HUME CITY COUNCIL

HUME BICYCLE NETWORK PLAN

Final Report

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Table of Contents

INTRODUCTION **5**

1 BACKGROUND **6**

2 METHODOLOGY **10**

2.1 OVERVIEW 10
2.1.1 Consultation *10*
2.2 USERS 12
2.3 PRINCIPLES 13
2.3.1 Connectivity *13*
2.3.2 Directness *13*
2.3.3 Legibility *13*
2.3.4 Pleasantness *13*
2.3.5 Safety *14*
2.3.6 Integration *14*
2.4 INITIAL BICYCLE NETWORK PLAN 14
2.4.1 Assess Cycle Demand *14*
2.4.2 Identify Bicycle Route Options *15*
2.5 FINAL BICYCLE NETWORK PLAN 17
2.5.1 Evaluate Cycle Route options *17*
2.5.2 Overlapping Cycle Routes *17*
2.6 FINAL HUME BICYCLE NETWORK 18

3 PRIORITISING THE BICYCLE NETWORK **20**

3.1.1 Prioritisation of Cycle Routes *20*
3.1.2 Funding Prioritisation *24*
3.1.3 Target Projects *25*
3.1.4 Advocacy Projects *30*
3.2 IMPLEMENTING THE BICYCLE NETWORK PLAN 34
3.3 CONSIDERATIONS FOR DETAILED DESIGN AND DELIVERY 34

REFERENCES **35**

Table of Figures

Figure 1. Map of existing bicycle infrastructure in Hume 8
Figure 2. Methodology Process 10
Figure 3. Consultation Process Overview 10
Figure 4. Map of Initial Plan 16
Figure 5. Final Bicycle Network Plans 19
Figure 6. Example of importance to the network assessment 22
Figure 7. Example of ease of deliver assessment 22
Figure 8. Process to find Target and Advocacy Project Lists 24
Figure 9. Map of Bicycle Network Plan – Target Projects in Sunbury 26
Figure 10. Map of Bicycle Network Plan - Target Projects in Hume Corridor 27
Figure 11. Map of Bicycle Network Plan – Advocacy Projects in Sunbury 31
Figure 12. Map of Bicycle Network Plan – Advocacy Projects in Hume Corridor 32

Table of Tables

Table 1. Type of Users in Hume Bicycle Network Plan 12
Table 2. Information collected for demand assessment 14
Table 3. Key destinations per type of user 15
Table 4. Rating process to resolve overlapping routes 18
Table 5. Importance to network criteria 21
Table 6. Ease of deliver criteria 23
Table 7. Target Project List – Hume Corridor 28
Table 8. Target Projects List - Sunbury 29
Table 9. Advocacy Projects List - Hume 33

INTRODUCTION

Cycling, like walking, is an important travel mode. Cycling is a popular recreational activity in Hume, but it also plays a crucial role in a sustainable and equitable transport system by providing affordable access to a range of services and links to public transport. Increasing the amount of cycling trips in Hume will help to reduce traffic congestion, result in healthier residents and more active, vibrant and safer public spaces.

Hume currently has low cycling participation rates, especially as a form of transport. According to the Victorian Integrated Survey of Travel and Activity (VISTA) 2007, Hume residents make 1% of their daily trips by bicycle and cycling accounts for less than 0.1% of the distance travelled. Given the high proportion of relatively local journey to work trips in Hume there is potential to increase the level of cycling throughout the municipality.

One of the main objectives of the Hume Integrated Land Use and Transport Strategy (HILATS) adopted in 2011 is to encourage cycling for local transport and recreation trips by providing safe, connected and enjoyable cycling environments. In order to achieve this, HILATS recognises the need to develop a continuous, direct and legible local bicycle network to link Hume residents to key destinations such as activity centres, schools, employment areas, recreation facilities and public transport nodes.

The Project

The aim of the Hume Bicycle Network Project is to define a comprehensive cycling network of off-road and on-road paths that provides a range of routes to suit different cycling needs. The development of a local cycling network in Hume will legitimise the importance of cycling as mode of transport and recreation and will provide a supportive environment and infrastructure for all types of cycling trips.

This project has the following objectives:

- Identify and develop a comprehensive municipal wide Bicycle Network Plan for Hume that connects residential areas with key destinations and the wider regional cycling network.
- Identify the priority cycling routes to inform Council's capital works program and future grant applications in order to deliver bicycle infrastructure.
- Provide an update to the Walking and Cycling Strategy Implementation Plan. The outcomes of this project will inform the prioritisation of the construction or upgrade of the cycling paths that are part of this plan.
- Inform the designation of an on-road bicycle network in areas to be redeveloped and subject to future road reconstructions.
- Identify the required locations for cycling support facilities in the municipality.

1 BACKGROUND

Hume is facing major challenges and opportunities to increase the uptake of cycling as a transport mode. In order to increase the cycling participation in Hume from its current levels to participation levels observed in metropolitan Melbourne. A comprehensive bicycle network is required that provides all potential users with access to bicycle infrastructure that suits their needs. The first step in delivering such a network is the development of a plan of the desired bicycle network that guides future planning and investment.

This Bicycle Network Plan provides this network, clear guidance of user needs and their infrastructure requirements as well as target projects for delivery and funding.

Policy Framework

Cycling is widely recognised across all government levels as a legitimate mode of transport and an effective way to ease traffic congestion, reduce car dependency and reduce greenhouse emissions. The National Cycling Strategy (2011-2016) provides a consistent national approach to cycling as both a mode of transport and a recreational activity. The Victorian Cycling Strategy (2013-2023) aims to take an integrated approach to planning and delivery of cycling infrastructure in Victoria, identifying the need for better connectivity and better targeted investments complementing the operational improvements aimed by SmartRoads (VicRoads, 2012).

At a local level, the Hume Integrated Land Use and Transport Strategy - HILATS (2011-2020) aims to improve transport options for residents and visitors of the municipality with an integrated land use and transport approach, and the Hume Walking and Cycling Strategy (2010-2015) provide a framework to develop bicycle paths as part of daily recreation, health and commuter routines.

The Bicycle Network Plan is one of the main actions of HILATS to encourage sustainable transport modes for local transport and recreation trips by providing safe, connected and enjoyable cycling environments.

Current Situation in Hume

There are low cycling participation rates in Hume, with cycling representing only 1% of the daily trips in Hume. This very low indicator compared to other Melbourne municipalities and it is explained by multiple factors including: lack of understanding about the cycling demand; unsafe riding conditions and perceptions; a strong focus on off-road recreational paths that do not cater for commuter trips; lack of priority for cyclists at intersections; a lack of convenient bicycle parking facilities; lack of direct, integrated and connected bicycle networks; and low levels of investment in bicycle infrastructure, especially on-road bicycle infrastructure.

The key findings outlined below summarise the current situation in Hume relating to bicycle users, bicycle infrastructure and bicycle network. Detailed information regarding these findings is outlined in the *Background Paper (2013)*.

Users - Key findings:

A review of cycling participation rates data in VISTA (2007), Census (2011), Super Tuesday Counts and targeted bicycle surveys identified the following:

- Hume has very low cycling participation levels that are comparable with neighbouring outer metropolitan Council areas but below inner areas where there has been a greater level of implementation of sustainable transport initiatives and promotion of cycling as a mode of transport over the last 10 years
- The number of people cycling to work has decreased marginally since 2006 despite strong population growth. Many inner metropolitan areas have seen an increase.
- There is insufficient long term data to identify spatial variations in cycling but surveys record higher counts where there is a good variety of infrastructure and a more complete network
- The lack of existing data and scale of growth means that a predict and provide approach is required in network planning
- Both safe riding conditions and negative perceptions of road safety are the major barriers to the uptake of cycling in Hume.

The bicycle network plan provides an important first step in increasing cycle participation by identifying the network and infrastructure required by current and potential cyclists. Over time, improved data collection will increase the understanding of cyclists needs in Hume – who is riding, where and for what purpose- that can inform future reviews to this plan.

Infrastructure - Key findings:

Analysis of the current cycling infrastructure within Hume identified the following:

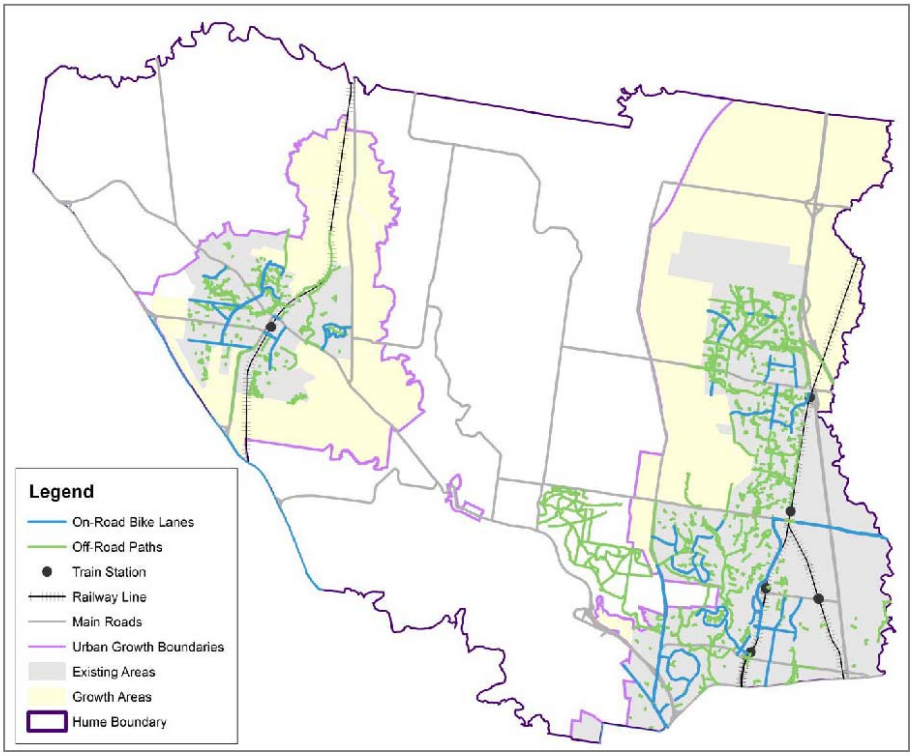
- Existing cycling infrastructure in the municipality varies in terms of standards, surface, path widths, materiality and line marking.
- Existing cycling infrastructure mostly caters for recreational cyclists on off-road paths and varies across the municipality.
- Opportunities for commuters are much more limited and on road facilities are not currently integrated. There are also safety concerns on some of the on-road facilities, particularly at intersections and in areas where cyclists are encouraged to utilise parking lanes.
- A high proportion of the existing shared paths are not designated as such, and lack the directional signage required to make it safe for cyclists.
- There is a lack of bicycle parking and end of trip facilities at key destinations in Hume to encourage cycling to local destinations. To this end Hume need to establish a clear process to identify, install and replace bike parking and end of trip facilities.

The Bicycle Network Plan will assist in addressing the challenges identified with the current planning and delivery of infrastructure by:

- Clearly identifying where new bicycle infrastructure is required in the growth areas
- Ensuring that new roads and bicycle infrastructure is designed to better meet the intended bicycle users of that part of the network.
- Identifying where cycling infrastructure should be considered in the upgrade or improvement to any existing roads
- Informing the prioritisation of routes for future maintenance.

The following map shows the existing bicycle infrastructure in Hume, both off-road paths and on-road bicycle lanes:

Figure 1. Map of existing bicycle infrastructure in Hume



Network - Key findings:

Analysis of the current and proposed network identified that:

- The current network comprises mainly off road paths that suit leisure and recreation cycling trips well but are less convenient to commuter trips
- Most of the on-road bicycle routes are non-continuous that are disconnected from the wider network
- The future bicycle network needs to include a greater mix of on-road and off-road facilities that cater for all riders independently of the level of confidence, and for all trip purposes;
- There are a variety of agencies responsible for planning, funding and delivering bicycle networks across the local, regional and metropolitan network.;
- Although 30% of the Principal Bicycle Network (PBN) has been completed in Hume, further work is required to complete the nearly 70% that is still missing, which accounts for approximately 200 km.

The Bicycle Network Plan will assist in addressing the challenges identified with the current planning and delivery of the bicycle network by:

- Guiding the future planning and prioritisation of the identification of the bicycle network and future infrastructure delivery.

- Providing a network that delivers opportunities for all bicycle users and improving the connectivity legibility and integration of existing and future paths and regional and metropolitan networks
- Identifying priorities for investment by the different agencies responsible for delivering the network

Conclusions

The Background Paper identified the importance of developing a bicycle network plan and its value in addressing the challenges of increasing cycling participation in Hume. Key implications from the Background Paper for how the Bicycle Network Plan is prepared are:

- Hume requires a greater range of cycle route options to attract potential cyclists that ride for different purposes other than recreation, and that will contribute to reduce traffic congestion and air pollution.
- A *predict-and-provide* approach is required in Hume for the growth areas and to overcome the data constraints on existing cycling participation and cyclist needs in established areas. Such an approach will give the best opportunity to cater for a broader range of cyclists.
- Hume needs a cycling plan to ensure coordinated planning and implementation of cycling in infrastructure that is adequate to the different rider profiles in the municipality.
- Hume's bicycle network needs to aim to be connected with other on-road cycle lanes and off-street paths; legible for cyclists; and integrated in terms of land use and transport.
- The prioritisation of routes and funding will ensure an appropriate level of investment in bicycle infrastructure. Hume will be able to set a short, medium and long term projects priority list that can be easily presented to a broader audience and stakeholders.

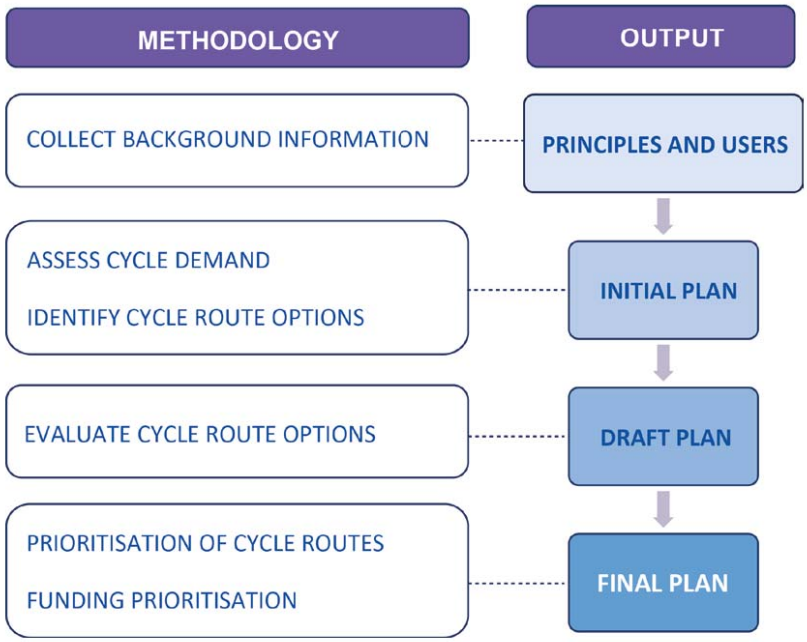
2 METHODOLOGY

The methodology process used to develop the bicycle network plan in Hume was based mainly on the methodology proposed by the Cycle Network and Route Planning Guide (New Zealand). The methodology was also adapted and complemented with information found in the best practice review that was done as part of the development of the Background Paper.

2.1 Overview

The figure below summarises the process followed to define the network:

Figure 2. Methodology Process

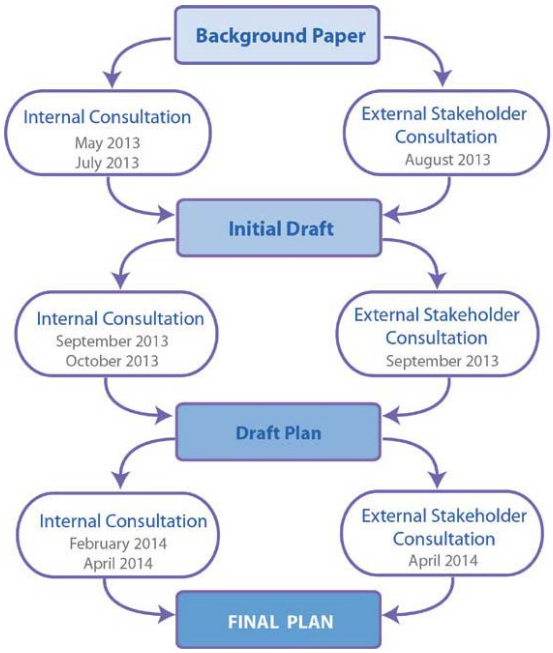


The development of Bicycle Network Plan is based on a methodology that considers meeting the needs of all cycling users and the opportunities and constraints within Hume. Specifically, it has sought to identify the different users, where they wish to ride, for what purpose they ride and their skills to deal with a variety of conditions.

2.1.1 Consultation

This Hume Bicycle Network Plan has been informed by internal and external consultation on a series of technical documents and maps during each phase of the project. The overall consultation process is shown in the figure below:

Figure 3. Consultation Process Overview



a. Internal Stakeholders Consultation

Six internal workshops were undertaken with the internal working group that includes representatives from Strategic Planning, Leisure, Engineering and Assets, Subdivisions Engineering and Landscape, Urban Places and Capital Works departments.

b. External Stakeholders Consultation

The consultation with Bicycle User Groups (BUGs) consisted of a one-to-one meeting with representatives of each group and the distribution of an Initial Bicycle Network Plan to provide feedback to Council.

Two meetings were held with Bicycle Network Victoria (BV) in order to present the project and to discuss the Bicycle Network Plan.

c. Schools Consultation

A consultation process was set up to consult with schools in collaboration with Council's Health Promotions Team.

- A consultation letter and a survey were sent to all schools in Hume to determine their level of engagement in this project and to gather information regarding current cycling participation and issues at each school.
- 30% (19) of schools in Hume responded to the survey. Council officers from the Health Promotions Team undertook five classroom activities in primary schools in Broadmeadows, Greenvale, Craigieburn and Sunbury.
- The information collected from the survey and classroom activities has informed the development of the Bicycle Network Plan. The key findings of this consultation regarding cycling to school are that there are safety concerns among parents and teachers and many schools do not currently participate in any cycling programs or have not identified "safe routes to cycle to school".

- Additional work with schools regarding cycling routes to school will be undertaken as part of the "Safer Routes to School Program" identified in Council's Sustainable Transport Education and Promotion Plan (STEPP).

2.2 Users

During the best practice review, seven types of cyclists were identified that have different characteristics and requirements. A detailed description of these types of users can be found in Appendix 1. Following discussions with internal and external stakeholders, these types of users were grouped in four main categories: novice, commuter, recreational and primary school children.

Given the complexity and need for consultation with school principals, parents and school children, it was agreed that the development of the primary school children' bicycle network will require a more detailed process and it will need to be done in a case by case project. The final bicycle network does not have detailed network around primary schools, but the feedback and comments received during the consultation sessions at schools were taken into account in developing the wider network.

Therefore, three types of user groups were considered to develop Hume's bicycle network. The table below shows these users, their characteristics and infrastructure requirements:

Table 1. Type of Users in Hume Bicycle Network Plan

User Type	Key Characteristics	Infrastructure Requirements	Example of user type and Infrastructure
Commuter	Confident riders Commuting trips Long distances trips	Prefer: On-Road Paths – Off-road: some prefer this type of infrastructure – On-road: some prefer low-stress roads, but others want quick trips regardless of traffic conditions. Primarily require space to ride, smooth riding surface and ability to maintain speed.	
Novice	Non-confident riders Secondary School Children (over 12 y) Local trips	Prefer: Exclusive Bicycle Paths – On-road: facilities are used – Off-road: paths are used where available as even if it take longer to get to destination.	
Recreational	Recreational and touring riders Leisure trips Sport trips	Prefer: Off- Road Paths – Off-road: desire off-road paths – On-road: desire quiet local streets, avoid heavily trafficked routes, and more experienced will prefer to use road system for long journeys	

2.3 Principles

The development of the six principles that guide the development and delivery of the bicycle network plan was based on a review of best practice documents and the feedback received during the first meetings with internal and external stakeholders. A detailed description of the six principles can be found in Appendix 2. The sections below define each principle and describe how those principles are to be achieved in the development of the bicycle network plan and how they can be used during its future implementation.

2.3.1 Connectivity

"All bicycle routes should connect to each other and to the wider bicycle network"

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Linking the residential area with identified destinations
- Ensuring that the ultimate network is continuous with minimal gaps
- Combining on and off road facilities
- Providing a choice of route options to cater for the different potential bicycle users and their specific needs

2.3.2 Directness

"The bicycle network should provide the most direct possible routes to key destinations".

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Ensuring that the network balances the level of directness and perceptions of safety appropriate to the intended user with more direct routes for commuters
- Minimising travel distances by limiting deviations and circuitous routes
- Improving permeability in the existing network through provision on new routes

2.3.3 Legibility

"Bicycle routes should be legible, continuous and recognisable"

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Identifying options where signage could be introduced to improve legibility and fill gaps in the network

2.3.4 Pleasantness

"The bicycle network should provide a good level of comfort for cyclists along routes"

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Identifying potential for scenic, quiet and pleasant environments where possible, particularly for recreation and novice cyclists
- Identifying destinations that could be attractive to cyclists for the provision of end of trip facilities

2.3.5 Safety

"The bicycle network should provide safe routes for cyclists"

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Assigning routes to a specific user so that their differing perceptions of safety and confidence can be considered in determining the required level of separation from pedestrians and motor vehicles, the future infrastructure that is delivered and the design of intersections and roundabouts.

2.3.6 Integration

"Cycling infrastructure should be integrated with key destinations, public transport and other transport projects"

To achieve this principle, the development of the Bicycle Network Plan has focussed on:

- Linking the residential area with key destinations, notably activity centres and public transport nodes
- Connecting new routes into the existing network

2.4 Initial Bicycle Network Plan

An Initial Plan was developed using information collected during the assessment of potential demand of bicycle trips and through the identification of bicycle route options in Hume for the different user types.

2.4.1 Assessing Cycle Demand

The assessment of the cycle demand creates an understanding of what to provide for different cyclists, and where they wish to ride, for what purpose they ride, and how confident they are to handle a variety of conditions.

This demand assessment was undertaken only in existing developed areas and did not include the growth areas because there was not enough information regarding the land use outcomes or planned infrastructure in all parts of the growth areas to perform this assessment.

Given the constraints in information for Hume, and the lack of a method to measure demand for bicycle trips in growth areas, the demand assessment was qualitative and focused on areas with potential to attract more bicycle trips. The assessment identified the location of key origins and destinations, known transport patterns, and the current use of bicycle paths observed in surveys. A description of the information used in this process can be found in the following table:

Table 2. Information collected for demand assessment

Origins	Destinations	Transport Patterns	Use of Paths
• Residential Zones • Population Data	• Schools • Employment • Facilities • Activity Centres • Tourist sites	• Desire Lines • Car Ownership • Method of Travel to Work	• Bicycle Counts and Surveys • On-Road Bicycle Lanes • Off-Road Bicycle Paths

The information collected provided characteristics of each area of Hume. This information provided the location where the main target groups of cyclists (people aged between 4 and 45 years old) currently live, the location of key destinations like train stations and activity centres, location of areas of high car ownership where mode share change could be possible and patterns of users on existing paths.

The demand assessment that was carried out provided important background information and maps that informed the development of the network plan throughout the whole process. This information was used to map the bicycle networks and support the decision making when identifying bicycle routes.

2.4.2 Identifying Bicycle Route Options

As a starting point for developing the Initial map, the existing and proposed bicycle infrastructure was mapped. The proposed routes were found in different sources such as the Walking and Cycling Strategy action plan, structure and master plans and other known Council's projects planned for the existing areas, and for the growth areas the proposed cycle paths were obtained from Precinct Structure Plans, Development Plans, Local Structure Plans, Concept Plans and other known projects.

These existing and proposed bicycle routes were then included into one of three networks: commuter, novice and recreational. Routes were allocated by considering whether the infrastructure and destination satisfied the user requirements identified in Table 1 and Table 3.

In order to ensure adequate access to the bicycle network for the three different types of users, a coverage buffer was mapped along each of the existing and proposed routes. A 400 metres buffer was considered appropriate for commuter cyclists as this type of cyclist is willing to travel longer distances in the local road network to get to a formal bicycle path. Novice and recreational riders prefer to avoid mixing with traffic and therefore a 200 metre buffer was considered more appropriate for these types of users.

Using these buffers, the gaps in cycling infrastructure for each type of users were then identified. These gaps in infrastructure were reviewed and new cycle route options were identified, focussing on connecting key origins to key destinations for each type of user. Table 3 shows the key destinations identified per type of user.

Table 3. Key destinations per type of user

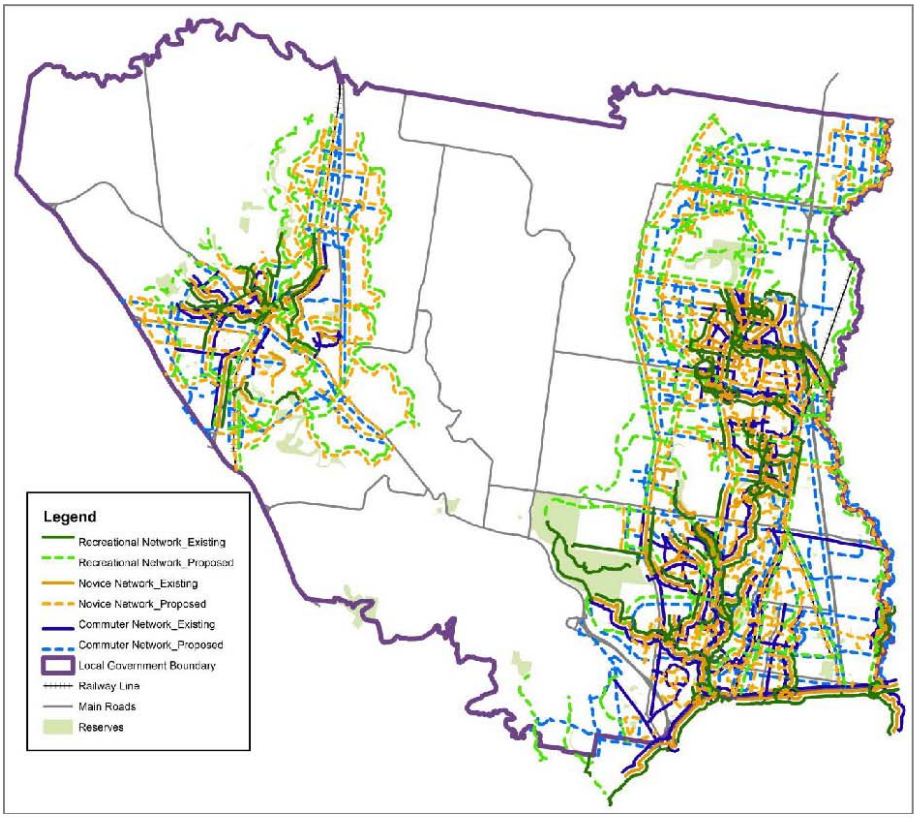
Type of User	Key Destinations
Commuter	Activity centres Train stations Employment areas
Novice	Secondary schools Activity centres Train stations Community facilities Sport and recreation facilities
Recreational	Creeks Parks Reserves Open spaces Sport grounds

To create a complete network, the remaining gaps were filled adding new routes in areas where there was no proposed infrastructure in the planning documents reviewed; and using the local road network and open space availability.

As a result of this process, the Initial Plan consisted of three combined bicycle networks: commuter, novice and recreational that served each type of user respectively, with routes that could be part of two or more different networks. A map of the Initial Plan can be found in Figure 4.

The following figure shows a map of the Initial Plan, a more detailed map can be found in Appendix 3.

Figure 4. Map of Initial Plan



2.5 Final Bicycle Network Plan

The Final Plan was developed by evaluating and comparing the options for satisfying the needs of the three types of bicycle users: commuter, novice and recreational, and trip purposes likely on each cycle route.

2.5.1 Evaluating Cycle Route options

The Initial plan was presented during the first round of consultation to share the initial findings and gather local knowledge from internal and external stakeholders. The main purpose of this consultation was to test the proposed route options for the three different types of users, to identify known constraints and opportunities in the network and to fill the existing gaps.

This process resulted in three combined proposed network with new route options being added and others being removed due to feasibility constraints.

2.5.2 Overlapping Cycle Routes

The combined network had some sections which there was an overlap between the commuter, novice and recreational routes. In order to ensure the provision of a mix of route options for all type of users and to inform the future infrastructure options (on-road vs. off-road) for each route; an additional step was incorporated to the process for identifying which type of user should have priority in each bicycle route.

A rating process was developed to determine the priority in those sections of the network that presented overlaps between the three bicycle users' networks: commuter, novice and recreational. Using the profile of each user identified in Table 1, the matrix in Table 4 was developed to assign each route to the most appropriate user. A description of the rating process developed is outlined below:

a. Relevance and importance of route to each type of user:

The level of importance of all bicycle routes to each type of user was evaluated. This criteria assigned a score if the route was located in an environment where each type of user was expected to ride. For example, a high score was given to bicycle routes that run along an arterial road or a railway line for the commuter cyclists.

b. Part of a regional network:

In this step of the process, routes were prioritised depending on whether the route was part of the following regional and metro bicycle networks: Principal Bicycle Network (PBN), Bicycle Priority Route (BPR) or Metropolitan Trail Network (MTN). The PBN and BPR are the main regional networks for commuter cyclists and MTN is the main network for recreational cyclists.

c. Number of relevant destinations that connects to

The main destinations for each type of user were identified in order to connect the residential areas to these locations; a description of these destinations can be seen in Table 3. This step also helped to ensure that the bicycle routes cater for each different purpose trips.

d. Review of gaps - Is there an alternative route?

Finally, in order to select a priority user for each route, it was necessary to review the availability of alternative routes that each type user had at that particular location in the surrounding bicycle network. This also allowed identifying the need to prioritise a bicycle

route for a particular user by considering the needs of the other types of users and distributing them in an equitable way.

Table 4. Rating process to resolve overlapping routes

Rating Criteria	Commuter	Novice	Recreational
Relevance and importance of link to each type of user	Arterial Road	Connector Road	Creek
	Train Line	Creek or Reserve	Open Space
Part of a regional network	Principal Bicycle Network – PBN	N/A	Metropolitan Trail Network - MTN
	Bicycle Priority Route - BPR		
Number of relevant destinations that connects to	Activity Centre	School	Reserve
	Train Station	Community Centre	Park
	Employment Area	Activity Centre	Sport Ground
		Train Station	
Review of gaps - Is there an alternative route?	Only one route	Only one route	Only one route
	Alternative route	Alternative route	Alternative route

The methodology outlined before enabled the delineation of a comprehensive bicycle network for Hume that will guide the delivery of a supportive environment and infrastructure for all types of cycling trips.

2.6 Final Hume Bicycle Network

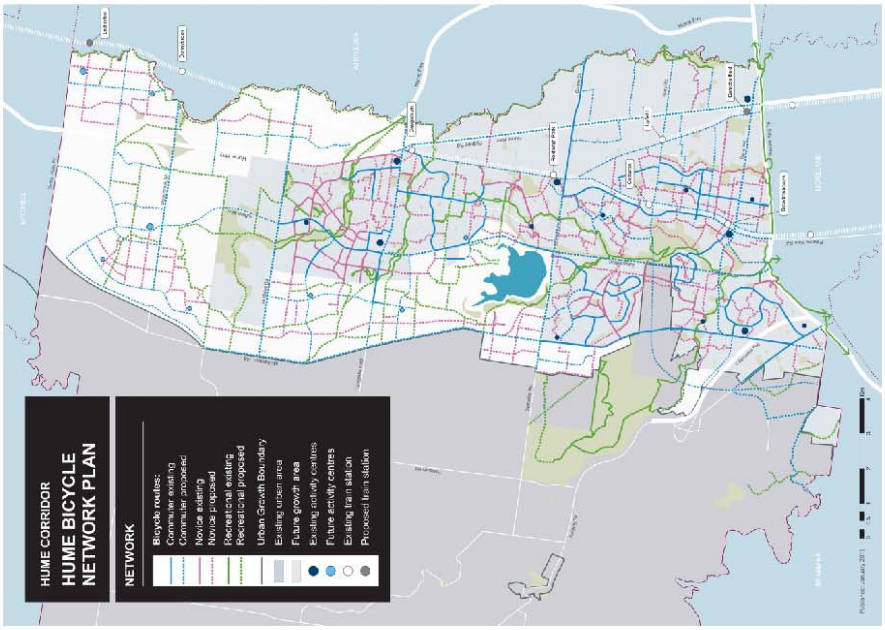
The Final Hume Bicycle Network is a network of well-connected and continuous bicycle routes that connect residential areas to key destinations. This network is a combination of existing and proposed off-road and on-road bicycle paths that provides a choice of routes and caters for all type of users: commuter, novice and recreational.

The bicycle network identified for Hume considers that each type of cycle user has different needs in regards to directness and safety. Therefore, it provides more direct routes to commuter cyclists and safer routes for novice cyclists. The diversity of cycle routes in the network supports permeability and increases opportunities for multi-purpose trips as all users can choose to use any route in the network.

As cyclists value safety and comfort, this network aims to provide an appropriate cycling environment in each route and per different type of user. This network encourages separation between cyclists, pedestrians and motor vehicles in order to improve safety and where possible, routes for recreational and novice riders are located along quiet and scenic environments.

Below are the Final Bicycle Network Plans for the Hume Corridor and Sunbury areas. Larger versions are provided in Appendix 4.

The following sections prioritise this network to identify Target Projects that Council will aim to deliver and the Advocacy Projects that Council will be advocating for in the coming years.



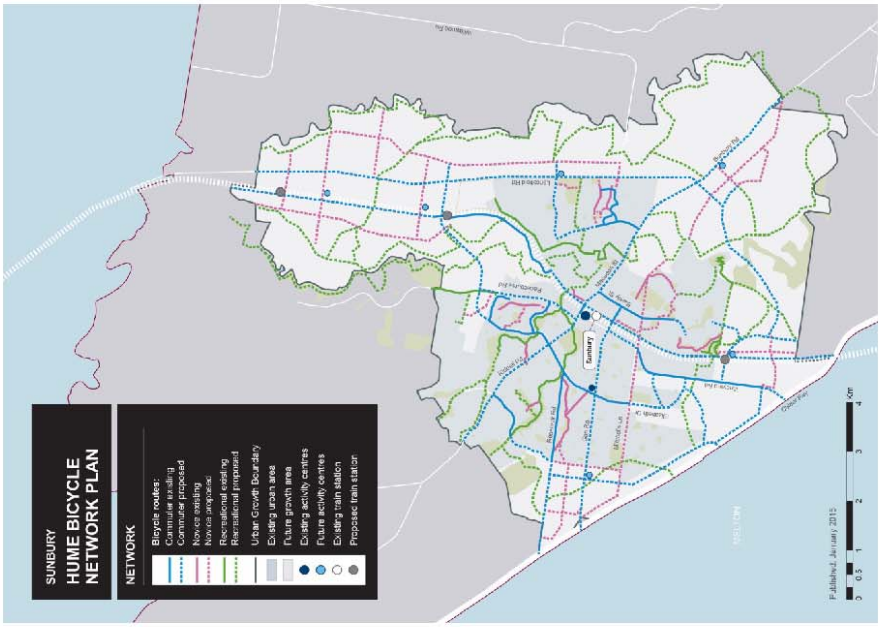


Figure 5. Final Bicycle Network Plans

3 PRIORITISING THE BICYCLE NETWORK

The Final Bicycle Network Plan showed that the amount of growth and change together with the limited existing network makes the scale of the proposed additional bicycle network in Hume very large and extensive. Therefore, it was important that a hierarchy of priority routes and priority projects were identified to implement overtime. This stage of the process aimed to prepare a program of projects for future detailed investigation, design and implementation.

The prioritisation process described in this section for Council projects was applied to established areas of Hume only as it was assumed that the bicycle routes planned in growth areas will be delivered overtime principally by developers as part of their land development.

Although priority routes are identified below, it is important to recognise that the complete network identified in the Final Plan will inform future planning decisions and should be implemented overtime by developers, State Government as well as by Council. Further, some routes that may not be the highest priorities should be delivered as part of associated duplications or other works where this is cost effective.

3.1.1 Prioritisation of Cycle Routes

The prioritisation of the cycle routes was determined by defining a rating system with two separate components: importance of each cycle route to the overall network; and ease of delivery.

a. Importance to the network

In order to establish the priority in which the cycle routes should be rolled out, first it was necessary to determine how important each route is to the network. This was achieved by using a criteria system that assigned a level of importance (high, medium or low) and a score (3, 2 or 1 respectively) to each route as follows:

- **Number of Destinations** – A level of importance was assigned to the whole network considering how many key destinations are served by each route. The key destinations used to undertake this assessment are divided in three groups as described in Table 3.
- **Importance of Destinations** – This criterion assessed the significance of the destinations served by the route as it may serve only a few destinations but each one could be a very important bicycle trip attractor e.g. a town centre or a leisure centre.
- **Metro or Regional Network** – The level of importance in this case was assigned by reviewing if the route is part of any metropolitan, regional or other municipal network as described in Table 4. Given that these networks already have a defined level of priority, the level of importance was assigned in accordance to it as follows: high score for BPR or MTM, medium score for PBN and low score for routes that connect to neighbour municipalities.
- **Contribution to the Network** – This criterion evaluated the contribution of each route to improving connectivity and its capacity to remove gaps in the network.
- **Potential Demand** – This criterion assessed the capacity that each route has to satisfy the potential demand generated in the study area (coverage). This level was defined using the outcome of the qualitative assessment of demand for bicycle routes described in section 2.4.1.
- **Importance to Users** - This criterion assessed the number of different type of users that could potentially use the route by using the information collected for the overlapping routes assessment described in section 2.5.2.

The criteria used is summarised in Table 5 below and the assessment table used is shown in Figure 6.

Table 5. Importance to network criteria

Criteria	High (Score 3)	Medium (Score 2)	Low (Score 1)
Number of destinations	The highest score is given to a route that serve 7 or more key destinations listed in Table 3	The medium score is given to a route that serve between 4 and 6 key destinations listed in Table 3	The lowest score is given to a route that serve 3 or less key destinations listed in Table 3
Importance of destinations	The highest score was given to routes that had at least one of the following key destinations: • Town Centre (TC) • Principal Activity Centre (PAC) • Train Station (TS) • Open Space (OS) • Leisure Centre (LC)	The medium score was given to routes that had at least one of the following key destinations: • School (Sch) • Reserve (Res) • Community Centre (CC) • Major Activity Centre (MAC)	The lowest score was given to routes that had at least one of the following key destinations: • Neighbourhood Activity Centre (NAC) • Park • Neighbourhood Centre (NC)
Metro or regional network	The highest score was given to routes that are part of the Bicycle Priority routes (BPR) or Metropolitan Trail network (MTN)	The medium score was given to routes that are part of the Principal Bicycle Network (PBN)	The lowest score was given to routes that connect directly to a neighbour municipality
Contribution to the network	The highest score was given to routes that remove a very significant gap in the network	The medium score was given to routes that remove a gap in the network	The lowest score was given to routes that remove a small gap in the network
Potential demand	The highest score was given to routes that had a high level of coverage	The medium score was given to routes that had a good level of coverage	The lowest score was given to routes that had a small level of coverage
Importance to users	The highest score was given to routes that could cater for the three type of users based on the type of infrastructure	The medium score was given to routes that could cater for the two type of users based on the type of infrastructure	The lowest score was given to routes that could cater for only one type of users based on the type of infrastructure

Figure 6. Example of importance to the network assessment

Importance to the network						
Number of Destinations	Importance of Destinations	Metro or Regional Network	Contribution to Network (Connectivity/Gaps)	Potential Demand (Coverage)	Importance to users (see overlapping Assessment)	SubTotal
H = 3 (7 - 10) M = 2 (4 - 6) L = 1 (1 - 3)	H = 3 (TC,PAC,TS,OS,LC) M = 2 (Sch,Res,CC,MAC) L = 1 (NAC,Park,NC)	BPR / MTN = 3 PBN = 2 Other Municipality = 1	H = 3 M = 2 L = 1	H = 3 M = 2 L = 1	H = 3 (All users) M = 2 (2 users) L = 1 (1 user)	
3	3	3	3	3	3	18

b. Ease of delivery

Given that some projects will be more difficult to deliver than others and to provide a more realistic approach to the prioritisation of bicycle routes, the level of complexity of the implementation of each route was estimated. As in the previous step, a rating system was formulated to establish the ease to deliver routes based on the following criteria:

- **Infrastructure Change** – The level of ease was assigned by reviewing the type of works that are required to deliver each bicycle route. A description of the different levels of ease assigned to each route can be found in Table 6.
- **Road Reserve or Open Space Capacity** – With this criterion the existing capacity in the road reservation or the land availability to deliver each route was evaluated.
- **Future Project or Road Upgrade** – A level of ease was assigned considering the knowledge of existing projects where there is already a budget commitment from Council or others to deliver them and bicycle routes are planned as part of other known projects.
- **Land Ownership Issues** – The level of ease was defined by the known or expected land ownership issues to deliver each route.
- **Physical Barriers** – This criterion assessed the significance of physical barriers to be overcome in order to deliver each route.

Table 6 describes this criteria process and Figure 7 shows the assessment table used.

Figure 7. Example of ease of deliver assessment

Ease to deliver					
Infrastructure Change	Road Reserve / OS Capacity	Future Project or Road Upgrade	Land Ownership Issues	Physical Barriers	SubTotal
H = 3 (Signage) M = 2 (Upgrade) L = 1 (Gaps) 0 (Does not exist)	H = 3 (There is Capacity) M = 2 (Low - Reallocation) L = 1 (High - Reallocation)	H = 3 (Commited) M = 2 (Known) L = 1 (Unknown)	H = 3 (Not known issues) M = 2 (There is a solution) L = 1 (Land acquisition)	H = 3 (No barriers) M = 2 (Arterial Road) L = 1 (Freeway/Creek/Railway)	
3	3	3	3	3	15

Understanding that the purpose of the Bicycle Network Plan is to develop a network of efficient routes even if in some cases routes may not be easy to deliver, the route importance component was given a weighting of 2 and the ease to deliver component a weighting of 1. This meant, the Final Priority was calculated using the following function:

Final Priority of Cycle Route = 2 x Importance to Network + 1 x Ease to Deliver

Table 6. Ease of deliver criteria

Criteria	High Level (Score 3)	Medium Level (Score 2)	Low Level (Score 1)
Infrastructure Change	The high level represents: in the case of off-road routes, routes that were already constructed and need signage to be improved. For on-road routes, the assumption was that these routes will use existing road space (with no road space reallocation) and will only require line marking or signage to operate, usually novice routes on local roads.	A medium score was assigned when: an off-road route will require an upgrade, usually to increase its width to 2.5m; and it is proposed to widen an on-road route or make it an exclusive bicycle lane.	The low level was assigned to routes that required construction of sections in order to fill the gaps on them. A very low category (*score 0*) was created to assess new routes as they will require a more significant investment to be delivered.
Road Reserve or Open Space Capacity	A high score was given to routes that in the assessment appear to have enough space be constructed or there are no any issues identified to date	This level was assigned to routes that will need a low reallocation of space to be delivered, especially on-road routes. This assessment was done based on the width of the road reservation available.	A low level of ease was assigned to routes that will require a significant reallocation of space to be constructed. Most of the routes identified in this level are on-road routes that run along narrow road reservations.
Future Project or Road Upgrade	The higher score was assigned to routes that had already Council's budget allocated to be delivered or there were part of other projects already funded by other organisations.	A medium score was given to routes that have been identified in a known project. Some of these routes are part of a bigger scale projects e.g. a reserve master plan or a road redevelopment.	This level was assigned to routes that are not part of any known project and therefore, it will be more difficult to deliver.
Land Ownership Issues	A high level was assigned to routes that did not have any issues identified with land ownership.	This level was assigned to routes where a land ownership issue has been identified but a solution has also been found. For instance, Council is already discussing with the land owner or it is formalising an agreement.	This score was applied to routes that are located in land that is owned by others and there were some issues identified in the past such as an agreement with other agency is needed or Council will require buying the land.
Physical Barriers	This score was applied to routes that were located in areas without any identified physical barriers.	The medium level was assigned to routes that will need to cross a major physical barrier such as an arterial road or hill.	A low score was given to routes that will need to cross a significant physical barrier e.g. a freeway, a creek or a railway line. Therefore, it will require a significant piece of infrastructure to be delivered such as a bridge or a traffic light.

3.1.2 Funding Prioritisation

The prioritisation of cycle routes provided a ranking for each route in the network but the implementation of these projects cannot be guided solely by the priority in the network. A more balanced approach is needed to ensure that funding is directed to routes which benefit all users all across the municipality. The approach also needs to recognise the different agency responsibilities for delivery, notably State Government's responsibility for the Principal Bicycle Network (PBN) and Metropolitan Trail Network (MTN).

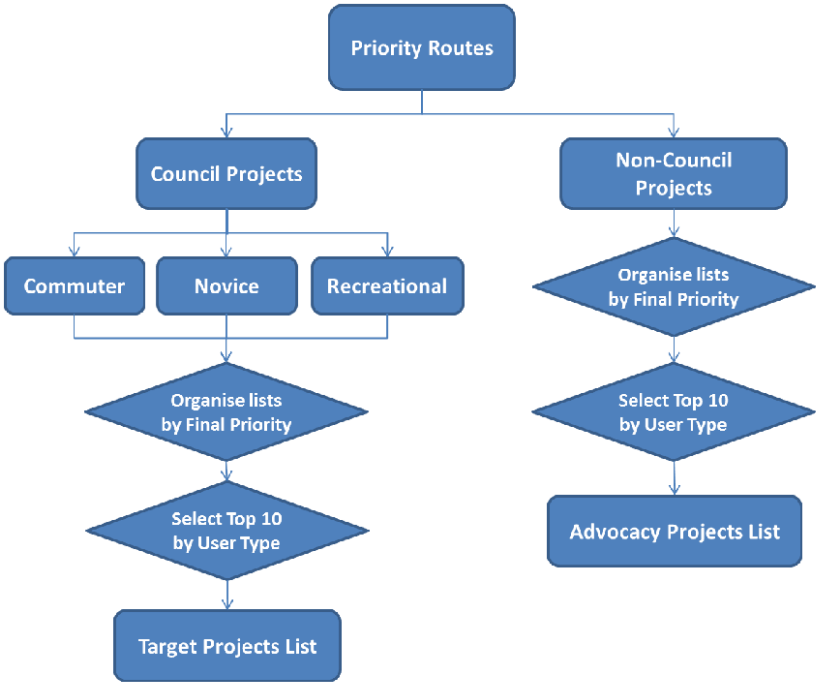
There is no fixed methodology to prioritise funding of cycling infrastructure within best practice though key considerations are identified in Appendix 5. These considerations were combined to identify two lists:

- Target projects – projects that Council will aim to deliver
- Advocacy projects – projects that Council will be advocating for to State Government during the coming years.

The Target Projects list identified the top 10 priority projects for the three users: novice, commuter and recreation cyclists. These were verified to ensure that they provided a good spatial distribution across the municipality and provided a good mix of infrastructure typologies reflective of community aspirations and Council's budget allocation. Specifically, the Target List was tested to ensure it included a mix of projects that both extended the network and filled gaps in the existing network

The Advocacy Projects list was identified by selecting the top 10 priority projects for the three users: novice, commuter and recreation cyclists.

Figure 8. Process to find Target and Advocacy Project Lists



Page 24

3.1.3 Target Projects

The Target projects are a list of projects that Council will aim to deliver in the coming years. They include the Top 10 Target Projects per users type: commuter, novice and recreational.

The following figures show a map of the target projects in Sunbury and the Hume Corridor respectively.

Figure 9. Map of Bicycle Network Plan – Target Projects in Sunbury

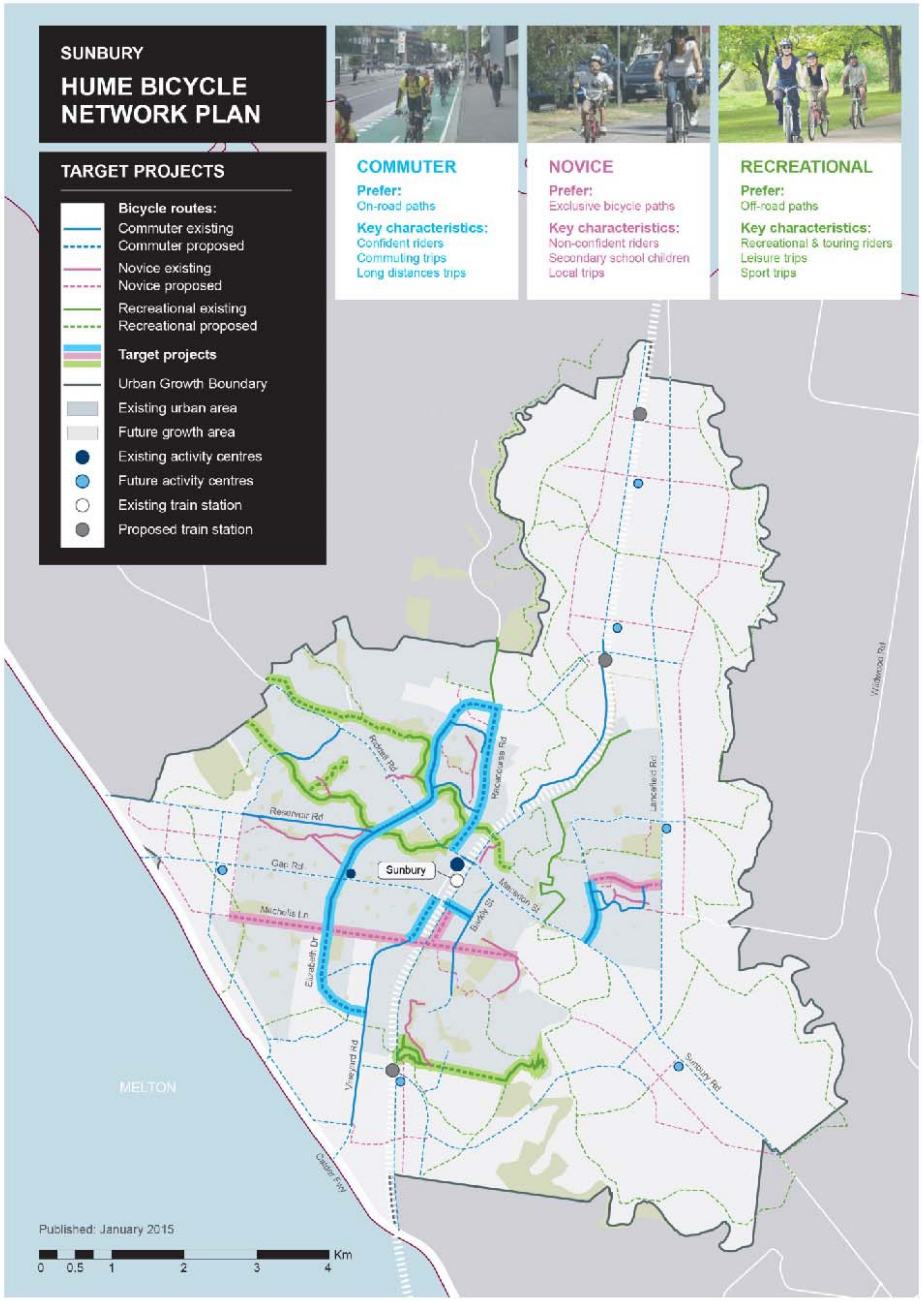


Figure 10. Map of Bicycle Network Plan - Target Projects in Hume Corridor

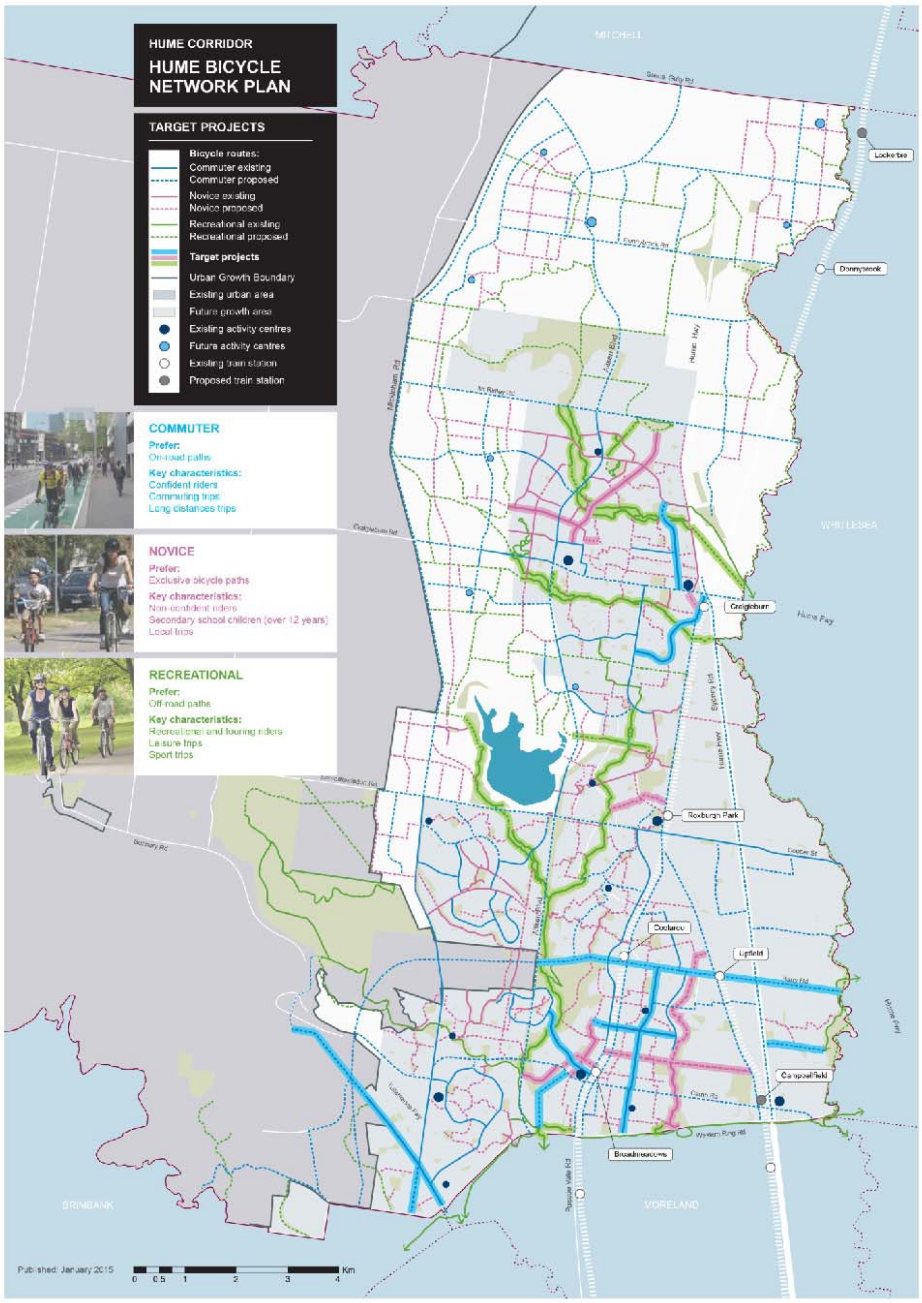


Table 7. Target Project List – Hume Corridor

Rank	Code	Suburb	Cycle Route	Section (from)	Section (to)	Network	Project Works
1	HCC_C_2051	Roxburgh Park	Shankland Reserve trail	Somerton Road	Bridgewater Road	Recreational	Gap in network
2	HCC_B_1009	Meadow Heights	Yuroke Creek	Broadmeadows Valley Park Trail	Somerton Road	Recreational	Gap in network
3	HCC_C_2002	Craigieburn	Aitken Creek Trail	Craigieburn Road	Merri Creek	Recreational	Gap in network
4	HCC_C_2015	Craigieburn	Malcolm Creek	Merri Creek	Mount Ridley Road	Recreational	Gap in network
5	HCC_B_1041	Jacana	Moonee Ponds Creek (East)	Western Ring Road	Johnstone Street	Commuter	New bike path
6	HCC_B_1013	Dallas	Merlynston Creek	Western Ring Road	Upfield Train Line	Novice	Gap in network
7	HCC_B_1042	Broadmeadows	Pearcedale Parade/Fern Close	Johnstone Street	Riggall Street	Novice	Gap in network
8	HCC_B_1044	Broadmeadows	Tanderrum Way	Johnstone Street	Pascoe Vale Road	Novice	Line marking
9	HCC_B_1047	Broadmeadows	Meadow Link	Craigieburn Train Line	Upfield Train Line	Novice	New bike path
10	HCC_B_1034	Tullamarine	Melrose Drive	Western Ring Road	Centre Road	Commuter	Upgrade
11	HCC_C_2034	Craigieburn	Benston Street	Craigieburn Road	Hothlyn Drive	Novice	Line marking
12	HCC_B_1006	Westmeadows	Broadmeadows Valley Park Trail	Moonee Ponds Creek	Somerton Road	Recreational	Signage
13	HCC_B_1152	Broadmeadows	Western Ring Road Crossing	Western Ring Road	Merlynston Creek	Recreational	Upgrade
14	HCC_C_2032	Craigieburn	Hanson Road	Craigieburn Road	Grand Boulevard	Commuter	Gap in network
15	HCC_C_2040	Craigieburn	Marathon Boulevard	Aitken Creek	Windrock Avenue	Novice	Gap in network
16	HCC_C_2043	Craigieburn	Windrock Avenue/Grandview Boulevard	Lygon Drive	Mount Ridley	Novice	Signage
17	HCC_B_1023	Broadmeadows	Widford Street/Blair Street	Western Ring Road	Barry Road	Commuter	Upgrade
18	HCC_B_1038	Dallas	Barry Road	Aitken Boulevard	Merri Creek	Commuter	New bike path
19	HCC_B_1005	Jacana	Jacana Reserve	Moonee Ponds Creek	Johnstone Street	Novice	Upgrade
20	HCC_C_2056	Roxburgh Park	Woodworth Park/Manley Park/Murchison Square/Sherwin Place	Shankland Drain	Craigieburn Train Line	Novice	Upgrade
21	HCC_C_2087	Craigieburn	Leigh Banbury Walkway/Leigh Court	Clarendon Avenue	Leigh Court Reserve	Novice	Upgrade
22	HCC_B_1046	Broadmeadows	Riggall Street	Nathalia Street	Dallas Drive	Commuter	Upgrade
23	HCC_C_2009	Roxburgh Park	Woodlands Park	Aitken Boulevard	Coopers Road Drain	Recreational	Gap in network

Rank	Code	Suburb	Cycle Route	Section (from)	Section (to)	Network	Project Works
24	HCC_B_1043	Broadmeadows	Dimboola Road	Erinbank Crescent	Pascoe Vale Road	Commuter	Upgrade
25	HCC_C_2024	Craigieburn	Hothlyn Drive	Bridgewater Road	Walters Street	Commuter	Upgrade
26	HCC_B_1124	Jacana	Western Ring Road North	Western Ring Road	Pascoe Vale Road	Recreational	Signage
27	HCC_C_2044	Craigieburn	N-S Linear Park	Mount Ridley Conservation Reserve	Grand Boulevard	Recreational	Gap in network
28	HCC_B_1071	Tullamarine	Broadmeadows Road	Sharps Road	Melrose Drive	Commuter	Line marking
29	HCC_C_2001	Greenvale	Greenvale Reservoir Park Trail (West)	Venezia Promenade	Somerton Road	Recreational	Gap in network
30	HCC_B_1084	Campbellfield	Somerset Road	Sydney Road	Merri Creek	Commuter	Line marking

Table 8. Target Projects List - Sunbury

Rank	Code	Suburb	Cycle Route	Section (from)	Section (to)	Network	Project Works
1	HCC_S_002	Sunbury	Blind Creek	UGB West	Sunbury Train Line	Recreational	Extension
2	HCC_S_090	Sunbury	Horne Street	Mitchells Lane	Gap Road	Commuter	New bike path
3	HCC_S_058	Sunbury	Station Street	Sunbury Train Line	Barkly Street	Commuter	Extension
4	HCC_S_010	Sunbury	Mitchells Lane	Wilsons Lane	Horne Street	Novice	New bike path
5	HCC_S_009	Sunbury	Elizabeth Drive	Racecourse Road	Vineyard Road	Commuter	Extension
6	HCC_S_093	Sunbury	Shields Street Crossing	Mitchells Lane	Shields Street	Novice	New bike path
7	HCC_S_089	Sunbury	Evans Street	Shields Street	Gap Road	Novice	New bike path
8	HCC_S_043	Sunbury	Racecourse Road	Riddell Road	Northern Link	Commuter	Gap in network
9	HCC_S_052	Sunbury	Francis Boulevard	Sunbury Road	Sunningdale Avenue	Commuter	Gap in network
10	HCC_S_037	Sunbury	Shields Street	Sunbury Train Line	Harker Street	Novice	New bike path
11	HCC_S_032	Sunbury	Blind Creek	Sunbury Train Line	Jacksons Creek	Recreational	New bike path
12	HCC_S_003	Sunbury	Kismet Creek	UGB West	Blind Creek	Recreational	Extension
13	HCC_S_044	Sunbury	Sunningdale Avenue	Francis Boulevard	Lancefield Road	Novice	Gap in network
14	HCC_S_046	Sunbury	Stewarts Lane Nature Reserve	Stewarts Lane	Blind Creek	Recreational	Upgrade
15	HCC_S_038	Sunbury	Kenthill Court	Wanginu Park	Holden Flora Fauna Reserve	Recreational	Gap in network

3.1.4 Advocacy Projects

The Advocacy Projects are a list of projects that Council will be advocating to State Government to be delivered in the coming years. The following figures show a map of the advocacy projects in Sunbury and the Hume Corridor.

Figure 11. Map of Bicycle Network Plan – Advocacy Projects in Sunbury

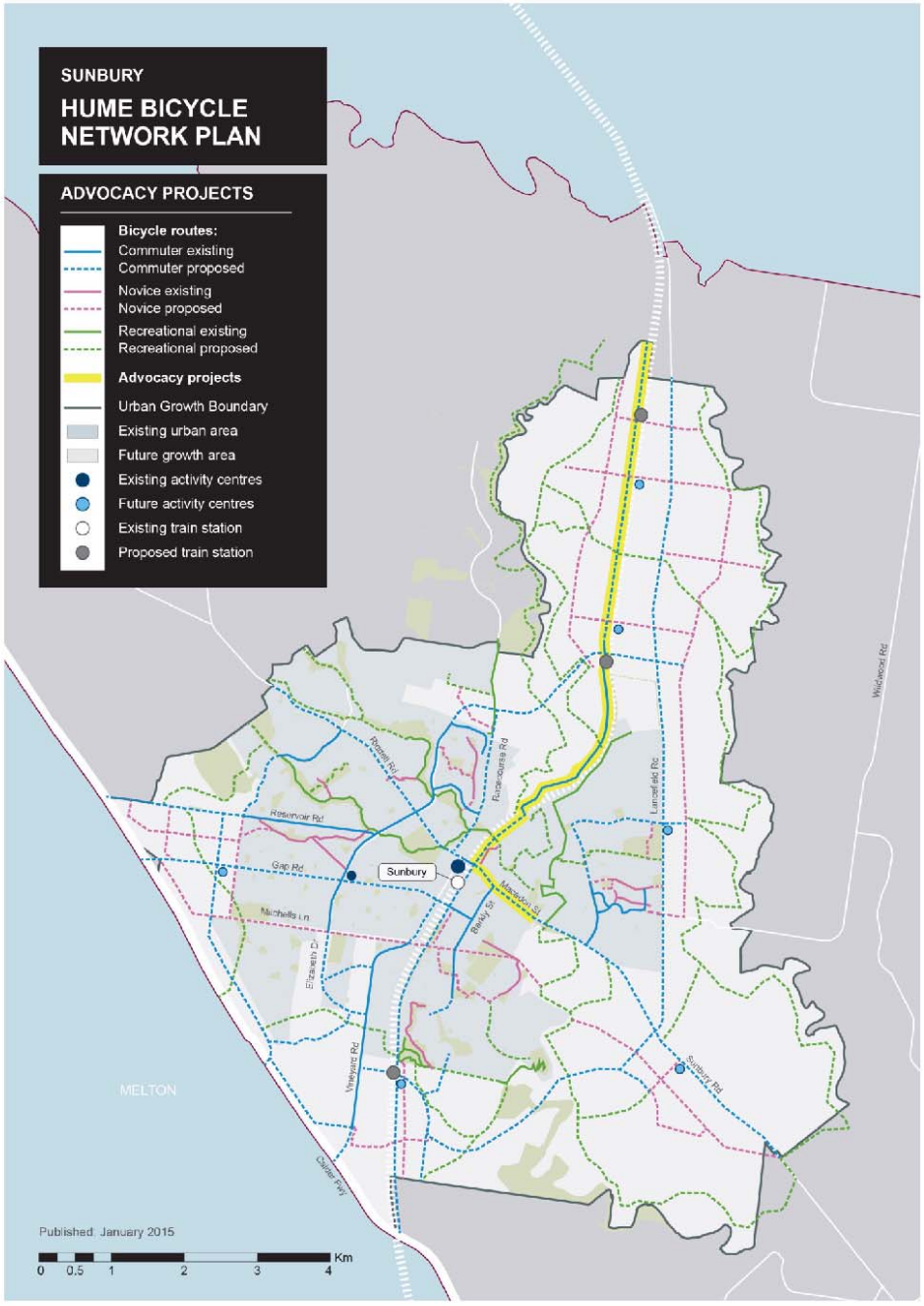


Figure 12. Map of Bicycle Network Plan – Advocacy Projects in Hume Corridor

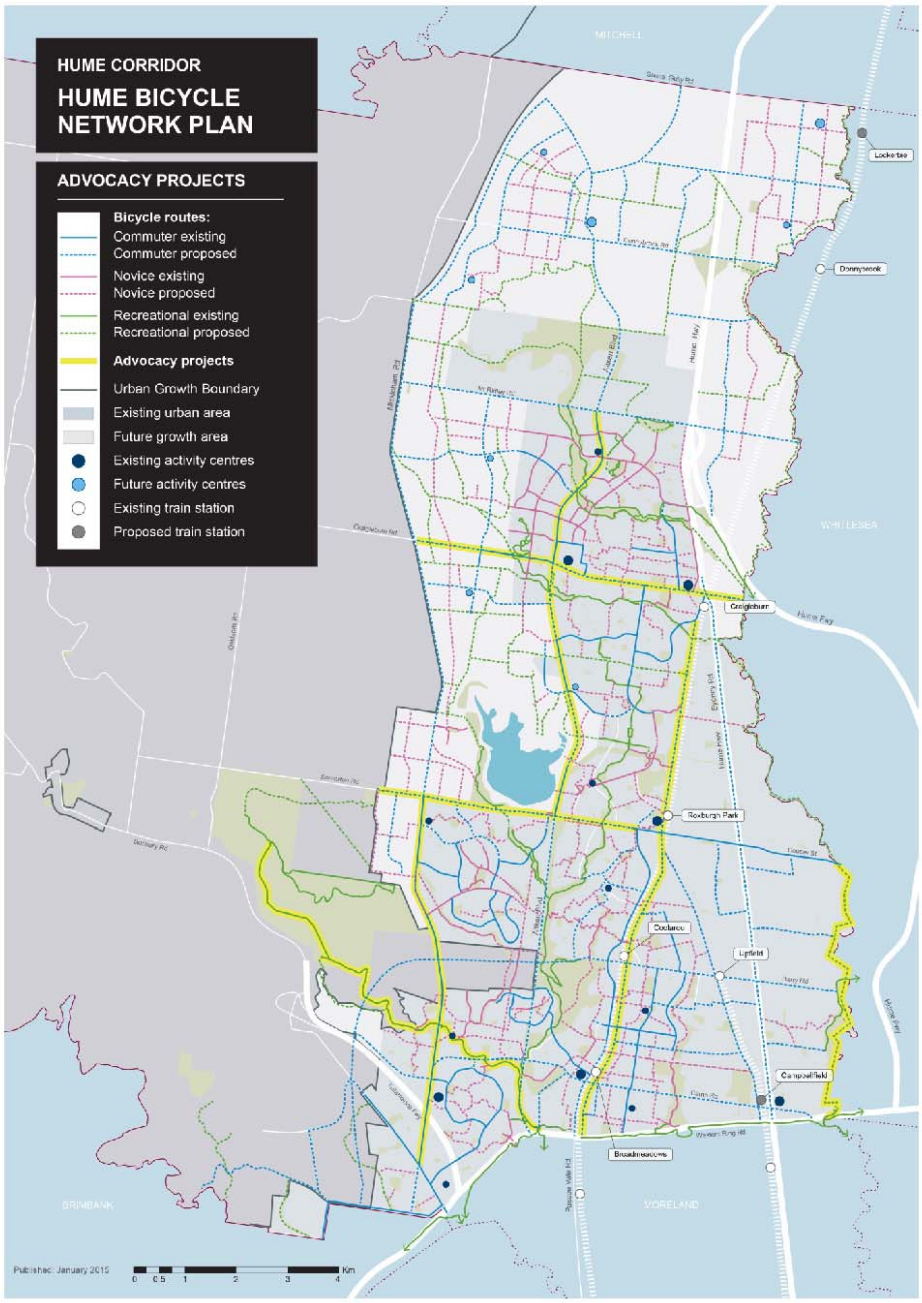


Table 9. Advocacy Projects List - Hume

Rank	Code	Suburb	Cycle Route	Section (from)	Section (to)	Network	Hierarchy	Works
1	HCC_C_2020	Roxburgh Park	Aitken Boulevard	Somerton Road	Mount Ridley Road	Commuter	BPR	New path
2	HCC_C_2027	Craigieburn	Craigieburn Road	Mickleham Road	Merri Creek	Commuter	BPR	Bike lanes
3	HCC_S_005	Sunbury	Sunbury Train Line North	Macedon Street	UGB North	Commuter	BPR	New path
4	HCC_B_1001	Broadmeadows	Moonee Ponds Creek	Western Ring Road	Woodlands Historic Park	Recreational	BPR	Gap & part upgrade
5	HCC_C_2010	Craigieburn	Craigieburn Train Line	Somerton Road	Craigieburn Road	Commuter	BPR	Bike lanes
6	HCC_B_1014	Campbellfield	Merri Creek	Western Ring Road	Cooper Street	Recreational	PBN	New/extended Shared Path
7	HCC_B_1031	Greenvale	Mickleham Road	Melrose Drive	Somerton Road	Commuter	BPR	Bike lanes
8	HCC_B_1036	Somerton	Somerton Road	Merri Creek	Section Road	Commuter	BPR	Bike lanes
9	HCC_S_028	Sunbury	Macedon Street	Sunbury Train Line	Powlett Street	Commuter	BPR	Bike lanes
10	HCC_B_1025	Broadmeadows	Craigieburn Train Line	Western Ring Road	Somerton Road	Commuter	BPR	New path

Projects that are outside of this list still priorities and the full project list should be considered in determining future funding opportunities.

New cycle paths on arterial roads that support new development areas are significant priorities and should be delivered with new development and certainly as part of any road upgrades. These include cycle paths on Donnybrook Road, Mickleham Road (north of Somerton Road), Sunbury Road and Lancefield Road.

3.2 Implementing the Bicycle Network Plan

The development of a municipal wide bicycle network for Hume is the starting point to better deliver future cycling infrastructure. The delivery of bicycle infrastructure is a joint responsibility that includes Council, developers, the Victorian Government and other agencies.

The following are recommendations to implement the bicycle network plan in future:

- Use the Target Projects list to inform the next update of the Walking and Cycling Strategy and Hume Integrated Land Use and Transport Strategy (HILATS).
- Ensure the use of the bicycle network plan in all Council's planning processes.
- Ensure that all projects delivered by Council (community facilities, libraries, activity centres, etc) make provision for bicycle infrastructure including paths, parking and other end-of-trip facilities.
- Use the advocacy projects list created as part of the Bicycle Network Plan to advocate to Victorian Government.
- Develop concept plans and costs for regional or metro bicycle projects so when funding becomes available they can be timely presented for consideration.

3.3 Considerations for Detailed Design and Delivery

The following considerations are recommended to be taken into account when planning and delivering the bicycle network plan projects in future:

- Ensure adequate access to all bicycle routes. The infrastructure delivered needs to help achieve ***connectivity***, for example ramps at grade changes and facilities at intersections and roundabouts should be provided.
- During the design of bicycle routes, a balance must be found between providing a ***direct*** route and providing an alternative route free of delays or safety issues.
- The provision of a high level of consistency and ***legibility*** in future cycle infrastructure will support an increase in the usage of cycle routes and will avoid unsafe transitions for users.
- Provide more dedicated cycle paths as they minimise the conflicts with other users. Design paths to avoid narrow sections, poor visibility, unnecessary widening and degraded surfaces will create a ***pleasant*** experience for cyclists. Cyclists should also be provided with effective and convenient end of trip facilities at key destinations.
- ***Safety*** can be improved significantly during the design of cycle infrastructure. In order to minimise the risk of traffic and hazard related injuries appropriate treatments should be provided along routes, especially at intersections and roundabouts. Passive surveillance and lighting need to be considered along cycle routes and at end-of-trip facilities.
- A key part of the implementation of this bicycle network plan will be achieved through future planning processes. This plan will allow improving ***integration*** between bicycle facilities in existing and growth areas and it will ensure that bicycle facilities are provided by developers as part of their land development.
- Include signage as part of the delivery of the infrastructure in existing and growth areas. Especially in existing areas, the installation of signage will allow designating some cycle routes in the network and will improve navigability in the existing infrastructure.

REFERENCES

Australian Bicycle Council and Department of Infrastructure and Transport, Regional Development and Local Government (2006). *Prioritisation of Bicycle Infrastructure Proposals*. Australian Government, Canberra.

Australian Bureau of Statistics (2012). *Census data 2006 and 2011*. www.abs.gov.au.

Austroads (2011). *Cycling Aspects of Austroads Guides*. Sydney.

Austroads (2001). *Forecasting Demand for Bicycle Facilities*. Sydney.

Department of Transport (2012). *Victorian Cycling Strategy: Cycling Into the Future 2013-2023*. Victorian Government, Melbourne.

Department of Transport (2011). *Draft Methodology: Principal Pedestrian Networks*. Victorian Government, Melbourne.

Department of Transport (2010). *Walking and Cycling Assessment Framework for Land Use and Development*. Victorian Government, Melbourne.

Department of Transport (2009). *Victorian Integrated Survey of Travel and Activity 2007 - VISTA 2007*. Victorian Government, Melbourne.

Hume City Council (2011). *Hume Integrated Land Use and Transport Strategy - HILATS 2011-2020*. Broadmeadows.

Hume City Council (2010). *Hume Walking and Cycling Strategy 2010-2015*. Broadmeadows.

Land Transport Safety Authority (2004). *Cycle Network and Route Planning Guide*. New Zealand

VicRoads (2012). *Bicycle Priority Routes*. Victorian Government, Melbourne.

VicRoads (2010). *Principal Bicycle Network*. Victorian Government, Melbourne.

APPENDIX 1. CATEGORIES OF CYCLISTS AND THEIR CHARACTERISTICS

Category	Photo	Rider characteristics	Required riding environment
Primary school children		Cognitive skills not developed, little knowledge of road rules, require supervision.	– Footpaths (where permitted) – Off-road: all paths – On-road: very low volume residential streets
Secondary school children		Skill varies, developing confidence.	– On-road: facilities are generally used – Off-road: paths where available
Recreational		Experience, age, skills vary greatly.	– Off-road: desire off-road paths – On-road: desire quiet local streets, avoid heavily trafficked routes, and more experienced will prefer to use road system for long journeys
Commuter		Vary in age, skill and fitness, some highly skilled and able to handle a variety of traffic conditions.	– Off-road: some prefer paths, willing to take longer to get to destination, – On-road: some prefer low-stress roads, but others want quick trips regardless of traffic conditions. Primarily require space to ride, smooth riding surface and speed maintenance.

Page 36

Category	Photo	Rider characteristics	Required riding environment
Utility		Ride for specific purposes (shopping), short length trips, routes unpredictable.	– On-road: not on highly trafficked roads, needs include comprehensive ard low-stress routes. – It requires appropriate end of trip facilities.
Touring		Long distance journeys, may be heavily equipped, some travelling in groups.	– Often route is similar to that of other tourists.
Sporting		Often in groups, two abreast occupying left lane, needs similar to commuters.	– On-road: travel long distances in training on arterials, may include challenging terrain in outer urban or rural areas – Of-road: generally do not use off-road routes because of high speed and conflict with other users.

Source: Austroads 2011

Page 37

APPENDIX 2. HUME BICYCLE NETWORK PLAN - PRINCIPLES

1. Connectivity

All bicycle routes should connect to each other and to the wider bicycle network

Key features:

Link origins and destinations - Cyclists need to be able to undertake and complete meaningful trips by bicycle to all potential origins and destinations.

Continuous network - A route for cyclists should not start and end abruptly to avoid safety issues, especially for novice riders.

Combination of on-road and off-road - A linked network should be achieved by integrating existing off-road with on-road routes that connect to key destinations.

Route options - A choice of routes should be provided in order to increase the number of cycle trips, as origins and destinations are diverse.

Crossing points - Adequate access to bicycle routes should be provided, for instance provide ramps at grade changes and provide facilities at intersections and roundabouts.

2. Directness

The bicycle network should provide the most direct possible routes to key destinations

Key features:

Fit by purpose and type of user - Cycle routes should be direct for commuter cyclists as they can ride along the fastest and most direct route available. Instead, children will tend to use the footpath and be happy to take a less direct route to remain safe.

Balance between direct and safety - Balance must be found between providing a direct route and providing an alternative route free of delays or safety issues.

Minimise travel distances - Distances between key destinations should be minimised to encourage bicycle usage. This can increase opportunities for multi-purpose trips.

Improve permeability - The bicycle network should be permeable to allow for the easiest and most direct routes to a destination.

Short and Direct Route - Deviations or circuitous routes should be avoided as they provide a barrier to people choosing to cycle compared with other transport modes.

3. Legibility

Bicycle routes should be legible, continuous and recognisable

Key features:

Consistency - Bicycle routes should to be consistent in quality so they are easy to follow.

Recognisable - To be recognisable, cycling routes should use consistent standards, signage and design of infrastructure.

Avoid unexpected changes - Unexpected changes in the type of bicycle infrastructure along a bicycle route reduce legibility and potentially create an unsafe transition.

Intersection treatments - The cycling route across an intersection should be clearly defined to ensure that cyclists follow the route.

Information and signage - Signage needs to be located at decision points, in transport stops, and in station exits and platforms to minimise confusion to cyclists.

4. Pleasantness

The bicycle network should provide a good level of comfort for cyclists along routes

Key features:

Scenic and quiet routes – The bicycle routes should be scenic, quiet and provided in a pleasant environment.

Design – Provide paths that are easy to use and avoid narrow paths, blind corners, poor visibility, squeeze points, steepness and unnecessary winding.

Quality surface – Bumpy or degraded path surfaces should be avoided.

Dedicated cycling paths – This type of infrastructure offer the best cycling environment as minimise the conflicts with other users.

End of trip facilities – Cyclists should be provided with effective and convenient end of trip facilities at key destinations.

5. Safety

The bicycle network should provide safe routes for cyclists

Key features:

Routes free of traffic - The bicycle route should ideally be free of heavy traffic and traffic travelling at high speeds.

Separation from pedestrians - Provide separation from pedestrians in high pedestrian movement areas.

Design of intersections – Appropriate treatments should be provided at intersections and roundabouts, especially on priority bicycle routes.

Free of hazards – Minimise the risk of traffic and hazard related injuries.

Passive surveillance and lighting - Opportunities for passive surveillance and lighting along cycle routes or at end-of-trip facilities should be provided.

6. Integration

Cycling infrastructure should be integrated with key destinations, public transport and other transport projects

Key features:

Key destinations – Bicycle routes should be developed linking residential areas with activity centres and employment areas.

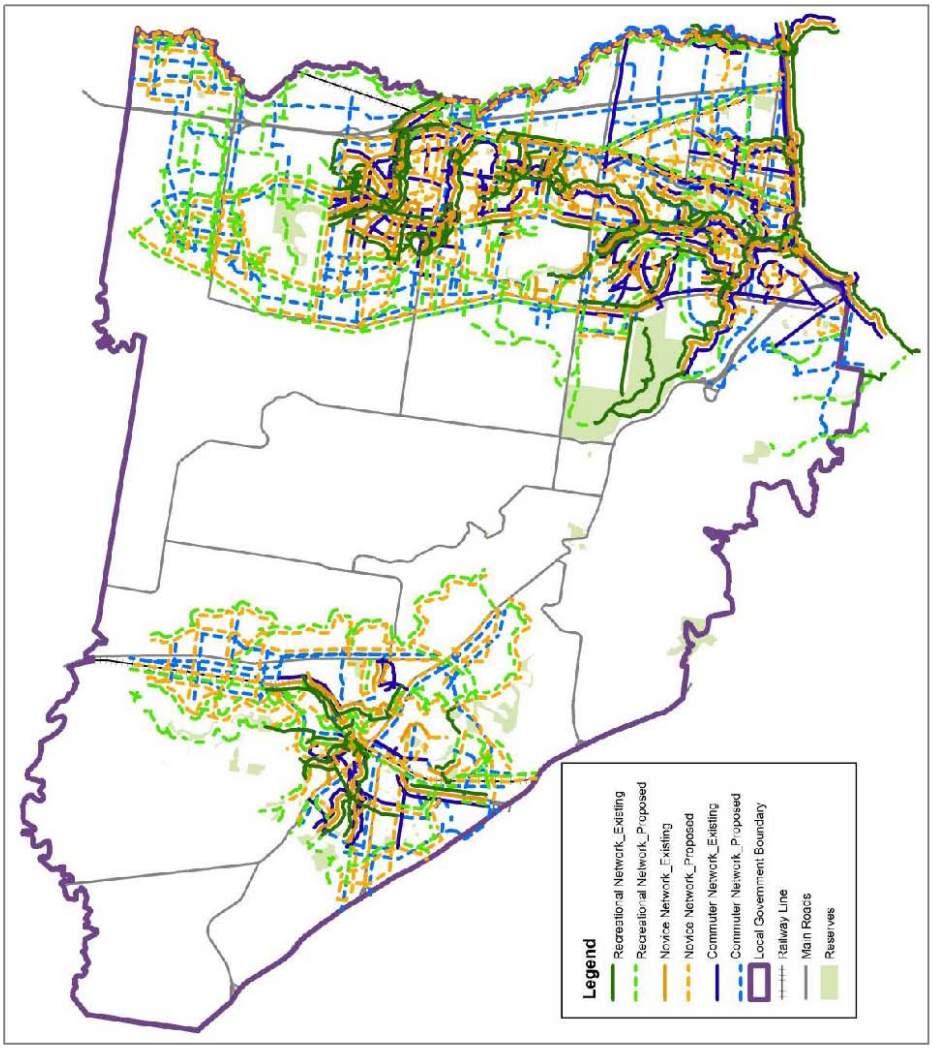
New developments – The provision of bicycle facilities should be part of all planning processes and especially in new residential and mixed use developments.

Growth areas - Connect bicycle facilities in the new areas with the infrastructure provided in existing areas.

Public transport – Cycling infrastructure should be integrated with public transport nodes.

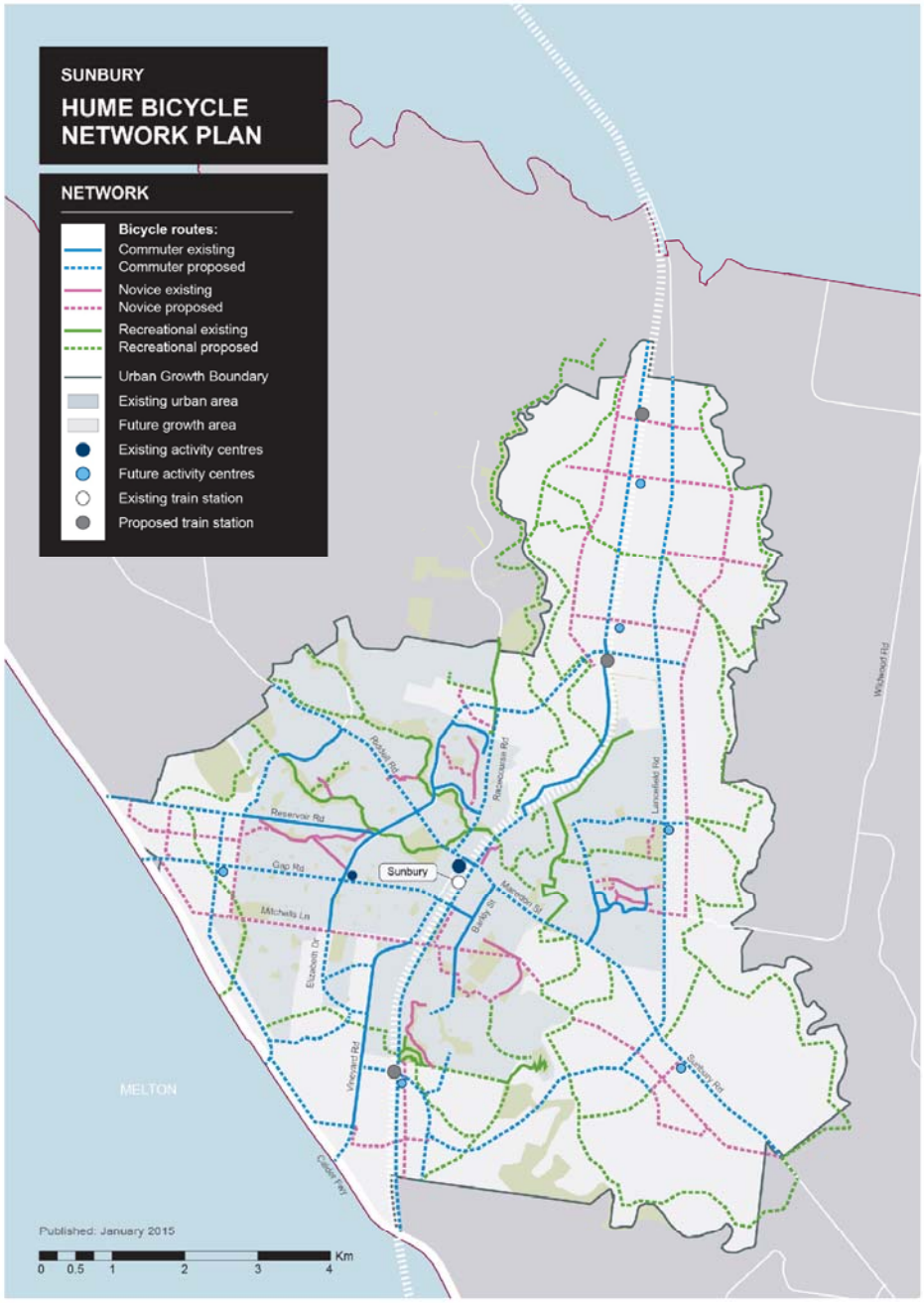
Transport infrastructure projects – Bicycle facilities must be included in the development of all major transport projects.

APPENDIX 3. INITIAL PLAN

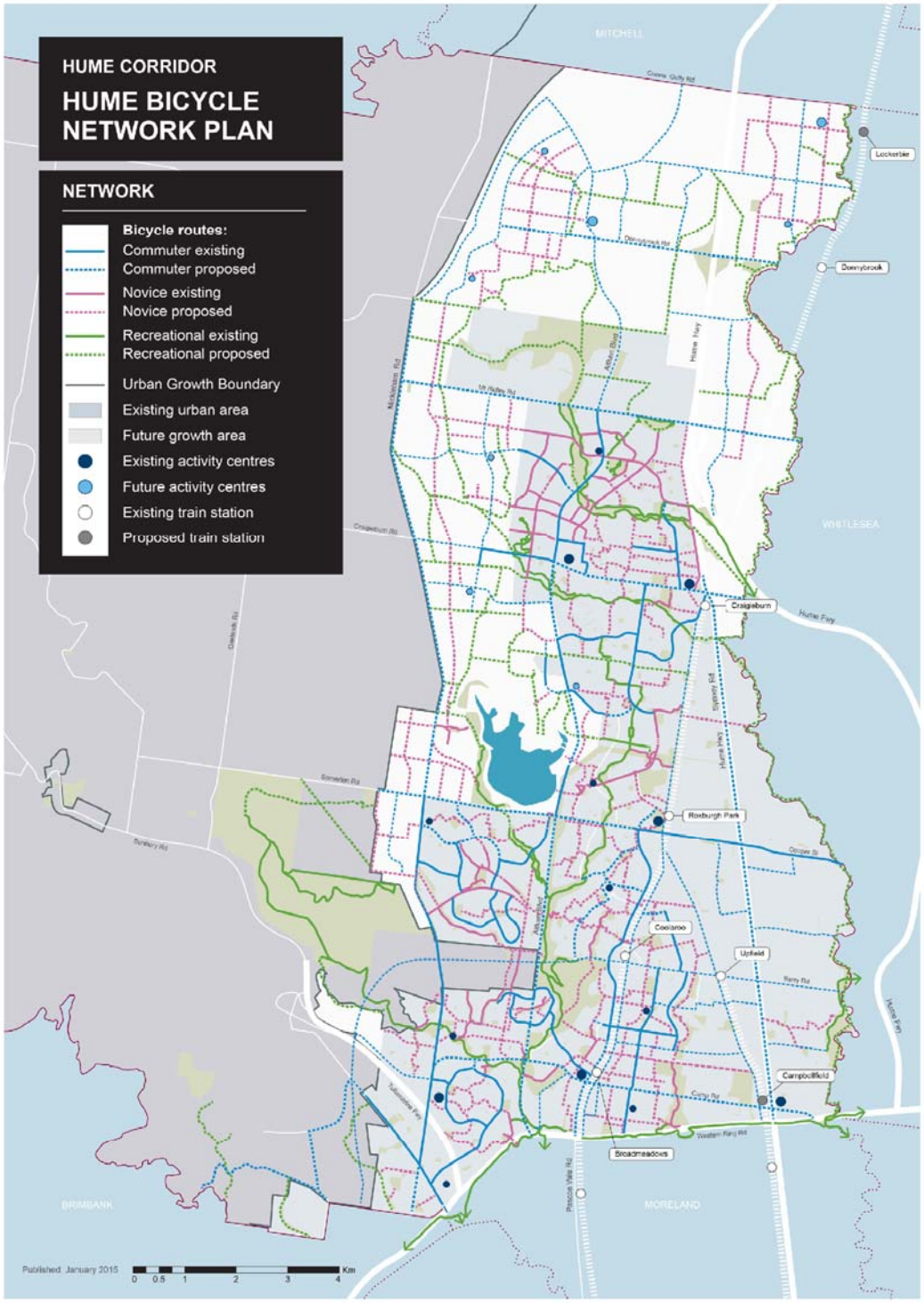


Page 41

APPENDIX 4 – FINAL BICYCLE NETWORK PLANS



Page 42


HUME CORRIDOR
HUME BICYCLE NETWORK PLAN
NETWORK
Bicycle routes:
Commuter existing
Commuter proposed
Novice existing
Novice proposed
Recreational existing
Recreational proposed
Urban Growth Boundary
Existing urban area
Future growth area
Existing activity centres
Future activity centres
Existing train station
Proposed train station
MITCHELL
WHITTLESEA
BRIMBANK
MORELAND
Lockerbie
Donnybrook
Craigieburn
Roxburgh Park
Coolaroo
Upfield
Campbellfield
Broadmeadows
Hume Hwy
Western Ring Rd
Published: January 2015
0 0.5 1 2 3 4 Km

Page 43

APPENDIX 5. FUNDING CRITERIA PRIORITY OPTIONS

Table 5a. Criteria Options - Best Practice

Possible Criteria	Description	Advantages	Disadvantages
Area Consolidation	Spreading cycling provision across a substantial area. Once a consistent usage has been achieved in one area, provision is spread to another.	Consolidation may increase cycling and be more clearly demonstrable achievement. If the whole area has achieved a satisfactory standard, cycling promotion can take place without undue concerns about safety.	A focus on a single area over several years may lead to charges of inequitable treatment in relation to areas that do not enjoy this investment.
Usage numbers	This approach assigns priorities to existing routes with the most cyclists, which can be based on counts at peak times.	It is sound business practice to retain existing customers before seeking to attract new ones. Observing cyclists' preferred routes tends to be a sounder measure of their attractiveness than theoretical models.	This approach does not consider: • Demand supressed by traffic dangers, physical barriers or personal safety concerns that most affect more timid cyclists • Route elements that do not yet exist, such as a path or bridge yet to be constructed.
Easiest or Cheapest first	The easiest and cheapest elements of a program are given priority.	A simple achievement measure, such as the total length of a cycle route meeting standards, gives an impression of achievement.	The easiest or cheapest elements are not always the most needed. The importance of the different elements also needs to be considered. There is a risk that such a short-term approach will lead to lower-quality outcomes in the longer term.
Quality demonstration projects	Priority is given to flagship projects to showcase attractive and high quality facilities that others will want to emulate in their own community.	This can build community support for providing quality facilities of which they can be proud.	It may be expensive and use up all the budget.

Source: Cycle Network and Route Planning Guide, NZ

Table 5b. Criteria Options – Hume City Council Options

Possible Criteria	Description	Advantages	Disadvantages
Priority Routes Only	Priority is given to the Top 30 projects from the Priority Routes list.	The main bicycle routes are delivered.	Priority list dominated by regional links so may not prioritise sufficient local links. May be beyond budget.
Links by User Type	This approach assigns priority to the Top 10 projects per user from the Priority Routes list.	Consideration is given to the different user's requirements. Therefore, a mix of routes (regional and local) as well as routes with different purposes is delivered.	May not deliver a connected network.
Local Links	Priority is given to local routes with higher scores in the Priority Routes list.	More projects could be delivered if it is assumed that the length and cost per project is less.	Long bicycle trips may not be catered for.
Metro/Regional Networks	This approach gives priority to deliver bicycle routes that are part of the main cycle corridors (BPR,PBN, MTN)	It provides a better network for longer trips, especially to commuter and recreational cyclists.	This approach does not include main local routes and funds other's network (i.e. VicRoads - PBN)
Missing Links	Allocate main resources to remove gaps in the existing network.	This approach optimises the current network and improves connectivity.	The development of new bicycle routes is disregarded. The need for these projects is not considered.
Geographically located links	This approach focuses on delivering projects equally distributed in Hume (i.e. by suburb)	It provides equal investment of bicycle infrastructure in different areas of Council.	This approach does not consider the importance of projects to the wider network.