



Horsham Bicycle and Shared Paths

Infrastructure Plan 2024 – 2034



Contents

Horsham Rural City Council acknowledges the five Traditional Owner groups of this land – the Wotjobaluk, Wergaia, Jupagalk, Jaadwa and Jadawadjali people.

We recognise the important and ongoing place that all Indigenous people hold in our community.

We pay our respects to the elders, both past and present, and commit to working together in the spirit of mutual understanding and respect for the benefit of the broader community and future generations.

Horsham Rural City Council acknowledges the contribution of Safe System Solutions in the development of this Plan.



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Disclaimer

These guidelines are general in nature and provide a framework for the provision of a network of bicycle and shared pathways. More detailed information about cycling and pedestrian paths is available via Austroads technical design manuals and other related publications.

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Glossary

Access roads: Low to medium volume of traffic, traffic speed of up to 50 km/h. These are the local streets that link to connector and arterial roads.

Active transport: Using your own power to get from one place to another. This includes: walking, cycling, and other physical modes of travelling.

Arterial roads: High vehicle volume, mixed vehicle type (cars and trucks) traffic speed of 50-60 km/h. The main roads and highways that intersect Horsham.

Austroroads: Austroroads is the collective of the Australian and New Zealand transport agencies, representing all levels of government.

Connector roads: Medium volume vehicles, generally no trucks, traffic speed of up to 50km/h. These roads provide access to arterial roads and for short trips between activity centres and the business district.

Existing Conditions Assessment: Reviewing the current situation of what is in place and identifying opportunities for improvement.

Infrastructure Design Manual (IDM): A joint initiative of Victorian rural and regional Councils to develop and maintain consistent requirements and standards for the design and development of infrastructure.

Protected bike lanes: A section of the road is allocated for cycle use only. Physical barriers are used to stop vehicles from entering the cycle lane.

Separated bike lanes – road: Exclusive use by cyclists. Located within or directly adjacent to the road way. Line marking to designate the cycle lane.

Separated bike lanes – off road: Exclusive use by cyclists. Located separate to the road way. May have line-marking to show two-way cycle movement.

Shared pathways: Are pathways for use by both pedestrians and cyclists.

Traffic calming: May include a range of measures designed to break up long, uninterrupted street lengths that encourage speeding. Calming measures include: street narrowing, speed cushions and road humps, raised pavement and safety platforms, small roundabouts.

VicRoads, Public Transport Victoria and Department of Transport and Planning: On 1 July 2019, VicRoads and Public Transport Victoria came together with the Department of Transport (DoT) to create an integrated transport department.

Effective 1 January 2020, all road management functions and responsibilities of the Roads Corporation (VicRoads) were transferred to and vested in the Head, Transport for Victoria.

On 1 January 2023, DoT was renamed the Department of Transport and Planning.



Executive Summary

Horsham Rural City Council’s Vision is that by 2041 the Horsham region will be:

... a vibrant, liveable hub that thrives on strong economic growth and social connectedness [and that empowers] its people to live, work and access opportunities for recreation and culture, now and into the future.

To achieve this vision, Horsham Rural City Council (HRCC) provides a range of services and infrastructure and encourages active transport options for commuting to school, work, or for engaging in cultural and recreational activities.

The 2012-2016 Horsham Municipal Bicycle and Shared Paths Plan contained a detailed analysis and action plan for the development of an extensive network of bicycle lanes and off-road and shared pathways infrastructure.

The 2024-2034 Horsham Bicycle and Shared Paths Plan (The 2024 Plan) builds on the 2012 Plan and includes:

- A commitment to upgrade existing and implement new cycle and shared pathways according to Safe System Principles.
- A review of existing pathways against Austroads Safe System Principles and current expectations regarding safety by design
- Consideration of urban development and movement patterns that have occurred since the 2012 Plan
- Recommendations from relevant HRCC plans and strategies
- Recommendations linking the hierarchy of roads, pathways and associated safety solutions
- Reiteration of the importance of a connected network of people and places
- A prioritisation tool that guides the annual scheduling of works and that can respond to emerging demands
- Evaluation measures to capture and record progress.

The Austroads Safe System framework, a national approach to road safety, is at the core of the 2024 Plan.

Risk assessment is central to the planning process, ensuring infrastructure improvements are designed to significantly reduce or eliminate risks to users. At the centre of the Safe System framework is human fallibility and an awareness that if the appropriate cycling infrastructure is not provided on our road network, errors can result in unintentional death and injury (Austroads 2021. Guide to road safety. Part 1).

Safe System Principles seek to identify and then eliminate or significantly reduce risk to users through design and infrastructure improvements.

For pedestrians and cyclists, the main objective of the Safe System is to achieve a clear separation from vehicular traffic, either through off-road options or via physical barriers.

Where complete physical separation of cyclists and vehicles is not possible, the focus is designing and modifying local streets to ensure potential collisions involving vehicles and cyclists remain below the Safe System speed threshold of 30km/h.

Adapted from: Transport Accident Commission (TAC) Local Government Authority grant funding guidelines 2023

Cycle and shared pathways throughout the urban area (Horsham and Haven) have been audited against the Safe System framework and risk identification principles.

A plan to create a connected network of cycle and shared pathways has been developed.

The network builds on the road hierarchy of arterial, collector, connector and access roads, developed by the Department of Transport and Planning.

Safe System treatment according to road and cycle hierarchy

C1	<p>Arterial roads (highways)</p> <p>High vehicle volume, mixed vehicle type (cars and trucks) traffic speed of 50-60 km/h.</p> <p>Recommended treatment: single-use off-road pathways for cyclists, or off-road shared pathways for cyclists and pedestrians or protected on-road cycle lanes with a physical barrier between bicycles and vehicles</p>
C2/C3	<p>Collector / Connector roads (provide access to schools and recreational areas)</p> <p>Medium volume vehicles, generally few trucks, traffic speed of 50 km/h</p> <p>Recommended treatment: separated lanes from traffic or protected, on-road, separated lanes.</p>
C4	<p>Access roads (neighbourhood and local roads)</p> <p>Low-medium volume of traffic, traffic speed of a maximum of 50 km/h. Lower speeds are preferred.</p> <p>Recommended treatment: road sharing of cyclists and vehicles with traffic calming measures to reduce speeds to 30km/h.</p>

Note: Arterial roads (highways) are not controlled by HRCC and regardless of road type, all road and cycle treatments occur in consultation with external authorities such as Department of Transport and Planning.

Recommendations from both the Bicycle Advisory Committee and the 2023 Bicycle Community Reference Group have been incorporated into the proposed network of cycle and shared paths.

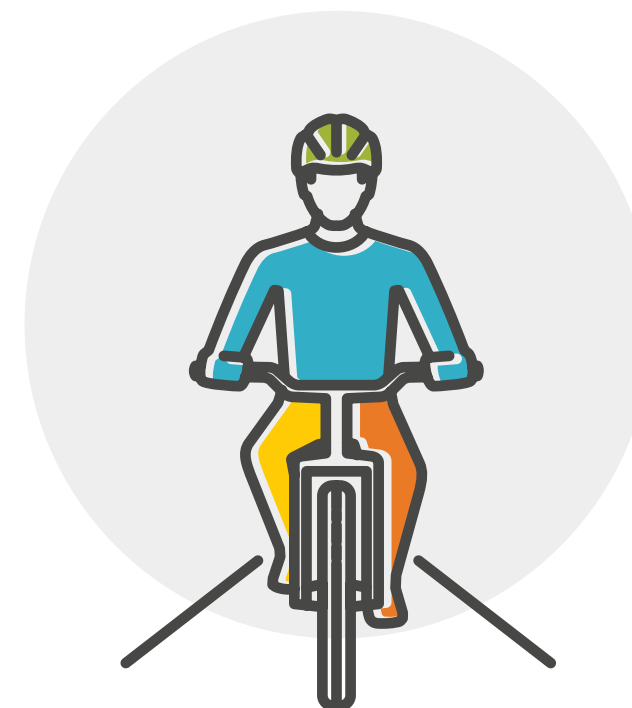
The 2024 Plan includes:

- Actions for amenity and infrastructure improvements,
- A prioritisation tool and
- A table of prioritised infrastructure upgrades.

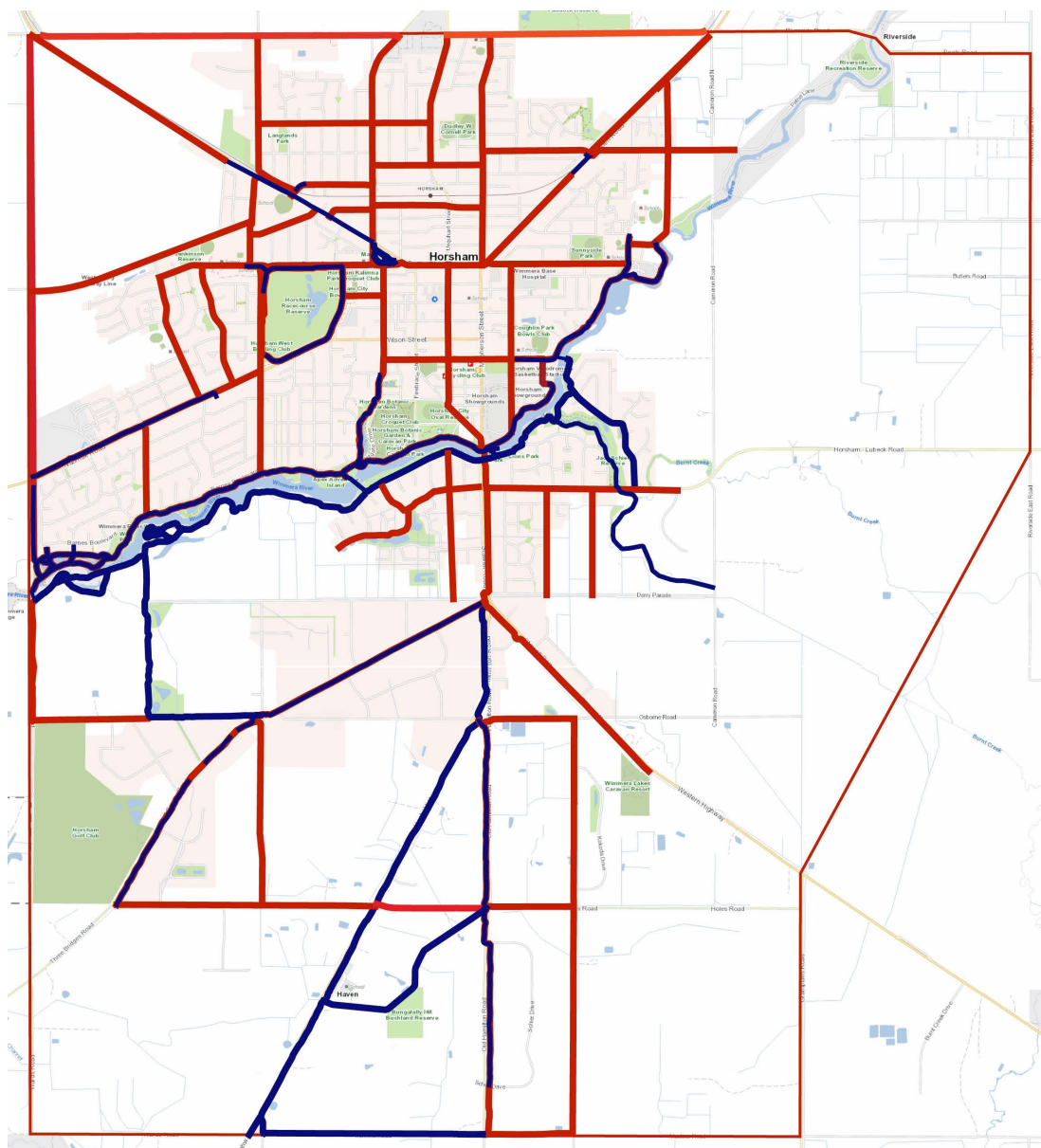
The 2024 Plan provides a roadmap to create a cycling and pedestrian network across the urban areas of Horsham and Haven.

The focus of the Plan is the careful design and provision of cycling and shared path infrastructure.

Because of population numbers, Horsham and Haven have been the focus of this plan. However implementation of Safe System Principles for the provision of cycling and shared paths are applicable across the entire municipality.



High level recommendations



1. Create a network of shared pathways for cyclists and pedestrians

A connected network provides opportunities for cyclists and pedestrians to move throughout the Horsham - Haven area. The proposed network reflects the established hierarchy of arterial, connector and access roads. Road type generally reflects differences in expected vehicle volume and type, and vehicle speed.

Safe System Principles reflects the hierarchy of treatment options, including traffic calming measures, protection of cyclists (from vehicles) and complete separation of vehicles and cyclists.

Above: Recommended cycle and shared path network

Blue lines – Existing cycle pathways that meet Safe System requirements.

Red lines – Add to the endorsed existing cycle pathways to create the proposed cycle and shared path network.

The proposed network reflects existing urban development and movement patterns.

New areas of development (sub-divisions, infill and growth areas) must provide connections with the network, reflect the road and cycle hierarchy and be based on Safe System Principles.

2. Complete entire routes of the cycling network

The Prioritisation tool in the 2024 Plan provides guidance regarding the order of works to be completed.

The HRCC annual cycling and pathways budget will not be adequate to fund all improvements in any section of the network. Because of this, delivery of entire routes will require both a commitment for works to be staged over multiple years and the sourcing of external funds.

The HRCC Long Term Capital Expenditure Plan (10 year plan of proposed works) will assist in the scheduling of upgrades to the cycling network, guided by the priorities in this plan.

3. Provide en-route and end-of-route facilities

Effective transport networks are people focused and include places and sights of interest and amenity.

Effective networks include:

- parks, play areas and public art which can be enjoyed during travel and that also provide destinations for travel
- places to rest (wayside stops with seating and tables and drinking stations)
- places of amenity (toilets, BBQ, phone charging facilities)
- accurate wayfinding signage
- appropriate lighting
- educational opportunities
- bike racks (some sheltered)
- bike repair and/or pump stations

The development of each stage of the network will involve consideration of neighbourhood characteristics, and proximity of other infrastructure (existing and planned).

Each stage of works (upgrades and new) must include required en-route facilities located strategically and as part of a larger plan for the network.

4. Monitor cycling activity and review implementation of the 2024 Plan

Monitoring progress of the 2024 Plan will ensure prioritised projects are delivered and the objectives of a safe and connected network are met.

Monitoring may also identify further improvements to existing and proposed cycling infrastructure.

Data from various sources should be utilised to evaluate the Plan's effectiveness regarding safety and increased levels of participation:

- Australian Bureau of Statistics (ABS) Census data
- Cycle and pedestrian counters (and)
- Transport Accident Commission (TAC) injury data
- Department of Transport and Planning crash data

The 2024 Plan will be reviewed annually.

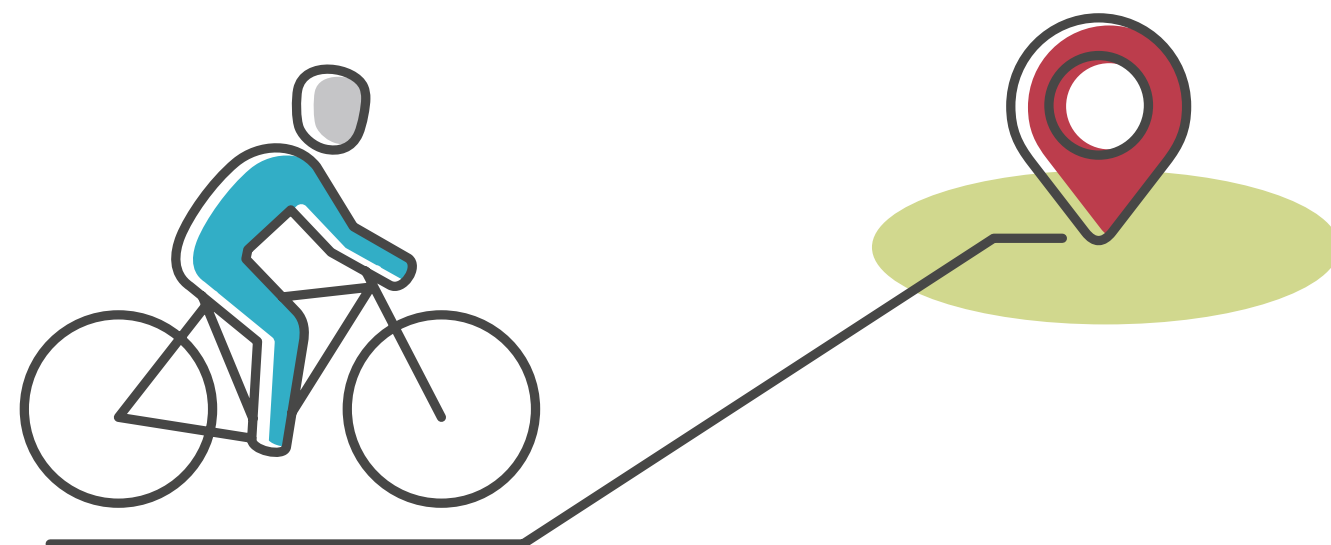
A formal review of the Plan after 5 years of implementation will provide an opportunity to:

1. Re-confirm proposed actions and celebrate achievements
2. Adjust priorities and actions to reflect changing circumstances
3. Provide feedback and updates to our community and Council

Top 10 Infrastructure priorities

PRIORITY	CYCLE ROUTES – EXISTING & PROPOSED (SUMMARY)	PRIORITY RATING	COST ESTIMATE	NOTES
1	Darlot Street (Wawunna Rd - May Park Terrace – Darlot St – Wimmera River)	H	\$645,000	North-South Link – 9 projects in total
2	Baillie Street (Churchill Rd – Menadue St) - Planning	H	\$30,000	East-West Link – Cost is to engage a consultant
3	Bennett Road (Wimmera River - Baillie St)	H	\$185,000	North-South Link – projects in total 5
4	Wimmera Highway/Natimuk Road (Curran Rd – Park Drive)	H	\$235,000	East-West Link – 3 projects in total
5	Hamilton St (Menadue St – Darlot St) - Planning	H	\$30,000	East-West Link – Cost is to engage a consultant
6	Dooen Road (Riverside Rd – Baillie St) - Planning	H	\$30,000	East-West Link – Cost is to engage a consultant
7	O’Callaghan’s Parade (Stawell Rd – Hamilton St)	H	\$180,000	North-South Link – 1 project in total
8	Urquhart Street (O’Callaghan’s Parade – Baillie St)	H	\$200,000	North-South Link – 1 project in total
9	Kalkee Road (Connecting Horsham North with central Horsham & surrounds)	M	\$200,000	North-South Link – 1 project in total
10	Dimboola Road (High St – Wawunna Rd)	M	\$200,000	East- West Link – Four projects in total

Above: Top 10 prioritised infrastructure actions



Part 1: Strategic Context

Background

Safe System Solutions Pty Ltd was engaged by Horsham Rural City Council (HRCC) to create a Bicycle and Shared Path Plan to improve the safety, uptake and investment in active transport. Objectives of the project included mapping to identify existing and planned routes, development of a hierarchy of cycle routes and development of a short (5 year) and longer-term (10 year) infrastructure plan to implement recommendations.

The 2024 Plan provides definitions, standards and prioritisation of required infrastructure for an improved, safer and connected network for cyclists and walkers in the most populated areas of the municipality.

An improved network of bicycle and shared pathways has many benefits, including that it:

- provides design solutions to improve safety for cyclists and pedestrians,
- provides options for people to move throughout the township, without relying on cars,
- increases health and wellbeing outcomes for residents and visitors,
- takes advantage of our flat landscape and weather conditions
- provides active connections to key recreation, employment and education locations.

The Plan also seeks to address a number of issues with the current ‘network’ by:

- the provision of protected and separated cycle paths - reducing the risk of road trauma (accidents)
- installing traffic calming measures
- extending and linking existing pathways
- improving links between existing bicycle corridors
- improving wayfinding and educational signage,
- improving connections to the Central Activity District (CAD) from all areas of Horsham,
- embedding Safe System planning when other HRCC plans and strategies are implemented
- ensuring planned works and budgets include essential infrastructure (bike storage, shade, wayfinding, seating).

Introduction

There is a direct relationship between cycling infrastructure and the number of cyclists. The better the cycling network, the more people choose to ride their bike.

Australian Bureau of Statistics (ABS) 2021 census data revealed that despite the majority of our community living within 5 km of their place of work, only 1% of individuals cycled to work in the municipality.

Existing cycling infrastructure around Horsham is not connected, is inconsistent in application, with a lack of dedicated facilities and links between existing corridors.

There are limited cycling options to access the CAD or other key destinations across the city.

The 2024 Plan builds on HRCC’s Municipal Bicycle and Shared Path Plan (2012-2016) and applies national Safe System Principles to upgrade existing and in the construction of future infrastructure.



Context

Demand and attitudes to cycling

There is a direct relationship between the provision of safe and accessible cycling and walking infrastructure and the number of people choosing active transport options.

A fear of cycling on roads shared with vehicles is greater among inexperienced cyclists, risk-averse individuals, women and younger cyclists. Bike paths and separate facilities are safer alternatives that may help the less confident cyclist make the decision to ride a bicycle. (Buehler, 2015).

The Australian Bureau of Statistics (ABS) Census data (2006) revealed that 174 people (2.7% of workers) cycled to work in the Horsham municipality. In 2011, 121 people cycled to work and by 2021, only 94 people (1.0% of workers) cycled to work.

Despite the majority of Horsham’s population living within a 5km radius of their workplace, a moderate climate and flat terrain, there has been a continual decline in cycling to work numbers.

There are many reasons why people do not walk, ride or use other active transport options to access work, school or places of interest (parks, shops, entertainment).

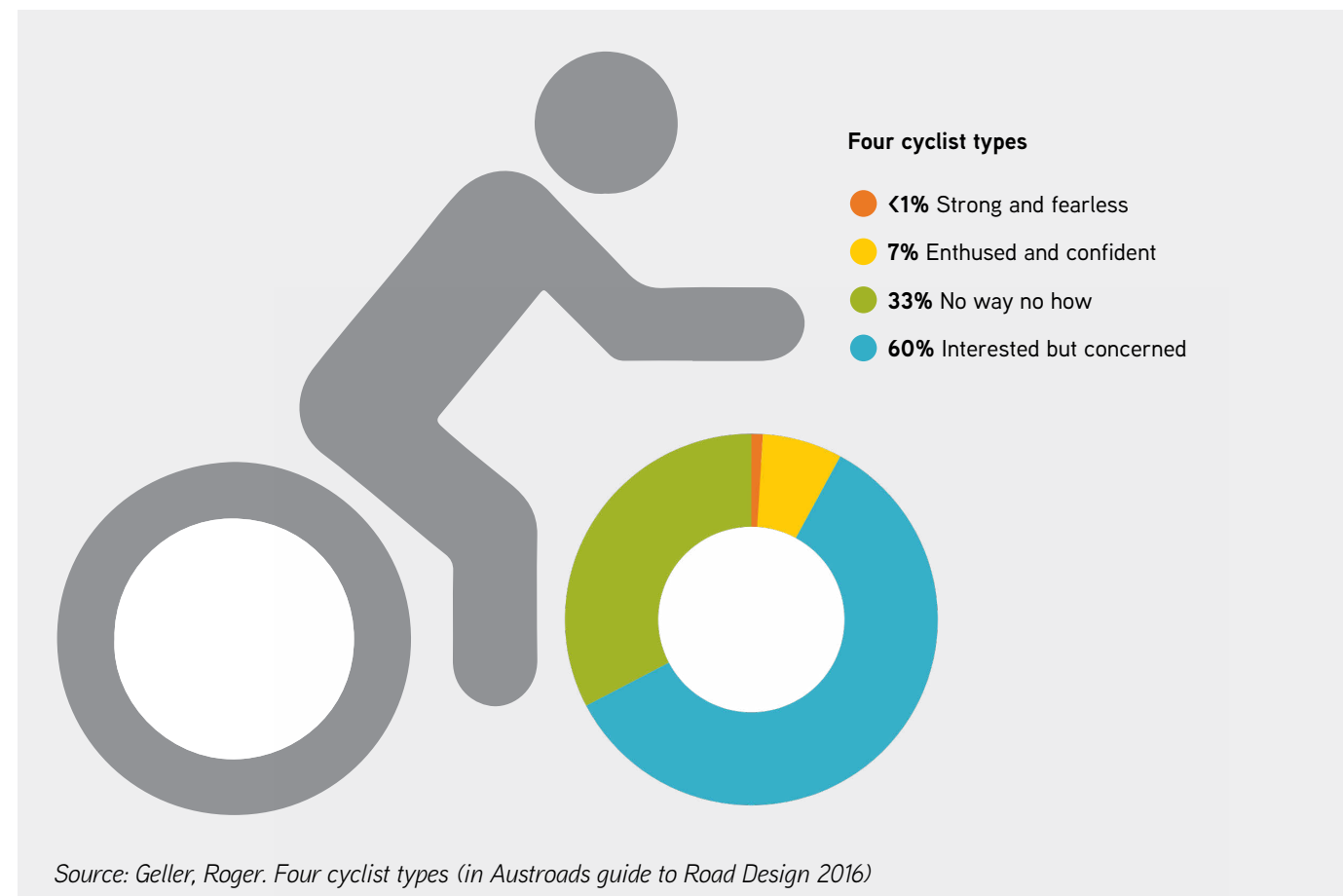
Employment patterns (type and hours of employment), parenting and care-giving responsibilities (pre-and post-school/traditional working hours), housing density, the distribution of services and health status are some factors that impact on cycling and pedestrian activity.

Analysis of cycling and walking activity (barriers and enabling factors) has the potential to identify opportunities to increase active transport in our community. The development of an Active Horsham Strategy will support this analysis and this future work is highly recommended.

Although a detailed exploration of cycling patterns is beyond the scope of this Plan, assessment of existing cycling conditions in Horsham highlighted the barrier created by poor alignment between cyclist needs and fears, particularly when targeting the “interested but concerned” demographic, which constitutes 60% and the largest group among potential cyclists.

Providing a network of cycling and shared path infrastructure will address many of the concerns of people interested in cycling but concerned for personal safety.

Until safety concerns are addressed, through the provision of paths and cycleways that meet Safe System Principles, cycling rates within Horsham will remain low and may continue to fall.



Source: Geller, Roger. Four cyclist types (in Austroads guide to Road Design 2016)

Focus area of the 2024 Plan

Because of the current low level of cycling participation, assessment of existing conditions and plans for a connected network have focused on the urban area of Horsham and the developing area of Haven, where housing and population density support the introduction of bicycle and shared infrastructure.

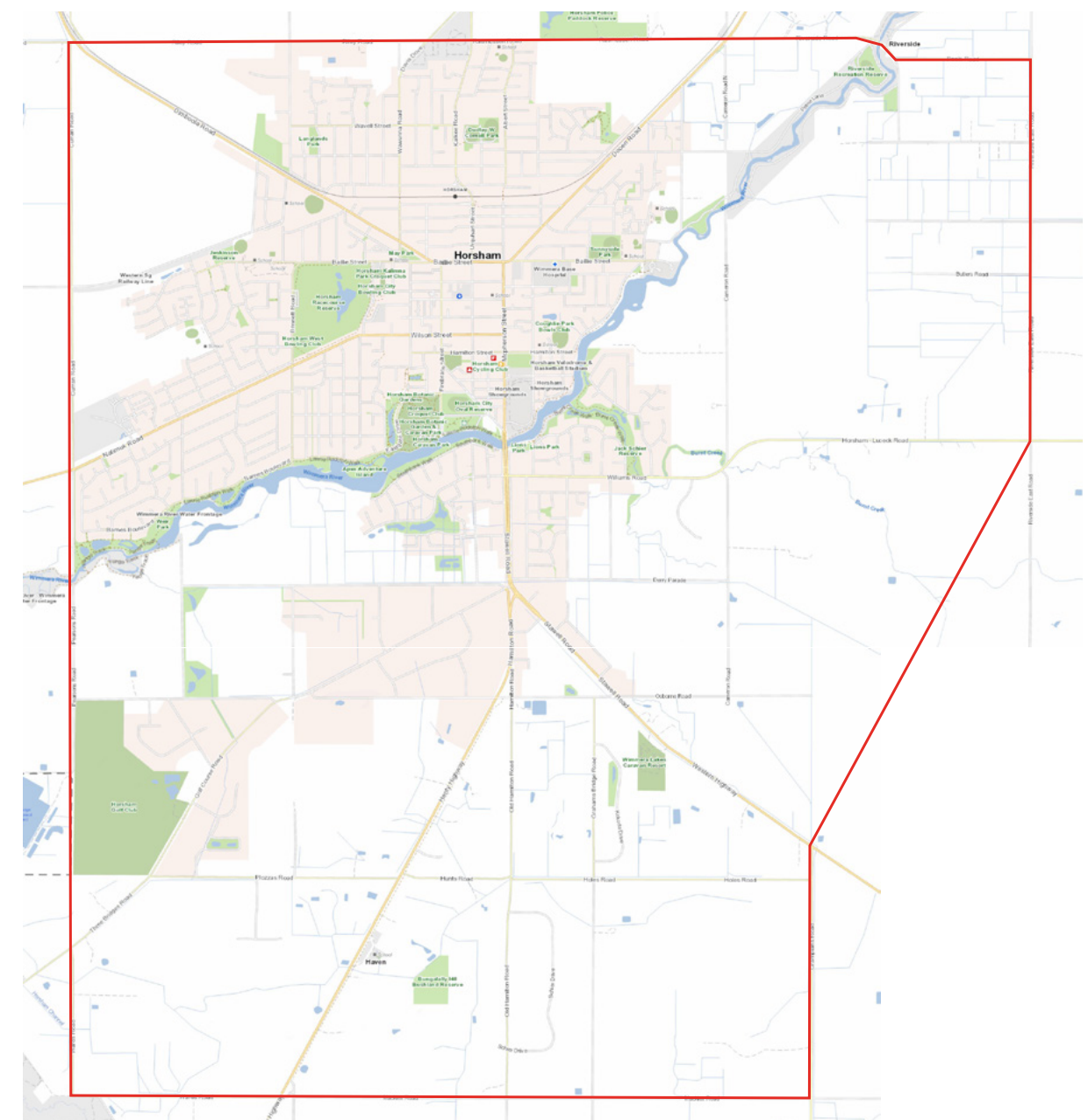
Safe System Principles and the prioritisation tool for the implementation of upgrades and scheduling of new works apply across the municipality.

The application of national Safe System Principles and use of the prioritisation tool will enable consistent messaging and transparency of decision making regarding community requests for new infrastructure.

Although recreational cycling, including mountain biking, off road and cycle touring are important, they are not the focus of the 2024 Plan.

Shared paths along the Wimmera River have been included in the mapping because they contribute to the proposed urban network are part of a more extensive network of recreational pathways and trails.

Focus area includes Horsham and Haven



Engagement Summary

There has been a long history of engagement with our community regarding the development of bicycle and shared path facilities. The 2012-16 Municipal Bicycle and Shared Paths Plan was developed after extensive community engagement and provided an important basis for a program of improvements.

The 2024 Plan was developed with input and support of the:

Bicycle Advisory Committee

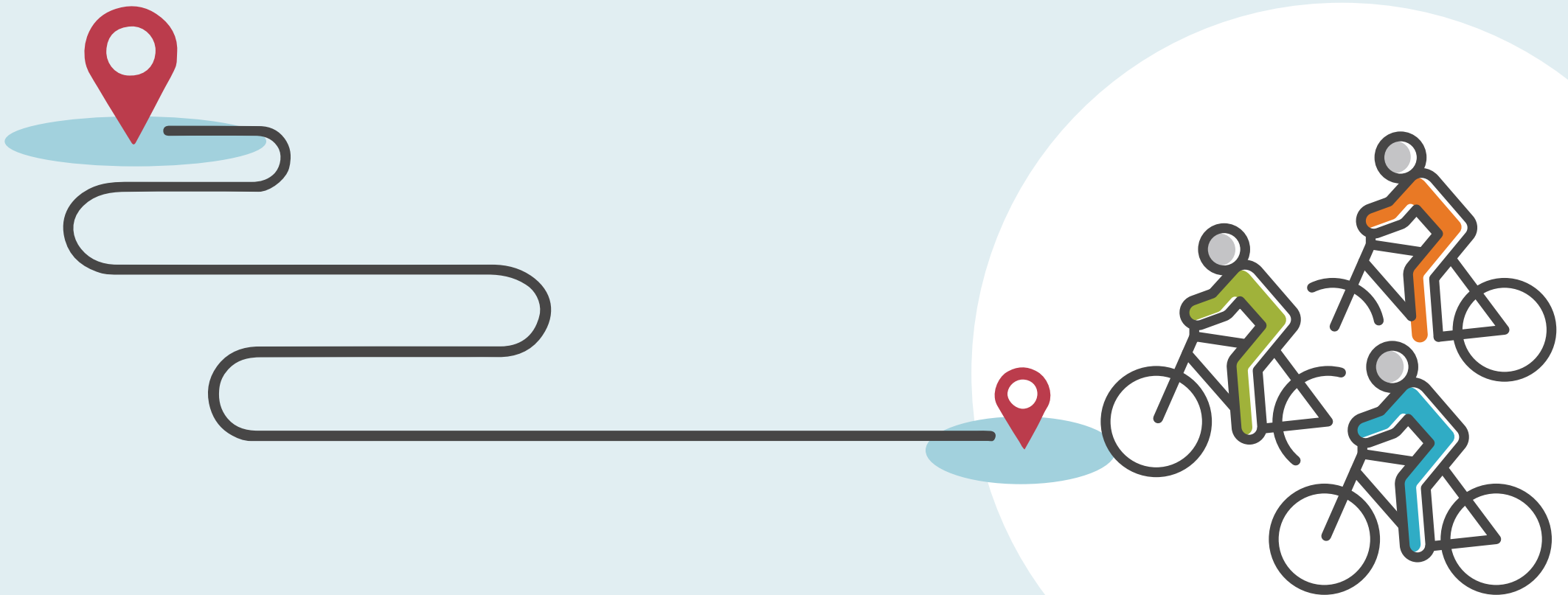
The Bicycle Advisory Committee was formed in 2013 and met regularly for approximately 10 years. The Advisory Committee acted as a representative voice of the Horsham cycling community.

Priorities identified by the Committee included:

- Safety for users of bicycle pathways
- Identifying areas of improvement (both infrastructure and strategically)
- Opportunities to increase cycling participation throughout the municipality.

Community Reference Group

A Community Reference Group was formed in 2022 to assist in the development of the 2024 Plan. The Community Reference Group represents diverse community interests and involvement with cycling and has provided recommendations regarding the proposed network and feedback regarding the 2024 Plan.



Council Officers

Council officers provided input into the development of the 2024 Plan.

Officers identified the need to:

- Create a connected network, linking key destinations (schools, sports centres, parks, key facilities, the Wimmera River and the Central Activity District)
- Physically separate bicycles and cars, (off-road or protected lanes) particularly in areas of high volume or speed
- Introduce traffic calming measures across the built environment
- Ensure appropriate levels of service/maintenance of the bicycle and shared path network.

Strategic Context

Many HRCC plans refer to improvements to bike and walking tracks in specific localities and precincts. The 2024 Plan considers key recommendations and actions from previous and existing plans and strategies to create a comprehensive plan of actions to improve the cycling and active transport network throughout Horsham.

The 2024 Bike Plan reflects the Goals and Actions in the following Horsham Rural City Council documents:



Part 2: Safe System – A National Framework

The following section outlines the principles of the Safe System.

Austrroads

Safe System Principles is a national road safety philosophy that requires roads to be designed and managed so death and serious injury are avoidable.

The Safe System was endorsed in Australia in 2003 by the Australian Transport Council and adopted by Austrroads in 2004. The approach is now integral to road safety strategies in jurisdictions in Australian and New Zealand.

The Safe System approach is regarded as international best practice in road safety and provides an outcome whereby death and serious injury are virtually eliminated amongst users of the road system. Safe System is the management and design of the road system such that impact energy on the human body is firstly avoided or secondly managed at tolerable levels by manipulating speed, mass and crash angles to reduce crash injury severity.

Source: Austrroads, 2018. Integrating Safe System with Movement and Place for Vulnerable Road Users.

The Safe System is a holistic approach to road safety that recognises different elements of the road environment must work together to keep everyone safe. These elements include roads and roadsides, vehicles, road users and travel speeds. Efficient movement should not be at the expense of human wellbeing.

The Safe System is based on the following understanding:

People make mistakes

Humans are fallible and inevitably make mistakes when driving, riding or walking,

When those mistakes occur on the road, they can lead to crashes. Road trauma should not be accepted as inevitable.

Humans are fragile

Our bodies are vulnerable and have limited ability to tolerate crash forces. Any impact above 30 km/h significantly increases the risk of dying.

Road safety is a shared responsibility

Shared responsibility exists amongst those involved in planning, designing, building, managing and using roads and vehicles. Everyone has a part to play in keeping themselves and others safe on the roads.

The road system must be forgiving

All parts of the system must be strengthened to multiply their effects, so that if one part fails, road users are still protected. Building a forgiving road system ensures crash forces do not exceed the limits the human body can tolerate.

Adapted from: Austrroads: Guide to Road Safety Part 1: Introduction to the Safe System 2021, and Transport Accident Commission: Grant Funding Guidelines 2023).

Safe System Principles are based on four areas of action.

Safe System areas of action



Safer Speeds Safer Roads Safer Road Users Safer Vehicles

Source: VicRoads Safe System Assessment Guidelines

All Safe System treatments can be categorised into one of two areas:

1. Primary - eliminate

Treatment that virtually eliminates the potential for a fatal or serious injury to occur (off-road shared paths, wombat crossings)

2. Secondary - reduce

Treatment that reduces the potential for a fatal or serious injury to occur (on-road bicycle lanes, bicycle crossing warning signs, reduced speed limits.

VicRoads/Department of Transport and Planning

The Safe System framework underpins Victoria’s strategic approach to road safety.

The *Victorian Road Safety Strategy 2021-2030* aims to halve road deaths and reduce serious injuries by 2030. The Strategy contains ten Goals, and six Principles.

The six principles are central to the 2024 Plan:

1. We want positive outcomes for all Victorians.
2. Our approach to road safety is built around a safe system approach that is coordinated and collaborative and includes all the Road Safety Partners of Victoria.
3. We will use all the levers available to us to address immediate road safety concerns while also preparing for and welcoming technological advancement opportunities.
4. We will ensure the data and evidence base of our initiatives and interventions is sound and strong.
5. We will take a holistic approach, to address all aspects of the system through initiatives including public health, vehicle safety technology, infrastructure, and behaviour change supported by enforcement practices.
6. When developing action plans we will consider how we adapt to changes in road safety technology, the needs of the Victorian community, and the social and economic environment.

Source: Victorian Road Safety Strategy 2021-2030. P10

To achieve a meaningful transition towards the consistent implementation of a Safe System network, VicRoads is developing policies and practices to ensure road improvement projects developed and delivered through its programs and across the Victorian road network consider road safety outcomes.

Safe System Assessments will be required for all VicRoads and Government funded projects in accordance with the VicRoads Safe System Assessment Guidelines. It is envisaged that Safe System Assessments will ultimately apply to all projects on roads for which VicRoads is the responsible authority.

Adapted from: VicRoads (2018). Safe System Assessment Guidelines.

The Department of Transport and Planning is the coordinating road authority for arterial roads within the municipality, including the highways that traverse the residential areas of Horsham and Haven.

Horsham Rural City Council

Horsham Rural City Council is responsible for road and road related infrastructure as defined under the Road Management Act 2004 and associated Regulations and Codes of Practice.

The provisions of the HRCC Road Management Plan (2021) apply to public roads listed in the Register of Public Roads for which Horsham Rural City Council is the co-ordinating road authority, and roads or parts of roads that Council maintain under agreement with another road authority.

Council will collaborate closely with the Department of Transport and Planning to facilitate implementation of measures outlined in this Plan that apply to arterial roads controlled by the Department.

An Infrastructure Design Manual (IDM) documents and standardises Council requirements for municipal infrastructure. The IDM provides minimum standards for pedestrian/cycle provision within road reserves. The objectives of the IDM complement the objectives of the 2024 Plan:

To promote

- Walking and cycling to daily activities
- Universal access within the community
- Community health and wellbeing associated with increased activity, and
- To develop layouts that allow for access in all directions, link to public transport, reduce dependence on cars and provide pathways and cycleways that are continuous and linked to each other.

Source: Infrastructure Design Manual, Clause 13 Mobility and access provisions).

The three sectors (Austrroads, VicRoads/Department of Transport and Planning and Horsham Rural City Council) deliver infrastructure within a framework and according to technical specifications developed from extensive research, analysis of data and emerging best practice.

Hierarchy of roads within Horsham

The proposed bicycle network and hierarchy is based on the Movement and Place framework developed by the Victorian Department of Transport, (now Department of Transport and Planning).

Movement and Place considers the relationship between Movement (traffic volumes, road types) and Place (destination, surrounding areas, and accessibility).

The needs of people moving throughout the built environment is central to the planning of preferred routes.

The 2020 Horsham Urban Transport Plan and the 2021 Horsham Central Activity District (CAD) Revitalisation and Streetscape Plan incorporate the Movement and Place framework.

Both the Horsham Urban Transport and Horsham CAD Plans identify opportunities to strengthen the network and improve safety and amenity along preferred routes.

These recommendations have been included in the 2024 Plan.

Existing road hierarchy

Council has an existing road hierarchy that describes the movement status of roads beyond the CAD.



Source: Horsham Rural City Council (2020). Horsham Urban Transport Plan. The road hierarchy guides the design and maintenance of roads throughout the municipality.

The road hierarchy has been adapted in the 2024 Plan to reflect local destinations and places of interest and to include, where possible existing cycling pathways and infrastructure.

The 2024 Bike Infrastructure Plan acknowledges arterial roads of the hierarchy but also suggests alternative routes to and through the Central Activity District (CAD) to create safer cycling options.

Alternative routes include:

- Natimuk Rd – Park Drive – Gleed St – Darlot St –(rather than Wilson St)
- Stawell Rd – O’Callaghan’s Parade – Urquhart St (rather than McPherson St)

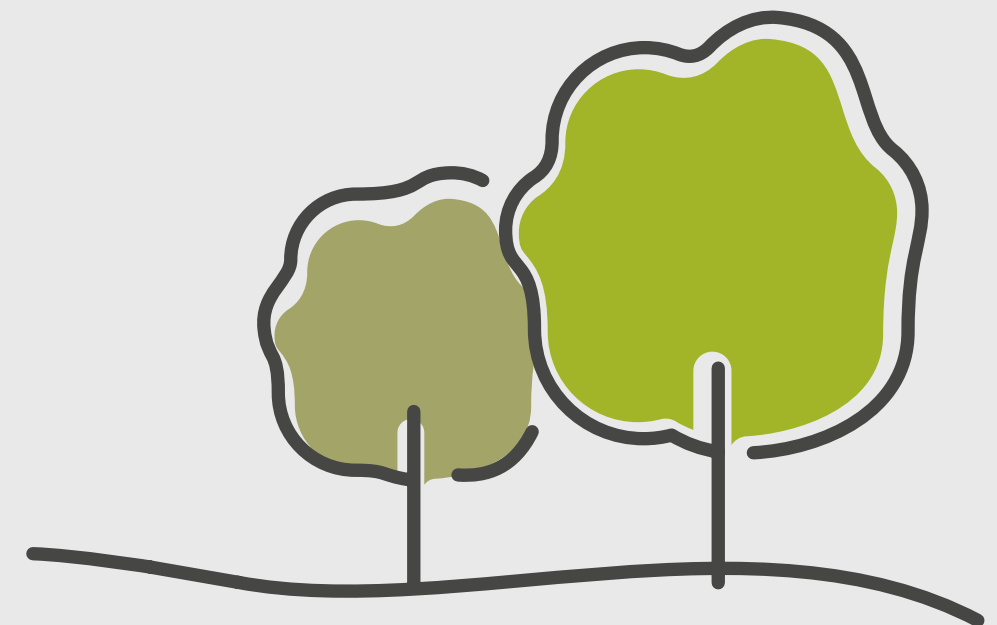


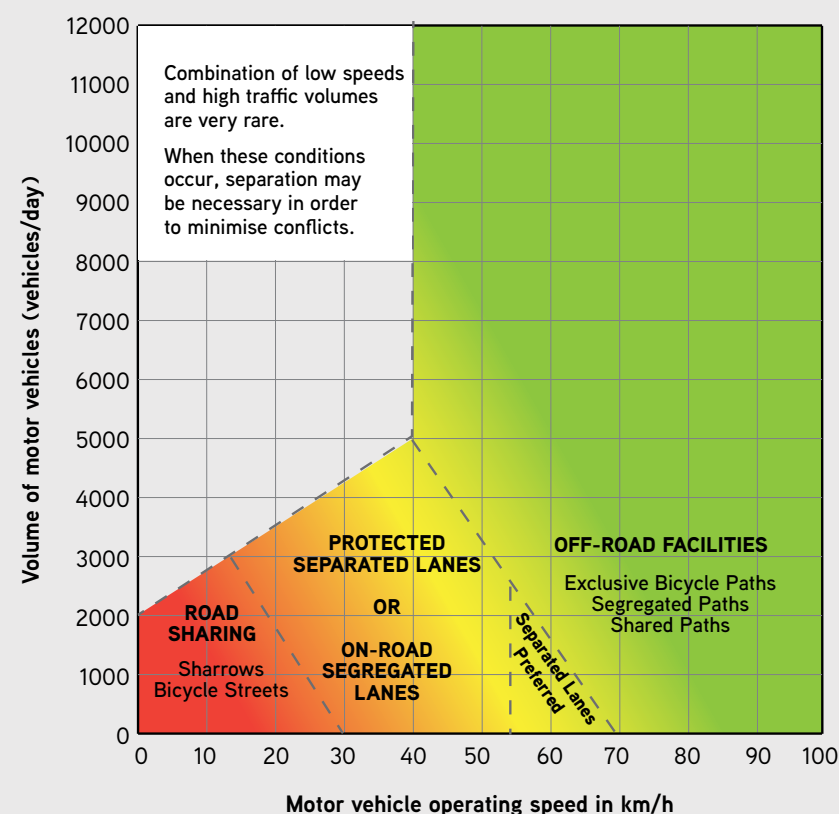
Hierarchy of cycling routes – urban area

The following hierarchy is embedded in the prioritisation of infrastructure works table.

C1	<p>Arterial roads (highways)</p> <p>High vehicle volume, mixed vehicle type (cars and trucks) traffic speed of 50-60 km/h.</p> <p>Cycling: Primary routes providing a core cycling network connecting the CAD and places of significance. These routes are designed to cater for high volumes of cyclists and pedestrians.</p> <p>Recommended treatment: off-road, single-use pathways for cyclists, or off-road shared pathways for cyclists and pedestrians or protected on-road cycle lanes with a physical barrier between bicycles and vehicles</p>
C2	<p>Collector / Connector Level 1 roads</p> <p>Medium volume vehicles, generally few trucks, traffic speed of 50 km/h</p> <p>Cycling: Routes providing access to activity areas, schools and recreational areas. These routes cater for medium-high volumes of cyclists.</p> <p>Recommended treatment: protected on-road lanes, or lanes separated lanes from traffic separated lanes.</p>
C3	<p>Connector Level 2 roads</p> <p>Routes providing access for local residents – short trips between activity centres that feed into the busier C1 and C2 routes.</p> <p>Cycling: These routes cater for low-medium volumes of cyclists.</p> <p>Recommended treatment: separated lanes from traffic or protected, on-road, separated lanes.</p>
C4	<p>Access roads</p> <p>Low – medium volume of traffic, traffic speed of 50 km/h.</p> <p>Cycling: Neighbourhood and local links provide short connections to C1-C3 routes.</p> <p>Recommended treatment: road sharing of cyclists and vehicles with traffic calming measures to reduce speeds to 30 km/h.</p>

Note: Arterial roads (highways) are not controlled by HRCC and all road and cycle treatments occur in consultation with external authorities such as Department of Transport and Planning.





Notes: This diagram is to be applied to urban roads and is not appropriate for rural or non urban roads.

Zone boundaries shown on this graph are indicative only.

Safe Systems Risk Analysis

Safe System assessment of pedestrian and cyclist infrastructure is based on the extent to which the infrastructure removes or reduces the potential of crash likelihood, injury severity, and exposure to potential conflict with other road users.

Full separation of cyclists, bicycles and vehicles eliminates the likelihood of crashes.

As impact speeds increase, so do the risks of collisions, and the potential for serious injury escalates even more rapidly

Risk assessment involves the relationship between likelihood and severity regarding: Traffic volume and speed and Injury data.

Traffic volume vs speed

When designing for safety:

- **Off road, separated cycle lanes** are required when there is high traffic volume and speeds above 70 km/h

- **Protected and separated cycle lanes** are required when there is medium traffic volume and speeds between 30-70 km/h

Traffic calming measures and road sharing are suitable when there is low traffic volume and speed between 0-30 km/h.

Example: cycling along a local street

On local streets (access roads) where the default speed limit of 50 km/h generally applies, pedestrians and cyclists are exposed to impact speeds that exceed the Safe System human survivability threshold. If a collision occurs between a cyclist or pedestrian and a vehicle, this may result in significant injuries or even death.

In local streets, complete physical separation of bicycles and vehicles is not always possible.

In these circumstances, the focus should be on traffic calming measures - designing local streets to ensure any collisions involving vehicles and pedestrians or cyclists remain below the Safe System threshold of 30 km/h.

Although vehicle travel speeds of 30 km/h are generally considered survivable, cyclists and pedestrians, particularly older people and children, can still sustain significant injuries at this speed.

Safe System crash outcome threshold

LIKELIHOOD OF THE INCIDENT		SEVERITY OF THE INCIDENT				
		Insignificant	Minor	Moderate	Serious	Fatal
		Property damage	Minor first aid	Major first aid and/or presents to hospital (not admitted)	Admitted to hospital	At scene or within 30 days of the crash
Almost certain	One incident per quarter	Medium	High	High	Extreme	Extreme
Likely	One per quarter - one per year	Medium	Medium	High	Extreme	Extreme
Possible	One per year - one every 3 years	Low	Medium	High	High	Extreme
Unlikely	Once every 3 years - once every 7 years	Negligible	Low	Medium	High	Extreme
Rare	Less than once every 7 years	Negligible	Negligible	Low	Medium	High

Risk Mitigation Response

Negligible	No action required
Low	Should be corrected or the risk reduced if the treatment cost is low
Medium	Should be corrected or the risk significantly reduced, if treatment cost is moderate but not high
High	Should be corrected or the risk significantly reduced, even if the treatment cost is high
Extreme	Must be corrected, regardless of cost.

Injury data

– Horsham Local Government Area

Despite the low incidence of cycling (reported in ABS Census data), the Horsham Local Government Area has experienced an unacceptable rate of cyclist and pedestrian injury.

Department of Transport and Planning road crash data reveals that 20 accidents involving cyclists and vehicles occurred in Horsham during the 2018-2022 period.

- Accidents involved 15 male cyclists and 5 female cyclists
- 6 cyclists were under 15 years of age. 14 cyclists were aged 16-72
- 18 were recorded during day light hours and 2 accidents were recorded as occurring at 'dusk'
- 14 occurred on week days (Monday – Friday). 6 accidents occurred on weekends (Saturday – Sunday)
- The weather was recorded as being 'Dry' when accidents occurred
- On 4 occasions, cyclists required hospitalisation and tragically, in 2019, a cyclist was fatality injured
- 8 Accidents occurred at intersections
- 13 accidents occurred on roads managed by HRCC. 4 accidents occurred at intersections of arterial and connector roads

Crash locations

No accidents occurred twice at the same location, but:

- Two accidents were recorded along the length of McPherson St: Hamilton St and Smith St
- Three accidents were recorded along the length of Firebrace St: Hamilton St, McLachlan St and along a section of Firebrace St
- A total of 10 accidents (50%) occurred in the Central Activity District bounded by: Darlot / May Park Terrace, Baillie, McPherson and Hamilton Streets,
- Location data reveals 80% of the accidents (16) occurred within the built area of Horsham where the speed is limited to 50-60 km/h.

Injury data

The Safe System Risk Assessment Matrix provides guidance in the assessment of risk and the identification of the need for intervention.

Risk assessment considers the relationship between:

- the likelihood of an event occurring (rarely to almost certainly occurring) and
- the severity of the incident (property damage to a fatality).

Although cycling numbers in Horsham are historically low, accident data: number of accidents, location, road type and speed reinforce the need to implement infrastructure solutions to create a protected, cycling and shared path network that reflects local movement patterns and Council's strategic priorities.

Safe System Decision Making

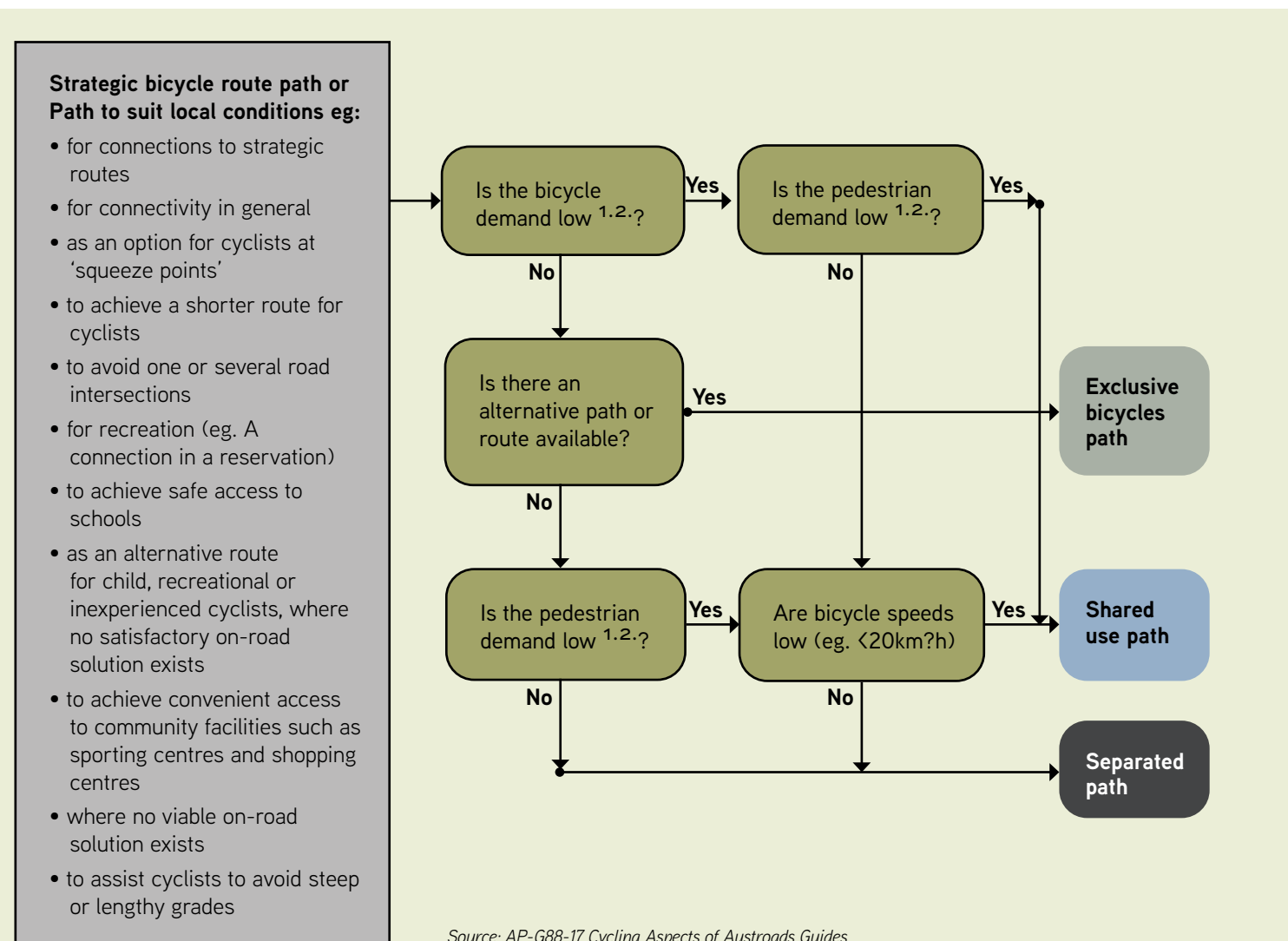
Implementation of a Safe System of active transport options involves consideration of solutions to eliminate the occurrence of fatal and serious injuries (primary solutions).

In some situations, the best options (primary solutions) may not be feasible because of project constraints (budget, site conditions, conflicting road user needs, or the environment).

If so, the next safest feasible solution needs to be identified (secondary solutions).

Incident/injury data traffic volume, traffic type and speed must be considered when identifying whether pathways should be:

- **Exclusive bicycle use**
Separated from both vehicular traffic and pedestrians for the single use of cyclists
- **Shared use path**
Separated from vehicular traffic but designed for shared use by both cyclists and pedestrians
- **Protected / Separated/ path**
Protected pathways have physical barriers separating cyclist from vehicles; separated cycle lanes are identified by line-marking or paint.



¹ The level of demand can be assessed generally on the basis of the peak periods of a typical day as follows:
 a. Low demand: Infrequent use of path (say less than 10 users per hour)
 b. High demand: Regular use in both directions of travel (say more than 50 users per hour)
² These path volumes are suggested in order to limit the incidence of conflict between users, and are significantly lower than the capacity of the principal path types.

Safe System Treatments

The following guidelines are indicative only, providing examples of:

- Protecting cyclists and pedestrians,
- Increasing predictability of pedestrian and cycling road crossing decisions,
- Reducing the time pedestrians spend on the road in the presence of passing vehicles, and
- Introducing traffic calming measures.

Austrroads technical manuals and other publications provide detailed specifications and design guidelines.

Local conditions and context should be considered when applying specifications. The goal is to provide a safe use environment.

Designing a road according to these [Safe System] principles is not the same as designing a road which simply meets design standards. There is no reason to think that by meeting standards the appropriate level of safety is built into roads" (Professional Engineers Ontario 1997).

For information regarding the widths for shared and separated paths, refer to AP-G88-17 Cycling Aspects of Austroads Guide.

General principles for pedestrians and cyclists

For pedestrians and cyclists, the main objective of the Safe System is to create a clear separation from vehicular traffic.

A holistic approach to safety treatment is recommended, involving measures not only at the proposed site but also before and/or after the site or area of development.

Supporting treatments include: line markings, lane narrowing, and advisory and regulatory signage.

Adapted from Transport Accident Commission: TAC Local Government Grant Program. Victorian Government, 2023

Pathway design should also consider elements including: sight lines, vertical clearance, drainage, gradient, cross-fall batters and fencing.

Treatment 1: Pathway selection to separate or protect cyclists

- Off-road cycle facilities are preferred where possible.
- When complete separation of cyclists and vehicles is not possible, protected on-road cycle lanes can help minimise interactions between cyclists and vehicular traffic.
- Cycle lanes built to high standards improve cyclist safety, whereas those built to lesser standards can reduce cyclist safety. Wider cycle lanes (1-1.8m) are preferred.
- Projects that include speed reductions from 50 km/h to 40 km/h or 30 km/h should be prioritised, as well as projects that provide greater lateral separation (ideally at least 1m) between cyclists and passing traffic, and/or parked vehicles.
- Where cyclists and general traffic have less than 1m of clearance or are expected to share a traffic lane, lower travel speeds (preferably not exceeding 30 km/h) will be required to align with the principles of the Safe System approach.
- The IDM requires that walkways and cycle ways be continuous and linked with each other, provide universal access and promote walking and daily cycling activities.
- Pathways should be constructed from bitumen, be free from obstructions, trips and falls hazards, with specified minimum widths and maximum cross-fall.
- Minimum standards regarding specifications are provided in the IDM.



Protected cycle lane



Protected cycle lane – Physical barrier and signage separates cycling from other road use.

Treatment 2: Colour contrast and lighting

- Accessibility standards require a colour contrast between pathways and surrounding surfaces.
- Bitumen surfaces provide a durable riding surface but may not provide the required colour contrast between the pathway and surrounding surface type. Line marking (edge of pathways) assists the definition of pathways.
- Alternatively, concrete pathways (white/cream) provide adequate contrast and reflect light in low-light conditions.



Two way cycle lane with line marking to provide colour contrast.

Treatment 3: Intersections

Roundabouts are commonly perceived by cyclists and pedestrians as one of the most hazardous forms of intersection control on the road network. At roundabouts, 80% of crashes involving cyclists are due to motorists failing to correctly judge the cyclist's speed and having a lack of awareness of the cyclist's presence.

Source: VicRoads TEM Vol 3 Part 2.15.



Protected intersection – Cyclists are separated from traffic. The 'jellybean' safety island increases sight lines for vehicles turning left.



Treatment creating a protected intersection. Note the continuous cycle path and separation from pedestrians. Note also the landscaping barrier between vehicles and bicycles.



Speed calming treatment at intersection. (Ballarat, Victoria). Creates continuous pathway for cyclists and pedestrians crossing the intersection.

Treatment 4: Traffic Calming

A range of traffic calming (speed reduction) measures are available and may include: road narrowing and shaping, speed cushions, raised platforms and other design elements.



Speed cushions slow traffic at pedestrian and cycling crossing points.



Speed humps slow traffic speed.



Street width and design contributes to traffic speeds on access roads.



Treatment 5: Canopy cover

Shade increases cycling and walking comfort and provides protection from both the sun and rainfall. Tree planting along cycle routes provides shade, reduces heat island impacts and supports increased usage of the pathways.



Natimuk Rd, Horsham.

Treatment 6: Art work and places of interest

Cycling and shared path routes present opportunities to create social areas with seating and tables, showcase artwork such as murals and sculptures, offer educational information about local indigenous history, and raise environmental awareness about habitat, flora, and fauna.



Artwork along cycle path, Plympton, Adelaide

Treatment 7: Signage and wayfinding

Appropriate signage clarifies decision-making for cyclists and motorists, creating a safer travel experience and increasing the visibility of routes and options for cyclists and the wider community. Wayfinding signage guides people to destinations along the bicycle and shared path network.



Barnes Boulevard, Horsham



Part 3: Existing Condition Assessment – Audit & Recommendations

Existing condition assessment – audit of cycle routes

During November 2022 – February 2023, an assessment of the existing bicycle and shared paths network in Horsham was undertaken to review and assess:

- The implementation of the 2012-2016 Plan (development of cycling network and safety upgrades) and determine
- If upgrades to the cycle pathways reflect Safe System principles and design solutions

The audit considered Movement and Place categories, the hierarchy of roads and associated cycling and shared path treatments proposed in the IDM and local cycling conditions and movement patterns across the network.

Assessment criteria evaluated:

Road treatments and the hierarchy of roads

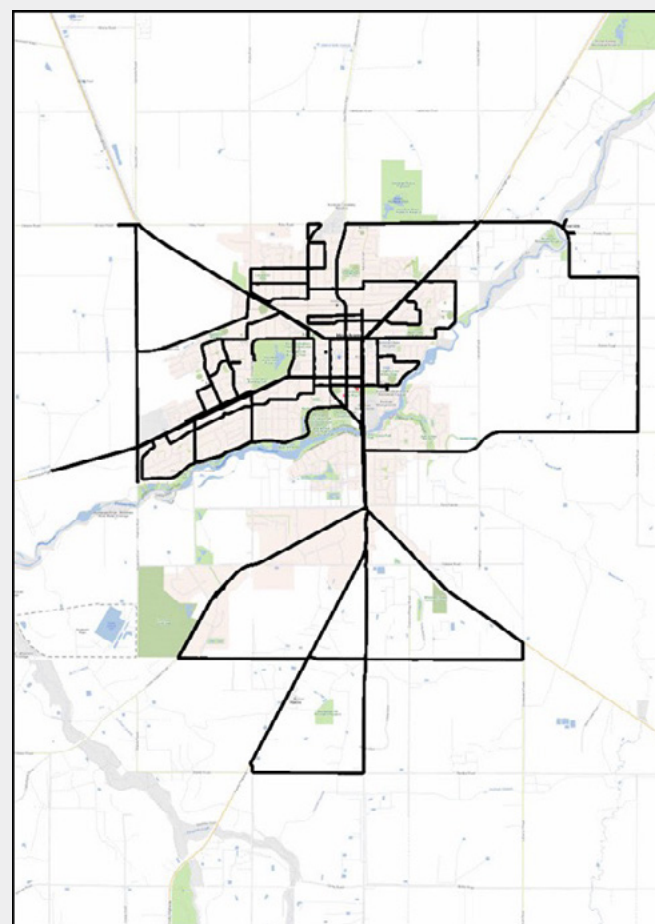
- Separation of bikes and vehicles in areas of high volume and speed
- Intersection treatments
- Clarity of messaging to cyclists and drivers regarding cycling lanes and cycling right of way across intersections
- Traffic calming measures where bikes and vehicles share the road network
- Line marking

Path treatments

- Surface materials
- Colour contrast
- Lighting

The review of existing cycle and shared pathways also included identification of opportunities to create a connected network providing east-west and north-south movement to and through the city centre and other destinations, including schools, work locations, and places of recreation and entertainment.

The first phase of the audit was undertaken by vehicle, using dash cam technology. Site assessments were then conducted by walking and cycling specific sections of the network to determine connectivity, potential levels of stress to cyclists and pedestrians and to observe interactions between different modes of transport.



Roads and area assessed by using a combination of cycling and walking and vehicle based dash-cam technology.

Existing cycling network – assessment outcomes

An annual funding allocation of \$75,000 for maintenance and upgrades to the cycle pathways has enabled the gradual implementation of the 2012-2016 Horsham Municipal Bike Plan.

Despite annual funding, the budget is insufficient to establish a connected network or to effectively upgrade or install new pathways and as revealed in 2021 ABS data, cycling participation rates have fallen.

Intersection treatments are complex and expensive and if cycling activity is to increase, require a focus on the safety needs of cyclists.

Less expensive options such as signage and line-markings on roadways are mininstallation of cycle lanes across the focus area has not reflected Safe System Principles.

This has resulted in:

- unprotected bicycle lanes on arterial roads,
- vehicle parking lanes sign-posted as cycle lanes,
- faded line-marking across the network (and)
- inconsistent cycle lane widths.

Shared pathways, separated from the road network or meeting Safe System Principles, exist only in sections of a network, rather than being continuous and connected.

No protected cycle lanes were identified during the assessment.

Summary of findings

Observations of existing conditions were checked and confirmed through the engagement process, and found:

- Cycling is not supported on busy arterial roads. Cycle lanes are shown via line-marking only,
- In connector streets, cycle lanes are of varying widths and are being used for vehicle parking,
- Traffic calming measures are rarely used in access streets,
- There are limited connections from the northern areas of Horsham to the CAD – steep road bridge without safety rail on Urquhart Street and underpasses at the railway line are unsuitable for cycling and pedestrian access,
- There are limited connections from the eastern areas of Horsham to connect to the CAD – access via Dooen Rd or Baillie St with signalised treatment options at two locations,
- Connections from both the west and southern areas of Horsham are disconnected - with some separated pathways along the length of both routes but no continuous or consistent treatment or network,
- There is inconsistency throughout the bicycle and shared path network, regarding infrastructure, connectivity, line-marking and signage,
- Cycle paths end at road crossings and intersections,
- Intersection treatments do not provide separation of cyclists from cars or pedestrians,
- Roundabouts do not reflect Safe System Principles (separation of cyclists and vehicles),
- Surface materials vary across the network,
- There is inadequate colour contrast between cycle paths and the surrounding environment,
- Line marking is not used to identify pathway edging,
- The Haven area lacks east-west lateral connections, although generally has good separation for north south shared path facilities which are off road,
- En-route amenity (shade, options to rest, public art) is generally not provided,
- End of route facilities are inconsistent,
- Limited/lack of formal crossing points, particularly on busy, arterial roads to accommodate safe access for pedestrians and cyclists.

Common elements across the road hierarchy

The following examples identify cycling treatments that do not meet the Safe Systems principles.

Safe System principle:

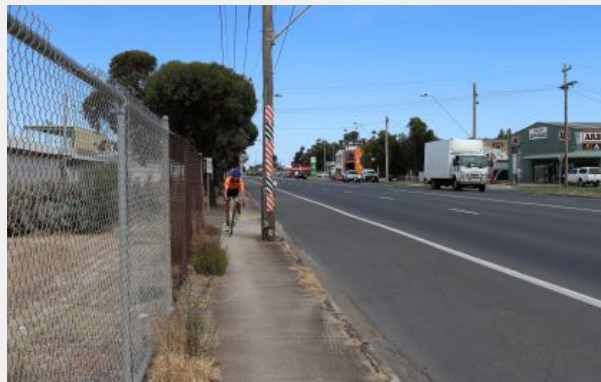
High volume traffic, high speeds (50-80kmh), heavy vehicles.

Treatment- Bicycles separated from traffic (shared or single use cycle paths) or on road in protected cycle lanes

Arterial roads (C1)

Example 1: McPherson Street

- Off-road shared cycle path is provided but there are no street crossings along the length of the cycle route,
- Shared pathway (footpath) along eastern side of McPherson St does not provide safe reaction time for cars reversing from driveways,
- Shared path contains obstructions for pedestrians and cyclists,
- Shared pathway near velodrome ends at car park – no continuous network.



Narrow shared cycle and pedestrian path – Obstruction within footpath, McPherson St.



McPherson St, looking south – Shared path ends at car park near stadium, McPherson St.



McPherson St (looking north) – Footpath ends at southern entrance to Showgrounds.



McPherson St near Stawell Rd intersection – Unprotected cycle access to off-road (shared) path. Kerb treatment not consistent with preferred cycle treatment.

Example 2: Baillie Street

- Signage and line-marking (cycling lane) but cyclists share the road with heavy vehicle, high daily traffic volume trucks at speeds between 50-60km/h



Baillie St (looking west) – High volume traffic but no separation of bicycles and vehicles.



Baillie St (looking east) – High volume traffic and cycle lane is not protected and is shared with parked vehicles.

Example 3: Dooen Road

Cyclists share the road with high volume and heavy vehicle traffic on a narrow bike path.



Cycle lane on arterial road not protected from high volume traffic.

Example 4: Wilson Street

The cycle lane on the arterial road is not protected from high volume traffic.



Wilson St (looking east) - Bicycles coexist with heavy vehicles in a lane that lacks both separation and protection, positioned behind angle-parked cars.

Example 5: Natimuk Road

- Limited sections of off road pathways
- Signage and line-marking (cycling lane) but cyclists share the road with heavy vehicles
- High daily traffic volume at speeds between 50-60km/h
- Cycling not supported across most intersecting roads



Natimuk Rd (looking west) – Cycle lane on arterial road not protected from high volume traffic.

Connector Roads (C2 – C3)

Safe System principle:

Road speed of >30kmh = separate bicycles from traffic and/or traffic calming.

Consistent treatment (surfaces, line marking, lane treatment, signage) required to reduce confusion for cyclists and motorists.

Example 1: Baillie Street

- Shared off-road pathway provided between Park Drive and Bennett Rd
- Poor surface condition
- Poor colour contrast
- Variable traffic conditions along the length of Baillie St
- Inconsistent cycling and pedestrian treatments



Baillie St – Park Drive intersection.



Baillie St / May Park Terrace intersection – Cycle lane ends at intersection.

Example 2: Bennett Road

- Shared off-road pathway provided between Natimuk Road – southern end – cars parked in bike lane and different lane widths (on either side of the road)
- Cycle lanes not consistently applied
- No road crossing intersection treatments provided along the length of Bennett Rd
- Pathway along the racecourse has an overhead roof line impacting the pathway.



Bennett Rd (Wimmera river end) – Cycle lane used for parking.



Bennett Rd (looking south) – Cycle lane gives way to parked vehicles.



Bennett Rd looking north – Cycle lane not visible.



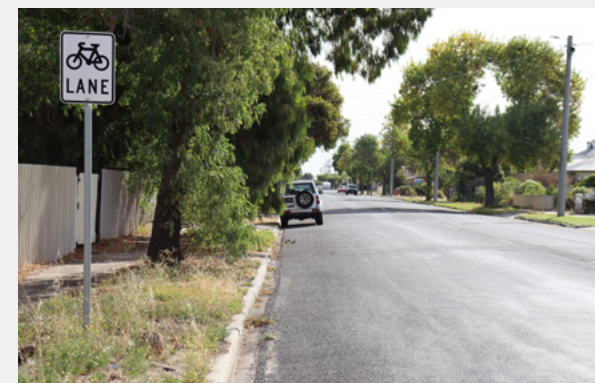
Bennett Rd looking north – Cycle lane on western side of road. Different width to lane on eastern side of the road.



Cycle lane through racecourse car park. Shared pathway is through a car park and against traffic flow.

Example 3: Lynott Street

- Shared off-road pathway provided between
- Cycling lane shared with vehicles, traffic speed of 50km/h
- Faded line marking
- Lack of road crossing treatment along the length of the roadway



Lynott St (near Albert St intersection) – Faded line marking and car parked in cycling lane.



Lynott St (looking east).

Example 4: Mill Street – Hazel Street

- Heavy vehicle, high volume, speed of 50km/h – no provision for off road cycle/shared path



Mill St (looking east).

Hazel St (looking west).

Example 5: O'Connor Street

- Variable cycle lane treatments across the urban area



O'Connor St (looking east).

Existing conditions – that support cycling

Existing infrastructure separating cyclists from vehicles or providing continuous travel lines for cycling was also identified.



Hamilton St, Horsham (looking east).

Example 1: Hamilton Street

The left turn into McPherson St offers a protected and separated option, ensuring cyclists are distinct from left-turning vehicles.



Natimuk Road, Horsham (looking west).

Example 2: Natimuk Road

A shared cycling and pedestrian pathway, distinct and separated from the road carriageway.



Corner of Firebrace St and O'Callaghan's Parade, Horsham.

Example 3: O'Callaghan's Parade

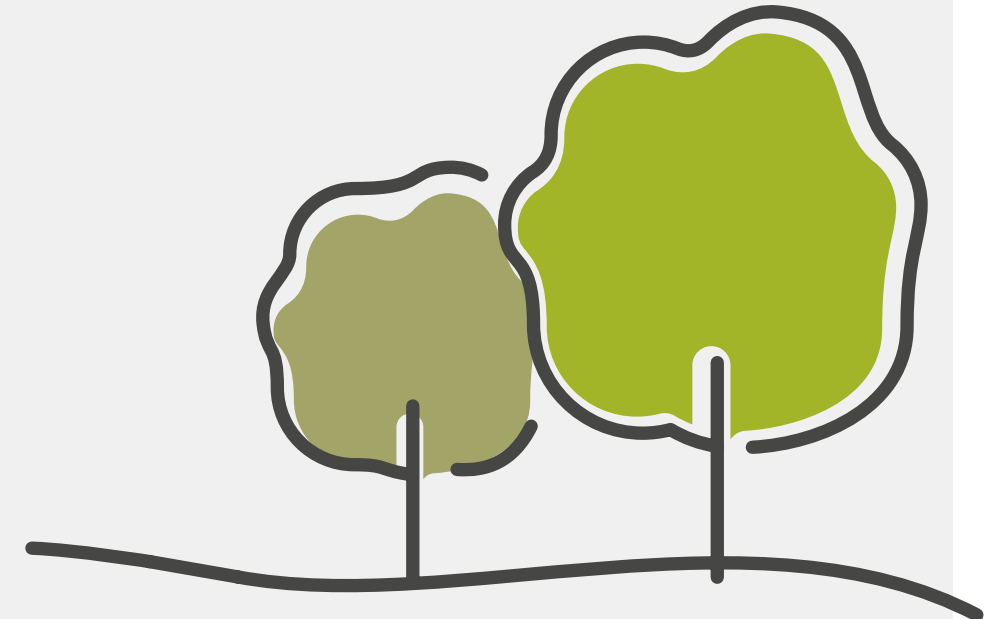
Situated at the corner of Firebrace St and O'Callaghan's Parade, the infrastructure ensures continuous connections across intersections.



Dimboola Road, Horsham (looking west).

Example 4: Dimboola Road

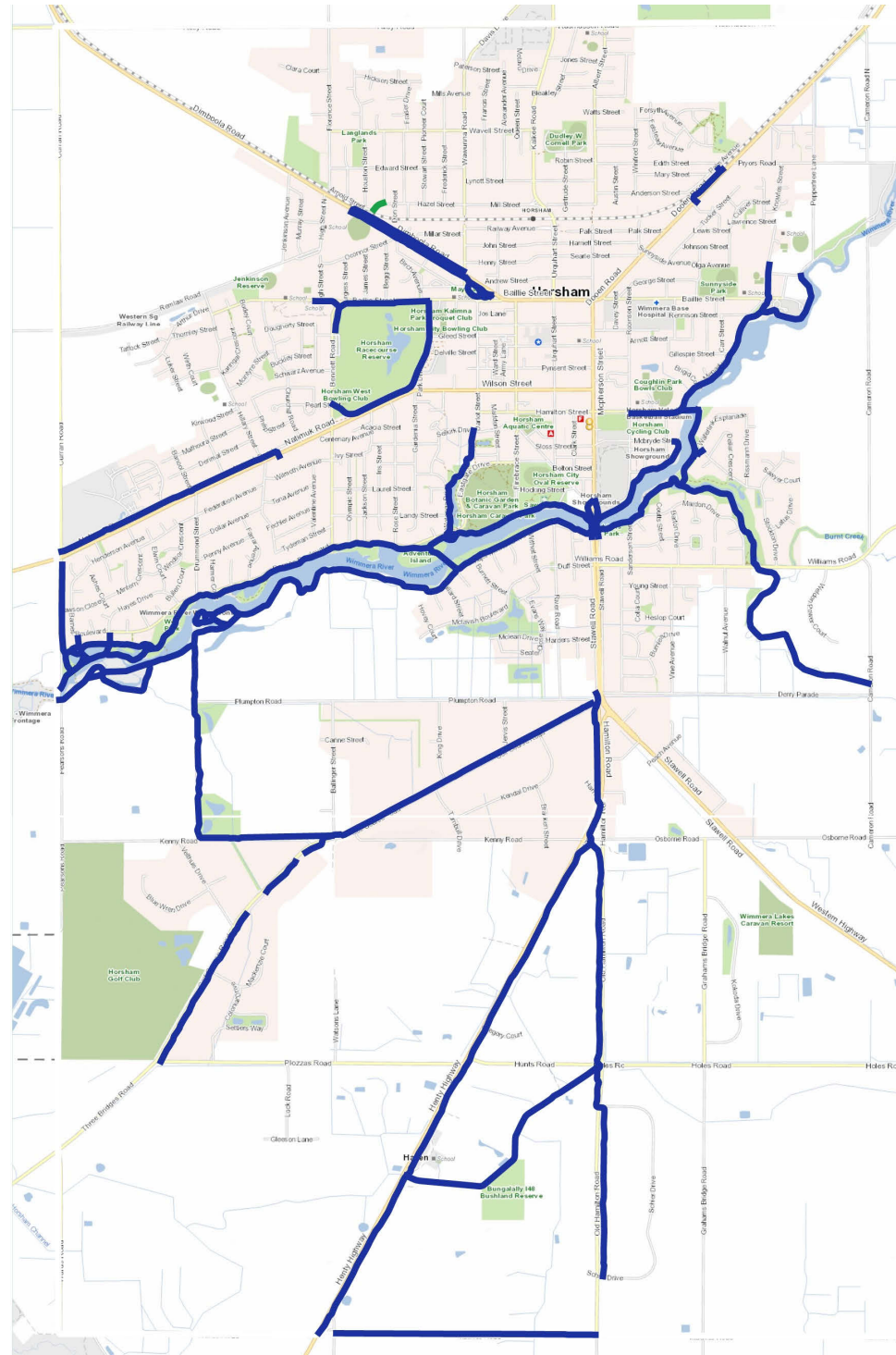
Along Dimboola Rd, the pathway running alongside the arterial road is separated for pedestrians and cyclists, with the concrete surface offering a visual contrast against the adjacent grassed area.



Audit results – existing shared path routes

Applying Safe System Principles has identified many gaps in the existing cycling network throughout Horsham.

The majority of routes meeting Safe System Principles are off-road or shared path options. A significant proportion of the network is located along the Wimmera river and adjacent natural areas.



Cycling and shared pathways that meet Safe System requirements

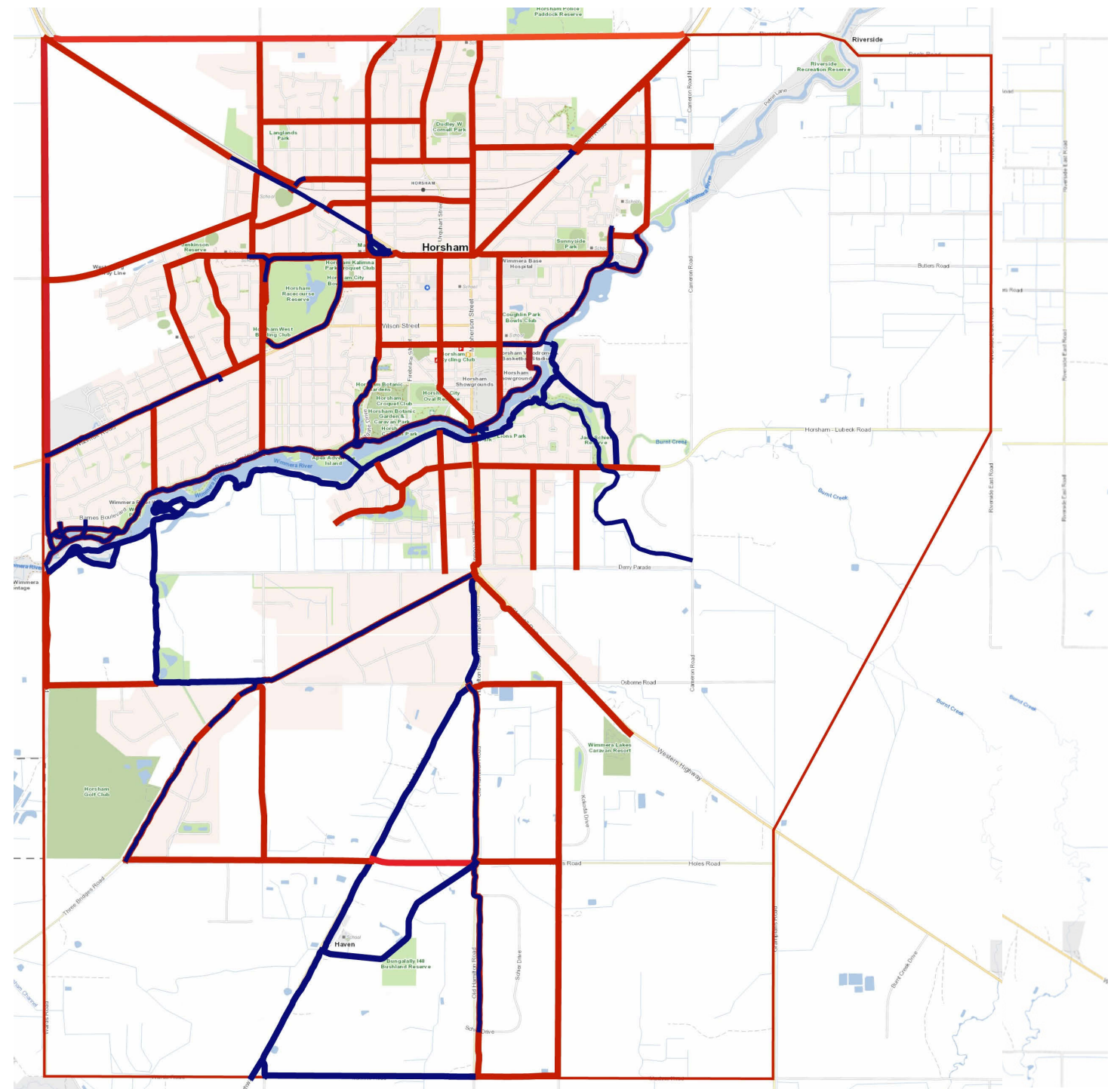
Recommended cycling and shared path network

The audit identified opportunities to create safer cycle routes across the network. Existing pathways provide a framework upon which a Safe System network can be created.

Red lines on the map represent proposed routes to create a connected network throughout the developed areas of Horsham and Haven. Existing (Green) and proposed new (red) cycle and shared path treatments combine to create a connected active transport network.

The proposed network includes arterial, connector and access roads.

The network will require a variety of safety and traffic calming measures specific to reflect the road hierarchy and associated traffic conditions.



Recommended cycle and shared path network

Funding Options

Funding for the implementation of the 2024 Bike Plan will be through Council’s annual Capital Works Program.

External funding will be required to support the full implementation of the Plan.

This includes further analysis of treatments for sections of the proposed network and implementation of significant infrastructure projects including:

- intersection treatments,
- new sections of the network,
- controlled crossing points,
- end of trip facilities,
- bridge connections
- signage and
- other safety interventions.

Budget history

Through the HRCC Capital Works Program, an annual budget of approximately \$75,000 has been directed to the construction of new or improved bicycle infrastructure.

External funding

External funding will contribute to larger scale works. Funding sources may include:

- **Developers:** Opportunities through new sub-divisions for developer contributions to align with HRCC’s strategies to improve accessibility is important to promote growth and ease of movement, connecting the community to activity centres and key destinations.
- **TAC Local Government Grant Program:** Encourages Local Government Authorities to improve road safety within their local communities and is specifically designed to improve the safety for walking and cycling by focusing on infrastructure projects focused around Safe System principles (primary and secondary treatments).
- **Black Spot Program:** Part of the Federal government’s commitment to reduce crashes and road trauma on Australian Roads. The program targets known locations with a significant crash history – and funds treatments that directly address the types of crashes occurring.
- **Federal Government:** Funding can be obtained in association with large scale Federal projects such as major transport projects (rail extension, freeway construction), road safety programs and health improvement strategies.



Conclusion

Since 2003, Safe System Principles have provided a nationally endorsed framework to guide the provision of road infrastructure for a variety of active transport modes, including cycling.

The 2012-2016 Horsham Municipal Bicycle and Shared Paths Plan demonstrated Horsham Rural City Council’s commitment to the provision of cycling and shared path infrastructure.

However, despite an annual investment in cycle pathways, cycling numbers have declined since 2006. Although there are many reasons why people do not walk, cycle or use other active transport options, there is a direct relationship between the provision of safe and accessible infrastructure and the number of active transport and active recreation participants.

Safe System principles recognise that:

- People make mistakes
- Humans are fragile
- Road safety is a shared responsibility
- The road system must be forgiving

The Safe System philosophy underpins Victoria’s strategic approach to road safety.

Cycling and other active transport options are supported in several current Horsham Rural City Council strategic documents, including the Horsham Planning Scheme.

The 2024 Plan provides a roadmap for the implementation of various initiatives that will create a network of cycle and shared paths to and through the urban areas of Horsham and Haven.

The 2024 plan identifies required traffic management infrastructure (separated or protected pathways, traffic calming, line marking, signage, surface materials) to create a connected network.

The 2024 Plan also identifies supporting infrastructure (seating, wayfinding, en-route and end-of-route facilities) to improve the experience of cycling and walking.

The 2024 Plan recommits Horsham Rural City Council to the creation of a connected, active community, providing a vibrant, liveable hub [that empowers] its people to live, work and access opportunities for recreation and culture, now and into the future.



