



Knox Cycling Action Plan

2024-2035

Background
Document

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NOTE: All layouts and images in this document will be altered during the design phase.

Executive summary

Bicycle facilities are important community assets and provide:

- a free recreational facility
- an opportunity to increase health and wellbeing through incidental exercise while commuting
- a feasible alternative mode of transport, especially in times of natural disaster when public transport or the ability to use a motorised form of transport has failed
- an accessible facility for people with special mobility needs
- an all ages facility for the community.

As a highly car-dominant community, our cycling network needs to compete with the private motor vehicle as a feasible transport mode. As a low-cost and non-polluting transport option, cycling can be used in combination with other modes such as public transport or car share schemes and is a wonderful transport option that supports Council's response to the climate change emergency.

Traditionally designed to cater for recreational trips, our cycling network needs to evolve to allow cyclists to travel to work, socialise, and access retail, services and educational facilities.

In response, the Knox Cycling Action Plan (2024-2035) provides a blueprint of Knox's future cycling network and a lays out a 10-year roadmap of the actions that Council will deliver to achieve a cycling network that:

- aims to provide a low-stress cycling environment to encourage inexperienced or less confident cyclists to use their bicycles more regularly
- is well-connected locally and to the wider regional cycling network across Victoria
- is extensive and links our homes to key destinations, services and facilities across Knox.

This document is a background paper that highlights the findings, data sets and discussions that has informed the final version of the Knox Cycling Action Plan.

Background

Council's Knox Bicycle Plan was originally endorsed in 2008. The plan focused on:

- reducing reliance on car use for transport
- delivering a shared path and on-road cycling network
- reducing crash casualties
- increasing cycling uptake of students and workers.

Of the 9 high priority projects identified for delivery between 2008 – 2018 only four links were delivered. The projects that were delivered during this period include:

- Bayswater Railway Station – shared path separation from the car park
- Mountain Hwy between Koomba Park – 105 Mountain Hwy
- Burwood Hwy Milpera Crescent to Knox School
- Ferntree Gully Road – Stud Road to Henderson Road

Although the 9 key priority projects were not completed, Council has been able to continue constructing and building upon our cycling network with key projects such as:

- The completion of the Burwood Hwy shared path link between Morack Road and Eastlink to complete the Carrum to Warburton Trail
- Napoleon Road Shared path
- Wantirna cycling link connecting George Street to Boronia Road.

The 2008 Knox Bicycle Plan focuses on deliverables and objectives that still resonate with us today. The new Knox Cycling Action Plan builds upon the main principals but incorporates and adopts modern transport planning principles and aims to improve how main actions within this plan translate into Council's delivery processes.

Our strategy

The Knox Cycling Action Plan (KCAP) is a 10-year action plan that aims to enhance Knox's existing cycling network to better service the current needs and demands of our cycling community.

When cycling, users do not acknowledge municipal borders and so the plan aims to create a more seamless experience for riders that allows them to access routes that will take them further, connecting them to their desired destinations and offers routes that are more than simple recreational rides.

With cycling high on the State Government's agenda, the KCAP looks to align Knox's vision with regional and state objectives, corresponding network maps and strategies such as the:

- Eastern Regional Trails Strategy
- Towards Zero Strategy
- Victorian Cycling Strategy
- Strategic Cycling Corridors in Victoria
- Victorian Principal Bicycle Network.

The diagram below highlights the KCAP's relationship with state, regional and local strategic contexts.

A draft version of the KCAP was developed in 2019. However, with the onset of the COVID-19 pandemic and associated lockdowns, the way we live, work and spend our social time was disrupted and over the years, has changed. As a result, Council decided to re-engage the community to understand these shifting priorities and how it may impact on how we deliver Knox's future cycling network.

Figure 1: Strategic Relationships with the Knox Cycling Action Plan



The KCAP is underpinned by four key principals:

Safe systems

This principal consists of four pillars.

- Safer Roads by fixing unsafe roads
- Safer People by sharing the responsibility of safety while on the road
- Safer Speeds by making sure speed limits and road designs suit road conditions
- Safer Vehicles by using the safest vehicle in our price range.

Low stress cycling

Traffic stress refers to the perceived danger associated with riding in a road environment. Traffic stress is a perception; as such, for each cyclist the level of traffic stress and environment can differ, affecting their confidence and influencing their route choice, mode of travel and sometimes time of travel.

Movement and Place

This is a framework created by Transport for Victoria (TfV) that evolved out of the SmartRoads concept. The framework acknowledges the inter-relationship of place (land use) and movement (transport corridors and modes). The framework aims to categorise diverse types of place interactions with different levels of movement that occur at that place. Based on this, guidelines are created for each mode of transport to determine how it should be designed.

All abilities and all ages

Knox's cycling network is used by cyclists with different abilities and ages. Cycling provides an independent mode of transport for people who cannot travel using a motorised vehicle. As such, the cycling network should be designed to cater for all skill levels and age levels to make it as accessible as possible for everyone to use.

Our City

Knox is located at the base of the Dandenong Ranges in metropolitan Melbourne's outer east, approximately 25 kilometres east of Melbourne's Central Business District (CBD).

Our City has approximate land area of 114 square kilometres, hosting around 62,000 dwellings (2021 ABS Census) with more developments on the way.

Considered a gateway to key recreational activities with visitors passing through from across Victoria and beyond, a variety of cyclists travel through Knox to access:

- the 1000 steps
- the Basin to Sassafras 1 in 20 ride
- Lysterfield Lake Park and associated mountain bike circuits
- Gilbert Reserve BMX and Skate Park
- Doongalla Forest Reserve and Mountain Bike Trail
- Jells Park.

With a total of 120 kilometres of off-road shared paths, Knox's cycling network follows the railway line and key water bodies across the municipality, providing east-west cycling connections.

North-south links across the municipality are restricted to main arterial roads such as Eastlink Trail and the sporadic cycling facilities along Stud Road and Scoresby Road.

Over the last 10 years, Council has started to shift our focus by increasing cycling links along arterial roads and within Activity Centres to provide better cycling route coverage and integration with the public transport networks.

Enhancing our cycling network will address Knox's current challenges of:

- having a highly car-dependent community where on-street car parking is expected to always be readily available
- competing road space demands that include on-street car parking, vegetation planting, dedicated through-road lanes and cycling facilities in a limited urban space
- the balance required to maintain and enhance the local natural corridors versus providing safe and accessible paths for all users and complying with the *Disability Discrimination Act 1992*

- the need to support more vulnerable cyclists such as those with special needs, who are inexperienced or young versus confident and experienced cyclists travelling at faster speeds.

Understanding our people

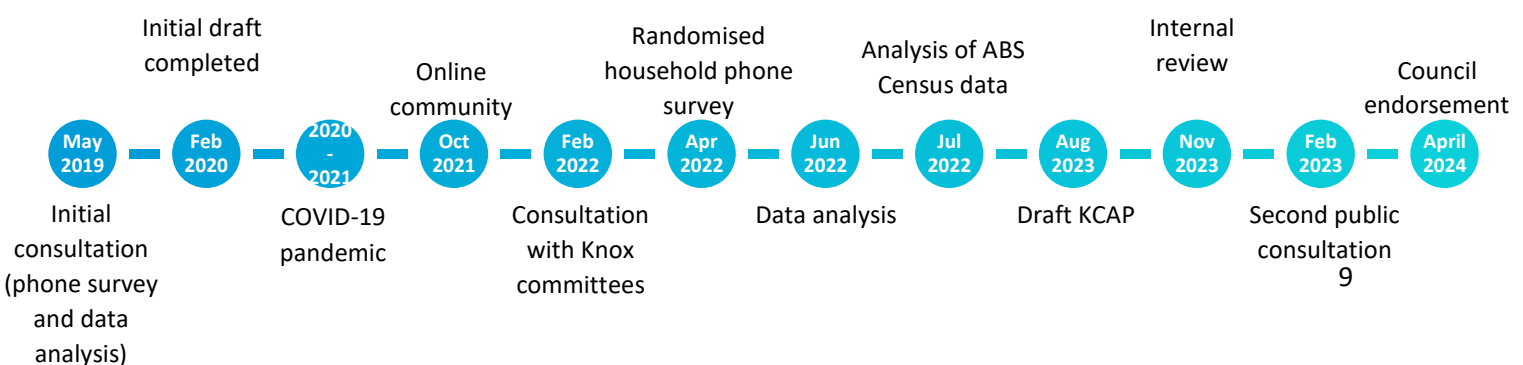
Consultation Methods

In 2019 Knox City Council undertook a randomised household phone survey to gauge public opinion and behaviours with regards to cycling facilities in Knox. This was cross-analysed with CrashStat data, BikeSpot data, existing network maps and strategic plans relevant at the time. However, with the occurrence of the COVID-19 pandemic and associated lockdown, an increase in cycling uptake was observed.

In response, Council decided to re-engage the community in a more comprehensive consultation process to determine whether Knox’s cycling network needed to be redesigned to better service our community in the future. The community was engaged using the following methods:

Online	Knox Advisory Committees	Phone Survey
592 contributions 184 unique contributors 1,659 individual visits	7 Committees 7 separate focus groups 86 participating individuals	430 households with completed interviews 1,038 captured individuals 3,467 households dialled
<ul style="list-style-type: none"> • Survey • Geomapping (identified 409 self-reported individual sites for network improvement) 	<ul style="list-style-type: none"> • Recreation and Leisure Committee • Disability Advisory Committee • Active Ageing Advisory Committee • Multicultural Advisory Committee • Early Years Committee • Environment Advisory Committee • Youth Advisory Committee 	<ul style="list-style-type: none"> • National Walking and Cycling Participation Survey • Randomised household phone survey

Figure 2: Knox Cycling Action Plan – project development timeline

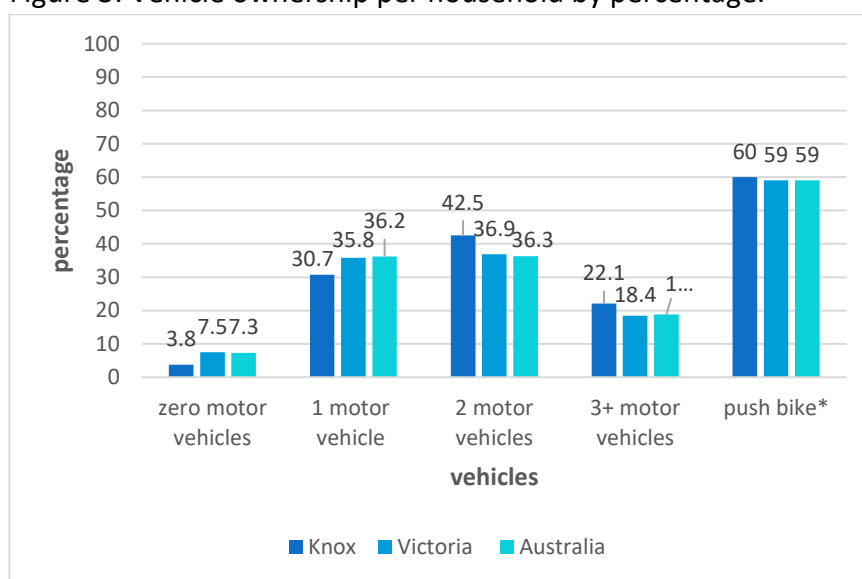


Cycling Uptake

There are more households in Knox that own larger quantities of private motor vehicles per household than the average Victorian or Australian household (2021 Australian Bureau of Statistics, ABS Census)..

Our households own more bicycles per person per household with a median ownership rate of 1.3 bikes per person per household. This ownership rate is validated by the results received through the National Walking and Cycling Participation Survey (a randomised household phone survey) as shown in the figure below.

Figure 3: Vehicle ownership per household by percentage.



* Note: Push bicycle percentage based on 2022 National Walking and Cycling Participation Survey conducted by phone. The 430 completed household surveys were weighted against the ABS population data to generate the percentages.

Ownership of electric bicycles and personal electric devices (PEDs) such as e-scooters and electric skateboards have increased based on 2019 and 2022 household surveys. PEDs allow for a more comfortable ride and longer distances can be achieved. With the onset of the Department of Transport and Planning altering road rules and trialling e-scooter programs in the City, Knox has seen an increased uptake of electric devices operating within our local community.

When asked, respondents indicated a gamut of users that benefit from Knox's cycling facilities. These include but are not limited to:

- visitors, workers and local residents

- cyclists of differing confidence, age, needs and travel purposes
- pedestrians using the shared paths
- organised groups using the trails or on-road links for commuting, recreation, social catch-ups or education. Examples of these include local bicycle user groups, primary schools or alternative educational facilities and social groups catching up for exercise
- people with special needs using the shared path network as a more accessible and faster travel option around the municipality versus the infrequency and unreliability of public transport.

Our Community

During October and November 2021, Council conducted an online consultation survey to understand the impacts of COVID-19 restrictions on the rate of cycling in our community. When comparing the frequency of travel for different purposes, it was observed that:

- the participation and frequency of children, youths and 30 to 49-year-old cyclists significantly dropped. This suggests that families usually riding most days, or every week, became more casual cyclists
- cyclists were travelling less frequently for recreational and travel to work but were travelling for other purposes such as visiting friends and retail.

During the consultation workshops, Council advisory committees reported an increased number of shared path users during the pandemic which created more perceived dangerous situations on the shared path with:

- new shared path users unaware of basic shared path etiquette (for example, keep left, walking no more than two abreast, ringing bike bells)
- more users reducing the available space where young children could safely cycle freely on the shared paths.

Figure 3: An overview of the rate of change between pre Covid-19 (2019-2020) to post COVID-19 years (2021-2022).

		All travel purposes					
		Never	Once or twice a year	Every 3 months	Every month	Every week	Most days
Rate of Change	Under 9 yr old	10	5	2	11	-21	-7
	10–19 yrs old	10	4	-6	9	-10	1
	20–29 yrs old	10	6	-8	9	-12	-2
	30–39 yrs old	10	-3	9	0	-9	-3
	40–49 yrs old	10	5	2	14	-23	2
	50–59 yrs old	10	3	-4	4	2	-4
	60–69 yrs old	10	2	0	3	0	-3
	70–79 yrs old	10	0	0	-1	-2	1
	80+yrs old	10	0	0	0	0	0
	Undisclosed	10	6	5	5	-9	-5
	All ages combined	10	28	0	54	-84	-20

* Note: Green indicates an increased change and red highlights a decrease in cycling uptake.

As online survey respondents are more likely to be self-reported cyclists, it suggests that cyclists who were already cycling pre COVID-19 may have decreased their frequency of cycling, and post COVID-19 we observed an increase of new cyclists using Knox’s cycling network. This observation would then be in line with the randomised household phone surveys conducted in 2019 and 2022:

- residents cycling typically every week increased from 12.7% to 14.9%
- residents cycling at least once a year increased from 32.3% of the population to 39.4%.

These rates were weighted against ABS population data to provide a more realistic representation of our community.

All three data sets are relevant and tell us that more needs to be done to ensure cycling continues to be a feasible form of transport by creating a network that:

- is attractive and safe to use for new cyclists of all ages
- continues to meet the transport and recreational needs of our community.

Things our community said about our cycling network during the consultation period:

Cyclists prefer to take a safer route even though it may not be the most direct.

81% of respondents prefer a shared path facility with pedestrians rather than bike lanes on the street.

Cycling is uncomfortable at night due to little to no lighting.

A bike lane with car parking permitted is preferred over using sharrows on the road.

Installing drink fountains, seating and bike repair stations at key locations would greatly improve cycling experience and comfort.

“Good cycling accessibility and tracks in Knox” however, we “need better north-south links”. The network “feels disjointed” and “doesn’t have a purpose” because it doesn’t “link to destinations”. “Please ensure paths allow you to cycle from A and B anywhere in the municipality”.

A high-quality wider shared path on one side is preferred to footpaths on either side with no off-road cycling facility.

We need safer spaces for children and families where younger children can safely learn to ride.

Improve access and availability of mountain bike facilities

Our cycling network

Knox's current cycling network comprises predominantly off-road shared paths which follow key water bodies or the railway line and mostly cater for recreational trails. Community needs are shifting with more inexperienced riders wanting to cycle as a form of transport, exercise and social interaction.

The community is looking for a more user-friendly cycling network for all ages that will safely take them from their homes to any location in, around and out of the municipality at any time of the day.

In response to Knox's most common road accident types involving cyclists, our network aims to improve cycling safety on the road by:

- Increasing awareness of cyclists and other road users
- Designing and delivering infrastructure that addresses the most common types of accidents in Knox.

Cycling in Knox can be an invigorating and an affordable mode of transport. On the road, however, cyclists are among our most vulnerable users. Based on five years of accident data, Council has received 70 reported severe or fatal crashes involving other road vehicles within the last five years.

Of these crashes, the most common accident types are:

Rank	Definitions for classifying accidents (DCA)	Description of accident type
1	DCA 148	Pedestrian/cyclists travelling from a path colliding with a through vehicle.
2	DCA 147	Vehicle from a driveway or lane colliding with a through vehicle
3	DCA 133	Vehicles in parallel lanes (lane sideswipe)
4	DCA 130	Vehicles colliding in the same lane (rear end)
5	DCA 174	Vehicle out of control on the carriage way

Crash statistics between 2018 and 2022 inclusive indicated that most recorded crashes occurred along our arterial roads. The top four roads (from most recorded accident to the least):

- Mountain Highway (13 accidents)
- Burwood Highway (seven accidents)
- High Street Road (seven accidents)

- Wellington Road (five accidents).

As part of the 2020 BikeSpot survey, users reported the following sites as the most unsafe locations in Knox:

- 1 in 20 bend – 1458 Mountain Highway, The Basin
 - conflict between cyclists and vehicles
- Railway Trail, Boronia junction missing link
 - no dedicated cycling facility through a junction
- Dandenong Creek Trail at the Railway overpass S-bend
 - blind corner with insufficient space.
- Blind Creek Trail under the Eastlink Overpass
 - confusing intersection with no signage
- Ferntree Gully Road and Stud Road intersection
 - no continuous off-road cycling facility
- Railway Trail through the Ferntree Gully junction
 - no continuous off-road cycling facility.

Over the last 10 years, we have started to shift our focus by installing key cycling links along arterial roads and improving local road connections into residential areas to address the missing ‘last mile’ links to Knox’s main trail network and respond to community needs.

Council has trialled new infrastructure treatments such as the green intersection treatments and sharrows along the Wantirna Cycling Link to address specific crash types most commonly involving cyclists. Public bike repair stations or underpass lighting installations were also delivered to improve convenience and rider confidence within Knox.

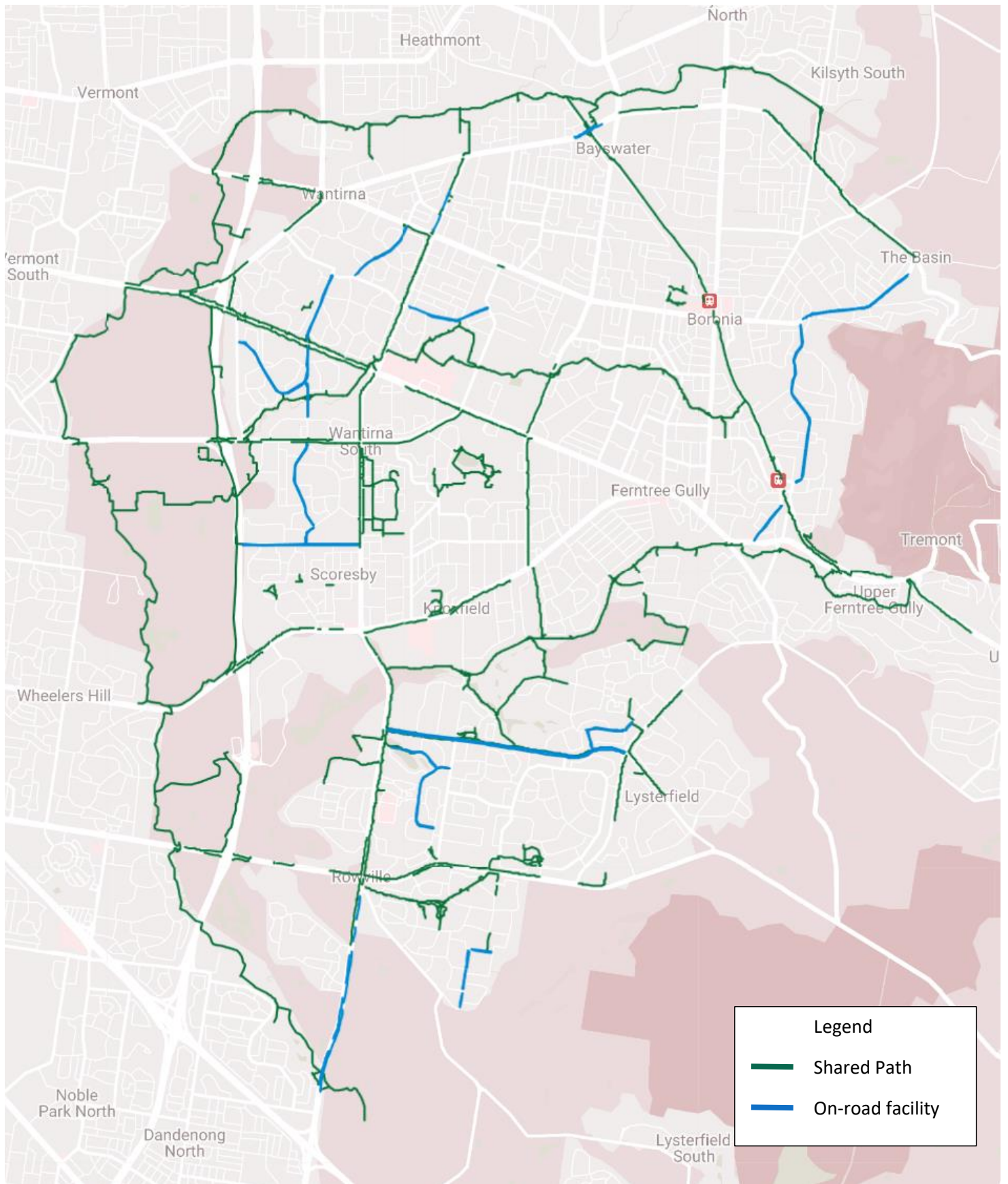


Figure 4: Knox's existing on-road and off-road cycling network.

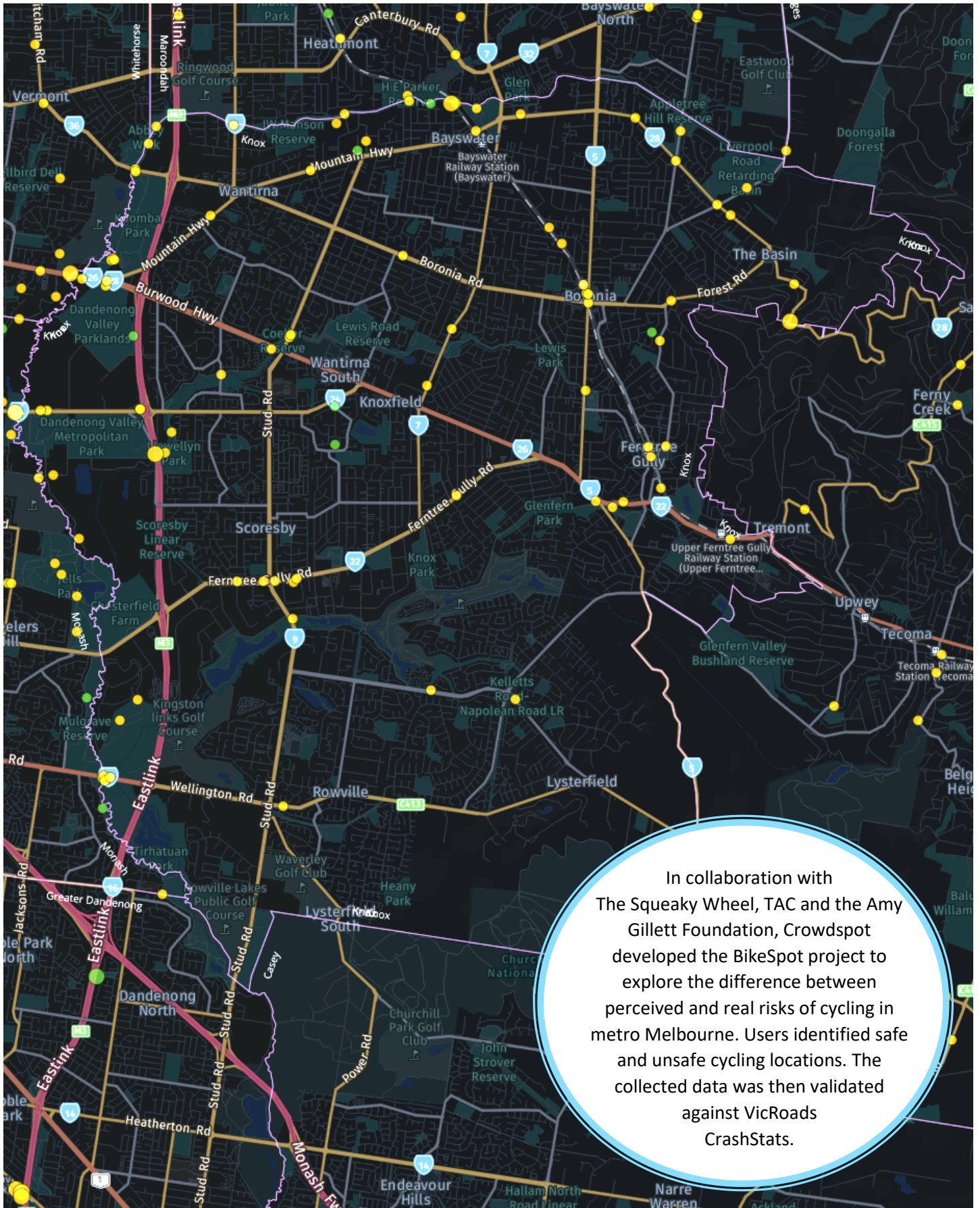


Figure 5: 2020 BikeSpot results highlighting self-reported sites with safety concerns.

Improving cycling experience

Providing a comfortable and attractive cycling network further encourages new and less confident users to cycle more frequently for a range of trip types.

Based on the community's feedback, cycling experience plays a big part on how enjoyable and easy a trip can be. Recognising this and based on the public consultation results, the following infrastructure will be installed along our network over time using the following principals to assist in supporting cyclists.

Cycling facility	Description	Suitable locations	Considerations for installation
Seating	Resting areas for cyclists and for those with low mobility.	Every 300 m within an urbanised environment and 500 m within a trail.	<ul style="list-style-type: none"> • Is it on the Principal Pedestrian Network? • Is it located in a Primary Route? • Is there sufficient space for the concrete pad? • Is there adequate shading?
Bike repair stations	High-security public bike pump with retractable tools to assist with cyclists' minor maintenance requirements.	Located with a seat, drinking fountain and/or public toilet within close vicinity of a major cycling route.	<ul style="list-style-type: none"> • Is it located near a point of interest such as a reserve, employment precinct or within a retail area? • Can the site be easily accessed from the cycling route? • Is there sufficient space that is clear from the path?

			<ul style="list-style-type: none"> • Is there sufficient surveillance during the day and night? • Is there lighting to support low-light hours of the day?
Bike parking	Secure parking facilities. The body of the bike can be lockable.	Located at key public or retail facilities requiring public access.	<ul style="list-style-type: none"> • Is it clear of the path or trading area? • Is it at least 1 m clear of other street furniture? • Is there surveillance during the day and darker hours? • Is there available lighting? • Is it supported by the private property if located in front of a private property?
Drink fountains	Public water fountains.	Located within reserve with access to a Primary or Secondary Route.	<ul style="list-style-type: none"> • Is there an available water outlet?
Wayfinding signs	Signage providing direction to suburb or local landmark providing distances.	Located on every route.	<ul style="list-style-type: none"> • Is this location a decision-making point? • Does this location need a repeater sign? Is the distance between the next and previous directional sign a

			<p>significant distance apart (the distance is dependent on whether it is on a trail or within an urban area).</p> <ul style="list-style-type: none"> • Is the location of the sign visible from all directions? • Are the signs catering for all directions of travel? • Does the sign require an update? • The signs should consider: <ul style="list-style-type: none"> ○ pointing to the next suburb ○ any shops or major public landmarks ○ the requirement of any G5-9 signs to identify useful facilities towards that direction.
Tree planting	Trees provide suitable shading from harsh weather conditions and supports the surrounding natural environment.	Along shared paths. Increasing tree canopy and health of existing tree stock will be considered during construction and renewal	<ul style="list-style-type: none"> • Is there a 1 m clearance from the path and the mature size of the tree? • Does the tree canopy allow for a 2.2 m vertical clearance of the path?

		of the shared path network.	<ul style="list-style-type: none"> • Is the proposed tree for planting suitable for the area? • Once mature, will the tree create a maintenance issue?
Bike lantern	Dedicated bike light to allow cyclists to cross a signalised intersection on a bike.	Located mid-block where there is a high volume of cyclists crossing the road or where a cycling route connects.	<ul style="list-style-type: none"> • Does the bike lantern location comply with the Department of Transport requirements ?
Path lighting	Lighting to improve surveillance and safety during darker hours.	Paths with sufficient sunlight to install solar lighting or access to hardwiring. This should comply with Australian Standard requirements of P3 level of service.	<ul style="list-style-type: none"> • Is there an available hardwire source or sufficient sunlight exposure? • Is the path within a site of biological significance? • Is the path prone to flooding?
Refuge crossing	Accessible crossing facilities located either at midblock or intersection. These provide safe crossing locations where each lane of traffic can be crossed at a time.	Located mid-block where there is a significant volume of two-way traffic but does not justify a dedicated signalised crossing point.	<ul style="list-style-type: none"> • Does the site experience a significant level of traffic or cycling use? • Are there any vulnerable cyclists using this path? • Does the location improve access to destinations with vulnerable cyclists (e.g.

			<p>schools, retirement village).</p> <ul style="list-style-type: none">• Will the installation of a crossing facility improve access for pedestrians as well?
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Personal mobility transport modes and services are continuously evolving with the rise of bike share schemes, privatised bicycle parking facilities and provisions of bicycle supplies in public spaces. Council will also work towards investigating these initiatives to ensure that our transport network responds and reflects the growth of technological advances within this space.

Figure 9: Examples of personal mobility and infrastructure improvements that Council can investigate further.



Bike share

- Bike rental scheme where users collect a bicycle for a selected dock or location and pay for the time used, usually through an app.



Scooter hire

- E-scooter rental scheme where users collect a scooter from a selected location and pay for the time used through an app.



Parkiteer

- Free service that provides a safe bicycle-parking facility at a station. Users are required to pay a refundable bond. Although located only at local train stations, Knox will aim to advocate for Parkiteer installations at major transport hubs.



Bike tower parking systems

- Bike towers allow for high-capacity bike parking with minimal footprint. They can also be used as key landmarks to enhance the local urban environment.



All-glo linemarking

- Glow in the dark linemarking could be utilised within environmentally sensitive areas to improve delineation at night as an alternative to street lighting. This product would reduce impact on local nocturnal animals. However, sufficient access to UV is required to be effective

Cyclist experience

Although the KCAP focuses on the delivery of infrastructure, the community highlighted on multiple counts that trails are not only used for community. The community suggested that they wanted to be part of an experience when travelling along key cycling routes and trails. These experiences could include tourist destinations, cycling program promotion, education of environmental and historical sites, and artwork could be scattered along the route.

Respondents also indicated that formalised trail names for Primary Routes in Knox would be useful to better identify and promote specific routes. Common route or trail names would assist in wayfinding through the network.

Future projects could include:

- the formalisation and advertising of trail names and routes in Knox
- the development of tourist and recreational trail routes along the major routes and circuits by enhancing educational, historical, environmental and artistic experiences.

Moving forward, Council also needs to place emphasis around advertising new cycling links to the community to raise awareness that cycling within Knox's neighbourhoods are competitive, safer and an alternative mode of transport to the private motorised vehicle.

There are a varying promotional methods ranging from social media, newspaper and on-site pavement markers. Based on focus group feedback, the programs, facilities and infrastructure available to residents and visitors appear to be poorly advertised with most respondents unaware of current projects and programs aimed at improving and encouraging cycling within Knox.

Mountain biking

Although this KCAP only focuses on the commuting and recreational shared path and on-road cycling facilities, the need for dedicated mountain bike trails and jumps was a reoccurring theme throughout the committee, online and survey consultation processes.

The types of mountain bike facilities that the community were interested in included:

- mountain bike trails
- junior and advanced freestyle jump facilities.

Additionally, in response to the increase of ad hoc mountain bike trails and jumps that were created by the public, it is recommended that a 'sand box' facility is investigated where public members could construct their own jumps and routes in a safe space without the risk of degrading the natural environment.

Council is now working toward developing a strategy to identify future sites suitable for mountain biking. Findings and comments received through the KCAP consultation process were provided to support the future strategy.

Building our future network

To support the needs of our changing community, Knox's cycling network must evolve in the next coming decades into a recreationally focused network that can provide a viable and safe transport option for residents, visitors, workers and students. As such, a network analysis was undertaken to understand where the key destinations are located across our municipality.

As highlighted in the following maps, key land uses included:

- key employment hubs
- Activity Centres and major hubs
- early years and kindergarten facilities
- primary schools
- secondary schools
- tertiary schools
- health providers
- recreational facilities.

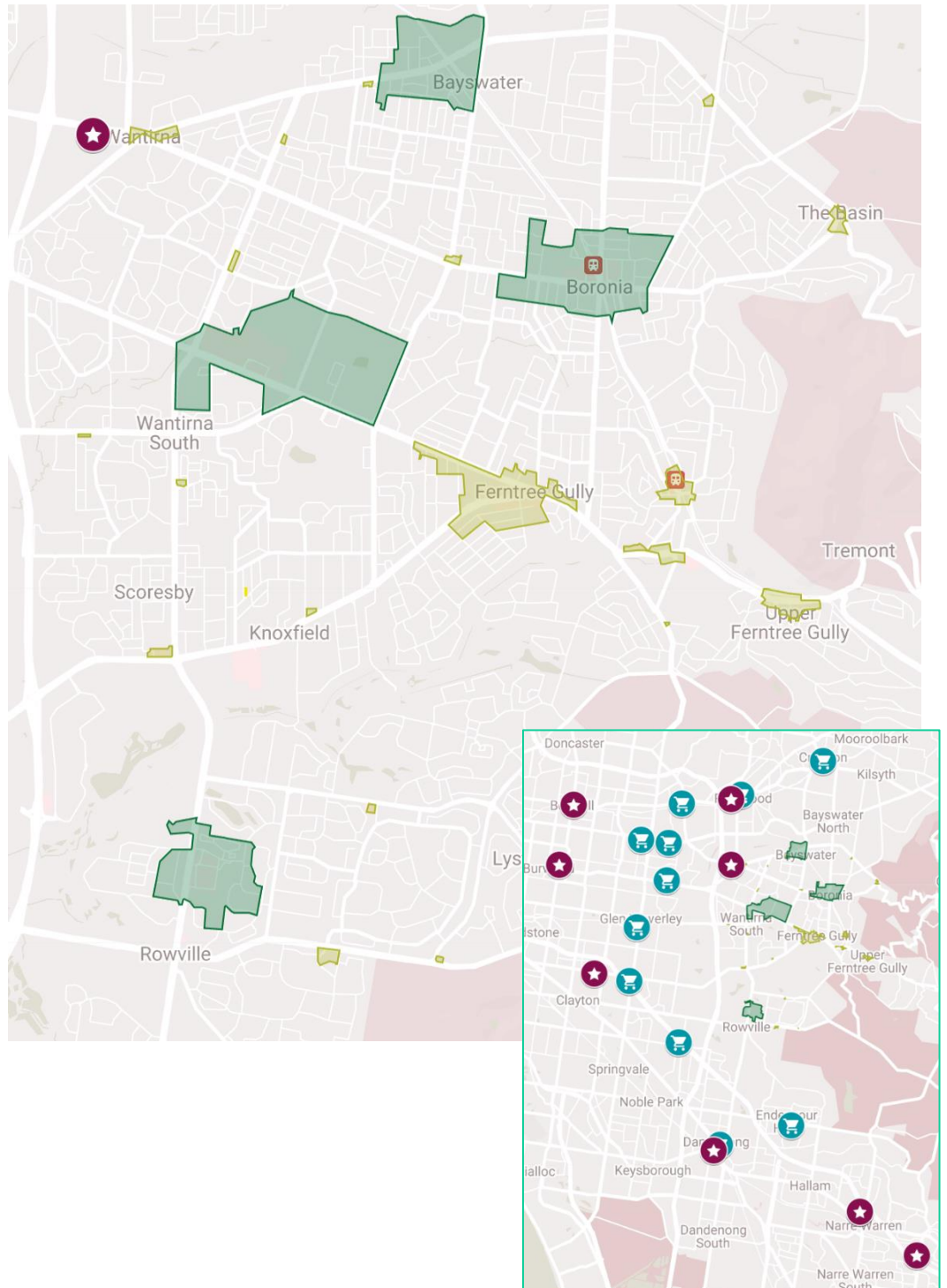
In support of the Movement and Place framework, land uses were referenced against key transport corridors and hubs. These included:

- train lines and stations
- the Victorian Strategic Cycling Corridors
- route priorities indicated in the Eastern Regional Trails Strategy
- major public transport hubs and interchanges located in Knox
- safe crossing locations.

Activity Centres

Under the Victorian Government's strategic document, Plan Melbourne 2017-2050, the following suburbs are identified as providing Major Activity Centres:

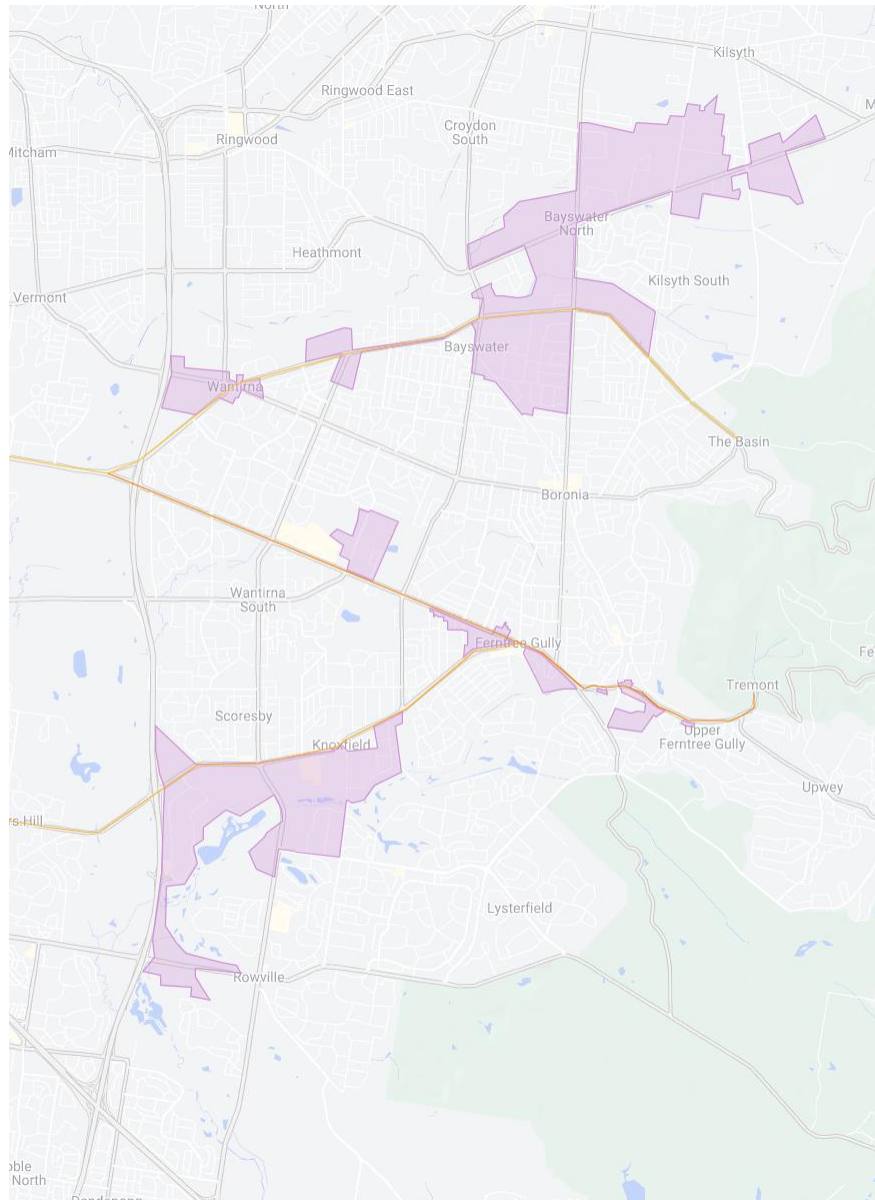
- Bayswater
- Boronia
- Rowville (Stud Park)
- Wantirna South (Knox Central)



Employment hubs

Five key employment hubs located in Knox:

- Bayswater Business Precinct and Activity Centre
- Scoresby – Rowville – Knoxfield Employment Cluster
- Knox Central
- Burwood Highway East Employment Precinct
- Wantirna Health Precinct

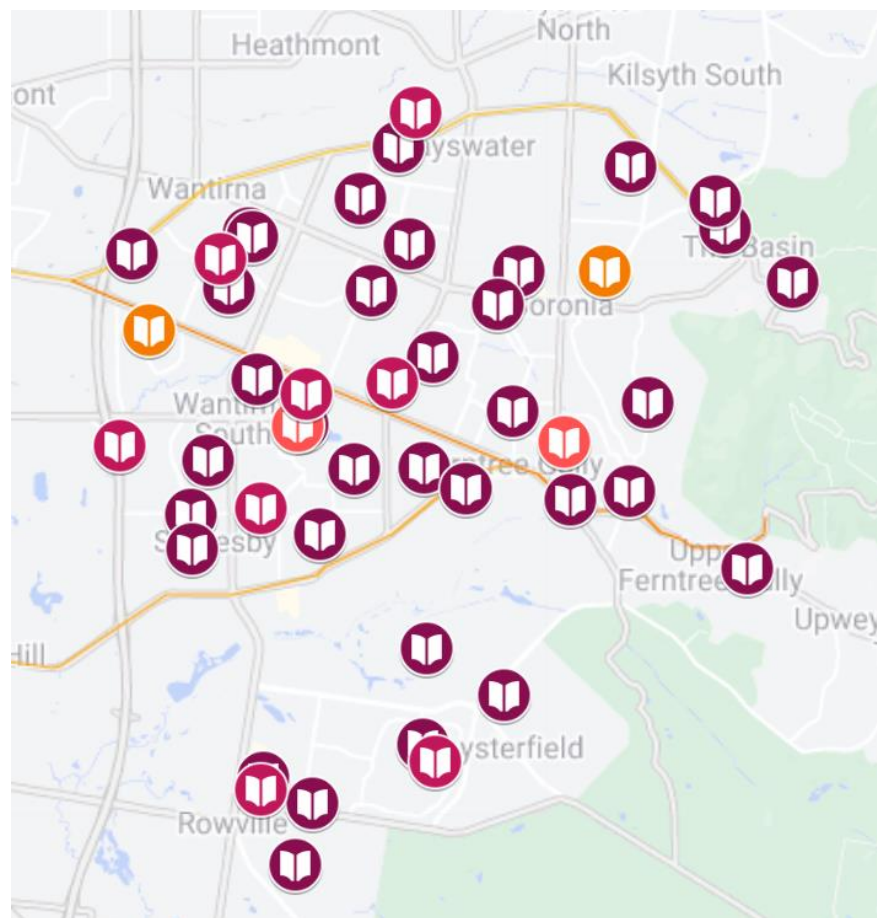


Primary and secondary schools





In the past, cycling to school was a key mode of transport for students. In recent decades, bike education was incorporated into many school programs to encourage safe cycling practices and to provide an understanding on how to ride a bike.

In Knox, our schools comprise of:

- 35 primary schools
- nine secondary schools
- two K-12 schools
- two special needs schools.

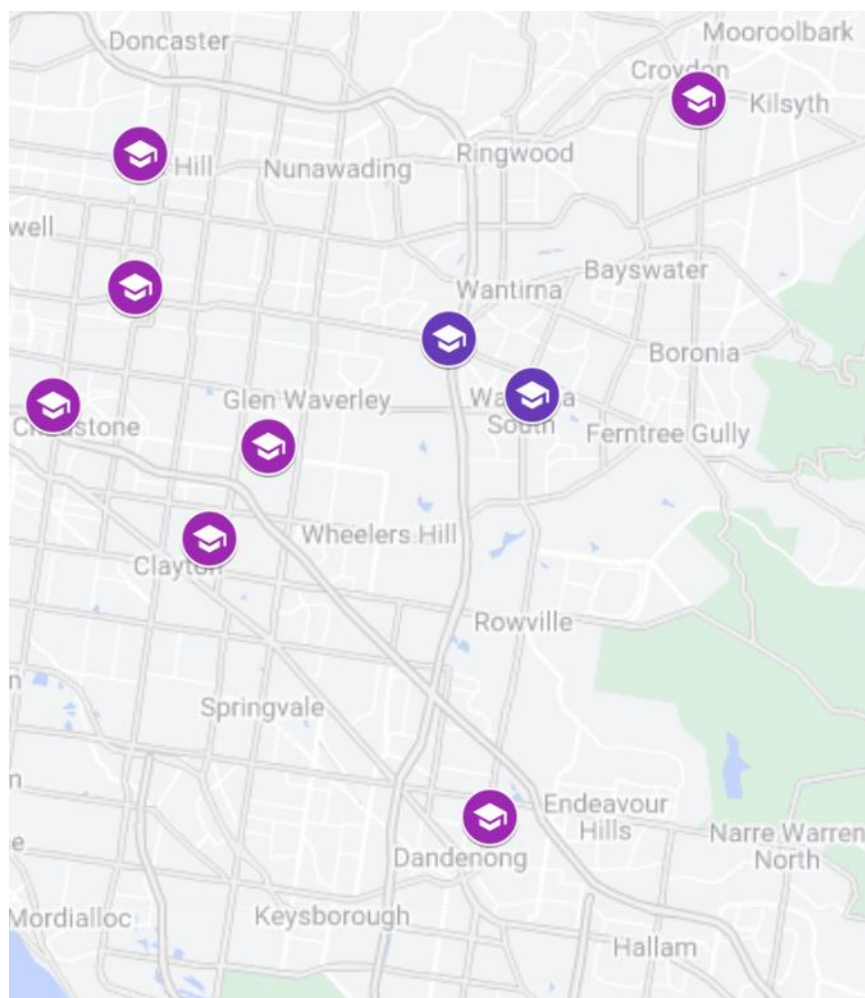


Legend



-  Primary School
-  Secondary School
-  K-12 School
-  Special Needs School

Tertiary schools

Swinburne University (Wantirna campus) and the Melbourne School of Theology are the only tertiary facilities located in Knox. For many tertiary students, cycling provides a cheap, reliable and independent form of transport. Combined with the train network, students are able to access tertiary facilities outside of the municipality.



Legend

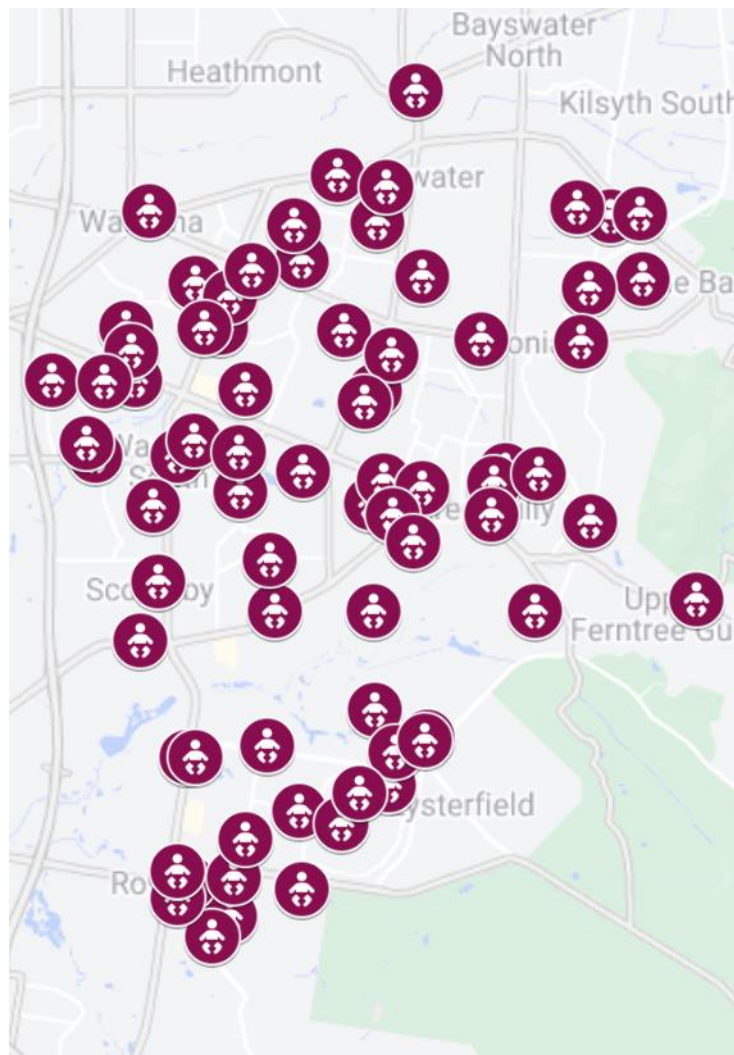
-  Tertiary facility in Knox
-  Tertiary facility outside of Knox

Early years and kindergarten facilities

Several early years, child care and maternal health clinics and kindergartens operate within Knox with a combination of publicly and provided facilities (see the map below).

Community consultation results indicated that parents were looking for more options for outdoor recreational opportunities with younger children. As reflected by international research, observations in Knox also saw a decrease in active transport use (i.e. cycling, walking, scooting, skateboarding) to school post the COVID-19 pandemic.

Similarly, studies have also shown that parental behaviours, and exposure to active transport options at a pre-school age impact on active travel rates of children as they get older. As a result, it is important to ensure cycling facilities are not only safe but an attractive alternative for parents and students alike and that they are exposed from a younger age.



Recreational facilities

Knox has a range of strategically significant open spaces and sports facilities that have local, municipal-wide, regional and state importance and draw audiences from varying distances.

Knox hosts the State Basketball Centre in Wantirna South while Gilbert Park, Knoxfield is identified as a regional centre for recreation and a sporting ground, mainly a hub for skaters, BMX riders and baseball teams.

Although both locations have poor access to public transport, each site could have improved connection to key cycling trails – The Blind Creek Trail and the Ferny Creek Trail, respectively.

Table three: Key municipal open space and sports facility sites

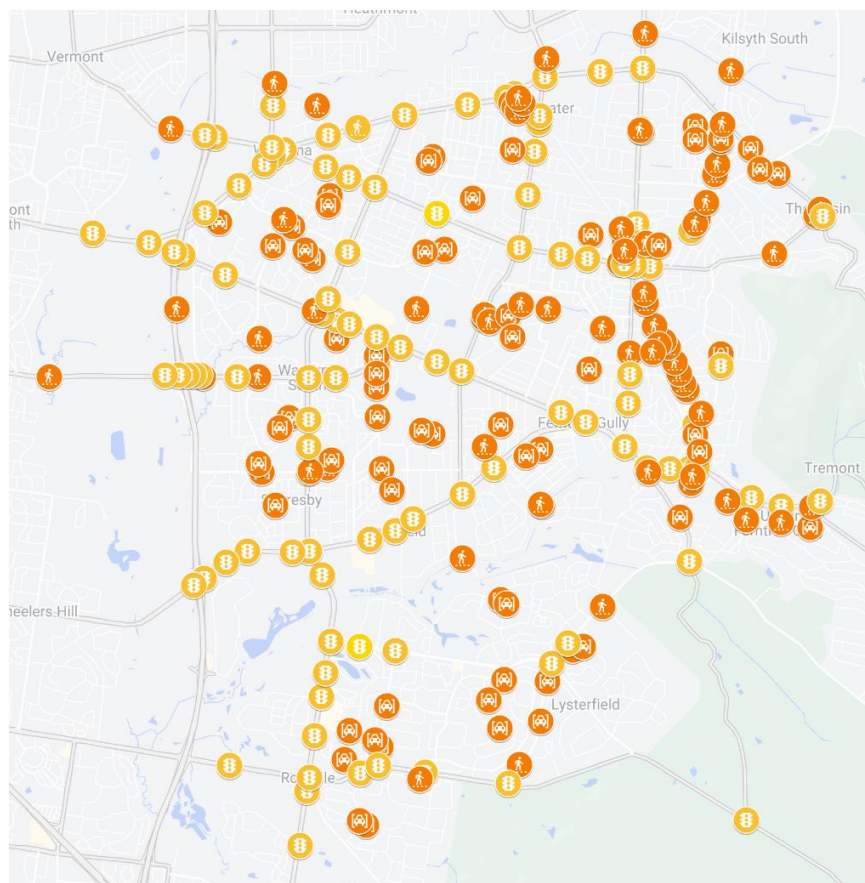
Open space	Sports facilities	
Marie Wallace (Bayswater Park)	Batterham Reserve	Walker Reserve
	Colchester Reserve	Carrington Park
Lewis Park	Egan Lee Reserve	Dobson Park
Tim Neville Arboretum	Fairpark Reserve	Eildon Park
Ferntree Gully Cemetery	H. V. Jones Reserve	Guy Turner Reserve
	Knox Gardens Reserve	Kings Park
Gilbert and Knox Park	Lakesfield Reserve	Lewis Park
	Liberty Avenue	Marie Wallace Bayswater Park
Wally Tew Reserve	Miller Park	Milpera Reserve
Boronia Park	Park Ridge Reserve	Pickett Reserve
Eastern Regional Sports Park	Rowville Recreational Reserve	Schultz Reserve
	Wantirna Reserve	Talaskia Reserve
Wantirna Reserve	Scoresby Recreation Reserve	Tormore Reserve
	Stamford House	Wally Tew Reserve
Stud Park Reserve	Templeton Reserve	Gilbert Park Reserve (Regional)
	Wantirna Recreation Reserve	Knox Regional Sports Park (State)

Safe crossing locations




Community consultation results indicated that people are willing to detour or cycle along a longer route if there is a safer space to cross or it is a better route option with dedicated facilities. As part of the network analysis, the following safe crossing locations were identified:

- signalised crossing locations
- school crossings
- refuge island crossing points
- underpasses
- zebra crossings.

To ensure the network encourages safe practices when cycling the road, the network analysis used existing crossing points to formalise safer cycling routes.



Legend

-  Signalised crossing (traffic lights/pedestrian-operated signals)
-  School crossing
-  Refuge island/underpass

Knox's cycling priorities

Using the strategic values underpinning the KCAP, key destinations and safe crossing routes highlighted above, an aspirational cycling network was generated which consisted of the following route hierarchy:

Knox cycling network hierarchy	Movement and Place category	Description	Example
Primary Route	C1 and C2	Arterial routes that are direct and can facilitate higher volumes of cyclists at a time. These routes minimise interaction with general traffic to allow for continuous travel and provide regional connections to adjacent municipalities. This category also includes the State Government-identified Strategic Cycling Corridors.	Eastlink Trail Burwood Hwy Ferry Creek Trail
Secondary Route	C3	Link routes that provide a connection between primary routes and local streets. These routes have dedicated cycling facilities that may be either on-road or off-road that provide significant connections within the City of Knox.	George Street Kelletts Road Napoleon Road
Local Routes	C4 and Cycling Non-Priority Routes (CPN)	Routes along streets with low traffic speeds and volumes. These routes are generally on-road facilities which provide a last mile connection.	Koomba Road
Recreational Routes	Cycling Recreation (CR)	Regional trails that are, for the most part, shared paths and separated from general traffic.	Proposed Ferry Creek extension to Glenfern Valley Bushland Reserve

Note: Movement and Place categories are detailed in Appendix 2.

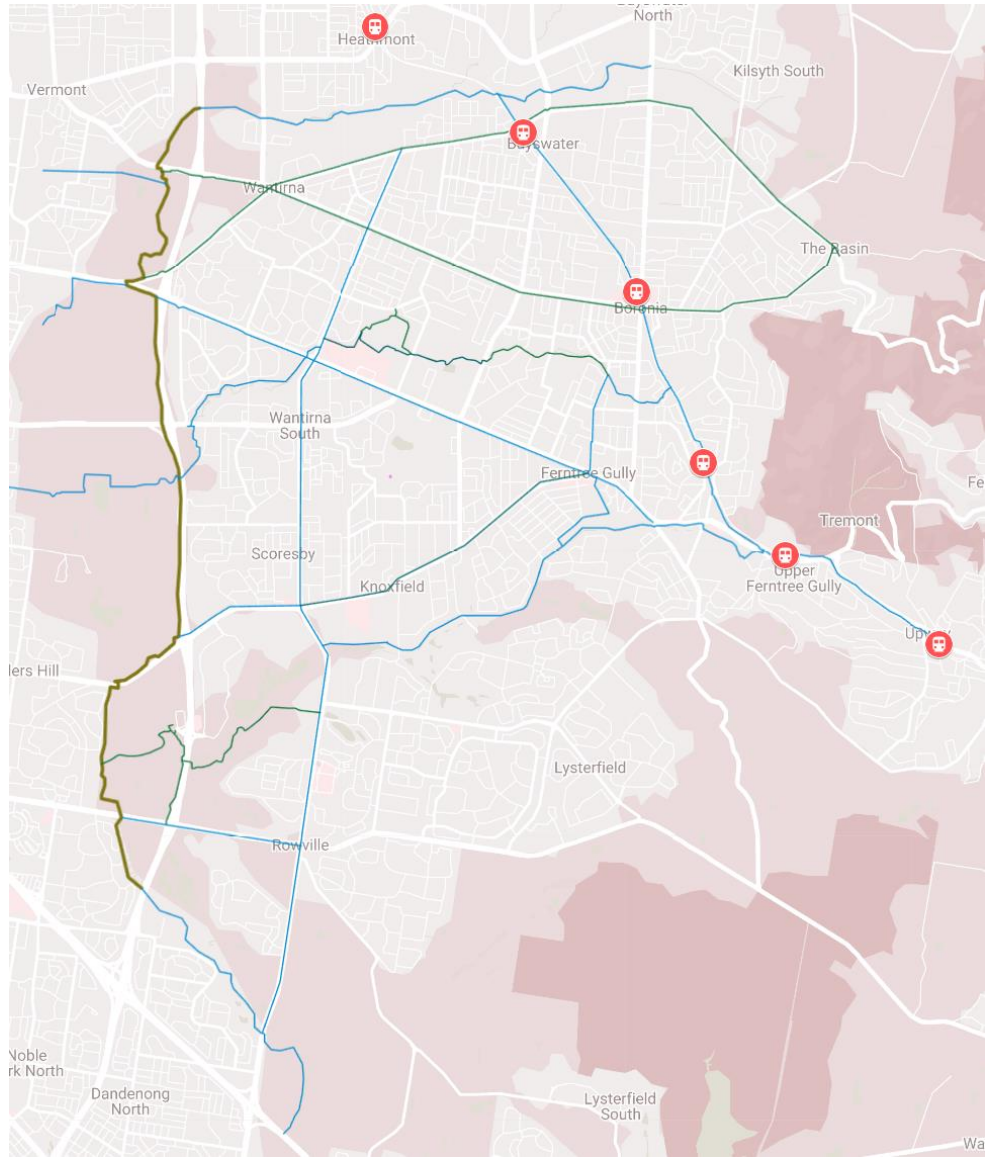


Figure 6: Knox's primary cycling network comprising the strategic cycling corridor.

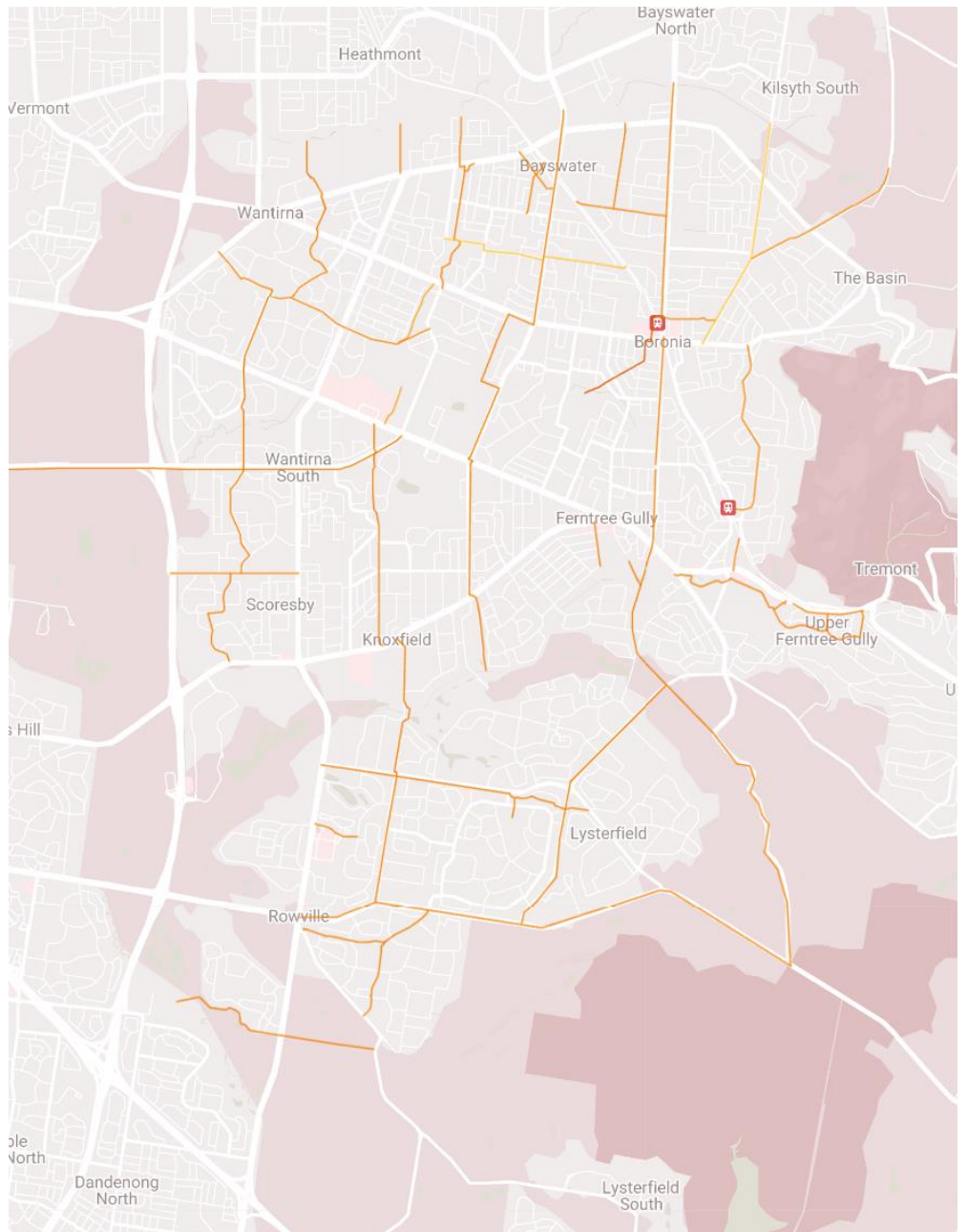


Figure 7: Knox's secondary cycling routes (orange)

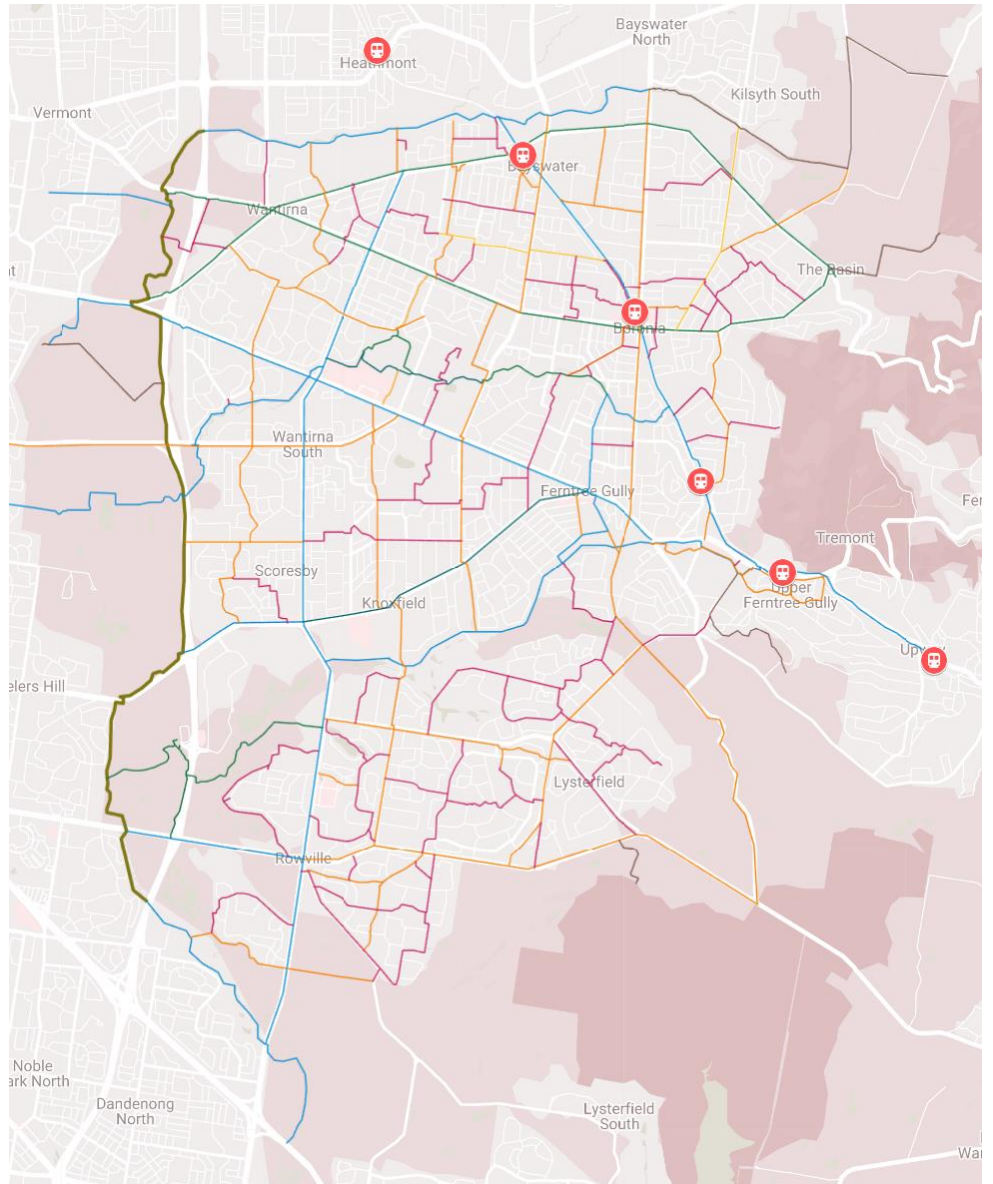
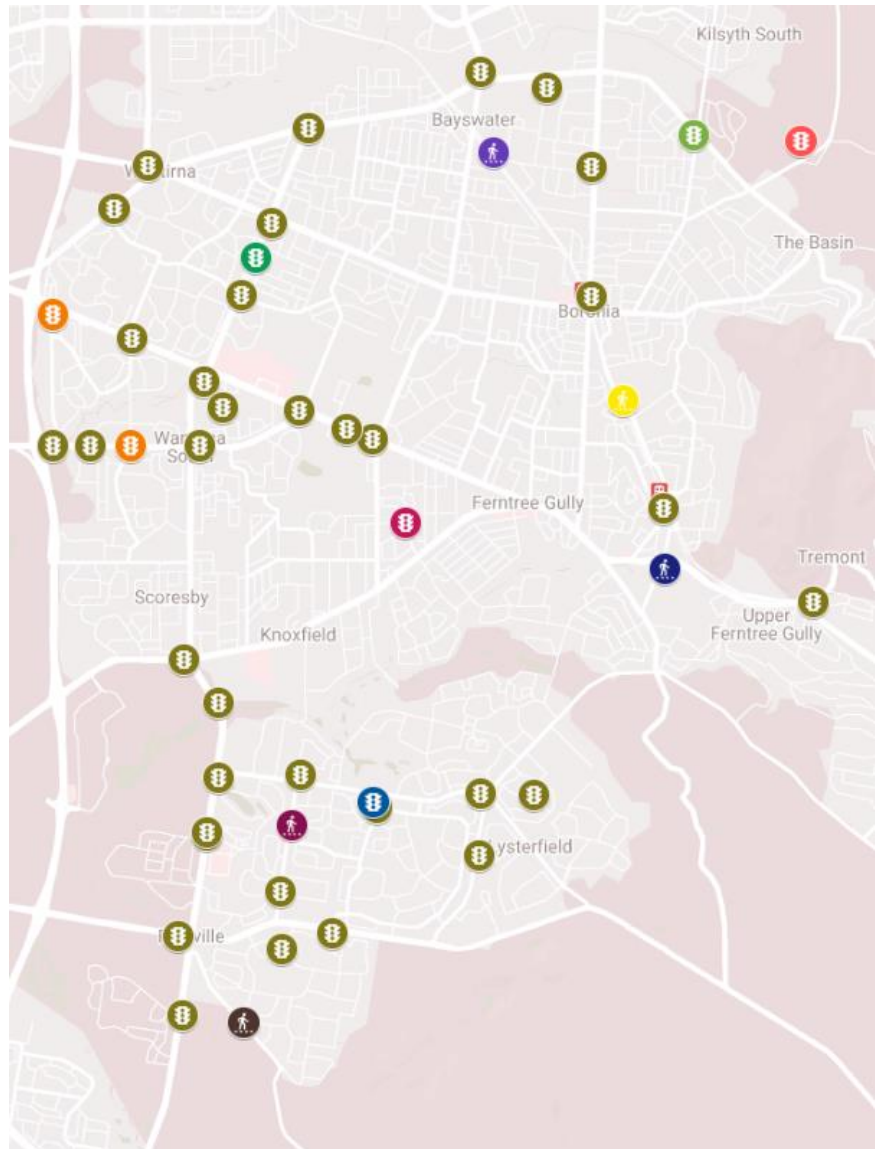


Figure 8: Knox's cycling routes (primary, secondary, local routes and recreational routes)

As shown in the map below, locations for upgrades and new safe crossing facilities were identified. Works included for these sites varied, with some sites requiring full intersection upgrades, installation of bicycle lanterns (signals) or providing a refuge when in low-traffic speed areas.



Delivering our network

In furthering Knox's cycling network, Council is responsible for:

- maintaining the shared path and on-road network within Council-owned land and local roads
- maintaining cycling infrastructure on leased land which may be owned privately or by the State Government
- improving on-road cycling-only facilities along local roads within the City of Knox
- undertaking condition audits every four years to understand the quality of each section of Council-managed shared paths. This process informs Council's maintenance and renewal programs.

The KCAP's network focuses on delivering Primary, Secondary and Local Routes that provide regional and local connections aiming to provide safer cycling routes from the home to the desired destination.

As the proposed network spans over 200 kilometres of cycling facilities, construction will need to be completed over several decades during which the urban and natural landscapes would logically evolve.

However, funding the installation of cycling infrastructure is dependent on Council's annual budget process.

Cycling facilities are delivered in several ways:

- as part of a reserve's masterplan
- as part of a road design and upgrade process
- as part of private or state-built developments
- a separately funded bicycle facility.

As a result, a variety of teams are responsible for the delivery of cycling infrastructure. Projects submitted for funding and delivery are organised through the Capital Works program using a ranking criteria. Although these programs provide an opportunity to improve Knox's cycling network, the programs are usually delivered separately with their own criteria and objectives. This results in missing out on minimising costs to deliver Council cycling infrastructure or upgrade existing footpath networks into shared path facilities.

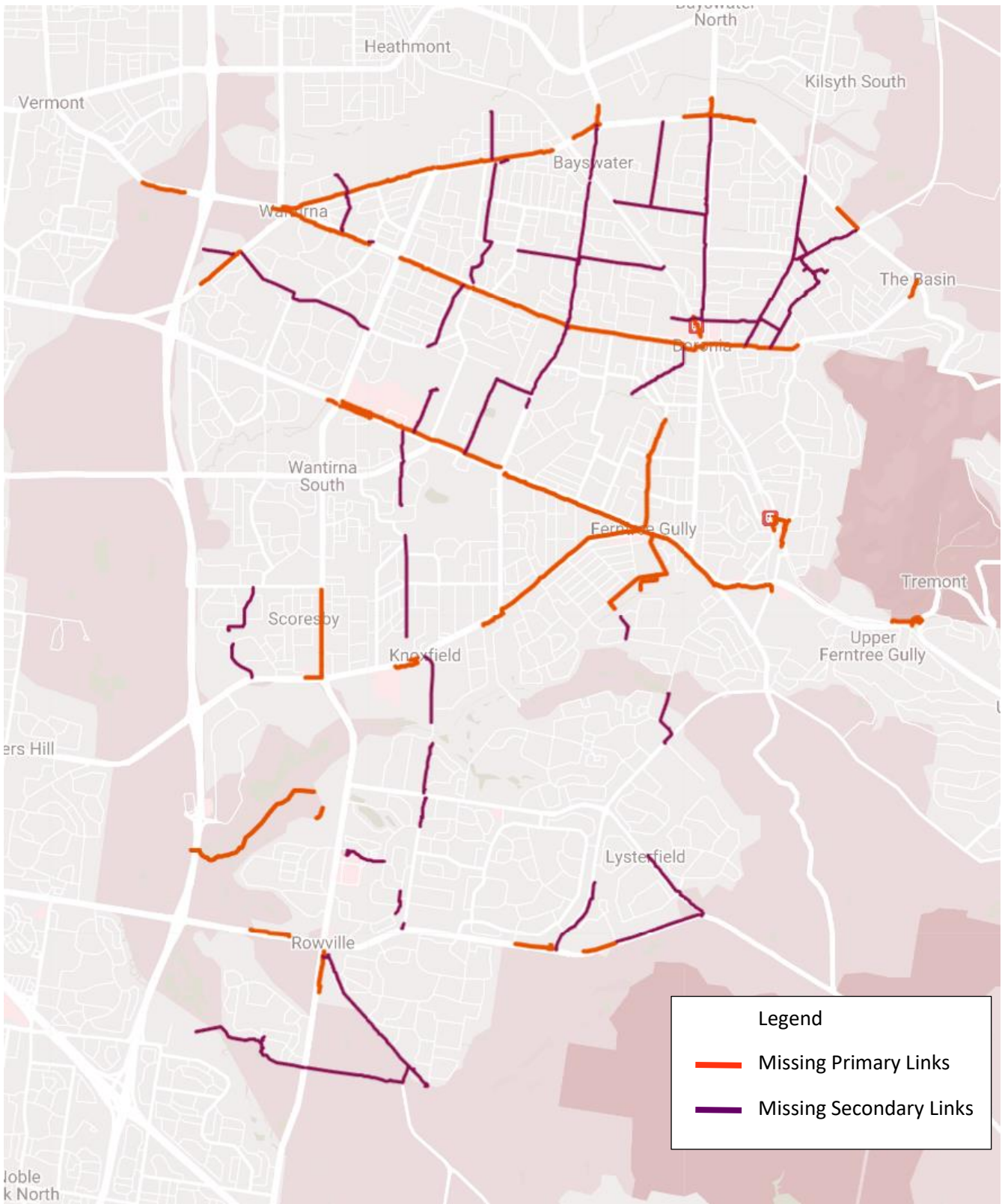


Figure 10: Missing Primary and Secondary cycling links for delivery

Establishing a Knox cycling network would identify new, renewal or upgrade projects requiring delivery. By delivering components of the cycling network as part of other projects, Council will be able to reduce disruption to the local neighbourhood and minimise project costs.

This will be further supported by the development of a dynamic, easy to use and access online interactive map that can be updated to allow daily alterations where needed. This will allow officers to appropriately respond to:

- new developments
- service locations
- geographical and topographical constraints
- improving connectivity
- plant growth.

Program	Affected infrastructure	Delivery team
Capital Works 4006 – New Shared Path program	New construction for shared paths, on-road cycling facilities and supporting cycling infrastructure	Transport and Traffic
	Upgrade and construction of new paths as part of an Open Space and Landscape Masterplan	Open Space and Landscape
	Shared path asset renewal program	Construction Group
Road Reconstruction project	Road reconstruction that looks at pulling out the existing kerb and channel	Project Delivery
Major Initiatives Unit projects	Projects may look at reconfiguring or developing larger Council sites	Major Initiatives Unit
Mobility Implementation Plan	Installation of seating across the pedestrian and shared path network across Knox	Transport and Traffic

Table 6: Capital works programs that assist in expanding Knox’s cycling network.

Council’s Capital Works program is restricted by the level of funding allocated to cycling infrastructure each year. As a result,

Knox's cycling network has been limited to expanding routes in small sections at a time.

Feedback from workshop and phone survey respondents indicated that they were not seeing many improvements made to increase Knox's cycling infrastructure. As a result, current projects are sometimes regarded as disconnected or unusable until such a time the whole link is completed.

Our future cycling network should deliver meaningful connections rather than using a piecemeal approach. As such, routes should be continuously constructed along one route until one link is completed. For example, in the last three years Council has focused on completing the cycling links along Napoleon Road, Mountain Highway and the on-road cycling facilities that make up the Wantirna Cycling Link. These routes were constructed over the course of three to four years and upon completion, cyclists can now connect:

- along Napoleon Road from Kelletts Road to Wellington Road
- along Mountain Highway from Scoresby Road to Dorset Road. This will eventually be part of the Mountain Highway link that will connect the Eastlink Trail to The Basin triangle along the northern side.

Additionally, Council could fast track the construction of the cycling network by:

- allowing renewal projects to upgrade existing footpaths to shared paths when the section of path is requiring reconstruction
- coordinating the delivery of missing cycling links in conjunction with other Council-delivered projects even if the route is considered lower in priority to minimise disruption to the community and reduce cost.

Knox has a strong sustainable transport advocacy portfolio with past projects supported by federal and state funding. Recent examples include:

- federal funding for the Burwood Highway shared path bridge overpass feasibility study
- state funding and delivery of the Burwood Highway shared path bridge and missing link to improve connection between the Eastlink Trail and the Dandenong Creek Trail.

Given the KCAP's proposed extensive network, Council will continue to advocate and work with State and Federal Governments to improve and expand our cycling facilities for residents and visitors alike.

Network design considerations

When delivering new cycling links, consideration needs to be given to the facility type, level of stress a user may encounter, available road space, topography, protection of native natural environments and materials required for use.

The following figure demonstrates the types of facilities that we will endeavour to deliver to reduce the level of stress and provide high-quality cycling facilities.

However, if site constraints cannot be mitigated as part of the project, we will gradually exhaust our build options and balance it with the available funding opportunities to ensure we can provide a cycling facility within our means and which is the best value for our community.

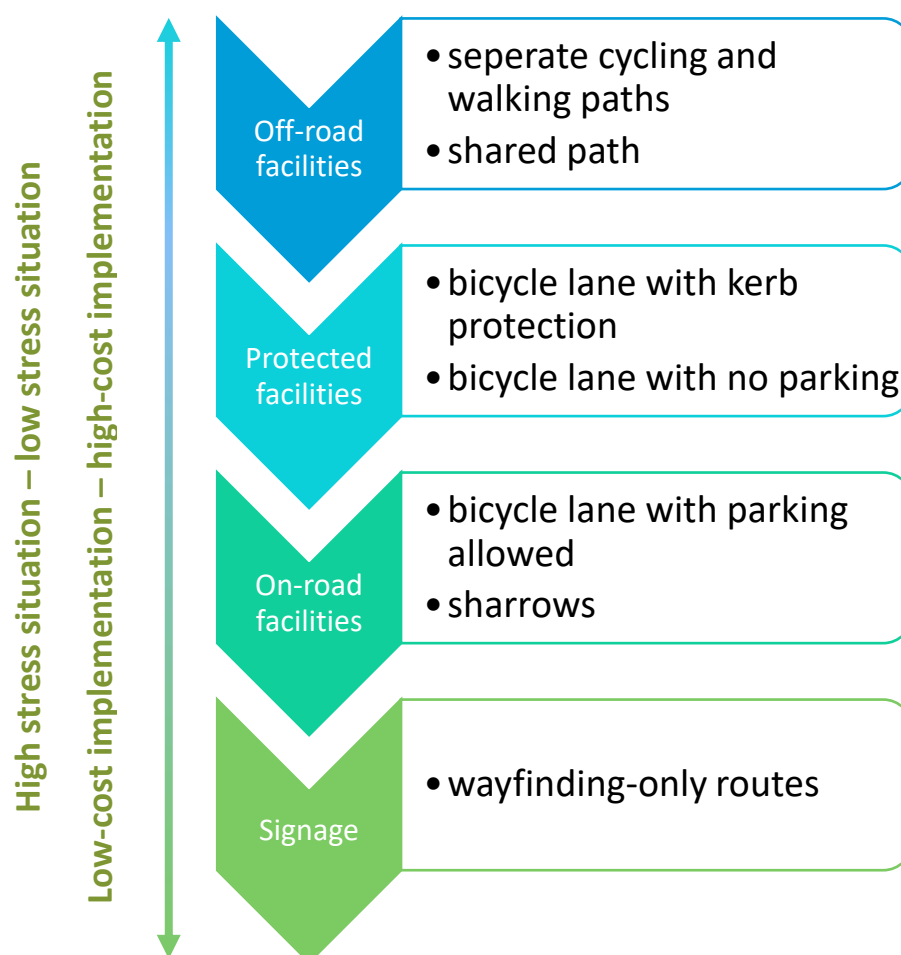


Figure 11: Hierarchy of preferred cycling facilities

Knox's urban landscape is diverse with tightly urbanised areas shifting to rural mountainous landscapes towards the Dandenong Ranges. Our City aims to protect and reawaken our original environmental landscapes. As a result, we utilise different construction methods and materials to appropriately respond to a route's site constraints. Following are examples of commonly used materials for our cycling network.

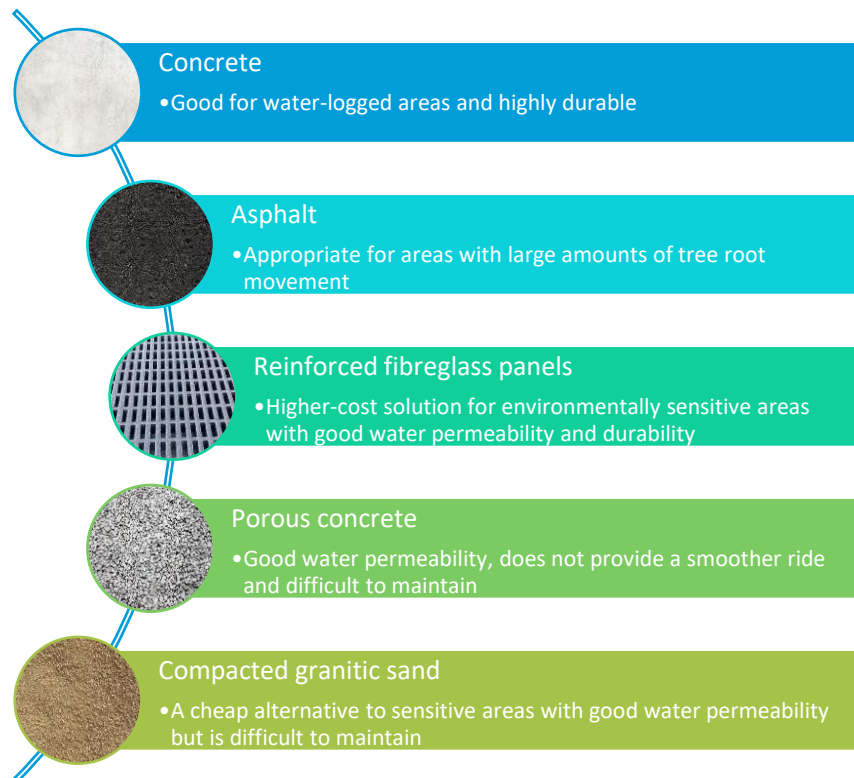


Figure 12: Preferred path construction materials.

Responding to climate change

Council recently adopted our Climate Change Response Plan which highlights a shift to enhance existing natural environments while making more sustainable improvements such as alternative modes to motorised private vehicles. As part of these key actions, the plan aims to:

- make sustainable transport options more accessible and appealing, including enhancing cycle and walking paths, providing better links between transport modes and advocating more efficient public transport to the region
- implement the Living Melbourne Metropolitan Urban Forest Strategy, which includes setting canopy tree targets.

When constructing new shared path links, internal teams work together closely to identify significant vegetation sites and to minimise any impact on natural environments including the reduction of vegetation or applying relevant vegetation off-sets as part of the path design and construction process to maintain the ecological corridor of the area. In other cases, once the path is constructed, the Parks team is notified of potential sites to increase canopy tree planting once the shared path is constructed.

Under the Metropolitan Urban Forest Strategy, Council is working towards a 30% canopy cover by 2050. As a result, we are increasing the amount of urban street planting to support this canopy target. Although canopy cover is an important aspect of enhancing cyclist and pedestrian comfort while travelling, the construction and expansion of the cycling network cannot keep up with the increased planting rates across the municipality. As a result, streets with wider nature strips identified as future shared path links are planted out with street trees before installation of a new path or upgrading of an existing footpath. Without the removal of these planted trees, future construction of a shared path becomes less viable once funding is obtained for the design and delivery of the shared path.

In response, Council will need to review existing processes and consider adoption of the following options:

- Option 1 – Prioritising shared path construction on selected routes
 - This initiative looks at placing a halt to street tree planting on identified cycling routes. Once constructed, tree planting will occur to maximise the amount of canopy cover along the street.

- This option would also delay the implementation of tree canopy planting across the municipality but would reduce the removal of planted trees in the future.
- Option 2 – Present Day Planting with Future Removal
 - This initiative allows immediate continued planting across the municipality's nature strips. Once funding is secured for the design and construction of a shared path, the design would aim to retain or relocate as many trees as possible along the route but the project team would be able to remove street tree vegetation to meet safety and accessibility standards required when constructing a shared path. Upon construction of the shared path, the project team will then replace removed trees where possible or further enhance the cycling link corridor with additional planting.
 - This option would mean the potential removal of healthy vegetation within the road reserve and increased project costs for removal and planting. However, vegetation would have five-20 years worth of enhancing the natural corridors within Knox and upon completion of the project, additional planting could occur.

The road reserve is high-value property where services, vegetation, accessibility and mobility corridors are located. It commonly encompasses the nature-strip, path, road and sometimes tree reserves with the intention that this space could one day be redesigned to widen the existing road space. With such a restricted amount of land and the need to adhere to stringent design requirements, the delivery of community assets needs to balance all different asset requirements and land-uses to ensure that the community is receiving the full benefit of Council's services.

The Action Plan

A separate document has been prepared for the Knox Cycling Action Plan. In summary, the findings and above discussion was used to inform the five categories for delivery:

- evolving our network design
- investing in capital works
- increasing our awareness
- managing our network
- investing in the future.

Although various actions require different teams to deliver the project, the Transport and Traffic team will monitor the overall progress of the KCAP.

The proposed KCAP is extensive and only focuses on delivering the primary routes in the next 10 years which already requires a significant investment from Council. As there are still the secondary and local routes identified to be completed, the KCAP could continue to inform the following decades and be extended into a 20 to 30 year plan if appropriate. Due to the fast changing nature of our urban environment which we expect will have additional developments over the next 10 years, the plan should still be reviewed after a decade to ensure relevancy.

Please refer to the Knox Cycling Action Plan for the full list of deliverables.

Appendix 1 – Route allocation

The following is a list of missing cycling links in Knox organised by their Movement and Place cycling categories. Only projects that are expected to be funded between 2025-2035 have been included. Therefore, local routes have not been included.

Note: Proposed alignments may be altered or diverted along a parallel route to improve safety and the ease and efficiency with which the route can be built. Trails are not rank in any order.

Primary Routes

Cycling category	Road/trail link	Link	Distance (metres)	Project notes
C2	Dandenong Creek Trail	Chandler Lane to Liverpool Road	577 m	
C2	Railway Trail	Chandler Road to Maryville Way	430 m	Requires VicTrack assistance
C2	Railway Trail	Underwood Road to Alpine Street via Ferntree Gully Train Station	900 m	Requires VicTrack assistance or level crossing removal
C2	Railway Trail	Burwood Hwy to Railway Avenue Upper Ferntree Gully Station entrance	80 m	Requires VicTrack approval. Project funded for 2023
C2	Railway Trail	Rear of Upper Ferntree Gully CFA to Dandenong Tourist Road intersection	580 m	Requires Parks Victoria and Yarra Ranges Council assistance
C2	Burwood Hwy	South side – Stud Road to Lynne Ave	400 m	Requires lease agreement and Department of Transport and Planning approval
C2	Burwood Hwy	North Side – Stud Road to Scoresby Road	2,100 m	Requires Westfield Knox and Department of Transport and Planning approval Supports the construction of Knox Central
C2	Stud Road	Blind Creek Trail to Burwood Hwy	200 m	Requires Westfield Knox and Department of Transport and Planning approval
C2	Burwood Hwy	South side – Scoresby Road to Clyde Street	940 m	Consult with business owners
C2	Burwood Hwy	South side – Clyde Street to Ferntree Gully Road	800 m	Consult with business owners
C2	Burwood Hwy	South side – Ferntree Gully Road to Dorset Road	700 m	Consult with Business Owners
C2	Burwood Hwy	South side – Dorset Road to Ferny Creek Trail/Glenfern Road	500 m	Consult with business owners
C2	Commercial Road	Burwood Hwy to Wattletree Road	500 m	Tree planting concerns

Cycling category	Road/trail link	Link	Distance (metres)	Project notes
C2	Wattletree Road	Commercial Road to Blind Creek Trail	950 m	Tree planting concerns
C2	Stud Road	West side – George Street to Scoresby Recreation Reserve	1,200 m	Partial construction on Service Road
C2	Stud Road	West side – Scoresby Recreation Reserve to Ferntree Gully Road	150 m	Requires redesign of road and approvals from Department of Transport and Planning. Current footpath is not DDA compliant due to bus stop
C2	Stud Road	West side – Timbertop Drive to Police Road	620 m	Partial construction on Service Road
C2	Fitzgerald Street	Burwood Hwy to Kevin Avenue	550 m	Requires lease agreement with businesses
C2	Kevin Avenue	Fitzgerald Linear Reserve to Lea Street shared zone	130 m	
C2	HV Jones Park	Lea Street to Ferny Creek Trail	350 m	
C2	Ferntree Gully Road	Lynton Place to Stud Road	230 m	Requires lease agreement with businesses. Tree constraints
C2/C3	Mountain Hwy	North side – Pedestrian-operated signals outside Wantirna Primary to Petalnina Drive	650 m	Significant vegetation concerns
C2/C3	Mountain Hwy	North side – Boronia Road to Dunbarton Drive Pedestrian-operated Signals	1,100 m	Partial construction on service road. Department of Transport and Planning approval required
C2/C3	Mountain Hwy	North side – Dunbarton Drive Pedestrian Operated Signals to Stud Road/Waldheim Road traffic lights	750 m	
C2/C3	Mountain Hwy	North side – Waldheim Road to Marlborough Road	550 m	Partial construction on service road
C2/C3	Mountain Hwy	North side – Marlborough Road to Valentine Street	900 m	
C2/C3	Mountain Hwy	North side – Bus stop near James Abernathy Memorial Drive to Scoresby Road	310 m	
C2/C3	Mountain Hwy	Withers Road to Dorset Road	350 m	Service road on-road connection
C2/C3	Mountain Hwy	North side – Dorset Road to Army Road	550 m	
C2/C3	Mountain Hwy	North side – Colchester Park Preschool connection to Liverpool Road	350 m	

Cycling category	Road/trail link	Link	Distance (meters)	Project notes
C2/C3	Boronia Road	South side – Wantirna Health Precinct to Ainsdale Avenue	350 m	
C2/C3	Boronia Road	South Side – Ainsdale Avenue to Amesbury Avenue	950 m	Partial construction on service road
C2/C3	Boronia Road	South side – Amesbury Avenue to Stud Road	350 m	Widen existing shared path
C2/C3	Boronia Road	South side – Stud Road to Lewis Road	950 m	Partial construction on service road
C2/C3	Boronia Road	South side – Lewis Road to Rathmullen Road	900 m	Service Road on-road connection
C2/C3	Boronia Road	South side – Rathmullen Road to Valerie Street	570 m	Requires Department of Transport and Planning approval
C2/C3	Boronia Road	South side – Valerie Street to Narcissus Avenue	750 m	
C2/C3	Boronia Road	Narcissus Avenue to Erica Avenue	450 m	
C2/C3	Boronia Park	Boronia Road to Park Crescent to Maryville Way via Boronia Park	400 m	Design and construct with the redevelopment of Boronia Park Reserve
C2/C3	Boronia Road	South side – Maryville Way to Hastings Avenue	180 m	Design and construct as part of the proposed Boronia Road narrowing project (Boronia Renewal Strategy)
C2/C3	Boronia Road	North side – Hastings Avenue to Alison Avenue	900 m	
C2/C3	Forest Road	Church Street to The Basin roundabout	250 m	On-road facilities
C2/C3	Ferntree Gully Road	South side – Rushdale Street to Bunjil Way	270 m	Lease agreement required and re-title of the Ferntree Gully Road Service Road
C2/C3	Ferntree Gully Road	North Side – Knox Park access road to Dobson Street	700m	Partial construction on service road
C2/C3	Ferntree Gully Road	North Side – Dobson Street to Burwood Hwy	1,300 m	Requires approval from Department of Transport and Planning
C2/C3	Corhanwarrabul Creek Trail	Eastlink Connection to Enterprise Drive	2000 m	Link will be partially constructed as part of the Waterlea/Stamford Wetlands
C2/C3	Corhanwarrabul Creek Bridge	Connection from Eastlink shared path to Bankside Estate		Construction subject to agreement with property owners
C2	Dandenong Creek Trail	Railway Overpass S-Bend to Railway Trail	70 m	Improve blind corner and reconstruct link with better sight distance

Secondary Routes

Cycling Category	Road/Trail Link	Link	Dist. (m)	Project Notes
C3	Borg Crescent	Ferntree Gully Road to Taunton Cres/Redcourt Reserve	500 m	On-road facilities
C3	Berrabri Drive	Redcourt Reserve to George Street	700 m	On-road facilities
C3	Stokes Road	Boronia Road refuge island to Amesbury Road	600 m	
C3	Gresford Road	Boronia Road refuge island to Mountain Hwy Pedestrian-operated signals	480 m	On-road facilities
C3	Rachelle Drive	Mountain Hwy to Mountain Hwy with connection to Selkirk Linear Reserve	970 m	
C3	Armstrong Road	East side – Dandenong Creek Trail to Mountain Hwy	600 m	Shared path
C3	Mountain Hwy	South side – Begonia Avenue (school entry) to Pedestrian Operated Signals via Lemon Grove	200 m	Shared path
C3	Begonia Avenue	Lemon Grove to Grieve Street	850 m	
C3	Katandra Court	Boronia Road Service Road to Mareeba Crescent	203 m	Shared path within reserve. On-road facilities and wayfinding
C3	Mareeba Crescent	Pindari to Terama Crescent	550 m	Optional route via Sasses Avenue Retarding Basin Reserve
C3	Grieve Street	Begonia Avenue to Terama Crescent	150 m	On-road facilities with shared path through the road closure
C3	Terama Crescent	Begonia Avenue to Mareeba Crescent	700 m	On-road facilities
C3	Lewis Road	Boronia Road to Blind Creek Trail	1,450 m	
C3	Lewis Road	Blind Creek Trail to Burwood Hwy	600 m	Shared path. Requires lease agreement with owners
C3	Tyner Road East	Burwood Hwy to High Street Road	350 m	Shared path on east side with narrowing at large trees
C3	Wallace Road Linear Reserve	High Street Road Pedestrian Signals to Wallace Road school crossing	150 m	Upgrade existing footpath to shared path
C3	Riddell Road	West side – Wallace Road school crossing to Riddell Road Preschool	450 m	Shared path

C3	Allister Avenue/Allister Close	Egan Lee Reserve to Carrington Park Reserve	1,250 m	
C3	Ferntree Gully Road Service Road	North side median – Carrington Park to Henderson Road traffic signals via rear of bus stop	150 m	Requires Department of Transport and Planning approval
C3	Henderson Road	Ferntree Gully Road to Ferny Creek Trail	900 m	Shared path or protected lanes due to industrial vehicle movements
C3	Taylor's Lane	Ferny Creek Trail link to Kelletts Road via Taylor's Lane Reserve	700 m	Shared path
C3	Taylor's Lane	Kelletts Road to Bridgewater Way	370 m	
C3	Fowler Road	Bergins Road to Shearer Drive Reserve	270 m	
C3	Pickworth Crescent	Shearer Drive to Adrian Place shared path	500 m	Connect to Shearer Drive Reserve shared path and Crampton Court cut through
C3	Seebeck Road	Stud Road to Timbertop Drive	1,500 m	On-road facilities
C3	Illawarra Avenue	Ashbrooke Reserve to Dandenong Creek Trail	1,000 m	Requires Parks Victoria and City of Greater Dandenong approval
C3	Park Ridge Reserve	Dandelion Drive School Crossing to Burchall Crescent via Balmoral Court	500 m	Shared path
C3	Willow Avenue	Blaxland Drive Reserve to Napoleon Road via Redgum Court and Snowgum Close	700 m	
C3	Blaxland Drive Reserve	Kelletts Road to Dandelion Drive School Crossing via Willow Avenue (west side)	230 m	Shared path
C3	Quinn Court Reserve	Napoleon Road to Quinn Court	200 m	
C3	Napoleon Road	West Side – Kelletts Road – Napoleon Road Linear Reserve to Blackwood Park Road	900 m	Shared path
C3	Springfield Road	North side – Blind Creek Trail to Park Crescent	750 m	Shared path
C3	Park Crescent	Boronia Road to Dorset Road via Boronia Park	500 m	Requires masterplan for Boronia Park to be completed
C3	Erica Avenue	Boronia Road to Orchid Avenue	250 m	
C3	Dorset Road	East side – Mountain Hwy to Old Joes Creek Retarding Basin walkthrough	1,400 m	

C3	Dorset Road	West side – Mountain Hwy to Dandenong Creek Trail	500 m	
C3	Jersey Road	Barry Street to Mountain Hwy	1,100 m	Difficult construction and alignment. Will require lease agreement with individual property owners. Route needs to be shared path or protected lane due to industrial vehicular movements. Potentially requires full road redesign to reallocate road space
C3	Barry Street	Power Road to Dorset Road	1,200 m	Requires a shared path or protected lane due to industrial vehicular movements. Alternate route or road realignment may be explored due to limited road space
C3	Liverpool Road	Chandler Lane to Mountain Hwy	1,300 m	Shared path
C3	Miller Road	Albert Avenue to Liverpool Road	900 m	
C3	Albert Avenue	Chandler Road to Miller Road	900 m	Potentially east side alignment, however further exploration is required
C3	Devenish Road	Railway Trail to Scoresby Road Pedestrian Operated Signals	1,100 m	
C3	Victoria Road	Scoresby Road to Sasses Avenue	800 m	Dedicated facilities to assist in visually narrowing Victoria Road
C3	Bayswater Road	Mountain Hwy to Dandenong Creek Trail	260 m	
C3	Scoresby Road	Station Street to Boronia Road	1,700 m	Shared path with narrowing
C3	Rathmullen Road	Boronia Road to Scoresby Road via Community Gardens	1,200 m	
C3	High Street	Scoresby Road to Mountain Hwy	650 m	
C3	Forest Road	Underwood Road roundabout	350 m	Improve the intersection to provide a continuous bike facility connecting Forest Road to the train line crossing via the Underwood Road roundabout
C3	Forest Road	East side – Underwood Road roundabout to Alpine Road roundabout	200 m	Construction of on-road/off-road dedicated facility

Recreational Trails

Note: Proposed alignments may be altered or diverted along a parallel route to improve safety and the ease and efficiency with which the route can be built. Trails are not rank in any order.

Cycling Category	Road/Trail Link	Link	Dist. (m)	Project Notes
CR	Ferny Creek Trail extension	Acacia Road to Glenfern Valley Reserve		Shared path
CR	Cornish Road	Wellington Road to Quarry Track		Shared path identified as part of Knox Green Areas and Rural Strategy (GARS)
CR	Basin-Olinda Road	Forest Road to Wicks Road Reserve		
CR	Sheffield Road / Doongalla Road / Simposons Road	Basin-Olinda Road to Doongalla Road Ridge Track		Mountain Bike link to Doongalla Forest
CR	Chandlers Lane	Dandenong Creek Trail to Liverpool Road		Not in Knox but identified as a missing link for advocacy.
CR	Liverpool Road / Glasgow Road	Chandlers Lane to Sheffield Road		Not in Knox but identified as a missing link for advocacy and to replace proposed Pavitt Lane connection to Doongalla Forest.
CR	Axford Road and Pumps Road	Eastlink Trail (Pumps) to Highbury Road, Vermont South		Connection through Parks Victoria site identified under GARS

Appendix 2 – New crossing facilities

Note: Bicycle lanterns and intersection upgrades along arterial roads require the Department of Transport and Planning to fund and approve. The sites have not been ranked in any order.

Crossing facility type	Location	Intersecting street	Notes
Bicycle lantern	Mountain Hwy, Bayswater	Armstrong Road/Bona Vista Road	Existing POS within 250 m.
Bicycle lantern	Stud Road, Wantirna South	Harold Street/Coleman Road	Existing signalised intersection.
Bicycle lantern	Boronia Road, Boronia	Dorset Road	Existing signalised intersection. Require lantern for a continuous route along the Railway Trail.
Bicycle lantern	Alpine Street, Ferntree Gully	Station Street	Existing signalised intersection. Provides a continuous route along the Railway Trail.
Bicycle lantern	Burwood Hwy, Upper Ferntree Gully	Dandenong Tourist Road	Improve connection along the Railway Trail.
Bicycle lantern	Scoresby Road, Ferntree Gully	Burwood Hwy	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Burwood Hwy, Wantirna South	High Street Road	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Burwood Hwy, Wantirna South	Lakewood Drive	Existing signalised intersection.
Bicycle lantern	Burwood Hwy, Wantirna South	Stud Road	Existing signalised intersection.
Bicycle lantern	Burwood Hwy, Wantirna South	Renou Road/Templeton Street	Existing signalised intersection. Provide bike lantern on all legs.
Upgrade intersection	Burwood Hwy, Wantirna South	Cathies Lane	Intersection requires upgrade.
Bicycle lantern	Mountain Hwy, Wantirna	Harold Street	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Mountain Hwy, Wantirna	Boronia Road/Wantirna Road	Existing signalise intersection. Provide bike lantern on all legs.
Bicycle lantern	Stud Road, Bayswater	Waldheim Road/Mountain Hwy	Existing signalised intersection. Provide north-south bike lanterns.
Bicycle lantern	Stud Road, Bayswater	Boronia Road	Existing signalised intersection. Provide bike lantern on western

			north-south leg and southern east-west leg.
Bicycle lantern and Pedestrian-operated signals	Stud Road, Wantirna South	Moonah Road/Teddington Way	Requires a new signalised crossing to improve permeability between the two estates.
Bicycle lantern	Stud Road, Wantirna South	High Street Road	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Stud Road, Scoresby	Ferntree Gully Road	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	High Street Road	Cathies Lane	Existing signalised intersection. Provide bike lantern on all legs.
Upgrade intersection	High Street Road	Mowbray Drive	Upgrade to a signalised intersection with bike lanterns on all legs.
Bicycle lantern	High Street Road	Tyner Road/Wallace Road linear reserve	Existing signalised intersection. Provide bike lantern on north-south link.
Bicycle lantern	Stud Road, Rowville	Centre Road	Existing signalised intersection. Provide bike lantern on eastern north-south leg and northern east-west leg.
Bicycle lantern	Kelletts Road, Rowville	Taylors Lane	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Kelletts Road, Rowville	St. Lawrence Way	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Napoleon Road, Rowville	Lakesfield Drive Linear Reserve	Provide bike lantern.
Bicycle lantern	Napoleon Road, Rowville	Kelletts Road	Existing signalised intersection. Provide bike lantern on eastern north-east leg.
Signalised pedestrian-operated signals and bike lantern	Napoleon Road, Rowville	Gill Court/Regency Terrace	Upgrade crossing due to high-speed vehicles, operational school crossing and bus stop access.
Bicycle lantern	Wellington Road, Rowville	Napoleon Road	Existing signalised intersection. Provide bike lantern on northern east-west leg.

Bicycle lantern	Wellington Road, Rowville	Braeburn Parade	Existing signalised intersection. Provide bike lantern on all legs.
Bicycle lantern	Wellington Road, Rowville	Taylors lane	Existing signalised intersection. Provide bike lanterns on all legs.
Bicycle lantern	Wellington Road, Rowville	Westminster Drive	Existing signalised pedestrian operated signalised. Provide bike lanterns.
Bicycle lantern	Wellington Road, Rowville	Stud Road	Existing signalised intersection. Provide all legs.
Bicycle lantern	Stud Road, Rowville	Lakeview Avenue/Fulham Road	Existing signalised intersection. Provide bicycle lanterns on eastern north-south leg.
Bicycle lantern	Stud Road, Rowville	Emmeline Row	Existing signalised intersection. Provide bicycle lanterns on northern east-west leg.
Bicycle lantern	Stud Road, Rowville	Kelletts Road	Existing signalised intersection.
Bicycle lantern	Stud Road, Rowville	Timbertop Road	Existing signalised intersection. Provide bike lantern on western north-south leg.
Bicycle lantern and intersection upgrade	Mountain Hwy, Boronia	Colchester Road	Existing roundabout intersection requires upgrade to improve cyclists and pedestrian movements across the intersection.
Roundabout upgrade	Mountain Hwy, The Basin	Liverpool Road	Existing roundabout intersection required upgrade to improve cyclists and pedestrian movements across the intersection.
Bicycle lantern	Mountain Hwy, Bayswater	Jersey Road	Existing signalised intersection. Provide bicycle lanterns on all north-south legs and the northern east-west leg.

Bicycle lantern	Dorset Road, Bayswater	Landscape Drive	Existing signalised intersection. Provide bicycle lantern on the northern east-west leg.
Refuge island/splitter island	Power Road, Bayswater	Barry Street	Improve connection into the railway trail.
Raise platform and priority crossing	Underwood Road, Ferntree Gully	St Elmo Avenue	Improve refuge island priority and design to prioritise pedestrians and cyclists connecting to the Railway Trail.
Raised platform and priority crossing	Dawson Street, Ferntree Gully	Ferny Creek Trail	Improve crossing visibility and priority for pedestrians and cyclists coming out of the Ferny Creek Trail.
Pedestrian-operated signals and bike lantern	Scoresby Road, Knoxfield	Cambden Park Parade/Beckenham Drive	New crossing facility required to increase permeability for active travel modes on Scoresby Road.
Refuge Island	Valleyview Drive, Rowville	Taylor's Lane/Ferny Creek Trail	Provide a safe road crossing to connect Ferny Creek Trail and Taylor's Lane.
Refuge island	Bergins Road, Rowville	Army Track/Providence Place	Provide a safe road crossing to provide access to Churchill National Park.
Bicycle lantern	High Street Road, Wantirna South	Tyner Road (west)	Existing pedestrian-operated signals. Provide new bicycle lantern.
Upgrade intersection	Boronia Road, Boronia	Albert Avenue	Existing roundabout to be upgraded into a signalised intersection to provide safer crossing points for pedestrians and cyclists.
Upgrade intersection	Boronia Road, Boronia	Forest Road	Existing roundabout to provide priority to pedestrians and cyclists.
Reconfigure roundabout	Forest Road, Ferntree Gully	Underwood Road	Improve roundabout to prioritise pedestrians and cyclists
Reconfigure roundabout	Forest Road, Ferntree Gully	Alpine Street	Improve roundabout to prioritise pedestrians and cyclists

Formalise railway crossing	Alfred Street, Boronia	Underwood Road	Formalise a railway crossing from Alfred Street to Underwood Road. Currently some people are using this as a crossing point – currently a vehicular maintenance access point.
Upgrade intersection	Police Road, Rowville	Stud Road	Upgrade full intersection with the intention to provide pedestrian, bus and cycling priority throughout the site.

Appendix 3: Movement and Place cycling classification

	C1	C2	C3	C4	C5	CT	CR
	Main Routes	Primary Routes	Designated Cycling Links	Municipal Links	All Other Cycling Links	Training Routes	Recreational Routes
Cycling (C) category definition	Link cities, NEICs and metropolitan Activity Centres	Link main routes to Major Activity Centres and stations	More direct alternatives for confident cyclists	Local trips including stations. Feeds to longer distance routes	All other links	Training and sports, longer distance and higher speeds	Quieter environment. E.g. Parks, waterways and rail lines
Networks	Strategic Cycling Corridors	Strategic Cycling Corridors		Municipal Cycling Network			Trail Network
User focus	Comfortable for most adults	Comfortable for all ages and abilities	Comfortable for confident cyclists	Comfortable for all ages and abilities	Varied	Comfortable for confident cyclists	Comfortable for all ages and abilities
Speed level of stress	25–30km/h	20km/h	25–30km/h	20km/h	25–30km/h	25–30km/h	20km/h
Mapping guidelines	60-minute connections CBD – Major Subregional Catchments Between Metropolitan Activity Centres.	10-minute connections Between Major Activity Centres Between transport interchanges Last mile connections to C1	High distribution of cyclists within built-up areas and expected to cater for low-medium volumes of cyclists	Last mile connections	Quiet streets on localised road network Short connections	Suitable sites for speed training, mountain bike riding	Targets key natural reserves or landmarks
Example routes in Knox	Eastlink Trail	Burwood Hwy	Chandler Road, Boronia Green Spine	Wantirna Cycling Link	Faith Street	Lysterfield Lake Reserve and 1 in 20 The Basin Ride	Dandenong Creek Trail

Appendix 4: Capital works investment

Council will work towards the above actions over the next 10 years, subject to the availability of funding. Actions that are business as usual or are part of the operational budget are not included in the table. The proposed estimated costs below would be additional funds required to deliver the actions in this plan.

Delivery year		1	2	3	4	5	6	7	8	9	10	Estimated Investment required
Year	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	
Action plan endorsed												
Design C1 & C2 cycling routes: <ul style="list-style-type: none"> • Mountain Hwy • Burwood Hwy • Boronia Road • Ferntree Gully Road • Railway Trail • Wattletree Road – Ferny Creek Trail • Stud Road • Corhanwarrabul Creek Trail to Monash 												\$500,000

Delivery year		1	2	3	4	5	6	7	8	9	10	Estimated Investment required
Year	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	
Design C3 cycling routes: <ul style="list-style-type: none"> • Wantirna Cycling Link • High Street Road • Kelletts Road • Boronia cycling links • Bayswater Business Park Precinct • Rowville to Dandenong Creek Trail • Scoresby Road • Dorset Road • Lysterfield to the Basin 												\$500,000
Delivery of C1 & C2 routes												TBC post route design
Delivery of C3 routes												TBC post route design
Formalise wayfinding standards												Officer hours
Deliver improved wayfinding												TBC post route design
Formalise 'quiet' and 'linking' streets												\$600,000

Delivery year		1	2	3	4	5	6	7	8	9	10	Estimated Investment required
Year	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033	2033-2034	2034-2035	
Non-standard lighting policy												Officer hours
Solar lighting trial												\$180,000
Safety Audits <ul style="list-style-type: none"> • underpasses • key trails 												\$600,000
Develop trail branding and experiences												\$250,000
Trail new cycling facilities												\$400,000
Installation of: <ul style="list-style-type: none"> • bicycle repair stations • seating • drink fountains 												\$380,000
Installation of bike parking at: <ul style="list-style-type: none"> • council reserves and facilities • Commercial streetscapes managed by Council 												\$550,000
Advocacy												\$15,000

