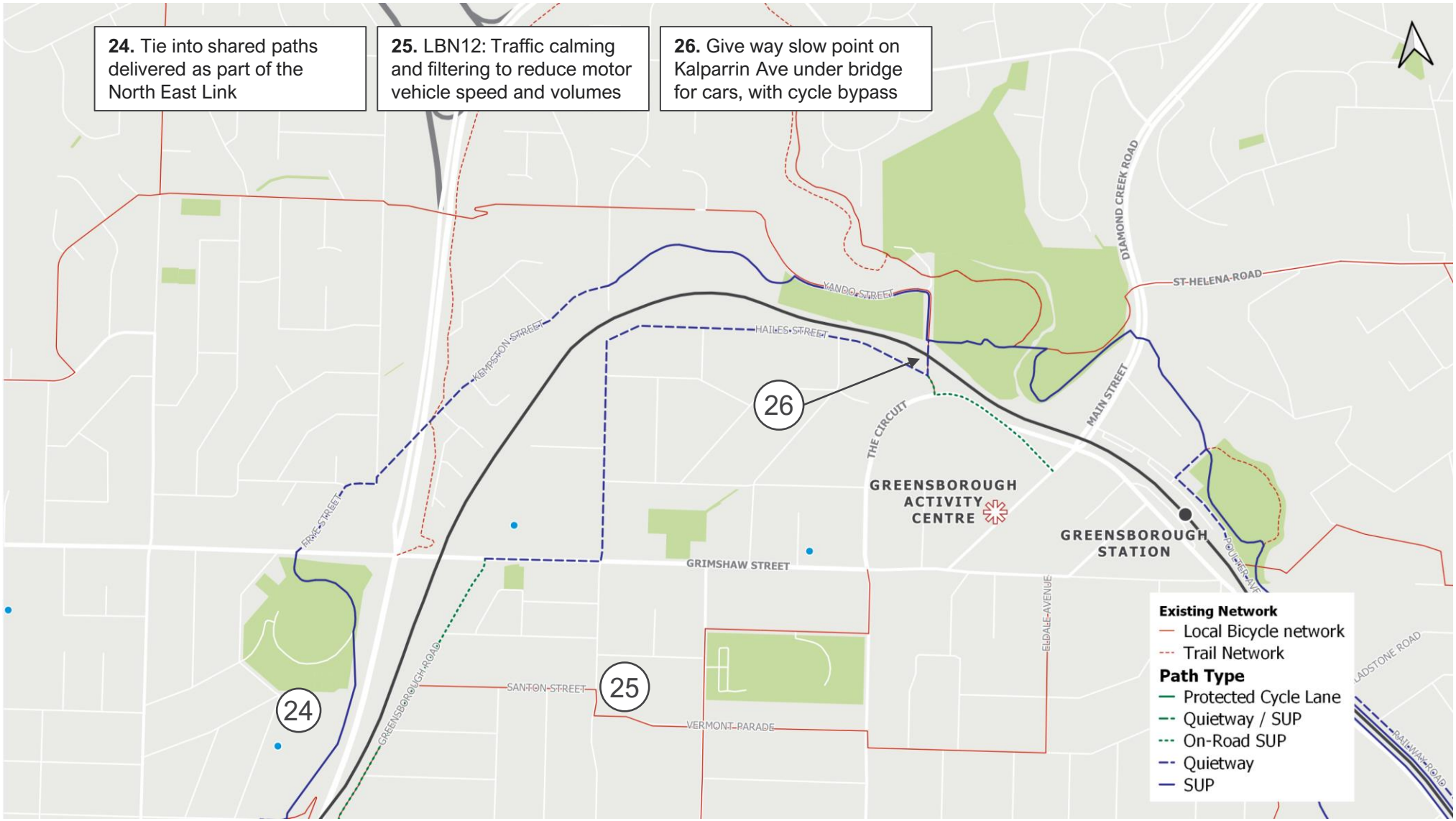
23. Long section without exits. Land acquisition would be useful for slivers of land to access route

24. Tie into shared paths delivered as part of the North East Link

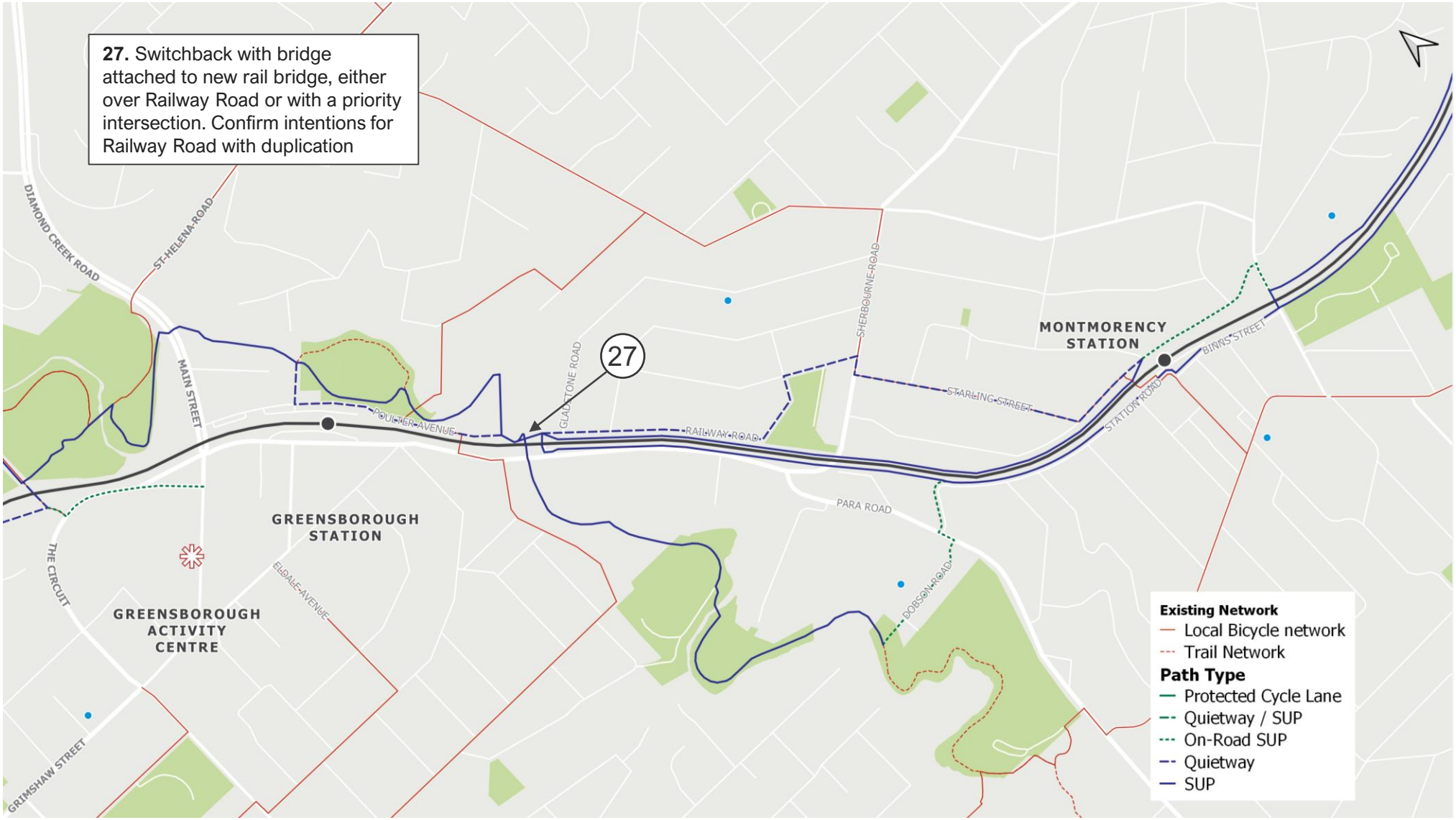
25. LBN12: Traffic calming and filtering to reduce motor vehicle speed and volumes

Corridor Arrangements

Watsonia to Kalparrin Gardens - Cycling Treatments

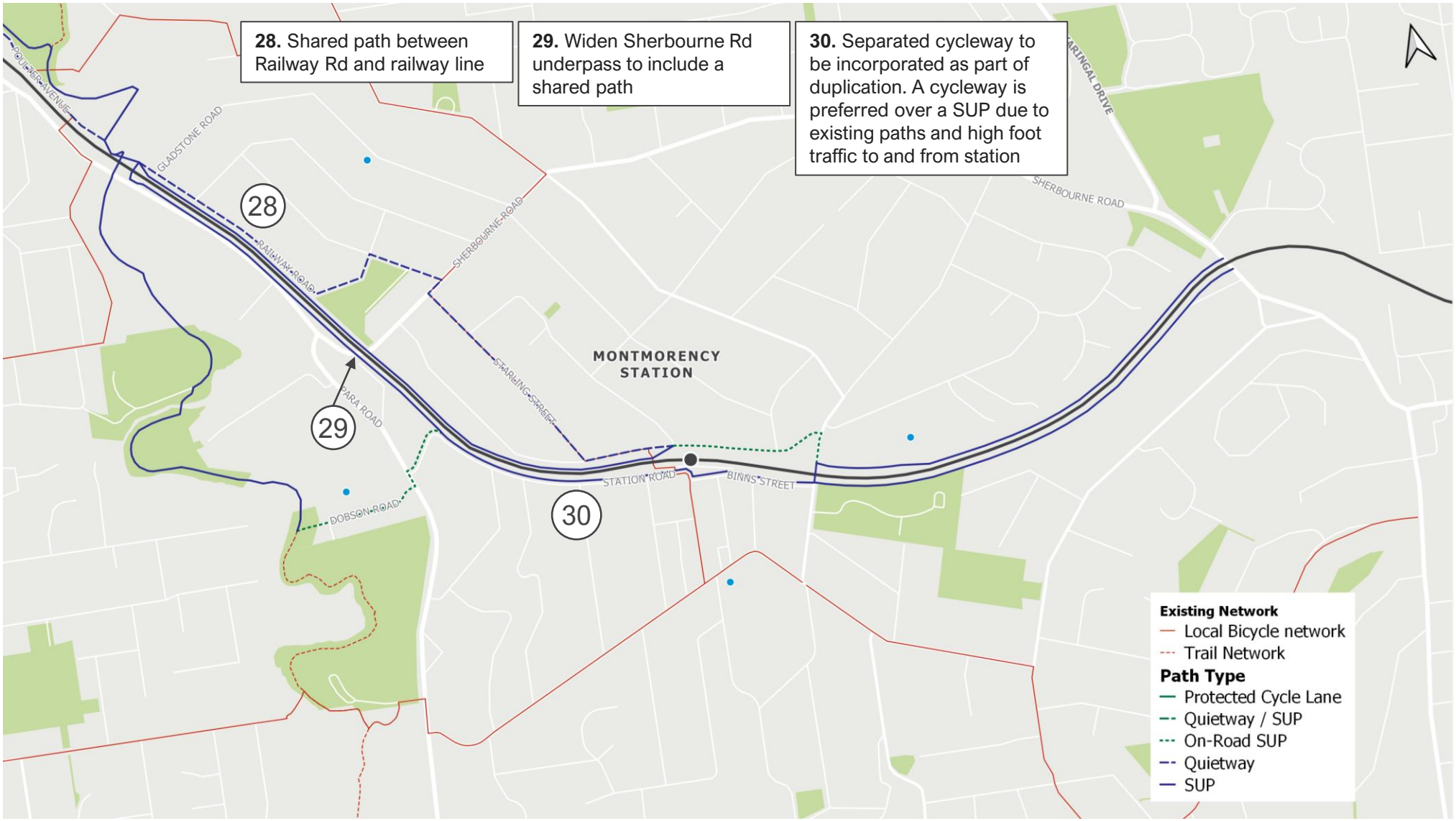


Kalparrin Gardens to Greensborough - Cycling Treatments



Corridor Arrangements

Greensborough to Montmorency - Cycling Treatments



Part Eight

Urban Design and Open Space

Urban Design and Open Space
Overview

As outlined in the *Banyule Public Open Space Plan 2016-2031*, Banyule is fortunate to have an extensive network of public open space, contributing to a local lifestyle, identity and character that is appreciated by communities.

The guiding principle of Council's open space strategy is community health and wellbeing, which recognizes the significant health benefits that proximity to natural environments provides.

The environment adjacent to the rail corridor and proposed cycle route presents an opportunity for enhancement and improvement through applying best practice open space and urban design principles.

Urban Design and Open Space
Approach

The proposed cycling corridor presents opportunities to make improvements to the urban environment.

Generally, each location or scenario would require a specific design approach. However, it is possible to summarize the various opportunities into key design principles.

The key design principles applied are:

- Ecology
- Amenity
- Safety

Water sensitive urban design applied along road verge

Urban Design and Open Space

Design Principle - Ecology

The principle of ecology encompasses the many aspects of landscape and open space design.

When thinking about the ways to implement ecological design in urban environments, various aspects are to be considered, such as water quality, air quality and soil health. This section will focus on:

- Biodiversity
- Habitat
- Aesthetics and visual improvement

The overriding design principles can be applied to design interventions ‘on the ground’ such as street tree planting, revegetation, perennial garden beds or community gardens.

Managing weeds around existing habitat trees improves their value.

Urban Design and Open Space

Strategies to implement Design Principle – Ecology

Biodiversity

Map and record native vegetation via arborist or ecological assessments. Rail corridors in Australia are particularly well-known as biodiversity hotspots, due to minimal landscape intervention and maintenance.

Retain and protect remnant vegetation – trees, bushes and groundcovers.

Plant a variety of species.

Habitat

Retain and protect mature trees which are habitat for native fauna.

Replace removed trees with locally indigenous species.

Plant insect and bird-attracting flowering species.

Leave logs on the ground for reptiles and invertebrates

Aesthetics and visual improvement

Retain and protect vegetation contributing to local character.

Plant street trees appropriate to their location and guidelines set by Council.

Encourage ‘greening’ of the urban environment by planting under-utilised spaces such as nature-strips, verges or the rail corridor.

Strategies to implement Design Principle – Ecology

Groundcover planting

Low groundcovers are often suitable for streetscape planting in verges and next to paths.

Native grasses and strappy plants are species that can be hardy and drought-tolerant.

Flowering plants and perennials are valued for visual and seasonal interest.

Water sensitive urban design within streetscapes or open space reserves can be used for passive irrigation or treatment of stormwater.

Mid-storey planting

Plant insect and bird-attracting flowering species, which are typically the mid-storey plants in an ecosystem.

Plant 'woody meadows' for interesting flowering, and low-maintenance gardens. (Woody Meadows are diverse shrub plantings maintained by coppicing (hard-pruning to 10-20 cm) to promote flowering and create dense canopies to exclude weeds.)

Bushes and medium-height plants are not often found in the public realm due to perceived safety issues around lack of visibility.

Opportunities exist along the rail corridor such as on embankments or areas set back from public paths or points of access.

Trees

Tree species selection should consider various factors, including:

- Location – streetscape, reserve, local character
- Size – height under powerlines, proximity to roads or other assets
- Suitability – species proven as street trees, or trees suitable for ecological habitat etc.
- Infill street tree planting where lacking

Increase tree canopy coverage to combat the urban heat island effect (see *Banyule Council's Urban Forest Strategic Plan*).

Trees adjacent to the rail line will need to conform with VicTrack and Metro Train guidelines with respect to height and spread.

Strategies to implement Design Principle – Ecology

Water sensitive urban design (WSUD)

Water sensitive urban design within streetscapes or open space reserves can be used for passive irrigation or treatment of stormwater.

Resident gardening

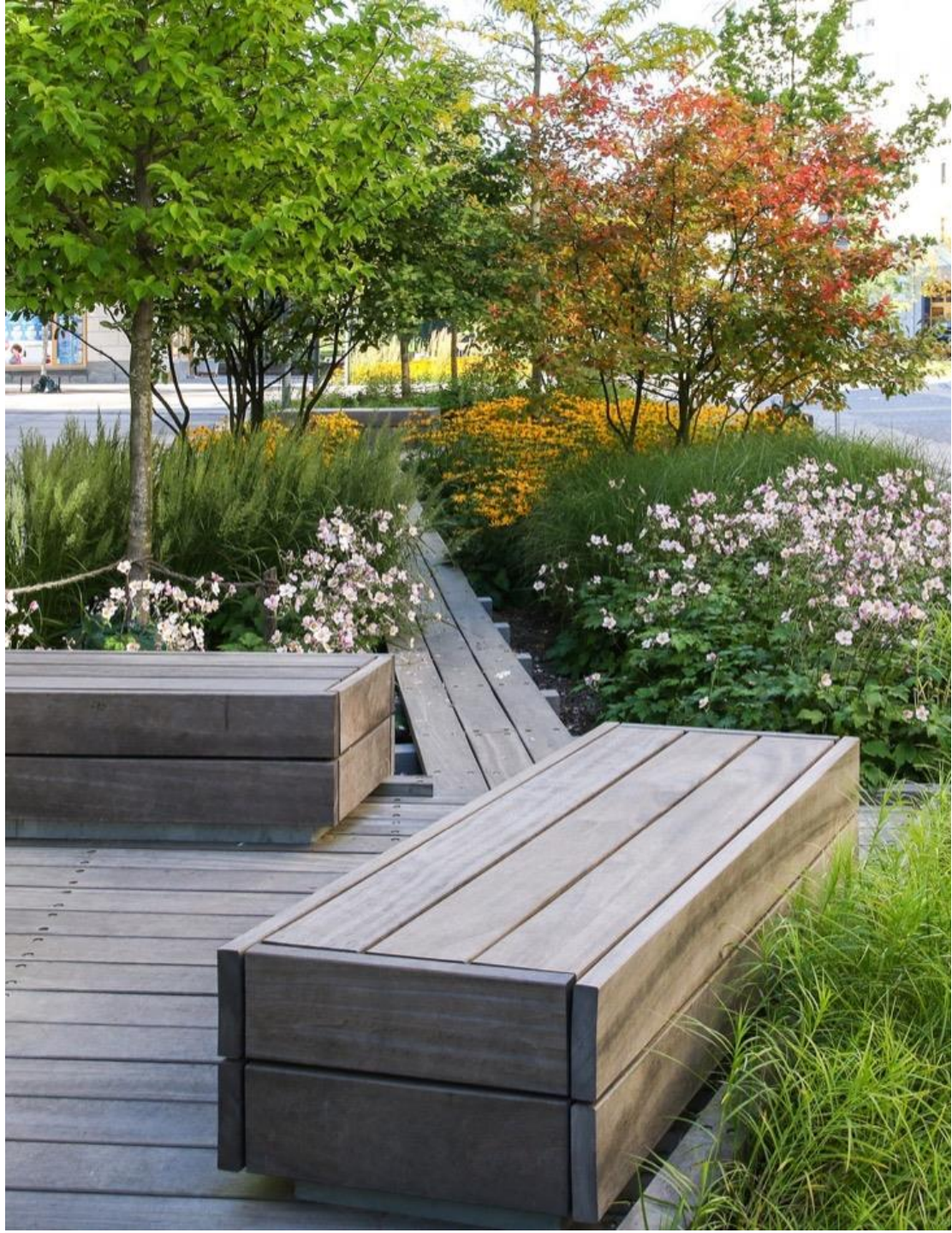
Encourage input and ‘ownership’ by resident or Friends’ groups to ‘beautify’ under-utilised land.

Urban Design and Open Space

Design Principle - Amenity

Supporting infrastructure is critical to improve user experience:

- Local connectivity and access
- Bicycle-user facilities
- Community engagement and activity



Provision of seating in pocket park.

Urban Design and Open Space

Strategies to implement Design Principle – Amenity

Connectivity and access

Ensure clear, accessible links to important destinations that are likely to correlate with cycle usage:

- Parks, playgrounds and reserves
- Schools and sporting facilities
- Shops
- Other bike routes

Bicycle user facilities

Install supporting infrastructure at regular locations, to facilitate and enhance the user experience:

- Bike parking, fixit stations or electric bike charging
- Pause-points, seating nodes
- Shade, either fixed structures or canopy trees
- Drinking fountains, picnic tables or shelters
- Wayfinding signage
- Toilets

Community engagement and activity

Encourage community engagement such as Friends' groups or community gardens within Council-owned land.

Provide signage and education regarding environmental values.

Provide local plant species lists and nurseries for use in back or front yards.

Urban Design and Open Space

Design Principle - Safety

Providing a safe environment for pedestrians and cyclists is a fundamental of good design.

Introduce traffic calming treatments that can be integrated with landscape interventions

- Visibility and passive surveillance
- Traffic calming
- Safety infrastructure

Low groundcover plants and clear-trunked trees assist with maximum visibility between user groups – pedestrians, cyclists and drivers.

Urban Design and Open Space

Strategies to implement Design Principle – Safety

Visibility and passive surveillance

Visibility is important to increase the perception of safety. Clear, open spaces are more comfortable and can be implemented in a variety of ways:

- Paths located close to areas of activity feel safer
- Lighting
- Visibility from adjoining properties, passive surveillance
- Trees and planting should ensure clear sightlines
- Vegetation should not cause a physical hazard to cyclists or vehicles

Traffic calming

Landscaping and urban design can facilitate traffic calming:

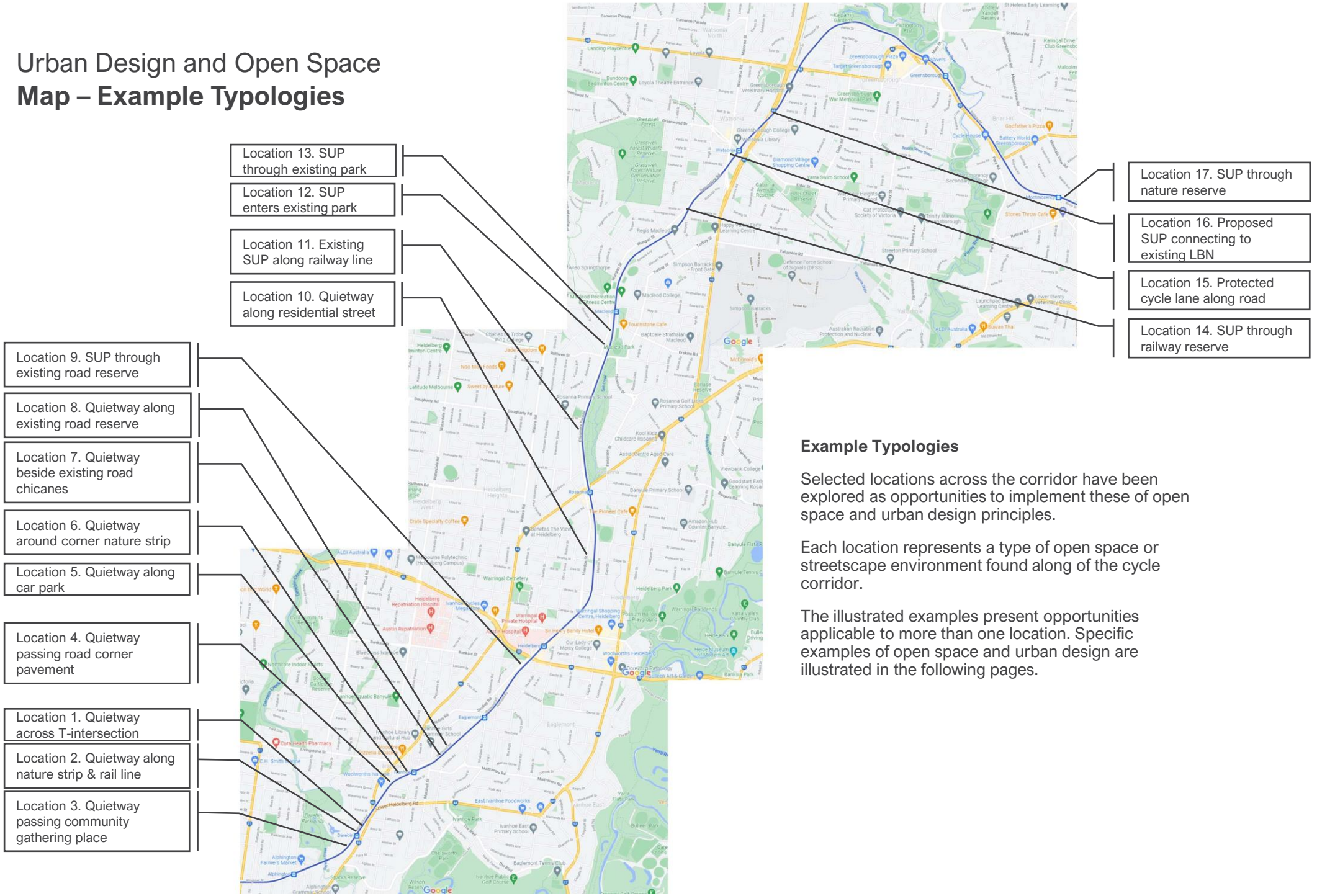
- Narrower streets and street trees indicate to drivers that it is a lower-speed environment
- Reduced road corner radius at an intersection can slow vehicles and provide an opportunity to plant in the verges
- Chicanes are designed to slow vehicles and are an opportunity for garden beds or street tree indents

Safety infrastructure

Supporting infrastructure can benefit users and improve their experience:

- Use lighting to improve areas of low activation or passive surveillance
- Use barriers where needed to reduce hazards, such as fencing along the railway line, bollards

Urban Design and Open Space
Map – Example Typologies



Example Typologies

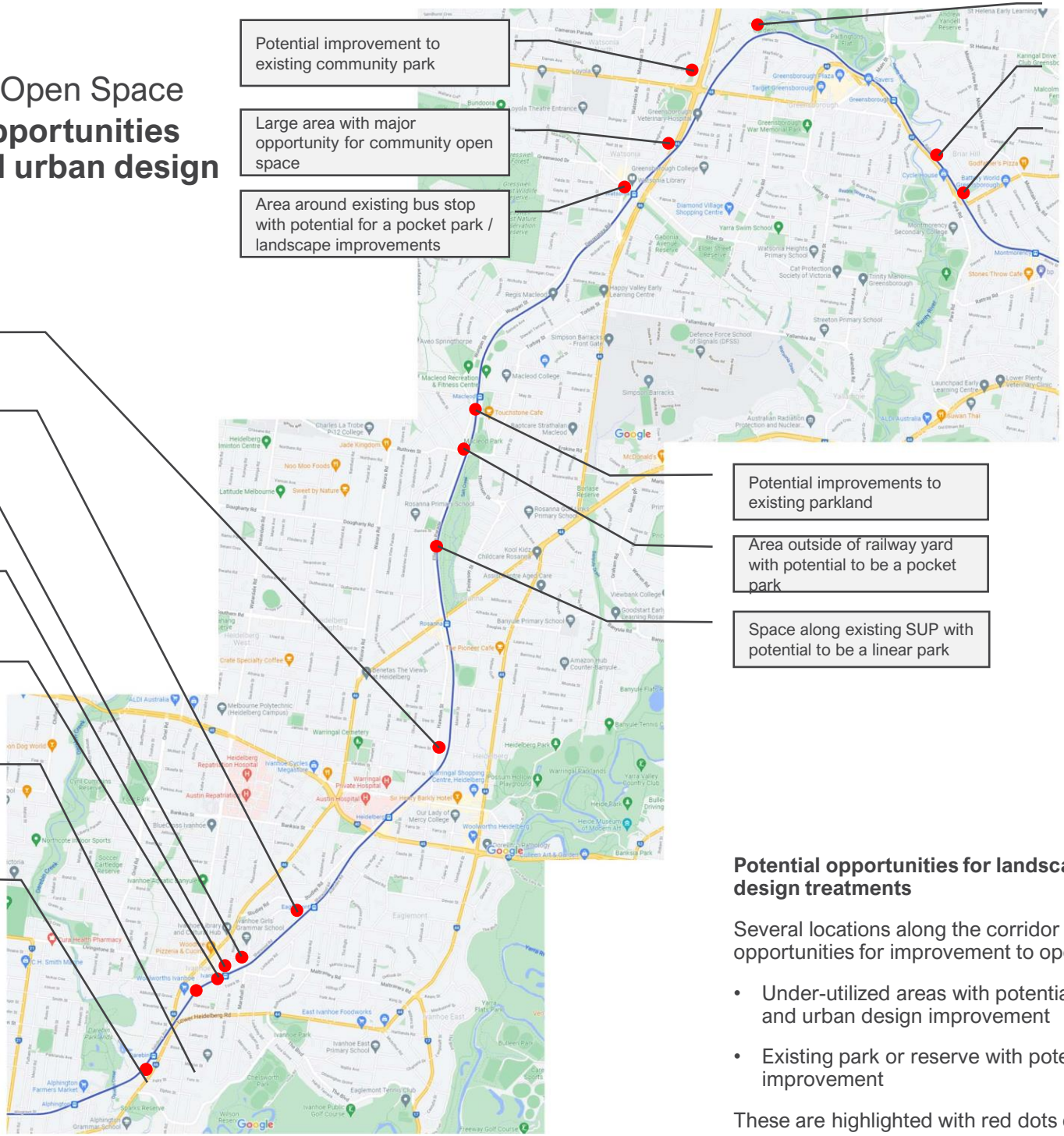
Selected locations across the corridor have been explored as opportunities to implement these of open space and urban design principles.

Each location represents a type of open space or streetscape environment found along of the cycle corridor.

The illustrated examples present opportunities applicable to more than one location. Specific examples of open space and urban design are illustrated in the following pages.

Urban Design and Open Space

Map - Potential opportunities for landscape and urban design treatments



Potential opportunities for landscape and urban design treatments

Several locations along the corridor are nominated as opportunities for improvement to open space:

- Under-utilized areas with potential for landscape and urban design improvement
- Existing park or reserve with potential for improvement

These are highlighted with red dots on the map.

Urban Design and Open Space
Illustrations

The following pages illustrate various ways to implement the principles of open space and urban design.

Specific locations have been illustrated as a guide and example of the strategies that can be implemented across the bicycle corridor.

Urban Design and Open Space
Example Typologies

Location 1. Quietway across T-intersection
(Darebin to Ivanhoe – Salisbury Ave)

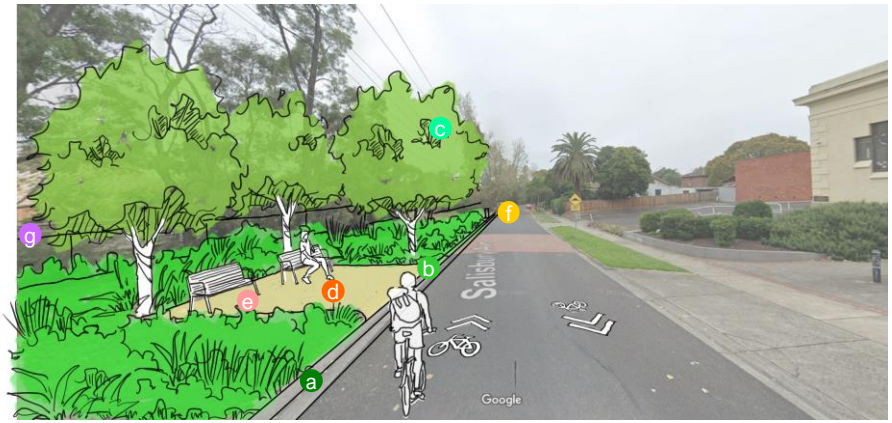
- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Introduce WSUD
- d Reduce road corner radii and introduce WSUD planting

Location 2. Quietway along nature strip & rail line
(Darebin to Ivanhoe – Salisbury Ave)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest

Urban Design and Open Space
Example Typologies

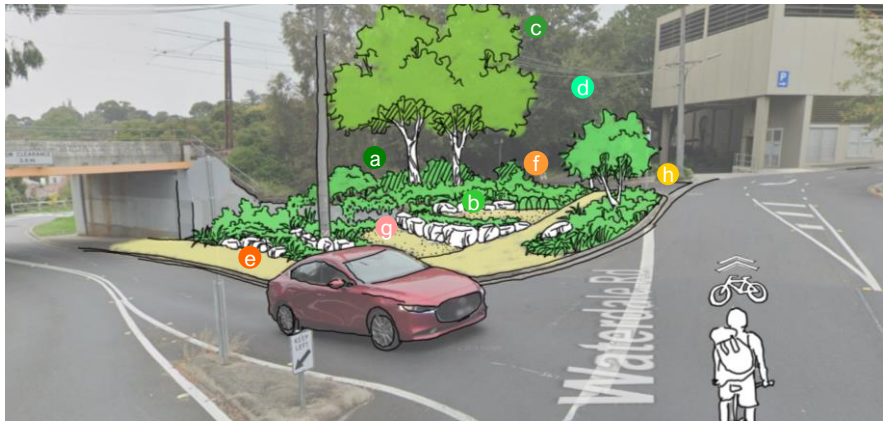
Location 3. Quietway passing community gathering place
(Darebin to Ivanhoe – Salisbury Ave)



- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Plant medium height flowering feature trees under power lines to provide shade and visual attraction
- d Identify potential location for community open space

  Enhance the usability of proposed community open space by providing amenities such as:
- e Seating
- f Wayfinding signages
- g Barrier fence along railway

Location 4. Quietway passing road corner pavement
(Ivanhoe to Heidelberg – Waterdale Rd)



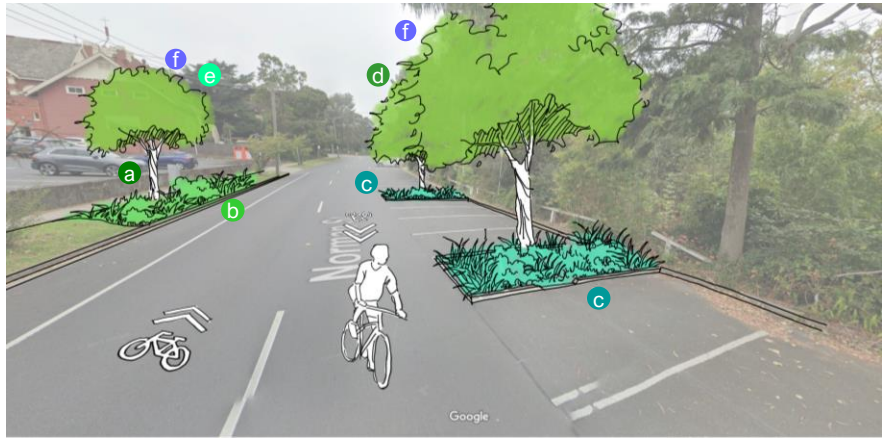
- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Planting clear trunk native shade trees to provide natural shade
- d Planting medium height flowering feature trees under power lines to provide shade and visual attraction
- e Identify potential location for community open space

  Enhance the usability of proposed community open spaces by providing amenities such as:
- f Bike parking / bike fixit stations
- g Seating / drinking fountains
- h Potential for wayfinding signage

* Area shown above will be considered as part of the Waterdale Road Pocket Parks and Shared Zone Project to be delivered in 2022 by Council.

Urban Design and Open Space
Example Typologies

Location 5. Quietway along car park
(Ivanhoe to Heidelberg – Norman St)



- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Introduce WSUD
- d Plant clear trunk native shade trees to provide natural shade
- e Plant medium height flowering feature trees under power lines to provide shade and visual attraction
- f Increase tree planting along the corridor as vertical visual elements to calm traffic

Location 6. Quietway around corner nature strip
(Ivanhoe to Heidelberg – Norman St)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Identify potential location for community open space

  Enhance the usability of proposed community open space by providing amenities such as:
- d Bike parking / bike fixit stations / e-bike charging at the proximity of train station
- e Seating / drinking fountain
- f Wayfinding signage

Example Typologies

Location 7. Quietway beside existing road chicanes
(Ivanhoe to Heidelberg – Sherwood Rd)

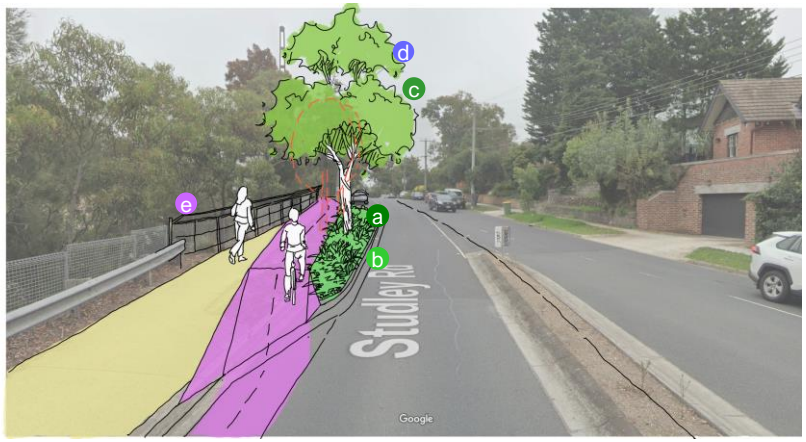
- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Introduce WSUD
- d Plant clear trunk native shade trees to provide natural shade
- e Plant medium height flowering feature trees to provide shade and visual attraction
- f Create pinch points by extending existing chicanes integrated with planting
- g Increase tree planting along the corridor as vertical visual elements to calm traffic

Location 8. Quietway along existing road reserve
(Ivanhoe to Heidelberg – Sherwood Rd)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Planting clear trunk native shade trees to provide natural shade
- d Plant supplementary planting of trees (medium height trees under power lines) for long-term provision of canopy
- e Increase tree planting along the corridor as vertical visual elements to calm traffic

Urban Design and Open Space
Example Typologies

Location 9. SUP through existing road reserve
(Ivanhoe to Heidelberg – Studley Rd)



- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Plant clear trunk native shade trees to provide natural shade
- d Increase tree planting along the corridor as vertical visual elements to calm traffic
- e Barrier fence along railway / SUP

* To accommodate proposed SUP through existing nature reserve by extending the edge of reserve and reducing road medium and removing existing trees (as shown dashed in red) .

Location 10. Quietway along residential street
(Heidelberg to Rosanna – Hawdon St)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Plant clear trunk native shade trees to provide natural shade
- d Plant medium height flowering feature trees under power lines to provide shade and visual attraction
- e Create pinch points by Introduce chicanes integrated with planting
- f Introduce speed humps integrated with planting
- g Increase tree planting along the corridor as vertical visual elements to calm traffic

Urban Design and Open Space
Example Typologies

Location 11. Existing SUP along railway line
(Rosanna to Macleod – Ellesmere Parade)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Plant clear trunk native shade trees to provide natural shade
- d Plant medium height flowering feature trees under power lines to provide shade and visual attraction
- e Identify potential locations for community open space

  Enhance the usability of proposed community open space by providing amenities such as:
- f Seating / drinking fountain
- g Increase tree planting along the corridor as vertical visual elements to calm traffic

Location 12. SUP enters existing park
(Rosanna to Macleod – McNamara St)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Plant clear trunk native shade trees to provide natural shade

  Enhance the usability of existing community open space by providing amenities such as:
- d Seating / drinking fountain
- e Increase tree planting along the corridor as vertical visual elements to calm traffic

Urban Design and Open Space
Example Typologies

Location 13. SUP through existing park
(Rosanna to Macleod – McNamara St)

a Introduce tiered native woody meadows planting

b Introduce flowering bulbs and perennials to create visual and seasonal interest

c Plant clear trunk native shade trees to provide natural shade

Enhance the usability of existing community open space by providing amenities such as:

d Potential for bike parking / bike fixit stations / e-bike charging at the destination

e Seating / drinking fountains

f Potential for wayfinding signages

g Increase tree planting along the corridor as vertical visual elements to calm traffic

Location 14. SUP through railway reserve
(Macleod to Watsonia – Devonshire Rd)

a Introduce tiered native woody meadows planting

b Introduce flowering bulbs and perennials to create visual and seasonal interest

c Barrier fence along railway / SUP

Urban Design and Open Space
Example Typologies

Location 15. Protected cycle lane along road
(Watsonia to Kalparrin Gardens – Watsonia Rd)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Planting clear trunk native shade trees to provide natural shade
- d Planting medium height flowering feature trees under power lines to provide shade and visual attraction
- e Increase tree planting along the corridor as vertical visual elements to calm traffic

Location 16. Proposed SUP connecting to existing LBN with major opportunity for community open space (Watsonia to Kalparrin Gardens – Greenaway St)

- a Introduce tiered native woody meadows planting
- b Introduce flowering bulbs and perennials to create visual and seasonal interest
- c Introduce WSUD
- d Plant clear trunk native shade trees to provide natural shade
- e Plant medium height flowering feature trees under power lines to provide shade and visual attraction
- f Identify potential location for community open space

Enhance the usability of proposed community open space by providing amenities such as:

- g Potential for bike parking / bike fix station / e-bike charging at the destination
- h Potential for seating / drinking fountains
- i Potential for wayfinding signages
- j Picnic / shade shelter

Urban Design and Open Space
Example Typologies

Location 17. SUP through nature reserve
(Greensborough to Montmorency – Mayona Rd)

a Introduce tiered native woody meadows planting

b Introduce flowering bulbs and perennials to create visual and seasonal interest

c Planting clear trunk native shade trees to provide natural shade

d Planting medium height flowering feature trees to provide shade and visual attraction

e Increase tree planting along the corridor as vertical visual elements to calm traffic

* To accommodate proposed SUP through existing nature reserve, existing trees are to be removed. (as shown dashed in red).

Part Nine
Alignment Options Assessment

Assessment Framework Criteria
Key Themes

The route options and treatments outlined in the previous sections were assessed using an assessment framework developed with input from Banyule City Council. Four categories of metrics were identified: Accessibility, Safety and Comfort, Network Integration and Path Performance, as shown in the diagram below. Scores for each of these categories were weighted based on their relative importance, for example Accessibility, and Safety and Comfort contributed 40% and 30% of the total score, respectively. Higher scores indicate a superior route for accessibility and user comfort. This assessment focused on the physical attributes of the routes and did not assess other elements such as cost.

1. Accessibility

Weighting – 40%

- Place
- Access to Points of Interest
- Connectivity to Open Space
- Crossing Opportunities

2. Safety and Comfort

Weighting – 30%

- Level of Traffic Stress
- Points of Delay / Crossings

3. Network Integration

Weighting – 15%

- Strategic Corridor
- Proximity to Public Transport

4. Path Performance

Weighting 15%

- Elevation
- Detour Factor
- Sharp Turn

Note – some criteria that were previously discussed have been removed as they were either not possible to be consistently assessed upon further work, or were criteria that the project team felt should be more of an outcome than a criteria of this study.

Assessment Framework Criteria
Criteria Bands

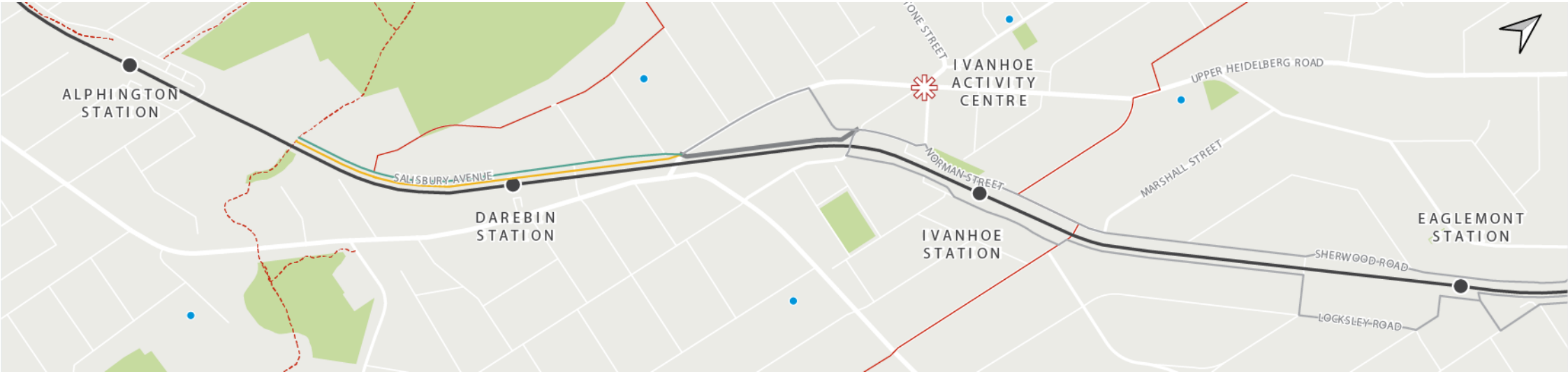
Key Theme	Criteria	Definition	Grade	Score	Definition
Accessibility – 40%	Place	The Place value within the M+P Framework	A	5	P1
			B	4	P2
			C	3	P3
			D	2	P4
			E	1	P5
	Places of Interest	Number of points of interest near the route, e.g. community centres, open space, schools	A	5	Connects to 4 points or more per kilometer
			B	4	-
			C	3	Connects to 2 points of more per kilometer
			D	2	-
			E	1	Connects to no points of interest
	Open Space	Distance to nearby public open space	A	5	Nearest open space is less than 200m away
			B	4	-
			C	3	Nearest open space is less than 400m away
			D	2	-
			E	1	Nearest open space is more than 800m away
	Crossing	Distance between crossing points over major road and rail links	A	5	No more than 25m
			B	4	-
			C	3	No more than 100m
			D	2	-
			E	1	More than 400m
Safety and Comfort – 30%	Traffic	Traffic speed and road type	A	5	Options are categorised based on the road speed and type, with separated trails rating the highest.
			B	4	
			C	3	
			D	2	
			E	1	
	Delay	Number of times a cyclist/pedestrian has to give way to other modes	A	5	No more than 0.5 stops per kilometer
			B	4	-
			C	3	No more than 1.0 stops per kilometer
			D	2	-
			E	1	More than 2.0 stops per kilometer

Assessment Framework Criteria
Criteria Bands

Key Theme	Criteria	Definition	Grade	Score	Definition
Network Integration – 15%	Strategic Corridor	Alignment with strategic corridors, e.g. SCC	A	5	Corridor is part of the SCC
			B	4	Corridor is part of the PBN
			C	3	Corridor is part of the LBN
			D	2	Corridor is part of the NRTS
			E	1	Corridor is not part of any strategic corridor
	Public Transport	Connectivity to public transport stations and stops	A	5	Corridor connects to a train station or major interchange
			B	4	-
			C	3	Corridor connects to bus stop
			D	2	-
			E	1	Corridor does not connect to any public transport
Path Performance – 15%	Elevation	Average gradient on path link	A	5	Flat grades 0-2%
			B	4	-
			C	3	Flat to steep grades 2-5%
			D	2	-
			E	1	Steep grades or steps 5% for more than 50m
	Detour	Route length compared to 'crow-flies' length	A	5	Detour factor is no more than 110%
			B	4	-
			C	3	Detour factor is no more than 120%
			D	2	-
			E	1	Detour factor exceeds 130%
	Turns	Number of sharp turns along a route	A	5	Less than 1.0 sharp turn per kilometre
			B	4	-
			C	3	Less than 2.0 sharp turns per kilometre
			D	2	-
			E	1	More than 3.0 sharp turns per kilometre

Assessment by Section

Section 1 – Darebin to Ivanhoe



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Quietway along Salisbury Avenue to Upper Heidelberg Road

Option 2

Shared use path along the western side of the Hurstbridge Rail Line to Upper Heidelberg Road

Common Section

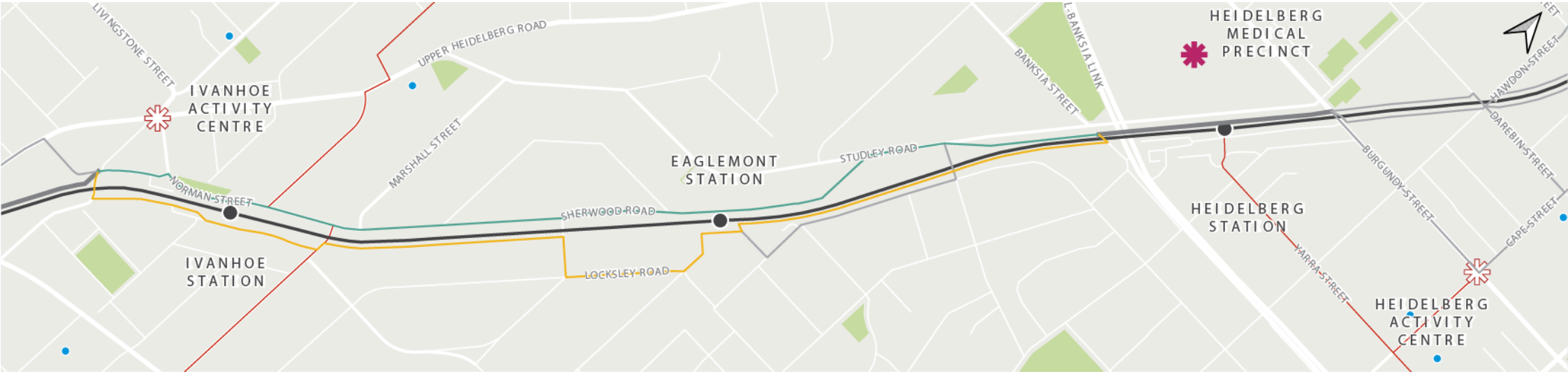
Shared use path along the western side of the Hurstbridge Rail Line from Upper Heidelberg Road to Kiernan Avenue

The southwest end of the corridor could connect to existing cycling corridors via Rockbeare Grove or the underpass at Darebin Station. In the longer term, a walking and cycling bridge over the Darebin Creek alongside the railway bridge could connect to the existing shared path at Alphington Station.

	OP 1	OP 2	Common
Place	C	C	C
Places of Interest	E	E	E
Open Space	C	C	A
Crossing	D	E	E
Traffic	C	A	A
Delay	E	D	A
Strategic Corridor	B	C	C
Public Transport	A	B	E
Elevation	C	C	C
Detour	A	A	A
Turns	A	A	E
Weighted Score	**8.10**	**8.30**	**8.95**

Assessment by Section

Section 2 – Ivanhoe to Heidelberg



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Quietway along Sherwood Road to Banksia Street and potential for sections of shared paths

Option 2

Shared use path along the eastern side of the Hurstbridge Rail Line to Banksia Street. Quietway around Eaglemont Station precinct

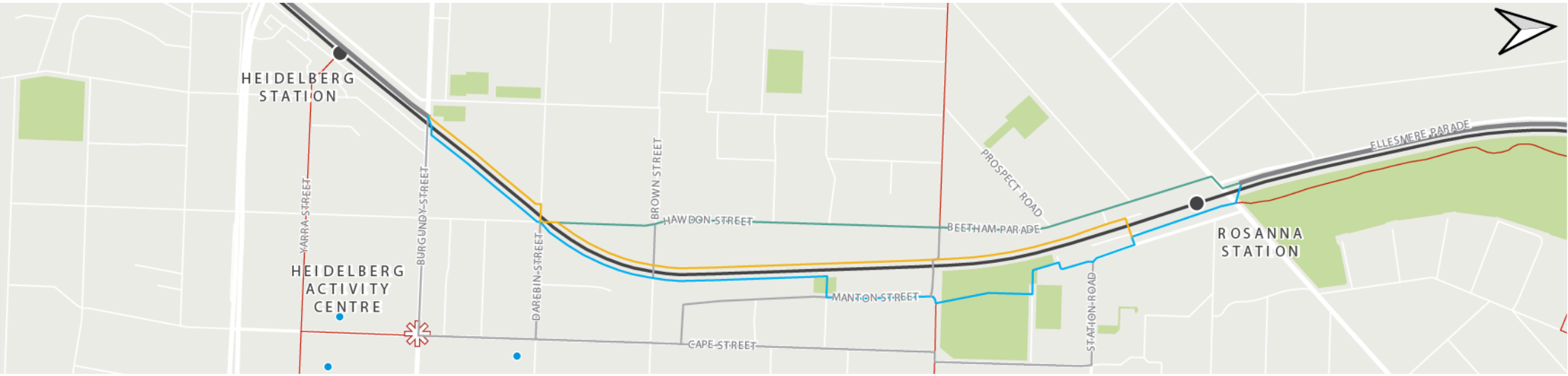
Common Section

On-road shared use path along Studley Road between Banksia Street and Burgundy Street

	OP 1	OP 2	Common
Place	D	C	D
Places of Interest	E	E	C
Open Space	A	A	A
Crossing	D	D	D
Traffic	C	B	A
Delay	D	D	E
Strategic Corridor	B	C	A
Public Transport	B	C	A
Elevation	B	B	A
Detour	D	E	A
Turns	B	E	A
Weighted Score	**8.20**	**8.00**	**10.35**

Assessment by Section

Section 3 – Heidelberg to Rosanna



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Shared use path between Burgundy Street and Darebin Street along western side of rail corridor. Quietway along Hawdon Street

Option 2

Shared use path between Burgundy Street and Rosanna Station along western side of rail corridor.

Option 3

Shared use path between Burgundy Street and Manton Reserve along east side of rail corridor. Quietway along Manton Street. While this section scores highest, it may not be feasible due to recent works at the park.

Common Section

Existing shared use path along the western side of the Hurstbridge Rail Line with extension towards Chapman Street.

	OP 1	OP 2	OP 3	Common
Place	D	D	D	D
Places of Interest	E	D	C	E
Open Space	A	B	A	B
Crossing	D	D	D	E
Traffic	C	A	A	A
Delay	D	C	C	A
Strategic Corridor	D	A	B	A
Public Transport	E	D	D	E
Elevation	B	C	C	B
Detour	A	B	C	A
Turns	D	E	E	A
Weighted Score	**7.60**	**8.65**	**9.15**	**9.20**

Assessment by Section

Section 4 – Rosanna to Macleod

Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

See next page

Option 2

See next page

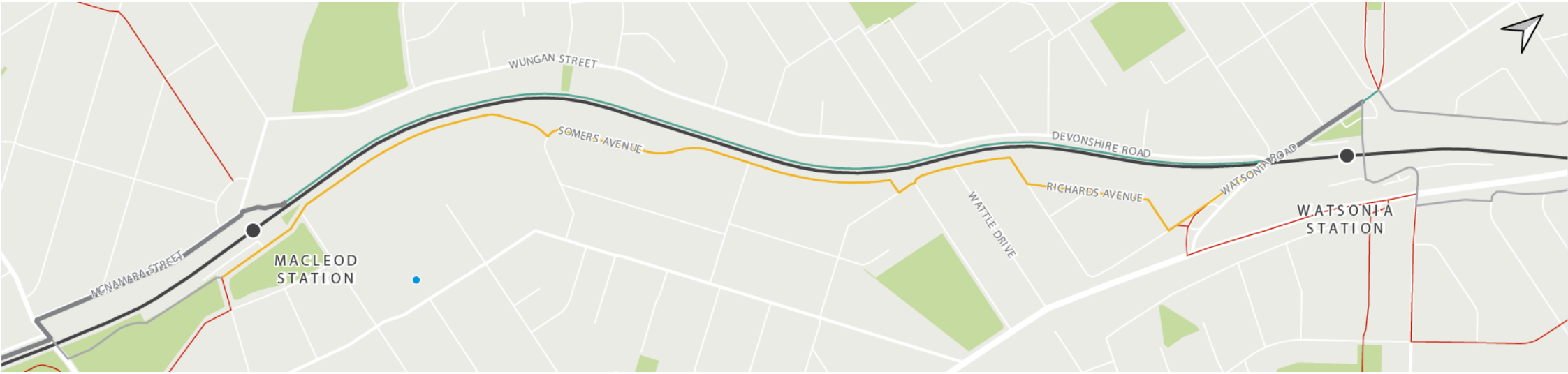
Common Section

Existing shared use path along the western side of the Hurstbridge Rail Line with extension to Chapman Street (first phase) and then from Chapman Street to Macleod Station (second phase).

	OP 1	OP 2	Common
Place	See next page		D
Places of Interest			C
Open Space			A
Crossing			D
Traffic			A
Delay			E
Strategic Corridor			A
Public Transport			A
Elevation			A
Detour			A
Turns			A
Weighted Score			**10.35**

Assessment by Section

Section 5 – Macleod to Watsonia



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Shared use path on the western side of the Hurstbridge Rail Line

Option 2

Quietway along Somers Avenue

Common Section

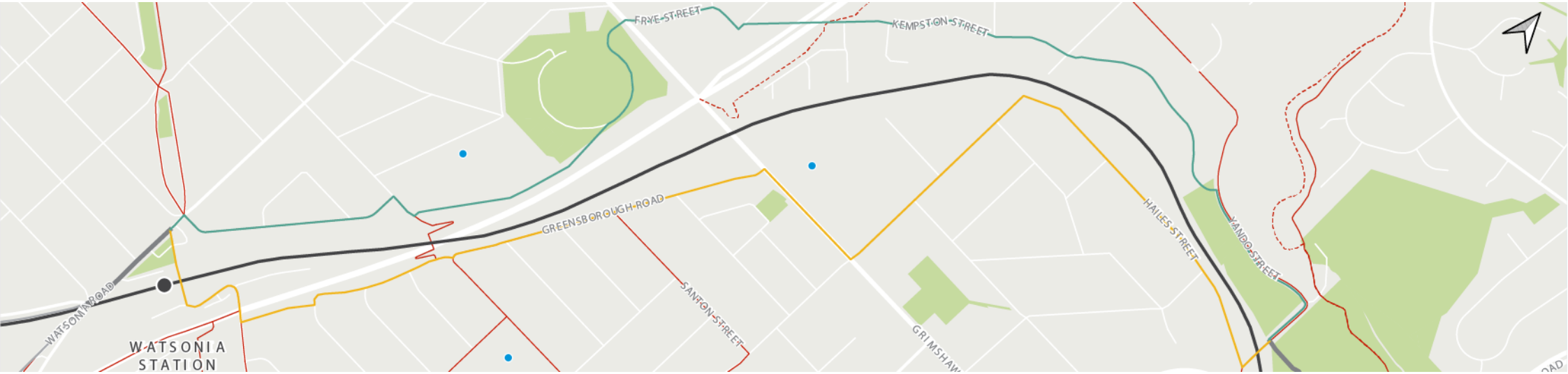
Protected cycle lanes along Watsonia Road

Note that Wungan Street was considered but ultimately excluded from assessment due to high traffic volumes and speeds and the availability of better alternatives.

	OP 1	OP 2	Common
Place	D	D	D
Places of Interest	D	D	A
Open Space	B	B	A
Crossing	E	D	B
Traffic	A	C	A
Delay	A	E	E
Strategic Corridor	A	E	E
Public Transport	E	E	E
Elevation	B	B	B
Detour	A	E	A
Turns	A	E	E
Weighted Score	**8.25**	**6.40**	**10.00**

Assessment by Section

Section 6 – Watsonia to Kalparrin Gardens



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Quietway on Ibbotson Street and Kempson Street. Shared path along Greensborough Bypass between Grimshaw Street and Nell Street then tie in to existing shared path in Kalparrin Gardens. This route will eventually be replaced by the NEL shared paths.

Option 2

On-road shared use path along Greensborough Road to Grimshaw Street then quietway to Kalparrin Gardens.

Common Section

See next page

LBN12 links Watsonia Station and the Greensborough Major Activity Centre via residential streets. This route should be promoted as the existing route for this section of the corridor while the NEL shared paths are being constructed.

	OP 1	OP 2	Common
Place	D	C	
Places of Interest	D	E	
Open Space	B	A	
Crossing	D	D	
Traffic	B	C	
Delay	E	E	See next page
Strategic Corridor	D	C	
Public Transport	D	C	
Elevation	B	C	
Detour	E	E	
Turns	D	E	
Weighted Score	**8.25**	**6.40**	

Assessment by Section

Section 7 – Kalparrin Gardens to Greensborough

Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Existing shared use path along Plenty River

Option 2

Quietway along Poulter Avenue and Main Street

Common Section 1

Existing shared use path along Plenty River

Common Section 2

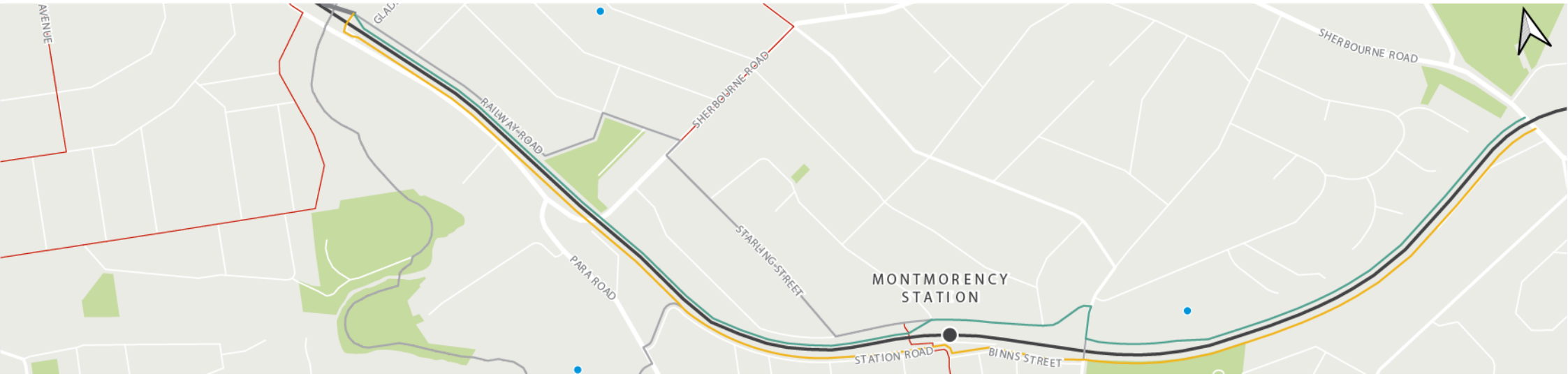
New active transport bridge across Plenty River

LBN12 links Watsonia Station and the Greensborough Major Activity Centre via residential streets. This route should be promoted as the existing route for this section of the corridor while the NEL shared paths are being constructed. From the Greensborough MAC, LBN12 could link to Greensborough Station via Flintoff Street and the station overpass.

	OP 1	OP 2	Common 1	Common 2
Place	D	D	C	E
Places of Interest	D	E	C	E
Open Space	A	A	A	C
Crossing	D	C	D	C
Traffic	A	C	A	A
Delay	E	E	E	A
Strategic Corridor	E	E	B	D
Public Transport	E	E	E	E
Elevation	B	B	B	D
Detour	E	C	E	E
Turns	E	E	E	A
Weighted Score	**7.40**	**7.10**	**8.65**	**7.85**

Assessment by Section

Section 8 – Greensborough to Montmorency



Major Precincts

- Major Activity Centre
- Major Education Precinct
- Major Health Precinct
- Schools

Connections

- Local Bicycle Network
- Existing Trail Network

Assessment Framework Options

- Common Section
- Option 1
- Option 2
- Option 3

Option 1

Shared use path along the northern side of the Hurstbridge Rail Line. On-road shared use path in front of Montmorency Station

Option 2

Shared use path along the southern side of the Hurstbridge Rail Line

Common Section

See previous page

At present, there are no connecting routes to the east of Sherbourne Road, but the long term intention is to extend this Strategic Cycling Corridor to Eltham Station.

	OP 1	OP 2	Common
Place	D	D	See previous page
Places of Interest	E	E	
Open Space	B	B	
Crossing	E	E	
Traffic	A	A	
Delay	C	A	
Strategic Corridor	C	A	
Public Transport	C	B	
Elevation	D	C	
Detour	E	E	
Turns	A	A	
Weighted Score	**7.70**	**8.90**	

Part Ten
Conclusion

Conclusion

This report presents the feasibility of developing active transport and open space options along the Hurstbridge railway line. The baseline conditions and resulting active travel participation rates were set out, along with the policies at state and local government levels that support this active transport route. The outcomes of a saddle survey were outlined, showing issues and opportunities identified along the railway corridor. Options for the proposed active transport route along with urban design and open space improvements were presented and assessed based on a framework developed with council.

The outcomes of this project is expected to help Council to continue to advocate for the implementation of the overall route, noting that it will likely be implemented in sections. Moreover, the details in this document will enable Council to consider the suitability of options for given sections as opportunities arise, such as through grants and major projects along the Hurstbridge railway line.

Next steps

The route alignment options presented in this report will be taken to public consultation to gather feedback and insight from the community. The feasibility report will then be updated based on the community feedback received, to help ensure it will best support the local community.

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
Draft	09.12.2021	Draft Report	Mitchell Su, Liz Irvin	Alex Blackett	Alex Blackett	
Final	14.01.2022	Final Report	Liz Irvin			

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