



Whitehorse Transport Background Study

Final Report

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Institute for
Sensible Transport



The Institute for Sensible Transport acknowledges the people of the Wurundjeri Woi Wurrung language group of the eastern Kulin Nation on whose unceded lands we work.

We respectfully acknowledge their Ancestors and Elders, past and present.

We also acknowledge the Traditional Custodians and their Ancestors of the lands and waters across Australia where we conduct our business.

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Executive Summary



Whitehorse City Council is undertaking the development of a new Integrated Transport Strategy (ITS) to replace the 2011 version. Since 2011, significant demographic, technological, and transport infrastructure initiatives have occurred. To ensure Council is able to meet contemporary transport challenges and achieve its long-term objectives, a new ITS is required. This report provides background information that can be used by Council as it embarks on the development of their future ITS.

What does this Background Report cover?

This Background Study provides a:

- comprehensive review of transport data
- review of Council and State government policies of relevance to transport
- description of emerging technologies
- summary of community feedback
- description of future transport opportunities in Whitehorse.

This report also offers cost estimates for the development of a new ITS to guide Council toward a more sustainable, accessible, and safe transport future.

Key transport challenges

Whitehorse faces several transport challenges, including:

- rising population growth and increased travel demand
- high car dependency and parking pressures
- parking and traffic congestion and road safety concerns
- the need to reduce transport emissions.

Slightly over 80% of Whitehorse residents rely on the car as their main mode of transport to work. This has remained at the same level since 2011.

Promoting sustainable transport choices will help address these challenges and improve liveability.

Policy and strategic context

A review of Council and State government policies highlights a strong emphasis on:

- the need to grow sustainable transport and reduced car dependency
- liveable, accessible neighbourhoods
- integrated land use and transport planning
- climate action and emissions reduction.

Key opportunities

The future ITS is an opportunity to create:

- a strong vision, that aligns with key themes included in the Council Plan
- an ambitious walking and cycling network that provides a compelling set of options for short to medium distance trips
- better integration between the active and public transport network
- a stronger connection between land use planning and transport, to lower trip distance and diversify transport options
- a powerful set of advocacy actions for improved public transport services
- measurable, outcome-driven targets.

Existing transport network

Key observations about the current transport network include:

- acceptable walking coverage, but gaps in accessibility around major centres

- cycling infrastructure is limited due to various constraints
- public transport mode share is below Greater Melbourne averages
- Electric vehicle (EV) ownership is growing but remains in the early stages.

The Suburban Rail Loop (SRL) will significantly improve regional access, but local connections will require additional considerations and investment.

The Suburban Rail Loop (SRL) will significantly improve regional access, but local connections will require additional considerations and investment.

Community feedback

Previous community surveys have emphasised the need for:

- more transport options, especially for active and public transport.
- safer streets for walking and cycling.
- improved public spaces and low-traffic neighbourhoods.

Feedback suggests strong support for a more sustainable and accessible transport system.

Opportunities for transformation

Analysis identifies key opportunities for Whitehorse, including:

- delivering integrated SRL precincts with strong active transport links.
- expanding protected bike networks across the municipality.
- implementing *Movement and Place* principles for people-focused streets.
- enhancing bus services and integrating with cycling and walking routes.

- planning for increased EV charging infrastructure.

Scenarios for future transport

Three transport futures were explored as part of this project:

- **business as usual:** continued car dominance, worsening congestion and more rat-running in local streets.
- **moderate change:** some improvements, but car reliance remains high.
- **sustainable change:** bold shift to active and public transport, delivering the best community, economic, and environmental outcomes.

Conclusions and next steps

The development of the future Whitehorse ITS provides an opportunity to create a strategic blueprint to guide transport investment and policy decisions that work to enhance transport choice, sustainability and safety.

Like other LGAs, there have been no significant shift towards sustainable forms of transport in Whitehorse over the last 15 years. This serves to highlight that more ambitious interventions are required to enable Council to achieve its goal for a safer, more sustainable transport system.

The existing policy context offers clear guidance regarding the need to achieve a mode shift in favour of sustainable transport options and enhancing the safety of the transport system.

The future ITS should be seen as an opportunity for achieving a safer, healthier, and more integrated set of transport options for Whitehorse.

1. Introduction



Whitehorse City Council is committed to updating the *Whitehorse Integrated Transport Strategy 2011 (WITS)*. The existing Strategy is 14 years old. As a first step in the development of a new WITS, Council has commissioned an analysis and review of current transport patterns, networks, and innovations in relation to current and future population numbers. This *Background Study* will provide Council with a detailed understanding of current and emerging transport issues and opportunities, a review of the existing policy landscape and cost estimates for developing a new WITS.

1.1 Why does Council need a new Integrated Transport Strategy?

Whitehorse faces several transport challenges. Population growth, the need to reduce emissions, parking pressure, road safety, and accessibility are

all important issues that an Integrated Transport Strategy (ITS) can help address.

An ITS assists Council by helping to ensure actions align with the City's wider strategic ambition. An effective ITS can help to widen people's transport options, increase the diversity of transport modes, promote sustainable transport, and increase street vibrancy.

1.2 Current context

The City of Whitehorse lies east of Melbourne, approximately 12 km from Melbourne CBD. Figure 1 shows the local government area in relation to Melbourne, along with key arterial roads and the railway network. The municipality is bordered by Highbury Road in the South, Heatherdale Road in the East, and a combination of various roads on the western side. The northern side presents unique challenges where roads do not mark the boundary in parts.

The M3 motorway runs along the boundary in the north (Eastern Freeway) and part of the east (Eastlink). Whitehorse Road and Burwood Highway are key east-west corridors for motor vehicles.

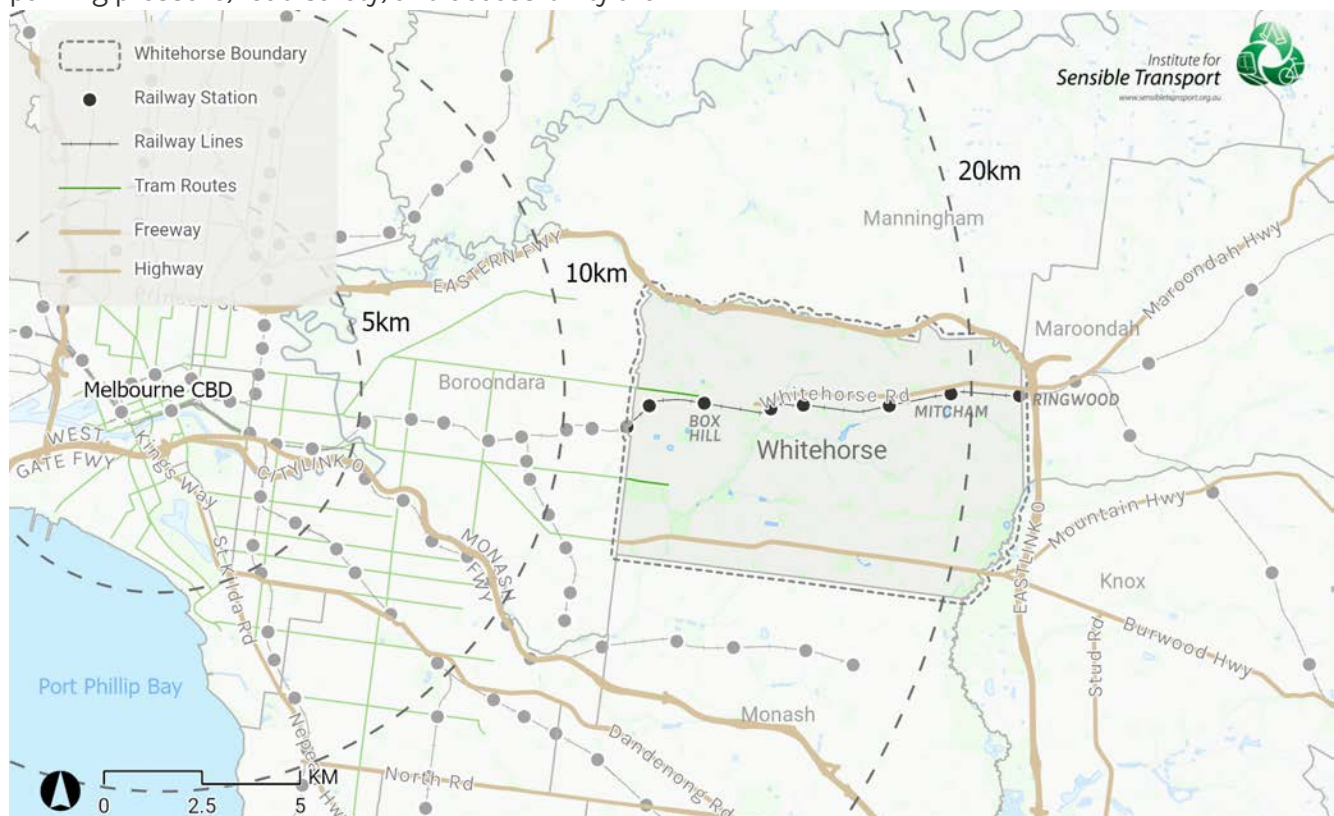


Figure 1 Whitehorse - Metropolitan Context

Source: Institute for Sensible Transport

1.3 Project structure

The eight key stages of this project are summarised in Figure 2. The draft report combines the *Desktop Review* and *Whitehorse Integrated Transport Strategy (WITS) Cost Estimate* to form the background study that informs the development of the Whitehorse Integrated Transport Strategy. A separate report has synthesised the themes from the staff workshop, which focused on the barriers and facilitators to sustainable travel in Whitehorse.



Figure 2 Key project stages

1.4 Report structure

An overview of the key report components is offered in Figure 3.

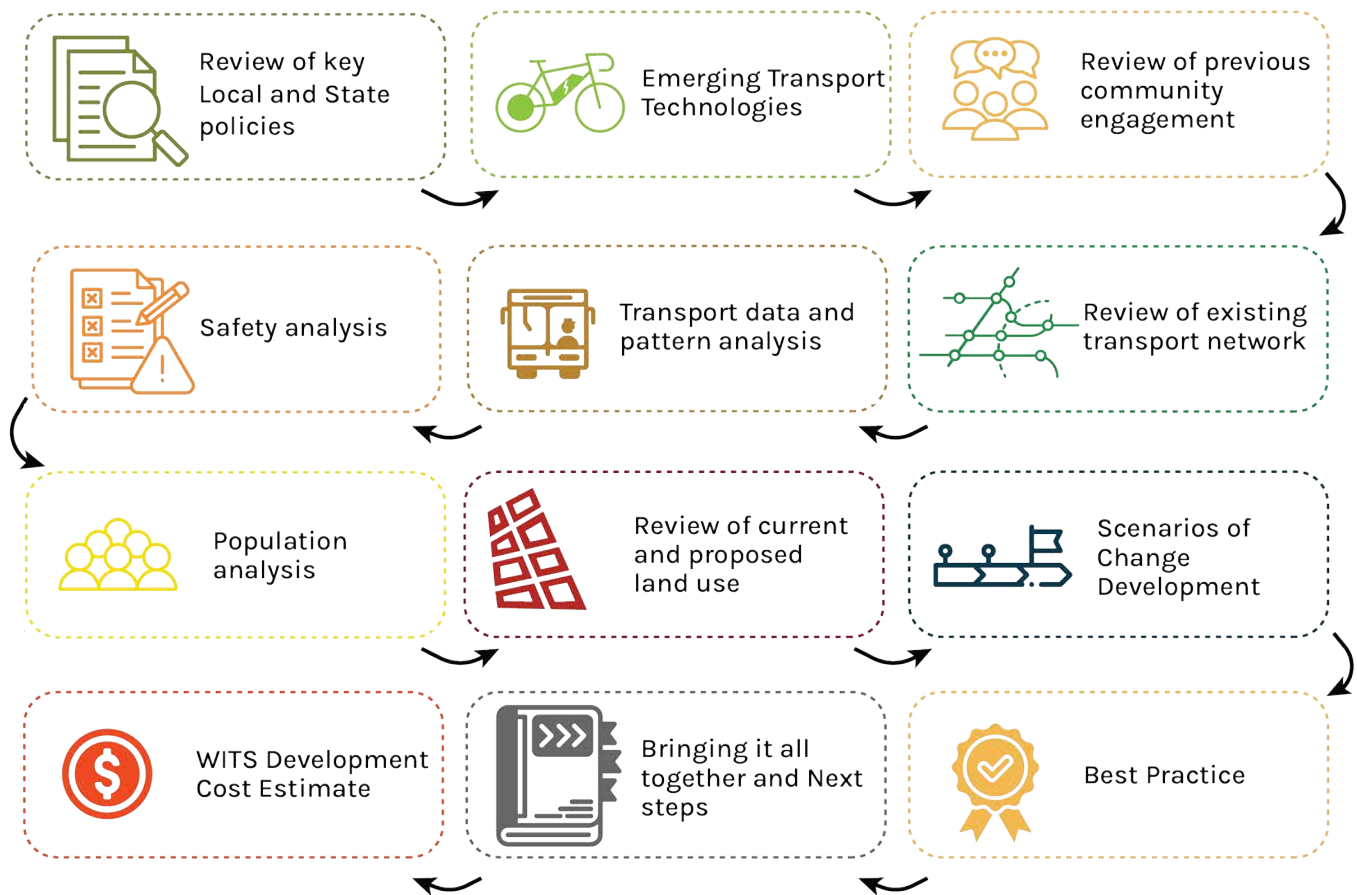


Figure 3 Key report components

2. Review of policies and plans



This section provides a succinct review of relevant documents across local and state governments.

2.1 Council policies and plans

This section summarises and reviews policies and plans prepared by Whitehorse City Council.¹

2.1.1 Council Plan 2021-2025

This Plan sets out how Council will work with residents to achieve their aspirations over the four-year council term. The plan identifies the following eight strategic directions:

- Innovation, transformation and creativity
- A thriving local economy; business, employment, education and skill development
- Diverse and inclusive community
- Our built environment, movement and public places
- Sustainable climate change and environmental care
- An empowered collaborative community
- Health and wellbeing
- Governance and leadership.

Within the *Council Plan*, several key actions have implications for the development of the future WITS. These include actions around public transport advocacy, transport accessibility and cycling routes. Objective 4.5 states that Whitehorse will support the provision of effective, sustainable and inclusive transport services. It includes several relevant actions, including:

- **4.5.1 Maintain, enhance and advocate for transport accessibility and improved transport routes and modes.**

The action calls for increased accessibility and improved transport routes and modes. The indicators, however, are related to road compliance and community satisfaction with sealed roads. Further, meeting the chosen

indicators would not be an accurate measure of whether Council advanced their strategic directions.

- **4.5.2 Advocate and create low traffic neighbourhoods where people can move safely.**

The indicator for this action, '*Number of transport advocacy programs*', is very broad and could include transport advocacy programs unrelated to low traffic neighbourhoods. There are also several ways Council could implement this action without needing advocacy, such as installing traffic filters and altering street designs on Council owned roads.

- **4.5.3 Continued implementation of the low-stress Easy Rides cycling routes.**

The indicator, '*Number of Easy Ride routes installed (Equal to or exceed previous year)*' provides a measurable indication of whether the action has been successfully implemented year on year. However, the Easy Ride routes do not feature cycling specific infrastructure. There is an implication that cyclists should be comfortable sharing the street with motorists, which is not always the case, especially for novice cyclists. These routes may provide limited improvements to the number of people cycling to their destinations.

There are further actions within the Council Plan that support the development of the ITS and can feed into the process. These include actions in areas such as public open space, the built environment, economic renewal and actions that reflect those in *Plan Melbourne* around community connection and increased liveability.

Providing more sustainable transport choices helps the city and the community meet their aspirations. This has clear implications for the future WITS: it will create better connections with the natural environment, boost physical activity within the community, and help enhance sustainability amid population growth.

¹ Open Space Strategy 2024 is currently in development and will be relevant to the development of a future WITS

2.1.2 Community Vision 2040

Through Council's Whitehorse 2040 community engagement, a vision was developed to reflect the community's aspirations for the 20 years up to 2040.

'Whitehorse is a resilient community where everyone belongs.'

'We are active citizens who value our natural environment, history and diversity.'

'We embrace sustainability and innovation.'

'We are dynamic. We learn, grow and thrive.'

The vision is supported by seven key strategic directions:

- Diverse and Inclusive Community
- Movement and Public Spaces
- Innovation and Creativity
- Employment, Education and Skill Development
- Sustainable Climate and Environmental Care
- Whitehorse is an Empowered and Collaborative Community
- Health and Wellbeing.

These themes all underpin a desire for Whitehorse to be a highly liveable, innovative and inclusive city in 2040. Key priorities from the *Community Vision 2040* project include creating low-traffic 20-minute neighbourhoods, public spaces that are activated and accessible by all and improving access to different active transport modes and options.

Also highlighted is the importance of sustainability, climate action, health and wellbeing, innovation and a collaborative community. All of which support efforts to shift trips away from cars and to other modes of transport.

2.1.3 Whitehorse Integrated Transport Strategy 2011

The existing Whitehorse ITS, developed 14 years ago, provided a framework for transport decision making. The transport landscape has changed

considerably since 2011. New technologies, emerging challenges and opportunities all mean a fresh look at transport in Whitehorse can yield important benefits. This is partly the motivation for embarking on a new ITS.

Fundamental changes since 2011 include:

- Emergence of commercial ride share such as Uber, Didi etc.
- Separated bike lanes have become the new gold standard for cycling infrastructure and are increasingly seen in cities and towns across Victoria, particularly in inner urban areas.
- Increased prevalence and availability of Electric Vehicles (EVs) and the need to factor in public EV chargers into the transport network.
- E-bikes have made cycling more accessible for people who need to ride further, up hills or have a lower starting level of fitness.
- E-scooters as a form of micromobility.
- Shared e-micromobility is now commonplace in cities, including parts of Melbourne.
- Gig-economy workers typically use e-micromobility (e.g. e-bike) to make their deliveries.
- A new *Plan Melbourne* focuses on sustainable neighbourhoods and encourages more walking and cycling for everyday trips.
- COVID-19 and the subsequent increase in work-from-home arrangements have fundamentally altered the number of workers who must travel to work daily. This has also resulted in people spending more time in their neighbourhoods and using local transport infrastructure.
- Development of a Box Hill specific *Integrated Transport Strategy*. (adopted in 2020)
- Increased density around activity centres and State government plans for further increases around large public transport projects such as the Suburban Rail Loop.
- North-East Link project will significantly increase road volume and enable a larger volume of vehicle traffic to travel on our roads, particularly along north-south routes linking to the freeway.

All these fundamental changes highlight the importance of developing a new Integrated Transport Strategy for Whitehorse.

2.1.3.1 Strategic successes

The *Whitehorse Integrated Transport Strategy 2011* has seen several projects come to fruition and several key advocacy successes. These include:

- Opening of the Eastern Rail Trail (ERT), which now connects Box Hill to Ringwood
- Implementation of walk and ride to school programs
- Upgraded train stations and precincts
- Grade separation of all level crossings within the LGA. This included the amalgamation of Mont Albert and Surrey Hills stations, to become Union Station (a state project separate from this policy).

2.1.3.2 Strengths

Discussion on the reduction of parking requirements in exchange for other sustainable travel infrastructure and options would be regarded as ahead of its time. The topic remains a difficult discussion for local governments. The Strategy also discusses the emergence of car-share schemes and how they could be used to effectively reduce the number of carparks needed in residential or office buildings. Car-share schemes are still developing and have become more common since 2011. Whitehorse has examples of car shares, including Go-Get and Flexicar.

The Strategy also strongly emphasises behavioural change programs that teach and encourage people to cycle or walk as a means of transport.

2.1.3.3 Limitations of the Strategy

Beyond the large number of fundamental changes that have occurred to our urban context since the 2011 WITS, there are several barriers in the document that limit the ability of Whitehorse to achieve the goals of reducing car mode share and increasing transport diversity, as highlighted below:

- **Many parts of the Strategy do not provide a clear spatial component** to better understand where existing issues and proposed changes are.

- **There are minimal measures in place to discourage car use**, relying heavily on state government public transport projects, lack of discussion on how to reduce traffic on local streets (modal filters, reduced speed limits in activity centres, etc).
- **Cycling infrastructure improvements are gradual**, with no firm funding guarantees, targets or preferred infrastructure types. The Strategy relies heavily on the provision of shared bike lanes and symbolic bicycle logos, which do not provide the necessary safety level to encourage the majority of those interested in riding to ride.
- **Largely focuses on cycling on the off-road trails** and acknowledges that commuter options are limited and usually shared with parking lanes, without actions to overcome this.

The Strategy also does not provide targets or indicators that can be used to measure the success of its actions. This reduces the accountability of the Strategy and makes it harder to determine if actions have been truly successful or not. These are particularly important when measuring mode share changes.

While public transport and major roads are the responsibility of the State Government, most of these actions within the Strategy are advocacy projects. There is room for more Council-based actions focused on infrastructure in local streets, in local activity centres or in Council's own operations.

2.1.3.4 Threats

Some of the actions within the Strategy are too vague, potentially leading to outcomes that are unintended or may even lead to no outcomes. For example, the action '*Continue Council's role in promoting sustainable transport within the municipality*', is quite vague and unmeasurable. Likewise, *action 3.3.13* does not detail what Whitehorse does to encourage sustainable transport use for business travel. Within the organisation, there have been previous programs to promote sustainable transport by staff. This includes previous shared e-bikes, which were underutilised and not replaced once the batteries had degraded. The shift to online meetings also reduces the need to travel between sites and,

therefore, reduces the opportunity for public transport use during the working day.

Currently, Whitehorse provides 'corporate' myki cards at key sites for work related trips, these are used primarily for trips to the CBD.

2.1.3.5 Opportunities

Due to several large-scale projects having been completed over the course of the Strategy, there is room to investigate new projects that can be undertaken by Council or advocated for. These opportunities include but are not limited to:

- The recent review into the north-eastern bus network as a pilot project. Ongoing advocacy to continue this process could lead to significant improvements to the local network.
- Completion of the Box Hill to Ringwood shared path along the rail corridor. Improved on-road cycling infrastructure and/or wayfinding could help create a clear route connecting the gaps between the shared path (between Blackburn Station and Laburnum Station). This provides a key east-west spine through the centre of Whitehorse and further development of safe cycling infrastructure.
- Advocacy around the development of the Suburban Rail Loop precincts to ensure they are walkable, cyclable and have efficient public transport connections to reduce reliance on cars.

2.1.3.6 Implications for the future ITS

There are several items that have not been achieved yet (or could continue to be improved) and can be considered for the new WITS. These include:

- Advocacy for the Tram Route 75 extension to Knox City Shopping Centre and Civic Precinct (also a key priority of Knox City Council)
- Advocacy for increased train frequency
- Advocacy for improved bus routes and services, including some routes that still have reduced or no services on Sundays
- More conducive environment for walking and cycling
- Advocacy for continued accessibility improvements to the public transport network

- Advocacy for enhanced amenity and transport integration around Box Hill Station and bus interchange
- Projects that support greater increases in trips made by bike.

2.1.4 Community Road Safety Strategy 2013

The *Whitehorse Community Road Safety Strategy 2013* outlines the Whitehorse City Council's commitment to reducing road injuries and fatalities. It identifies key road safety priorities and sets out an Action Plan to enhance road safety through education, infrastructure improvements and advocacy.

The Strategy is based on the 'Safe System' approach (outlined in Section 2.2.7), emphasising safe roads, safe vehicles, safe speeds, and safe road users.

Based on data from the years preceding the Strategy, vulnerable road users (pedestrians, cyclists and motorcyclists) are identified as making up 23% of injuries and fatalities on the road. This far outweighs their mode share.

The identified key road safety issues include:

- Young drivers (16-25 years) and elderly road users are the highest risk groups.
- Speeding, alcohol, fatigue and road infrastructure play major roles in road crashes.
- Station Street and Whitehorse Road are the most common locations for injuries and fatalities affecting pedestrians and cyclists.
- Vehicle rear ends are the most common crash type in Whitehorse.

Vulnerable road users (people walking and cycling) are identified as making up 23% of injuries and fatalities. This far outweighs their mode share.

Key road safety priorities for Whitehorse are:

- Safe travel by school and pre-school aged children
- Road users aged 16-25 years
- Vulnerable road users
- Elderly road users and road users with limited mobility
- Safe vehicles
- Risk contributors
- Safe roads and paths
- Leadership, communications, and evaluation.

The above priorities are the overarching themes that make up the action areas of the Strategy. The action plan includes a detailed set of actions, including:

- **Education Programs:** Includes initiatives like *'BikeEd,' 'Transit,'* and *'Fit to Drive'* for various age and demographic groups.
- **Infrastructure Improvements:** Focus on pedestrian safety, cycling paths, and accessibility for people with disabilities. However, the Strategy does not mention separated cycling infrastructure. Instead, it reinforces the Integrated Transport Strategy 2011's focus on on-road lane marking and visibility campaigns.
- **Advocacy:** Lobbying for better public transport access, lower speed limits in high-pedestrian areas, and more funding for road safety initiatives.

The Strategy also emphasises the importance of Evaluation & Reporting with regular assessments of progress to refine strategies and ensure effectiveness.

2.1.4.1 Limitations

The Strategy has several actions that remain vague and may not contribute to any realised changes. These include actions such as *'Continue to consider allocating Council funds each year to maintain and improve footpaths as well as on and off-road bicycle paths to a high standard.'* This action does not guarantee any funding and reflects a 'business as usual' approach that may be less than required to achieve higher levels of active transport. Considering allocating funds to footpath and bicycle infrastructure is a standard part of the annual budget process.

The actions within the vulnerable user category are largely education and behavioural change programs that seek to increase visibility of pedestrians and cyclists. Many LGAs now have a different approach that focuses on the provision of safer infrastructure and risk reduction. Similarly, in the *Safe Roads and Paths* section, actions are vague and provide qualifiers that reduce the likelihood of implementation, e.g. *'consider funding'* and *'consider preparing a paper'*.

2.1.4.2 Implications for the development of a new Whitehorse Integrated Transport Strategy (WITS)

The *Community Road Safety Strategy* highlights several key priorities that should be considered in the development of a new WITS, these include:

- Safer infrastructure for vulnerable users (pedestrians, cyclists, elderly, disabled), including the integration of active transport with public transport
- Speed and risk reduction strategies
- Separated cycling infrastructure and improved pedestrian safety.

Finally, the Strategy also encourages the expansion and development of more pedestrian friendly zones around activity centres and the use of traffic calming measures that increase safety and reduce vehicle speeds. This approach is highly applicable to the new WITS.

2.1.5 Whitehorse Cycling Strategy 2016

The *Whitehorse Cycling Strategy 2016* outlines the Council's 10-year plan to improve cycling infrastructure, increase participation, and promote safety across the municipality. The Strategy seeks to:

'...increase cycling through a connected network of attractive, safe and inviting low stress streets and paths that are accessible to all and respects the needs of all users.'

This vision is supported by the following goals:

- Plan and deliver a connected network of low stress cycling routes

- Plan and deliver a comprehensive program of cycling education activities
- For areas outside the control of Council, advocate for the provision of improved cycling facilities and services.

In developing the *Cycling Strategy*, Council extensively engaged with the community. Key issues identified by the community include:

- A lack of consistent and connected infrastructure and facilities for cyclists.
- Conflict amongst shared path users, particularly between pedestrians and cyclists travelling at high speed.

Suggestions included:

- Build more off-road paths
- Create safer ways for cyclists to cross arterial roads
- Improve connectivity between existing and new paths
- Provide additional secure bicycle parking facilities at major destinations
- Promote safe and courteous behaviour by all road and path users.

60% of the general population fall within the ‘interested but concerned’ category. This group are curious about cycling but have safety concerns.

The top 3 priorities for people within the ‘interested but concerned’ category are:

- Build more off-road shared paths
- Safer ways for cyclists to cross arterial roads
- More safe linkages from established cycle routes to shopping and other major precincts.

2.1.5.1 Strengths

The Strategy has several strengths, including:

- Sets measurable targets (e.g., increasing cycling participation, reducing cyclist injuries, and improving female ridership).
- Recognise cycling as both a transport and recreational activity, ensuring integration with broader urban planning.
- Large focus on educational and behavioural change programs for both potential cyclists and drivers.
- Acknowledgement of the complicated nature of existing cycling routes with an action to develop a *Wayfinding Strategy*.

2.1.5.2 Limitations

The Strategy largely focuses on ‘low stress routes’ which generally consist of on-road painted bicycle markings. This includes sharrows and painted bike lanes, often shared with parking. The policy also states that most of the population can still consider these routes unsafe. This indicates that this approach may have limited success. Other key limitations of the Strategy include:

- Does not explore different types of cycling infrastructure or mention protected/physically separated bike lanes, which are considered the safest type of cycling infrastructure.
- Fails to identify a proposed future network aside from showing existing and committed to infrastructure (shown in Figure 4). Figure 4 also does not indicate what type of cycling infrastructure is proposed.
- Some actions require further work to be undertaken. For instance, actions like ‘*identify, map and prioritise Low-Stress Easy Ride routes throughout the LGA*’ would typically have formed part of the Strategy itself.
- While the Strategy aims to increase female cycling participation, it lacks detailed gender-responsive cycling initiatives.

City of Whitehorse cycle network – existing routes and future routes that have been committed to by the state government or Council.

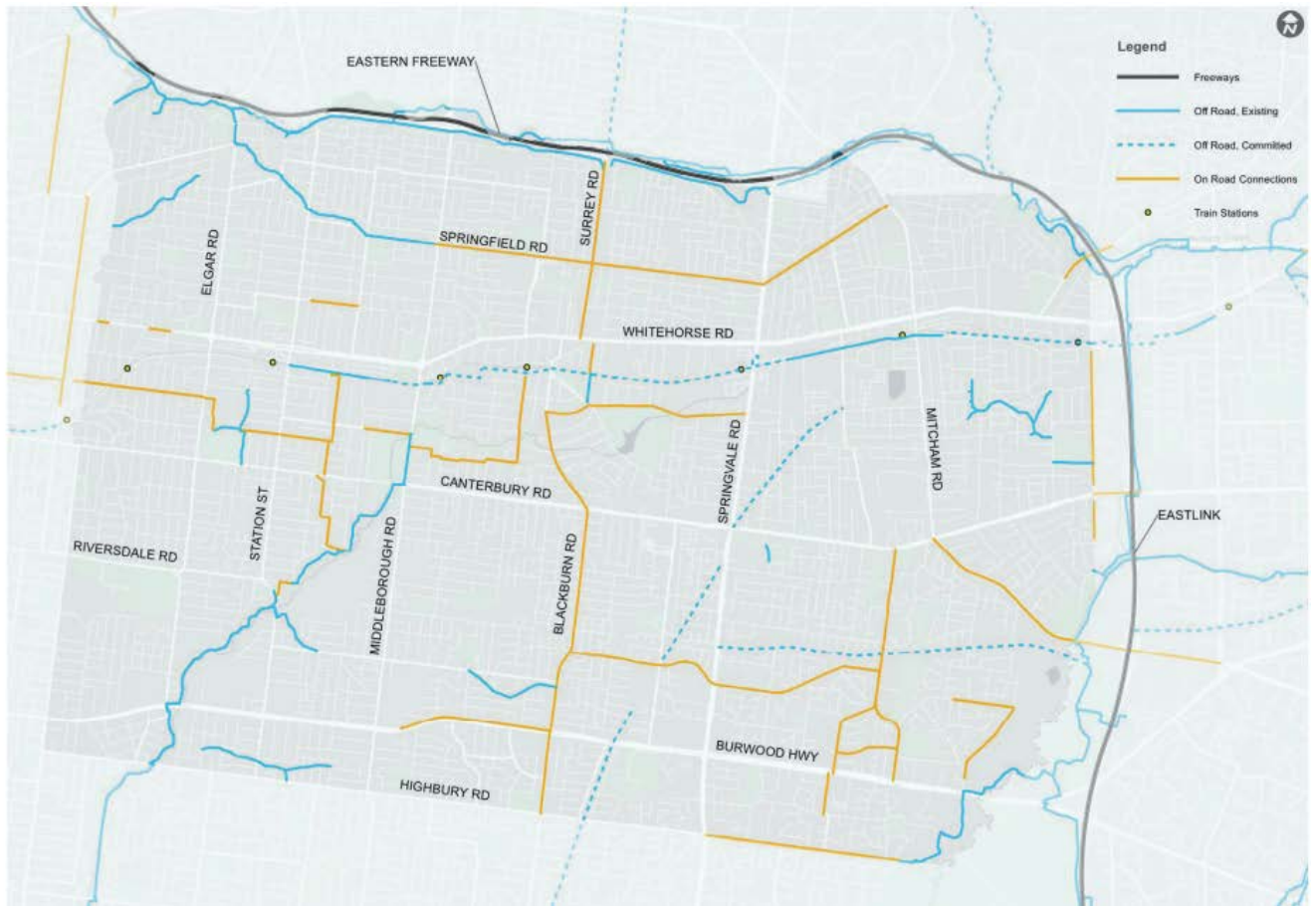


Figure 4 Existing routes and those committed to by local or state government

Source: Whitehorse City Council

2.1.5.3 Implications for the development of a new WITS

The *Whitehorse Cycling Strategy 2016* provides critical information about the profile of potential cyclists in Whitehorse as well as a view into the key cycling priorities and goals over the life of the Strategy.

Several of the projects that are committed to in this report have since been completed, providing the opportunity to develop a new pipeline of project options that can feed into the existing network. The new shared path along the rail corridor acts as a key east-west spine through the centre of the municipality. Future active transport planning projects should work to increase the cohesiveness of high quality cycling links, so they are joined together into a seamless network.

Since the adoption of the *Whitehorse Cycling Strategy*, riding as a method of transport to work has *reduced* rather than grown and, therefore, the targets have not been met. This highlights that other approaches to cycling and cycling

infrastructure should be implemented to achieve Council’s ambition.

Section 2.1.17 summarises the Easy Ride Routes evaluation report, which found that the development of the routes to date has not improved cycle ridership. It highlights the need for investment in more physical infrastructure such as protected bike lanes, to overcome safety concerns potential riders have when mixing with vehicle traffic.

Since 2016, cycling as a method of transport to work has *reduced* rather than grown.

2.1.6 Traffic Management Strategy 2003

The *Traffic Management Strategy 2003* was developed to address the rising rate of crashes within the LGA. The report identifies Whitehorse in the top 50% of local councils within Greater

Melbourne in most crash statistics categories, including ranked 12th for the number of casualties per 100,000 people.

The objectives of the Strategy are to:

- Address traffic safety issues on the City of Whitehorse Arterial and Local Road network
- Provide a decision making process for dealing with traffic issues
- Provide guidance for Council and Officers on traffic issues
- Provide a framework for prioritising traffic management infrastructure projects.

The Strategy acknowledges that Council is responsible for local roads and, therefore, should focus its efforts on these streets rather than State-managed assets. The Strategy indicates that traffic management measures should be considered when both of the following conditions are met:

- **The average speed on a local street is 55 km/h or higher.** Based on a standard 50 km/h road where measured speeds exceed the speed limit by 5 km/h or more, allowing for fluctuation in vehicle speedometer. This would trigger works in approximately 90 streets, with an estimated time frame of 16 years, at 5 streets per year. Determining the status of this action will be important in the development of the new WITS.
- **Traffic volume exceeding 1,500 vehicles per day,** with immediate intervention if greater than 200 vehicles per day.

This Strategy is now more than 20 years old, is largely outdated and no longer relevant to the WITS. Based on the warrants from the 2003 strategy, only 1-2 streets qualify for investigation, highlighting the need for a new TMS. In addition, the State and local policies referenced have since been replaced. The Strategy is also largely movement focused, and relevant government policy priorities have changed. In particular, the *Movement and Place* framework recognises the importance of creating people focused places.

2.1.7 Box Hill Integrated Transport Strategy 2020

The *Box Hill Integrated Transport Strategy 2020* provides a plan to improve transport infrastructure, reduce congestion, and promote sustainable transport in the Box Hill Metropolitan Activity Centre (MAC). It was developed in 2020 with the purpose to:

‘Provide a clear narrative that guides staged implementation of a prioritised set of transport planning initiatives for Council’

The Strategy was developed in the context of major changes to the fabric of Box Hill. Key changes include:

- Rapid population growth and the emergence of high density living around the central activity centre
- Re-development and expansion of the local hospital and medical precinct
- Opening of state government departments locally, as well as Commonwealth departments, such as the ATO
- Development of the Suburban Rail Loop East project, including a new underground station in Box Hill
- On-going growth of the Box Hill Institute TAFE.

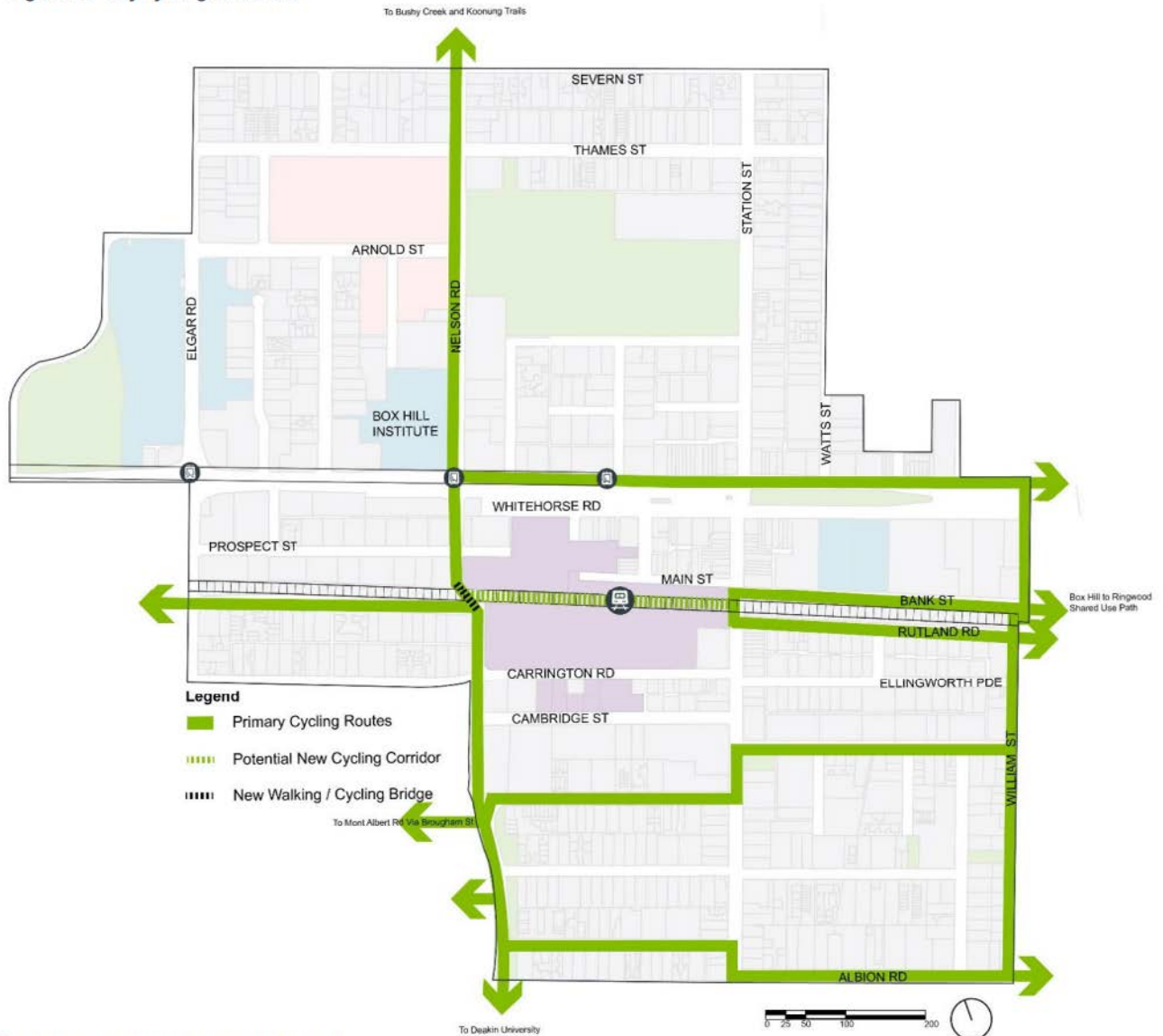
This Strategy forms the most comprehensive transport policy developed by Whitehorse. It provides detailed maps and project plans, which are complemented by a strong framework of actions.

2.1.7.1 Walking and Cycling

The Strategy prioritises walking, cycling, and public transport improvements over private vehicle use. It includes new pedestrian and cycling infrastructure, including bicycle boulevards and protected bike lanes.

The Strategy provides visual examples of different types of cycling infrastructure, making it clear what is being proposed and maps that show where actions will be implemented (e.g Figure 5). The Strategy provides examples of different types of cycling infrastructure.

Figure 20 Key cycling corridors



Outcomes supported by this initiative

THEME 1 – SAFE, HEALTHY AND INCLUSIVE

- 1 Accessible and integrated walking, cycling and public transport network
- 2 Safe and secure transport network accessible to all
- 3 Increased walking, cycling and public transport participation
- 4 Improved physical and mental well being

THEME 2 – SUSTAINABLE AND LIVEABLE

- 5 Allocation of street space to more efficient and sustainable modes of transport
- 6 Efficient and reliable public transport
- 7 A greener, cleaner environment
- 8 Minimal non-essential private vehicle trips

THEME 3 – VIBRANT LOCAL ECONOMY

- 9 An efficient and reliable transport network encouraging travel to, not just through
- 10 Efficient and adaptable purposing of land assets
- 11 A welcoming, safe and vibrant activity centre
- 12 Efficient functioning of local freight corridors

Figure 5 Key cycling corridors Box Hill MAC

Source: Whitehorse City Council

The Strategy also identifies the priority routes for walking (shown in Figure 6) through the precinct and opportunities to improve urban design through under-utilised laneways.

Figure 30 Laneway enhancement opportunities

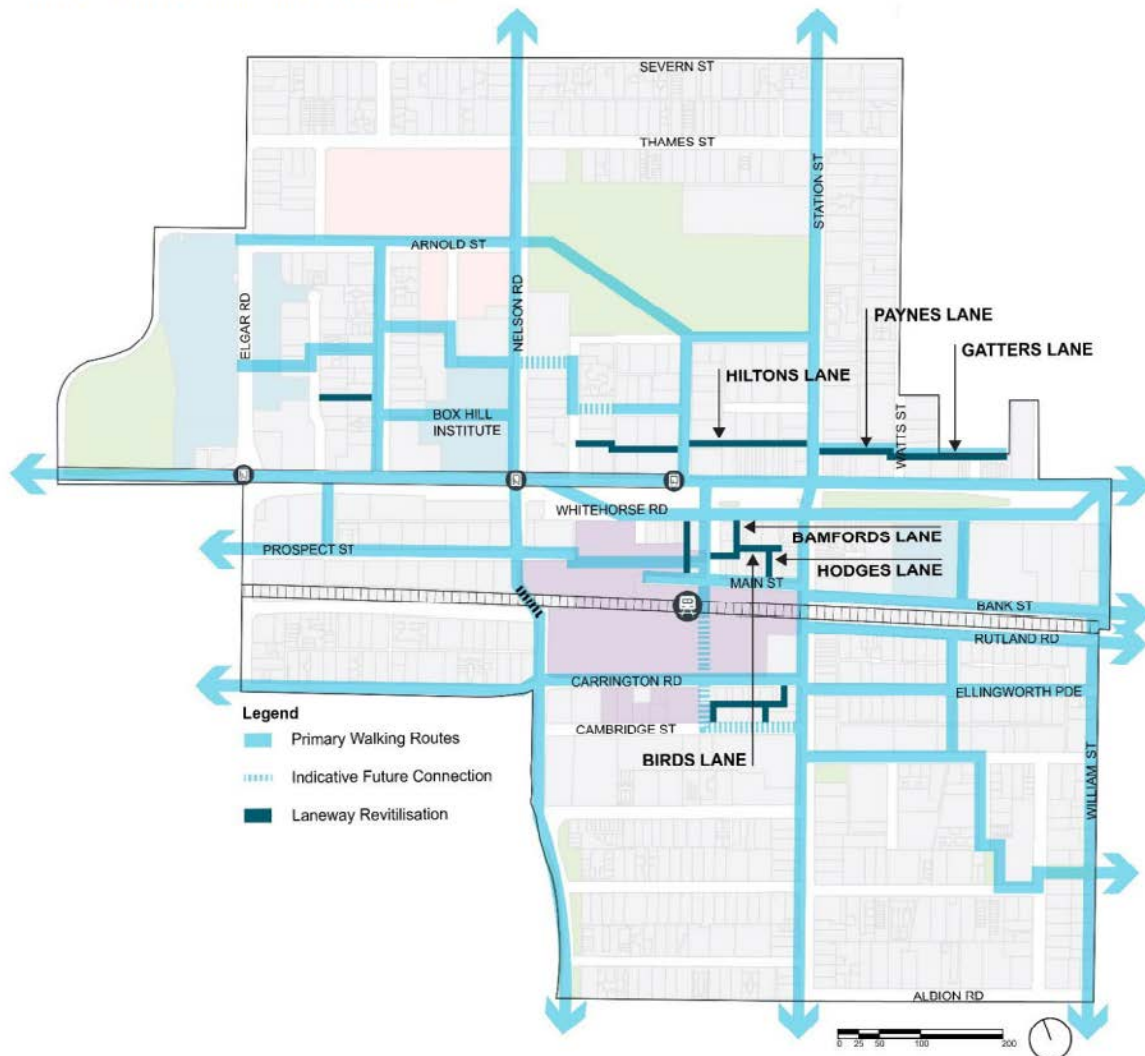


Figure 6 Key walking routes and laneway enhancement opportunities

Source: Whitehorse City Council

2.1.7.2 Public Transport

The Strategy identifies a number of improvements that can be made to the public transport system. These include, but are not limited to:

- Increasing train and tram frequency
- Simplifying and combining some bus routes, while alternating the route of others to serve the community better
- Changes to infrastructure to give buses more priority, including more bus lanes, priority signals and modal filters
- New bus services, including a new fast route from La Trobe University to Deakin University via Box

Hill and Doncaster. This would mimic the future SRL North alignment and provide fast access to key activity centres and tertiary education precincts

- Extending the 109 Tram to Middleborough Road to better connect nearby schools to the tram network and to Box Hill Central.

2.1.7.3 Streets, Roads and Motor Vehicles

The Strategy adopts several proposed changes to the road network. These include staged changes to Whitehorse Road over time to reduce through traffic and provide more space for people, cycling and tram line duplication. Other key proposals include:

- Temporary closure of several streets to motor vehicles at various times to accommodate night events and space activation initiatives
- Creation of parklets that could be used for seating, outdoor dining and/or bicycle parking
- Providing Electric Vehicle charging points
- Introduce 40 km/h speed zones on Whitehorse road and investigate potential further speed reductions to 30 km/h on local streets within the MAC.

2.1.8 Box Hill Car Parking Strategy 2014 and 2018 review

The *Box Hill Car Parking Strategy 2014* aims to create a more efficient, sustainable, and accessible parking system that supports economic activity while reducing reliance on private car use. The strategy acknowledges that managing parking effectively is crucial for Box Hill's future growth and urban development. It seeks to optimise existing parking and encourage sustainable transport alternatives. It seeks to balance the needs of businesses, residents, and visitors. By integrating parking management with broader transport and planning policies, the Strategy seeks to improve mobility and accessibility in the area.

The key strategic objectives are:

- **Manage car parking demand and supply** to satisfy user needs (with a focus on maintaining/increasing the vibrancy of Box Hill).
- **Locate and manage car parking** to minimise traffic generated by the search for a parking space.
- **Encourage the use of active and sustainable travel** modes rather than increased private vehicle travel.
- **Improve general amenity for pedestrians within Box Hill** to increase the willingness for visitors and staff to walk to and within the Centre to their destination.

To achieve these goals a number of key strategic recommendations were made:

- Regular and increased parking enforcement
- Wayfinding car parking signage to direct drivers to the underutilised parking

- Work with Box Hill Hospital to manage locations accommodating long-term staff parking and shuttle bus services for staff
- Limit parking to short term restrictions along street frontages adjacent to the hospital and commercial precincts
- Review and enforce the fee structure through key precincts
- Support potential infrastructure works in lieu of available car parking to encourage more sustainable travel and create new links
- Review parking ticketing and control systems at 'secure' off-street car parking sites.

While the Strategy sets out strong policy directions, success depends on external factors such as public transport improvements, active transport infrastructure improvements and community buy-in.

2.1.8.1 2018 Implementation Review

In 2018 a review of the progress made under the *Box Hill Parking Strategy 2014* was undertaken. This review looked at each of the original strategies actions and analysed progress made. The 2018 review also notes a higher-than-expected growth in parking demand due to increased commercial and residential development in Box Hill.

The review identifies the mixed success of parking enforcement, which it noted needs to be more consistent. Several parking restriction changes have also yet to be implemented.

The review also identifies that little progress has been made in improving public and active transport since 2014 and makes more recommendations for public transport.

2.1.8.2 Implications for a future WITS

The Strategy supports a shift toward sustainable transport, making it a good foundation for an integrated approach. To achieve the objectives of the Strategy, collaboration with the State government on public transport, active transport and the management of arterial roads is required.

2.1.9 Climate Response Strategy 2023 – 2030

The *Whitehorse Climate Response Strategy 2023-2030* outlines the City of Whitehorse’s approach to reducing emissions, adapting to climate change, and supporting the community in addressing climate challenges.

It adopts the following targets that guide the actions and approaches to be undertaken:

- Maintaining carbon neutrality for Council’s corporate emissions
- Sourcing 100% renewable electricity for Council operations by 2025
- Achieving net-zero corporate emissions by 2032.
- Aspiring for net-zero community emissions by 2040.

Whitehorse aspires for net-zero corporate emissions by 2032 and net-zero community emissions by 2040.

These targets align with State and Commonwealth commitments, including Victoria’s goal of 95% renewable electricity by 2035 and net zero emissions by 2045.

2.1.9.1 Key Climate Challenges and opportunities

Transport is one of the largest sources of emissions in Whitehorse (shown in Figure 7), alongside electricity and gas use. Reducing car dependency and increasing the use of public transport, cycling, and walking is critical for emissions reduction.

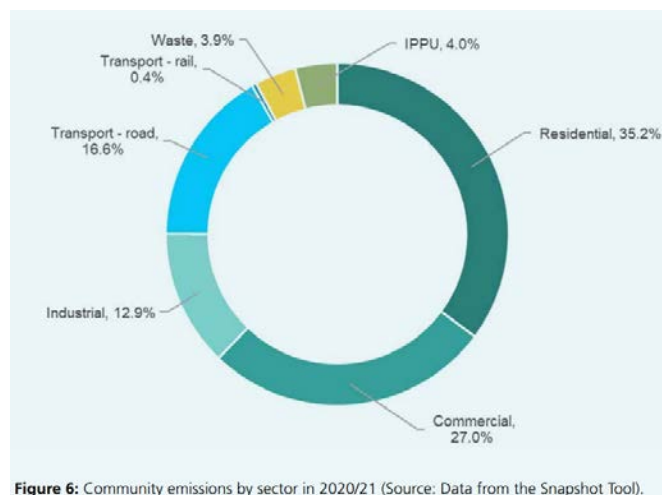


Figure 6: Community emissions by sector in 2020/21 (Source: Data from the Snapshot Tool).

Figure 7 Whitehorse Community Emissions profile

Source: Whitehorse City Council

Key challenges identified in the *Response Plan* include:

- Loss of vegetation due to urban development
- Limited Council control over community emissions (requires advocacy and incentives)
- Funding constraints for large-scale climate action.

Key opportunities identified include:

- Early investment in sustainability saves money in the long term
- Expanding cycling, walking, and public transport infrastructure reduces emissions
- Transitioning to renewable energy and electrification benefits residents and businesses.

2.1.9.2 Implications for the development of a future WITS

The Strategy encourages a mode shift from cars to public transport, walking and cycling; however, it does not include robust measures that will reduce transport emissions. Transport is the fastest growing source of emissions and the manager of most local roads and streets has a key role to play in providing the community with low-carbon transport options. There is opportunity to develop a WITS that is focused on providing greater transport options to the community and at the same time, more opportunities to reduce transport emissions. Creating a comprehensive and accessible public and active transport network is the best way to reduce local traffic and carbon emissions.

2.1.10 Climate Response Plan 2023-2026

The *Climate Response Plan 2023-2026* forms the first action plan to follow the *Climate Response Plan 2023-2030*. This Plan provides the actions that Whitehorse will undertake in the first three years to 2026.

Key actions related to the development of a new WITS include:

- *Action 2b: Increased electric vehicle uptake in the community*
- *Action 2c: Identify, prioritise and advocate for opportunities to improve connections between sustainable transport modes, including cycling routes and public transport hubs.*

The actions do not have any associated cost estimates, budget commitments or targets. This makes it hard to determine what level of investment or infrastructure provision is required for the actions to be deemed completed to a satisfactory level during review periods. The Strategy does reference the 2016 Cycling Strategy's goal of increasing cycling trips to work from 0.7% to 2% by 2026; however, it does not indicate how much progress has been made or what specific actions will be undertaken to reach the target.

The Plan's actions require further work but provides little guidance for what the goals or targets of future work should be. Examples of measurable

goals can include the length (km) of separated bike infrastructure installed, or target annual spend on cycling infrastructure/bus stop shelter. Goal and target setting should be included in any future Council documents, such as the future WITS.

2.1.11 Community Engagement Policy 2020

The Whitehorse *Community Engagement Policy* sets out the City of Whitehorse's commitment to involving the community in decision-making processes. It outlines engagement principles, legal requirements, and best practices for ensuring transparent, inclusive, and effective community participation.

The key principles underpinning the *Engagement Strategy* are:

- inclusion, access, and constructive participation
- clarity of purpose and scope
- transparency, informative, and clear
- integrity, caring, and responsiveness

The IAP2 Engagement spectrum (shown in Figure 8) is used by Whitehorse to determine the level of engagement that should be undertaken for any given project. The policy states that while no one item within the spectrum is better than any other, they do emphasise the more dynamic engagement levels as a priority, with strategies under the Inform category only to be used in specific circumstances.

	Inform	Consult	Involve	Collaborate	Empower
Goal	To provide balanced and objective information to assist in understanding the problem, alternatives, opportunities and/or solutions.	To obtain feedback on analysis, alternatives and/or decisions.	To work directly with our target participants throughout the process to ensure that their concerns and aspirations are consistently understood and considered.	To partner with our target participants in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of our target participants
Promise to target participants	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
Role of target participants	Listen	Contribute	Participate	Partner	Partner or Lead
Examples of methods	Participatory engagement		Deliberative engagement		
	Fact sheets Whitehorse News Website Social media Open houses Email (when available)	Surveys Submissions Focus groups Meetings Listening posts	Workshops Deliberative polling Advisory Committees Ranking and prioritising Co-design Community panels		Citizens Juries Ballots Representative deliberative panels

Figure 8 IAP2 Engagement spectrum from the Whitehorse Community Engagement Strategy

Source: Whitehorse City Council

Following the implementation of the new *Local Government Act 2020* and the new requirements around deliberative engagement, Council undertook a full review of the Strategy. Council developed an internal handbook to provide a suite of resources for the organisation to use when engaging with the community.

Whitehorse also has strong commitments within the policy to review engagement processes after completion to ensure continuous improvement. Council will report back to participants on how their feedback influenced decisions, ensuring inclusivity and accessibility.

2.1.12 Health and Wellbeing Action Strategy 2021-2025 (Final Year 2024-25)

The Health and Wellbeing Plan 2021 - 2025 fulfils the *Public Health and Wellbeing Act 2008* requirement for all Victorian Councils to prepare a Municipal Health and Wellbeing Plan every four years within 12 months of a local government election.

Community engagement for the Whitehorse Community Vision 2040 asked questions that helped shape the health and wellbeing priorities of the community. These include social justice, inclusivity and sustainability. The Strategy adopts the World Health Organisation statement:

‘Health is a state of complete physical, mental and social well-being, and not merely the absence of disease or disability.’
- World Health Organisation

The Strategy identifies four key themes of the Community Vision 2040 that align best with this policy:

- Theme 1: Diverse and Inclusive Community
- Theme 2: Movement and Public Spaces
- Theme 5: Sustainable Climate and Environmental Care
- Theme 7: Health and Wellbeing

Walking, cycling and public transport are key modes of transport, especially for younger people and older members of the community, who may be too young or old to drive. Their transport options may currently be limited in Whitehorse.

2.1.12.1 Implications for the development of the WITS

As part of the key themes and goals of the Strategy, it identifies physical and mental health as a key

component in improving the lives of the community. In doing so, the Strategy highlights the need to increase walking and cycling as transport modes. Walking and cycling are linked to both physical and mental health benefits.

The Strategy also focuses on social connectivity to improve the mental health of all residents. Those from multi-cultural backgrounds and the ageing population often feel more isolated from the broader community. This could include language or cultural barriers, or difficulty moving to places of social connection. Therefore, a diversity of transport options is essential for all members of the community to engage with the opportunities offered in Whitehorse and beyond.

2.1.13 Disability in Whitehorse Action Plan 2022-2025

The *Disability in Whitehorse Action Plan* was undertaken in alignment with the *Whitehorse Community Vision 2040*, the *Whitehorse Council Plan 2021-2025* and the *Whitehorse Health and Wellbeing Plan 2021-2025*. The development of the Plan acknowledges that while people with disabilities share aspirations and needs of others in the community, they face unique barriers and challenges that can differ from person to person.

The Plan prioritises improving access for people with disabilities to:

- services and programs
- information
- the built environment
- education, employment and training.

17% of Whitehorse's estimated population of 180,735 residents (~31,990 people) may have a disability.

Source: City of Whitehorse

2.1.13.1 Implications for the development of a new WITS

The Plan includes several actions that can feed into and align with the development of a new WITS. These include:

- *Action 19: Identify and address non-compliant properties and building sites with obstructed footpaths.*
- *Action 20: Increase the number of accessible car parks available in the municipality.*
- *Action 21: Continue to advocate for greater accessibility in public transport projects.*
- *Action 22: Increase accessibility of paths within parks and open spaces ensuring greater access for people with disability.*

The Plan also discusses the importance of accessibility to information. Wayfinding is a critical aspect of a transport network. While wayfinding is not specifically mentioned in the action plan, the use of accessible text, font sizes, symbols and features such as braille should be considered essential to the development of future transport infrastructure and the wayfinding strategies that accompany it.

2.1.14 Investment and Economic Development Strategy 2024 - 2028

The *Whitehorse Investment & Economic Development Strategy 2024-28* outlines the economic growth priorities and actions for Whitehorse City Council over the next five years. It aims to foster a sustainable, innovative, and inclusive economy that benefits residents, businesses, and visitors.

Key objectives of the Strategy include:

- Provide a collaborative approach to economic development
- Grow visitation and visitor spend
- Promote business growth and investment
- Improve local employment outcomes for workers and businesses
- Activate places for community connection and wellbeing.
- Create an environmentally sustainable and resilient economy

- Increase local consumption within activity centres.

Several of the priorities are directly linked with transport, with ambition for more commercial activity to be centred around Box Hill MAC, Nunawading Golden Mile, Burwood Heights and Burwood East Activity Centres (shown in Figure 9). *Better connections* and *diverse transport options* are identified as important parts of supporting local economies. This promotes both the local employment and economic areas, but also alternative transport options to cars.



Figure 9 Whitehorse Economic and Employment Areas

Source: City of Whitehorse

High quality walking and cycling and vibrant streetscapes are known to attract knowledge industry businesses to an area, and thus Whitehorse may benefit economically from such enhancements.² The Strategy also identifies the development of the new ITS as essential to addressing transport needs and the impact of the many new transport projects taking place across the LGA.

2.1.15 Whitehorse Planning Scheme

In 2025, a change in Victorian policy led to many updates to the Whitehorse Planning Scheme. The key focus is on housing and the development of higher density housing in areas rich with public transport. Recent ministerial amendments created the new Precinct zone and associated public benefit uplift framework which allows for public realm works. The new zone relies on a masterplan where transport connections would play a key role.

The Whitehorse Planning Scheme names and provides direction for the metropolitan and major activity centres network in the Municipal Planning Strategy (LPP 02.03-1). LPP 02.03-8 aims for reduced freight and private vehicle traffic on the main arterial roads in Whitehorse. The reduction of traffic volume responds to the community’s concern about traffic congestion. Council also states its support for:

- The extension of the Burwood Highway tram line to Knox City Shopping Centre
- Better integration and coordination between bus, rail and tram services.
- Encouraging sustainable transport to reduce car dependency
- Facilitate an integrated approach to land use and transport planning to maximise development around public transport facilities.

VPP 18 provides State high-level direction for land use and transport integration. Council direction is provided in:

- LPP 18.02-1L - introduces sustainable personal transport and proposes improvements to the pedestrian and bicycle network.
- LPP 18.02-4L - protects active street frontages by directing off-street car parking to be located to the side or rear of buildings. Off-street parking is encouraged to minimise on-street parking.

Other elements from the Planning Scheme, such as zoning and overlays, are discussed in more detail in Section 10.

² Richard, F. (2002). The rise of the creative class.

2.1.16 Whitehorse Recreation Strategy 2015 - 2024

The *Whitehorse Recreation Strategy 2015-2024* provides a framework for recreation and sport planning in the City of Whitehorse. It aims to promote active lifestyles, community participation, and accessible facilities for all residents.

The Strategy takes a broad definition to recreation, not only reflecting organised sport but also unstructured (walking, cycling, casual play) recreation.

During the development of the Strategy, members of the community raised the opportunity of enhanced signage to promote walking and cycling pathways between neighbourhoods. This aligns with some of the priorities in the Plan, particularly those identifying the need for walking and cycling infrastructure when planning both passive recreation and facilities (shown in Figure 10). This includes the infrastructure needed at recreation destinations, such as clubs and facilities (e.g., stadiums and swimming pools).

2.1.16.1 Key Actions within the Strategy related to transport

The Strategy has several actions that can provide guidance for the future development of a new WITS. These include:

Action 3: Older adults and recreation centres

This action supports programs that get older adults onto bikes. This can help increase social activity and prolong independence. It also mentions some organisations that could be partnered with to provide these programs (U3A etc). The language used in the action does not guarantee that anything will be accomplished. It states that various programs could be *'considered'* or *'investigated'*.

Action 7: Minimising barriers to walking and cycling to schools

This action seeks to increase the number of trips to and from schools that are undertaken by walking or cycling. Key areas of focus include reducing traffic around schools, identifying safe routes and working with schools to ensure infrastructure is safe and accessible for students.

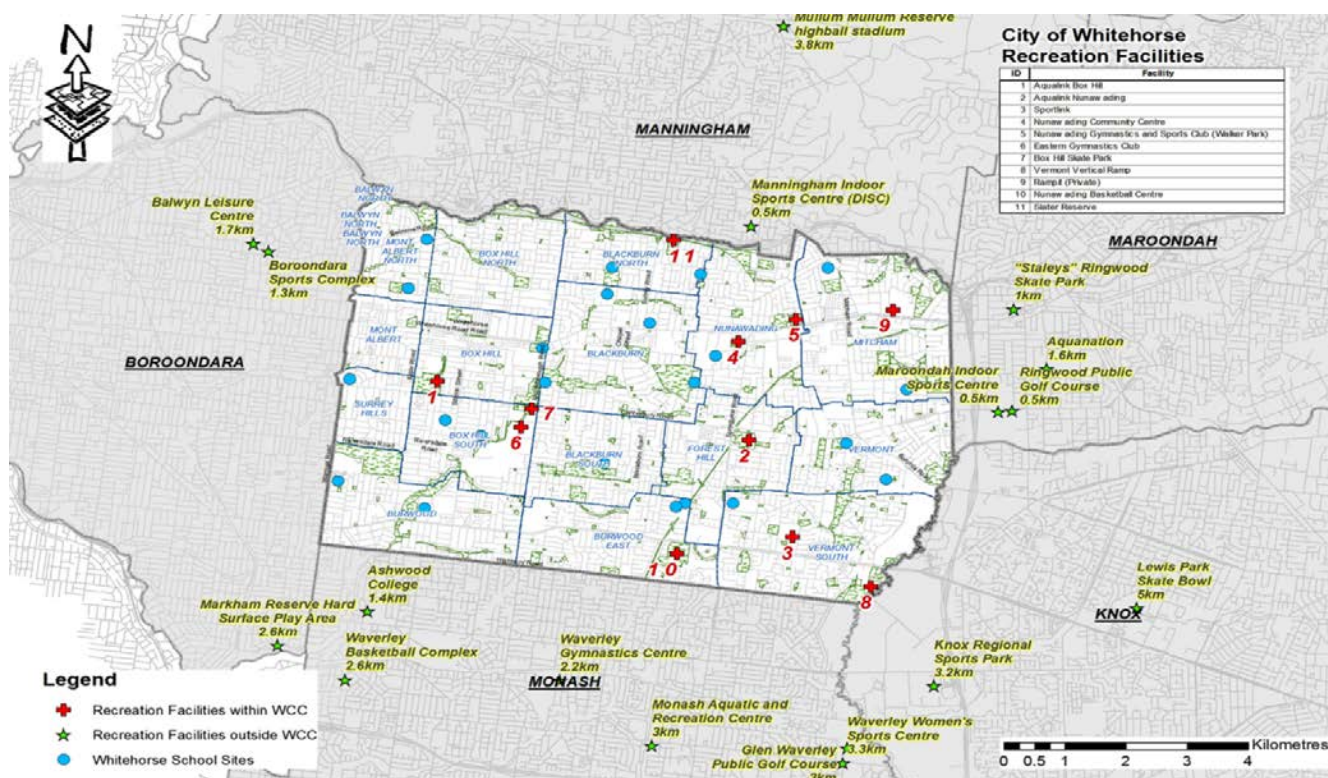


Figure 10 Whitehorse and surrounds recreational facilities map

Source: Whitehorse City Council

Action 16 and 17

These actions discuss the importance of integrating walking and cycling paths into open space plans and identifying gaps in the existing network to be filled. This includes links to public transport infrastructure and an emphasis on bicycle storage facilities at key locations such as railway stations.

Action 35: Bicycle Strategy

This action requires the review of the existing Bicycle Strategy, which resulted in the development of the *2016 Bicycle Strategy*. This is now also up for review and Whitehorse has suggested in various strategies that it be included as part of the future WITS.

2.1.16.2 Implications for the development of a new WITS:

This Strategy provides strategic support for developing a future cycling network that connects residential areas to schools, recreational facilities and public transport hubs. It highlights the importance of passive recreation in developing good physical and mental health, as well as building social connections in vulnerable communities.

A new Open Space Strategy 2024 is currently in development and will be relevant to the development of a future WITS

2.1.17 Easy Ride Routes evaluation report

Stantec was commissioned by Whitehorse City Council to evaluate Council’s *Easy Ride Routes*. Key findings of this report indicate that the routes did not result in reduced crashes involving bikes or an increase in trips made by bike. Through user trip surveys, the following issues were identified:

- Intersections with main roads were difficult to navigate and riders felt unsafe or uncomfortable
- Overall lack of bike friendly infrastructure
- Difficulty navigating the Easy Ride Routes (ERR) and a lack of consistent wayfinding
- Some routes are less direct and require frequent turns.

Overall, the routes are viewed positively by the community members who participated in the study, but significant barriers to cycling resulted in no increase in participation.

The key outcome from the report is that the provision of safe cycling infrastructure needs to be increased throughout the network. This includes

safe, separated bike lanes, going beyond the existing wayfinding, directional signage and sharrows. The review also states that infrastructure along these routes should be prioritised before rolling out new routes. Priorities for infrastructure are outlined in Figure 11.

Bike count data showed that in general, cycling volumes are low on the ERR network and have not changed since the routes were implemented.

The report also makes several specific infrastructure recommendations at various locations along the Easy Ride Routes. These include (but not limited to) upgraded intersections, cycling cut-throughs, protected bike lanes and widening of paths and traffic islands.

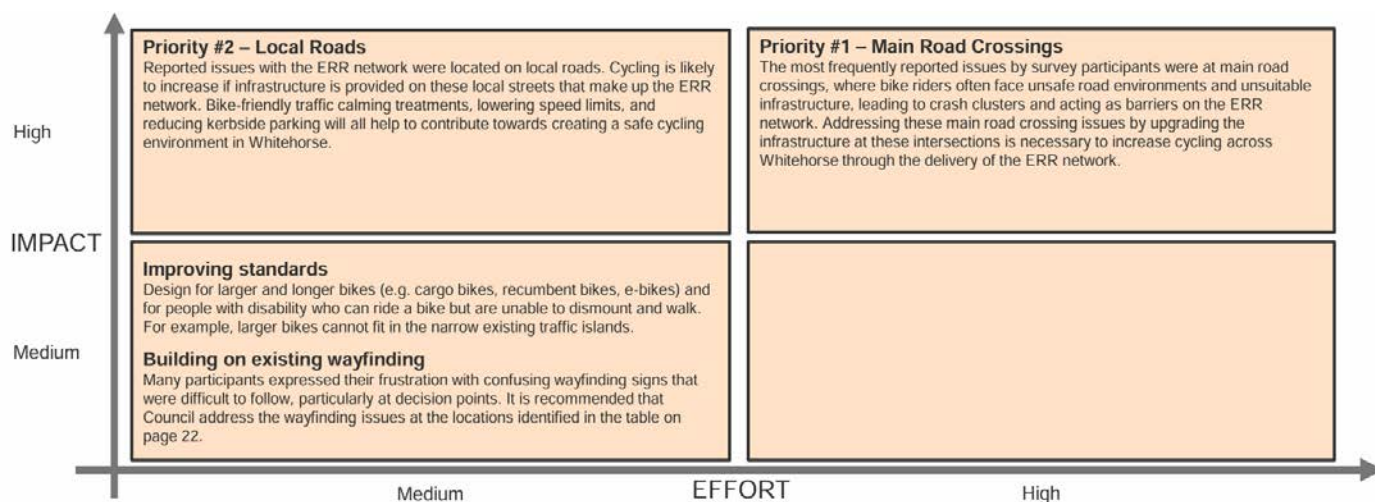


Figure 11 *Easy Ride Routes review – priorities*

Source: Stantec, City of Whitehorse

2.1.18 Whitehorse Transport Education Programs

The City of Whitehorse has implemented a range of educational and behavioural change initiatives to promote sustainable transport, particularly among school-aged children and their families. These programs aim to reduce car dependency, ease traffic congestion, and encourage healthier, more environmentally friendly travel habits. These programs include:

- Whitehorse Active and Safe to School Program
- Rangeview Primary School - Summary of Actions
- Stride and Ride Map
- Prep Transition Fact Sheet
- A2B Transit Program
- Ready 2 Ride
- Bike Skills Training Courses.

2.1.18.1 Whitehorse Active and Safe to School Program - Rangeview Primary School

The Whitehorse Active and Safe to School Program seeks to work with one school per year to develop a school travel plan. This program is part-funded by the Department of Transport and Planning. This program includes developing a *Stride and Ride Map* for each school (Shown in Figure 12).

The *Stride and Ride Map* for Rangeview Primary School is a visual tool designed to promote active and safe travel to school. It highlights recommended walking, cycling and scooting routes, as well as designated “Park and Stride” locations where families can drop off students to walk the remainder of the journey. The map aims to reduce traffic congestion around the school, enhance student safety, and encourage healthy, environmentally friendly travel habits. It also includes travel times and safety tips to support families in making informed and active commuting choices.



Figure 12 Rangeview Primary Stride and Ride Map

Source: City of Whitehorse

2.1.18.2 Prep Transition Fact Sheet

This is a flyer that has been developed for primary schools to include in their Prep transition packs. This informs parents about dropping off their children to school, what different signs mean and encourages them to reduce car trips. It also asks parents to seek parking locations further from the school to reduce traffic congestion and increase active transport.

2.1.18.3 A2B Transit Program

This program is designed for Year 6 students as they prepare to transition to high school, with a focus on developing travel planning skills and promoting safe, independent travel. It provides information and examples of travel planning tools (e.g. PTV app) and safety tips for walking and cycling.

2.1.18.4 Ready 2 Ride

Also known as a Bike Ed Challenge, this is a one-day bicycle skills program delivered on school grounds, ideally involving all students in Grades 5 and 6. The activity focuses on building students' confidence and competence in bike handling, road safety awareness, and practical riding skills. It offers a fun and engaging way for students to learn safe cycling techniques, understand traffic rules, and prepare for more independent travel. The challenge format encourages teamwork and participation while reinforcing key safety messages.

2.1.18.5 Bike Skills Training Courses

The City of Whitehorse conducts two types of bicycle training courses:

- Individual Bike Skills Sessions – 50 minutes (Adults and Children aged 7+)
- Urban Cycling Confidence – 4.5 hours (Adults)

The Individual Bike Skills Sessions seek to teach basic riding skills or improve basic skills for novice riders who wish to improve their confidence.

The Urban Cycling Confidence program is for adults who are confident riders off-road and on shared paths who want to develop their skills and confidence further before riding on the road. This program includes an initial 2.5-hour skills session off the road with an optional additional 2 hour on-road ride with the instructors.

These programs are generally comprised of small groups between 5-12 people.

2.1.18.6 Increasing Sustainable Travel Behaviours

It's unclear if these interventions and programs changed travel behaviours. Future activities may look to include information gathering on attitudes and preferences towards walking and cycling in Whitehorse.

These efforts represent a strong focus on encouraging more people to seek alternative transport options to the car. Future activities, however, may benefit from data collection and program evaluation to better understand their impact and inform continued improvements. The success of such initiatives also depends on the provision of supportive infrastructure that prioritises safe walking and cycling options.

2.1.18.7 L2P Program

The L2P program assists disadvantaged young people aged from 16 to 21 to have access to supervised driving practice with a volunteer driving mentor. This enables them to meet the minimum 120 hours of driving experience that is required to move from a learner permit to a probationary licence.

Whitehorse has partnered with Manningham City Council since 2014 to run the joint Manningham-Whitehorse TAC L2P program.

2.2 State government policies and plans

This section provides a review of the relevant Victorian government policy landscape.

2.2.1 Road Management Act 2004

The *Road Management Act 2004* defines the powers and responsibilities of relevant authorities managing roads in Victoria. This document is over two decades old and was written prior to many of the most important State government strategies and planning frameworks related to transport. The *Road Management Act* has three major purposes:

- Establish a system for managing road-related functions
- Set the standards for discharging duties related to road management
- Set the roles, functions, and duties of road management authorities.

Any document that is relevant to the management of roads, and the safety of roads, is subject to the Codes of Practice as directed in the Act.

Some inclusions within the Act that affect local government are:

- Enables local government to develop its road management strategy and standards
- Provides local government with responsibility for parking on arterial and other state-managed roads
- Establishing the allocation of responsibility for different parts of the road reserve (footpaths, roadways service roads, etc)
- A regulatory framework for undertaking works on roadways, including mandatory reporting, and the responsibility to notify other road management authorities if the work will affect them.

2.2.2 Transport Integration Act 2010

The Act establishes a framework for an integrated and sustainable transport system in Victoria. It outlines several key objectives for the transport system, including:

- Social and economic inclusion

- Economic prosperity
- Environmental sustainability
- Integration of land use and transport
- Efficiency, coordination, and reliability
- Safety and health and wellbeing.

The Whitehorse ITS will need to consider the objectives outlined in the Act, working towards a safe, sustainable transport system that benefits the community.

2.2.3 Local Government Act 2020

While transport planning is not specifically mentioned, the *Local Government Act 2020* establishes a framework for councils to manage infrastructure and services, which includes transport-related functions and urban planning.

Local councils are required to plan for the future development and maintenance of their municipalities. This Act encompasses transport infrastructure such as roads, footpaths and bicycle lanes.

Council has legislative obligations to mitigate and adapt to climate change impacts as set out in the *Local Government Act 2020*, the *Victoria Climate Change Act 2017*, and the *Planning and Environment Act 1987*. This includes supporting a transition to less carbon intensive transport options such as public transport, active transport and measures to reduce the level of use of internal combustion engine vehicles.

The Local Government Act 2020 in Victoria requires all local governments to consider the long-term negative impacts of climate change on future generations in their planning, decision-making and actions.

Further, the *Local Government Act 1989* includes several provisions that are still in effect, this includes those in Division 2 relating to transport:

- (S203) which authorises Council to develop a transport plan which facilitates sustainable transport
- (S205) Council has the care and management of certain roads usually referred to as local roads.

2.2.4 Plan Melbourne 2017-2050

Plan Melbourne 2017-2050 is the Victorian State Government’s metropolitan strategy for Melbourne. It plans to ‘*manage growth in the city and suburbs to the year 2050 and ‘to integrate long-term land use, infrastructure and transport planning, and, in doing so, meet the city’s future environmental, population, housing and employment needs.’*

Plan Melbourne 2017-2050 identifies ‘*places of state significance that will be the focus for investment and growth.*’ These include: ‘*Central city*’; seven ‘*National employment and innovation clusters*’; and nine ‘*Metropolitan activity centres*’ of which Box Hill is one.

The purpose of Metropolitan Activity Centres is ‘*to provide a diverse range of jobs, activities and housing for regional catchments that are well served by public transport.*’ Plan Melbourne views these centres as playing a major role in delivering government services, while also providing retail and commercial opportunities.

There are some principles that are of direct relevance to Whitehorse as it begins to consider the development of its ITS:

- Environmental resilience and sustainability
- Living locally – 20-minute neighbourhoods
- Strong and healthy communities.

For Melbourne to maintain its liveability, a reduction in car use and an increase in walking and cycling is required.

The North East Link (NEL) project was identified as a potential project in Plan Melbourne 2017-2050. It is now under construction. The Suburban Rail Loop (SRL), which is not mentioned in Plan Melbourne, is also in the early stages of development. Many other

transport objectives in Plan Melbourne are relevant to the development of a future WITS, including:

- Outcome 3: an integrated transport system connecting people with jobs and facilitating commerce.
- Outcome 5: focusing on inclusive, vibrant, and healthy neighbourhoods, including the 20-minute neighbourhood concept.
- Outcome 6: sustainability and resilience. Transport is the fastest-growing source of emissions, and car use reduction is essential to meet sustainability targets.

Outcome 3 of Plan Melbourne is for Melbourne to have an integrated transport system connecting people with jobs and facilitating commerce.

Other policies of relevance to Whitehorse include:

- Policy 3.1.6 - to support cycling for commuting
- Directions 3.3 and 5.1 - 20-minute neighbourhoods. This aims to create neighbourhoods that contain all necessary services, recreation, social activities, personal business and education. *20-minute neighbourhoods* increase travel choice as most local needs are within a walkable or cyclable distance.

The 20-minute neighbourhood aims to create neighbourhoods that contain all necessary services, recreation, social activities, personal business and education.

- Policy 5.2.1 - incorporate walking and cycling into everyday routines.
- Policy 6.1 - creating low-carbon urban environments, aligning with Victoria's objective

of net zero greenhouse gas emissions by 2050. This policy underscores the importance of integrating sustainable transport options as a key element in reducing carbon emissions and promoting environmentally friendly transport alternatives. This includes integrating active transport options with public transport. In Whitehorse, this would include ensuring that there are active transport routes and parking options located at the railway stations and major tram stops throughout the municipality.

2.2.5 Plan for Victoria (2025)

Plan for Victoria outlines a long-term planning strategy for Victoria. It focuses on more housing, jobs, sustainable environments, community development and self-determination. It sets out planning and housing priorities and targets for all LGA's.

'By 2050, Victoria will be a vibrant, accessible and connected community, valued for its diverse cultures, sustainable environmental practices and respect for the First Peoples of Victoria.'

Building a state that provides choices and opportunities for current and future generations of Victorians in quality housing, transport, employment, environment and connectivity will require input from the community, government, local businesses and industry alike.

'We will create a society that caters to the unique needs of all Victorians, nurturing individual health through physical and cultural recreation.' – *Plan for Victoria Vision*

Plan for Victoria prioritises housing. Sustainable transport and public spaces should be planned to support the needs of existing and future residents. Figure 13 and Figure 14 present the proposed concepts for what key streets and activity centres should look like when redesigned for higher density housing.

A key part of this policy is formalising the Governments housing targets and the *Activity Centre Program* (see Section 2.2.5.2).



Before: Limited home choices in an unwelcoming environment.



After: More home choices provided in green public areas with access to jobs, shops, public transport, facilities and services.

Figure 13 Before and after streetscape with more housing choices and sustainable transport options

Source: Victorian State Government



Before: Underutilised land limits opportunities for more homes, green spaces and vibrant communities.



After: More homes within commercial sites creates opportunities for a greater diversity of homes and support for local businesses.

Figure 14 Before and after local activity centre with more housing choices, sustainable transport options and public space

Source: Victorian State Government

2.2.5.1 Victoria’s Housing Statement and associated Activity Centres Program Victoria’s Housing Targets

The Victorian government has released housing targets for Victorian municipalities. The *Plan Victoria* target for Whitehorse is the construction of 76,500 new homes by 2051. Based on the existing Census household structure (2.53 people per house in the City Whitehorse), this equates to a target population increase of approximately 187,726 new residents.

Proposed Victorian Government targets aim to increase the Whitehorse population by 106% by 2050.

This new housing target is a significant increase on the previous Victoria in Future (VIF) forecast, which estimated an overall population increase of 37,209 people (17.8%) by 2036.

2.2.5.2 Activity Centres Program

The *Activity Centres Program* seeks to focus development within key locations with strong access to local services and public transport. Figure 15 shows the activity centres around Melbourne chosen for the development of new precinct structure plans. In addition to the two SRL precincts in Box Hill and Burwood (see section 10.3.1), the Activity Centre Program identifies Blackburn, Nunawading and Mitcham as key activity centres. Along with 22 other activity centres around Melbourne, they will undergo 6 months of community consultation to inform future precinct structure plans.



Figure 15 New target activity centres near train stations or trams

Source: Victorian Planning Authority

2.2.5.3 Implications for the future WITS

The proposed population and density increase poses both serious challenges and opportunities for Whitehorse. High car dependence, coupled with limited road space, means the liveability of these activity centres may diminish without an unprecedented focus on enhancing the walking and cycling environment. Better connections and integration between active and public transport will also be required. Without sustained, unprecedented action, applying population growth targets to a car dependent transport system will exacerbate the congestion and parking difficulties already experienced in Whitehorse. Figure 16 illustrates how active and public transport can move more people per hour than vehicle traffic lanes.

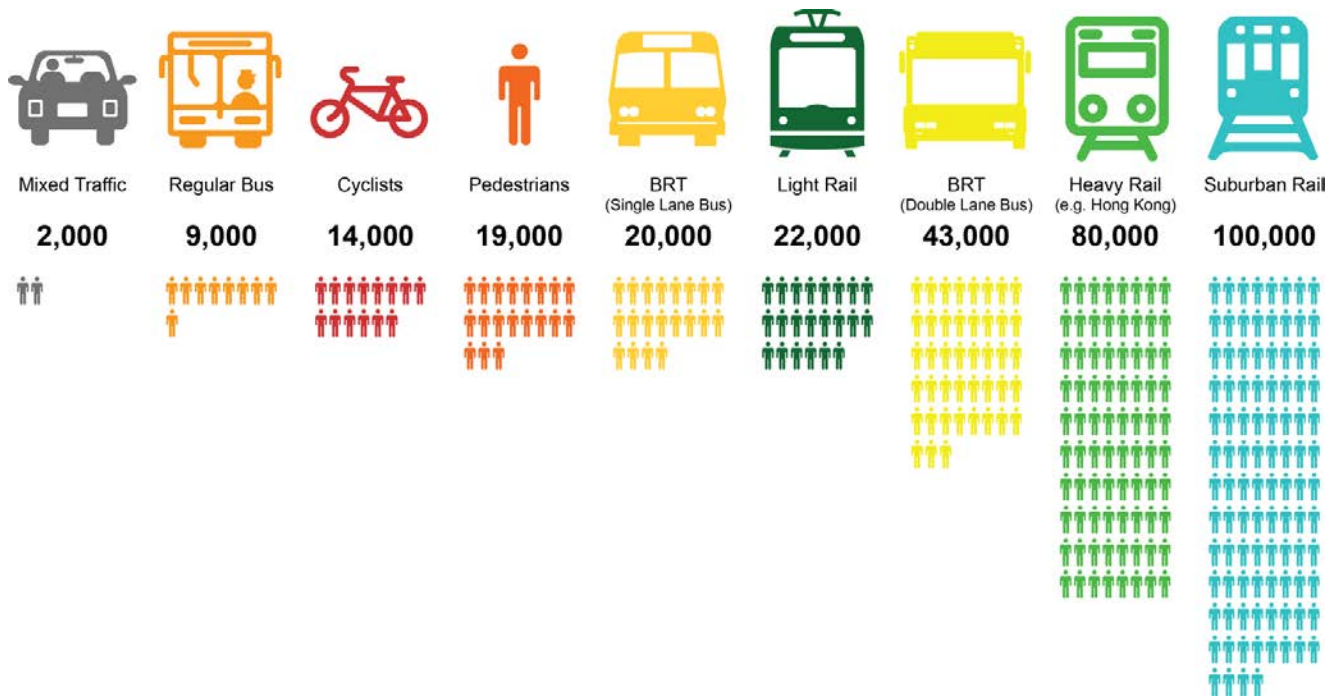


Figure 16 Carrying capacity of different modes of transport

Source: United Nations, 2013

2.2.6 Victoria's Movement and Place Framework 2019

The *Movement and Place Framework* has been adopted by the Victorian government and is designed to inform street design and policy decisions. At the heart of *Movement and Place* is a recognition of the dual role that streets perform in terms of being a *movement* corridor and a *place* in themselves. Implicit in the *Movement and Place* framework is an acknowledgement that in past decades, the role of the motor vehicle and vehicle throughput has been the primary goal underpinning street design. Sometimes, this can be detrimental to the *place* function that many streets perform and their ability to support active modes.

The *Movement and Place* framework consists of four broad modules: the first two are strategic, and the third and fourth are project or local.

- Module 1: Network classifications matrix
- Module 2: Performance Assessment
- Module 3: Toolbox & Design Guides
- Module 4: Options Assessment.

Figure 17 illustrates the graphic used in Module 2 of Victoria's *Movement and Place* framework. Many local governments in Victoria have taken an

interest in *Movement and Place* and have used it to create better outcomes for transport sustainability and place. This is particularly relevant for the main streets in each key activity centre within the City of Whitehorse. Implementing initiatives that enhance the role of *place* and the treatment of sustainable transport is especially relevant to the future WITS.



Figure 17 Movement and Place matrix for Victoria

Source: Victorian State Government

The core of the *Movement and Place* framework is shown in Figure 18. This highlights that instead of viewing roads through a prism of movement, we can consider a matrix of each one with a specific movement designation and a specific place

designation. We can use this matrix to compare and contrast the way streets are performing today with how we would like them to perform in the future.

THE M+P MATRIX (STREET TYPES VICTORIA)

The m+p offers an integrated approach to street classification by combining movement and place considerations into one system.

Example of a conventional road hierarchy



It introduces a second axis to a conventional road classification and thus produces a two-dimensional hierarchy system, with a movement and a place axis. Different street types can be plotted within this hierarchy.

Dual hierarchy axis for m+p classification

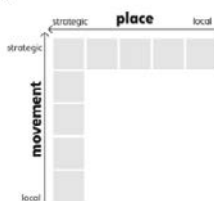


Figure 18 Understanding Movement and Place

Source: Department of Transport

2.2.7 Safe Systems Approach

The *Safe Systems* approach has been adopted by the Victorian government and acknowledges the inherent fallibility of road users. A Safe Systems approach to road design results in streets that are *forgiving*. It acknowledges that humans make mistakes and that mistakes should not lead to serious injury or death. Figure 19 provides an illustration of the different elements that make up the Safe System approach.

For vulnerable road users (pedestrians, cyclists and motorcyclist), the presence of safe pedestrian and riding infrastructure is critical to creating a safe transport network.

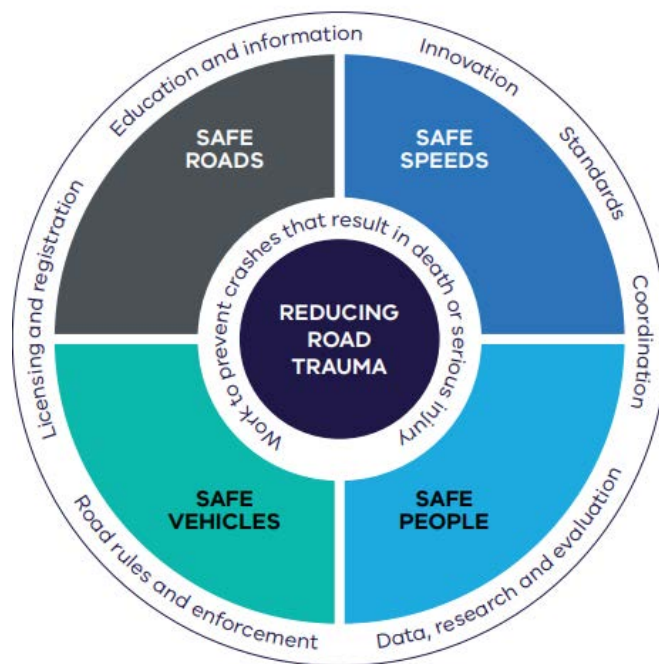


Figure 19 The Safe Systems approach

Source: Victorian State Government

There are four overarching pillars under the Safe System approach that influence road safety outcomes:

- Safe road user behaviour
- Safe road infrastructure
- Safe speeds at which people travel
- Safe vehicles.

2.2.8 Victorian Road Safety Strategy 2021-2030

The Victorian Road Safety Strategy's objective is to eliminate road deaths by 2050. An interim target of halving deaths by 2030 is also committed. However, it is unclear how this might be achieved using the current set of policies. The Strategy focuses on creating a safe road environment and supporting road users to make safe choices. The Strategy also seeks to embed a culture of road safety within the Victorian community and deliver initiatives that have an immediate impact while also preparing for future changes to road safety technology.

The Victorian Road Safety Strategy aims to eliminate road deaths by 2050 and halve deaths on the road by 2030.

The *Road Safety Strategy* aims to improve the safety of vulnerable road users, such as older road users, children, and young drivers, and foster liveable cities that encourage active transport. Initiatives include:

- Safe infrastructure
- Safer road design
- Land-use planning strategies
- Behaviour change campaigns to protect at-risk communities like pedestrians, cyclists, and motorcyclists.

2.2.9 Victorian Cycling Strategy 2018-2028

The *Victorian Cycling Strategy 2018-28* is a 10-year strategy to encourage more people to cycle for transport to work, school, to public transport, and around their neighbourhoods. According to the Strategy, the Victorian government will plan for and invest in delivering a better-connected bicycle network, prioritising strategic cycling corridors, and ensuring it is safer and lower stress. This is designed to make cycling a more inclusive experience. The Strategy recognises that encouraging people to cycle for transport will reduce short trips by car, reduce pressures on the road network, and supports the delivery of *20-minute neighbourhoods*. While cycling for recreation and fitness has major health and social benefits, this Strategy is focused on increasing cycling for *transport*.

The Victorian Cycling Strategy 2018-28 aims to transform cycling over the next decade. The Strategy is now beyond the halfway mark and there has been no increase in cycling.

The Strategy draws on an American study that groups people into four types of cyclists according to their cycling attitudes and behaviours (Geller, 2009), shown in Figure 20. Understanding people's propensity to cycle for transport and investigating what can be done to reduce barriers to increase cycling participation is a core principle of the Strategy. Riding close to motor vehicles and pedestrians, especially on roads with higher speeds and higher traffic volumes, is articulated as a key barrier to a safer and lower-stress riding experience. The *Whitehorse Cycling Strategy 2016* acknowledges that locally, 60% of residents fall within the *Interested but Concerned* category.

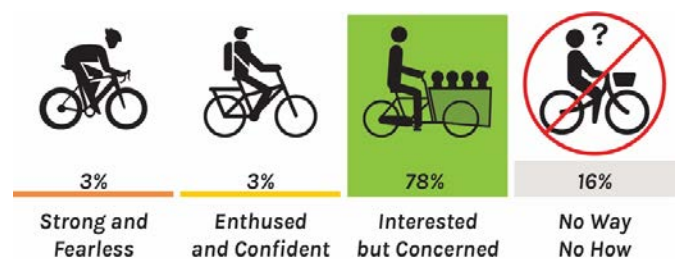


Figure 20 Four types of cyclists

Source: City of Portland (USA) and Pearson et al., 2021

2.2.9.1 Key initiatives set out in the Victorian Cycling Strategy 2018-28

In delivering a safer, lower stress and better-connected bicycle network, the Strategy includes the following key initiatives of relevance to Whitehorse:

- Improve safety using a *Safe Systems* approach (see Section 2.2.7), where safety is viewed as a shared responsibility for all road users, as well as the design of the road itself.
- Provide a lower stress cycling experience through implementing the *level-of-traffic stress approach* (see Figure 21). This should be used to guide investment in the cycling network.



Figure 21 Level-of-traffic stress scale

Source: Transport for Victoria

- Prioritising *strategic cycling corridors* for investment. The most suitable type of infrastructure for each site is determined with consideration for:
 - Different users
 - Land use
 - The road environment
 - Level of traffic stress
 - Network hierarchy
 - Natural environment
 - Heritage factors.
- Update guidelines for *strategic cycling corridors* to ensure a consistent approach and understanding of what a high-quality network of cycling infrastructure looks like. Prioritising intersections.
- Integrate cycling and public transport, particularly at *strategic cycling corridors*.
- Work with local councils to address gaps in *strategic cycling corridors*. This encompasses local streets, arterial roads, highways, rail corridors (including the recently completed Box Hill – Ringwood corridor) and green spaces.
- Improve cyclists' planning outcomes by amending the Victorian Planning Provisions (VPPs) to recognise *strategic cycling corridors* and require new developments to consider the need for high-quality cycling infrastructure.

Actions to make cycling a more inclusive experience include:

- Improve awareness and acceptance of cycling as a mode of transport through public awareness campaigns
- Increase the participation of underrepresented groups, particularly for women, children and senior Victorians
- Support cycling to school through programs and the provision of a safe cycling network around schools
- Plan for emerging technologies.

While all these actions appear positive and aim to increase cycling, current participation levels have stagnated in Victoria. There is a risk that upon reaching its horizon year, levels of cycling participation will be no higher than when the Strategy was written.³

2.2.10 Victoria's Climate Change Strategy

In 2017, the Victorian Parliament passed the *Climate Change Act 2017*, which includes a long-term goal of achieving net zero greenhouse gas emissions by 2050.

Transport is the fastest growing source of emissions and is expected to be the single largest polluting sector by 2030.

The Climate Change Strategy recognises that everyone, including government, businesses and individuals, play a role in reducing emissions and preparing for climate change impacts. It provides a clear framework for action, setting targets for a net-zero emissions economy by 2050. Businesses are encouraged to make voluntary pledges to reduce emissions, and the Act supports their transition. Communities are informed about climate risks and progress, while local governments are not mandated but encouraged to participate in emissions reduction efforts. Overall, the Act aims for a coordinated and proactive approach to tackle climate change and build a resilient future for Victoria.

Adaptation Action Plans (AAPs) under the Climate Change Act 2017 aim to enhance Victoria's resilience and prepare for the inevitable impacts of

³ Austroads 2024. *Prioritising Active Travel*. <https://austroads.gov.au/publications/active-travel/ap-r711-24>

climate change. AAPs will be developed every five years, covering the following systems:

- Built environment
- Education
- Health services
- Natural environment
- Agriculture
- Transport
- The water cycle.

The future WITS must be developed in a manner that supports a reduction in transport emissions.

2.2.11 Victoria's Zero Emissions Vehicle Roadmap

The Victorian government has articulated its support for the EV market with the publication of its *Zero Emissions Vehicle Roadmap*. The government has set a target of 50% of vehicles sold in 2030 to be zero-emission. The following commitments have been made to stimulate EV use:

- \$19 million for charging infrastructure
- Replace the diesel public bus fleet with zero-emission buses (ZEBs).
- Including more EVs in the government fleet
- \$100 off registration costs for EVs, ending on the 1st January 2026.

There are currently 194⁴ DC Fast Charging sites in Victoria, 74 Ultrafast Charging sites, and well over 400 locations with chargers offering speeds below 24kW available for public use. As of 2024, there were 41,546⁵ registered EVs in Victoria. See Section 5.6 for details on local EV charging in Whitehorse.

2.2.12 Melbourne's Tram Plan 2023

Melbourne's *Tram Plan* outlines a long-term strategy to modernise the city's tram network, making it more accessible, efficient, and integrated with the broader transport network. The Plan is driven by Melbourne's population growth and urban densification, aiming to improve passenger

experience, reduce congestion, and enhance sustainability.

Key challenges identified in the Plan include:

- **A growing and changing Melbourne**

Melbourne has sustained and continuing population growth, urban expansion and densification.

- **Changing patterns of travel and demand**

Significant growth in employment and residential development along nearly all tram routes means increased service levels and corridor capacity are needed.

- **Accessibility**

Differing levels of accessibility across the network exclude people with various disabilities from tram travel, this includes both tram stops and the tram fleet.

- **Meeting passenger needs**

Modern-day travel requires up-to-date travel information in addition to frequent and comfortable services. Many tram stops also pose safety hazards, such as requiring passengers to cross multiple lanes of traffic, exposing them to conflict with vehicles.

- **Legacy infrastructure – an ageing network**

On some parts of the network, the existing power supply is at or nearing capacity. Some of the newer low-floor trams can require up to three times as much power as older trams, and some old stops are not able to accommodate newer longer trams.

- **Road congestion and tram performance**

Over 75% of trams operate on routes that share road space with cars, leading to delays and over 1,000 crashes a year.

The identified challenges are met with key targets focused on:

- Building accessible tram stops,
- Replacement of older tram stock with new low-floor accessible trams

⁴ Electric Vehicle Council State of Electric Vehicles 2024

⁵ Electric Vehicle Index - Australian Automobile Association

- Integration with long-term transport projects such as Suburban Rail loop in both Box Hill and Burwood.

Upgrades to the tram network, including accessible tram stops and low-floor trams will have a positive impact on the tram corridors within Whitehorse (Routes 70, 75, 109).

The Plan encourages medium density development along trunk corridors with frequent services (Figure 22). This includes corridors such as Whitehorse Road and Burwood Highway.

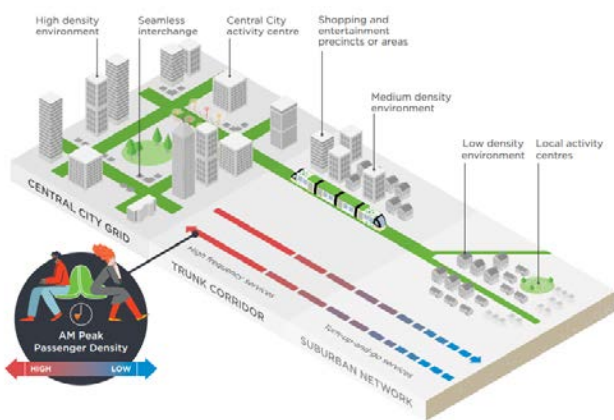


Figure 22 Trunk corridors development – Tram Plan
Source: Victorian Government

The Whitehorse ITS should prioritise pedestrian-friendly infrastructure, cycling infrastructure, and inter-modal interchanges to support these upgrades and better integrate the network. Council could advocate for additional accessible stops along key local routes, particularly near Box Hill, Deakin University, and local activity centres.

2.2.13 Victoria’s Transport Accessibility Strategy

The *Accessible Public Transport Action Plan 2020 - 2024* highlights opportunities to enhance the whole-of-journey experience for individuals with disabilities. This Plan has five priorities:

- Customer, community, and engagement
- Access to public transport services
- Accessible processes and systems
- Access to facilities
- Workplace accessibility.

Some of the initiatives for metropolitan Melbourne include:

- Disability awareness training
- Providing accessible ticketing and timetables, including more hearing loops in railway stations and key tram stops.
- Consider innovative alternative transport solutions
- Continually upgrade railway stations, tram stops, bus stops (including level access tram stops)
- Improve wayfinding and signage
- Improve access to roads, shared paths, footpaths, and parking areas.

Whitehorse is currently facing the challenge of an ageing population. Ensuring accessible public transport is crucial in enabling people with disability as well as older individuals to maintain their independence. As part of the Whitehorse ITS, it is essential to prioritise public transport accessibility for individuals with disabilities and older people.

2.2.14 Victoria’s Bus Plan, 2021

Victoria’s Bus Plan was released by the then Department of Transport – now the Department of Transport and Planning (DTP). It flags the government’s intention to support the delivery of a modern, productive and environmentally sustainable bus system that increases the number of people choosing to take the bus. This will be achieved by delivering simple, safe, reliable and comfortable journeys. The Plan signalled a renewed interest in significant bus reform for the first time since *2006’s Meeting our transport challenges*.

The Plan signalled a renewed interest in significant bus reform for the first time since *2006’s Meeting our transport challenges*.

The Plan highlights improvement opportunities for the whole bus system, including the network, bus fleet, performance, commercial, innovation and

customer experience. The six key objectives for reform include:

- make the network simpler, faster and more reliable
- introduce a cleaner, smarter fleet – the right buses for the right routes
- better-performing buses
- a better customer experience
- better governance and systems management
- delivering better value for money.

There is significant variation in the types of services across Melbourne’s bus network. These services align to varying degrees with meeting patronage or coverage purposes. The Bus Plan has defined bus route categories. Routes are divided into four categories, with (mostly) two or three subcategories under each. These are outlined in Figure 23.

There is significant variation in the types of services across Melbourne’s bus network.



Figure 23 DTP’s Bus Plan bus route categories

Source: DTP

The Plan acknowledges the importance of service frequency regarding the overall user experience. For example, frequency, span and timeliness of service are stated to be the primary drivers of customer satisfaction. It also acknowledges the mismatch between demand and frequency with low service frequency on some high-patronage routes or high frequency on low-demand routes.

The Plan acknowledges the mismatch between demand and frequency.

Individuals’ bus travel planning is acknowledged as complicated and non-intuitive. The Plan identifies the need for more real-time information and simpler journey planning. Additionally, the Plan mentions that more direct bus routes can make journeys easier to understand.

The Plan highlights the need for more real-time information and simpler journey planning.

2.2.14.1 Implications for the development of a future WITS

Victoria's Bus Plan highlights the importance of Bus Rapid Transit (BRT) and the development of the first dedicated busway in Melbourne, along the Eastern Freeway to Doncaster. At present, there are touchpoints with this BRT corridor at Blackburn Rd and Middleborough Rd as they intersect with the Eastern Freeway. The 907 from Mitcham would also use the future Busway, however this is less direct as it first travels along Doncaster Road.

There is an opportunity to review the bus services provided to, within and from Whitehorse. Investigating new or altered routes that would provide BRT services to Melbourne's inner north and the CBD from Whitehorse may help increase the competitive advantages of buses, compared to the car.

2.2.15 Healthy Streets design principles

The Healthy Streets design principles have been developed by an independent body and used by some government agencies in Australia and the UK. They are based on 10 indicators, derived from the need to enhance the user experience (see Figure 24). The Healthy Streets approach was developed by Lucy Saunders, a researcher on public health and its intersection with urban life. The indicators have been developed using a multi-disciplinary approach involving transport planning, public health and urban design.

In Australia, Healthy Streets has been supported by state governments (Western Australia and NSW). It has featured in several local government strategies including from the City of Melbourne and the City of Stonnington.

The Healthy Streets indicators are shown in Figure 24. They are intended to increase road safety, reduce through traffic, add more green space and places for social interaction, and reduce pollution.



Figure 24 Healthy Streets Indicators

Source: Healthy Streets

2.2.16 Infrastructure Victoria's 30-year Infrastructure Strategy 2025 – 2055 (Draft)

Infrastructure Victoria's Draft *30-year Infrastructure Strategy 2022 - 2055* focuses on sustainable, connected, and accessible transport network. The strategy prioritises major projects like the Suburban Rail Loop, expanded bus services, and safer active transport options. These projects support population growth and enhance mobility across all communities.

Key transport related recommendations include:

- Up to \$1.5 billion for upgraded bus and tram stops to make them accessible
- Placing new housing and jobs close to quality public transport options to reduce car dependency
- Extending the tram network. The extension includes linking the tram route 70 to route 75 route via Elgar Road to connect to the future Burwood SRL station (shown in Figure 25)
- New 'bikeways' which are high capacity cycling corridors. This includes upgrading and building new links to form a 'bikeway' from Box Hill to the CBD and Docklands

- Re-configuring the City Loop (post Metro Tunnel opening) to allow more train services on other lines including the Belgrave-Lilydale Lines. This would also allow these trains to continue through the city onto other lines
- Developing infrastructure to support the move to net-zero emissions buses
- Increase the frequency and affordability of public transport services
- Simplified bus routes with more dedicated lanes to increase the speed and directness of services.
- Reduce speed limits to 30 km/h on local streets
- Adopt carbon values and measure carbon in infrastructure projects to reduce emissions.



Figure 25 Tram network extensions to support precincts, activity centres and major transport projects

Source: Infrastructure Victoria

The Strategy provides guidance to the state government, parliament and local councils around infrastructure priorities within the next 5 years. Long term goals are also included in the Strategy. However, these priorities are recommendations and are not reflected in official state government policy.

3. Emerging transport technologies and implications for Whitehorse



Over the last 15 years, the transport sector has begun its most rapid transformation in decades. Disruptive transport technologies, such as app-based and ride-sourcing platforms, innovations in car sharing, and electric vehicle technology have all advanced significantly since 2010. E-bikes and e-scooters have also made significant advances, enabling more people to make trips by these small footprint forms of transport.

3.1 Micromobility

Micromobility, such as e-scooters and other forms of ‘small footprint’ transport, is rapidly evolving. The term micromobility encompasses everything from children scooting to school to food delivery riders.

Micromobility does not have a strict, universally accepted definition. For the purposes of this document, micromobility can be thought of as ‘small footprint transport’ that:

- Travels at less than 45 km/h. Laws in Victoria require e-scooters to travel no more than 20 km/h and motors on e-bikes to cut out at 25 km/h
- Typically weigh less than 350 kg. In most cases, the devices weigh closer to 15 – 35 kg.

Figure 26 provides an example of a rapidly growing form of shared e-cargo bike, popular in the Netherlands and other Western European nations. This is useful primarily for families with young children, as well as those moving items that are unable to be easily carried on standard bicycles. Users pay an hourly fee. This type of micromobility service only operates in cities that have a well-developed network of connected bicycle infrastructure. These vehicles essentially act as a replacement for a family’s motor vehicle or avoid the need for a second household car.



Figure 26 e-cargo bike share, The Netherlands

Source: Institute for Sensible Transport

3.1.1 Bike share and other forms of micromobility

Shared transport is not solely focused on four-wheeled vehicles. The burgeoning two-wheeled shared transport sector has been especially active and innovative over the last decade. The number of shared use bicycles has ballooned to over 4.5 million, and many of these bikes are dockless systems that rely on GPS and other technologies to track bikes and integrate with users’ smartphones to unlock and pay for the bikes (Fishman, 2019).

One of the most exciting innovations in bike share has been the development of electric assist bikes, which are used more than 3 times as frequently as non-electric bike share bikes. Figure 27 provides an image of one of the LIME e-bikes in use in Melbourne.

Given that a significant number of trips that take place in the City of Whitehorse are short (Section 7.2.1), shared e-bikes could be well placed to form an additional transport offering. However, as highlighted earlier, the infrastructure network for cycling must improve considerably if such a system is expected to be successful.



Figure 27 LIME e-Bike share, Melbourne

3.1.2 E-bikes

The global electric bicycle (e-bike) market has grown substantially in the last decade. E-bikes represent the largest, most rapid uptake of alternative fuelled vehicles in the history of motorisation (Fishman and Cherry, 2015).

E-bikes offer the user quicker travel time, with less effort. E-bikes have been found to lessen some of the common barriers to conventional bikes, including the ability to overcome topographical challenges, physical limitations of the rider and arriving at work without perspiring. Moreover, e-bike owners report that being able to ride with greater loads (e.g. children or groceries) opens up greater possibilities for cycling, including replacing some car use. E-bikes are generally more expensive than conventional bikes (~\$2,000 – 4,500), and this acts as a barrier to increased adoption.

Figure 28 presents a snapshot of the benefits of e-bikes.

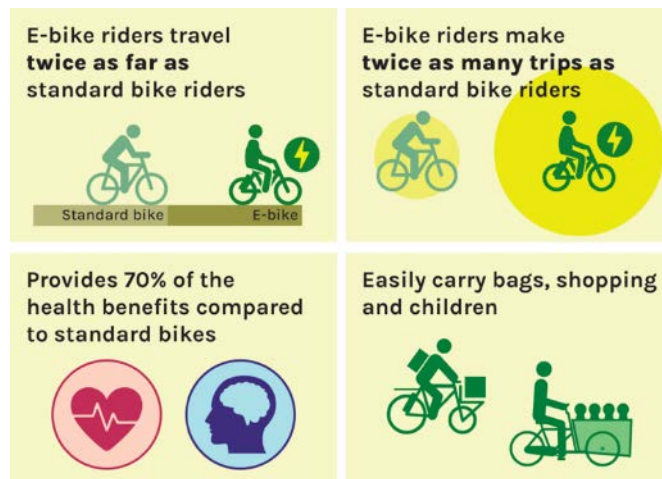


Figure 28 Benefits of e-bikes

Source: Institute for Sensible Transport

A brief summary of the benefits of e-bikes is provided below:

- Replace car trips. E-bikes have been shown to replace car trips more readily than conventional bicycles. One US study of 1,800 e-bike owners found 76% of e-bike trips would have otherwise been made by car. Reducing car use helps:
 - Reduce congestion
 - Reduce transport emissions
 - Lower car parking demand
 - Reduce transport costs.
- Ride further with less effort. Studies have found that people who own an e-bike use them 50% more often than people with regular bikes, and each trip is on average 50% longer.
- Physical activity. Physiological studies have found that people riding e-bikes gain about 60 – 70% of the physical activity benefits of those riding regular bikes. This, combined with the extra cycling associated with e-bikes means e-bikes still provide the necessary level of physical activity to protect from sedentary lifestyle diseases.
- Increase female participation: Females are under-represented in cycling participation in Australia and e-bikes have been shown to reduce the gender imbalance.

As the City of Whitehorse continues to grow and move towards a zero-emission economy, e-bikes have the potential to lower emissions and transport costs, while reducing congestion.

E-bike owners ride more often, and further than other cyclists and can better maintain speed with less effort. E-bike ownership reduces car use to an even greater extent than regular bicycles. Figure 29 provides an image of a modern e-bike. Such bikes are generally capable of travelling ~100 km between charges, and are particularly relevant to enhancing sustainable mobility options in the City of Whitehorse.

Research suggests that the main barriers to a greater take up of e-bikes relate to a higher purchase price and the concerns of riding on inadequate infrastructure (mixing with motor vehicles).



Figure 29 Modern e-bike

Australia’s harmonisation of e-bike regulation, which broadly equates to European standards, coupled with growing market interest, has resulted in a flourishing local e-bike sector.

Importantly, however, people do not make transport decisions in isolation; they weigh the pros and cons of the different modes and choose the one that makes sense to them, often from a safety, cost and time perspective.

People do not make transport decisions in isolation; they weigh the pros and cons of the different modes and choose the one that makes sense to them, often from a safety, cost and time perspective.

Unless e-bikes offer a compelling value proposition, it is unlikely to be a popular choice in the City of Whitehorse. This means a growth in high quality bike lanes that align with the State government’s *levels of stress*. In short, this means protected bike lanes on busy roads, and a connected network of quiet streets where rat running and high speeds are prevented through the introduction of interventions such as *modal filters*.

3.1.3 Barriers and facilitators to micromobility uptake

The role local government plays in micromobility is crucial to achieving its long-term sustainability vision and strategic objectives. The role that Council can play is captured in Figure 30.

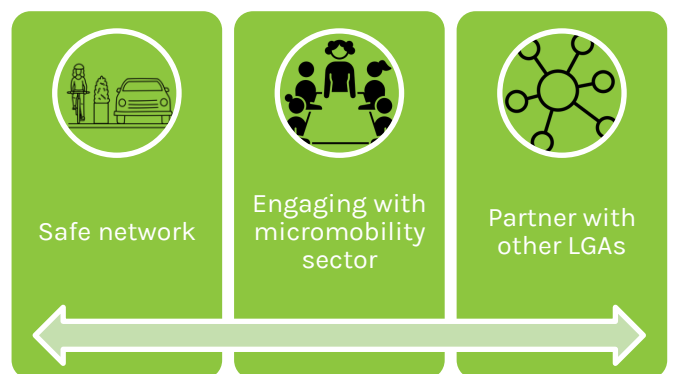


Figure 30 Council's role in growing micromobility in Whitehorse

The single most important responsibility Council has for enabling micromobility to flourish is to create a safe network. Creating a connected, high quality network of protected bicycle lanes, shared paths and quiet streets is key to enabling micromobility to flourish.

While Council will be dependent on cooperation with the State government for protected lanes on declared roads, the majority of the street network in Whitehorse is managed by Council.

The single most important responsibility Council has for enabling micromobility to flourish is to create a safe network.

3.2 Mobility as a service

While the sharing of transport resources is not new (e.g., taxi services, borrowing friends'/neighbours' cars, and of course public transport), the ubiquity of the Internet has spawned a dramatic growth in the diversity of shared mobility options.

3.2.1 Car share

Car share is not new to the City of Whitehorse. Council has previously run a trial with GoGet in Box Hill in 2022. The 18-month trial was successful, with an additional two cars added to the fleet after it concluded. By the end of the trial, the three cars were booked for 6.7 hours each day and had an average of 21 bookings per month, per vehicle.⁶

Car share can be seen as consisting of three distinct offerings. The first has been around for just about as long as the car itself, rental *by-the-day* (e.g., Hertz, Budget, and Avis). This category has now evolved, such that rather than just accessing a car in full day increments, they can be accessed *by the hour*, and this is becoming a very dynamic part of the market. At first, these 'clubs' operated distinct from traditional car rental companies, and although many still do, there is an industry shift (e.g., Hertz) to enter the *by-the-hour* market.

Some car manufacturers are also entering the *by-the-hour* market due to an appreciation that changing consumer preferences are valuing *access* over *ownership*. Free2Move offers vehicles in 16 cities in Europe and the US. An offshoot of the *by-*

the-hour car share offer is *one-way* usage, in which the user is no longer required to return the car to its original pick-up location. The benefits to the user are significant when one considers that the typical *by-the-hour* car share rental lasts six hours, but involves less than an hour of actual driving (City of Melbourne, 2015).

Access to commercial car share providers is available in the City of Whitehorse from GoGet, Flexicar and Kinto.

3.2.2 Ride sourcing

Routinely described in the media as '*ride sharing*', services such as Uber are in fact not technically '*shared transport*', as the driver is making a trip purely to transport the passenger. A more accurate term for these sorts of services is '*ride sourcing*' (Rayle et al., 2014). They use an App to connect a driver with a paying passenger. Uber has been operating in Australia since 2012. Uber drivers must show they have comprehensive car insurance, pass a police check and have a good driving record. Some evidence has emerged to suggest that Uber and Uber like services can *increase* rather than decrease congestion by acting as a replacement for trips formerly made on public transport.

3.3 Smart parking technology

To ensure Whitehorse is able to manage growth in a manner that protects and enhances its liveability, vibrancy and productivity, best practice parking management principles are essential. This involves measures to determine how to allocate scarce space to deliver the greatest public benefit. Box 1 provides a snapshot of some key facts related to car parking.

⁶ <https://www.whitehorse.vic.gov.au/car-share#:~:text=Reducing%20cost%20of%20living%20pressures,usage%20ramped%20up%20very%20quickly.>

Summary of facts related to car parking

- Cars sit idle for 95% of the time
- Historically, car parking policies have shaped cities into car-dominated landscapes
- On average, 40% of off-street, residential parking is vacant
- On- and off-street parking can account for 50% of all land use in a city
- Car parking adds \$30,000 - \$122,500 to the price of a residential dwelling in multi-dwelling developments
- Up to 30% of all traffic is caused by people seeking a no-fee kerbside parking space.

Box 1 Key parking facts

The following sections provide some information on various car parking technologies and information on this rapidly evolving area.

3.3.1 License plate recognition

License Plate Recognition (LPR) is a technology that uses cameras and recognition software to convert images of vehicle license plates into text data. LPR systems are widely used in enforcement and parking management. In parking enforcement, mobile cameras read license plates and compare the data against known plates for validation. In parking management, mounted cameras monitor larger areas for compliance.

For on-street parking, LPR technology is mounted on a vehicle and used to detect the length of time vehicles have stayed in a particular parking space. An example of a mounted LPR camera is shown in Figure 31. A Video Processing Unit (VPU) processes the mobile LPR results and displays them on an inboard, web-enabled tablet device. Officers monitor the device and are alerted to any vehicle detected as having parked for too long in a time-restricted zone. The roof-mounted LPR cameras can capture parallel, 45°, 60° and 90° angle parking, and simultaneously cover cars parked on both sides of the street.



Figure 31 Mounted Licence Plate Recognition camera example

Source: Duncan Solutions

As shown in Figure 32, for larger, off-street parking complexes, LPR cameras are placed strategically at the facility's entry and departure points. LPR systems are often used to automate the process of recognising license plates and granting or denying access to a parking lot. These can allow users to enter without the need to obtain a ticket and pay at exit (or at a pay station) for their parking stay. This feature is useful in large parking lots, activity centres and apartment buildings. Additionally, LPR systems can offer real-time information on parking availability.



Figure 32 Licence Plate Recognition camera at entry point example

Source: Becas

In many cities, including Whitehorse, parking patrol officers check parked cars manually instead of using LPR technology. LPR can significantly reduce workload by continuously scanning plates and eliminating the need for human intervention until an event of interest occurs. Many private Australian and international companies offer LPR and the associated services.

3.3.2 Paid parking technologies

Paid parking is one strategy that can be used to increase turn over and raise revenue. Its ability to moderate demand for car use is limited. Paid parking generally occurs in retail/commercial areas in which demand for parking is higher than the supply. Prior to embarking on a paid parking program, it is important for Whithorse to think carefully about what the objective is for charging for parking. If it is about reducing car use, it can be more effective to remove the parking. If it is revenue generation, then paid parking can be a useful strategy in certain high demand areas.

Paid parking can be implemented using multiple technologies, ranging from physical meters to mobile apps that allow users to pay for parking through their smartphones. Physical meters can be configured in a range of different uses, depending on how the parking arrangement is setup. For instance, some councils choose to have one meter for every row of car parking in a larger complex, while others may opt for one meter per 1-2 on-street car parks. Technology improvements have also made parking meters easier to install, more energy efficient and durable. This includes using a vehicle's number plate as the identifier, meaning printed tickets will no longer be required to be displayed on vehicles.



Figure 33 Smart parking meter example, Townsville
Source: City of Townsville

3.4 Electric vehicles

Electric vehicles (EVs) are experiencing a surge in growth globally, and while Australia is behind most OECD countries in terms of sales, the trend is rising sharply. In the last few years, the number of EVs owned in the City of Whitehorse has more than doubled year-on-year, and this is expected to continue. In 2024, over 9% of new vehicles sold in Australia were EVs.

3.4.1 What is an electric vehicle?

There are several different categories of EVs, and it is important to identify the main types, as shown in Figure 34.

The following provides a brief description of each of the vehicle categories listed in Figure 34.

- *Conventional vehicle* – also referred to as an Internal Combustion Engine (ICE) vehicle, is the standard vehicle type widely known and used since the invention of the motor vehicle. The fuel source for most ICE vehicles is petrol, diesel or gas, with some able to utilise renewable fuels such as ethanol. It is not an EV.
- *Hybrid vehicle* – a vehicle that uses petrol/diesel as its only fuel source, but also has an electric motor and battery that can store energy from regenerative braking. A Toyota Prius is a common example of a hybrid vehicle.
- *Plug-in Hybrid Electric Vehicles (PHEV)* – combines a mixture of fuel combustion and electricity. It is similar to the hybrid vehicle described above; however, it has the ability to take electricity from a socket and can store this in a battery. A Mitsubishi Outlander is an example of a model that is available as a PHEV.
- *Battery Electric Vehicles (BEV)*, or All-Electric, take electricity from a socket and rely entirely on the electricity stored in an on-board battery for propulsion. A Tesla Model 3 and BYD ATTO 3 are two popular models of BEV.

	Energy Sources	Consumption	Emissions
Conventional			
Hybrid			
Plug-In Hybrid			
All-Electric			

Figure 34 Different types of consumption and electric vehicles

3.4.2 Electric vehicle sales in Australia

Figure 35 captures recent EV sales in Australia, both in total and as a percentage of light vehicle sales.

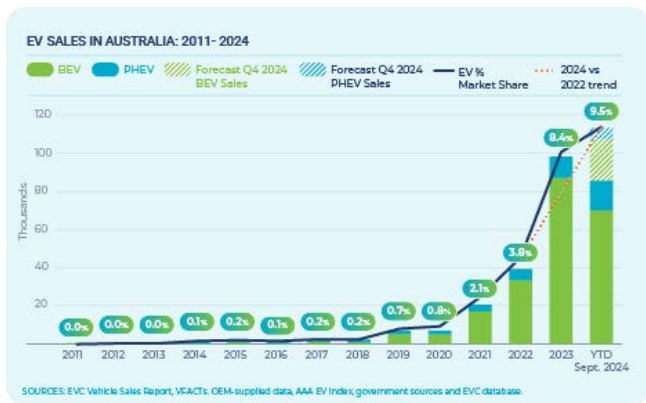


Figure 35 EV sales in Australia

Source: Electric Vehicle Council, 2024

Several surveys have found that around 50% of consumers are considering an EV for their next vehicle purchase.

Around half of consumers are considering an EV for their next vehicle purchase.

3.4.3 Electric vehicle advancements

Electric vehicle technology has advanced rapidly in recent years. Electric vehicles avoid the tailpipe emissions of ICE vehicles, have lower running and servicing costs, and last longer. Compared to just five years ago, EVs:

- Have become cheaper
- Offer a longer battery range
- Available in a wider variety of vehicle types.

Electric vehicles have access to a growing network of chargers, including publicly available fast chargers, in more locations around Australia. This is set to expand further in coming years. Range anxiety is still a key stated barrier to the greater uptake of EVs and more chargers will reduce this barrier.

The next 12 months are set to see the introduction of several lower cost models that, while still more expensive to purchase than their ICE equivalents, will compete strongly in terms of *whole of life* cost.

Electric vehicles are important because they:

- Improve local air quality
- Eliminate tailpipe GHG emissions
- Reduce noise pollution
- Reduce vehicle running costs.

3.5 EV ownership in Whitehorse

By the third quarter of 2024, approximately 2,476 EVs were registered to households in Whitehorse. Figure 36 shows that since 2021, there has been a doubling of EV registration in Whitehorse every year.

Since 2021, there has been a doubling of EV registration in Whitehorse every year.

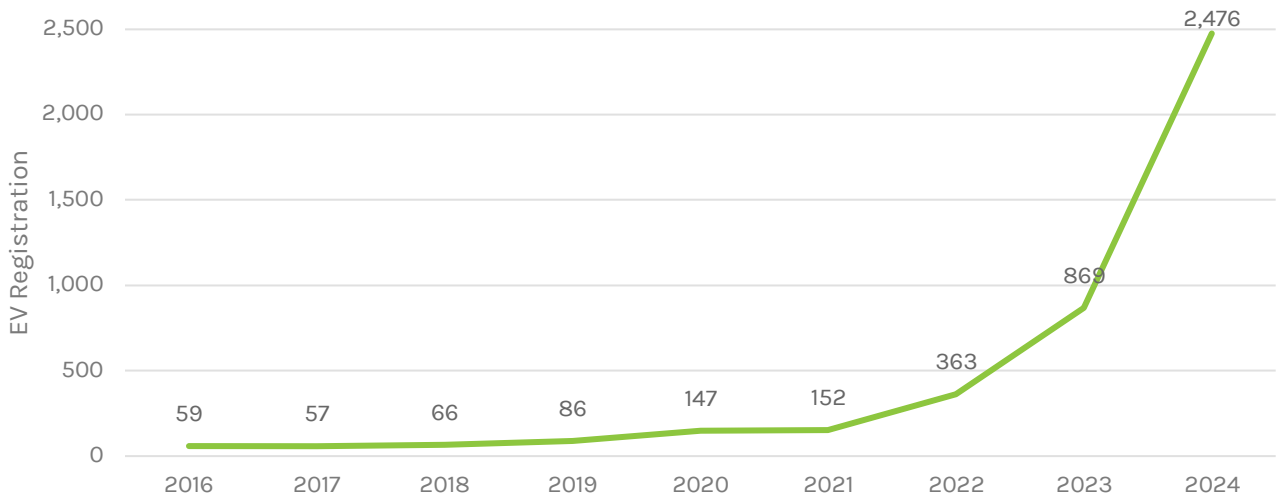


Figure 36 EV Registration in City of Whitehorse

Source: BITRE, Department of Transport and Planning

3.5.1 Projected EV ownership

The national science agency, CSIRO, has modelled EV ownership by postcode based on three scenarios of uptake: *high*, *medium* and *low*. The trajectory for all three scenarios is shown in Figure 37. Even in the low scenario, it is expected that there will be a 36-fold increase in EV ownership by 2045. A 44-fold increase is projected in the medium scenario, and a 52-fold increase for the high scenario.

From current levels, CSIRO expects EV ownership in Whitehorse will increase 36 to 52-fold by 2045.

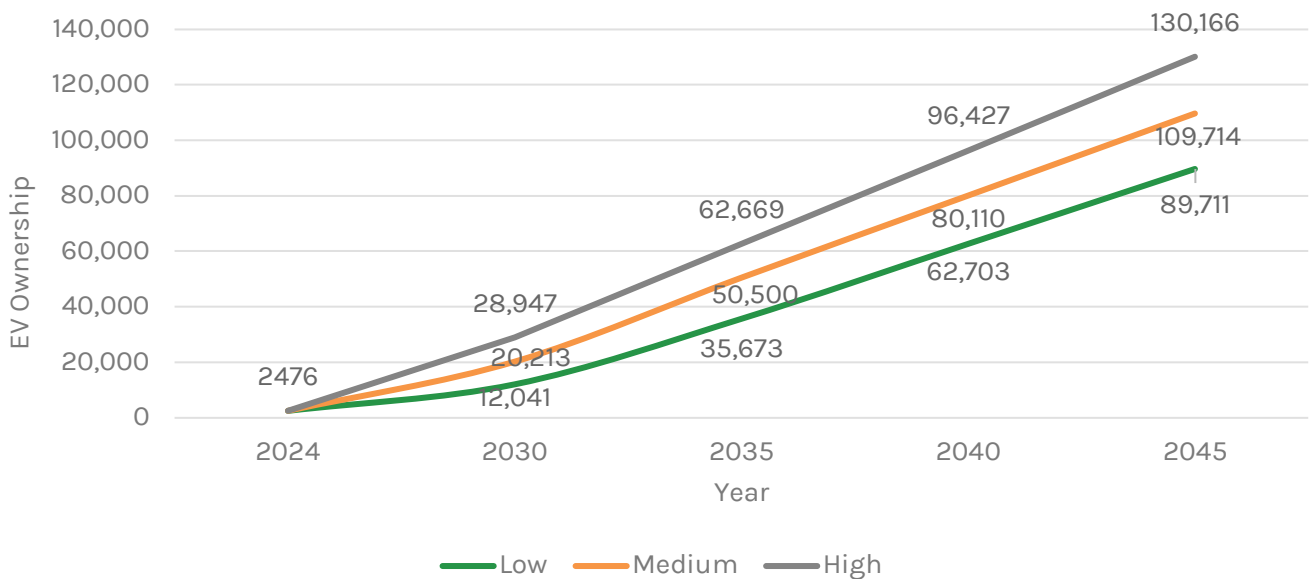


Figure 37 Projected EV ownership for Whitehorse, CSIRO scenarios

Source: CSIRO, Institute for Sensible Transport

3.5.2 EV chargers





The three main EV charging equipment characteristics that differentiate chargers from one another include (International Energy Agency, 2018):

- Level: the power output range of the EV charging outlet. The maximum power output is lower for Alternating Current (AC) for most cars.
- Type: the socket and connector used for charging.

The number of chargers and the speed at which a battery can be charged have improved significantly over recent years. Victoria is building networks of fast chargers to facilitate long distance travel. Figure 38 provides a snapshot of different charging plug types.

One critically important observation from EV owners regarding their charging habits is that *over 90% of charging happens at home or work*. This has implications for the selection of appropriate sites for charging infrastructure and the speed of the charger selected.


Table 1 EV Charging types⁷

	 Power	 Range added per hour	 Charging Time	 Typical Application
Level 1 - single phase (domestic)	2.4 - 3.7kW	10 - 20km range / hour	5 - 6 hours	Home
Level 2 - slow single phase (domestic or public)	7kW	30 - 45km range / hour	2 - 5 hours	Home, work, shopping centres, car parks
Level 2 - fast three phase (public)	11 - 22kW	50 - 150km range / hour	30mins - 2 hours	Urban roadside
Level 3 - fast charge (public)	50kW	250 - 300km range / hour	20 - 60 mins	Activity centres, and near highways, motorways and key routes
Level 4 - super-fast charge (public)	120kW	400 - 500km range / hour	20 - 40 mins	Highways, motorways and key routes
Ultra fast charge (public)	350kW	1,000+ km range / hour	10 - 15 mins	Major highways and motorways

Source: Institute for Sensible Transport

Vehicle manufacturers are continuing to upgrade their cars to accept high-capacity chargers. From a usability perspective, this means that an EV can be fully charged in as little as 15 minutes. It is important to recognise that this will be rare (few vehicles will be able to) and expensive (it is based on a battery optimised for high-speed charging with other downsides). The reality is that most fast-charging sessions, even now, are only ~30 minutes – enough to get you to where you are going.

Main Electric Vehicle Charger Plug Types




Type 2
(Mennekes) Plug
AC Charging

- Tethered cable or BYO cable



Combined Charging System (CCS) Plug
DC Charging

- Tethered cable only
- Used for 98% of DC charging sessions



CHAdeMO
DC Charging Plug

- Tethered cable only
- Used for less than 2% of DC charging sessions




Figure 38 Main EV Charger Plug Types

Source: Institute for Sensible Transport

It can be helpful to categorise how EV users differ in terms of their charging needs. Figure 39 segments the market into three main categories, based on their circumstance and the charge time they are likely to consider acceptable. At the base of each of the three categories is a suggested charger speed.

⁷ Relatively few cars can use full capacity of three phase AC chargers.

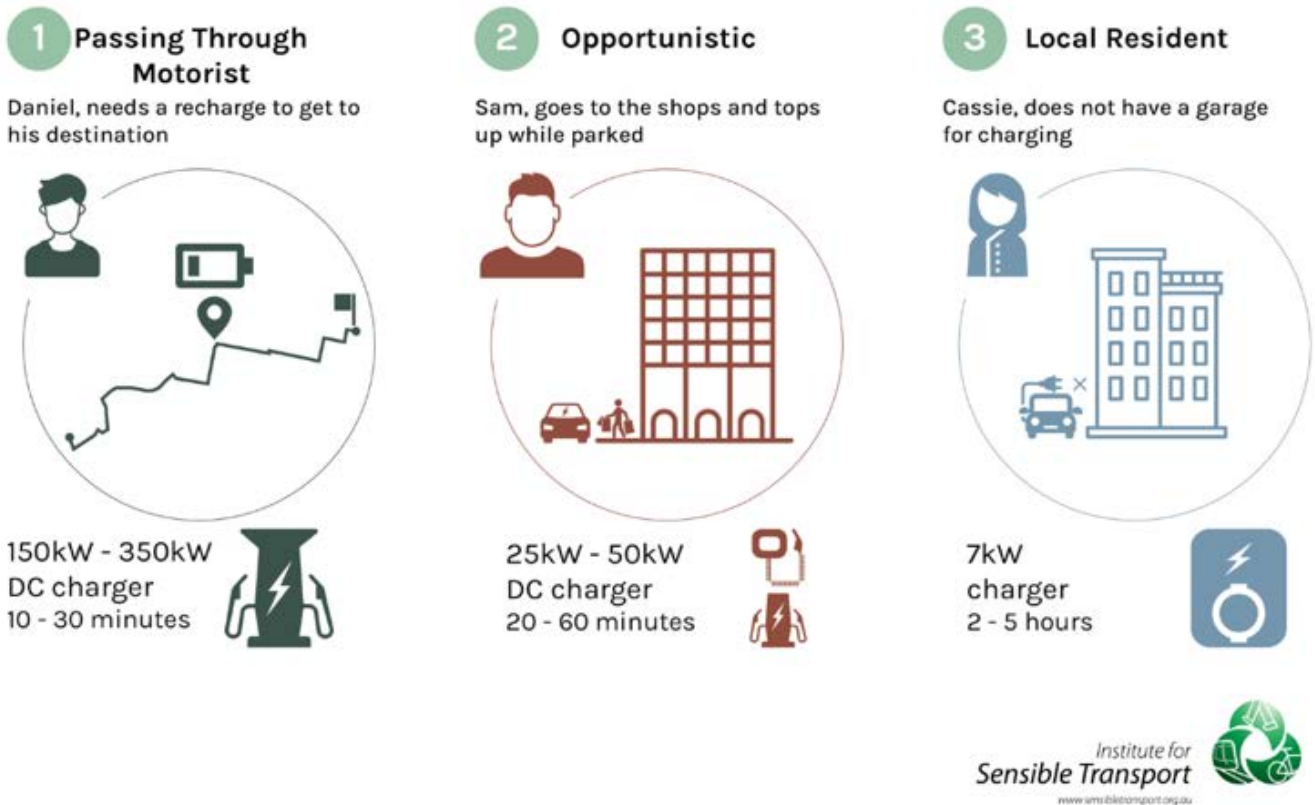


Figure 39 Differentiating the charging market

Source: Institute for Sensible Transport

A *passing through motorist* will generally not want to spend a long time waiting for their battery to charge and their priority is to continue their journey with minimal delay. Charging speeds of between 70 and 150 kW are suitable for most instances. These are often co-located within close proximity of amenities required by people charging. This enables users to go to the toilet, buy a coffee etc., while their vehicle is charging. The typical duration of stay is around 20 - 30 minutes. Ultra-fast chargers are expensive and require funding from the state or Commonwealth, and it is generally a better use of funds to have twice as many plugs of 150 kW than one 350 kW charging plug.

Opportunistic charging describes the charging that takes place when someone is going to that particular location anyway, and takes the opportunity to top up because of the availability of a charger. This can be thought of as analogous to charging a phone, not because you are low on charge, but because it is convenient for you to top up the battery. It is common for batteries to have more than 20% charge when entering a charging location in these contexts.

A *local resident* without the ability to charge in an off-street car park will generally find a slow, 7kW public charger suitable for their needs, as overnight charging is possible. These chargers need to be close to where users would have parked anyway and are intended to provide a charging opportunity for those who lack an off-street parking bay in which a charger can be easily installed. Given the type of housing stock in Whitehorse, it is unlikely these types of chargers will be required. Indeed, for houses built from 2024, the new National Building Codes will require parking bays to be EV-ready.

Finally, it is important to recognise that an EV owner is likely to move between these different charging categories at different times. A family on a road trip may be a passing through motorist at one time and later the same week, an opportunistic charger.

It is expected that 90% of EV charging will take place at home in the City of Whitehorse, with large numbers of dwellings having easy access to on-site (at home) charging.

It is expected that 90% of EV charging will take place at home in the City of Whitehorse, with large numbers of dwellings having easy access to on-site (at home) charging.

Figure 40 provides a conceptual illustration of how different types of chargers integrate with different land use types, based on the typical duration of stay.

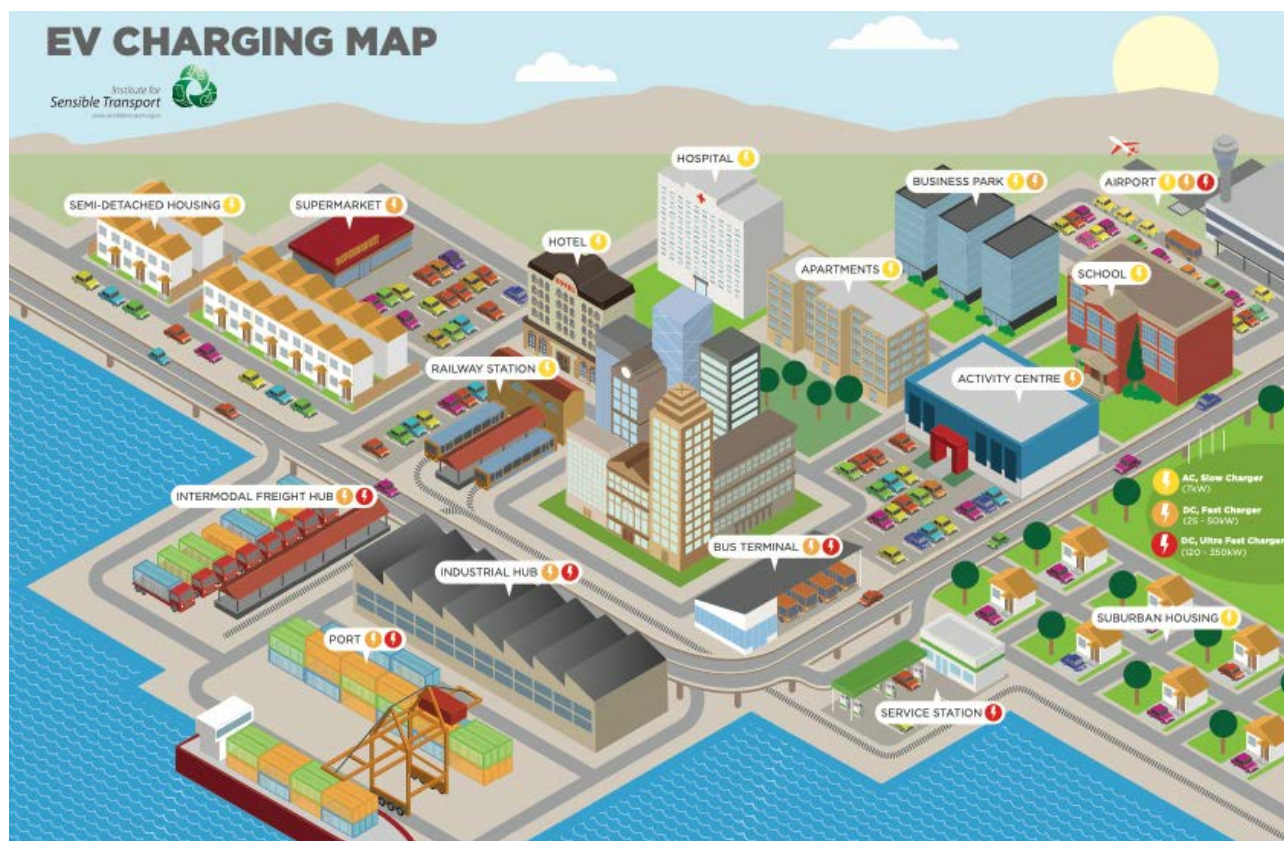


Figure 40 EV charging eco-system

Source: Institute for Sensible Transport

3.5.3 Electric vehicle charging – implications for Whitehorse

The last *Integrated Transport Study* for the City of Whitehorse was produced in 2011, when EVs were in their infancy. There were very few chargers and little demand for them. In the subsequent 14 years, considerable growth in EVs and charging opportunities has occurred. These trends are expected to continue, and the future WITS will need to identify how Whitehorse will support the transition to zero-emission motoring.

4. Review of previous community feedback



In 2024, Whitehorse undertook an extensive community consultation on all aspects of the local community and Council operations. The *Shaping Whitehorse* engagement was used to determine the community priorities in the ongoing development and renewal of Council’s key long-term strategic plans. Over seven weeks, 1,431 people were consulted through an online survey, pop-up stalls and targeted workshops. Data that is relevant to the development of the WITS has been distilled in this section.

4.1 Transport related responses and comments

The following provides a synthesis of themes to emerge from the community consultation that intersect with transport.

4.1.1 Vision

One in 10 people wanted a stronger focus on sustainability/climate change and the natural environment.

19% of those aged 75 and over want a stronger focus on Sustainability, Climate Change and the natural environment

4.1.2 Community connection priorities

When asked what is needed for a strong and connected community:

- Those aged between 35 and 69 were more likely to select *Footpaths/Bike paths* than *Parking/roads/traffic*.
- 22% of those born overseas selected *Footpaths/Bike paths* as a key priority.
- Those aged under 35 were the most likely to select *Public Transport* as a key priority.

Ensuring that people can easily access quality transport was a theme across all sectors of the community.

4.1.3 Infrastructure priorities

When asked which type of assets and facilities Council should prioritise over the next 10 years, 38% of respondents selected *Paths*. This is followed by 30% for *roads and drains* and 29% for *public spaces*. Figure 41 shows the top 4 priorities from the survey results.

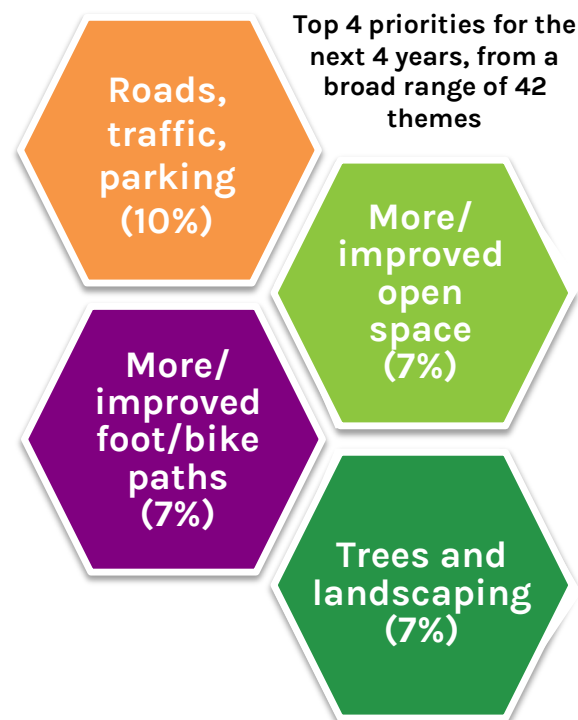


Figure 41 Shaping Whitehorse survey results, Top 4 Priorities for the next 4 years

Source: City of Whitehorse

4.1.3.1 Paths

Across all demographics, *paths* is the most preferred option. Broken down further, we can see that:

- 46% of males want greater focus on paths
- Those younger than 49 were least likely to select roads and drain improvements
- Those ages between 35 and 69 were most likely to select paths as their priority

4.1.3.2 Buildings and Spaces

Respondents were also asked about their views on what is needed most to create suitable buildings and spaces. The results are shown in Figure 42. The most relevant results to transport are identified in the following points:

- 21% of males and 17% of females indicated that quality footpaths and bike paths are needed
- 26% of females and 17% of males indicated Roads/parking and traffic are important, with those younger most likely to agree.
- Those aged 50+ were more likely to indicate that footpaths and bike paths were important compared to roads/parking and traffic
- Those under 35 were also the demographic most likely to choose quality public transport
- Those born overseas were more likely to choose Roads/Parking and traffic (30%), while those born in Australia were more likely to support footpaths and bike paths (22%).

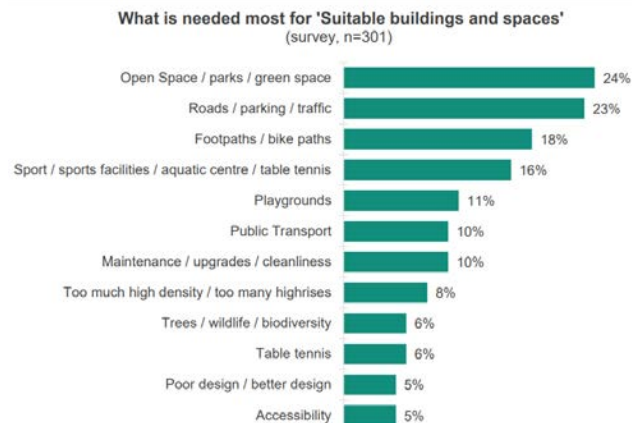


Figure 42 Shaping Whitehorse survey results for Buildings and Spaces

Source: City of Whitehorse

4.2 Individual responses and comments

Respondents were given many opportunities to provide their own direct comments on the different questions and topics surveyed. These have been reviewed and the following key themes identified.

4.2.1 Barriers to sustainable transport

Many people have highlighted a lack of transport infrastructure as a key issue, particularly a lack of protected bike lanes, as highlighted below:

'Improve interface of bike paths to slip lanes by removing requirement to ride on main road (Whitehorse Rd especially). Build cycle path along Middleborough Rd to connect Canterbury Rd to the Railway cycle trail.'

'What Whitehorse sorely lacks is decent bike path infrastructure so that its citizens can safely travel around the area off-road by walking or by bike.'

Other barriers to sustainable transport mentioned include:

- Poor connection between cycling and public transport infrastructure

'Transport network, especially connecting railway stations with other transport modes, needs to be improved.'

- Lack of direct public transport connections to key destinations (Deakin University etc)
- Poorly maintained footpaths leading to accessibility issues for the elderly or those with a disability.

4.2.2 Issues with existing infrastructure

Key issues with existing infrastructure include:

- Lack of non-vehicle transport options and indirect bus routes.
- Existing shared paths that don't feel wide enough for cyclists and pedestrians to co-exist safely.

'Wider bike paths. For example, the one along the Eastern Freeway is too narrow. It is also too bumpy in sections due to tree roots, so please fix this.'

- Frustration with bike lanes that are obstructed by parked cars.

'More dedicated on road bike lanes that do not double as parking for cars'

Respondents have mentioned several safety issues for pedestrians and cyclists, these include:

- Lack of accessible crossings allowing pram access into Wattle Park

- Cyclists using footpaths instead of the road.

4.2.3 What people want

Respondents make several requests for infrastructure improvements. These include:

- Develop stronger walkable precincts around activity centres.
- More protected and separated bike lanes

‘Safe bike and walking paths to encourage people to travel sustainably rather than driving short distances causing traffic and parking issues’

- More public transport connections to main activity attractors

‘Our roads are car canyons. As a cyclist, you are at risk every time you ride. More separated bike lanes are needed.’

4.2.4 Implications for the development of a future WITS

The feedback provided by the community through this engagement present a number of opportunities for enhanced transport choice, safety and sustainability. Several comments mention issues with similar locations, which could identify common issues to be further investigated, these include:

- Cycling infrastructure along Middleborough Road and Whitehorse Road
- Cycling safety and congestion along Springvale Road
- Pedestrian safety around train stations (Particularly Box Hill, Blackburn and Laburnum)
- Public transport access to Deakin University
- Pedestrian safety and connections to local parks (specifically including Wattle Park and Blackburn Lake)
- More off-street parking, particularly in Box Hill.

4.3 Limitations of the survey

This survey provides some valuable insights into the transport issues and opportunities in Whitehorse. However, because it was a general survey, it was limited in the degree to which it can

provide detailed information on the community’s views on transport. For instance, the survey did not differentiate between pedestrian and cycling infrastructure, limiting the use of statistical data in differentiating between modes. Additional engagement activities may be necessary to provide more detail to Council regarding the community’s aspirations for future transport in Whitehorse.

5. Existing Transport Network

A long-exposure photograph of a truck on a road at sunset. The truck is in the foreground, moving from left to right, with its wheels and body blurred. The background shows a road with white lane markings and a bright sunset sky. Light trails from other vehicles are visible in the distance. A white text box is overlaid on the top left of the image, containing the section title.

This section provides a review of the current transport network in the City of Whitehorse. This section utilises available data to develop an analysis of the existing public and active transport networks, local roads, electric vehicle charging and major transport projects.

5.1 Public transport

Whitehorse is serviced by several railway stations along the Belgrave-Lilydale railway line:

- Mitcham Station and Heatherdale Station (in Mitcham)
- Nunawading Station
- Blackburn Station and Laburnum Station (in Blackburn)
- Box Hill Station
- Union Station (Mont Albert), formerly Mont Albert and Surrey Hills stations.

The completion of Union Station marks the final level crossing removal within the City of Whitehorse.

Whitehorse is also serviced by three tram routes:

- Route 109 from Box Hill to Port Melbourne, servicing Mont Albert and Box Hill.
- Route 70 from Wattle Park the Waterfront City Docklands, servicing Box Hill South, Burwood and Surrey Hills.
- Route 75 between Vermont South and Central Pier Docklands, servicing Burwood, Burwood East, Vermont South and Deakin University.

Alongside trains and trams, Figure 43 shows the extensive bus network throughout Whitehorse. Whitehorse is served by both local bus routes and the Smart Bus routes: 703, 901, 902, 903, 906, 907.

The Box Hill MAC is the key major transport interchange within the City of Whitehorse. In addition to Box Hill Railway Station, it contains a major bus terminal and is the terminus of the tram route 109 (which also serves as a night route).

Mitcham and Blackburn railway stations are serviced by several local and Smart Bus routes providing connections between transport modes. Laburnum and Union railway stations are the least connected to other modes of transport. A 200 m walk is required to reach the closest bus stop to Laburnum Station.

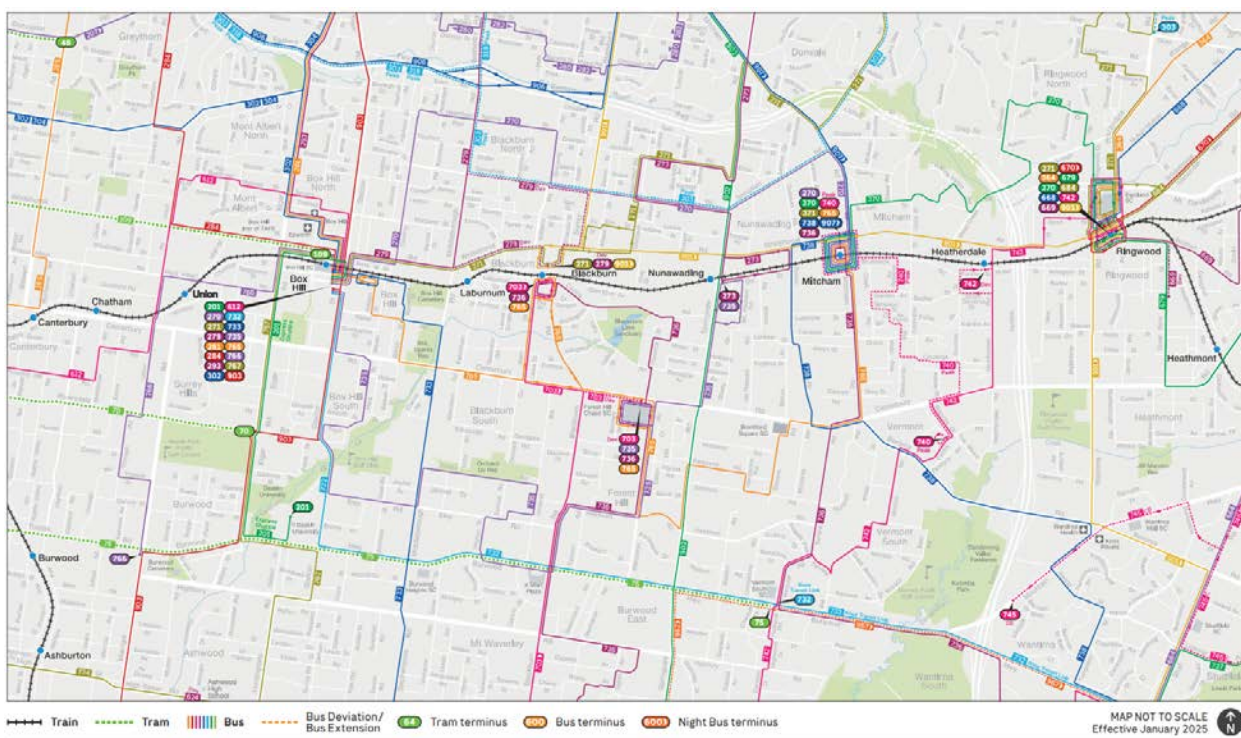


Figure 43 Whitehorse Public Transport Network

Source: Public Transport Victoria

5.2 Cycling and micromobility

Whitehorse has several off-road paths, including the trails along the Belgrave-Lilydale railway line and along the Eastern Freeway. Shared paths through parks and reserves enable safe cycling within these areas. There appears to be some disconnect between some paths and nearby Activity Centres.

The Whitehorse *Easy Ride Routes* generally have some form of cycling infrastructure. However, there is a lack of separated and protected bike lanes or offroad paths. This limits the ability of people to consider using these routes for cycling. Further details can be found in the review of Easy Ride Routes evaluation report (Section 2.1.17). The evaluation report highlights inadequate wayfinding

and routes that require many turns as a barrier to their success.

Figure 44 shows the existing cycling infrastructure in Whitehorse. According to data provided by the State Government and the City of Whitehorse, infrastructure has been split into:

- **Protected cycling infrastructure**, which includes shared paths, protected bike lanes and pedestrian plazas.
- **Unprotected cycling infrastructure**, which includes most on-road infrastructure. These are generally in the form of sharrows, painted lanes and shared bicycle-parking lanes.

More about the most suitable type for cycling infrastructure according to the environment and rider is discussed in Section 6.3.

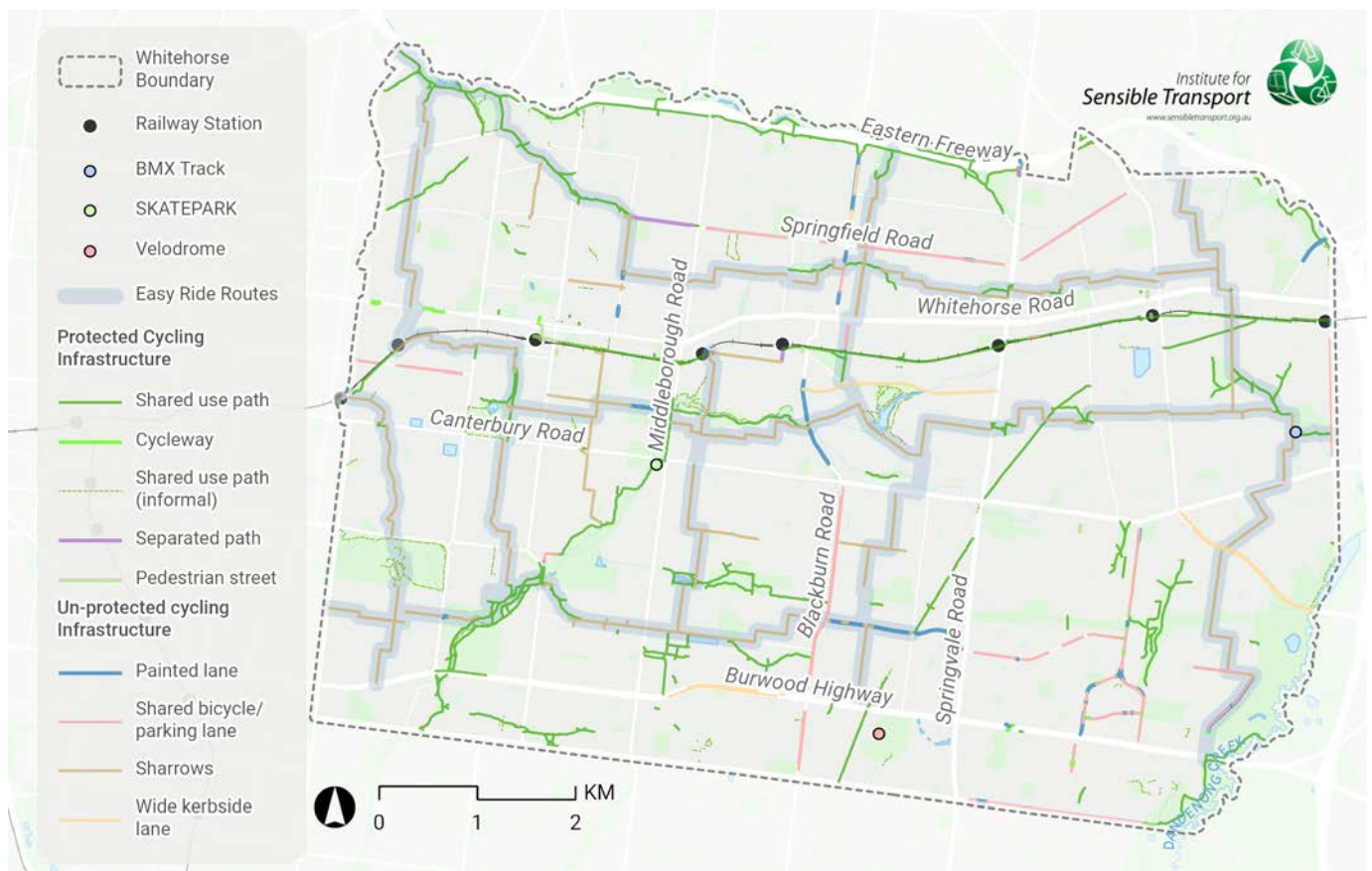


Figure 44 Existing Cycling Infrastructure

Source: Victorian State Government, City of Whitehorse

On-road cycling infrastructure typically consists of painted line markings, sharrows and some separated painted bike lanes. The grade-separated path along Springfield Road between Middleborough Road and Dorking Road (shown in Figure 45) provides one of the few examples of local dedicated cycling infrastructure outside of the shared path and parklands network.



Figure 45 Separated Path - Springfield Road

Source: Google Maps

There are several gaps and issues within the current network. Some examples include:

- Non-continuous and inconsistent bike lanes along Blackburn/Surrey Road. Lanes stop and start, and in some sections are only provided on one side of the road.
- Shared bike/parking lane ends west of Blackburn Highschool along Springfield Road, before starting again after John Holland Ct. This creates a cycling gap extending along Blackburn Highschool and the Blackburn Square Shopping Centre.
- Many routes include bike lanes that are shared with parking. This creates issues where cyclists must merge into vehicle traffic to move around parked cars. This design is outdated because of the risk of ‘car dooring’. This reduces the perceived and actual level of safety that bike lanes can provide. This has also been noted in submissions to the *Shaping Whitehorse* engagement.
- Bike lanes end abruptly in many locations, sometimes ending in locations that are not ideal for any road users (Figure 46).



Figure 46 Issue: Bike Lane ends at obstacle, reducing space for cyclists when approaching the round-a-bout

Source: Google Maps

The cycling network in Whitehorse excludes 80 – 90% of the population. Cycling levels in Whitehorse are very low and have stagnated over the last 20 years or more. A future WITS is an opportunity to create protected, connected bike lanes and an even more extensive network of shared paths. The cycling network must focus on a user centred design that connect homes to key destinations.

5.3 Walking

Footpaths are an essential component of the transport network and facilitate the most fundamental transport mode. Regardless of people’s mode of transport, walking will generally form an important link at the beginning and end of any trip. Figure 47 illustrates the footpath network in Whitehorse.

In general, most local residential streets in Whitehorse have a DDA-compliant footpath on both sides of the street. This means residents have easy and readily available paths to walk on. This is especially important for vulnerable road users, such as children or those with mobility issues.

Not all parts of the footpath network comply with DDA requirements. Some of these locations are indicated in Figure 47. This includes some crucial links such as the ‘Pipe Track’ between Springvale Road and Hawthorn Road. This trail could form an important link in cycling access from southern Whitehorse to the Railway corridor.

There are also several footpaths with widths of 2.5m or wider. These could be considered for upgrades to shared paths.



Figure 47 Footpath Network Whitehorse

Source: City of Whitehorse 2024

Note: Paths indicated categorised as 'Unknown' (pink line), were not surveyed as part of Whitehorse's data collection. Some, such as the Railway path between Box Hill and Ringwood and the Koonung Creek trail are Shared Paths.

5.4 Road network

Whitehorse has an extensive road network that connects every property in the LGA, as well as a large number of connections to other parts of Melbourne. The hierarchy of the road network is shown in Figure 48. The Eastern Freeway, Burwood Highway and Whitehorse Road (incl. Maroondah Highway) form the main connection to neighbouring LGA's and the wider region. *EastLink* also connects from the Eastern Freeway and runs down the east of Whitehorse with connections to Whitehorse, Canterbury and Boronia Roads and Burwood Highway.

Springvale Road, while not classified as a Highway, carries a similar level of traffic to Burwood Highway and Whitehorse Road. It offers 3 - 4 lanes of traffic in each direction through Whitehorse. Along with Middleborough Road, Springvale Road forms the primary north-south thoroughfare across Whitehorse.

Roads classified as Freeways, Highways, Arterial and Sub-Arterial are managed by the State, Collector and Local/Minor roads are managed by Council.

The Eastern Freeway/Eastlink serves as the Principal Freight Network (PFN) route serving commercial and industrial operations within the City of Whitehorse. Roads connecting Commercial and Industrial Zones with the PFN typically have higher freight volumes than roads that do not connect with the PFN. This highlights where it is most important to avoid having vulnerable road users sharing road space with trucks.



Figure 48 Road network classification, Whitehorse

Source: Department of Transport and Planning

5.4.1 Speed zones

The posted speed limits for every street and road in Whitehorse are shown in Figure 49. The vast majority of roads are sign posted at 50 km/h with limits of 60-80 km/h along the highways, arterial and sub arterial roads. The only instances of speeds higher than 80 km/h are along the Eastern Freeway and Eastlink.

Generally, local schools are supported with 40 km/h school zones. The exception being outside Emmaus College in, which has a school zone along Springvale Road signposted at 60 km/h. Whitehorse Road outside Antonio Park Primary School has recently been changed (April 2025) from 60 km/h to 40 km/h during school times.

The new Whitehorse ITS represents an opportunity to align speed limits with the *Safe Systems* approach to road safety and minimise the potential and severity of injury from crashes. In the last decade, many local governments have begun to lower their default speed limit to 40 km/h in residential streets and create shared zones with even safer speeds.

Some local councils in Greater Melbourne have also begun to implement or investigate 30 km/h limits along local streets. Whitehorse has begun a 30km/h trial speed zone in Glenburnie Avenue, Mitcham and is considering others. The DTP’s guidelines make it difficult to apply for 30 km/h speed limits, existing approvals are only made as ‘trials’ at the time of writing.

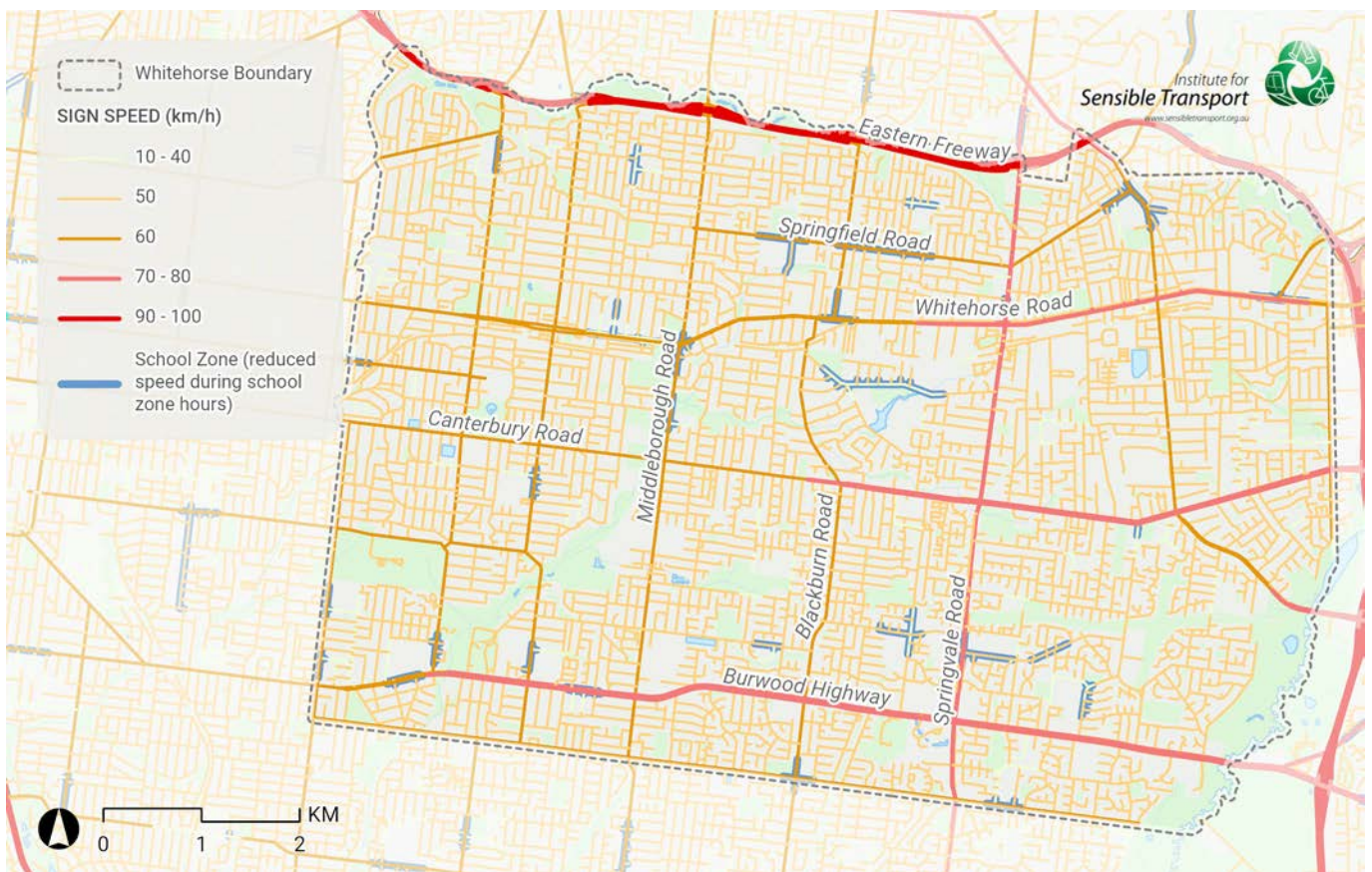


Figure 49 Speed Zones in Whitehorse

Source: Department of Transport and Planning

5.4.2 Traffic volume

Traffic volume data is collected for declared roads in Victoria by VicRoads. The recorded two-way yearly volume is divided by 365 and represented by a single line to show *average daily volume* for all vehicles. The result of this exercise is shown in Figure 50.

As expected, the highest road volumes are on the freeways, major highways and arterials such as the Burwood Highway, Eastern Freeway and Springvale Road. The area of highest traffic volume within Whitehorse (aside from freeways) is around the intersection of Burwood Highway and Springvale Road. Traffic volume also increases around the intersections of Springvale Road – Whitehorse Road and Whitehorse Road – Station Street.

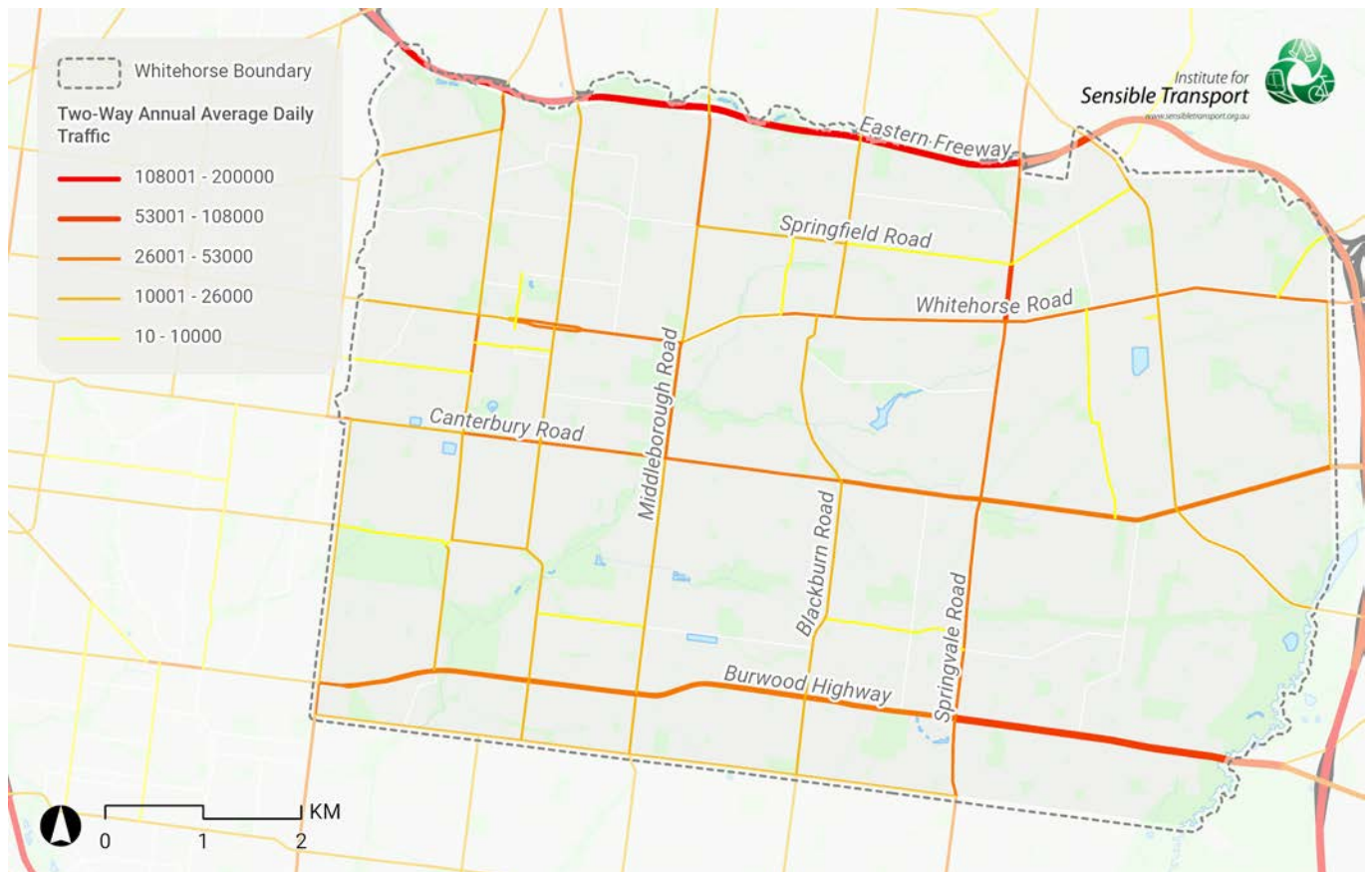


Figure 50 Average daily traffic volume for all vehicles

Source: Department of Transport and Planning

significant areas outlined in *Plan Melbourne*. Four of the seven National Employment and Innovation Clusters (NEIC) will be connected along with universities, education precincts and activity centres.

Construction has commenced on the first stage of the project, SRL East, between Cheltenham and Box Hill, and is scheduled to be completed in 2035.

This stage includes two SRL stations in Whitehorse - Box Hill and Burwood. Improved accessibility and connectivity will be provided through this stage to locations such as Deakin University, Box Hill and Epworth Hospitals and Box Hill Institute. Timelines for further stages of SRL have not been announced by the Victorian Government. Figure 52 shows the different stages of the project.



Figure 52 Map of Suburban Rail Loop

Source: Victorian State Government

Stage 2 from Box Hill to the Airport is still in planning without any official timelines. This stage would provide access to:

- Doncaster, Heidelberg and Broadmeadows MAC's
- La Trobe and RMIT Universities Bundoora (NEIC)
- Melbourne Airport all train lines in-between.

Stage 3 connects Melbourne Airport with the western metropolitan and V-Line trainlines and the Sunshine and Werribee NEICs. It incorporates the Airport Rail line, where a change of train will be required to continue west from the Airport.

The Suburban Rail Loop will significantly impact precincts surrounding the planned Burwood and Box Hill SRL stations. Providing a high-quality active transport network and local public transport network will be essential in realising the benefits

and addressing the growth challenges this major infrastructure project will bring. The structure plans for the two station precincts within Whitehorse have been reviewed in section 10.3.1.

5.6 Electric vehicles

Electric vehicles (EVs) are becoming increasingly popular and play a more important role in the transport mix in Whitehorse. With EV ownership rising, more people will require public EV charging options. Some of the benefits associated with a charging network include:

- Local economic benefit, by attracting motorists from outside of Whitehorse to stop and spend time in the area while their vehicle is charging
- Reduces range anxiety and helps people have the confidence to buy an EV for their next vehicle

- Providing chargers for those who live in homes without easy access to EV charging
- Should be powered by 100% renewable energy through private providers or Council’s own 100% renewable energy through the local government collaboration energy contract (VECO).

Further information about EV and charging can be found in *Electric vehicles* (Section 3.4).

Figure 53 shows the known existing and planned EV chargers that are available to the public. The type of infrastructure varies from slower Level 2 AC charging to Level 3 DC fast chargers and Tesla SuperChargers (only those open to all EVs).

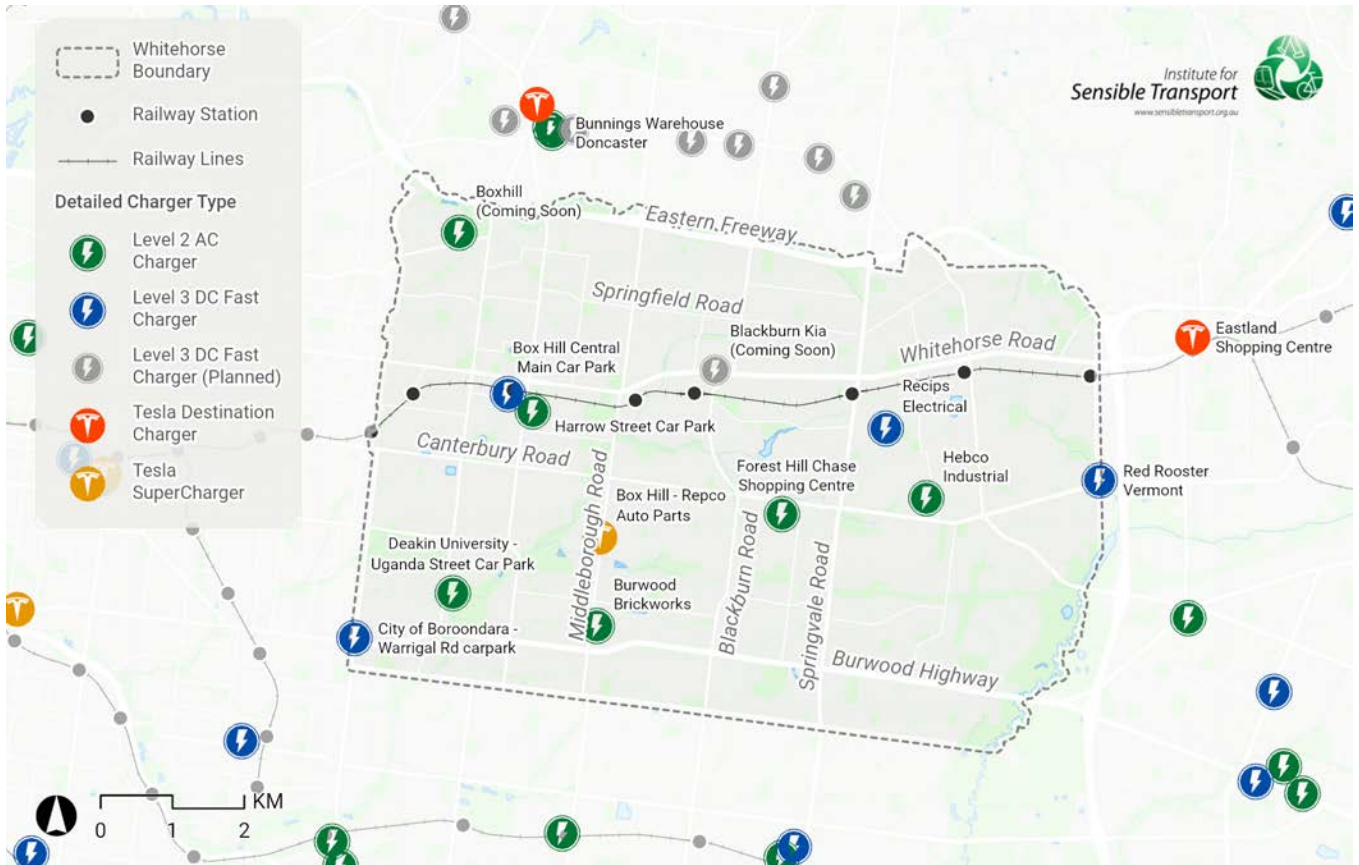


Figure 53 Existing and Planned EV Chargers

Source: Plugshare, City of Manningham, City of Boroondara

6. Unlocking Transport Potential



This section describes analysis conducted for this project on public transport accessibility and latent demand for cycling. Both are focused on highlighting opportunities for improvements to transport choice.

6.1 Public Transport Accessibility Index (PTAI)

A *Public Transport Accessibility Index (PTAI)* assesses the quality of public transport by considering the coverage, along with the frequency of the service.

Coverage addresses the geographical reach of the network. This is calculated as the number of people who live in proximity to the public transport stop.

Frequency refers to how often buses, trains or trams arrive at each stop, with higher frequency reducing wait times and making public transport a more convenient option for everyday trips.

A PTAI has been produced for Whitehorse as part of this project and is shown in Figure 54. Train, tram

and bus access were analysed together for the number of average daily (weekday) services and frequency. The darker the shade, the higher the level of public transport accessibility.

To account for ease of access, areas closer to stops were weighted more favourably. For bus and tram stops, this was done at intervals of 400, 600 and 800 metres. For train stations, larger intervals of 800, 1200 and 1600 metres were used. The distances are based on the distances people generally walk. The train is higher than the bus because people are more willing to walk a greater distance for rail.

The values for train, tram and bus accessibility were combined and Figure 54 shows the resultant *Public Transport Accessibility index* for the whole of Whitehorse. Box Hill Central, which has train, tram terminus and bus interchange, has the highest access to public transport. Areas of high accessibility are concentrated along the railway stations and tram stops. Station Street also show reasonably high access between Riversdale Road and Whitehorse Road.

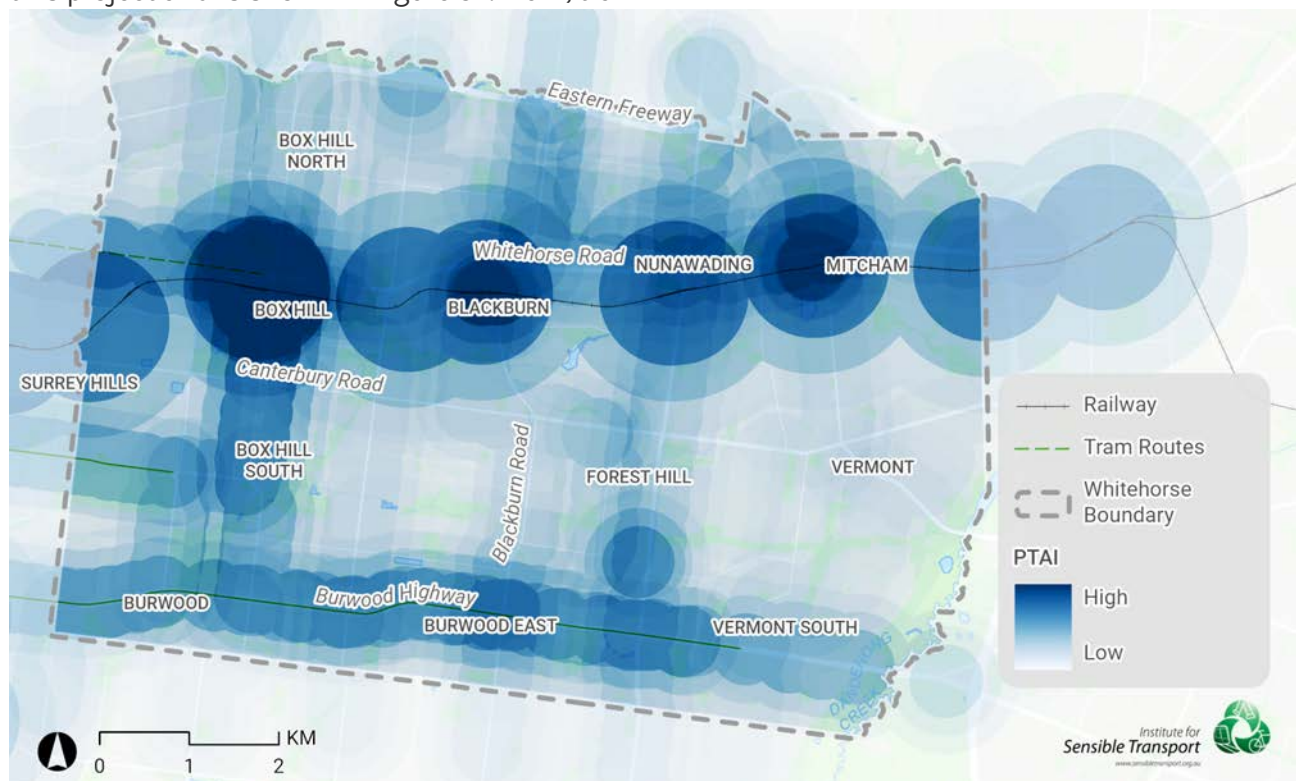


Figure 54 Public Transport Accessibility Index (excl. SRL)

Source: Institute for Sensible Transport, GTFS

6.1.1 PTAI including Suburban Rail Loop

Figure 52 considers the potential PTAI when the Suburban Rail Loop (SRL) is introduced. Based on the SRL Demand Modelling Report,⁸ some assumptions have been made to assess SRL's inclusion into the Public Transport Accessibility Index. For the SRL to run an average of 142 trips a day in one direction on weekdays:

- The service runs between 0500 hours to 0000 hours.
- The service runs every 6 minutes during peak hours (0700 - 1000 hours and 1500 to 1900 hours).
- The service runs every 10 minutes during off-peak hours.

The introduction of the SRL shows that Burwood residents will gain significant access when Burwood Station opens, while the areas around Box Hill are further enriched.

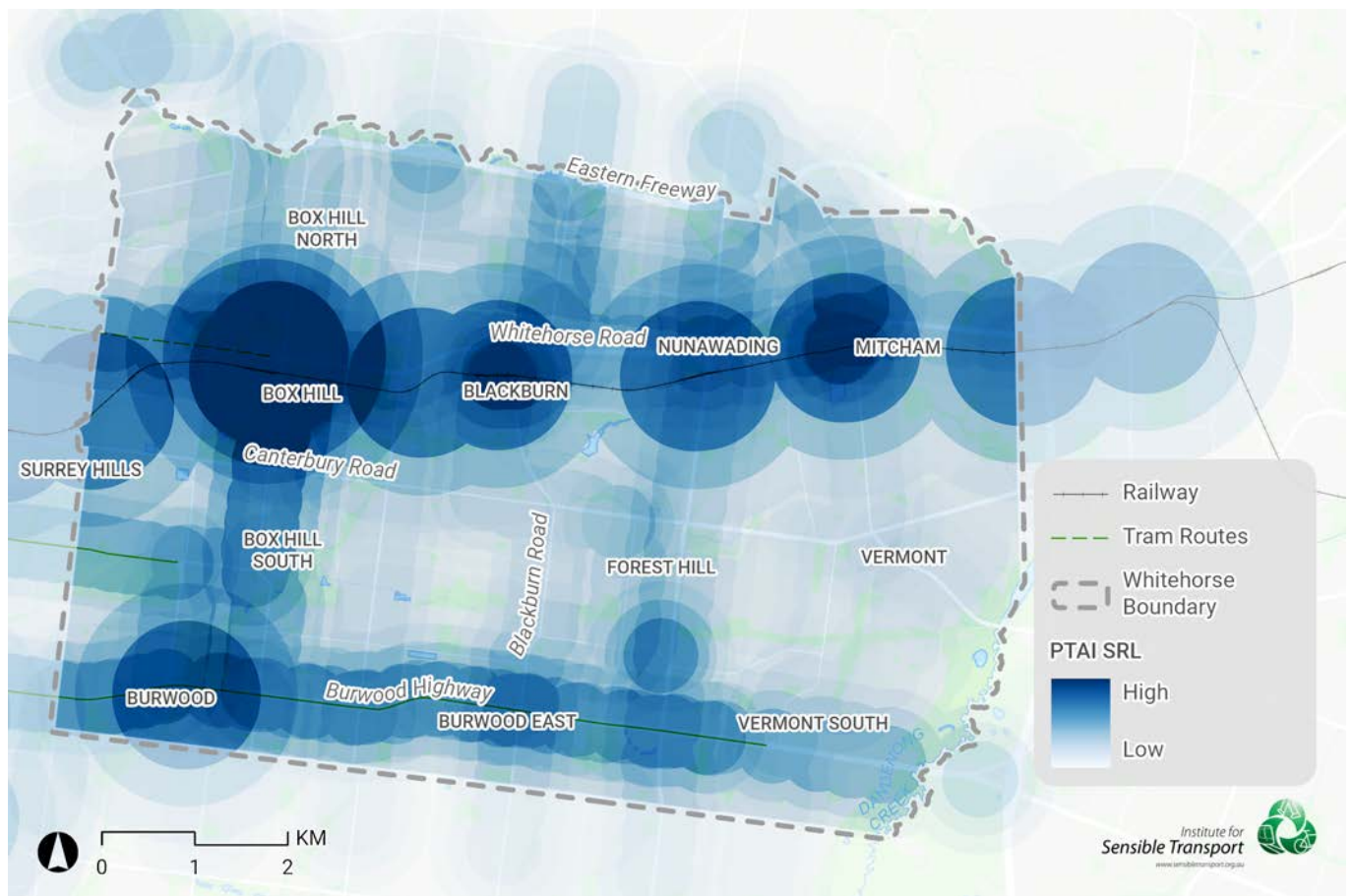


Figure 55 Potential Public Transport Accessibility Index (incl. SRL)

Source: Institute for Sensible Transport. GTFS

⁸ [SRL-Appendix-C1-Demand-Modelling-Report.pdf](#)

6.1.2 Where and who has access to public transport in Whitehorse

Figure 56 shows Mesh Blocks that have been spatially joined to the PTAI. Mesh Blocks are the smallest geographical statistical unit provided by the ABS. They provide population and dwellings figures for a specific geographic area. To maintain privacy, a level of ‘jitter’ is introduced into Mesh Block figures. However, the overall proportions are maintained. The total counts of population and dwellings have been grouped according to their PTAI scores. The proportion of people and homes and their levels of access *now* and *after* the SRL is implemented is presented in Table 2. Very high access is only available to people living near Box Hill Central.

Approximately 18% of people live within high and very high access to public transport. These areas are near trains stations, with the exception of pockets of residential areas off Burwood Highway. When the SRL commences services, 24% of people will have access to high – very high public transport access. This marks a 6% improvement to accessibility to public transport. Dwellings located in public transport “deserts” will remain inaccessible, and people living in those areas are likely to be car dependent.

The number of people and dwellings shown in Table 2 are based on the 2021 Census figures. The impact to population and dwelling figures forecasted for 2036 is also provided.

Table 2 Population and dwelling grouped based on Public Transport Accessibility

	2021 (No SRL)		2036 (No SRL)		2036 (After SRL)	
	Dwellings	Persons	Dwellings	Persons	Dwellings	Persons
Total counts	71,670	169,391	90,135	206,617	90,135	206,617
Very High	3%	2%	5%	3%	12%	8%
High	19%	16%	22%	18%	21%	20%
Adequate	14%	13%	14%	14%	12%	12%
Poor	23%	24%	22%	24%	21%	22%
Very Poor	32%	33%	28%	31%	26%	29%
Inaccessible	10%	11%	9%	10%	8%	10%

Source: Institute for Sensible Transport

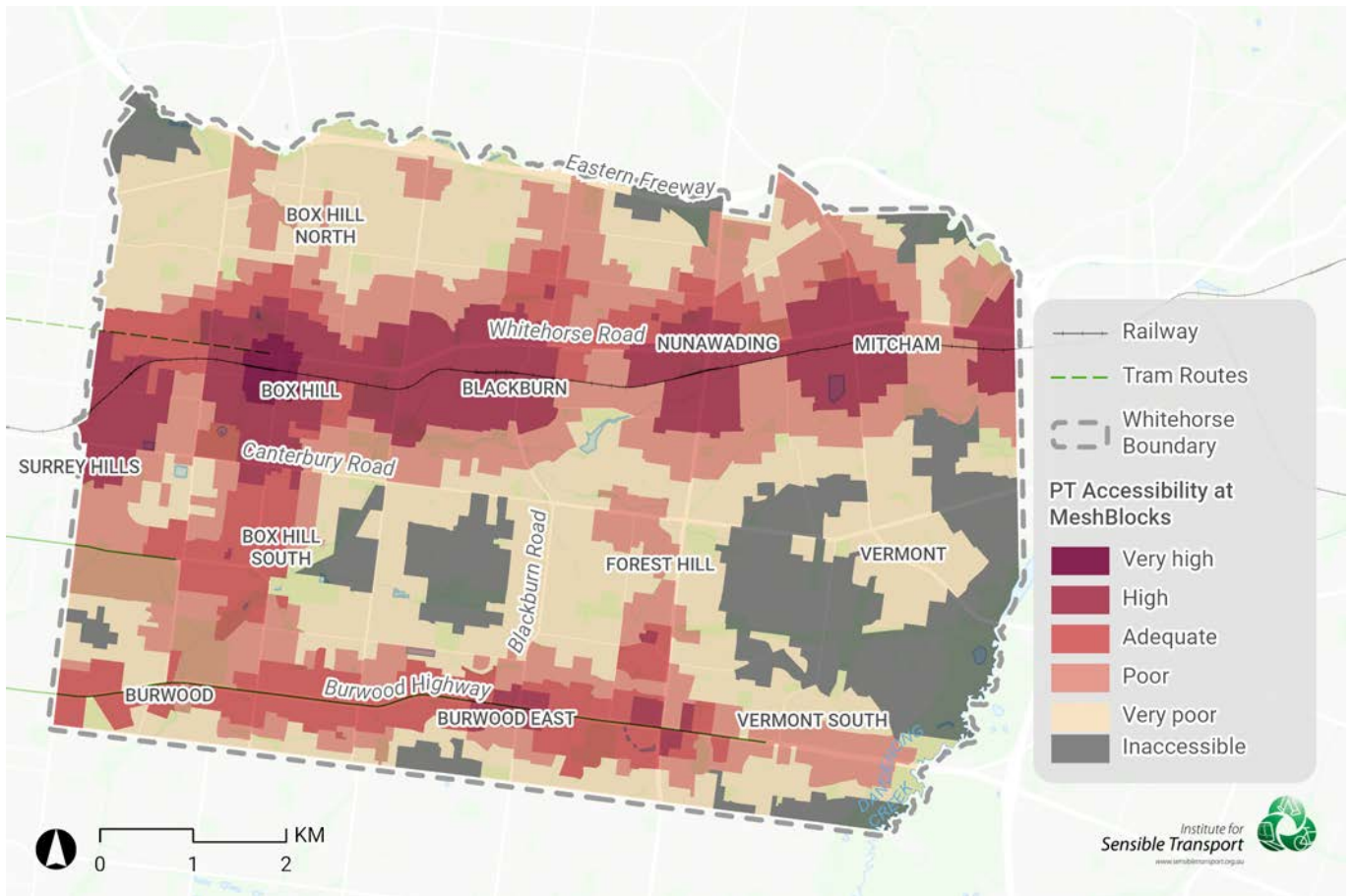


Figure 56 PTAI at Mesh Block level

Source: Institute for Sensible Transport. GTFS, ABS Census

6.2 Bike and Micromobility Use Propensity Index

The *Bike and Micromobility Use Propensity Index* uses seven Census variables (as shown in Figure 57) to illustrate spatial variation in latent demand for cycling. This is important because high quality bicycle infrastructure can be expensive, and it is important that it be developed in the areas with the highest potential demand for cycling.

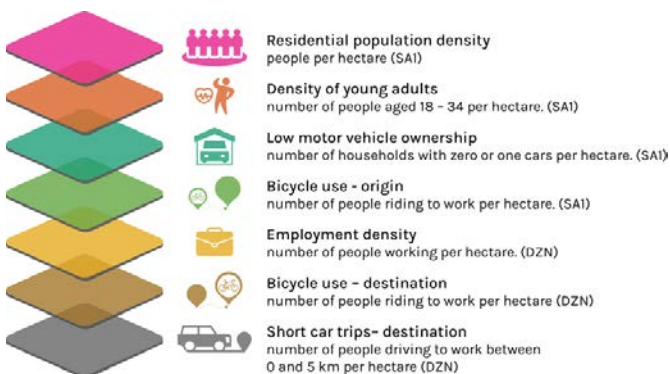


Figure 57 Variables for Bike use Propensity Index

Source: Institute for Sensible Transport using ABS Census

The results from the analysis for Whitehorse are presented in Figure 58. The darker the colour, the greater the latent demand for cycling and other forms of micromobility. In Whitehorse, the highest value for overall propensity is 3.7, whereas the Melbourne CBD receives over 4.5. Box Hill, Box Hill North, Blackburn, parts of Burwood, Mitcham and Nunawading show the highest propensity for cycling in Whitehorse. More details regarding the analysis and methodology are available in the Appendix. The separate scores for the origin and destination variables are shown in Figure 164 and Figure 165 respectively.

This exercise is particularly useful for Whitehorse, which has a disconnected network of off-street trails and shared paths with on-street infrastructure largely consisting of sharrows. Currently, there is minimal high-quality safe cycling infrastructure connecting key locations highlighted in this Propensity Index.



Figure 58 Bike and Micromobility Use Propensity Index - Overall

Source: Institute for Sensible Transport, based on ABS Census data

6.3 Suitable cycling and micromobility infrastructure for Whitehorse

The existing cycling and micromobility network throughout Whitehorse primarily consist of shared use paths. These are in the form of trails connecting local parklands and the corridor along the Belgrave-Lilydale railway line. High quality protected infrastructure increases the safety of all

road users by separating those on slower, more vulnerable modes of transport from motor vehicles.

The type of bicycle infrastructure must be appropriate to the function and design of the road on which it is located. Figure 59 presents work completed for Austroads, indicating the most suitable type of infrastructure based on the *speed* and *volume* of motor vehicles. In later stages of the WITS development, this approach should inform network upgrade recommendations.

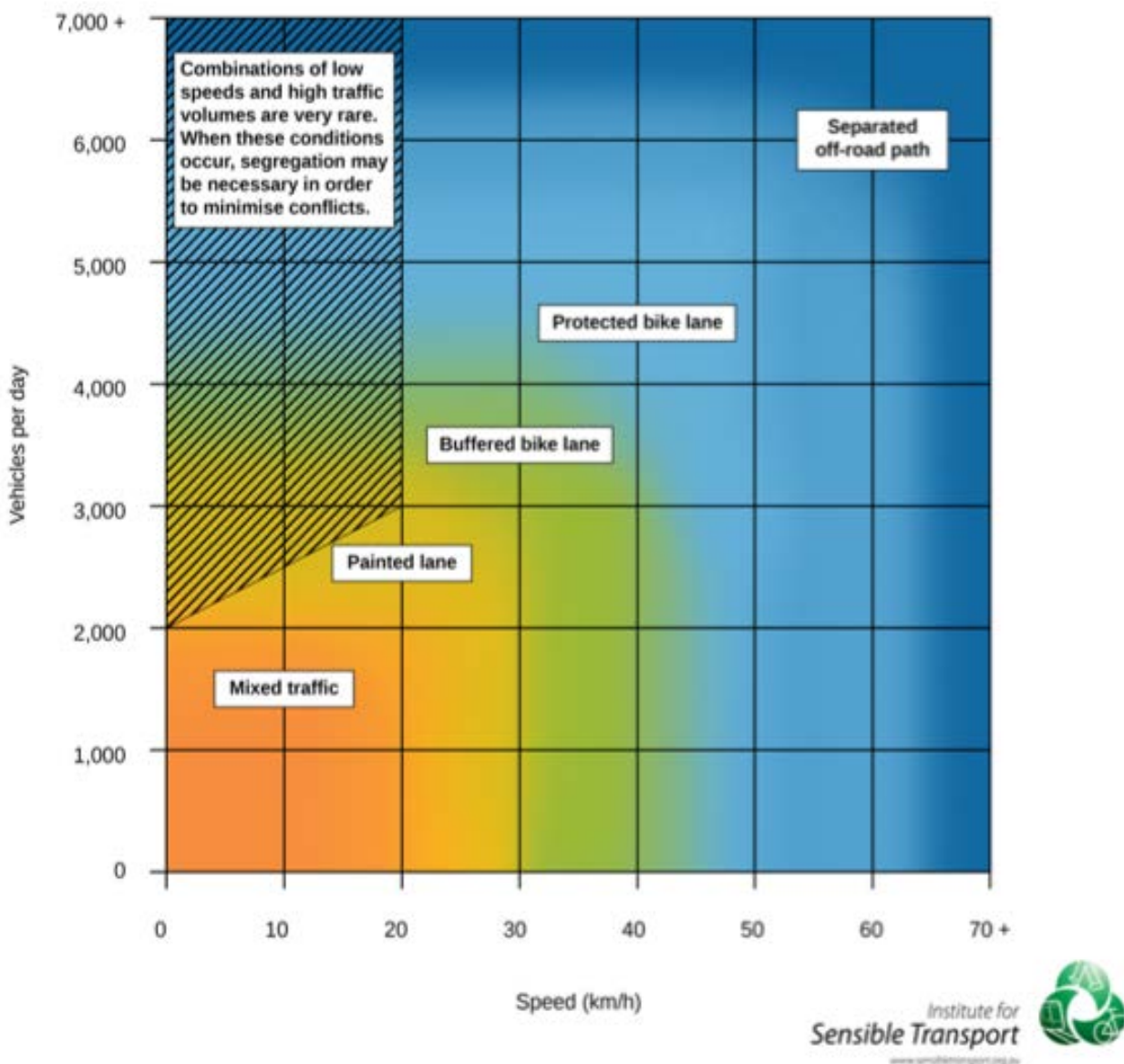


Figure 59 Bicycle infrastructure design based on the speed and volume of motor vehicle traffic

Source: Institute for Sensible Transport

7. Transport patterns



A thorough understanding of current travel patterns in Whitehorse is critical for the development of the future WITS. This section provides an analysis of transport patterns for journeys to work and *all-purpose* journeys. This analysis creates a baseline to inform Whitehorse as it embarks on the development of the WITS.

7.1 Journey to work

Travel to work data is captured at every Census. It is the most complete dataset relating to transport available in Australia. This dataset includes mode share of journey to work trips, trip distance, and demographic factors such as age and sex. Mode share is a term that describes the proportion of trips by various transport modes.

The most recent Census was conducted in 2021. The 2021 Census was conducted while metropolitan Melbourne was subject to health orders that restricted movement to halt the spread of COVID-19. Although the COVID-19 pandemic restrictions have an impact on responses, the mode share of those who *did* travel to work are similar to pre-pandemic patterns. The largest change was in working from home, which increased from 6% in 2016 to 39% in 2021.

7.1.1 Mode share

Figure 60 shows the change in journey to work mode share for Whitehorse and Greater Melbourne over the past fifteen years. This data is also shown in a tabulated format in Table 3 and Table 4. Like the rest of Melbourne, the car is the dominant mode of transport in Whitehorse. Despite several policies described in Section 2.1 that commit to achieving a

more sustainable transport system, Census data indicates limited growth in active transport participation and public transport patronage. Car use has remained high, with no significant reductions over the past decade. Since 2011, the car has accounted for approximately 80% of all journeys to work for Whitehorse residents. This is similar to the rest of metropolitan Melbourne.

Car use is the dominant travel mode in Whitehorse, accounting for 82% of trips to work in 2021. The proportion of people who use the car to travel to work has remained largely unchanged in the last fifteen years.

Public transport patronage is slightly higher in Whitehorse compared to the rest of Melbourne. This may be partly attributed to the larger train and bus network, as well as three tram routes operating throughout the City of Whitehorse. Journey to work trips completed by train are the next most reported mode, following the car. The highest proportion of residents who took the train to work was recorded in 2016, at 12%. Journey to work trips by bus remained stable at 2 - 3% despite the impacts of COVID-19 on travel movements. Around 1% of people travelled to work by tram in Whitehorse.

Active transport is consistently among the least reported mode of travel to work in Whitehorse, with only 4% of trips to work completed by bicycle or foot. Less than 1% of people who travel to work from Whitehorse rode a bike, which is half the rate of the metropolitan Melbourne average.

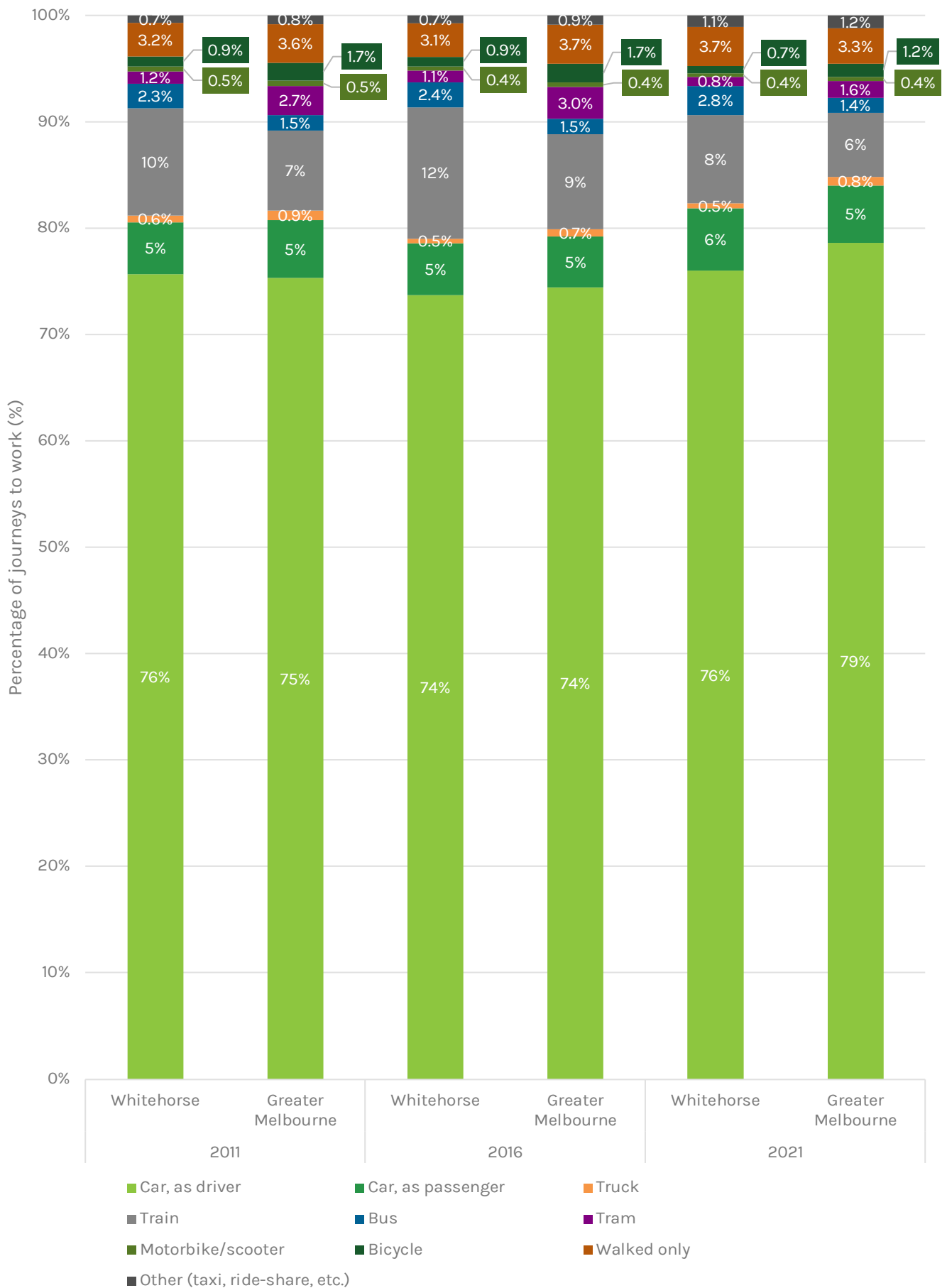


Figure 60 Journey to work mode share, Whitehorse and Greater Melbourne

Source: ABS Census Data

Table 3 Journey to work mode share, Whitehorse

Mode	2011	2016	2021
Car, as driver	76%	74%	76%
Car, as passenger	5%	5%	6%
Truck	0.6%	0.5%	0.5%
Train	10%	12%	8%
Bus	2.3%	2.4%	2.8%
Tram	1.2%	1.1%	0.8%
Motorbike/scooter	0.5%	0.4%	0.4%
Bicycle	0.9%	0.9%	0.7%
Walked only	3.2%	3.1%	3.7%
Other (taxi, ride-share, etc.)	0.7%	0.7%	1.1%

Source: ABS Census Data

Table 4 Journey to work mode share, Greater Melbourne

Mode	2011	2016	2021
Car, as driver	75%	74%	79%
Car, as passenger	5%	5%	5%
Truck	0.9%	0.7%	0.8%
Train	7%	9%	6%
Bus	1.5%	1.5%	1.4%
Tram	2.7%	3.0%	1.6%
Motorbike/scooter	0.5%	0.4%	0.4%
Bicycle	1.7%	1.7%	1.2%
Walked only	3.6%	3.7%	3.3%
Other (taxi, ride-share, etc.)	0.8%	0.9%	1.2%

Source: ABS Census Data

A comparison of journey to work mode share between Whitehorse and other metropolitan LGAs is shown in Figure 61. This shows that Whitehorse is similar to other metropolitan areas with

comparable access to public transport. Additional charts for mode share by suburb can be found in the Appendices.

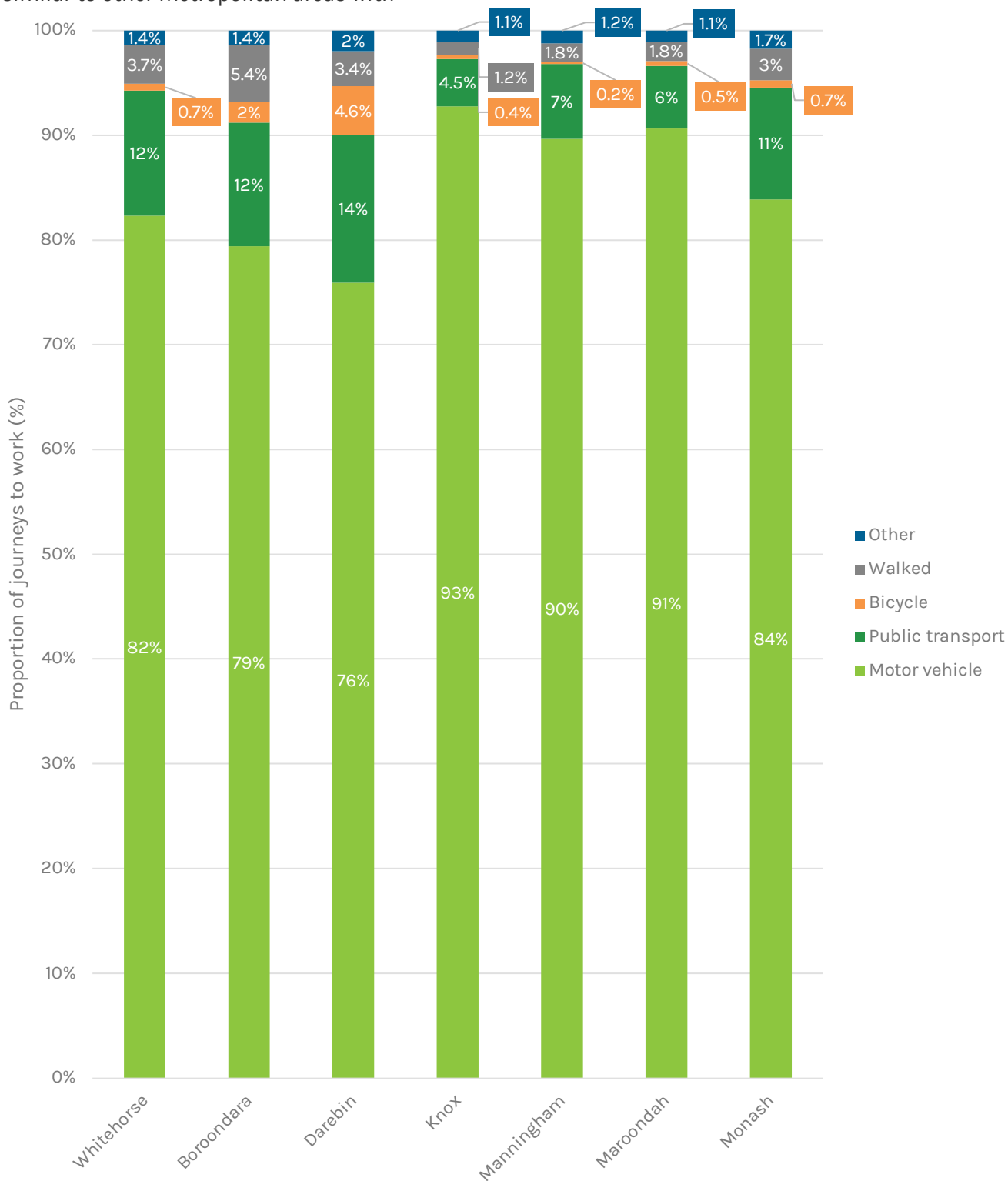


Figure 61 Mode share of Whitehorse compared to other Melbourne LGAs

Source: ABS Census 2021

7.1.1.1 Mode share by gender

Understanding how people of different genders travel reveals how the existing transport network

may support equitable access. A gender analysis of mode share is presented in Figure 62. The car remains the primary mode of transport for both

groups. However, it is observed that women’s participation in car trips is less pronounced, at 81% compared to men at 84%.

Women take public transport to work more often than men in Whitehorse (13%) and demonstrate a greater prevalence of ‘walked only’ trips (4.6%). Notably, more than three times as many men rode a bike to work as women, at 1% and 0.3%, respectively. This trend is similar to that found across Greater Melbourne and is commonly linked to poorer experiences and perceptions of safety of riding on roads amongst women.

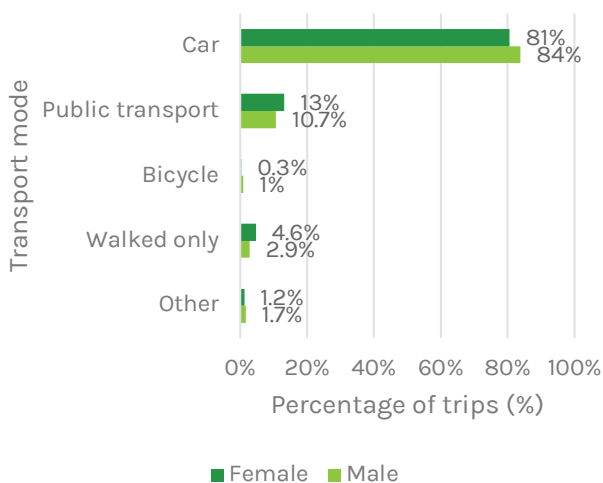


Figure 62 Mode share by gender

Source: ABS Census 2021

7.1.1.2 Work from home population

Unsurprisingly, there have been significant changes to the *work from home* population in Whitehorse. Figure 63 shows that the work from home population in Whitehorse prior to COVID-19 pandemic was similar to the rest of Greater Melbourne, at around 5%. In 2021, the proportion who worked from home increased dramatically,

rising from 6% to 39% among Whitehorse workers. This is notably higher than rest of Greater Melbourne and is likely associated with the greater proportion of Whitehorse residents employed in professional roles (34%) that provide workers the opportunity to work from home.

It can be expected that the work from home population will reduce somewhat by the 2026 Census, but will remain higher than 2016.

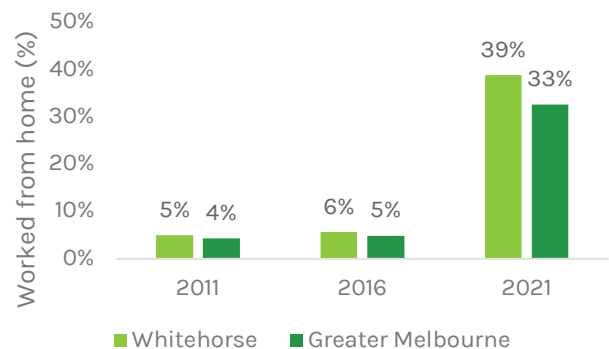


Figure 63 Work from home population

Source: ABS Census Data

The mode of transport used by commuters from points of *origin* in Whitehorse is shown in Figure 64. The car is the most common mode of transport used by residents living across the municipality.

Taking public transport to work is most concentrated in the eastern area of Whitehorse, particularly for those residing in Box Hill, Burwood, and Blackburn. Journeys to work by bus are dispersed across Whitehorse but is most concentrated in Box Hill and Blackburn. Unsurprisingly, residents near railway stations are more likely to use the train than other Whitehorse residents.

Walked and cycled trips are most concentrated in Box Hill – Box Hill North.

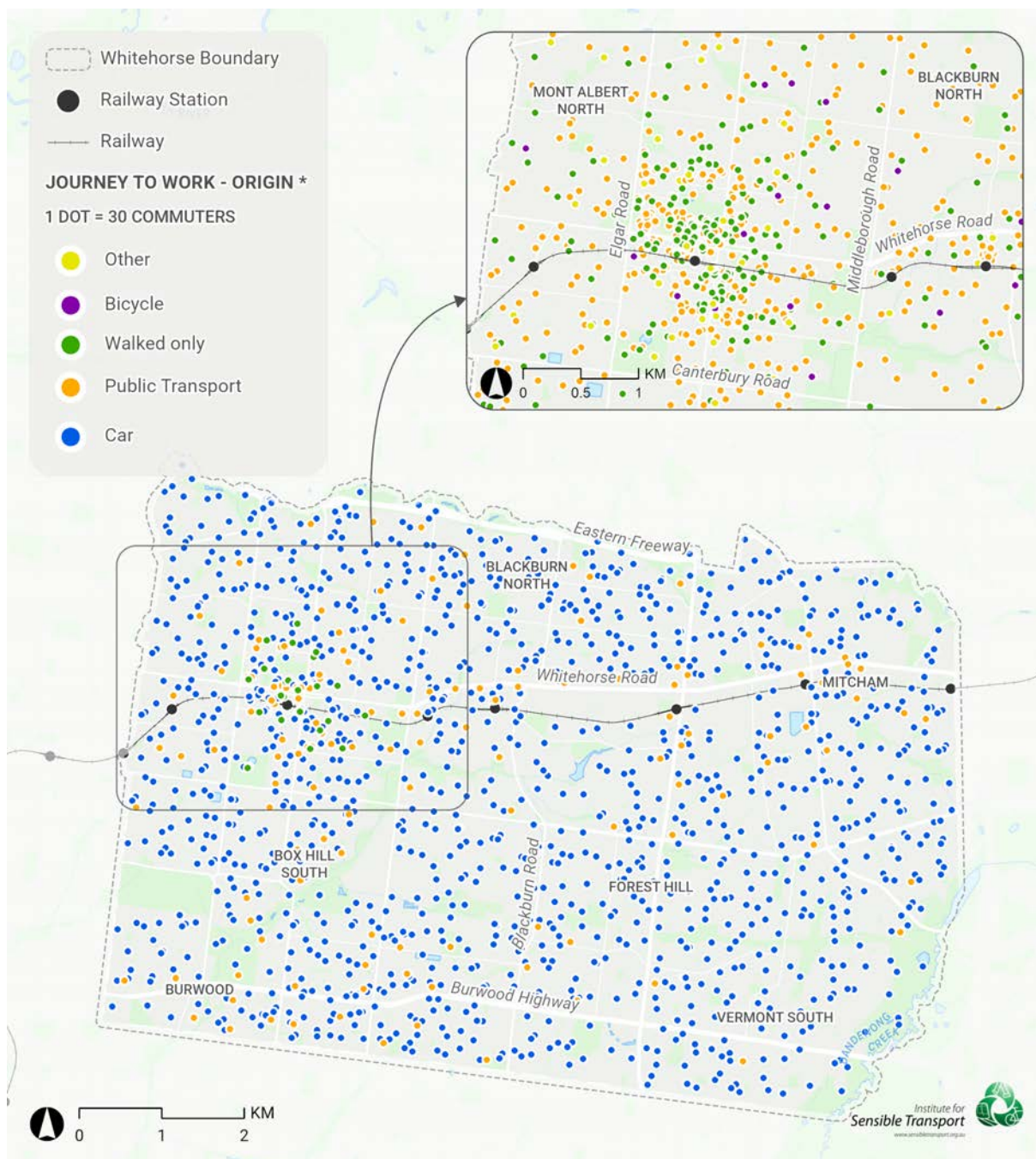


Figure 64 Journey to work from Whitehorse

Source: ABS Census 2021

*Note the enlarged area excludes journeys to work by car to better illustrate the density of non-car trips. One dot in the enlarged area represents *five* commuters.

Table 5 tabulates the data visualised in Figure 64 by *Statistical Area Level 2 (SA2)*. SA2s are geographic regions defined by the ABS that are most representative of communities that interact together socially and economically. SA2 regions generally have populations between 3,000 and 25,000.

Residents in Vermont and Vermont South have the highest proportion of journeys to work by car, at 91% and 90%, respectively. In contrast, Box Hill residents report the lowest proportion of journeys to work by car, at 70%, and the highest proportion of public transport (19%) and active transport trips (10.5%). These findings are largely associated with the level of access and proximity to the public transport network, walking and cycling infrastructure, and land use density.

Table 5 Transport mode to work from Whitehorse

SA2 (Usual Residence)	Car	Train	Bus	Tram	Bicycle	Walked only	Other	Total
Box Hill	4,533	881	281	34	31	619	85	6,464
Blackburn	4,367	513	124	0	28	143	46	5,221
Box Hill North	4,094	323	181	7	40	177	48	4,870
Mitcham	3,825	448	67	0	3	105	24	4,472
Burwood	2,696	192	154	125	0	120	45	3,332
Nunawading	2,657	326	52	0	14	69	39	3,157
Vermont South	2,747	158	49	22	4	31	45	3,056
Burwood East	2,520	169	87	73	6	37	34	2,926
Vermont	2,448	156	42	0	3	25	26	2,700
Blackburn South	2,390	162	49	0	4	76	15	2,696
Forest Hill	2,366	168	35	0	3	69	31	2,672
Surrey Hills East – Mont Albert	2,000	232	8	36	4	95	22	2,397

Source: ABS Census 2021

The mode of transport used by commuters to work destinations within the City of Whitehorse is shown in Figure 65. This shows that for many destinations across Whitehorse, the car is the dominant mode of travel. Despite the majority of jobs being concentrated around metropolitan railway stations, the majority of journeys to work in Whitehorse are completed by car.

Figure 66 shows the mode of transport used by commuters to work destinations excluding cars. Unsurprisingly, levels of public transport commuting are higher in the northern and western area of Whitehorse. This is where high quality public transport services are located. Most active transport trips to work in Whitehorse end in Box Hill.

Most active transport trips to work in Whitehorse end in Box Hill.

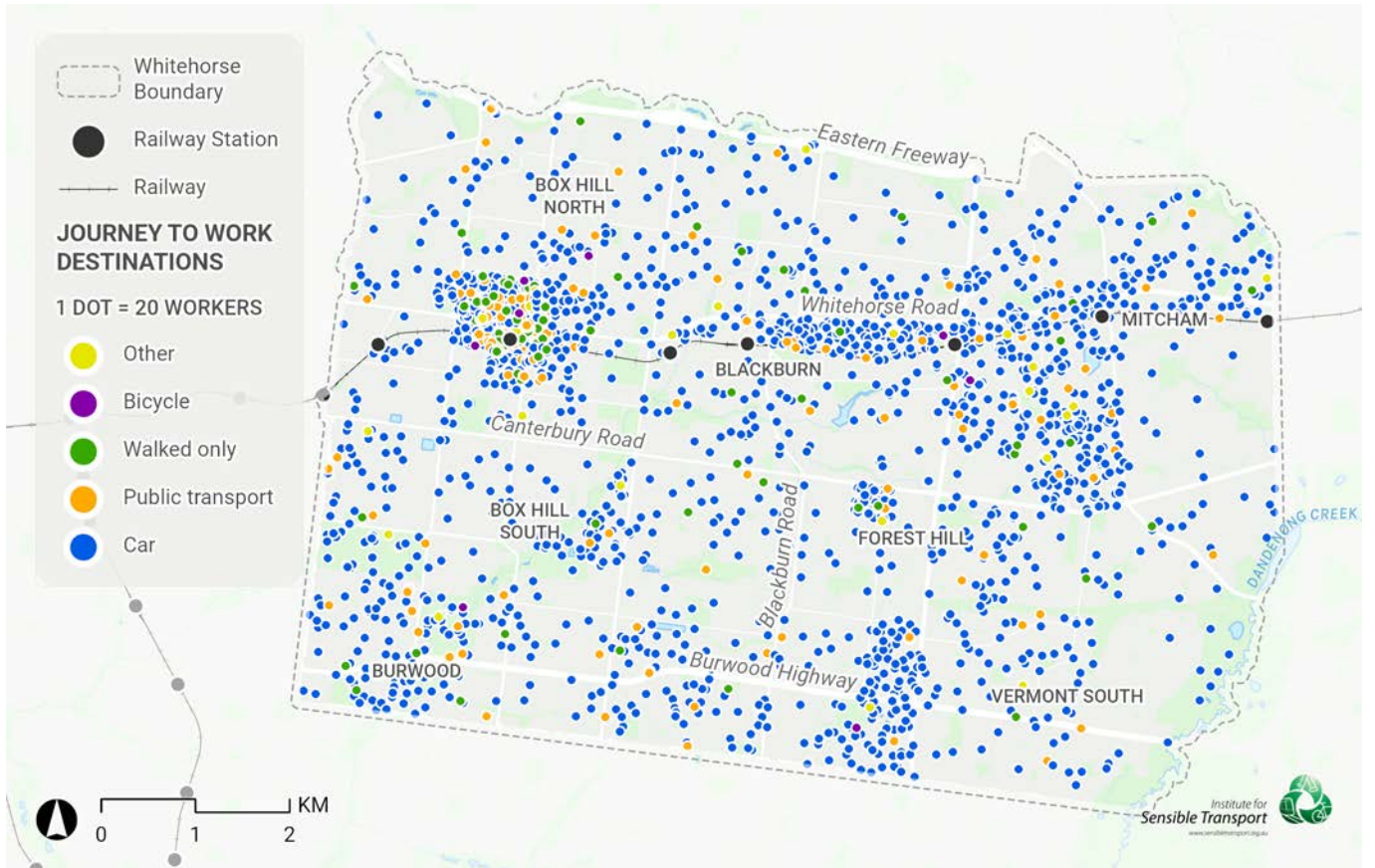


Figure 65 Place of work, City of Whitehorse

Source: ABS Census 2021

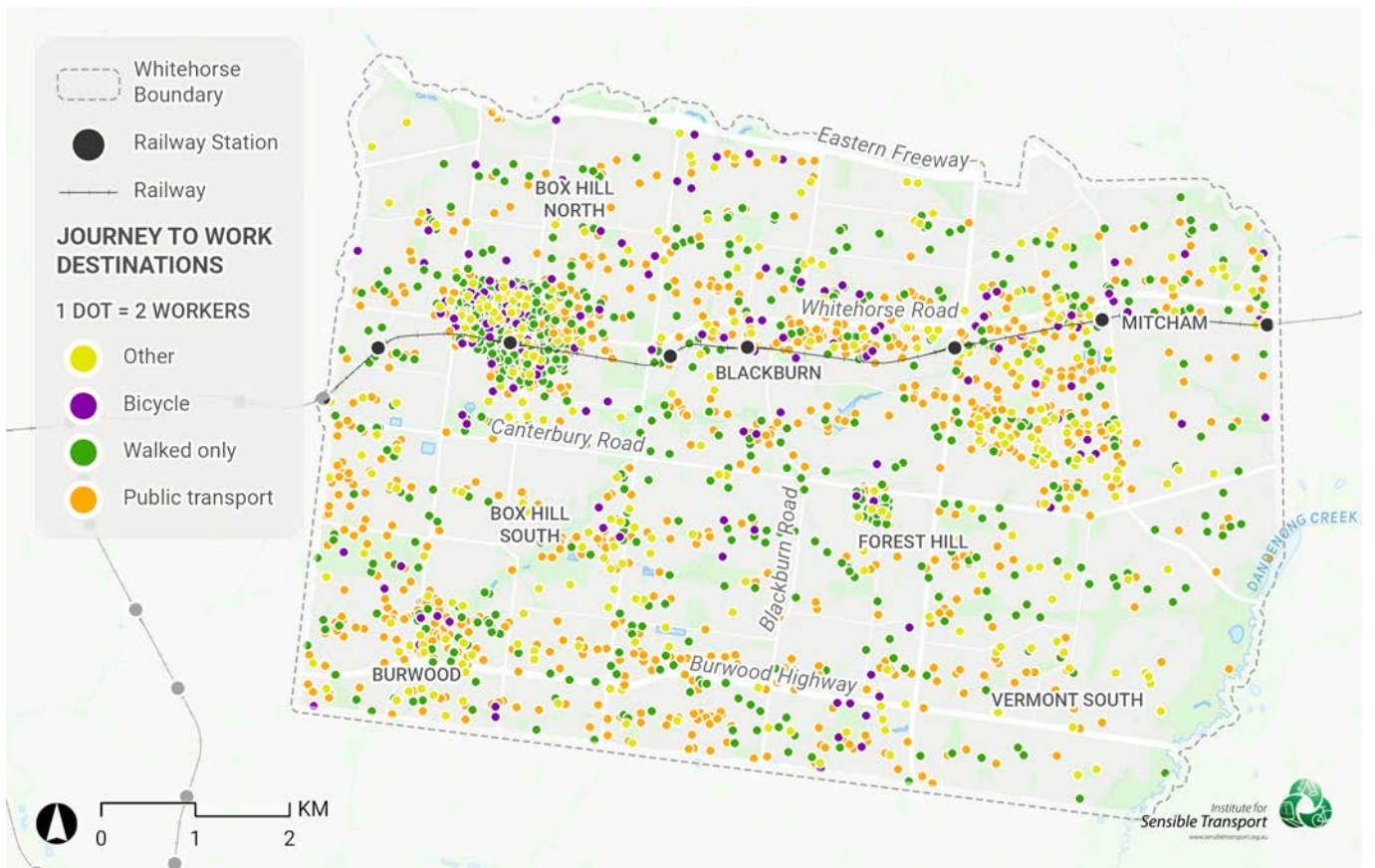


Figure 66 Mode of transport by place of work excluding cars, Whitehorse

Source: ABS Census 202

Table 6 compiles the data visualised in Figure 65 by SA2 areas. The majority of jobs in Whitehorse are located in the areas of Box Hill, Nunawading, Blackburn, and Mitcham. Despite the proximity of jobs to the train corridor, with the exception of Box Hill, only 5% of workers completed their commute on public transport. Approximately 9% of workers

commuting to their work destination in Box Hill took public transport.

For active transport, the highest proportion of cycled trips ended in Box Hill North (2%), while the highest proportion of walked trips ended in Box Hill (6%).

Table 6 Transport mode to place of work in Whitehorse

SA2 (POW)	Car	Train	Bus	Tram	Bicycle	Walked only	Other	Total
Box Hill	10,414	768	356	56	99	780	159	12,632
Nunawading	4,407	166	63	4	29	79	80	4,828
Blackburn	4,190	161	74	0	44	156	65	4,690
Mitcham	4,013	131	59	8	27	99	55	4,392
Burwood	2,960	86	79	72	22	103	64	3,386
Forest Hill	2,859	39	89	5	10	90	25	3,117
Burwood East	2,650	56	42	50	11	65	31	2,905
Vermont	1,692	30	16	4	5	44	34	1,825
Vermont South	1,527	18	40	12	0	30	31	1,658
Box Hill North	1,463	38	34	0	25	49	16	1,625
Surrey Hills East – Mont Albert	1,328	94	18	3	5	54	21	1,523
Blackburn South	914	25	13	0	6	46	22	1,026

Source: ABS Census 2021

7.1.2 Trip distance to work

An understanding of trip distance is critical for making strategic changes to the transport system. Census data helps to develop a picture of how far people travel to work.

Figure 67 shows most Whitehorse residents travelled over 5 km (77%) to get to work. Overall, almost one in four trips to work by Whitehorse residents are under 5 km. Figure 68 shows the cumulative trip distance for journeys to work. This shows 25% of trips are less than 6 – 7 km, and the median trip distance to work is between 13 – 14 km.

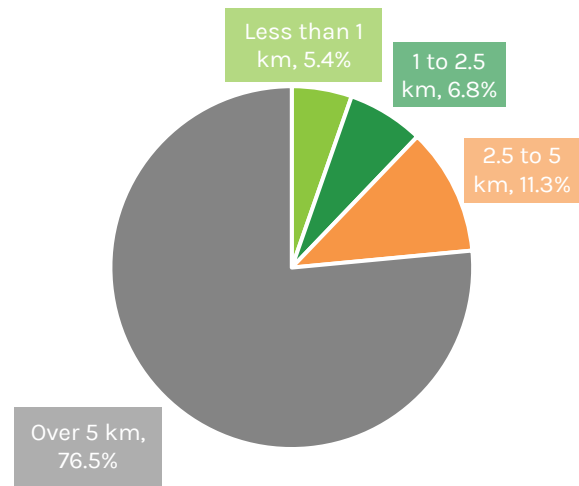


Figure 67 Trip distance for those who travelled to work, Whitehorse

Source: ABS Census 2021

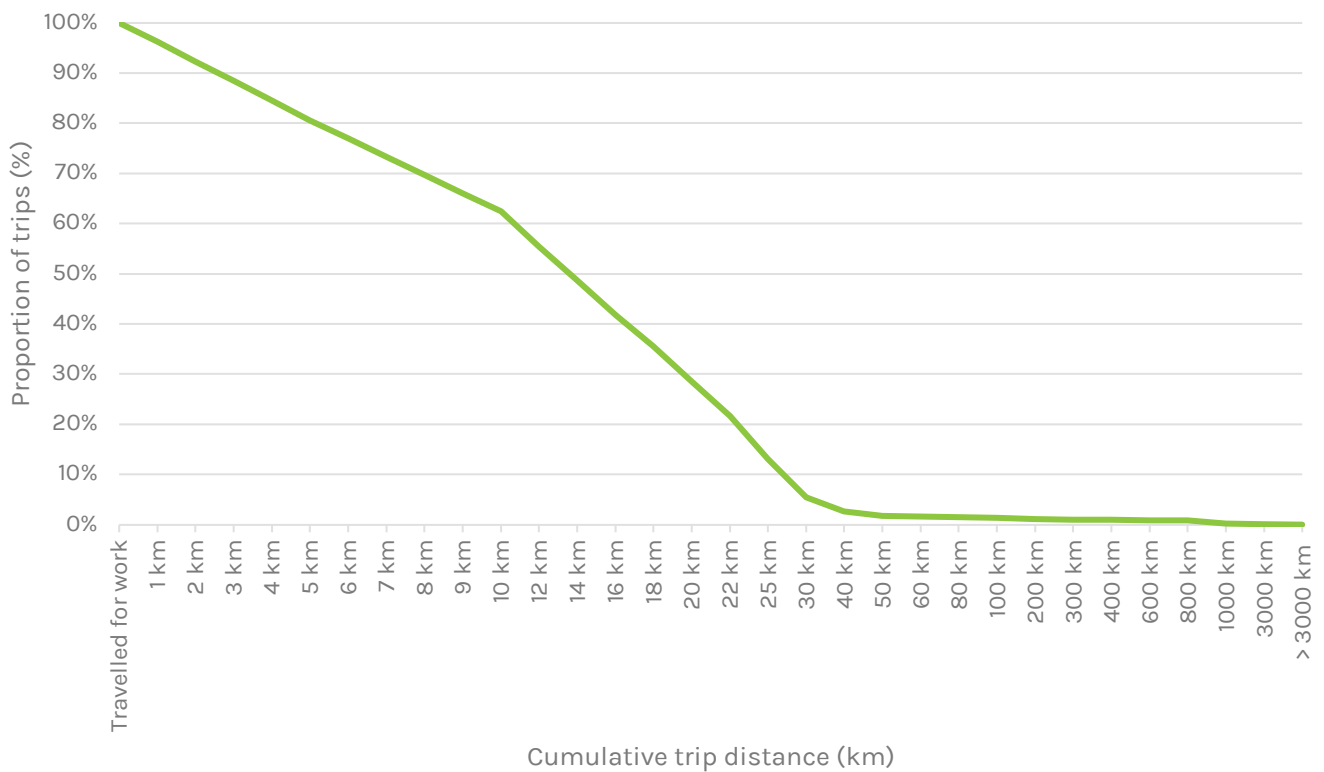


Figure 68 Cumulative trip distance of journeys to work

Source: ABS Census 2021

The median trip distance to work for Whitehorse residents is between 13 – 14 km, but one in four are less than 5 km.

7.1.2.1 Trip distance by mode

The data shown in Figure 67 and Figure 68 highlight the potential for achieving a shift towards more sustainable modes of transport. Most walking trips are around 1 km, while people who cycle usually travel around 5 - 6 km. Some 23% of trips to work in Whitehorse are short enough that people could walk or cycle, provided the conditions were safe, attractive, and convenient.

The mode share for all trips to work under 5 km in Whitehorse is shown in Figure 69. Even for those shorter trips, the car is dominant, with over 75% of people using a car either as a driver or passenger. Walking is the next highest mode share (15%).

Mode share data for each suburb has been included in Appendix A.1.

Even for trips under 5 km, some 75% of people used a car.

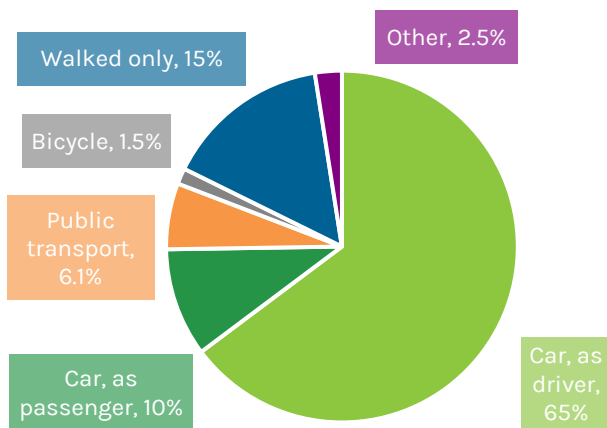


Figure 69 Mode share of trips under 5km to work

Source: ABS Census 2021

There were 14,593 Whitehorse residents who travelled less than 5 km to their work destination in 2021. For all SA2 areas, approximately 1 in 10 of *all* journeys to work were short trips completed by car. Box Hill, Blackburn, and Box Hill North have the highest potential for replacing short car trips with more sustainable modes. Over 20% of journeys to work are under 5 km in these suburbs.

Box Hill, Blackburn, and Box Hill North have the highest potential for replacing some short car trips with more sustainable modes.

This analysis demonstrates targeted action to improve access to sustainable transport choices and safety in Box Hill, Burwood, and Surrey Hills (East) - Mont Albert, is likely to see the most benefit in the short term. Other projects, such as Suburban Rail Loop are also likely to facilitate some change in mode share.

Table 7 Journeys to work less than 5km, by SA2 Area*

SA2 (UR)	Total residents*	Short trips	Short trips by car
Box Hill	11,101	22%	8%
Blackburn	10,102	21%	11%
Box Hill North	9,005	20%	11%
Blackburn South	5,154	18%	10%
Burwood (Vic.)	5,870	18%	9%
Forest Hill	4,942	17%	10%
Surrey Hills (East) - Mont Albert	5,151	17%	8%
Vermont	5,192	16%	10%
Mitcham (Vic.)	8,818	16%	9%
Nunawading	6,185	16%	9%
Burwood East	4,884	14%	8%
Vermont South	5,275	13%	8%

Source: ABS Census 2021

*Total residents only include those who travelled to work.

7.1.2.2 Trip distance by gender

It is important to consider gender variations around transport modes for journeys to work. Figure 70 shows the mode share of trips under 5 km to work for males and females, respectively. Overall, men are more likely to use the car as a driver for short trips to work (69%), while women are more likely to use the car as a passenger to get to work. More women take public transport (7%) or walk (17%) for short trips than men.

As highlighted earlier, participation rates for cycling to work for females are significantly lower than those of their male counterparts. This may be attributed to females being more sensitive to the rider environment and a lack of safe routes. It may also be the case that women undertake a large proportion of trips to get children to/from school etc., which reduces their willingness to cycle, something not entirely disconnected from the quality of the riding environment.

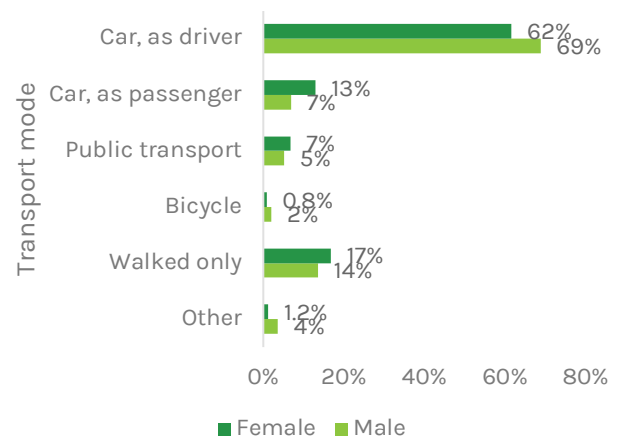


Figure 70 Mode share of trips under 5km to work by sex

Source: ABS Census 2021

Men are more than twice as likely to ride a bike to work than women, at 2% and 0.8%, respectively.

7.1.3 Origin-destination analysis

The relationship between origin and destination for commuters travelling to and from Whitehorse is visualised in Figure 71. The volume of people travelling to Whitehorse for work, and residents travelling elsewhere for work is represented by *line thickness*. The thicker the line, the more commuters. The ring in Whitehorse indicates the volume of work trips that both start *and* end in the LGA.

A significant proportion of Whitehorse residents (46%) travelled within Melbourne's inner-east to go to work. Further, over a quarter (27%) of residents travelled within the municipality to go to work. The City of Melbourne is the most reported destination for work outside Whitehorse (19%), followed by the City of Boroondara (8%), Monash (7%), and Knox (4%).

Over 1 in 4 residents work locally within the City of Whitehorse.

Around 19% work in the nearby municipalities of Boroondara, Knox, and Monash.

For people who work in Whitehorse, approximately 30% of jobs are occupied by Whitehorse residents. The remaining 70% of local jobs are occupied by residents from other LGAs. Residents from the City of Knox account for the greatest proportion of local jobs after Whitehorse, at 8%. This is followed by residents from Maroondah (8%), Manningham (7%), Boroondara (6%), and Monash (6%).

Almost a third of local jobs in the City of Whitehorse are occupied by Whitehorse residents.

These statistics show a significant proportion of commuter trips that originate or end in the City of Whitehorse are local trips. Understanding where short trips take place in Whitehorse will help Council determine areas with the highest potential for replacing short car trips. This may help Council prioritise actions that may be implemented at part of the WITS.

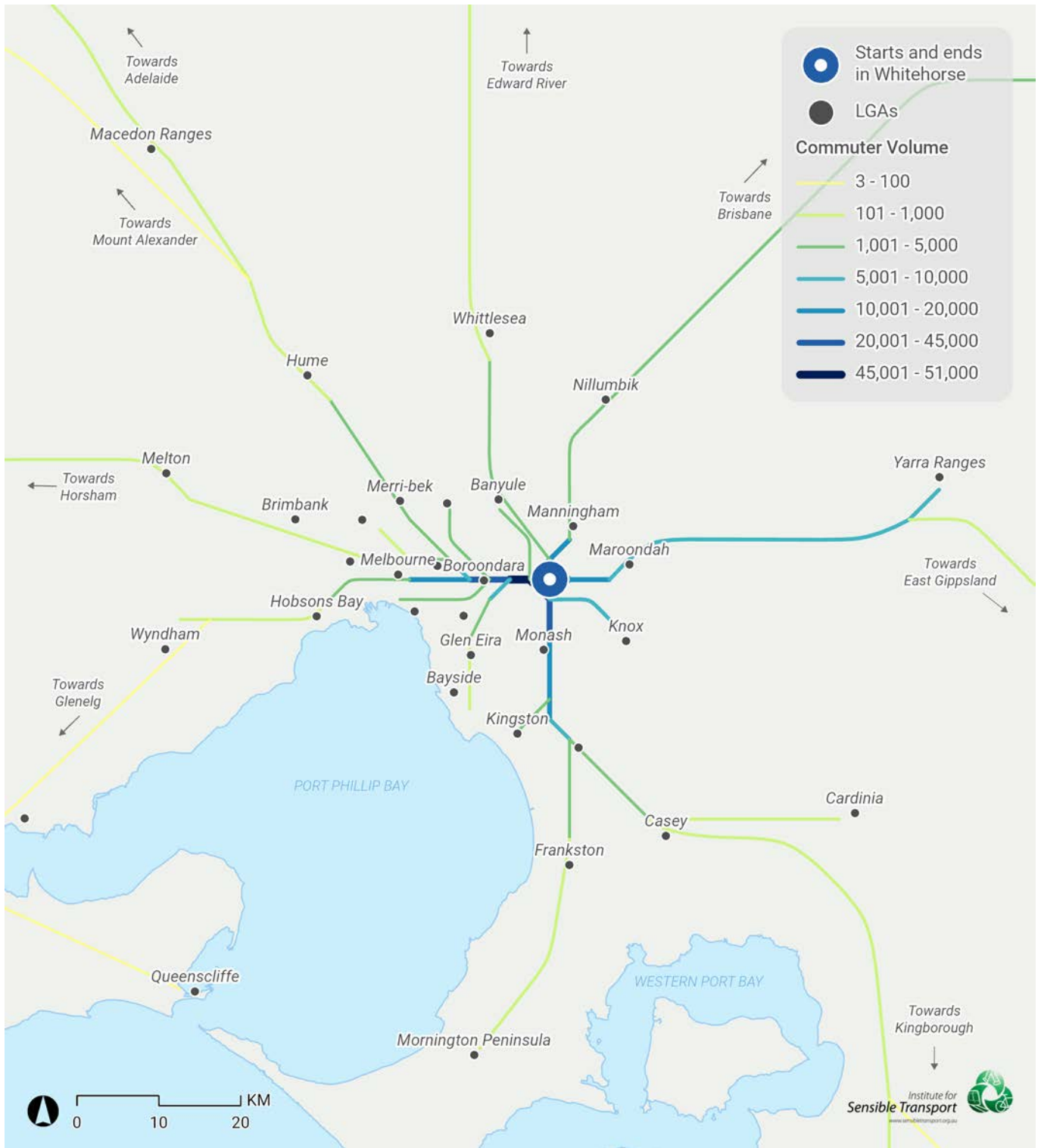


Figure 71 Commuter volumes to and from Whitehorse

Source: ABS Census 2021

Figure 72 provides a more zoomed in view of the work trip patterns within Whitehorse and surrounding areas. Using ABS SA2s in and surrounding the Whitehorse LGA as network nodes, commuter volumes to or from the Whitehorse SA2s are visualised through desire line paths. As with Figure 71, volume of commuters between each node is represented by line thickness, and rings around SA2s within Whitehorse represent work trips that start and end in the same SA2 (suburb).

up to 788 commuters, and the north - south corridor from Doncaster to Burwood sees 314 commuters. SA2s in Camberwell, Surrey Hills (West) - Canterbury, Balwyn, Doncaster East - South, Wantirna, and Glen Waverley - West are key connectors outside the Whitehorse LGA. As a more zoomed-in view, some of these commutes will be short trips that may be able to be serviced by improved active transport links. This information can help aid decision making regarding improvements to transport networks.

Figure 72 illustrates the most significant commuter corridors. The east - west desire line between Ringwood to Blackburn and Box Hill sees

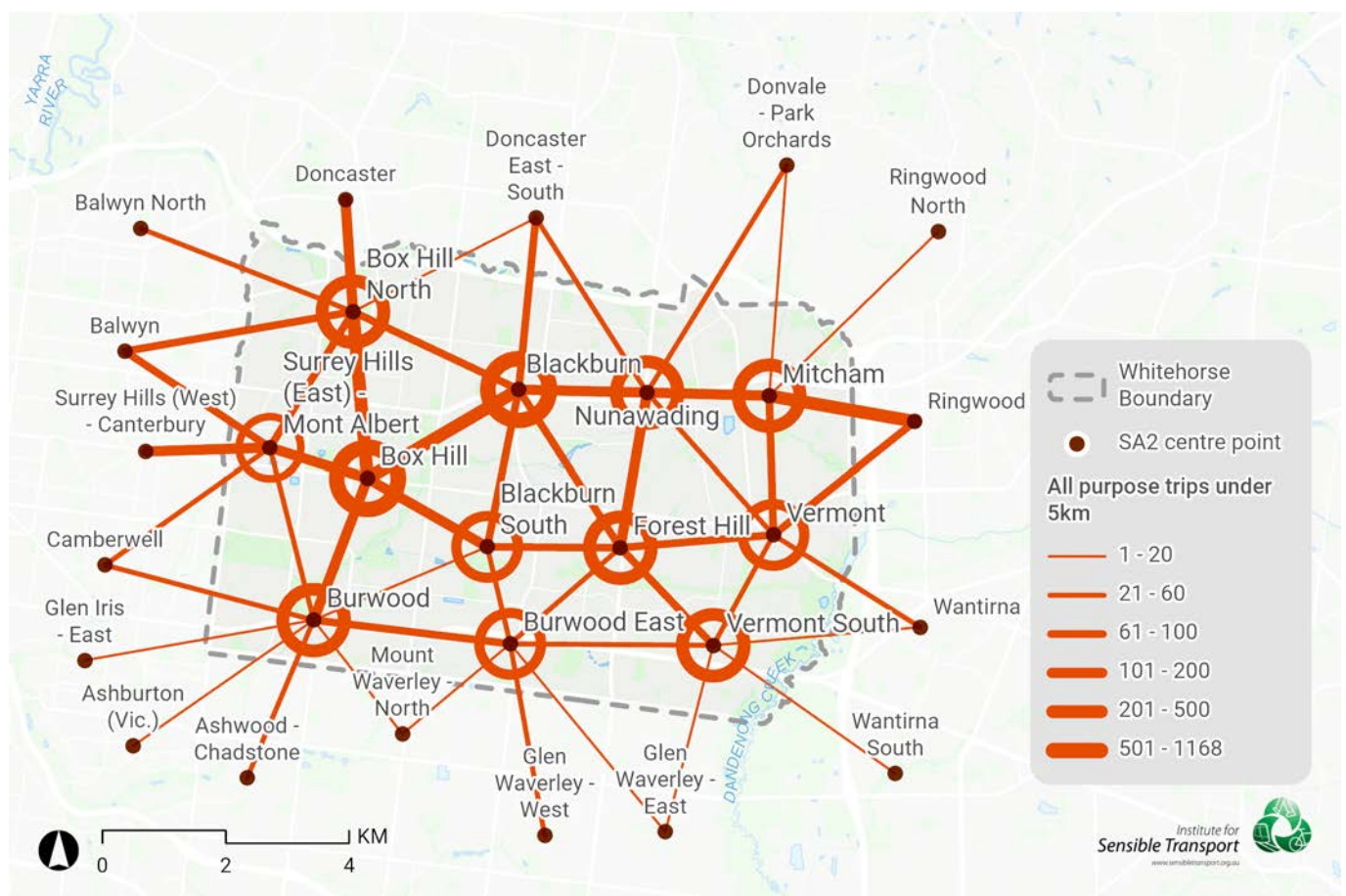


Figure 72 Origin - Destination for all purpose trips under 5km

Source: ABS Census 2021

7.2 Victorian Integrated Survey of Travel and Activity (VISTA) data

The Victorian Integrated Survey of Travel and Activity (VISTA) is a travel diary survey that records information about people's travel, including mode, distance, and purpose. Demographic data about the person is also collected, allowing an analysis to differentiate based on sex.⁹ This is an important data set because the ABS Journey to Work only covers around 20% of trips. The VISTA data set builds a more comprehensive picture of mobility patterns in Whitehorse.

All trips recorded in VISTA that start or end in Whitehorse have been analysed as part of this transport study. Based on this data it is estimated that 39% of all trips begin *and* end in Whitehorse, while 30.5% of trips originating in Whitehorse end outside of the municipality. Equally, 30.5% of all trips beginning or ending in Whitehorse originate from outside of the council area.

Around 2 in 5 trips begin and end in Whitehorse.

7.2.1 Mode share and travel patterns

The mode share of all trips starting or finishing in Whitehorse is shown in Figure 73. The largest mode share is for private motor vehicles at 81% (57% as a driver and 24% as a passenger). However, 11% of all trips are walked or cycled, with 10.1% walked and 0.9% cycled. This is higher than public transport, with a combined 7.5%.

11% of trips are active, with 10.1% walked and 0.9% cycled.

The average trip distance across all modes is 9.6 km; however, this varies depending on mode, as shown in Figure 74. Walking trips average 1.1 km and bicycle trips average 8.5 km. Tram, bus, and car trips have similar average distances, between 8 – 12 km, while train trips have the longest average distances, at 20.7 km.

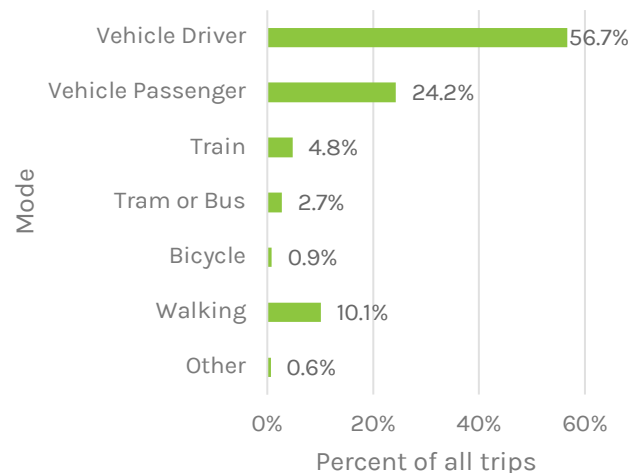


Figure 73 Mode share in Whitehorse, VISTA

Source: DTP

⁹ Note that only binary data about sex is shown in VISTA data.

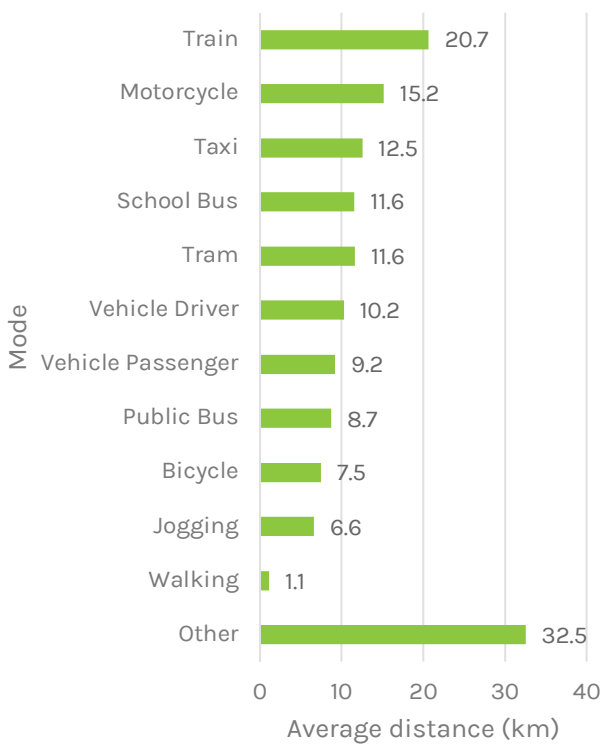


Figure 74 Average trip distance by mode, Whitehorse, VISTA

Source: DTP

The preferred mode of travel based on trip distance varies significantly, as shown in Figure 75. For trips up to 1km, 61% were walked, and 1.4% were done with a bicycle. This shows that people are more likely to walk shorter distances than use any other mode of travel; however, the willingness to walk decreases as distances grow. Public transport patronage is low for trip distance less than 10 km. This is starkly contrasted for trips over 10 km, where public transport accounted for 17% of trips recorded, with 13% completed by train and 4% by bus or tram. Car mode share is particularly high for trips between 5 to 10 km, at 94%.

61% of trips under 1 km were walked.

Around 94% of people used the car to travel 5 to 10 km to their destination.

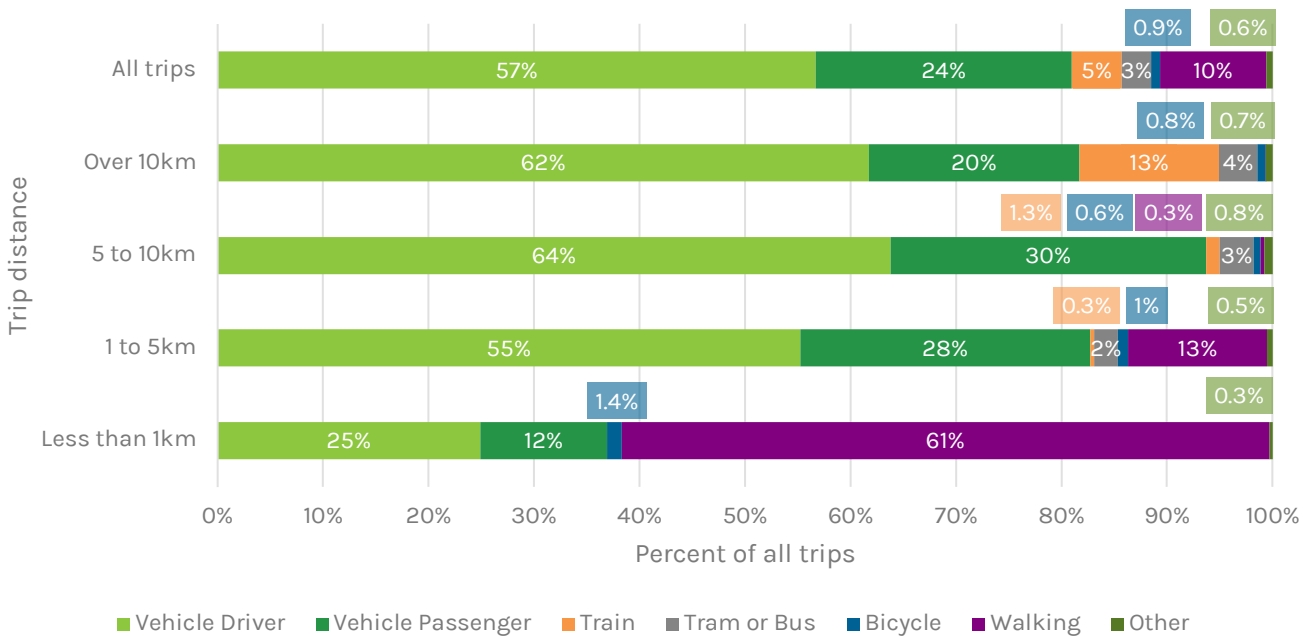


Figure 75 Mode share by distances travelled, Whitehorse, VISTA

Source: DTP

Another way of looking at mode share over distance is to examine cumulative trips by distance band, by mode. This is shown in Figure 76. The results show that walking trips are generally shorter, with approximately 53% of all walked trips being less than 1 km, and 88% less than 2 km. Approximately half of all cycled trips are less than 4 km, and 71% less than 10 km. Interestingly, vehicle trips and tram or bus trips follow a more similar distribution.

Of all trips recorded by VISTA that begin and/or end in Whitehorse, 9% are less than 1 km, 44% are less than 5 km, and 67% are less than 10 km. Only 33% of all trips that start or finish in Whitehorse are over 10 km.

The trip distances in Whitehorse have implications for the potential to shift modes. The data shows that many journeys that currently use motor vehicles are of a distance that could be shifted to walking or cycling. Walking trips already make up a large share of shorter trips; however, this quickly drops as distance increases. This is also observed for cycling trips, albeit less prominently. For all trips less than 5 km, over 73% are currently completed by the private vehicle, either as a driver or passenger. This highlights the potential to mode shift from the car to active modes for all trips that begin or end in Whitehorse by a significant 32%.

44% of trips that begin or end in Whitehorse are less than 5 km.

Even for trips that begin or end in Whitehorse that are less than 5 km, 73% are completed by car.

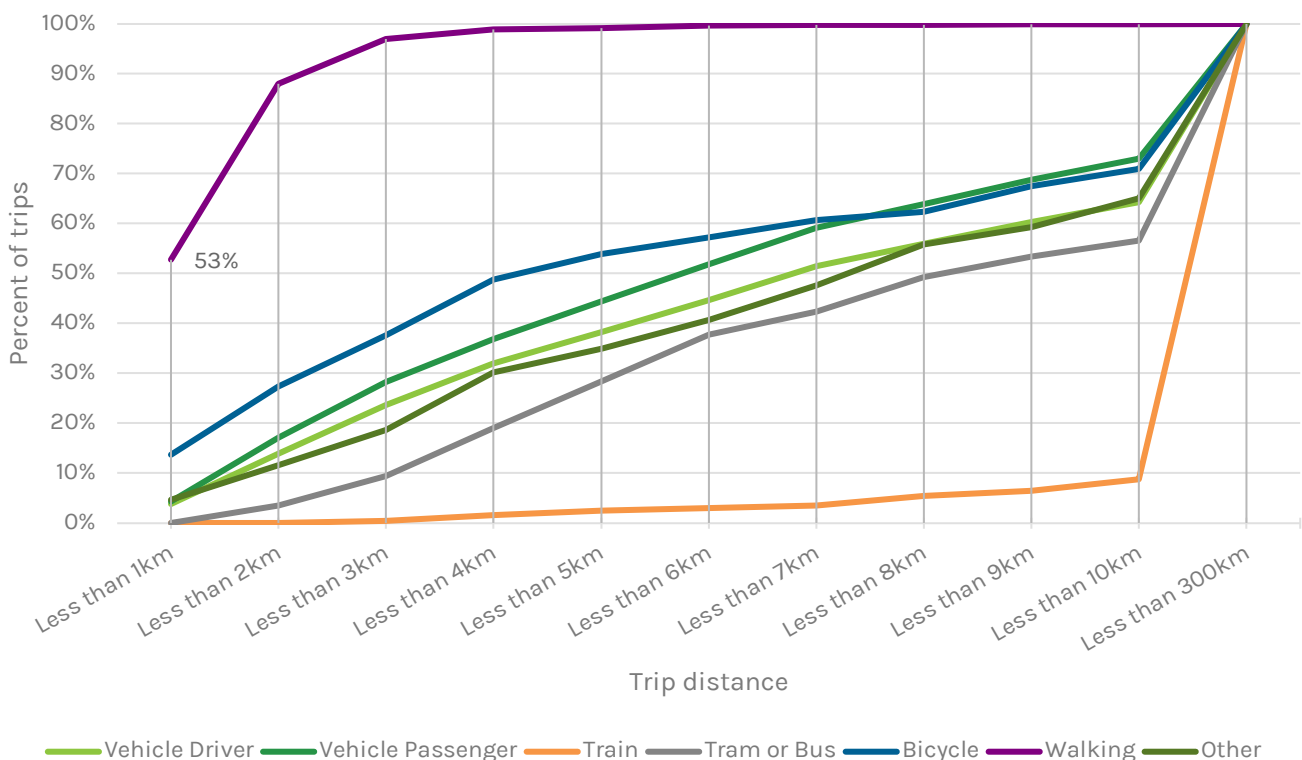


Figure 76 Cumulative percent of trips per mode, by distance, Whitehorse, VISTA

Source: DTP

7.2.2 Trip purpose

VISTA data includes trip purpose. Understanding *why* people travel provides valuable insight for predicting trip generation from destinations and land uses. Some trip types (e.g., social and recreational) are more likely to be done by walking or bicycle. By comparison, shopping trips, picking up or dropping off someone or something, are less likely as they involve moving other people and/or objects.

The distribution of all trips that *begin* in Whitehorse is shown in Figure 77. Shopping trips and journeys to work make up the majority of all trips, at 20% and 18%, respectively. Socialisation, picking up or dropping off someone, and recreation are the next highest. Almost one quarter of all trips (24%) beginning in Whitehorse have a social or recreational purpose.

Almost one quarter of trips beginning in Whitehorse have a social or recreational purpose.

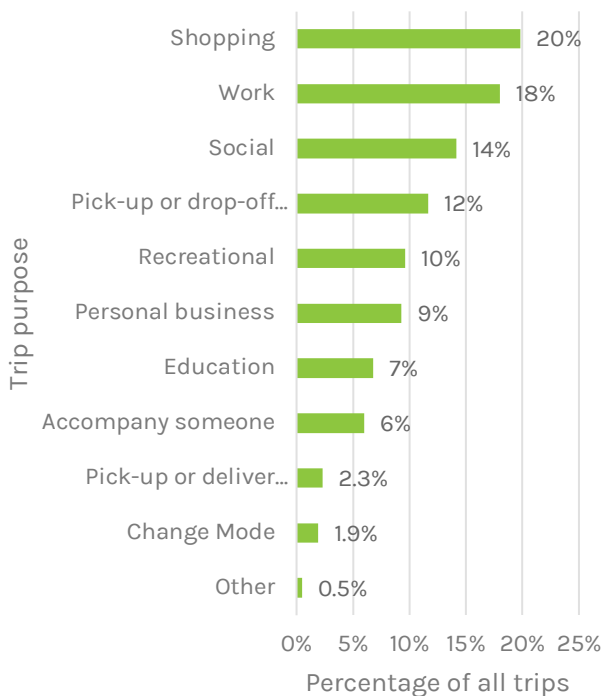


Figure 77 Trip purpose, trips beginning in Whitehorse

Source: DTP

Some 9% of trips are people travelling for personal business, 7% for education, and 6% to accompany someone. Travelling to pick up or deliver something is among the least reported reasons for travel, at 2.3%. Around 2% of all trips were transiting through.

Similar trip purposes were reported for all trips *ending* in Whitehorse, as shown in Figure 78.

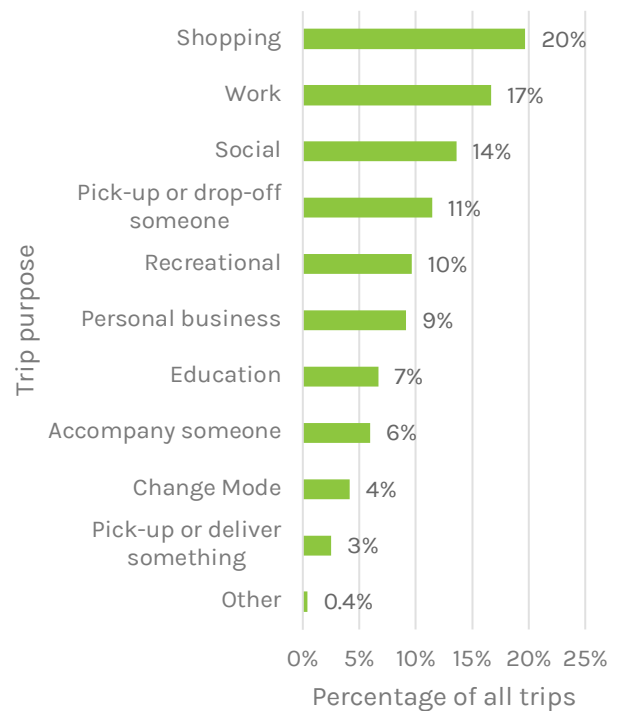


Figure 78 Trip purpose, Whitehorse as a destination

Source: DTP

7.2.2.1 Trip purpose by mode

For almost all trip purposes, the car is by far the dominant mode of travel, as shown in Figure 79. The exception is for those transferring from one mode to another, where 56% of mode change trips were by train and 30% by tram or bus. Notably, there is a vast difference in train patronage by trip purpose. Around 5 – 8% of trips to work and education were completed by train, while only 0.5 – 2% were reported for other trip purposes. Walking is the next most recorded mode for all trip purposes, where trips completed for recreation were highest (34%), followed by personal business (25%), and education (15%). Similarly, trips for recreation recorded the most trips cycled (4%), followed by education (2%).

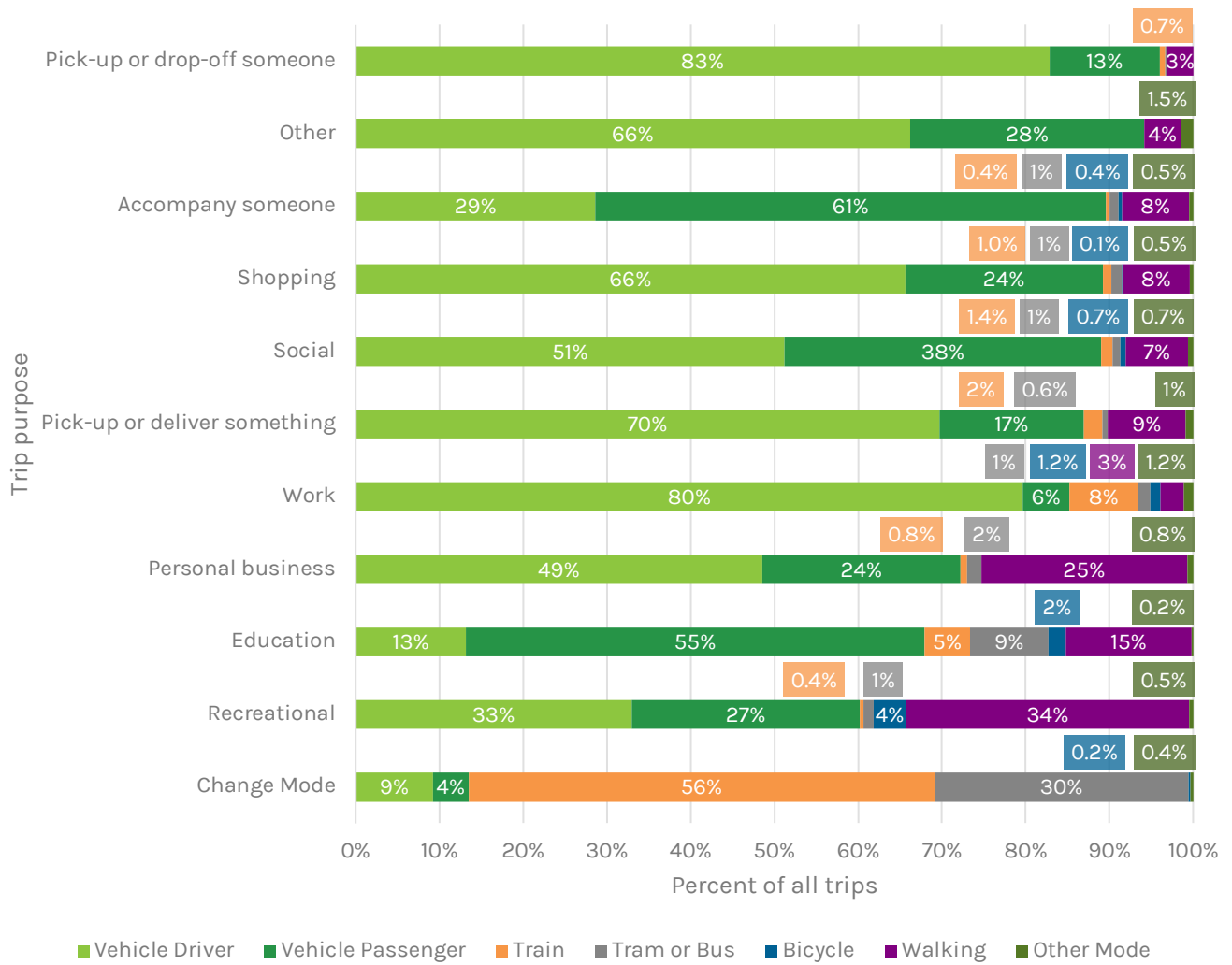


Figure 79 Trip purpose by mode, Whitehorse, VISTA

Source: DTP

7.2.3 Bicycle and vehicle ownership

VISTA data includes information on residents' bicycle and vehicle ownership. Bicycle and vehicle ownership significantly influence the ease of access to mode choices. Figure 80 and Figure 81 compare bicycle and vehicle ownership levels for Whitehorse residents and residents in the City of Boroondara and the City of Darebin. These municipalities were selected for comparison as they have similar levels of access to the public transport network and are in the inner to middle ring region of metropolitan Melbourne.

Around 37 per 100 residents in Whitehorse own a bike, with 26 owning an adult bike and 11 owning a kids' bike. This is comparably lower than residents in Boroondara and Darebin.

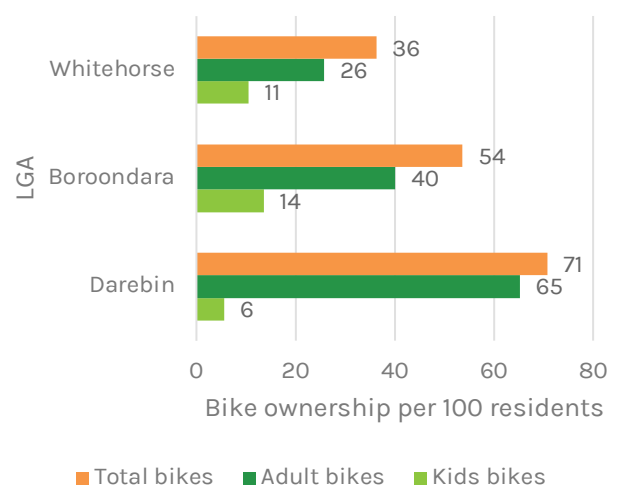


Figure 80 Bicycle ownership, Whitehorse and comparison LGAs

Source: DTP 2020

Almost 70% of residents in Whitehorse own a motor vehicle. This is especially significant as 18% of the surveyed population is under the legal driving age of 18 years old. Most vehicles owned by residents are passenger vehicles, at 72.5%. 4WD's are the next most reported vehicle types owned by Whitehorse residents, with over 1 in 5 vehicles owned (21.7%) classified as 4WDs.

This pattern is similarly observed in the City of Boroondara. Whitehorse residents own more vehicles than residents of Darebin. Notably, Darebin residents own less vehicles and more bicycles, while the inverse is observed for Whitehorse. This suggests a positive relationship between bike ownership and lower vehicle ownership. An important difference to note between these two councils is variation in topography. Areas in Whitehorse, including Blackburn, Nunawading and Vermont, are characterised by greater changes in elevation, while Darebin is comparatively flat.

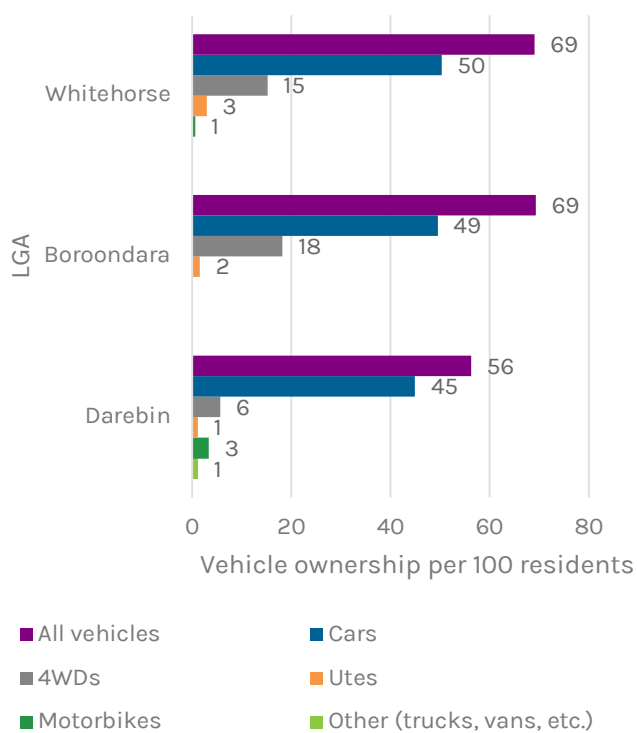


Figure 81 Motor vehicle ownership, Whitehorse and comparison LGAs

Source: DTP

For every 100 residents in Whitehorse, 36 own a bike. Almost twice as many residents own a motor vehicle.

7.2.4 Mobility differences between sexes

As VISTA data contains basic demographic information, travel differences between sexes and ages can be analysed.

The average trip distance for females is lower than for males, as shown in Figure 82. This means that lower cycling participation and higher car use cannot be attributed to longer trips. Indeed, the opposite is true, with females averaging a trip distance of 9 km, while males have an average trip distance of 10.3 km.

There is a noticeable difference in mode share between females and males, as shown in Figure 83. Both females and males complete approximately 11% of trips by active transport, where the split between bicycle use is noticeable. Females walk for 11% of trips and use a bicycle for 0.3%. Males walk for 9% of trips and use a bike for 1.5%. In Whitehorse, bike mode share for males is 5 times the bike mode share for females.

Males are five times as likely to cycle as females.

Females and males travel in motor vehicles for almost equal proportions of their trips, either as a driver or a passenger. Females travel in motor vehicles as a passenger for a greater proportion of trips than males, whereas males have a greater mode share as a vehicle driver. Similarly, mode share split is relatively even for females and males on public transport.

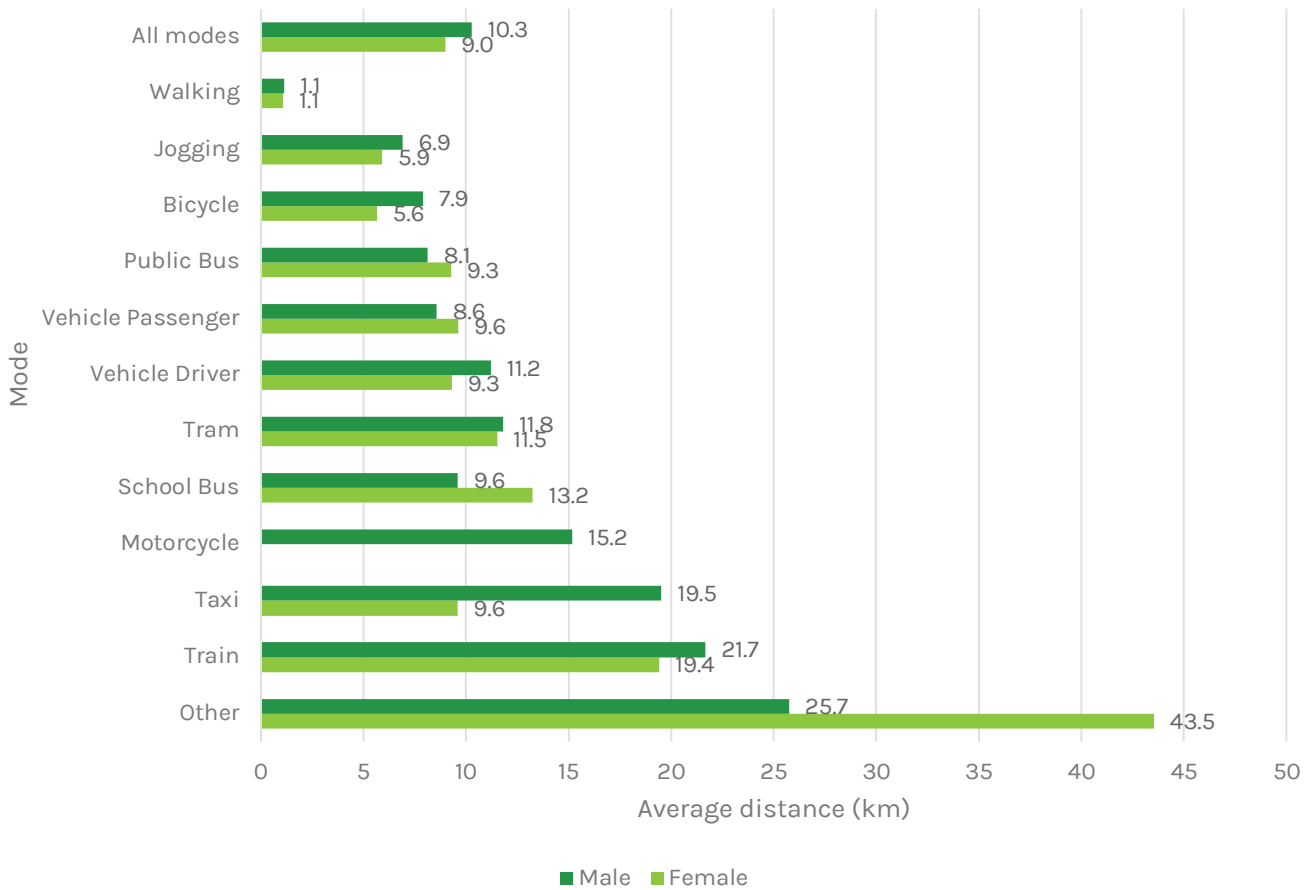


Figure 82 Average trip distance by mode and sex, Whitehorse, VISTA

Source: DTP

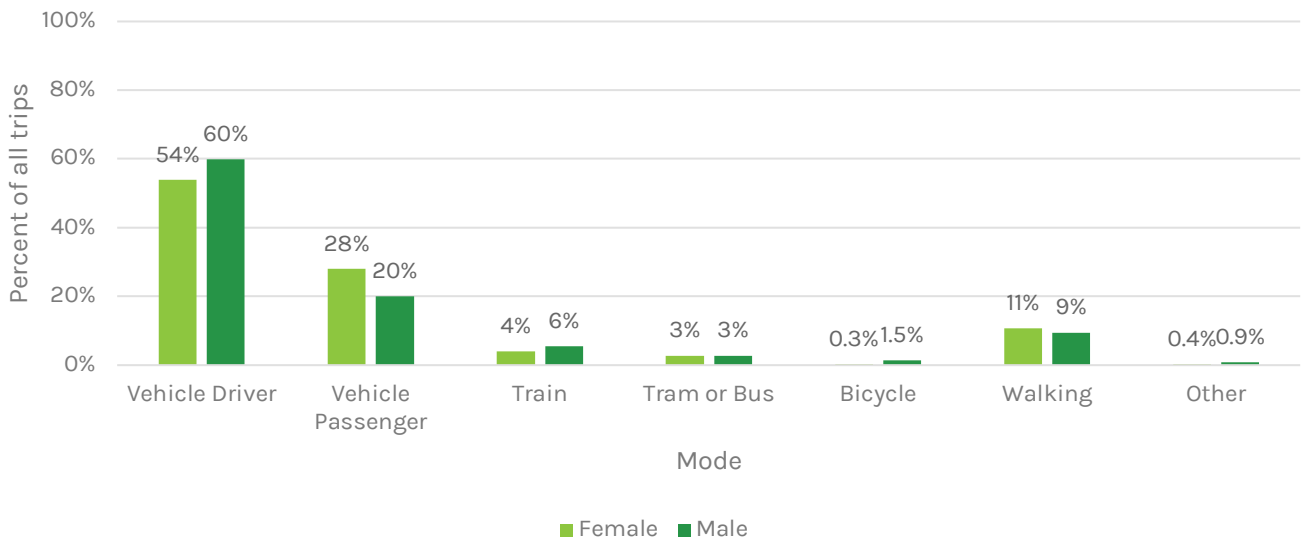


Figure 83 Mode share in Whitehorse by sex, VISTA

Source: DTP

Greater detail in the differences between female and male trip distances is shown in Figure 84. This shows that 55% of female's trips are over 5 km, while 57% of male's trips are over 5 km. In Whitehorse, males are slightly more likely to travel further to their destination.

There are noticeable differences in trip purposes for females and males, as shown in Figure 85. Males complete more work-related trips (25%) than females (17%). Conversely, females complete 1.2 times as many trips to buy something, to pick-up or drop-off someone, and for personal business.

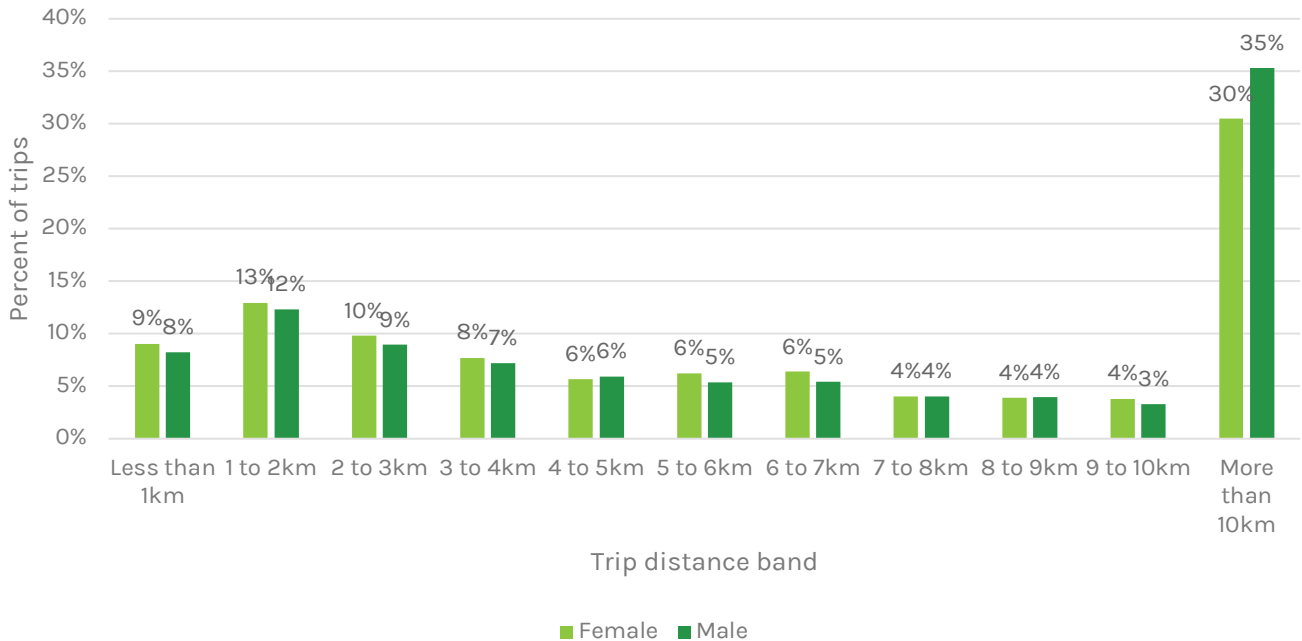


Figure 84 Percent of trips per distance, by sex, VISTA

Source: DTP

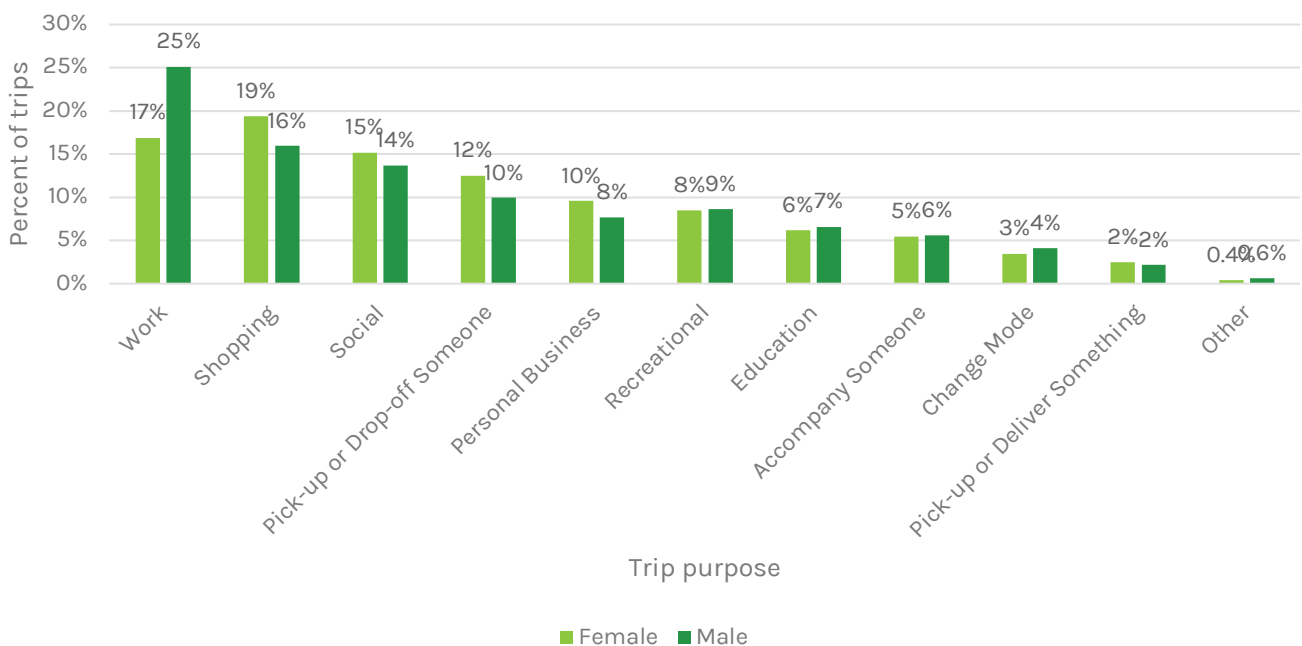


Figure 85 Percent of trips by purpose, by sex, VISTA

Source: DTP

Females complete 1.2 times as many trips to buy something, pick-up or drop-off someone, and for personal business, as males.

Females are also more likely to perform trip chaining, where trips include more than one stop before arriving at the final trip destination, as shown in Figure 86. Overall, 53% of trips that involved trip chaining were completed by females, compared to 47% for males. Around 2 - 3% of people who trip chained made 3 stops.

For all age groups, the car is the dominant mode choice for all trips, as shown in Figure 87. There is a significant difference in the proportion of those who used a car as a driver or as a passenger, for people under the age of 25. Unsurprisingly, the majority of car trips for children and teenagers are as passengers. For young adults between 18- to 25-years-old who used the car, 30% were vehicle passengers. This is similarly observed for older adults over 65 years old, with 21% of trips completed as a vehicle passenger.

Public transport patronage is most reported for 15 - 18-year-olds (22%) and young adults (19%). In Whitehorse, people over 35 years old are less likely to take public transport. The proportion of walked trips is similarly reported across all age groups, while the majority of cycled trips were completed by 15 to 18 year olds.

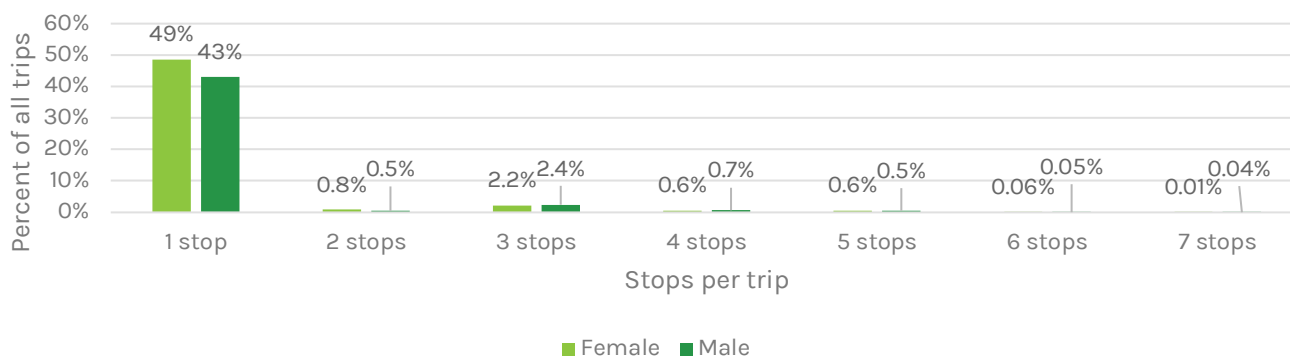


Figure 86 Trip chaining in Whitehorse, by sex, VISTA

Source: DTP

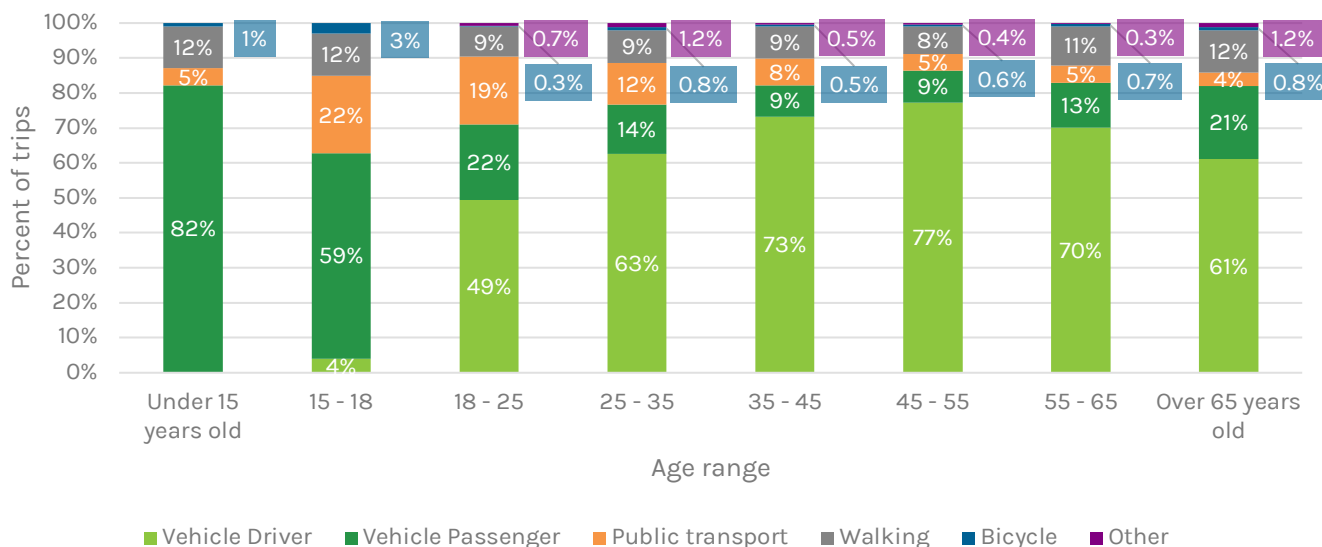


Figure 87 Mode share in Whitehorse by age, VISTA

Source: DTP

Note: Some 4% of 15- to 18-year-olds used the car as a learner driver.

Children and young adults are more likely to take public transport or use active modes in Whitehorse than older adults.

Figure 88 shows the distribution of age for various trip purposes. Unsurprisingly, the majority of trips to education are completed by children and young adults, while the majority of trips completed by adults over 65 years old are for shopping, personal business, and social or recreational purposes. People between the age of 35 to 55 years old are most likely to travel to pick up or drop-off someone/something, at 20 - 23% of all trips.

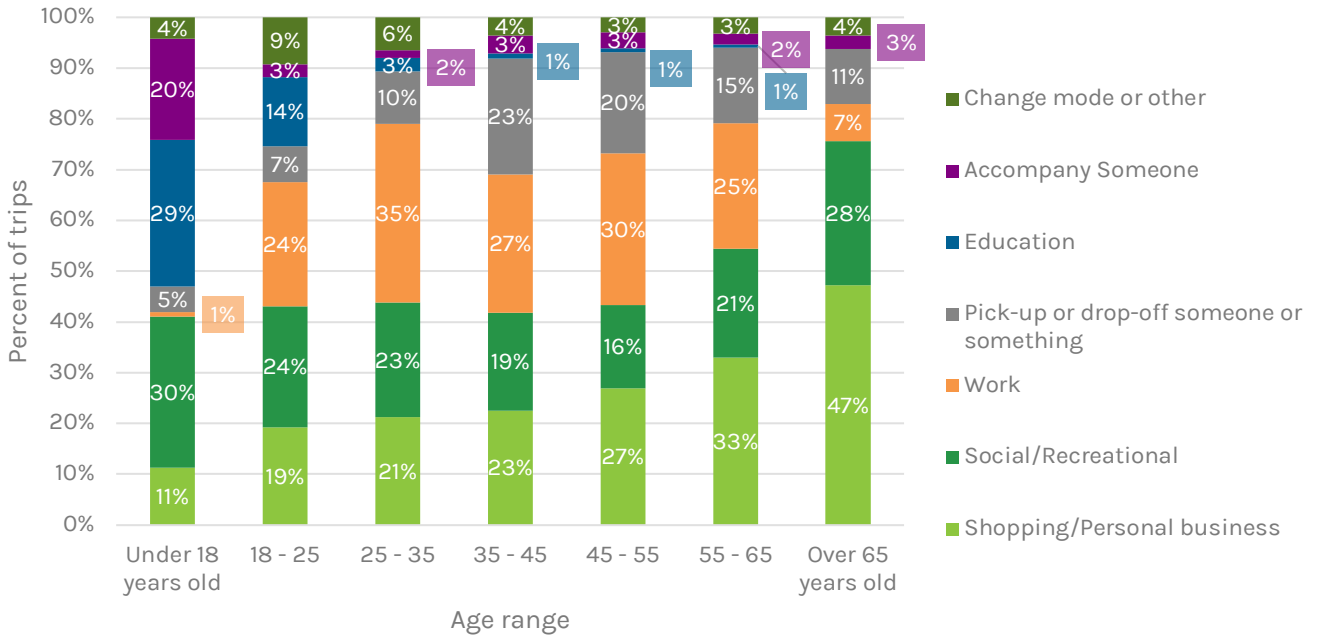
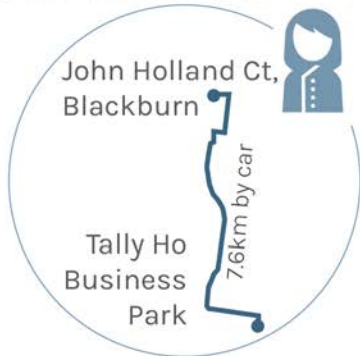


Figure 88 Trip purpose in Whitehorse by age, VISTA

Source: DTP

The VISTA data provides more detailed information about travel patterns in Whitehorse, allowing for a more inclusive and comprehensive understanding of mobility. This data enhances Council’s ability to craft future transport related actions that are sensitive to the specific mobility patterns of a larger proportion of trip types.

Cassie,
an employee working in the
Tally Ho business park, travels
to work from Blackburn



-  Takes 14 mins
Costs \$1.05
-  Takes 28 mins
Cost \$0
-  Takes 53 mins
Costs \$5.50

Daniel,
a student at Deakin
University, travels to Burwood
from Blackburn North



-  Takes 19 mins
Petrol Costs \$1.20
-  Takes 27 mins
Cost \$0
-  Takes 54 mins
Costs \$5.50

Sam,
travels to the Box Hill for
dinner from Nunawading



-  Takes 14 mins
Costs \$1.20
-  Takes 27 mins
Cost \$0
-  Takes 35 mins
Costs \$5.50



Figure 89 Travel time comparison and cost competitiveness for different modes

Source: Institute for Sensible Transport

8. Transport Safety



The Victorian government have adopted the *Safe Systems Approach* to road safety, in which the fallibility of the road user is acknowledged. Creating a transport system that is forgiving, where errors do not result in death is central to the Safe System, or Vision Zero approach.

This section examines the Victorian government crash data between January 2019 and June 2024. Using GIS, we pinpoint crash clusters and hotspots, categorising data by mode and severity. Where possible, data has been disaggregated by gender and age.

8.1 Crash analysis

A total of 3,615 people were involved in 1,487 crashes recorded within Whitehorse between January 2019 and June 2024. For Whitehorse, the number of crashes and persons involved reduced significantly from 2019 to 2020. This is most likely due to the restricted travel movements implemented by the COVID-19 health orders to stay at home.

These figures rose in 2021 as lockdown restrictions in Victoria were periodically lifted, with 654 people involved in 254 crashes. The number of crashes and people involved continued to rise in 2022 and 2023 and travel patterns returned to 'normal', with the total number of crashes and people involved in 2023 nearing pre-pandemic levels. A total of 140 crashes involving 347 people were reported in the first half of 2024.

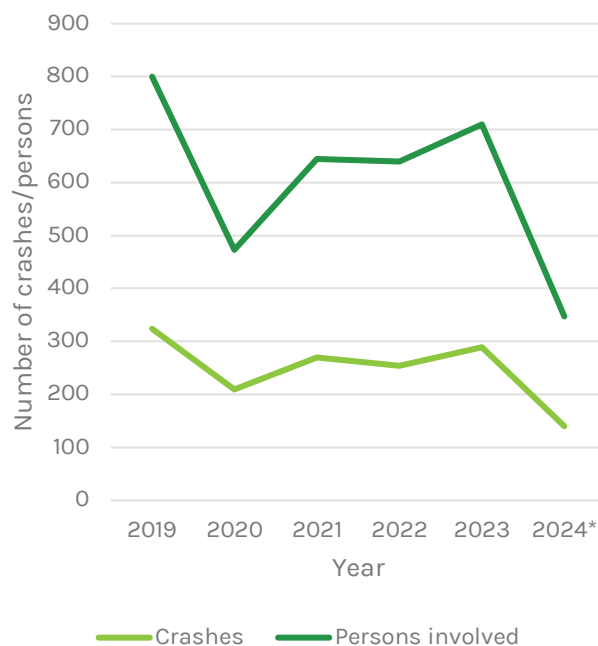


Figure 90 Number of crashes and persons involved per year, Whitehorse

Source: VicRoads

Note: The number of crashes and persons involved for only includes figures recorded between 1st January and 30th June.

The Victorian government's *Road Safety Strategy* seeks to halve road fatalities by 2030 and eliminate death from Victorian roads by 2050. These commitments cannot be met without Whitehorse making substantial improvements to the safety of the transport network. Introducing measures beyond those tried in the past will be required in order, from crash reductions to align with state government targets. This has direct implications for actions that will need to form part of the future Whitehorse Integrated Transport Strategy.

The identification of crash clusters and opportunities to enhance road safety outcomes will contribute to making roads safer for all users.

Crashes in Whitehorse reduced by only 10.8% between 2019 and 2023. Over 700 people were involved in crashes in 2023.

8.1.1 Crashes by location and vulnerable modes

Table 8 shows the number of crashes by their location within the road network. It shows that 55% of crashes across the LGA occurred at intersections, while 45% were mid-block. More than half of the crashes at intersections occurred at 'T'-intersections. Notably, there were no traffic controls at 33% of crash sites recorded at intersections, and 68% of crash sites recorded mid-block.

Almost all crashes (96%) occurred on paved roads. Approximately 18% of crashes occurred in poorer driving conditions due to rain, fog, smoke, and icy or wet road surfaces. There were 16 crashes recorded in dark driving conditions on roads without streetlights or where streetlights were off.

Table 8 Crashes by location

Crash location	Number of crashes	Persons involved
Mid-block	672	1,629
T intersection	431	1,068
Cross intersection	358	864
Multiple intersection	25	52
Y intersection	1	2

Source: VicRoads

There were no traffic controls at 33% of crashes that occurred at an intersection.

Figure 92 illustrates the location of crashes and the mode of persons involved. The majority of crashes occurred on arterial roads and highways (65%). Roads that recorded the highest number of crashes include:

- Burwood Highway (180)
- Canterbury Road (150)
- Springvale Road (138)
- Whitehorse Road (135)

- Station Street (106)
- Middleborough Road (104)
- Elgar Road (80)
- Eastern Freeway (75)
- Mitcham Road (55)
- Blackburn Road (38).

Figure 93 shows the speed zones of the road network in the City of Whitehorse. Locations on the road network that recorded the highest density of crashes are indicated. Further analysis on the major crash clusters identified is detailed in Section 8.1.4. These locations are likely hotspots for future crashes and should be a focus for further road safety work. The majority of crashes occurred in 60-80 km/h speed zones.

Major crash hotspots in Whitehorse include Burwood Highway, Canterbury Road, Springvale Road, and around the Box Hill Activity Centre.

As crashes may involve multiple transport modes, Figure 91 shows the proportion of road users involved in crashes across the municipality. This shows that most crashes involve the car, with 72% as drivers and 17% as car passengers. A total of 188 pedestrians, 129 motorcyclists and 101 bicyclists were involved in crashes in Whitehorse. These road users are especially vulnerable to more severe injuries and fatalities as they have little or no protection in the event of a crash.

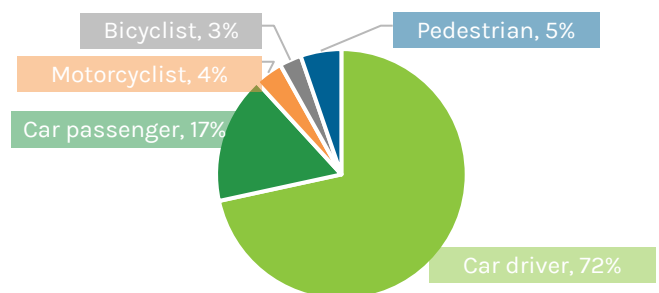


Figure 91 Road users involved in crashes in Whitehorse, 2019 - 2024

Source: VicRoads

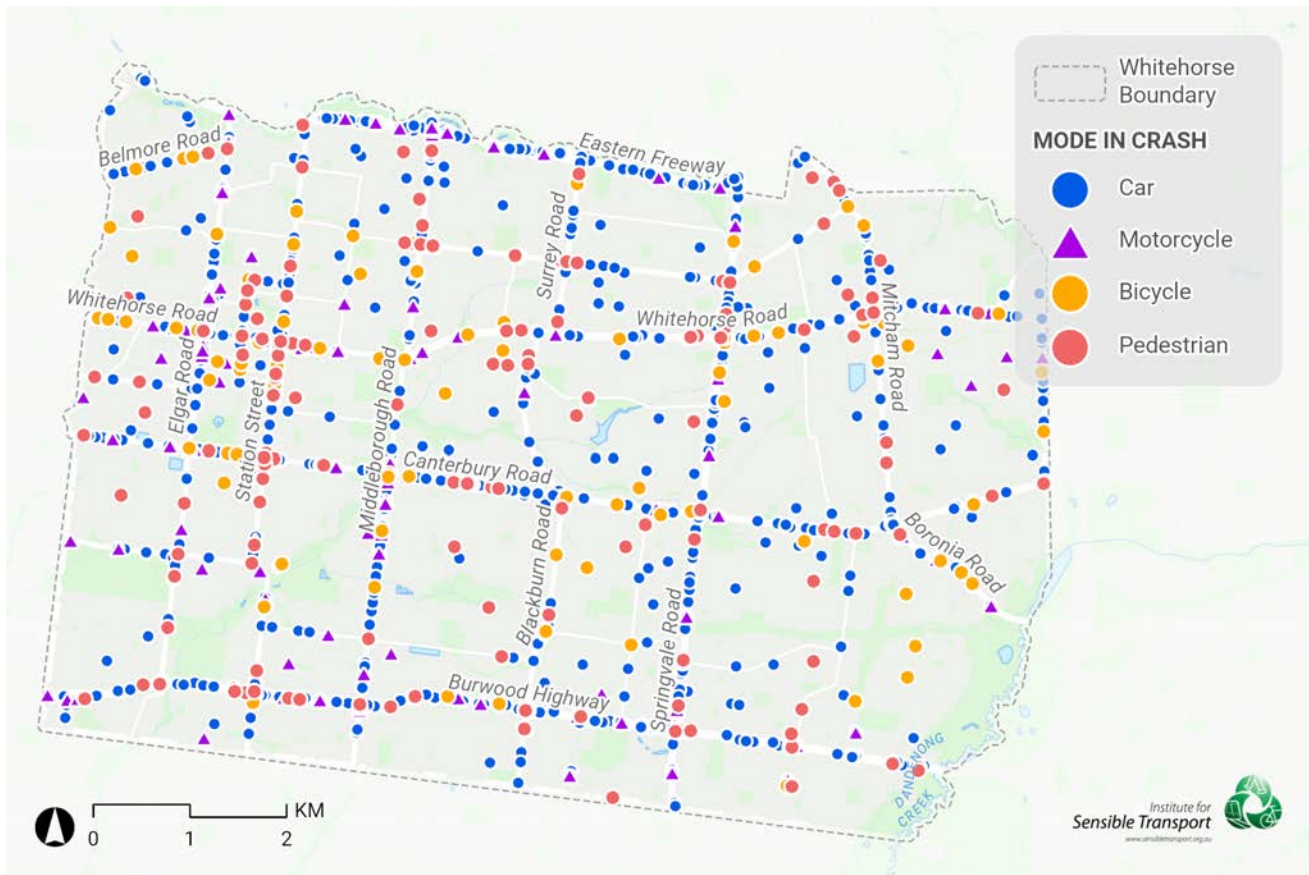


Figure 92 Crashes by transport mode in Whitehorse, 2019 - 2024

Source: VicRoads



Figure 93 Crash clusters in Whitehorse, 2019 - 2024

Source: Transport Victoria and VicRoads

Figure 94 shows crash locations involving pedestrians and cyclists. There is a noticeable concentration of crashes around the Box Hill activity centre on Station Street and Whitehorse Road. This is particularly concerning as this area is characterised by high levels of pedestrian activity. The majority of crashes around the Box Hill activity centre occurred in 60 km/h speed zones.

A significant number of crashes involved a pedestrian in the Box Hill Activity Centre.

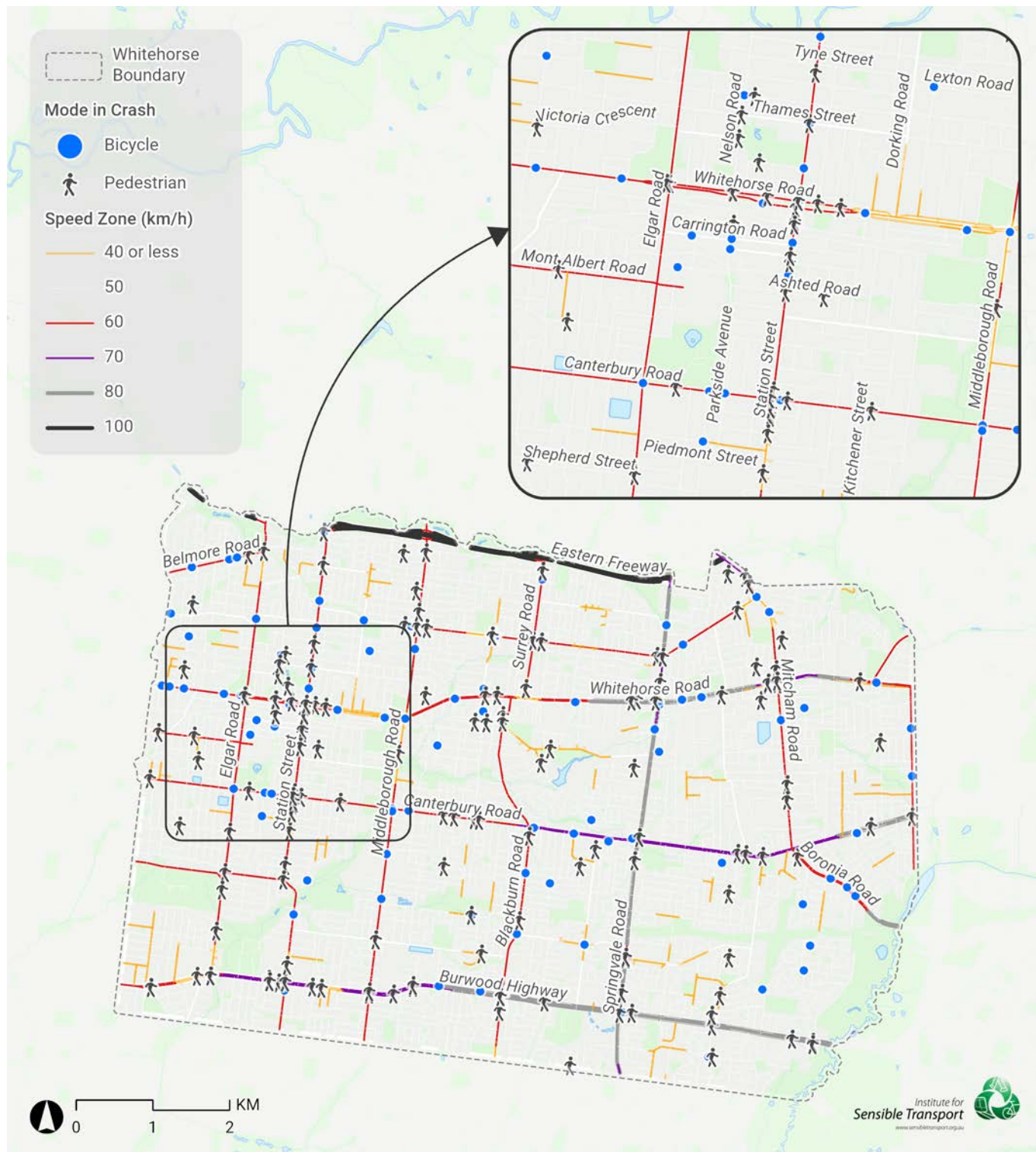


Figure 94 Crashes involving active modes in Whitehorse, 2019 - 2024

Source: Transport Victoria and VicRoads

8.1.2 Crashes by severity

Table 9 shows the severity of recorded crashes in Whitehorse between 2019 and 2024. Of the 3,615 people involved in crashes during this period, 9 people were killed, 446 suffered serious injuries and 1,361 reported other injuries. Just less than half of those involved in a crash reported no injuries (49.7%).

Table 9 Crashes by severity

Crash severity	Active modes involved in crashes	Total persons
Fatality	3	9
Serious injury	126	446
Other injury	151	1,361
Total	280	1,816

For all crashes resulting in a fatality or injury, 15% involved a pedestrian or cyclist. Further, nearly half (46%) of all crashes involving active modes resulted in a fatality or serious injury. Three pedestrians were struck by vehicles and suffered fatalities as a result.

Figure 95 shows the location of crashes recorded in Whitehorse between 2019 and 2024, broken down by the severity of injuries reported from the crash.

9 fatalities were recorded on Whitehorse roads between 2019 and 2024.

Nearly half of all crashes involving active modes resulted in a fatality or serious injury.

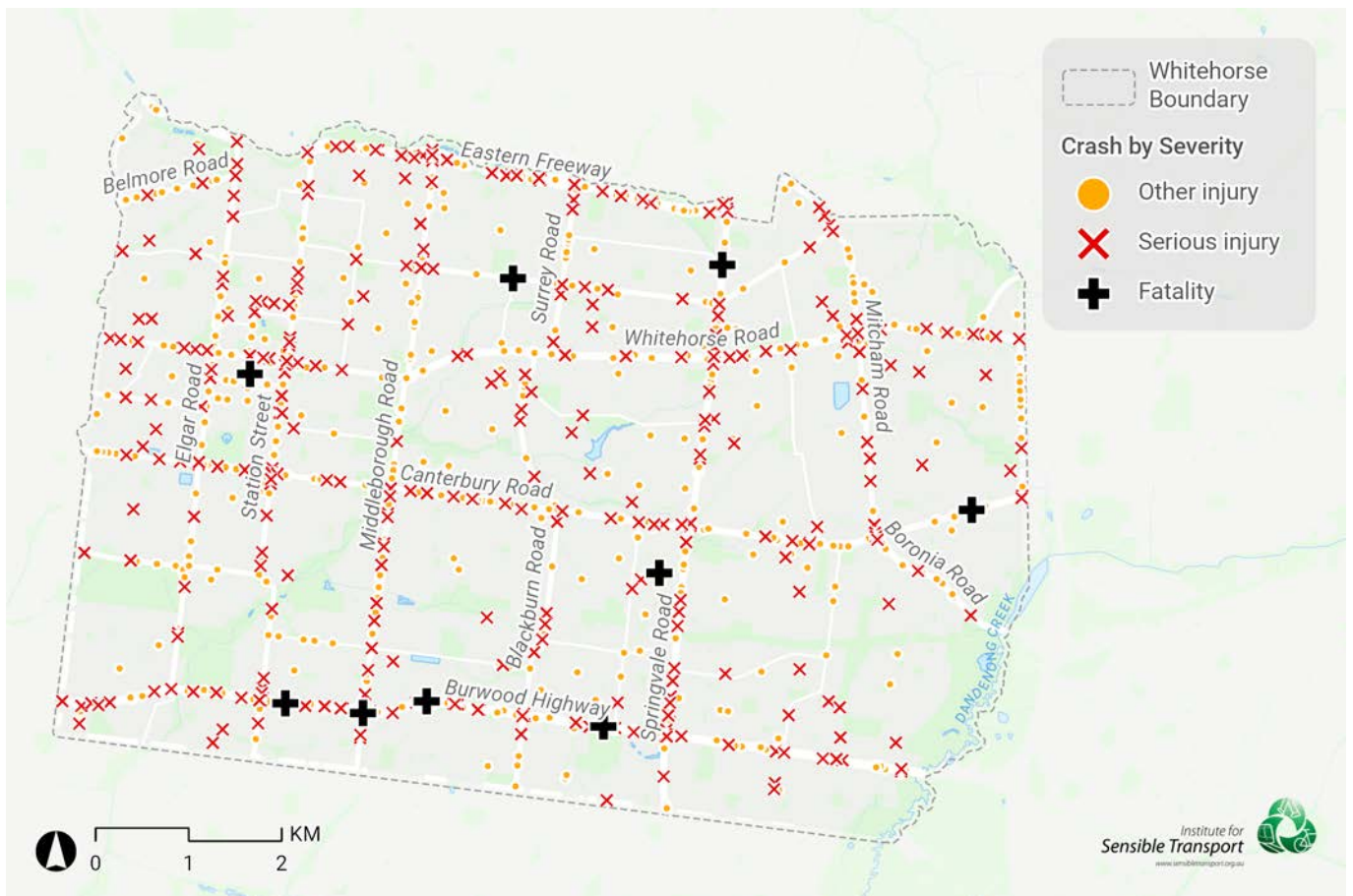


Figure 95 Crashes by severity, 2019 – 2024

Source: VicRoads

Of the 9 fatalities recorded, there were no traffic controls present at 7 crash locations. Burwood Highway was the location of four fatalities. The locations of the remaining five fatalities are listed below:

- Canterbury Road, between Adele Street and Andrew Street
- Mill Avenue, between Course Close and Thornhill Drive
- Intersection of Williams Road and Springfield Road
- Intersection of Springvale Road and Junction Road
- Intersection of Thurston Street and Hopetoun Parade.

Over 53% of all crashes occurred in 60 – 70 km/h speed zones, with 5 crashes resulting in fatalities, and 237 crashes resulting in serious injuries. Compared to crashes recorded in 50 km/h speed zones, the number of fatalities recorded in 60-70 km/h speed zones more than doubled, and the number of serious injuries more than tripled. There were no fatalities, and 8 serious injuries reported in 30 – 40 km/h speed zones. These figures highlight how lowering speed limits can significantly reduce crash injury severity and risk of road fatalities.

Table 10 Crashes by severity and speed zones

Speed Zone (km/h)	Fatalities	Serious injuries	Other injuries	Total people involved
30 - 40	0	8	18	26
50	2	72	173	247
60 - 70	5	237	748	990
80 - 100	2	110	319	431

Source: Transport Victoria and VicRoads

Crashes that occurred in 60 – 70 km/h speed zones are more than three times as likely to result in serious injuries, as crashes in 50 km/h speed zones.

Crash severity for vulnerable modes is shown in Figure 96.

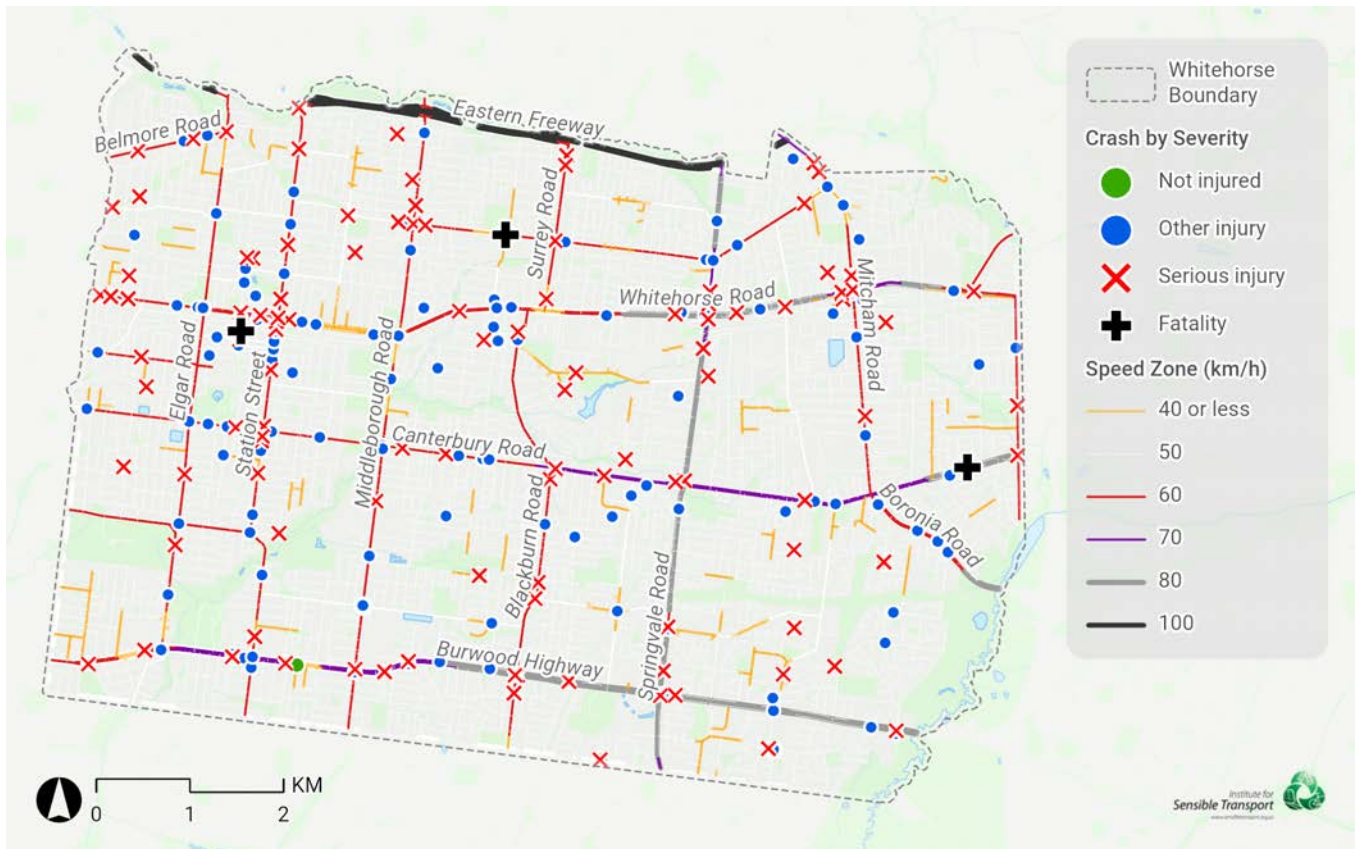


Figure 96 Crash severity involving vulnerable modes

Source: Transport Victoria and VicRoads

8.1.3 Crash by sex and age

Crash data provides insight into disparities between the sex and age of crash victims. Analysis of this data helps to identify vulnerable groups with increased risk of crash, and increased risks of fatalities and serious injuries in Whitehorse.

This analysis is based on crash data that categorises individuals into two gender categories: male and female. We recognise that these binary categories do not fully represent the diversity of gender identities and acknowledge this limitation may not capture the full scope of gender related factors. Further, while this data looks only at the direct impacts on crash victims, women often bear the burden of crashes following a crash, regardless of their involvement in a crash (e.g., taking up additional housework and caregiver duties). These factors should be taken into consideration in addition to the following findings.

In this five-year period, 1,905 crash victims (53%) for all transport modes in Whitehorse were men. In comparison, 1,595 crash victims (44%) were women.

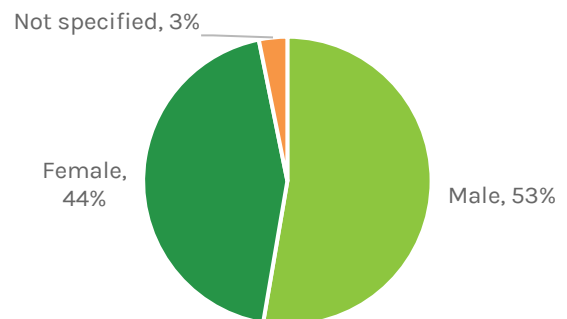


Figure 97 Mode in crash by sex, all modes

Source: VicRoads

Figure 98 provides a breakdown of crashes by sex and the most vulnerable mode. In crashes involving a car, men accounted for 54.5% of all crashes, compared to 43.9% for women. Men were 9 times as likely to be involved in a motorbike crash and 5 times as likely to be involved in a bicycle crash, as women.

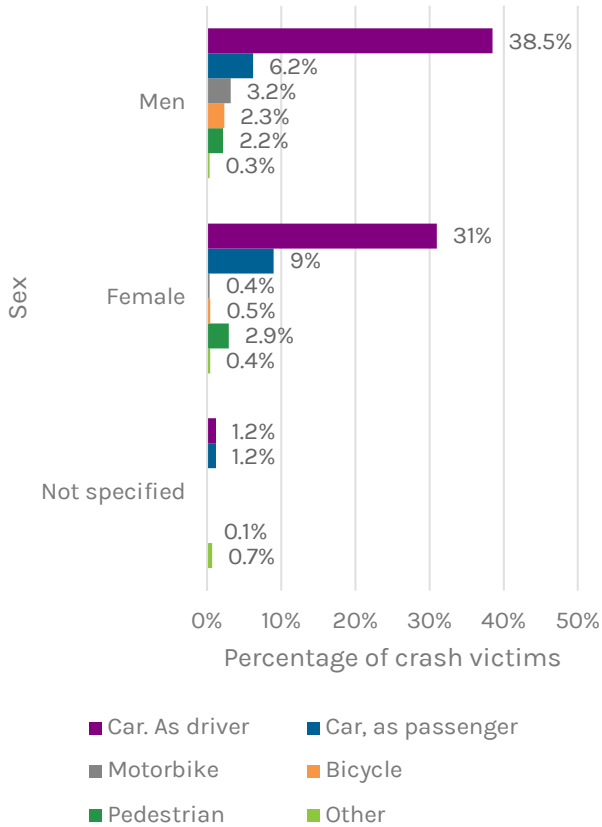


Figure 98 Mode in crash by sex

Source: VicRoads

Similarly, Figure 99 shows men were more likely to report serious injuries compared to women. However, women were likely to report injuries overall compared to men, at 26.3% and 23.5%, respectively.

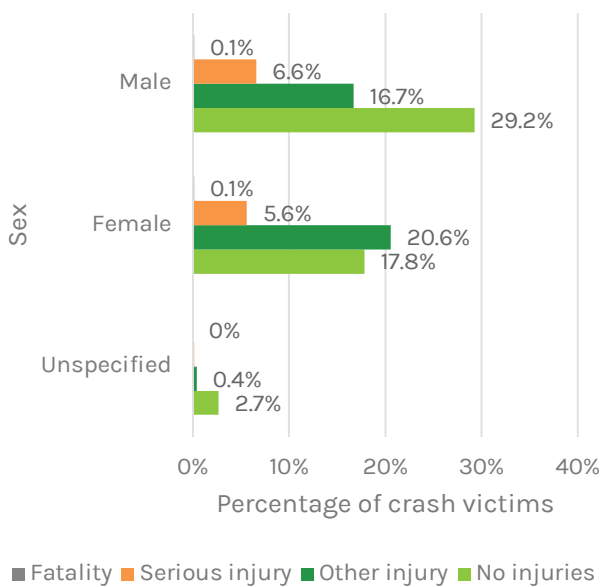


Figure 99 Crash severity by sex

Source: VicRoads

The implications of road crashes for different age groups are considerably varied, as shown in Figure 100. Young adults are disproportionately impacted, with nearly a fifth of crashes on roads within the City of Whitehorse involving 22 - 29-year-olds, and 8.9% involving 16 - 21-year-olds. Vulnerable groups, including children and older adults over 70 years of age, accounted for nearly 15% of all crash victims. Figure 101 highlights males between 22 - 29 years old are the most vulnerable age group in Whitehorse, at 11% of crash victims belonging to this group.

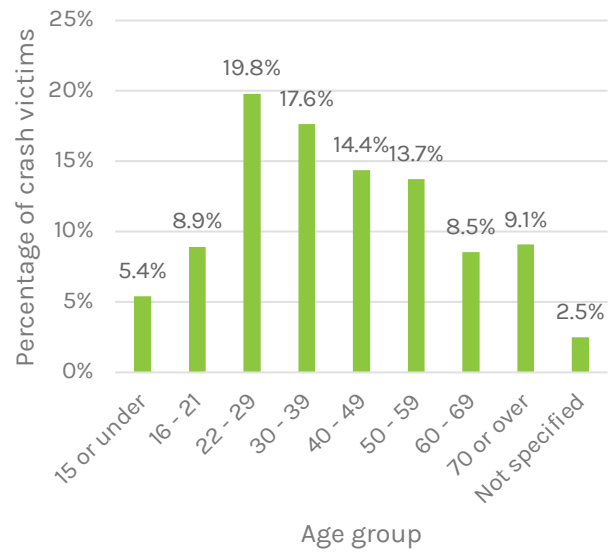


Figure 100 Crashes by age

Source: VicRoads

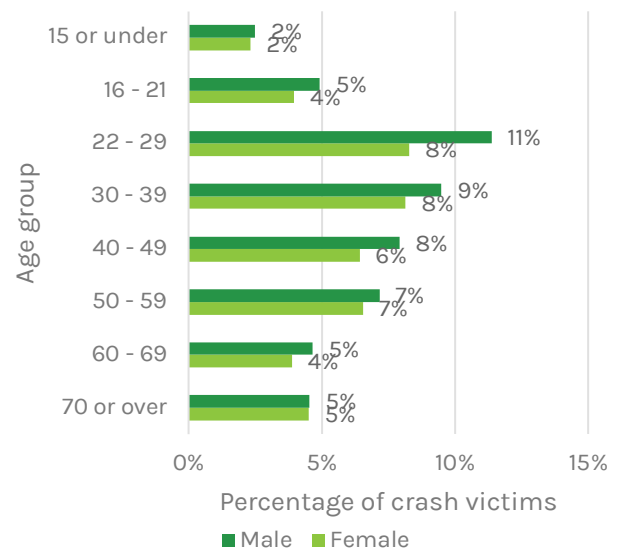


Figure 101 Crashes by age and sex

Note: This chart does not add up to 100% as crashes with incomplete data is not shown. Approximately 2.3% of crashes contained incomplete data where age, sex, or both were not specified.

Young adults between 22 – 29 years old are the most vulnerable group to road crashes in Whitehorse.

Children and older adults over 70 years of age, accounted for nearly 15% of all crash victims.

Unsurprisingly, the car/truck is the most reported mode in crashes for all age groups. Approximately 17.4% of all crashes involved people in the 22 – 29 age group using a car/truck. Pedestrians aged 70 or over were most likely to be involved in a crash as a pedestrian compared to other age groups.

Crash injuries were more severe for older adults aged 70 or older and adults in the 22 – 29 age groups, as shown in Figure 102. These age groups reported the greatest proportion of injuries that

were serious or resulted in a fatality, at 5.3% and 4.4% respectively. In summary, groups reporting higher risk of injury from a crash include adults in their 20's (18.7%) and 30's (18.3%), middle-aged adults between 50 – 59 years old (14%), and people 70 years old or older (12.5%).

These findings have implications on the development of Whitehorse Integrated Transport Strategy. While the Strategy is likely to implement a combination of measures that promote safer road behaviours and infrastructure design across the City of Whitehorse, additional targeted measures should be implemented to address vulnerable groups in road crashes. This may involve:

- Targeted educational campaigns for young drivers
- Enhanced school safety initiatives to protect children
- Traffic calming and slower speeds in school zones and high pedestrian activity areas.

Table 11 Mode in crash by age group

Age group	Pedestrian	Bicycle	Motorbike	Car/truck	Other
15 or under	0.4%	0.3%	0.03%	4.6%	0.1%
16 – 21	0.7%	0.3%	0.3%	7.4%	0.2%
22 – 29	0.8%	0.3%	1.1%	17.4%	0.1%
30 – 39	0.7%	0.3%	0.8%	15.8%	0.1%
40 – 49	0.4%	0.6%	0.4%	12.9%	0.03%
50 – 59	0.6%	0.5%	0.5%	12.1%	0.03%
60 – 69	0.5%	0.3%	0.4%	7.4%	0.1%
70 or over	1%	0.2%	0.03%	7.8%	0.1%
Not specified	0.1%	0%	0.03%	1.7%	0.6%

Source: VicRoads

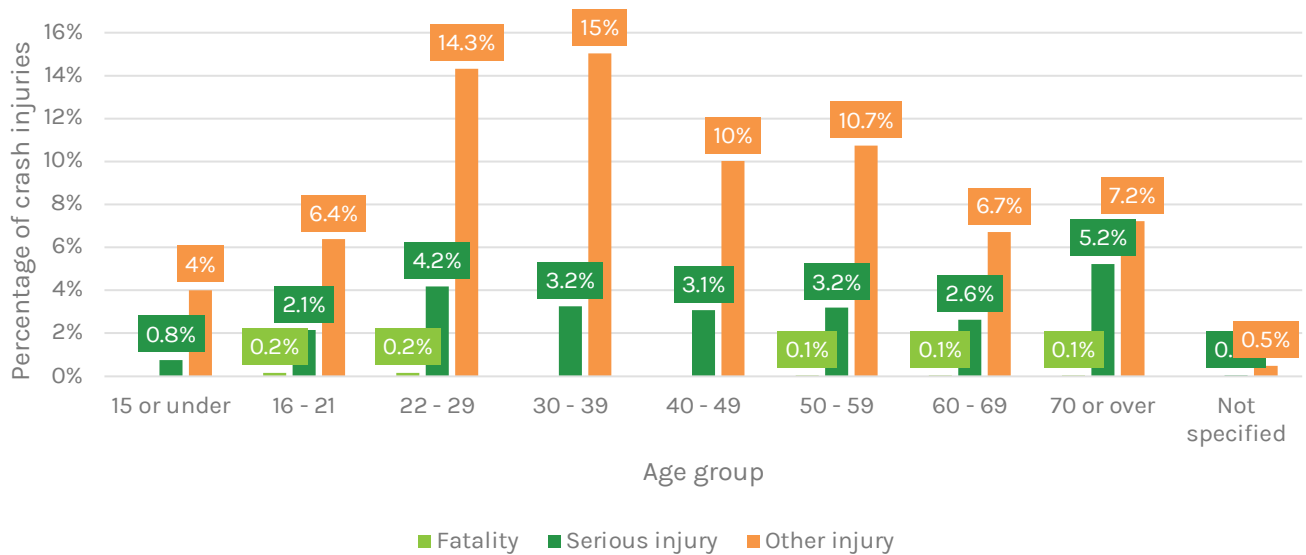


Figure 102 Crash severity by age

Source: VicRoads

8.1.4 Crash clusters

This section provides finer grain maps of major crash clusters recorded across the City of Whitehorse over the last five years. These maps show the traffic controls present at crash locations and speed zones. This highlights opportunities to implement and/or improve existing traffic controls to improve the road safety environment across Whitehorse.

Suburbs containing major crash clusters include:

- Burwood East and Vermont South (Figure 103)
- Burwood (Figure 104)
- Box Hill (Figure 105)
- Forest Hill and Vermont (Figure 106)
- Mitcham and Nunawading (Figure 107)
- Box Hill North (Figure 108).

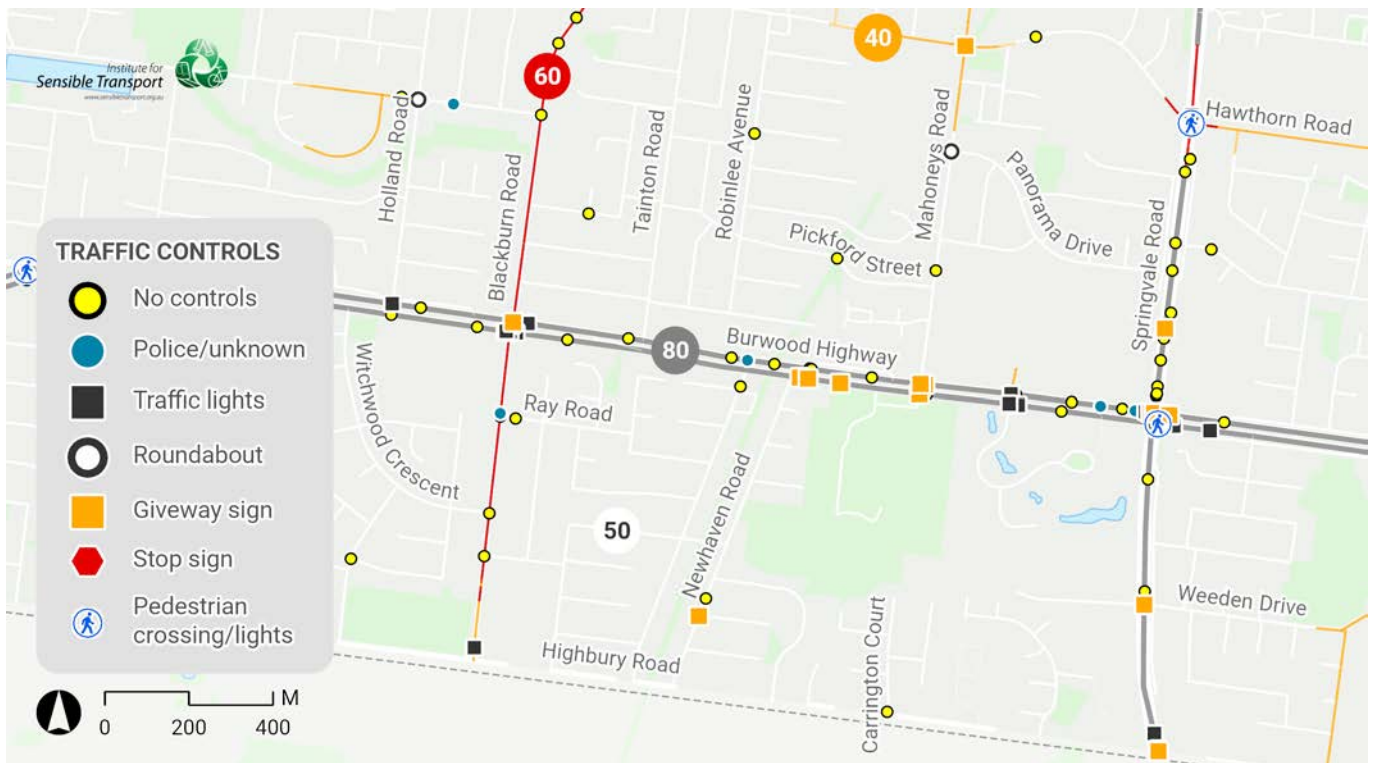


Figure 103 Crash clusters, Burwood East and Vermont South

Source: Transport Victoria and VicRoads

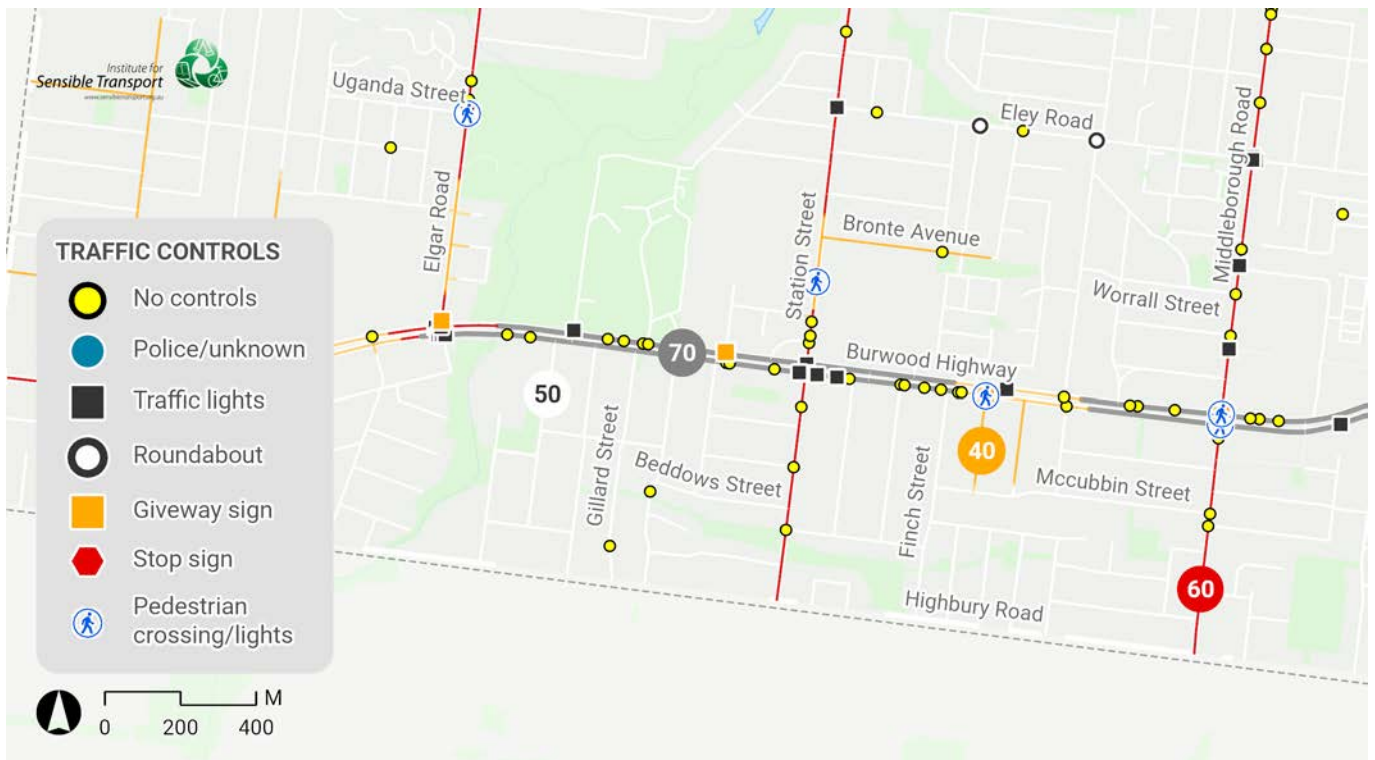


Figure 104 Crash clusters, Burwood

Source: Transport Victoria and VicRoads

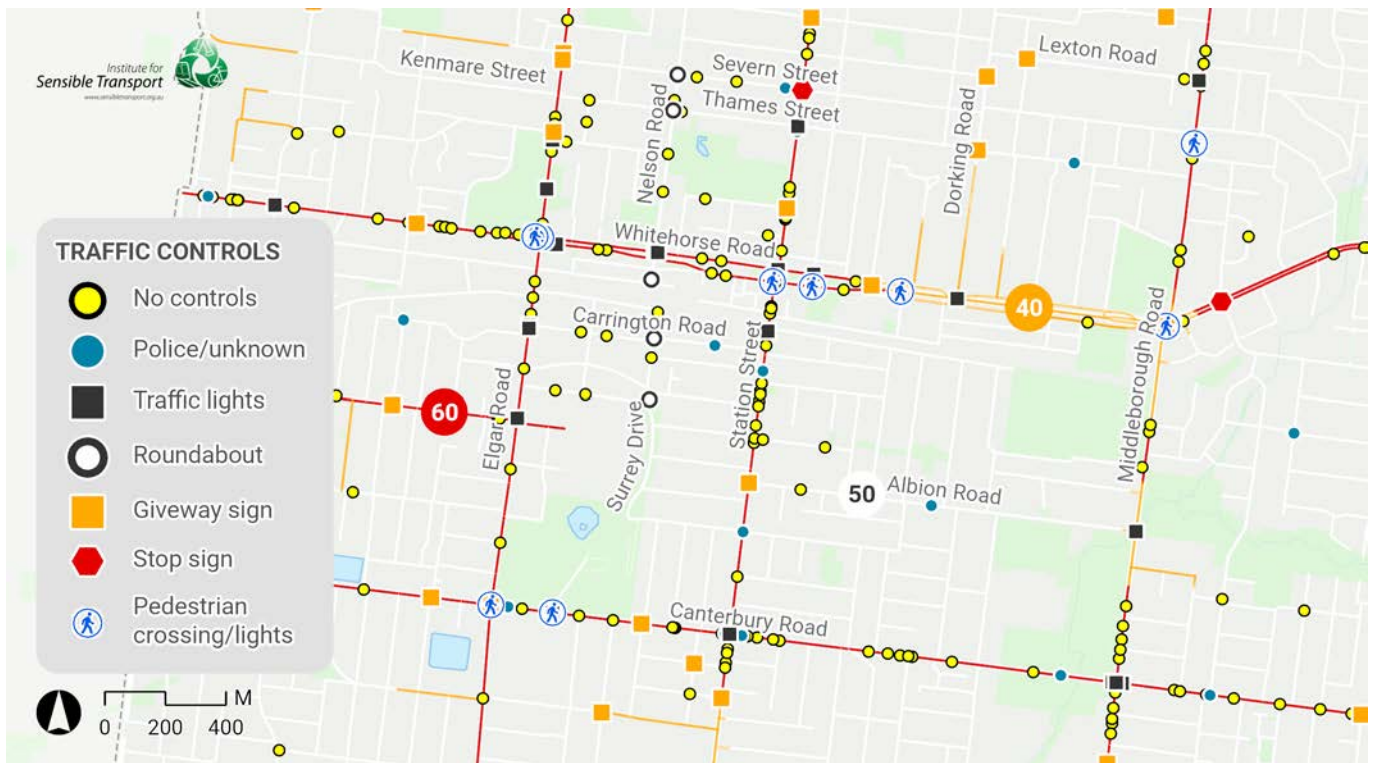


Figure 105 Crash clusters in Box Hill

Source: Transport Victoria and VicRoads

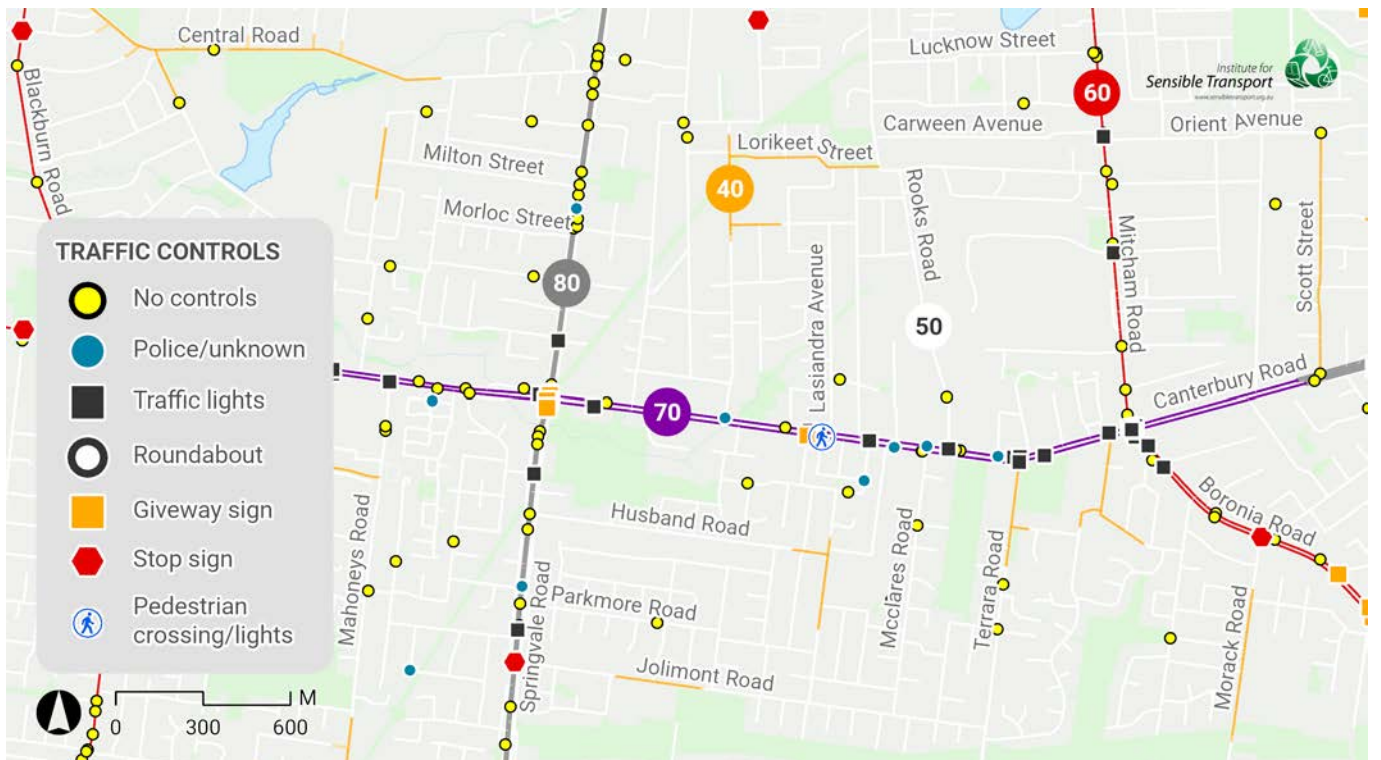


Figure 106 Crash clusters, Vermont and Forest Hill

Source: Transport Victoria and VicRoads

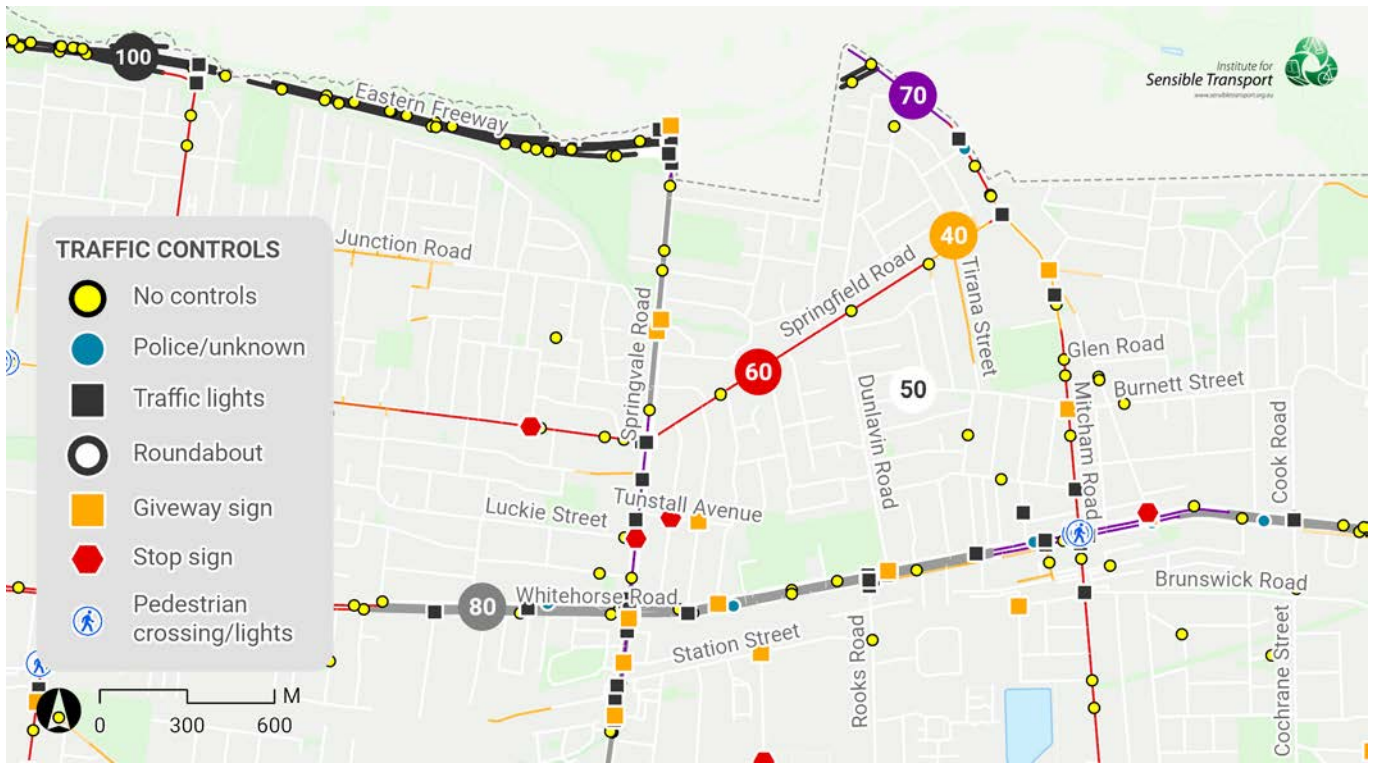


Figure 107 Crash clusters, Mitcham and Nunawading

Source: Transport Victoria and VicRoads

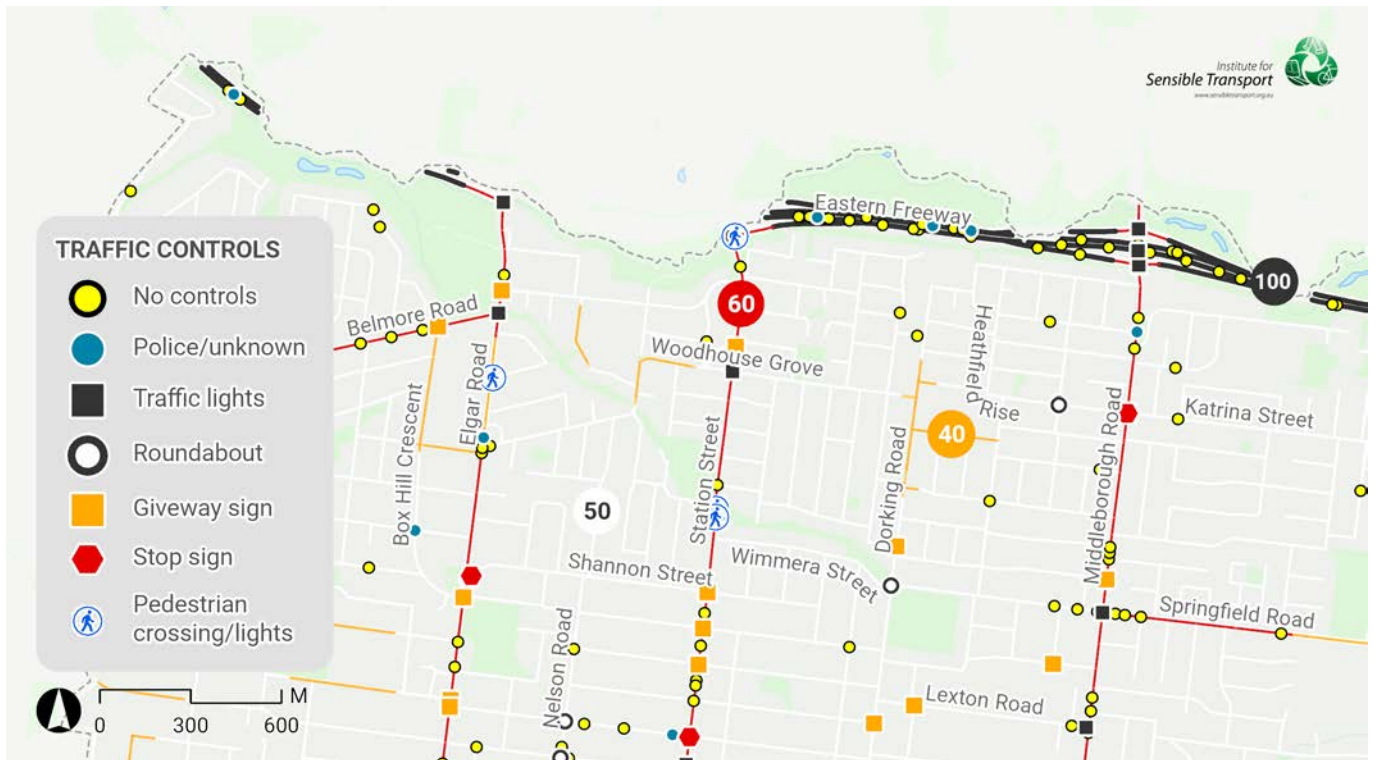


Figure 108 Crash clusters, Box Hill North

Source: Transport Victoria and VicRoads

8.2 Bicycle Safety Survey

Safety issues and the perception of safety are critical factors in an individual’s decision to cycle

¹⁰ survey between October 2023 and the end of January 2024, collected 72,844 responses from over 10,000 individuals across the country. An interactive map allowed for individuals to submit locations (spots), comments and the ability to ‘support’ other’s submissions.

In Whitehorse there were 86 locations identified (11 safe, 75 unsafe) with 159 indications of support and 29 detailed comments. Across the locations, there were 16 supporting reasons why a spot was safe and 152 reasons a spot was identified as unsafe (summarised in Figure 109).

or not. In 2023, CrowdSpot provided the opportunity for the population to share their perception of cycling safety in their local community. The BikeSpot 2023

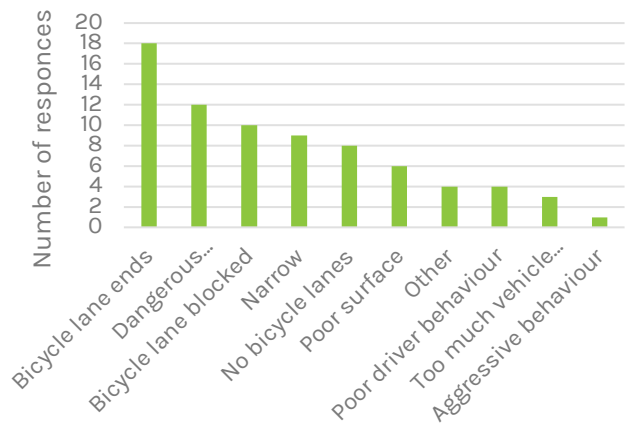


Figure 109 Categorised Responses - Safety Issues

Source: CrowdSpot

These locations are shown in Figure 110. When compared to the existing cycling network, most of the locations deemed safe by users are located in areas where cycling is separated from vehicle traffic, along shared paths. Key clusters appear in central Box Hill and along Middleborough Rd and Springvale Rd (aligning with comments in the Shaping Whitehorse engagement)

¹⁰ BikeSpot 2023. *BikeSpot 2023 Submissions Archive Map*. <https://www.bikespot.org/>

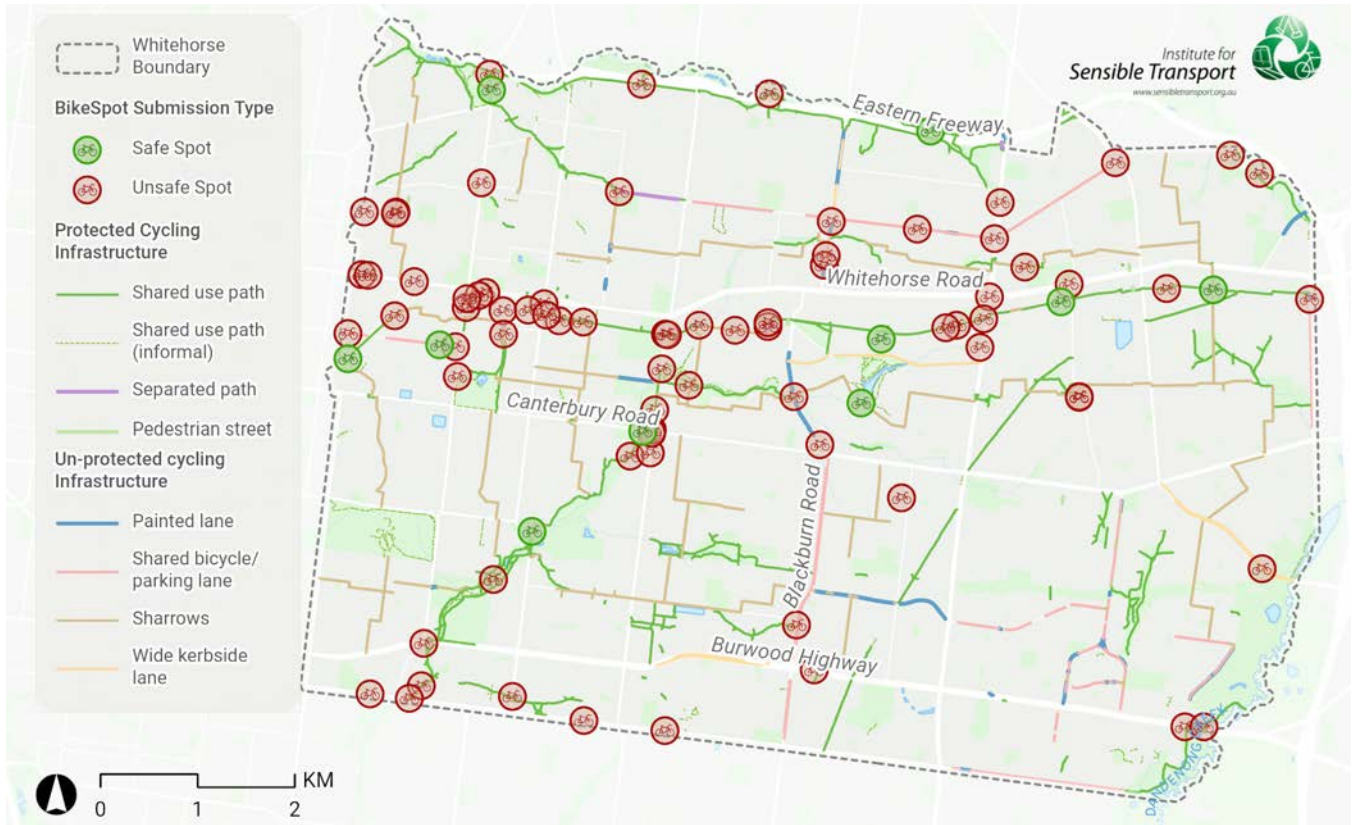


Figure 110 BikeSpot Bicycle Safety Survey Submission Locations and Infrastructure

Source: CrowdSpot, Institute for Sensible Transport

9. Population Data



Demographic analysis is essential for developing an effective ITS as it helps identify the target audience, understand travel patterns and address barriers and disparities. By analysing demographic data such as age, gender, ethnicity, income level and household structure, the ITS can cater to the diverse needs of the Whitehorse population.

Using Australian Bureau of Statistics (ABS), State government and Council data, this section examines the demographic profile of the Whitehorse population and the implications for the ITS. A detailed analysis of household structure and income is presented below, as well as age profile, health status, employment, gender and ethnicity.

9.1 Population

ABS Census data reveals Whitehorse had 178,639 residents in 2023, with a population density of 2,781 persons per square kilometre. Figure 111 shows Whitehorse's population density using 2021 Census data. Between 2021 and 2023, Whitehorse's population grew by 9,293 residents (+5.5% growth).

Whitehorse's population grew by 5.5% between 2021 and 2023.

The most densely populated area in the LGA is in the suburb of Box Hill, with an average population density of 4,875 residents per square kilometre. Population density in Box Hill varies considerably, with apartment complexes around the Box Hill Activity Centre recording the highest population

densities across Whitehorse, at 125,000 to 176,000 residents per square kilometre, and areas immediately adjacent recorded less than 3,000 residents per square kilometre. Between 2021 and 2023, Box Hill's population grew from 14,353 to 15,961 residents (11.2% growth).

Other areas with pockets of higher population density are concentrated around the metropolitan railway stations in Blackburn, Nunawading, and Mitcham, and between the suburbs of Burwood and Burwood East. The least densely populated suburbs in Whitehorse are Vermont South and Box Hill South, with population densities of 2,385 and 2,490 people per square kilometre, respectively.

Box Hill is the most densely populated area in Whitehorse, with 4,875 residents per square kilometre.

Figure 112 shows the change in population across Whitehorse between 2016 and 2021 using ABS Census data. Most of Whitehorse saw little to moderate change in the number of residents. Areas that saw the most growth in number of residents is concentrated in Box Hill along Whitehorse Road and on Middleborough Road around Burwood and Burwood East. Burwood saw the most significant decline in population over this five-year period.

Box Hill is Whitehorse's fastest growing suburb.

Burwood saw the most significant decline in population between 2016 and 2021.

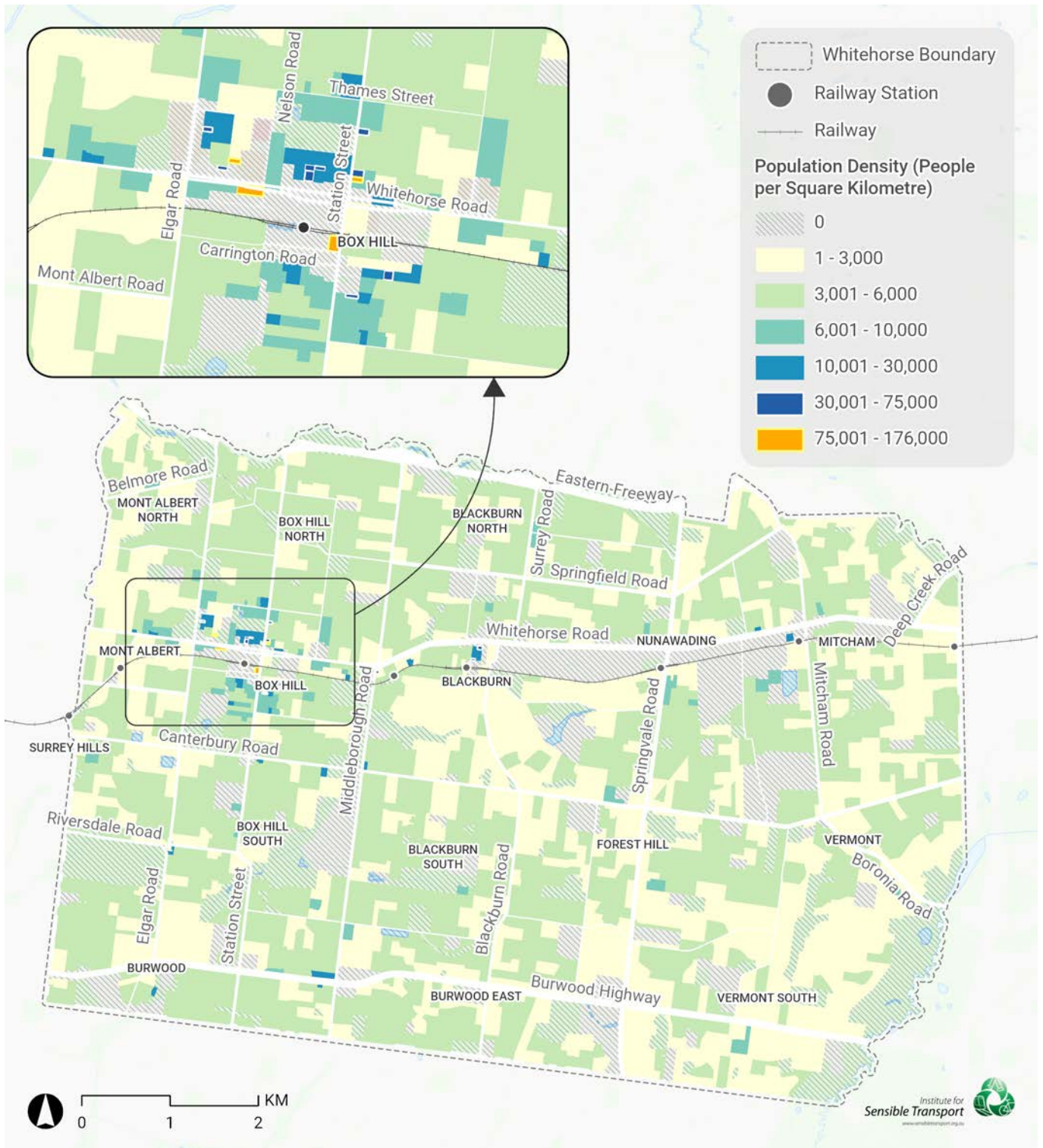


Figure 111 Population density, Whitehorse

Source: ABS Census 2021

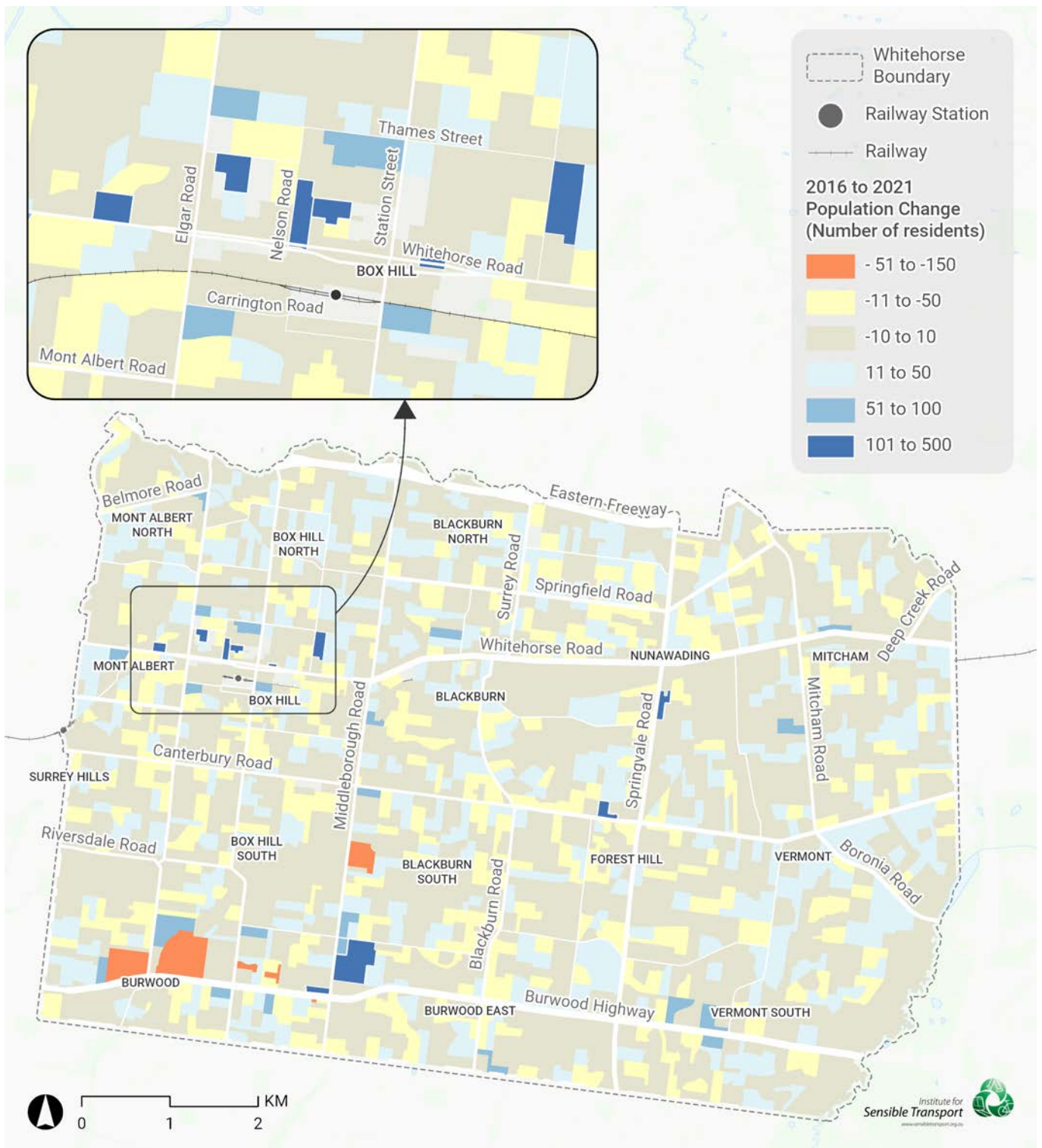


Figure 112 Previous population change, 2016 to 2021

Source: ABS Census Data

9.2 Age of population

The median age of Whitehorse City is 39 years, higher than the 37 years recorded for Greater Melbourne. The higher median age indicates that Whitehorse City is ageing. The age distribution in ten-year brackets is presented in Figure 113. The proportion of males is higher among newborns to 29 year olds, but there are more females in ages over 30 years old. In general, Whitehorse has more females at 52%.

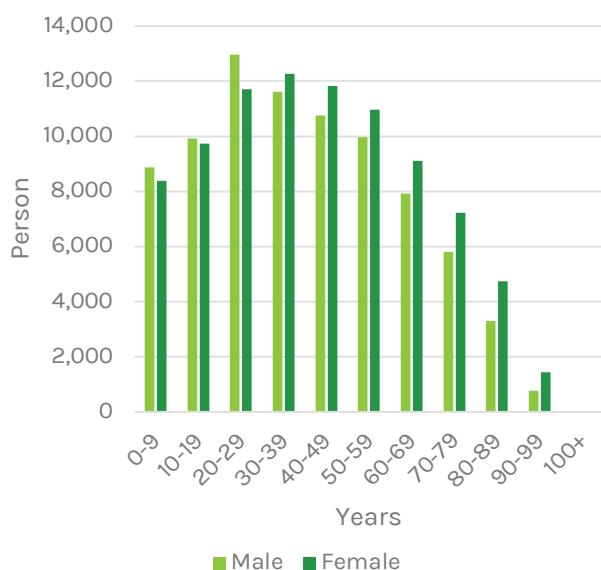


Figure 113 Age distribution of population by sex

Source: ABS Census 2021

People living in areas of high socio-economic disadvantage are discussed in Section 9.4. Other key groups that are disadvantaged by poor transport options are:

- People who need for assistance with core activities (6%)
- School children, aged 5 to 18 years old (16%)
- Older adults, aged 65 years and over
- Single parents (4%)

With the exception of school children, females are over-represented in the other groups listed above.

School children that can walk or ride a bike to and from school will have more autonomy and develop greater independence. Enabling school children to walk and cycle will reduce short distance car trips. Figure 114 and Figure 115 presents population density of primary and secondary school children in relation with schools.

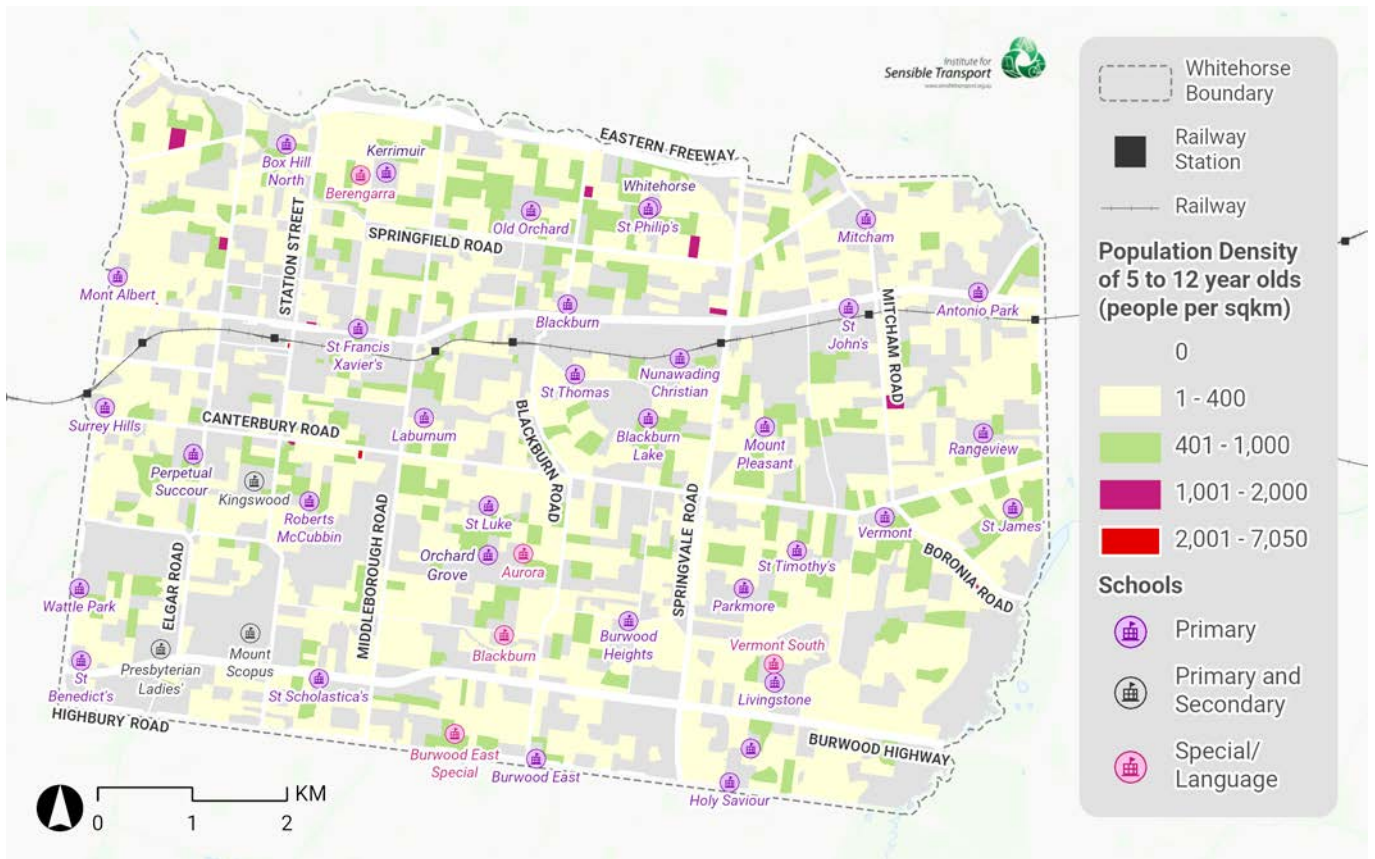


Figure 114 Population density of 5- to 12-year-old residents, Whitehorse

Source: ABS Census 2021



Figure 115 Population density of 13- to 18-year-old residents, Whitehorse

Source: ABS Census 2021

9.3 Future population

The *Whitehorse Council Plan 2021- 2025* and other strategic documents outline the need to prepare for a future population increase. Current forecasts predict Whitehorse will be home to 208,290 people by 2036 and 234,277 by 2046. This reinforces the need to plan for an efficient and sustainable transport network to ensure Whitehorse remains a liveable and sustainable city.

The population of Whitehorse is expected to grow by 37% between 2021 and 2046*

*Current population forecasts do not acknowledge recent government announcements, including the housing targets (an additional 76,500 dwellings in Whitehorse by 2051). They also do not account for planned density increases around the Suburban Rail Loop stations in Box Hill or Burwood (an additional 64,300 residents in Box Hill and 39,200 in Burwood by the 2050's). For more information about the housing targets see Section 2.2.5.1.

These changes have not yet been implemented in planning scheme controls, zoning and local development approvals are not yet reflecting this expected growth. The recent release of Plan Victoria indicates that forecasts will increase significantly; however, the modelling is not yet available.

9.3.1 Population forecast

Understanding the distribution of population growth is important when anticipating future transport requirements to accommodate the evolving needs of residents. Figure 116 details the growth expected across the City of Whitehorse based on existing modelling. Key findings include:

- All areas within Whitehorse will experience some growth.
- As seen in Table 12, the largest increase in population (by percentage) is expected to occur in:
 - Box Hill, increasing by 164% from 14,603 in 2021 to 38,584 in 2046

- Mont Albert with an increase of 76% from 4,879 to 8,586 in 2046
- Burwood with an increase of 56% from 12,543 to 19,623 in 2046
- Blackburn with an increase of 54% from 14,636 to 22,503 in 2046.
- Blackburn North, Blackburn South and Vermont are expected to see the least growth
- Suburbs along the railway line are expected to see the most growth, this supports further uptake of sustainable transport options
- While Mont Albert will see a 76% increase in population, its overall population will remain lower than neighbouring Box Hill
- While not accounting for SRL, high growth is expected in Box Hill and Burwood, where the stations are to be located.

Table 12 Population forecasts by suburb and locality

Suburb	Population 2021	Population 2046	Population Change
Box Hill	14,603	38,584	164%
Mont Albert	4,879	8,586	76%
Burwood	12,543	19,623	56%
Blackburn	14,636	22,503	54%
Burwood East	10,778	15,447	43%
Forest Hill	10,866	13,240	22%
Nunawading	12,203	14,752	21%
Box Hill North	12,467	14,770	18%
Mont Albert North	5,805	6,699	15%
Vermont South	12,044	13,835	15%
Mitcham	16,935	18,952	12%
Box Hill South	8,629	9,514	10%
Surrey Hills	5,415	5,973	10%
Vermont	10,618	11,677	10%
Blackburn North	7,724	8,361	8%
Blackburn South	11,040	11,761	7%

Source: ABS Census Data, forecast.id

Figure 116 shows the expected population growth compared to current population for each suburb or locality. The lighter green indicates existing population, with the darker representing the future population. The size of the symbol indicates the overall number of people in each year.

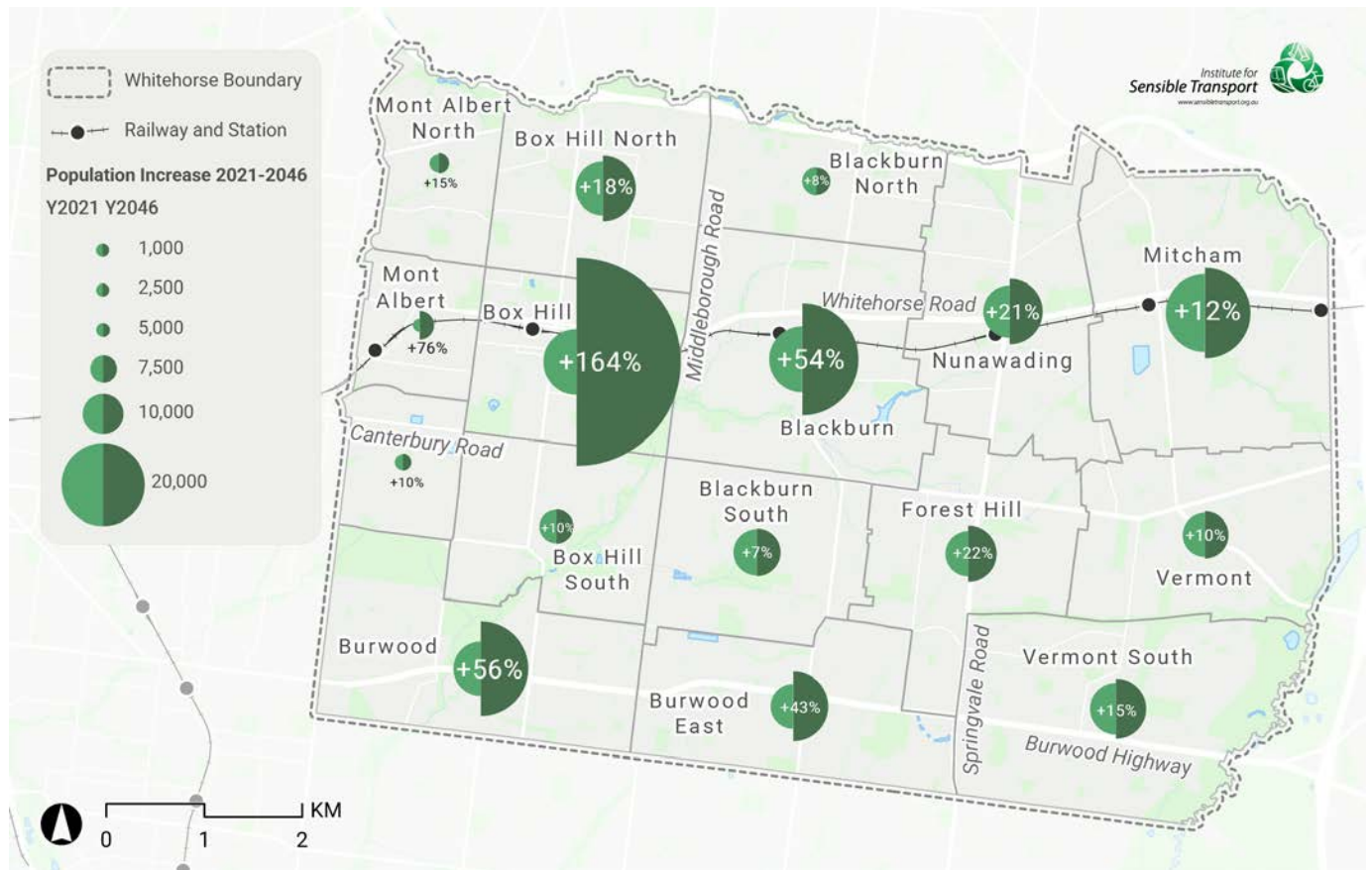


Figure 116 Population increase by Suburb and Locality 2021-2046

Source: ABS Census Data, forecast.id

9.4 Socio-economic profile

The ABS measures socio-economic status through a series of indexes called Socio-Economic Indexes For Areas (SEIFA). The Index of Relative Socioeconomic Disadvantage and Disadvantage (IRSAD) summarises the average level of advantage and disadvantage within an area. IRSAD scores for statistical areas across Australia, which are ranked and divided into equal groups of ten, known as deciles. Areas with decile numbers of 1 have the highest average level of disadvantage, and areas with decile numbers of 10 have the highest average level of advantage.

The SEIFA Index by IRSAD for Whitehorse (LGA) is shown in Figure 117. The IRSAD Index at the national scale reveals a wide range of advantage and disadvantage exists in the municipality. The most intense areas of advantage are west of Elgar Road in Surrey Hills, Mont Albert, and Mont Albert North. High levels of advantage are also observed in Blackburn and Box Hill South.

While the majority of Whitehorse is reported within the 6th to 10th IRSAD deciles, some areas of

disadvantage are observed. The largest and most intense area of disadvantage is located west of Rooks Road, between the Rooks Road and Redland Estate industrial precincts. Other areas of disadvantage are located:

- North-west from the intersection at Elgar Road and Uganda Street,
- North-west from the intersection of Whitehorse Road and Springvale Road,
- In Blackburn South, east of Middleborough Road,
- In Forest Hill, north of Hawthorn Road,
- North-east from the intersection of Elgar Road and Whitehorse Road.

A lack of good transport options often increases the burden of driving for people already suffering from disadvantage. The areas listed above are generally within 1.5 km of a train or tram line and could benefit from improvements to last-mile connections.

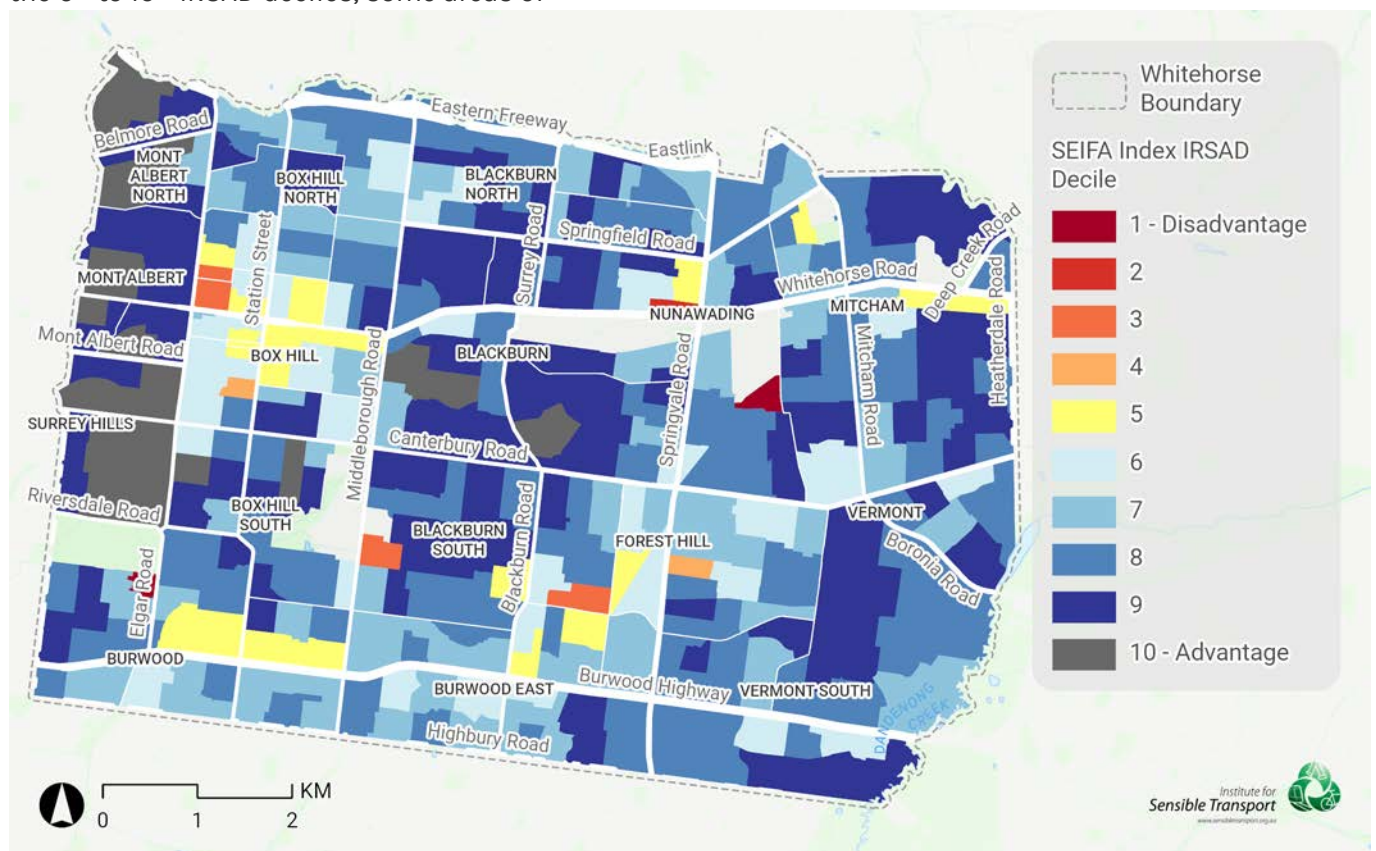


Figure 117 SEIFA Index – IRSAD for Whitehorse

Source: ABS Census 2021

10. Land Use



This section describes the land use policies and legislation that influence transport behaviour. Land use has a powerful impact on travel patterns. Low-density, single-use zoning is associated with high levels of car use. Conversely, medium-density, mixed-use development, especially when coupled with high-quality public transport, has been shown to diversify transport opportunities.

10.1 Planning zones

Figure 118 shows the planning zones across Whitehorse, where the most dominant land use is for residential. Approximately 73% of land in Whitehorse is used for residential purposes. This figure excludes mixed-use zones. Employment zones, made up of Commercial and Industrial zones, make up 7% of all land. While many industrial zoned areas abut residential zones, they are generally connected to an arterial road.

Generally, differently zoned areas are separated by streets and roads; however, there are some instances where there may be inconsistent zoning from property to property. An example of this is along the LGA border with the City of Manningham in Nunawading, here the Neighbourhood Residential Zone (NRZ) within Whitehorse abuts General Residential Zone (GRZ) in Manningham. In transport terms, greater density may occur along quiet streets, impacting the local transport needs. Changes to transport plans and priorities should consider what planning zones and overlays are present adjacent to Whitehorse’s boundaries. This includes the potential for apartment buildings within Manningham’s GRZ through the Future Homes program.

Zones that permit higher density of residential and commercial land uses are predominantly focused along the railway line and Burwood highway, where there is ready access to goods and services in local activity centres. Ensuring that there is high-quality sustainable transport options in these areas will help to reduce the number of car trips over the long-term and limit the increases in traffic associated with increased population density.

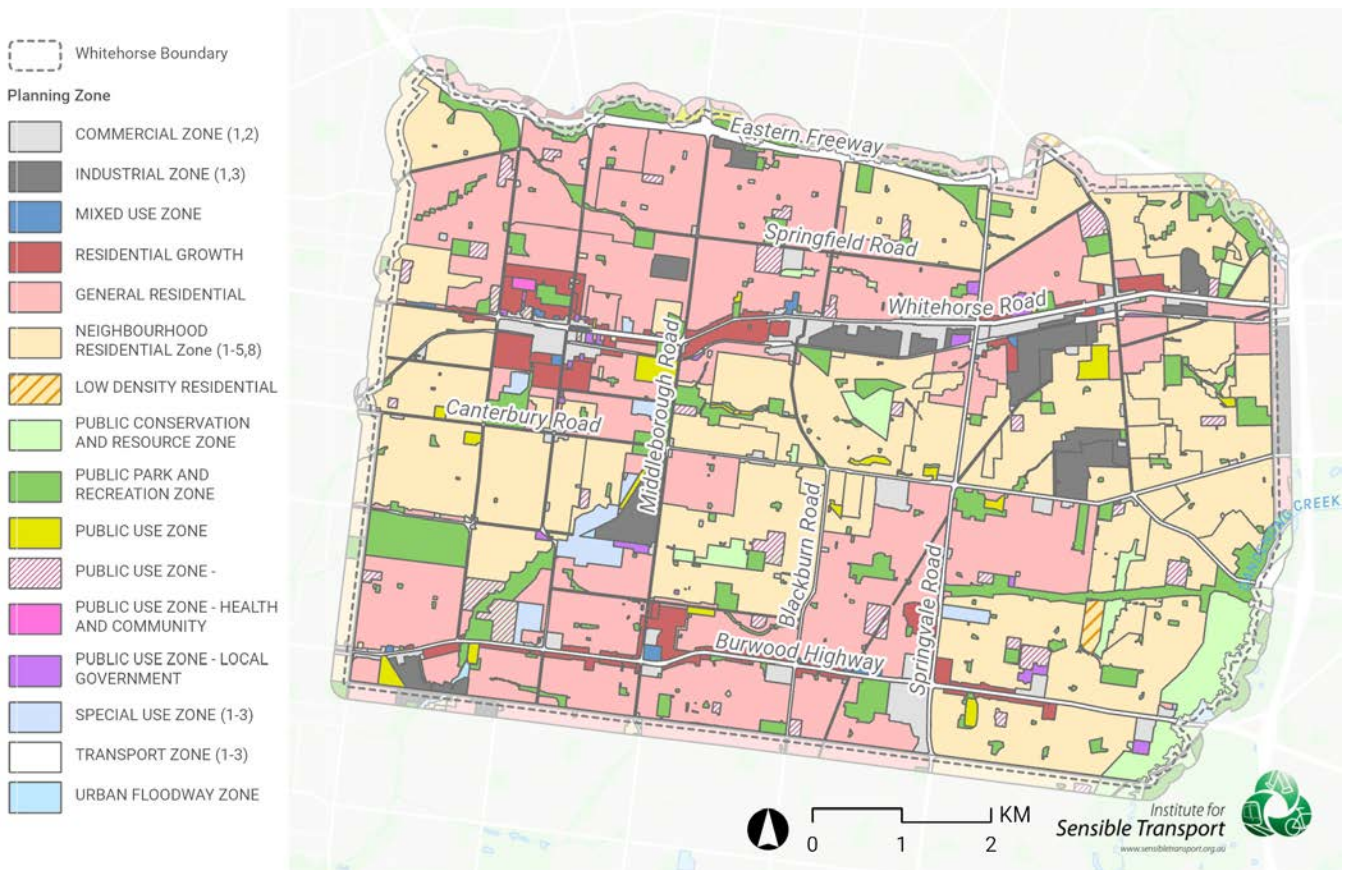


Figure 118 Whitehorse Planning Zones

Source: Victorian Government

10.2 Planning overlays

Key planning overlays (shown in Figure 119):

- Municipal-wide Developer Contributions Plan (not shown in the map)
- Specific controls overlay, includes North-East Link, the Suburban Rail Loop alignment. Both of these impact a significant amount of open space and will have impacts on local active transport infrastructure during construction.
- Flood zones (LSIO, SBO) – Where possible, public DC EV chargers should not be in these areas. Can still be installed if it is planned, i.e. locate vents or exposed parts of EVSE on light poles.

There are no Buffer Area Overlays (BAO) applied in Whitehorse. BAOs can be used to protect existing industry from incompatible land uses, such as

residential development near industrial areas with heavy vehicle movement.

There is one Parking Overlay Schedule in Whitehorse. This schedule covers the central part of Box Hill and implements the Box Hill Activity Centre Parking Plan. The Parking Overlay seeks to:

- Minimise traffic generated by the search for a parking space. Reduce vehicle trips through minimising parking provision where appropriate.
- Encourage the use of active and sustainable travel modes rather than increased private vehicle travel.
- Improve general amenity for pedestrians within Box Hill to increase the willingness for individuals to walk to their destination.

Specifically, this schedule seeks to achieve these goals by reducing the number of parking spaces required for both residential and office buildings.



Figure 119 Whitehorse Planning Overlays

Source: Victorian Government

10.3 Structure plans

There are several existing and draft structure plans that will impact transport decisions in Whitehorse. Figure 120 shows the existing and draft structure plans, including:

- SRL East Structure Plans for Burwood and Box Hill
- Nunawading Megamile – Mitcham Structure Plan
- Tally Ho Structure Plan
- Burwood Heights Activity Centre
- Burwood Village Activity Centre
- Blackburn Neighbourhood Activity Centre

Note: it is unclear whether the SRL East Burwood plan will result in the complete removal of the Burwood Village Structure plan. Upon inspection, it seems that the SRL Burwood plan takes in some, but not all of the *Burwood Village plan*. This may result in sections of the Burwood Village plan remaining intact.

The *Activity Centres Program (Section 2.2.5.2)* includes new structure plans for Mitcham, Nunawading, and Blackburn, which will supersede plans within these Station Precincts. However, depending on their extent, sections of the Megamile–Mitcham Structure plan may remain intact.

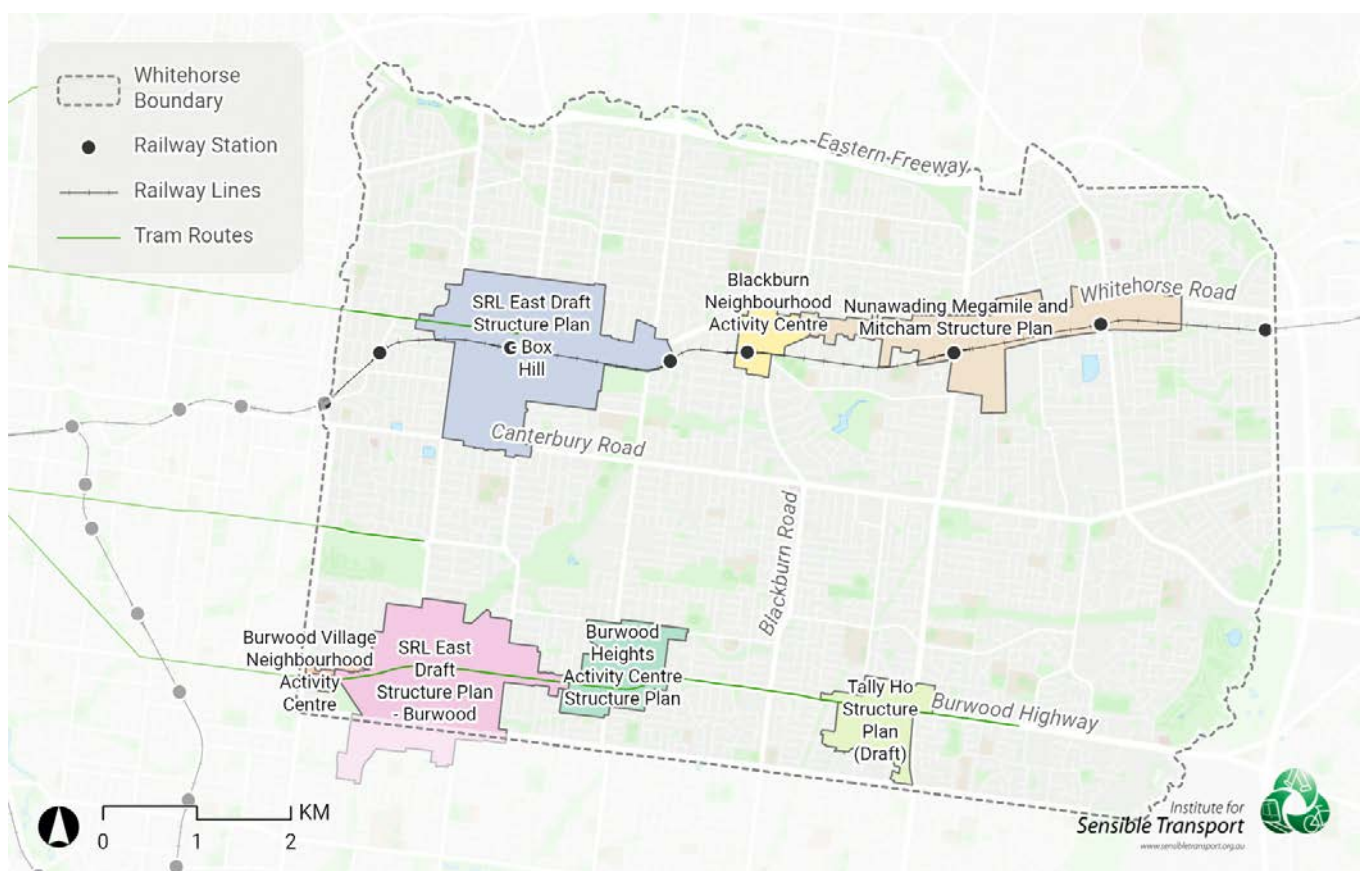


Figure 120 Whitehorse Structure Plans

Source: Institute for Sensible Transport

The existing structure plans are concentrated along key transport corridors:

- Belgrave-Lilydale railway line and Whitehorse Road/Maroondah Highway
- Burwood Highway and tramline.

This ensures that, at present, development and employment precincts are focused in areas where there are significant transport opportunities.

The structure plans generally support increased transport opportunities and a move towards less car-dependency. They mention the upgrade of key routes between locations such as Mitcham, Nunawading Stations and the Nunawading Civic Centre (*Nunawading Megamile – Mitcham Structure Plan*).

10.3.1 SRL Station Precincts (Drafts)

The development of precinct structure plans for the two Suburban Rail Loop stations within Whitehorse is currently underway. Draft precinct structure plans were released in early 2025 by the state government.

Note: For these structure plans and responses to the amendment please refer to Council's submission available on Council's website.

Key upcoming stages of the Precinct Structure plan development:

- Early 2025 - Exhibiting the plans (complete)
 - Draft structure plans and planning scheme amendments (released March 2025)
 - Seek stakeholder and community submissions and feedback
- 2025 - Public hearing
 - An independent advisory committee is convened and considers the planning documents, holds a public hearing
- 2026 - Sharing the outcomes
 - Structure plans are finalised,
 - Planning scheme amendments gazetted; structure plans are applied to all development within SRL East precincts.

10.3.1.1 Box Hill

The plan provides a strategic framework for managing anticipated population and economic growth while aiming to improve livability, connectivity, and sustainability in Box Hill.

'A thriving, culturally dynamic and cosmopolitan place where global and local communities connect.' - SRL Box Hill Vision

The plan focuses on delivering increased density alongside new active transport infrastructure, public transport interchanges and an expanded multi-use precinct. Figure 121 shows the proposed Precinct Plan Concept, key features include:

- Increased density of development in and around the new SRL station and the existing Box Hill railway station.

- Areas of most change include the area between Whitehorse Rd and the existing railway line, and the area between the railway and Surrey Park, which includes a former brickworks site.
- Proposed active transport routes along existing streets, through development precincts and connecting to existing routes.
- 'Enhanced corridors' along Whitehorse Road and Station Street, which the report mentions will have upgraded pedestrian spaces and active transport infrastructure. They will include more active and diversified commercial spaces.
- Connects different precincts within Box Hill including the Health and Education Precinct, commercial centres and existing residential areas with the areas of increased density and the SRL station.

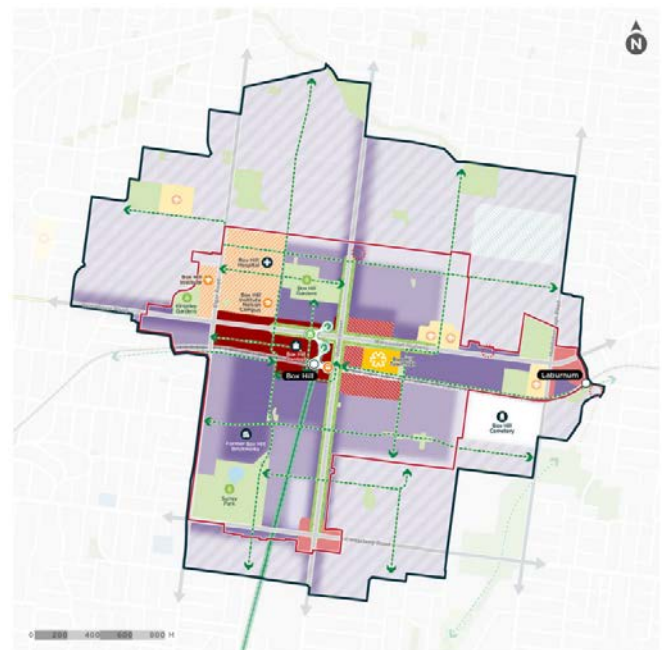
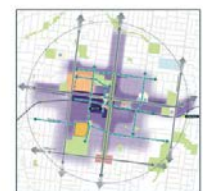


Figure 4: Box Hill Conceptual Precinct Plan



The Conceptual Precinct Plan has evolved from the Draft Precinct Plan released in the Box Hill Draft Precinct Vision in December 2023, in response to community feedback and stakeholder submissions.



Box Hill Draft Precinct Plan, December 2023

Figure 121 SRL Box Hill Proposed Future Precinct Plan

Source: Victorian State Government

Figure 122 shows the proposed height limits for developments within the PSP. The tallest buildings

will be located within the core of the precinct (up to 133 m), where there are existing residential towers. Medium density buildings will extend further out from the core along Whitehorse Road and Station Street. The increased density highlights the need for quality walking and cycling infrastructure connecting these areas to Central Box Hill.

The plan is unclear about what level of development could occur on the former Brickworks site. It indicates it as a Major Strategic Site, this ambiguousness could be in response to strong community views about what should be done with the site. Many community members hope it will be majority open space. The site does contain a large amount of contamination and further studies, and planning will be needed.

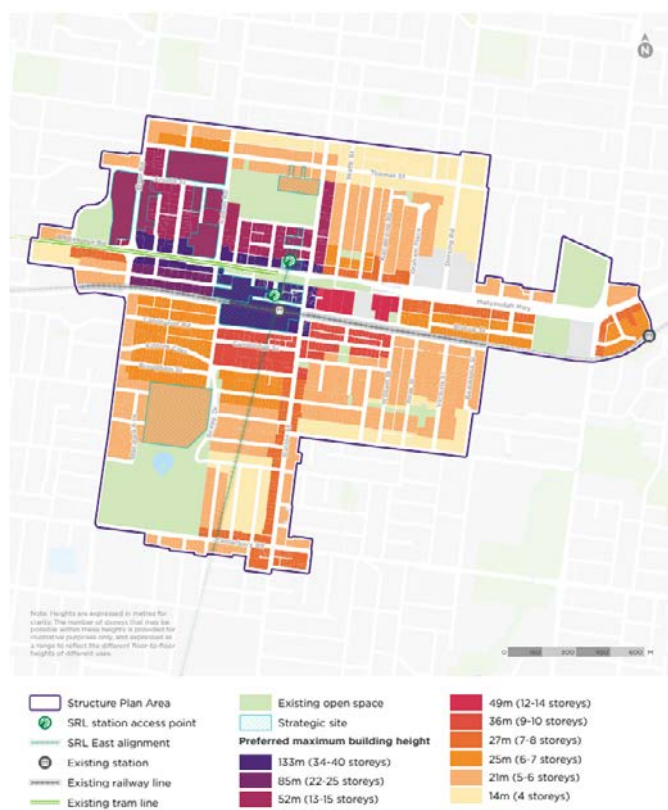


Figure 122 SRL Box Hill Structure Plan - Proposed Future Density

Source: Victorian State Government

Figure 123 indicates the key aspects of a proposed transport plan for the precinct. A key aspect of which is its mention of reducing private vehicles within the core of Box Hill. This priority reflects some of the aims of the existing *Box Hill ITS*, both of which seek to use existing major roads such as Middleborough, Canterbury and Elgar roads to direct traffic away from the precinct centre.



Figure 123 SRL Box Hill Precinct Key Directions - Proposed Transport

Source: Victorian State Government

10.3.1.2 Burwood

The plan provides a strategic framework for targeting population and economic growth around the future high capacity SRL station. The plan aims to leverage access to existing uses such as Deakin University in establishing Burwood Highway as a mixed-use economic corridor. This would integrate retail, office and residential spaces, while aiming to improve liveability, connectivity and sustainability in Burwood.

'A thriving urban centre growing responsibly in its natural environment to create a sustainable suburb.' - SRL Burwood Vision

Figure 124 presents the proposed precinct structure plan concept. It focuses the highest density increases closest to the station, lowering the heights as you move further away to assist in blending into the surrounding suburb. The majority of the precinct outside education uses, will remain residential, with a mixed-use precinct focused around the SRL station and along Burwood Highway. The plan, to the south and south-west of the SRL station, includes areas for preserving employment focused precincts, with more connections to the surrounding areas with active transport routes.

While most of the density increase is being focused south of the highway, many people will still need to cross the busy road either from the north to access the station, or from the south to access the University and schools. Whitehorse is advocating for a grade-separated crossing to increase pedestrian and cyclist safety.

The plan for Burwood takes advantage of existing green corridors to create a central spine, forming the main route within the proposed active transport network. Connecting the university with the main mixed-use and employment precincts with proposed adjoining routes.



Figure 4: Burwood Conceptual Precinct Plan

- Diversified mixed use areas**
- Significant change area
- Higher change area
- Predominantly residential**
- Higher change area
- Medium change area
- Supporting continued residential growth
- Predominantly employment**
- Higher change area
- Medium change area
- Existing schools
- Health, education and research growth
- Small retail nodes
- Open space
- Roads
- SRL East station
- Bus station
- Tram stop
- Key cross precinct connections (indicative location)
- Potential enhanced corridor
- Planning area
- Structure plan area
- Area subject to separate planning process

The Conceptual Precinct Plan has evolved from the Draft Precinct Plan released in the Burwood Draft Precinct Vision in December 2023, in response to community feedback and stakeholder submissions.



Burwood Draft Precinct Plan, December 2023

Figure 124 SRL Burwood Proposed Future Precinct Plan

Source: Victorian State Government

Figure 125 highlights the proposed density increase and development height limits for the Burwood Precinct. These include a maximum height limit of up to 20 storeys (69 m) within the precinct core, to the east of Gardiners Creek. This will give the Burwood precinct the second highest density and building height restrictions currently within

Whitehorse. It should be noted that Blackburn, Nunawading and Mitcham stations have been listed as other key locations for future PSPs by the state government's *Activity Centres Program*.

The risk imposed by this structure plan is that while Box Hill has existing major public transport infrastructure, including Box Hill Railway Station, Burwood does not. This could mean that if approved and gazetted, development could occur before the SRL station is delivered and could continue in the event a future government cancels the SRL project.

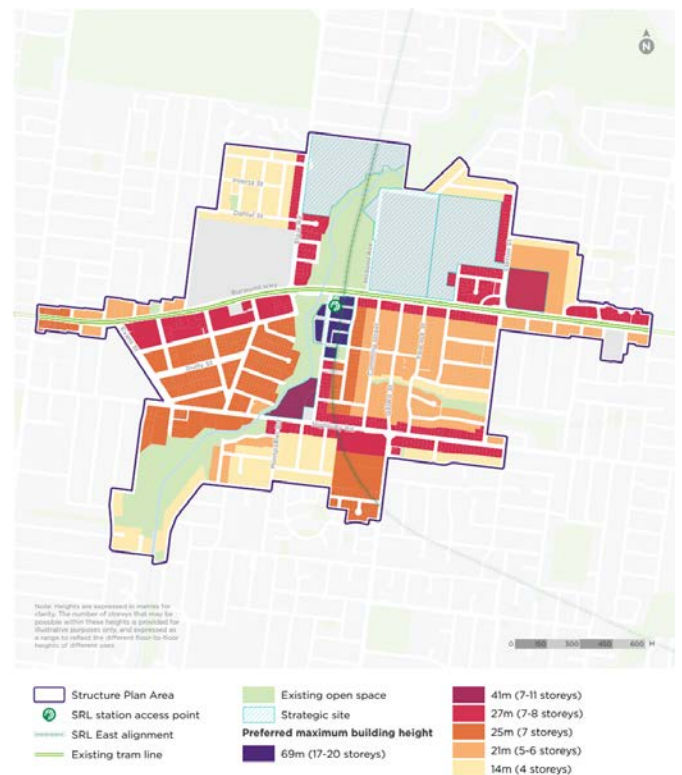


Figure 125 SRL Burwood Structure Plan - Proposed Future Density

Source: Victorian State Government

Figure 126 indicates the key aspects of a proposed transport plan for the precinct. A key aspect of which is its mention of increasing trips to and from employment and education using active transport.

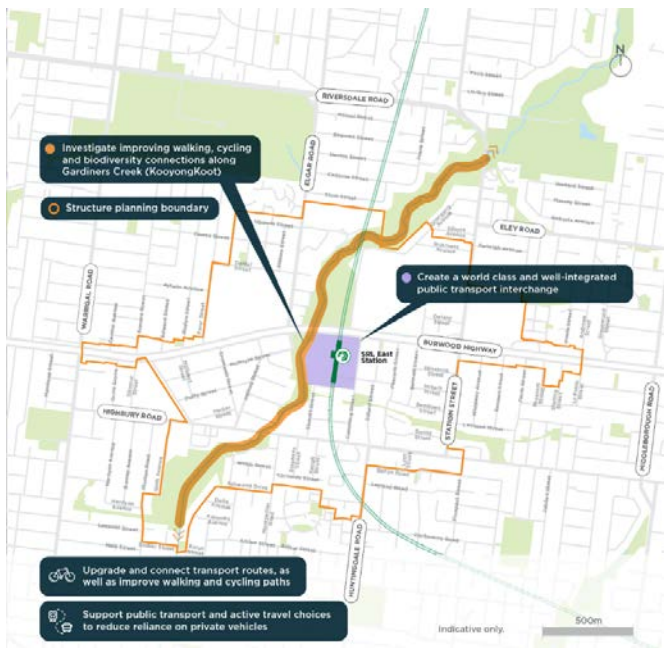


Figure 126 SRL Burwood Precinct Key Directions - Proposed Transport

Source: Victorian State Government

10.4 Future homes

VPP 53.24 sets out the Future Homes provision. Future Homes is a housing development program that supports Victoria's 2051 population projection. The selected sites under this provision can access a streamlined planning process for three storey apartment development.

Figure 127 shows the parcels of land that are eligible to participate in the Future Homes program. In line with meeting ambitious housing targets, the Victorian Government has established a fast-track process for multi-unit developments of up to 3 storeys throughout the General Residential Zone. The following eligibility criteria applies:

- The land is in a General Residential Zone, AND
- Any part of the land is within 800 meters of
 - a passenger train station, OR
 - an identified activity centre in Metropolitan Melbourne, OR
 - a designated centre outside Metropolitan Melbourne, and
- The land is not within a heritage overlay or neighbourhood character overlay, and

- The land does not have restrictions preventing an apartment development of this type.

Pre-designed plans are available for developers to purchase, they are designed to fit two side-by-side 800 sqm lots and can be altered to suit site specificities. Developments undertaking this process are exempt from third-party appeal rights, unless there is an overlay affecting the property, in which case the appeal can only relate to the overlay.

These areas will be subject to change based on future zoning changes around the SRL precincts and future Activity Centre Structure plans that will be developed for Mitcham, Nunawading and Blackburn stations.

In its present form, this plan encourages greater density in the areas highlighted in Figure 127. More diverse, sustainable transport considerations should be made within these areas due to the potential increase in dwellings and population, and the effect that could have on traffic and congestion. Reducing the need for car trips within these areas should be a priority in the development of a future WITS.



Figure 127 Future homes eligible land parcels – Whitehorse

Source: Victorian Government

Figure 128 overlays the *Public Transport Accessibility Index* over the *Future Homes* eligible sites. This highlights several areas in which the *Future Homes Program* allows for increased density in areas inaccessible by public transport. These areas are shown by bright blue; darker areas are within varying levels of transport accessibility. Most of the areas earmarked by the planning program are within *Poor/Very Poor* accessibility to public transport, rather than within *High/Very High* areas. This presents a scenario where density is increased in areas where there are little to no public transport options, leading to higher car-dependency.

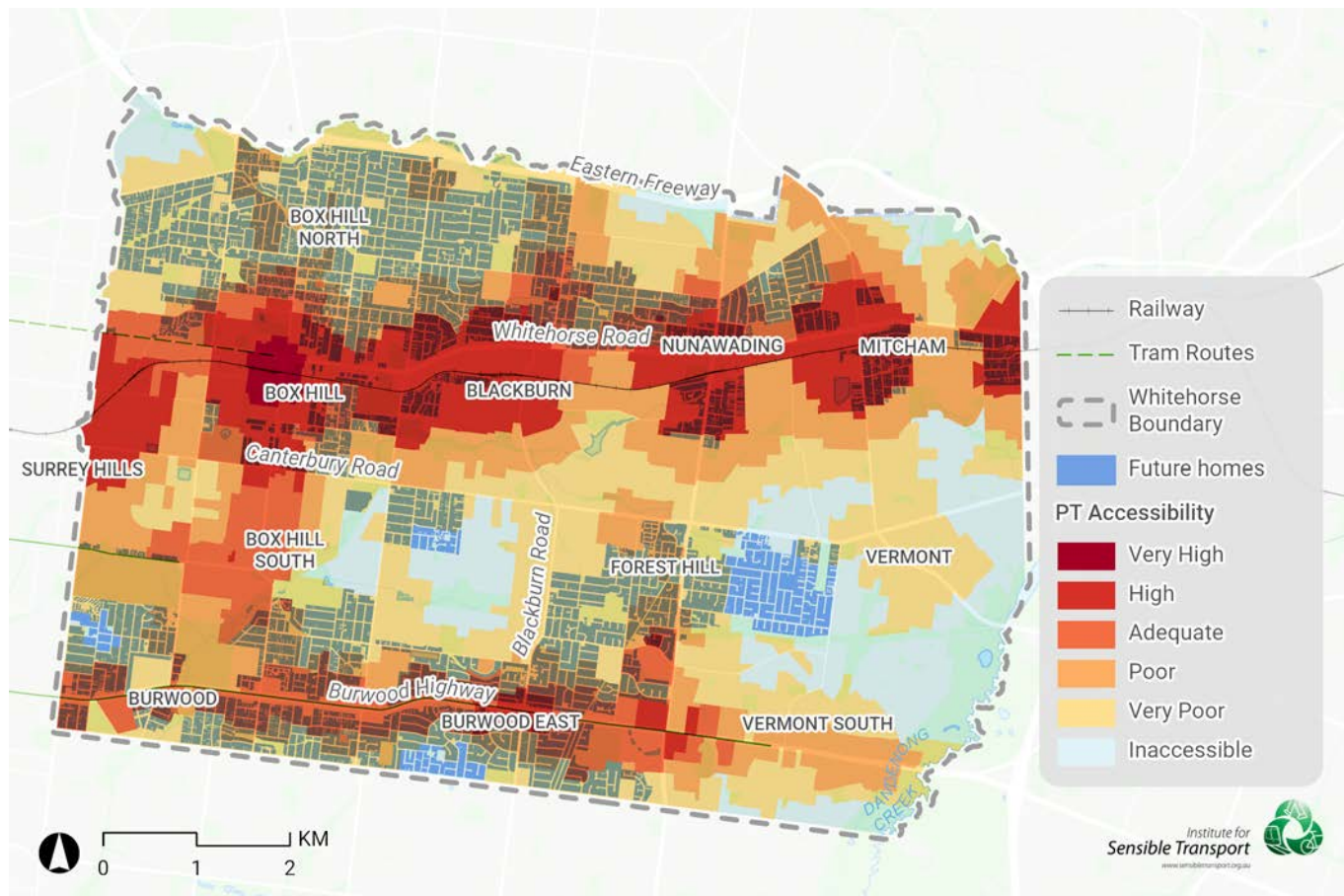


Figure 128 Public transport accessibility for future homes

Source: ABS, Census, Victorian Government, Institute for Sensible Transport

11. Scenarios of Change



Mode share targets are a key component of an Integrated Transport Strategy. It sets the goal for the strategy, considering population growth and how existing transport infrastructure will cope.

A forecasting model using Victoria in Future (VIF) and Victorian Integrated Survey of Travel and Activity (VISTA) data was developed to provide three scenarios of change for the updated WITS.

- A *'business as usual'* (BAU) scenario, where current transport practices continue, along with population growth

- A *'moderate change'* scenario, with some improvements to all transport modes to ensure a better balance to transport choices
- A *'sustainable change'* scenario, designed for a future where residents are able to move freely in and around Whitehorse regardless of the transport mode.

The existing and the 2051 target mode share for the three scenarios is presented in Figure 129. More regarding each scenario will be discussed in the following sections. The scenario that Council ultimately chooses should align with the vision and objectives for the updated WITS.

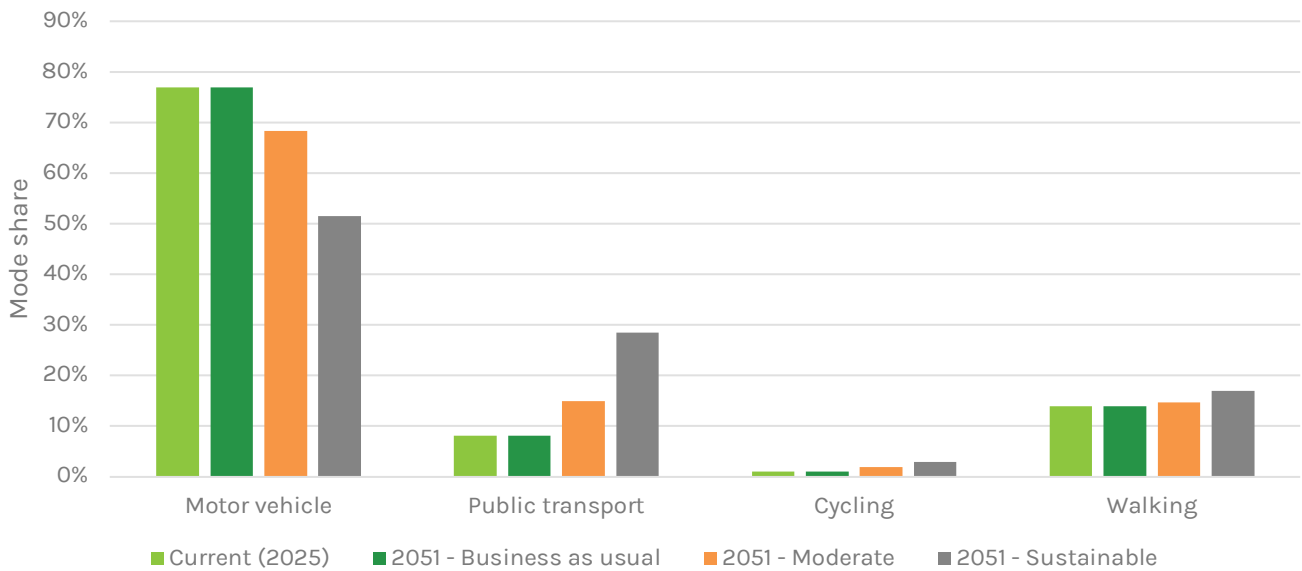


Figure 129 Existing mode share and 2051 scenario targets

Source: Institute for Sensible Transport

11.1 Business as usual scenario

State travel and population data, along with population growth forecast, was used to model a 'business as usual' scenario for all trips. The population is expected to grow by 53% between 2021 and 2051. This growth will generate more trips and more kilometres travelled.

Based on existing travel patterns, it is estimated 257,650 additional trips will be made per day, totalling 2,025 million kilometres travelled.

The projected number of trips per day is shown in Figure 130, while the projected number of kilometres travelled per day is shown in Figure 131. An increase in kilometres travelled is proportionate to population growth. If nothing changes in Whitehorse, the existing transport network and activity centres will be under traffic stress, with the congestion and parking issues exacerbated.

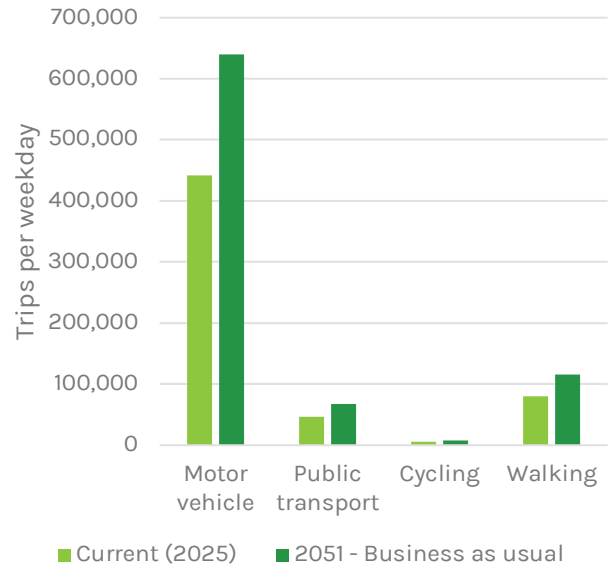


Figure 130 Business as usual, projected number of trips per day

Source: Institute for Sensible Transport

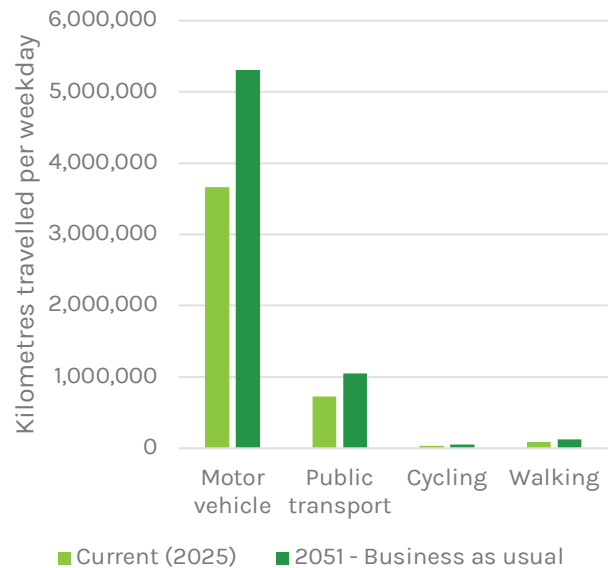


Figure 131 Business as usual, projected number of kilometres travelled per day

Source: Institute for Sensible Transport

11.2 Moderate change scenario

A moderate change scenario models what transport in Whitehorse could be like with improvements to reduce car dependency. Travelling by car will still be the main mode of transport (see Figure 129), but existing cycling rates will double, and public transport participation will increase to 15%. The access provided by the new SRL stations, discussed in Sections 6.1, and the proportion of residents travelling south towards Monash and beyond (see 7.1.3) will greatly facilitate this increase if and when the SRL is implemented.

The projected number of trips per day is shown in Figure 132, while the projected number of kilometres travelled per day is shown in Figure 133. While motor vehicles mode share is reduced by 9%, population growth will still see 126,400 more trips made by cars, and 1.05 million more kilometres travelled on Whitehorse roads. The reduction in motor vehicle mode share will grow public transport trips by 84%. Cycling trips will double and trip distances are likely to start decreasing from the existing average of 6.3 km.

A doubling of cycling mode share would represent a substantial growth in ridership, relative to historical trends. This also represents a tripling of trips made by bike over the same period. There are very few cities that have been able to achieve a significant increase in cycling participation. Factors that make growing cycling participation above 100% (doubling) possible include factors such as trip distance, cycling infrastructure and changing cultural norms.

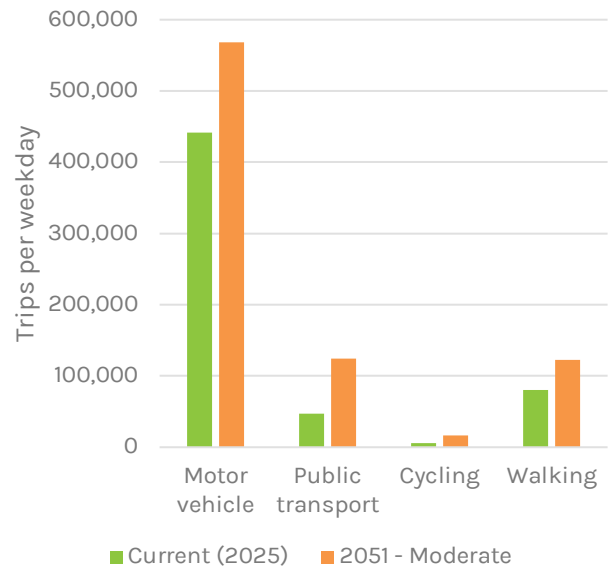


Figure 132 Moderate scenario, projected number of trips per day

Source: Institute for Sensible Transport

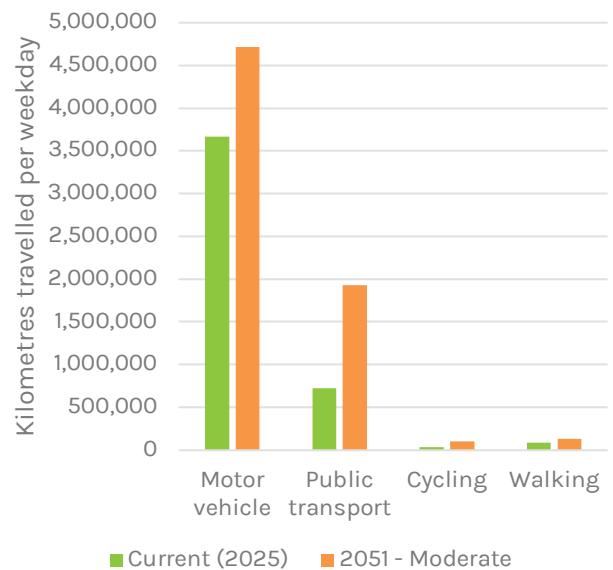


Figure 133 Moderate scenario, projected number of kilometres travelled per day

Source: Institute for Sensible Transport

11.3 Sustainable change scenario

The sustainable change scenario is underpinned by broader land-use policies, such as those included in Plan for Victoria and the Housing Strategy, which encourage all development into existing urban areas. These changes will give more people the opportunity to do more of what they need within their neighbourhood.

The sustainable change scenario is the most substantial change to mode share. It projects one in every two people will still use a car for all purpose trips (see Figure 129), yet public transport and cycling participation will triple, particularly for trips to work.

This scenario maintains driving trips at today's levels, with population increases a mode shift reduction from 78% to 51% is required to keep the same number of cars on the road.

These changes are hard and will require State and Commonwealth support to improve the frequency and integration of bus services and an extended network of bike lanes and shared paths. The changed travel patterns in the improved change scenario are estimated to result in 13,300 less car trips travelled each day (see Figure 134), and 110,700 less kilometres travelled each day by car, as shown in Figure 135.

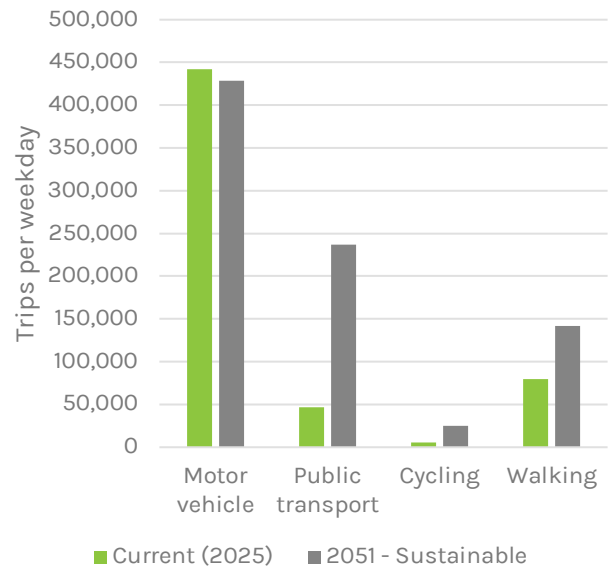


Figure 134 Sustainable scenario, projected number of trips per day

Source: Institute for Sensible Transport

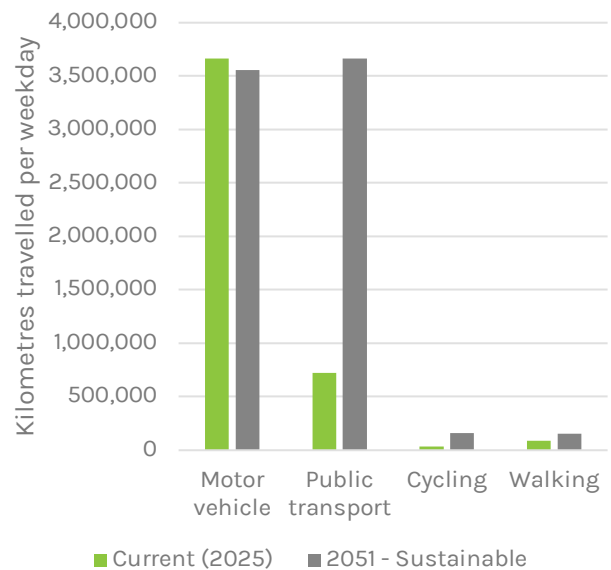


Figure 135 Sustainable scenario, projected number of kilometres travelled per day

Source: Institute for Sensible Transport

12. Best Practice



This section examines cycling strategies from a range of cities, to benchmark best practice transport planning. The review looks at a selection of Australian cities, including the City of Melbourne, Greater Bendigo, Yarra Ranges, Albury-Wodonga, Geelong and North Sydney. The aim of this section is to understand their objectives, actions, and targets. This provides a solid foundation for helping to inform the development of a future Whitehorse Integrated Transport Strategy.

12.1 City of Melbourne ITS

The City of Melbourne's *Transport Strategy 2030* provides a high quality comprehensive strategic structure to the city's transport planning priorities. Melbourne has a very different context to Whitehorse with different issues and factors impacting priorities and decision making. However, the structure provides a quality approach that could benefit Whitehorse.

Key structural qualities of the Strategy include:

- **Clear vision and strategic framing**, clearly explaining the 'why?' and providing an overview of outcomes and actions before getting into the detail.
- **Comprehensive multi-modal focus**, providing equal weight to all modes of transport where some strategies will prioritise motor vehicle traffic or public transport alone.
- **Integration with broader urban outcomes and liveability**. The Strategy ties transport planning to climate goals, public health, safety, and urban liveability. Transport is framed as a tool to shape the kind of city people want to live in. It focuses on people's experience moving through and within the city, rather than just the infrastructure itself.
- **Strong evaluation and monitoring program**. Lots of strategies lay out aspirations but fall short on accountability. The *Melbourne Transport Strategy 2030* details how the strategy will actually unfold and how progress will be tracked.

- **Future focused flexibility**. By planning for flexibility, Melbourne's strategy remains future-resilient, addressing things like automation, micro-mobility and EVs. The Strategy also looks at how technology can help reduce the need for on-street parking allowing for re-allocation to other uses.

The City of Melbourne's strategy is a user focused transport strategy, looking at the travel experience of residents and visitors, rather than purely network performance (travel times, volumes etc).

12.1.1 Presentation

The Strategy focuses on public readability in its design. The document is laid out in a clear, easy-to-read format, with maps, illustrations, and images explaining each policy and outcome to the reader. This gives a visible place-based approach to the design of the future transport network.

The Strategy also provides figures that explain the process and ensure the reader does not need an expert knowledge of transport planning to understand the Strategy. Figure 136 provides an example diagram explaining the roles and responsibilities for different infrastructure types within a given street.

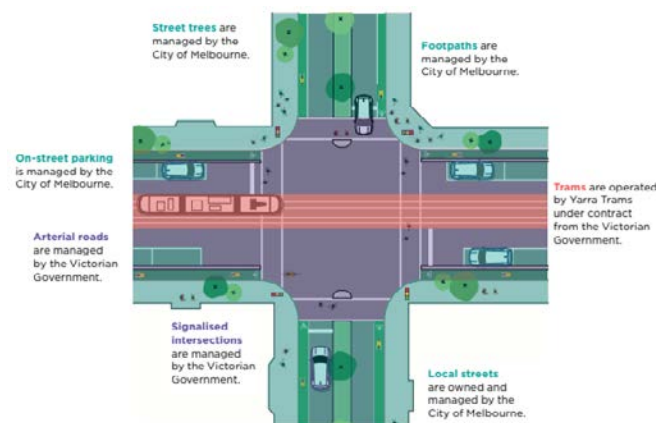


Figure 136: Road management roles and responsibilities

Figure 136 Road Management roles and responsibilities, City of Melbourne

Source: City of Melbourne

The Strategy does well to relate transport changes and having more diverse options directly to users lives. This is done throughout the document, providing the experiences of different users, both residents and those travelling to the city. Whitehorse would benefit from a similar approach, bringing the community into the strategy and

making it experience focused. This can help show how different actions can improve lives.

Evidence base: could electric bikes change cycling in Melbourne?

Recent e-bike technical developments and expanded range have resulted in rapid growth in use. Research from Oslo estimates that owning an e-bike avoids 87 to 144 kilograms of CO₂ annually. E-bike riders also experience significant health benefits. While the work rate is around 60 to 70 per cent of a conventional bike, the health benefits are similar as e-bike riders tend to ride further and more often.

If 5 per cent of people who work in the municipality and live between 7 and 14 km from the centre of the city switched from a car to an e-bike, an extra 5782 people would commute to central Melbourne by bicycle. This is the equivalent of adding almost three extra lanes onto the Monash Freeway.



"I love my electric bike, you get to experience the environment more than when you're stuck inside a car. It's helped me feel more confident to ride."

- Jackie, Brunswick East

Figure 137 Example user experience - Melbourne Transport Strategy 2030

Source: City of Melbourne

12.1.2 Implications for Whitehorse

Adopting a structure similar to the City of Melbourne's Transport Strategy 2030 could deliver a range of benefits to the City of Whitehorse, helping it respond to growth, modern mobility needs and sustainability goals.

This approach would enhance the liveability of local centres like Box Hill, Blackburn, Nunawading, Burwood and Mitcham by prioritising pedestrian access, reducing congestion, and encouraging local economic activity. Improved walking and cycling infrastructure would promote healthier lifestyles and reduce emissions. At the same time, a stronger focus on public transport and local connectivity would support those who don't drive, such as young people, older adults, or lower-income households.

This structure would help future-proof Whitehorse by planning for growth, densification, and emerging mobility technologies such as electric vehicles and on-demand transport. The inclusion of clear implementation timelines and monitoring processes would also make it easier for council and community to track progress and prioritise investment.

12.2 Bendigo ITLUS

The *Greater Bendigo Integrated Transport and Land Use Strategy (ITLUS)* was created in 2015. It was intended to offer a strategic approach to meeting the future transport, development and housing needs of Greater Bendigo – one of Victoria's fastest-growing regional cities. The Strategy is quick to highlight that the motor vehicle is the main mode of transport in Greater Bendigo. Only 5.4% of trips to work are by walking and cycling (4.4% in Whitehorse). One of the distinctive aspects of the Strategy is that it is not focused solely on transport but also includes land use. This is strong evidence that it is important to consider both of these issues together.

This strategy is highly relevant to the development of a WITS due to the contextual similarities between Greater Bendigo and Whitehorse. These include high car dependency and exponential predicted population growth over the coming decades.

12.2.1 Main objectives

The main objectives of the Transport Strategy are:

- Connecting Greater Bendigo
- Healthy Greater Bendigo
- Moving Greater Bendigo
- Engaging Greater Bendigo
- Inspiring Greater Bendigo.

Greater Bendigo has since supplemented this strategy with ambitious 2035 mode share targets of 1/3rd Active Transport and 1/3rd Public Transport.

12.2.1.1 Current issues

Greater Bendigo faces the following challenges:

- Housing growth and an ageing population
- Only 35% of Bendigo's population lives along the North-South 'Spline' where there is access to a full suite of transport options
- Bus services are infrequent and underused
- Train travel within Bendigo is poor and limited
- Private vehicles remain the dominant transport mode – accounting for 85 % of weekday commuter trips (84% in Whitehorse)
- Population growth which requires an investment in infrastructure growth
- Increased traffic congestion
- Cost of car dependency
- Equity of access.

When looking at the issues identified above, there are clear cross-overs with Whitehorse. Most, if not all the issues above are also seen in Whitehorse in some way.

12.2.2 Delivering the Transport Strategy

12.2.2.1 Connecting Greater Bendigo

The Strategy aims to establish Greater Bendigo's Activity Centres as thriving and well connected.

With this concept, all modes of transport will be improved and promoted to provide a better choice of transport.

12.2.2.2 Healthy Greater Bendigo

Most of urban Bendigo is within a 10-minute walk or cycle from an existing activity centre and a local primary school. To support a healthier Bendigo, the Strategy aims to promote active travel and improve public transport. Additionally, the Strategy identifies the potential for electric bikes to increase the uptake active travel.

12.2.2.3 Moving Greater Bendigo

The Strategy aims to optimise the use of land and infrastructure to extend the life of existing road network. The Strategy will work with VicRoads to apply a SmartRoad User Hierarchy to the Bendigo road network. The existing car parking provision will be reviewed to provide a more liveable urban area.

12.2.2.4 Inspiring Greater Bendigo

The Strategy seeks to establish an inspiring, collaborative and transparent governance model and a clear path for implementation of the Strategy. The Strategy seeks to lead and inspire change through innovation and by participating in pilot and case studies to improve the transport provision. The Council has allocated a budget for walking and cycling.

12.2.3 Presentation

The Strategy included a number of engaging infographics. These are used to enhance the communications quality of the document and help people understand the transport challenges Bendigo faces and the solutions designed to overcome these challenges. A number of these graphics are shown below (Figure 138).

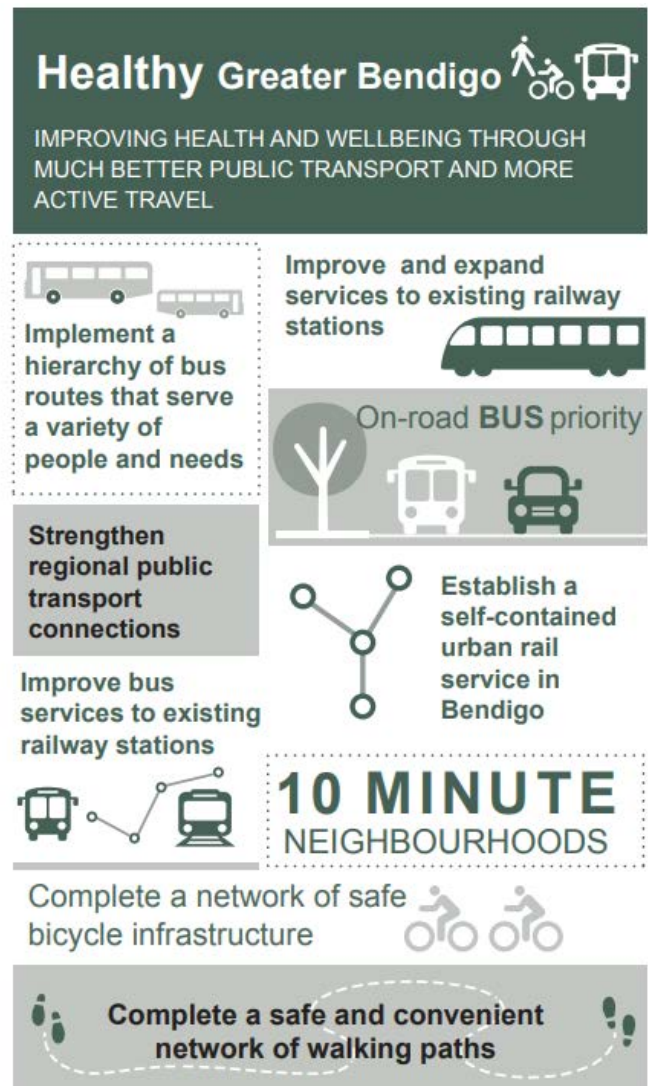


Figure 138 Infographics used as part of the ITLUS

Source: ITLUS

These directions, set out by Bendigo, appear to align very closely with many of Whitehorse's strategic objectives, such as boosting the diversity of transport options and maximising the use of sustainable mobility. It is, therefore, likely that much of the higher-level strategic content found in the Bendigo Strategy is highly relevant to Whitehorse. Figure 139 provides a pictorial description of Bendigo's approach to the Strategy, in terms of the areas it covered.

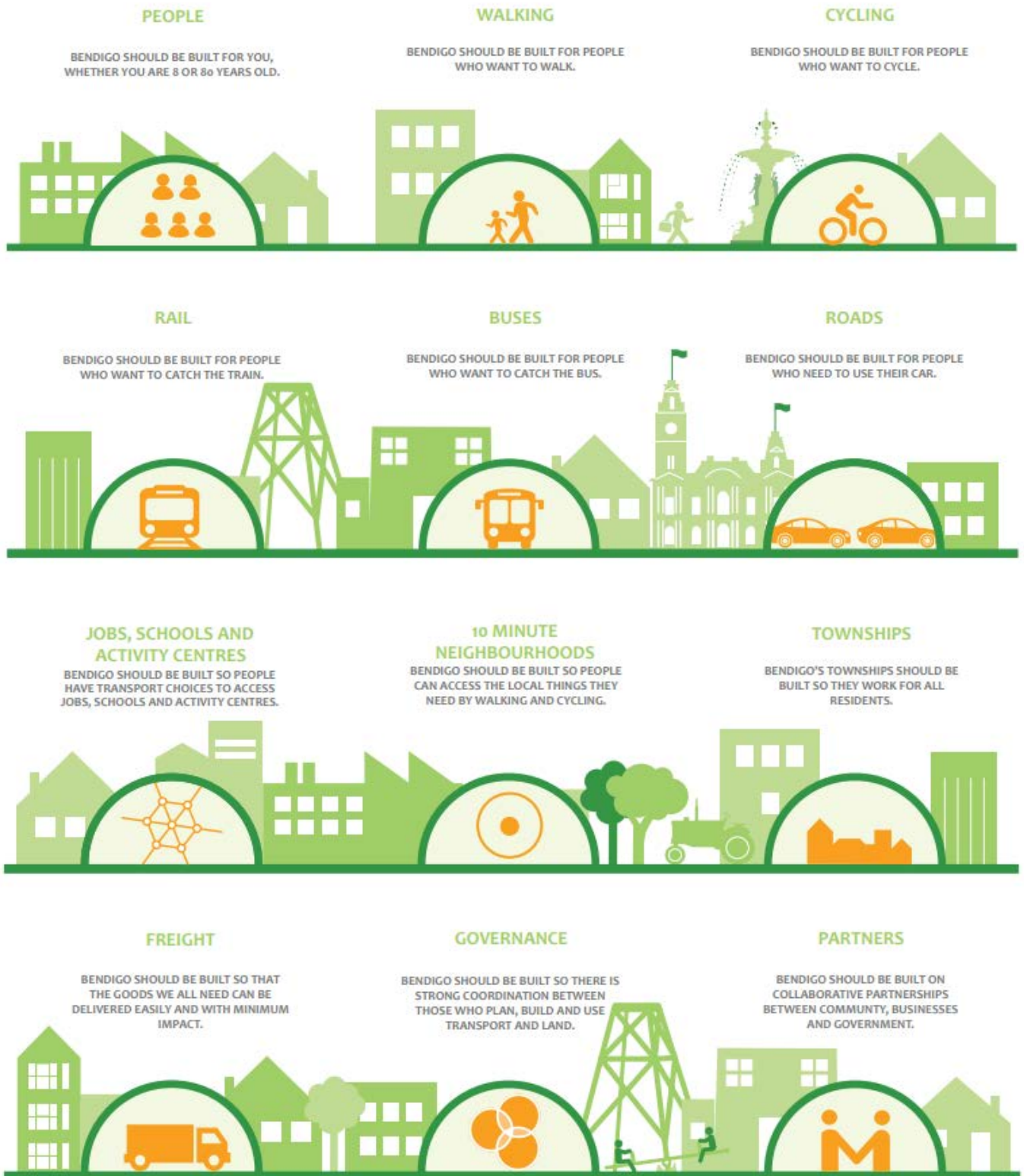


Figure 139 Bendigo's approach to the ITLUS

Source: ITLUS

One of the strongest, most consistent themes within the Strategy is the focus on reducing sprawl and densifying built-up areas with good access to services and public transport. Again, the Strategy makes good use of imagery and maps. This is a theme that the future WITS could benefit from. Moreover, the creation of a transport system in

which walking and cycling become the default modes for these trip types aligns with many of Whitehorse's wider strategic objectives. These can include strategies to encourage more walking and cycling to key public transport interchanges, rather than driving.

12.2.4 Implications for Whitehorse

During the development of the Strategy the collaborative work with stakeholders help to create a document that aligned with community aspirations for Bendigo. A number of behaviour change projects were undertaken, liaison with the Victorian State Government is underway to improve public transport and the Council has allocated budget for walking and cycling.

The Bendigo Strategy offers the following learnings as Whitehorse begins the process of developing its future ITS:

- The Strategy directly addressed policy failings of the past and sought to amend these. Specifically, this relates to the desire in past decades to spread development towards the periphery of Bendigo. This was then followed by an attempt to cater to the transport needs of these dispersed communities via road building. The Strategy was developed to change this policy direction, towards consolidated development and the provision of sustainable mobility options, in preference to additional road building. The Whitehorse ITS may benefit from taking a similar approach. This is particularly relevant as Whitehorse moves towards becoming an LGA with density focused around transport hubs (*SRL, Activity Centres Program*). This would provide the opportunity to develop communities where new residents do not need a car for everyday travel.
- Being open to do things differently. The Strategy has been explicit that they must be ‘open to exploring opportunities to do things differently’, and this is something all local councils, including Whitehorse, can benefit from
- Identification of ‘short trips’ play a key role in influencing travel behaviour change. A Whitehorse ITS should focus on achievable targets for sustainable mobility, especially for short car trips. Local government is able to influence this via the creation of more walkable and cyclable communities.
- Mode shift is not just about infrastructure provision. The Bendigo Strategy has been explicit that the way land is used, and the density of development, and the mixing of land uses are critical to people’s trip choices.

- To encourage a modal shift, new initiatives to encourage active travel should be sought and implemented for the Strategy.
- The Strategy should explore the most effective means of community engagement. The population and demographic of Whitehorse is extremely diverse, therefore, effective engagement with each user group is vital to support travel behaviour change.

12.3 Yarra Ranges ITS: *Connected*

In 2019, Yarra Ranges embarked on the development of a 20-year Integrated Transport Strategy. This process took around 12 months and involved extensive community and professional stakeholder consultation. Yarra Ranges is a peri-urban area on the edge of metropolitan Melbourne, and includes both built up and rural areas.

12.3.1 Big issues facing Yarra

The Strategy highlighted the big issues in Yarra Ranges, each of which have a relationship to transport. These issues are illustrated in Figure 140.



Figure 140 Big issues facing Yarra Ranges

12.3.2 Key themes

The key themes included in the Yarra Ranges Integrated Transport Strategy are captured in Figure 141.

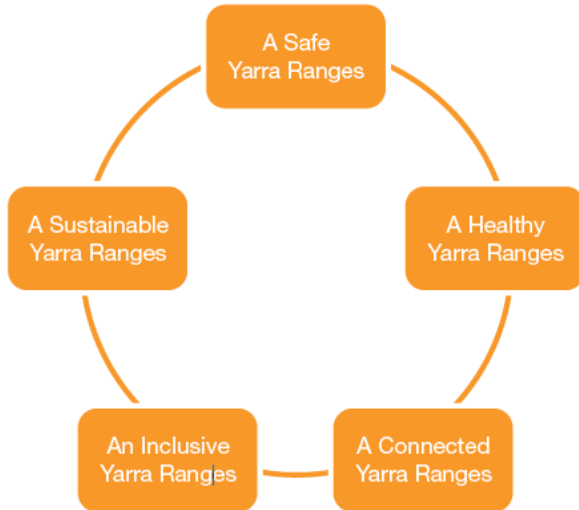


Figure 141 Key themes

12.3.3 Vision and guiding principles

The Integrated Transport Strategy's vision was *'Transport in Yarra Ranges provides safe, efficient access for the whole community, while protecting the natural environment and unique character of its townships and villages.'*

The vision was supported by six guiding principles, as captured in Figure 142.

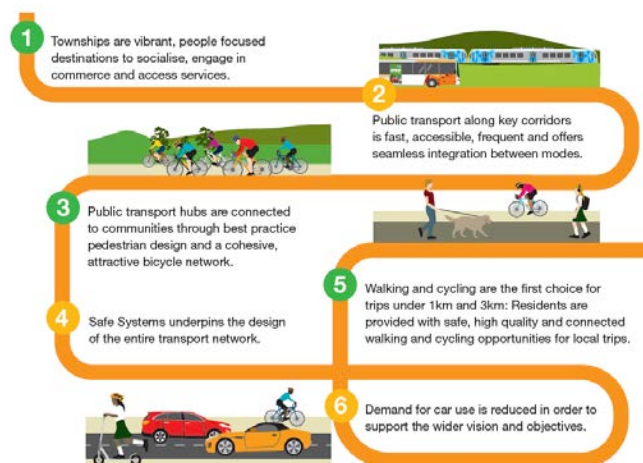


Figure 142 Guiding principles

12.3.4 Targets and mode hierarchies

The Yarra Ranges Integrated Transport Strategy contains a target of a 20% reduction in car use. By achieving this goal, the network will perform more

efficiently and enable those that must drive to have a more reliable journey.

Figure 143 provides a snapshot of the Yarra Ranges Integrated Transport Strategy mode share targets, both at the time the document was prepared, as well as a target for 2036. These targets were developed in order to provide Council with a goal to work towards and evaluate their performance.

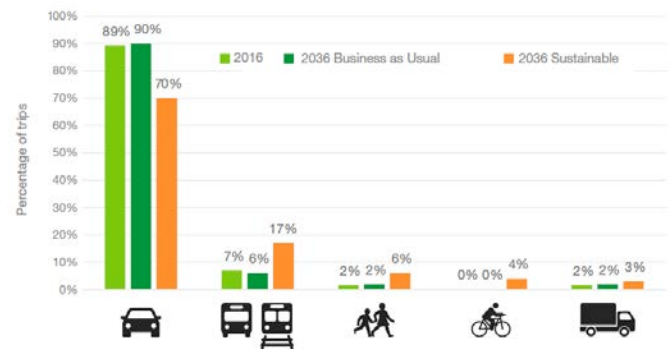


Figure 143 Journey to work, now and future targets

The targets cannot be met without re-evaluating the way in which road space is allocated. The lack of road space dedicated to active and public transport reduces opportunities for people to travel more sustainably.

12.3.4.1 Major moves

Connected summarised the key moves it was going to implement in order to achieve its transport targets. These moves, many of which apply to the Whitehorse context, included:

- Apply 20-minute neighbourhood principles with active transport priority
- Create a coherent, attractive and safe cycling network
- Advocate for transport infrastructure, especially with regard to public transport and high-quality bicycle infrastructure
- Capitalise on large transport infrastructure projects
- Introduce real time parking information displays
- Integrate railway stations with the wider transport network, especially walking and cycling.
- Create an electric vehicle charging network.
- Monitor and act on emerging transport technology.

12.3.5 Street design concepts

A key determinant in people’s decision to use sustainable transport is the degree to which the street supports safe, convenient travel by foot and bicycle. Given that a significant percentage of trips are within a walkable or cyclable distance in Yarra Ranges, a series of street cross sections were developed. These are intended to be used when an existing street is being re-developed, or when a new street is being established in a greenfield site. Some examples of these street designs are shown below. Figure 144 presents a preferred street design for an Activity Centre. In this design, kerbside car parking is provided only on one side, to enable a better balance with other modes of transport. This included protected bicycle lanes and wider footpaths with large tree canopies.

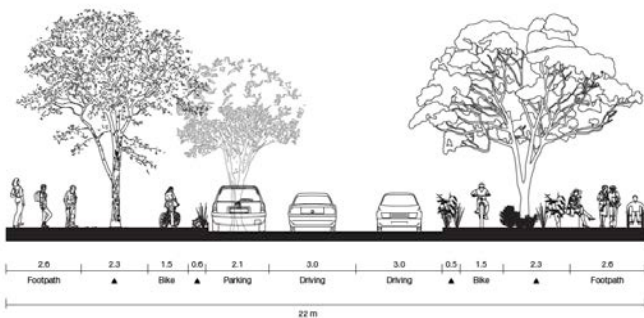


Figure 144 Activity Centre Street - Preferred Design

12.3.6 Car parking

A car parking management framework was developed as part of the Strategy and is designed to assist Council in making transparent and consistent decisions that work to support wider strategic objectives. This is captured in Figure 145.

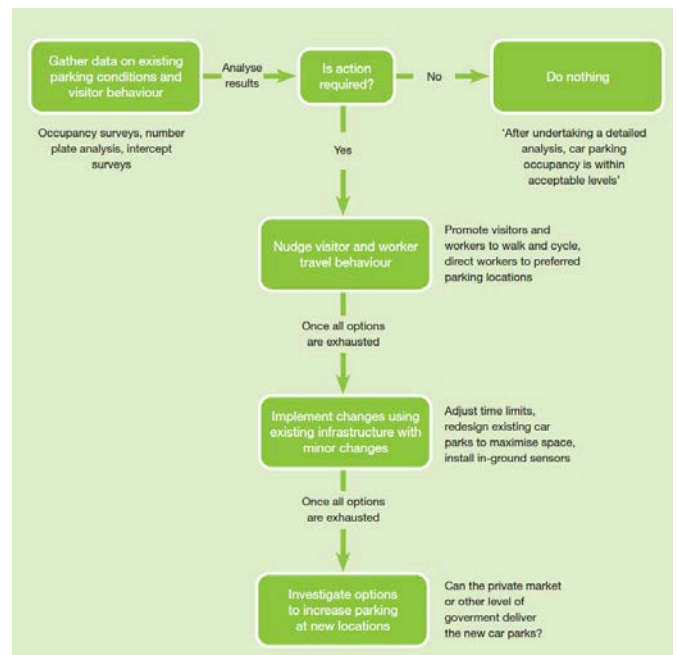


Figure 145 Yarra Ranges Parking Decision Making Framework

12.3.7 What Yarra Ranges is not going to do (and why)

An important element of the Strategy describes what Yarra Ranges is *not* going to do. This includes:

- Create new residential or large-scale commercial land releases beyond an easy walk from high quality public transport.
- Build additional car parking as our first response to concerns regarding parking problems.

The reason Yarra Ranges have decided against doing either of the activities identified immediately above is because it reduces transport options and creates car dependent communities.

12.4 Warrnambool

Warrnambool is a regional centre in the western district of Victoria. It is smaller than Whitehorse, at 35,000 residents, however, it consists of many of the same demographic and employment characteristics. Warrnambool is equally car dependent but has managed a number of street space re-allocation projects within the key activity centre.

Liebig Street is the main shopping street in Warrnambool. It has a mix of local businesses lining the street and parking along both sides of the road. Liebig Street has recently undergone a major uplift. The key changes to the street include:

- Repaving and widening the footpath
- Replacing some parking bays with trees
- Easing the kerb between the street and footpath
- Extra seating and shading
- Electric Vehicle charging
- Raised zebra crossings on each leg of the roundabouts
- Reduction in speed limit to 30 km/h.

Google Street View provides an excellent time series of change for Liebig Street. Figure 146 shows the street in 2008, with wide travel lanes, no pedestrian priority, and limited street amenity.



Figure 146 Liebig Street (2008), Warrnambool

Figure 147 shows the latest iteration of the street, with zebra crossings installed, more trees and street greening, seating, and a speed limit reduction to 30 km/h.



Figure 147 Liebig Street (2018), Warrnambool



Figure 148 show the change between 2014 (left) and 2020 (right) for the same intersection, from a bird's eye view. Liebig Street is an excellent example of making substantial change over time through an incremental approach.



Figure 148 Liebig Street (2014) and (2020)

12.5 Geelong Northwest Growth Area

The *Greater Geelong Northwest Growth Area Parking Assessment* is focused on ensuring that the parking supply aligns with projected changes in site use. It also addresses workforce growth and evolving transport patterns while supporting the city's broader sustainability and mode shift objectives.

12.5.1 Relationship between density and carparking

The report demonstrates that as site density increases, reliance on private car use can be effectively reduced, particularly when supported by high-quality alternatives such as active transport infrastructure and public transit. Rather than responding to higher density with expanded parking provision, the strategy adopts a progressive approach that prioritises mode shift, efficient land use and sustainability outcomes. This aligns with best-practice transport planning, where increased density is leveraged to support lower car dependency and a more sustainable transport system.

12.5.2 Implications for Whitehorse

The report concludes that the existing car parking supply is adequate for current and near-term demand. It recommends against constructing additional car parking, even as site density increases. Instead, it recommends:

- Greater investment in other modes to provide greater transport choice
- Using technology to create a demand responsive parking strategy
- Re-allocation of underutilised space and shared use arrangements
- Improving access to public transport, enhancing walking and cycling infrastructure, and providing end-of-trip facilities (like secure bike parking and showers).

13. Bringing it all together



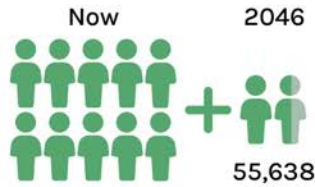
The infographic in Figure 149 captures a snapshot of the key findings from this background report.

Whitehorse Transport Background Study

Transport and Demographics



Median age of **39 years** slightly higher than the average for Greater Melbourne (37 years)



The population of Whitehorse is expected to see **31%** in growth by **2046**
Source: VIF Forecasts

Travelling to work

82% of residents travel to work **by car**

Source: ABS Census

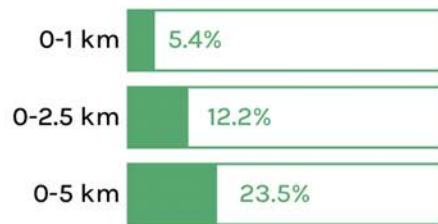


Where residents work



73% live in Whitehorse but work outside

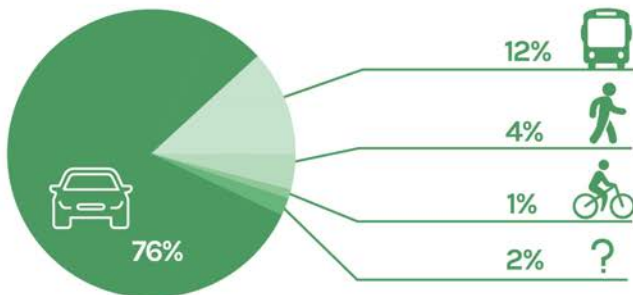
27% live and work in the City of Whitehorse
Source: ABC Census



23.5% are **5km or less**
Source: ABS Census

1 in 8 trips to work are less than **2.5km**

Travel in general



Extensive footpaths but **poor cycling infrastructure**, only 0.9% of all trips are by bike
Source: VISTA Travel Survey

Residents are **10 times** more likely walk than ride a bike.
Source: VISTA Travel Survey



Females make shorter trips and are more likely to walk or take public transport compared to males

Whitehorse is well serviced by public transport routes, however they are **INEFFICIENT** and **INFREQUENT**



Road safety

56% of crashes occurred on roads with speed limits of 60-70km/h
most intersections of arterial roads are crash hotspots

Source: VicRoads



Institute for **Sensible Transport**
www.sensibletransport.org.au



Figure 149 Transport and demographics in Whitehorse

13.1 Key issues and opportunities

Through the in-depth analysis of transport data, existing infrastructure and strategic documents, key issues and opportunities have been identified. Figure 150 provides a summary of the key issues/barriers as well as key opportunities that have been identified as most important to consider in the future WITS.

Topic	Issues / barriers		Opportunities	
Walking	Lack of mid-block crossings over arterial roads	Poor pedestrian safety	Promote walking through more pedestrian focused design	
		Poor network connectivity resulting in long distances and travel times		
Cycling	Fragmented cycling network with poor coverage, and disconnected from key destinations	Poor safety for people on bikes	Connect key destinations, future infrastructure, shared paths with high quality cycling options	Investigate options to provide protected bike lanes and modal filters along key routes
	Lack of dedicated and protected infrastructure.			
Public transport	Takes longer and is more expensive compared to driving	Bus routes are infrequent and indirect	Advocate to align timetables between different services	Advocate for bike racks on buses
	Lack of integration of transport modes			
Motor vehicles and parking	High levels of car dependency and high road traffic volume	Imbalances between car parking supply and demand	Reduce speed limits around activity centres and local streets	Implement the Safe System Approach in decision making
Land Use and public realm	Planning scheme encourages more density outside of public transport catchment	Low density built form	Passive surveillance incorporated in the design of built form.	Focus development in areas with high quality public transport
		Limited vibrancy and people-focused streets		
General	Social and cultural biases against sustainable transport options	Rising transport emissions	Integrate emissions reduction considerations in all transport projects and policies	Behaviour change programs

Figure 150 Key Issues and Opportunities

Source: Institute for Sensible Transport

14. Cost Estimate



This section provides guidance to Council on high levels costs typically associated with the development of a local government Integrated Transport Strategy. Site assessment and actions are a core deliverable for every ITS and these costs are included in all price estimates shown below.

Table 13 provides an indication of the costs for items included in the RFQ.

Table 13 Cost for items included in the RFQ

Item	Cost range
Community engagement using this Background Study, internal workshop, engagement with key external stakeholders and consultation through Council's community engagement platform	\$24,000 - \$34,000
Development of draft WITS	\$36,000 - \$44,000
Community consultation on the draft WITS, with a minimum of an internal workshop, two community pop up sessions, surveys for hard to reach groups, and consultation through Council's community engagement platform	\$34,000 - \$39,000
Analysis and provision of a summary report of the community consultation	\$7,000 - \$9,000
Final WITS based on consultation	\$13,000 - \$19,000

In addition to the high level costs shown in Table 13, we have also provided cost ranges for three different approaches to the development of an ITS, based on different levels of engagement (see Table 14). It should be noted that as the background data and policy analysis has been completed as part of this project, ~\$35,000 can be deducted from these cost estimates.

Table 14 ITS cost estimates, with various levels of engagement

Item	Cost range
Integrated Transport Strategy in which Council conducts all engagement activities, with consultant providing some guidance.	\$100,000 - \$120,000
Integrated Transport Strategy in which consultant provides two rounds of community engagement and internal Council engagement	\$160,000 - \$200,000
Integrated Transport Strategy in which consultant provides two rounds of community engagement and six rounds of internal engagement, at every stage of the development of the ITS.	\$250,000 - \$280,000

Appendix – Census data



A.1 Journey to work Mode Share by Suburb (SA2)

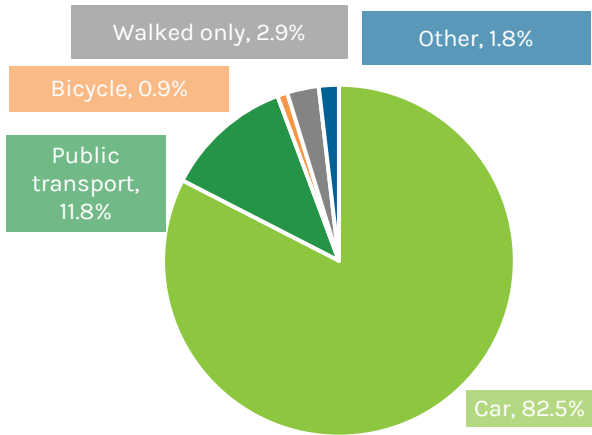


Figure 151 Journey to Work Blackburn

Source: ABS Census

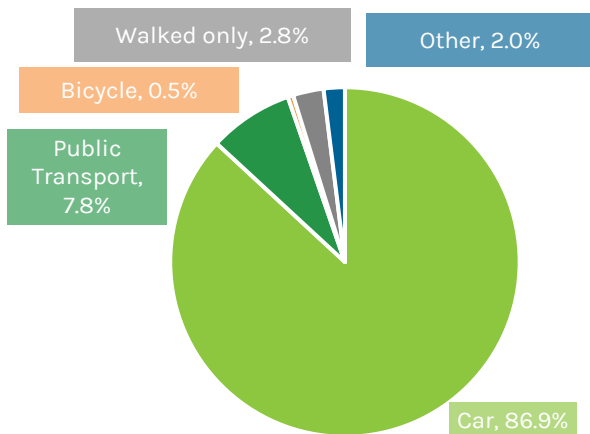


Figure 152 Journey to Work Blackburn North

Source: ABS Census

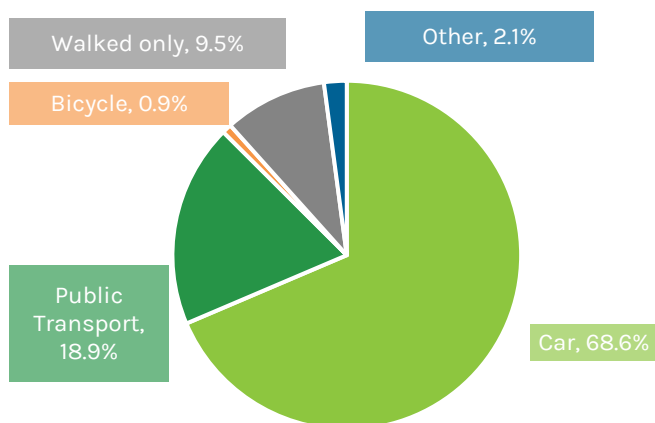


Figure 153 Journey to Work Box Hill

Source: ABS Census

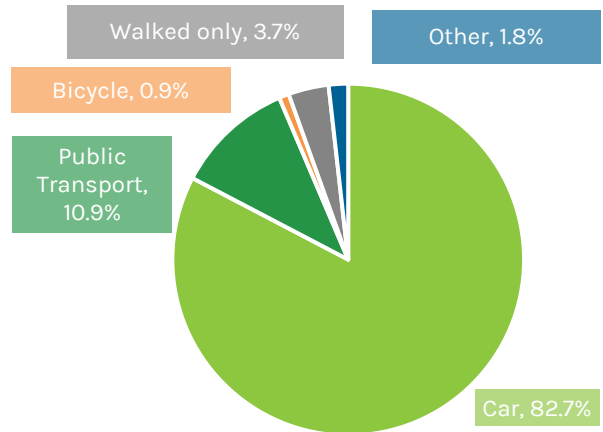


Figure 154 Journey to Work Box Hill North

Source: ABS Census

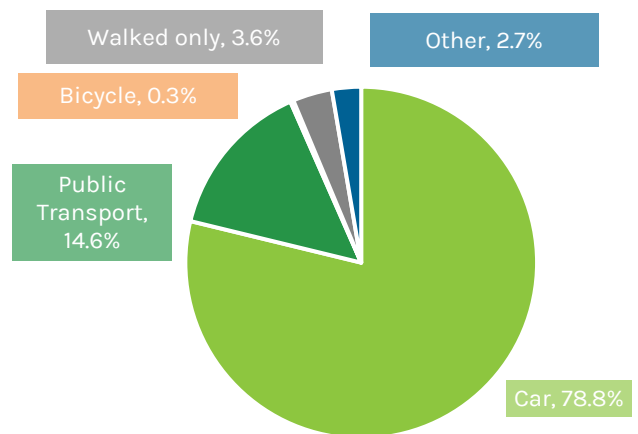


Figure 155 Journey to Work Burwood

Source: ABS Census

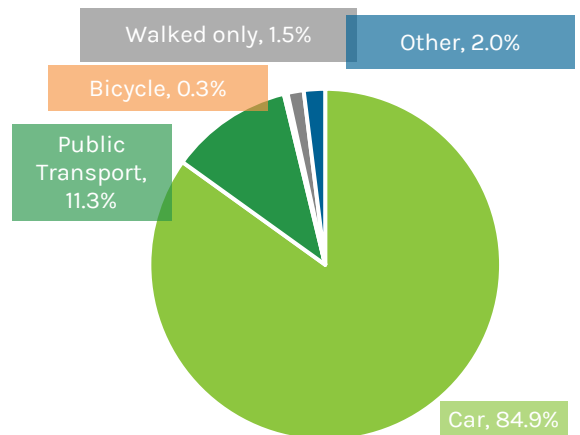


Figure 156 Journey to Work Burwood East

Source: ABS Census

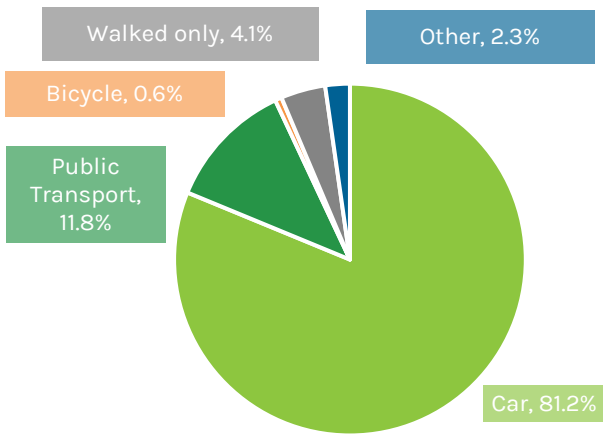


Figure 157 Journey to Work Surrey Hills

Source: ABS Census

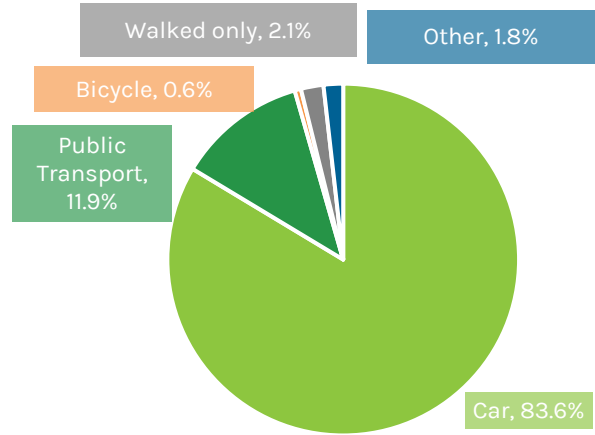


Figure 160 Journey to Work Nunawading

Source: ABS Census

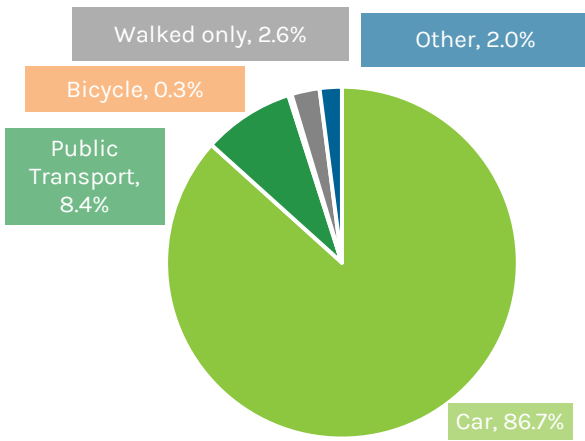


Figure 158 Journey to Work Forest Hill

Source: ABS Census

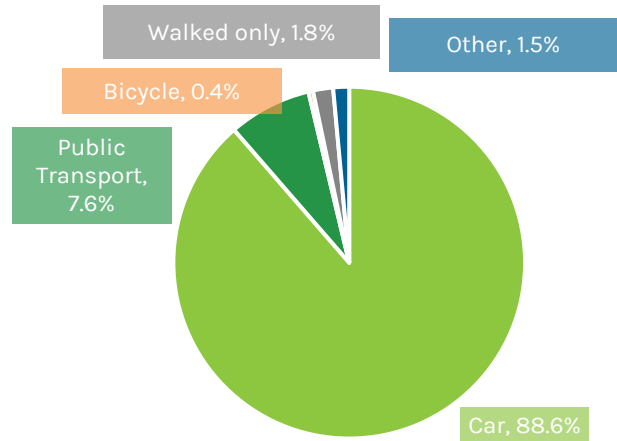


Figure 161 Journey to Work Vermont

Source: ABS Census

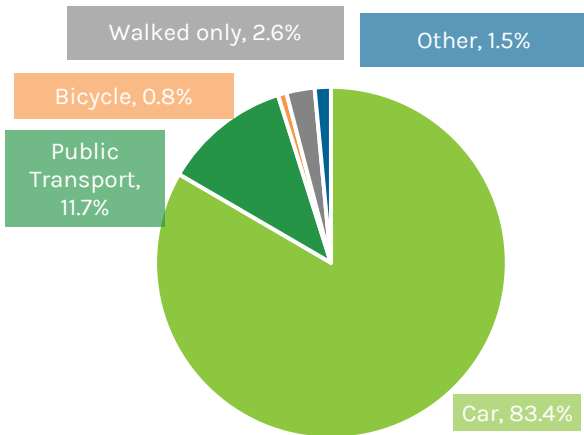


Figure 159 Journey to Work Mitcham

Source: ABS Census

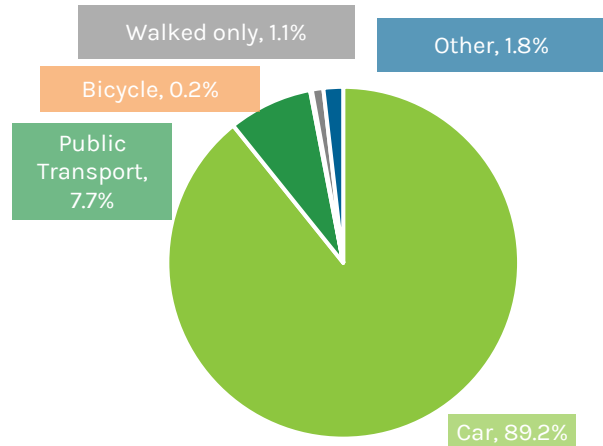


Figure 162 Journey to Work Vermont South

Source: ABS Census

A.2 Bike and Micromobility Use Propensity Index

High quality bicycle infrastructure can be expensive and government budgets are limited. Therefore, it is important when planning a future cycling network to determine the spatial variation in the *latent demand* for cycling. Through peer reviewed research, a number of Census collected variables have been isolated, in order to provide a heat map of latent demand for cycling, known as the *Bike and Micromobility Use Propensity Index*.

The Index is based on seven Census collected variables that are statistically significant predictors of bike and micromobility use, shown in Figure 163. In sum, these maps provide a clear illustration of the spatial variation in latent demand for cycling in Whitehorse.

The Index can help guide areas for future investment in cycling infrastructure by identifying the areas where the greatest uptake in cycling is likely to occur. Actions focusing on high propensity areas are likely to include infrastructure projects, but should also consider behaviour change initiatives and other support programs to encourage greater cycling uptake. This exercise is particularly useful for Whitehorse, which has a disconnected network of off-street trails and shared paths with on-street infrastructure largely consisting of sharrows. Currently there is minimal high-quality safe cycling infrastructure connecting key locations highlighted in this propensity index.

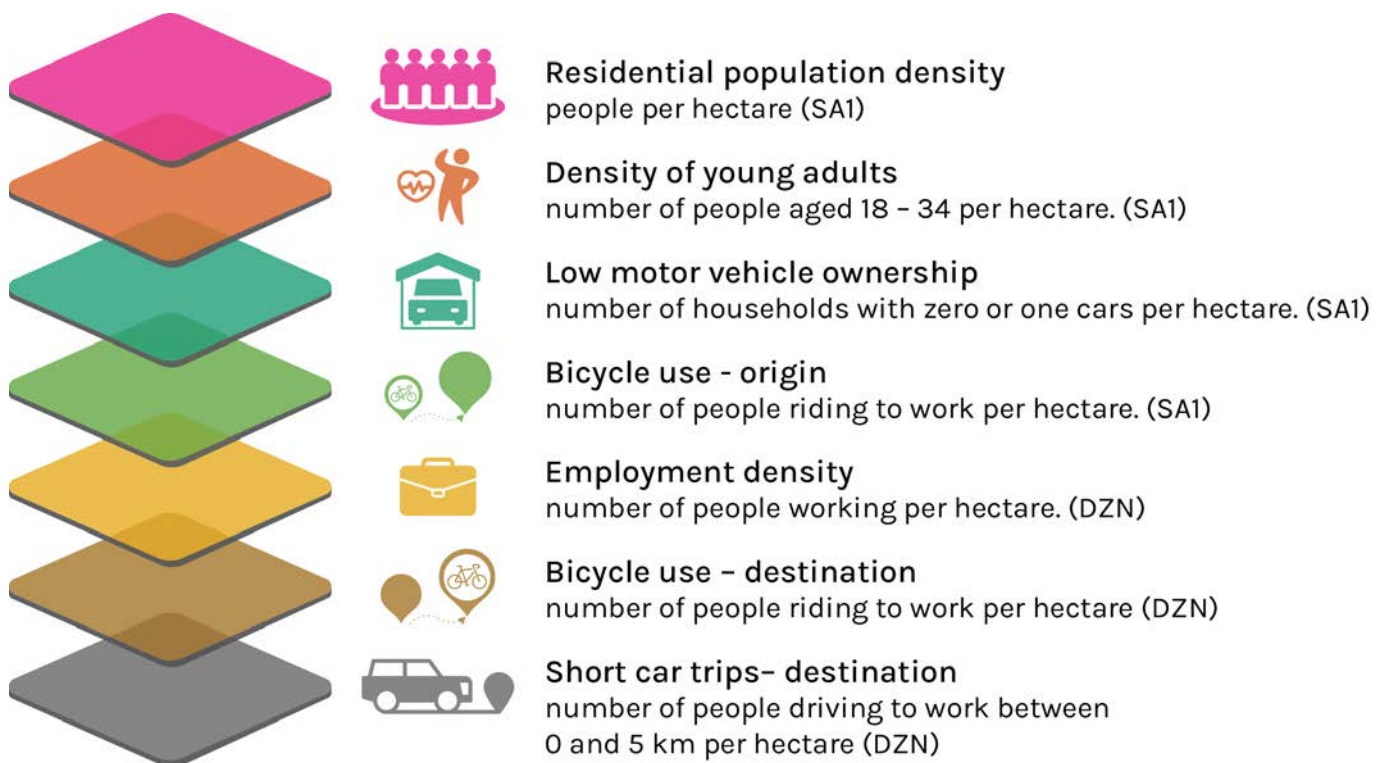


Figure 163 Variables for Bike and Micromobility Use Propensity Index

Source: Institute for Sensible Transport using ABS Census data

A.2.1 Methodology

The *Bike and Micromobility Use Propensity Index* combines seven variables, all of which are collected as part of the ABS Census. The current *Index* is largely similar and builds upon the original *Bike Use Propensity Index*. The statistical basis for the *Index* was developed through the collection of data on riding behaviour and demographic factors. This data was analysed using binary logistic regression in SPSS and STATA. The results, published in Transport Research Part A, revealed that there are some statistically significant factors for propensity to cycle.

The *Bike and Micromobility Use Propensity Index* has been designed to show the variation in the relative propensity to cycle, at the highest possible level of spatial detail.

The *Index* contains more residential-oriented variables than it does employment or destination variables. To ensure that employment rich areas that have comparatively lower residential populations are not undervalued, the employment variables in the *index* are weighted the same as residential factors. Doing this helps ensure important bike destinations, such as employment hubs, are adequately considered in the *Index*.

Geographic areas are given an absolute score, of between 0 and approximately 5 for each of the variables. These scores are then averaged to reveal an overall bike and micromobility use propensity score of between 0 and approximately 5. A score

close to 0 indicates a low propensity to cycle, while a score of 5 indicates a high propensity to cycle. The mapped values are aggregates of the attributes' scores.

SA1s that receive very high *Index* scores will have scored highly across all the variables included in the *Index*. In almost all cases, an SA1 that scores above 4.5 will have been the highest scoring in most variables. The maps used in this report have been colour-scaled to be comparable within the study area. However, the score is relative to all other areas in Australia (for example, the Melbourne and Sydney CBDs have areas with scores above 4.5).

A.2.2 Results

The *Bike and Micromobility Use Propensity Index*, for all seven factors, for Whitehorse, is presented as a quintile in Figure 58 of 6.2. The quintile is relative to Whitehorse, where the darker the colour corresponds with higher *Bike and Micromobility Use Propensity*. Box Hill, Box Hill North, Blackburn, parts of Burwood, Mitcham and Nunawading show the highest propensity for cycling in Whitehorse.

Figure 164 shows the origin score for the *Index*. The value indicates the willingness of residents living in that area who are more likely to consider bike riding for transport trips. Residential parts of Box Hill, Box Hill North and Blackburn have the largest clusters amongst the highest scoring areas.

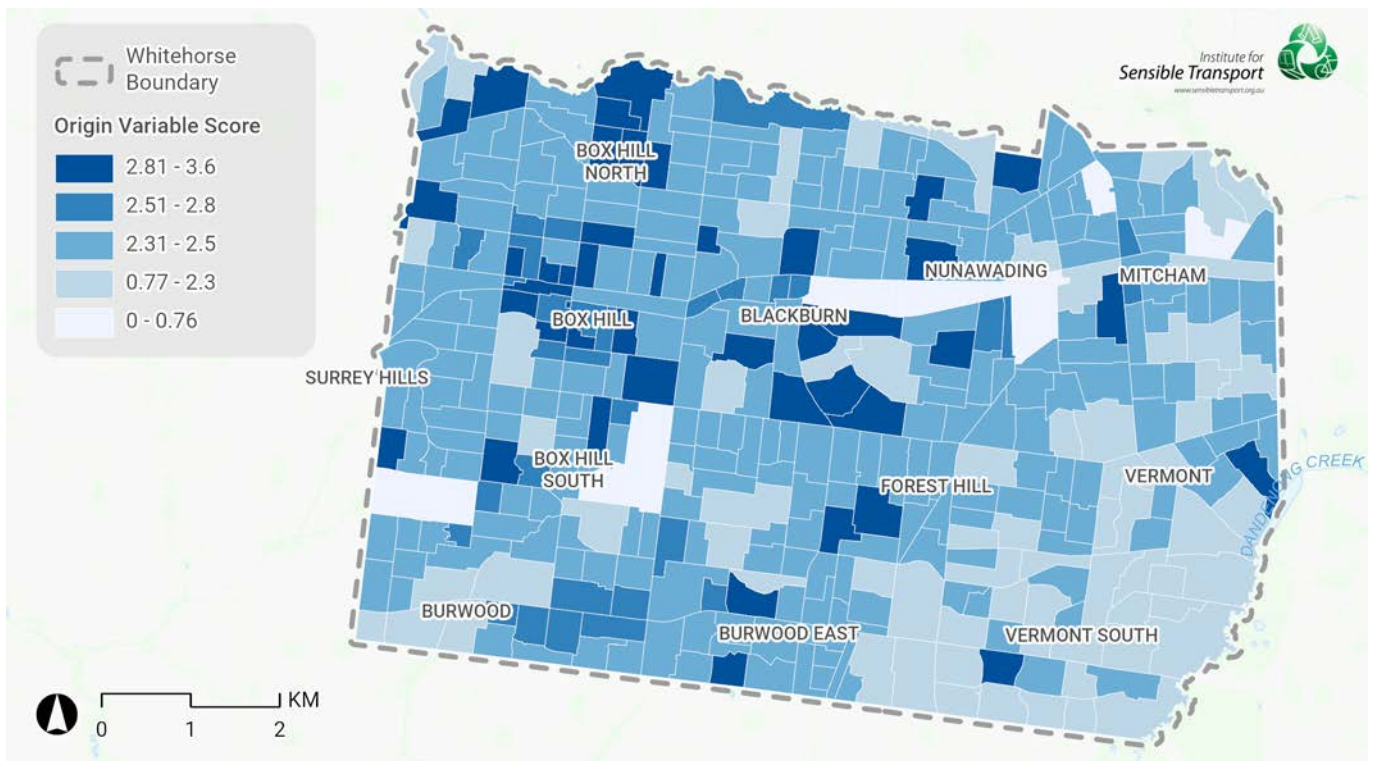


Figure 164 Bike and Micromobility Use Propensity Index - Origin Score

Source: Based on ABS Census data

Figure 165 shows the destination scores of the *Index*, areas where people are more likely to consider bike riding to, for transport trips in Whitehorse. The highest scoring destinations are in the major employment area located in the:

- Box Hill Metropolitan Activity Centre,
- Major Activity centres of Nunawading, Megamile (West). Tally Ho, Forest Hill Chase,

- Neighbourhood Activity Centre of Mitcham, Blackburn, Burwood Village,
- Industrial precincts of Redland Estate and Middleborough/Clarice.

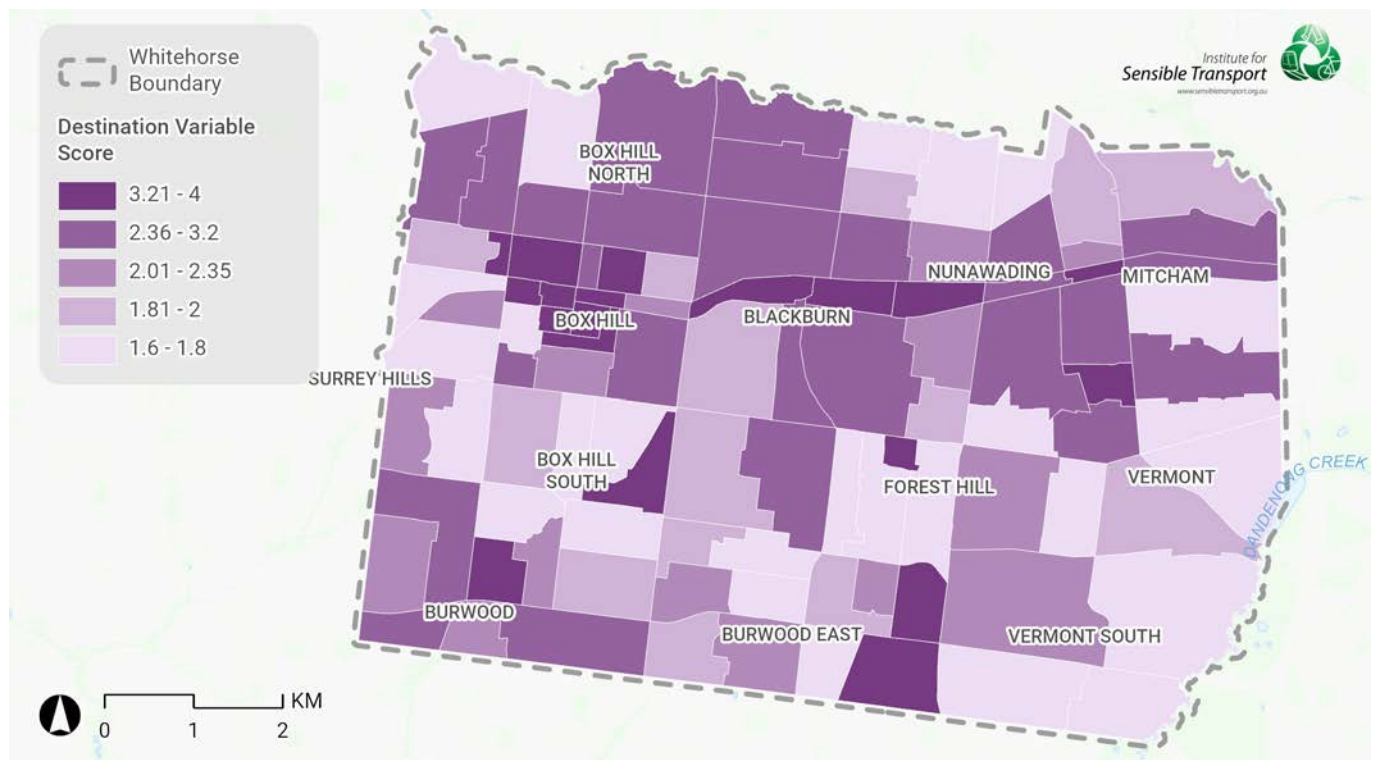


Figure 165 Bike and Micromobility Use Propensity Index - Destination Score

Source: Based on ABS Census data

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