

KNOX

Liveable Streets Plan

2012-2022



ACKNOWLEDGEMENTS

This plan has been written by ASPECT Studios in association with Context Pty Ltd and in partnership with the Knox City Council.

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CONTENTS

1	SUMMARY	7	4	CREATING LIVEABLE STREETS	
				<i>THE PLAN</i>	43
1.1	Vision	8	4.1	Overview	44
1.2	Key opportunities & challenges	9	4.2	Liveable streets	45
1.3	This plan	10	4.3	Vision	46
			4.4	Design principles	47
2	INTRODUCTION	17	4.5	Themes, goals and approaches	48
2.1	This plan	18	4.6	Streets as places	50
2.2	Creating liveable streets	20	4.7	Streets for travel	58
2.3	Issues and challenges	21	4.8	Streets for the environment	74
2.4	Taking action for liveable streets	24	4.9	Streets and the economy	90
2.5	How to use this document	26	4.10	Safe streets	100
			4.11	Streets for the community	110
			4.12	Streets for infrastructure	122
3	KNOX & LIVEABLE STREETS	29			
3.1	The anatomy of a street	30			
3.2	Management of streets	31			
3.3	Qualities that make a street liveable	33			
3.4	What are Knox's streets like today	36			
3.5	Community perspectives on liveable streets	38			

1.2 THEMES

5	LIVEABLE STREETS DESIGN GUIDELINES	134	6	IMPLEMENTATION	217
5.1	Management & street types in Knox	136	6.1	Four year action plan	218
5.2	Liveable streets checklist	142	6.2	Streets as places action plan	220
5.3	General glossary for design guidelines	145	6.3	Streets for travel action plan	228
5.4	General guidelines	146	6.4	Streets for the environment action plan	234
5.5	Dandenong creek gateways	148	6.5	Streets and the economy action plan	242
5.6	Bush boulevards	152	6.6	Safe streets action plan	248
5.7	Principal avenues	158	6.7	Streets for the community action plan	254
5.8	Paths into the hills	162	6.8	Streets for infrastructure action plan	258
5.9	Community link streets	166			
5.10	Neighbourhood green streets	170			
5.11	Home streets – general	176			
5.12	Home streets – courts	180			
5.13	Home streets – residential foothills	184			
5.14	Home streets – bush suburbs & rural parkland	188			
5.15	Home streets – garden suburb	192			
5.16	Home streets – garden court & villa court	196			
5.17	Home streets – home zones	200			
5.18	Industrial & business park streets	204			
5.19	Shopping streets	208			
5.20	Entrances & gateways	212			
				REFERENCES	264
				APPENDIX	274



1

SUMMARY

The *Knox Liveable Streets Plan* is a document which is visionary in its aspirations. It recognises and responds to the key challenges in creating liveable streets across Knox. It builds on, rather than replaces, other Council plans and strategies.

This *Plan* has been created through research, community and officer consultation and a thorough investigation of the streets of Knox.

1.1 VISION

Knox Liveable Streets Plan is designed to help achieve *Vision 2025* through a combination of policies and actions.

This *Plan* will make a major contribution to achieving the *Vision 2025* goals of healthy and connected communities, creating accessible transport choices and sustaining the natural environment.

The *Plan* offers a vision of liveable streets in Knox.

Liveable streets provide social, economic and environmental sustainability – the triple bottom line approach.

SOCIAL SUSTAINABILITY

It is about community health, social interaction, local identity and sense of place. There are many ways in which streets contribute to social sustainability.

ENVIRONMENTAL SUSTAINABILITY

It is about protecting and enhancing the ecological systems that are vital for life, and living in a way that does not compromise the future. Liveable streets create habitat, support biodiversity, improve the quality of stormwater, and reduce the effects of climate change.

ECONOMIC SUSTAINABILITY

It emphasises the ways liveable streets can significantly contribute to the attractiveness of commercial and industrial areas for businesses, their customers and employees. Liveable streets encourage people to increase their walking and cycling, and so decrease the costs of health care across the community. Liveable streets also increase property values.



Social sustainability:
rock warming party in Knox



Environmental sustainability:
significant road-side vegetation



Economic sustainability:
mountain gate shopping strip

1.2 KEY OPPORTUNITIES & CHALLENGES

Knox is an established community. Most of its street infrastructure reflects approaches and aspirations of past design. Today, Knox seeks to be more than a dormitory suburb. Knox wants to develop a vibrant employment economy, with strong activity centres and local jobs.

In addition, Knox wants the community's travel options to shift from car-dominated, to a more sustainable and healthy mix of walking, cycling, public transport and car travel.

The Knox community appears ready for this change. Consultation revealed that traffic in local streets is a real issue, and that people want their streets to be well-designed, treed, and safe community spaces.

Recent community and Council initiatives in Knox have demonstrated the interest in making local streets friendlier, attractive and used public spaces. The concept of liveable streets is likely to strongly engage the community and encourage local initiatives, especially if barriers to that engagement can be removed.

Changing the quality of the existing street infrastructure across the whole city is a long-term project. Some actions will be easier to implement than others. Partnerships between Council and other key players such as VicRoads, infrastructure providers, the community and local businesses, will be essential if the vision is to be achieved.

On the other hand, some of Knox's infrastructure is aging and will soon need upgrading, and this offers an opportunity to incrementally enhance the liveability of Knox's streets.

Streets are also highly regulated spaces. This is important given the many roles that streets are expected to play including travel, infrastructure services, habitat, greenery and trees, community and play spaces. Each type of street – from major highways to local streets – supports a different mix of these roles.

In creating liveable streets, risks still need to be carefully managed. Likewise, safety is a critical issue. Negotiating the regulatory requirements and the community's expectations is a major challenge for Council on the parts of the road network that it manages.

VicRoads manages the major roads. Achieving change in this part of the road network often involves extended negotiations, and both Council and the community can end up feeling powerless and frustrated. Finding new ways to work in partnership with VicRoads is a significant challenge.

Streets are an interdependent network. Streets need to be designed and managed as a system not as independent entities: this offers an opportunity to strengthen the connectivity of streets. But, isolated actions can appear small in scale against the scale of the street network, and are hence less likely to create substantial community benefits. In consequence, more comprehensive and coordinated approaches will be needed.

Streets have been seen as 'roads for cars' for many years. Attitudes are changing, and streets are increasingly being seen as multi-purposed public spaces. It will take time for all of the regulations and standard approaches to street design, construction and maintenance to catch up to current attitudes.

This *Plan* seeks to lead the way on all of these challenges and to take up the key opportunities that offer greatest potential for change.

1.3 THIS PLAN

This *Plan* promotes and provides tools for Council and the community to create change in attitudes by increasing pride, public use and ownership of their streets.

The *Plan* seeks to recognise all the benefits of more liveable streets, including:

- more use of streets and an increase in health and wellbeing of residents;
- less reliance on car travel for short and medium length journeys;
- more nature in our streets, healthier ecologies;
- more attractive streets to promote business opportunities and local street use;
- safer streets;
- more pedestrian use in activity and retail hubs and subsequent rise in retail activity; and,
- streets for services and infrastructure.

This *Plan* can be used to advocate for change in policy, standards and legislative requirements that run counter to the concept of liveable streets.



This photograph shows 'Streets as places', a street illustrating a distinct character



Knox City Council staff working towards an 'Integrated design approach' in designing streets

KEY STRATEGIC DIRECTIONS

In summary, the *Plan* embodies four key strategic directions.

Streets as places

Change the perception and management of streets that are dominated by vehicles to places that integrate multiple forms of activity by:

- balancing the needs of movement and place in street design;
- putting people and pedestrians as the priority in street design;
- delivering sustainable streets; and,
- ensuring street design is adaptable to changing needs and future aspirations.

Integrated design approach

Implement a coordinated design approach to the planning, design and maintenance of Knox streets by:

- coordinating with VicRoads to provide best value streets for the community;
- achieving a whole of Council coordinated approach to streets; and,
- engaging with local communities.

Integrated strategic approach

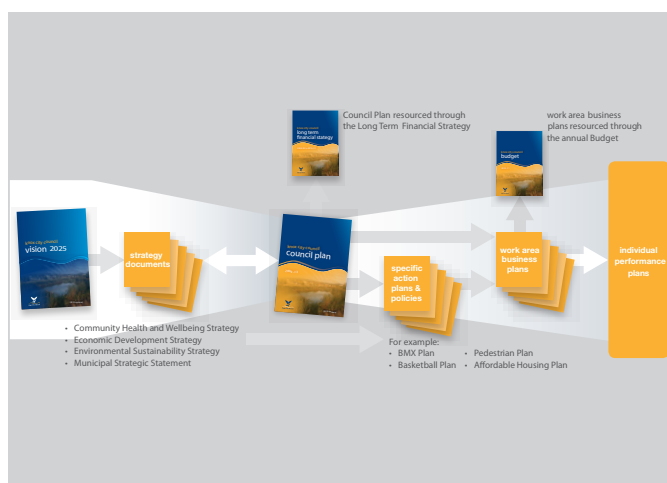
Coordinate, create and update the following key strategies and policies in accordance with the *Knox Liveable Streets Plan* so as to strengthen Council's capacity to deliver liveable streets:

- Knox City Council Streetscape Policy (2003);
- Knox City Council Road Management Plan (2006);
- Footpaths and Shared Path Asset Management Plan (2005); and,
- Indented Carparking Policy (2010).

Community action and initiatives

Support the ability of Knox's communities, residents and businesses to take positive and creative actions to enhance the liveability of local and commercial streets by:

- removing barriers to community initiatives and activities; and,
- involving communities in street design.



'Integrated strategic approach' to the streets of Knox – understanding how the system works



'Community action and initiatives' An example of a community workshop in designing their street

1.3 THIS PLAN

THEMES

The *Plan* is structured around 7 themes. In each theme, the challenges and opportunities identified for Knox are briefly described. Looking forward, a goal is proposed, and approaches and actions are defined. Some actions are for Council alone, some are for the community, and many are in partnership.

The goals for each theme – and therefore for the *Plan* as a whole – are summarised below.

THEME	GOAL
1. STREETS AS PLACES	To create and strengthen Knox's distinct sense of place through high quality streets
2. STREETS FOR TRAVEL	To improve the ability of streets to cater for an increase in sustainable transport options in Knox
3. STREETS FOR THE ENVIRONMENT	To improve environmental sustainability of streets in Knox
4. STREETS AND THE ECONOMY	To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities
5. SAFE STREETS	To improve the safety of Knox's streets for pedestrians, cyclists and motorists
6. STREETS FOR THE COMMUNITY	To increase community pride and action in Knox streets
7. STREETS FOR INFRASTRUCTURE	Coordinate street design and maintenance to balance infrastructure and community needs

LIVEABLE STREETS DESIGN GUIDELINES

The *liveable streets design guidelines* contained in section 5, cover all the streets in Knox. Each type of street has a design guideline.

The types of streets include those managed by VicRoads and Council.

VicRoads streets include:

Declared highways:

- Burwood Highway;
- Dandenong Valley Highway (Stud Road);
- Burwood Highway to Dandenong Creek; and,
- Monash Highway (Wellington Road)
–Dandenong Creek to Stud Road.

Declared Main Roads within the City of Knox are as follows:

- Stud Road;
- Croydon Scoresby Road;
- Dorset Road;
- Boronia Road;
- Ferntree Gully Road;
- High Street Road;
- Kelletts Road;
- Lysterfield Road;
- Napoleon Road;
- Wantirna Road;
- Wantirna-Sassafras Road (Mountain Hwy.); and,
- Wellington Road

The streets managed by the City of Knox can be described as all streets within the municipality other than privately owned roads and those managed by VicRoads.

A street typology for Knox has been developed based on the classification of roads in the *Knox Road Asset Management Plan* (2007) and builds on the *Knox Urban Design Framework* (2020).

The Knox Urban Design Framework 2020 recommends major street types:

- Bush Boulevards;
- Gateway Routes;
- Principle Avenues; and
- Paths into the Hills

This *Plan* builds on these types by including:

- Community link streets;
- Neighbourhood green streets;
- Industrial streets;
- Shopping streets;
- Residential foothill streets;
- Residential bush suburb streets;
- Residential garden suburb streets;
- Residential garden court or villa court streets; and
- Residential home zones streets.

Each design guideline addresses the design of new and existing streets. It considers community involvement, material selection and maintenance, service and infrastructure requirements, vegetation and environmentally sensitive design amongst other things.

Refer to Section 5.1 for the proposed street hierarchy table.

1.3 THIS PLAN

LIVEABLE STREETS ACTION PLAN

A four year action plan has been developed to guide the implementation of this *Plan*.

This *Plan* contains many initiatives. Of these, the eight listed below are the most important.

1. Develop pilot projects to test various themes within existing capital works programs, other community programs and based on community support.
2. Implement planting and design of Knox's key streets:
 - Dandenong Creek Gateways
 - Bush Boulevards
 - Principal Avenues
 - Paths into the Hills
3. Review the existing StreetScape Policy (2003) .
 - Develop a Street Tree Management Plan
 - Develop a Street Tree Selection Tool
 - Conduct a Street Tree Audit to feed into the plans above
 - Develop a Nature Strip Planting Application form and process
4. Adopt and implement green neighbourhood streets as a priority street type for improving neighbourhood character.
5. Work with community groups to facilitate community involvement in streetscape design and maintenance. Possibly as an extension of Gardens for Wildlife.
6. Improve pedestrian and cyclist connections to public transport nodes, by improving the safety and comfort of the journey and facilities at waiting points – for example, at bus stops, road crossings – through increased seating, shelter, safety, shade.
7. Provide seats with backs and arm rests along streets and at pedestrian pause points.
8. Targeted street tree planting to link bushland areas.






2

INTRODUCTION

The *Knox Liveable Streets Plan* is visionary in its aspirations.

A blue-tinted photograph of a residential street. The street is lined with trees and houses. A car is parked on the left side of the road. The overall scene is peaceful and suburban.

2.1 THIS PLAN

The *Plan* presents a coordinated approach to enhancing the liveability of all of the streets in Knox. It is based on understanding the attributes of Knox’s streets today, and the opportunities available to create positive change. It also looks at the barriers to change and recognises practical limitations.

Achieving the aspirations of the *Plan* will mean bringing together the concepts and strategic directions described in this report with other relevant Council strategies and policies through the *Liveable Streets Action Plan* see section 6, Implementation.

Community views have had an important influence on the shape and content of this *Plan*. Through an on-line survey, stalls, meetings and round table discussions, people had an opportunity to identify what they value about their street, and the preferred future character for Knox’s streets.

Council officers and other stakeholders have also played an important role in shaping an achievable vision of how Knox can make its streets more liveable.

This *Plan* covers all the streets in Knox. These include both Council owned and managed streets and those streets managed by VicRoads. The recommendations in this *Plan* will be used by Council to negotiate quality outcomes for those streets under VicRoads management.

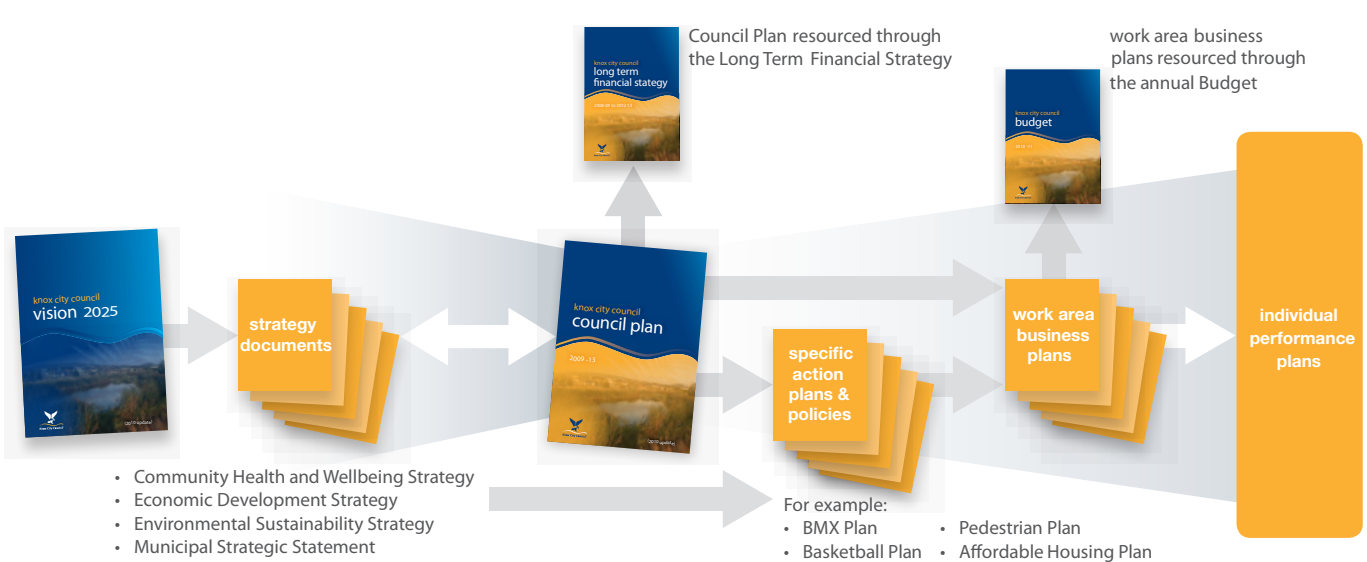


Figure 1: Policy Context Diagram

Vision 2025 describes the Knox community's hopes and aspirations for the future. It seeks to express what people want Knox to look and feel like in the future – and how best to make those changes.

Creating liveable streets will help achieve this vision.

Vision 2025 describes a community and Council working in partnership to create a safe, healthy and connected community that has access to high quality services, transport options, facilities and culturally rich experiences, while protecting the green, leafy neighbourhoods that are so highly valued.

Vision 2025 is shaped around seven themes:

- healthy, connected communities;
- culturally rich and active communities;
- dynamic services and facilities;
- accessible transport choices;
- sustainable natural environment;
- balanced quality urban development; and,
- a prosperous, modern economy.

Each of these important themes have helped shape the *Liveable Streets Plan*. There is a strong alignment between the *Vision 2025* themes and those in Section 4 of this *Plan*. For example, the *Liveable Streets Plan* supports healthy connected communities, by making streets safer and improving people's sense of connection to their local neighbourhood.

Care has been paid to aligning this *Plan* with other key Council strategies and policies such as the *Knox Sustainable Environment Strategy 2008-2018*, *Knox Integrated Transport Plan (2004)*, *Neighbourhood Character Study (1999)*, and the *Knox Pedestrian Plan (2005)*. A summary of these key strategies and plans is in the Appendix.

The *Plan* is based on research and analysis. The project team has undertaken a careful analysis of Knox and its current street infrastructure.

They have considered best practice from around Australia and overseas, and have sought to explore new ideas and test their application in Knox.

If the vision in this *Plan* can be achieved, the future streets of Knox will look and function in ways that make them more liveable – more connected, safer and greener – and more valued.

Through effective urban design, and with sufficient time, resources and community commitment, Knox's streets can be transformed.

The goals, actions and indicators in this *Plan* can be used to guide this progressive change.

2.2

CREATING LIVEABLE STREETS

The streets of Knox are valued public spaces. They are the prime facilitators of traffic, pedestrian and cyclist movements.

They provide habitat, help clean stormwater, create shade, provide play space, create delight and colour in users' daily lives and form the character of the neighbourhood. Streets are infrastructure corridors, containing power, gas and phone lines as well as water, sewerage and drainage systems.

A liveable street must also be a great place to be – safe, well-designed, attractive and sustainable.

The *Plan* examines the role of streets across the municipality and recognises that streets have many roles to play in creating a sustainable urban environment. It is these multiple roles that create many of the challenges that need to be resolved through this *Plan*.

For example, there is competition for space within and below the street, with many different users each with their own needs and perspectives, and different authorities managing different parts of the street infrastructure.

Vehicles, especially cars, tend to dominate our streets today. This wasn't true in the past. Many communities are looking for a better balance in their residential streets so that they can become neighbourhood spaces for play, meeting the neighbours and planting of trees.

Of course we all use streets to move around our local areas and to get from one place to another. So streets also need to be effective 'movement corridors' for pedestrians, bicycles, cars, and buses.

This *Plan* recognises the importance of transport in its many forms, and looks ahead to a more connected environment where walking and cycling are preferred modes of transport, public transport options are more accessible and desirable, where children and parents can walk to local schools, play grounds and open space and where local businesses thrive in their unique place.

2.3

ISSUES AND CHALLENGES

Achieving liveable street design in urban environments is a challenge everywhere. Learning from experience elsewhere can be a vital step in establishing appropriate principles and design guidelines for the streets of Knox.

SOME OF THE MAJOR CHALLENGES FACING KNOX IN ACHIEVING LIVEABLE STREETS

- Responding to changing community attitudes and expectations about the quality of the urban environment and residential areas;
- Engaging communities in finding solutions, resolving differences and caring for local streets;
- Managing risks and ensuring safety;
- Negotiating the stringent standards and legislation that govern the design of road environments and that at times run counter to the concept of liveable streets;
- Recognising streets as an interconnected network that require integrated design and management solutions; and,
- Providing for an aging community that is likely to become increasingly reliant on walking and public transport.

SPECIFIC ISSUES IDENTIFIED BY COUNCIL AND THE COMMUNITY

- Most streets are dominated by cars;
- Many streets are bland and unattractive and do not contribute positively to neighbourhood character;
- Some streets are unsafe and unwelcoming to pedestrians and cyclists;
- Many streets lack an established tree canopy cover, with other street plantings lacking in species diversity and visual interest;
- Traffic volumes and vehicle speeds associated with declared state highways and main roads are barriers to local connectivity within suburbs and neighbourhoods;
- Shopping streets often lack the good design and amenities desired by shoppers and businesses;
- Water sensitive urban design is not built into the design of most streets;
- Footpaths are often too narrow, and do not form an interconnected system, with some areas particularly lacking; and,
- Overhead powerlines limit tree planting opportunities and add to visual clutter.

To achieve success, the *Plan* needs to respond to all of these issues. But as well there are three major overarching challenges.

2.3 ISSUES AND CHALLENGES

OPPORTUNITIES

MAJOR OVER-ARCHING CHALLENGES

1. Co-operation and co-ordination

Streets are multi-functional spaces, managed by either Council or VicRoads, and containing infrastructure services managed by a plethora of agencies. Streets are subject to specific legislation (eg. *Road Management Act 2004*) and associated regulations, codes of practice and guidelines (see the Appendix).

Within Council, many departments are involved. Achieving a cooperative and coordinated approach that meets all legal requirements is a challenge.

2. Transforming existing streets

Knox has an established street network. Relatively few new streets are built each year. The challenge is to create liveable streets through the transformation of existing streets.

3. Divergent community views

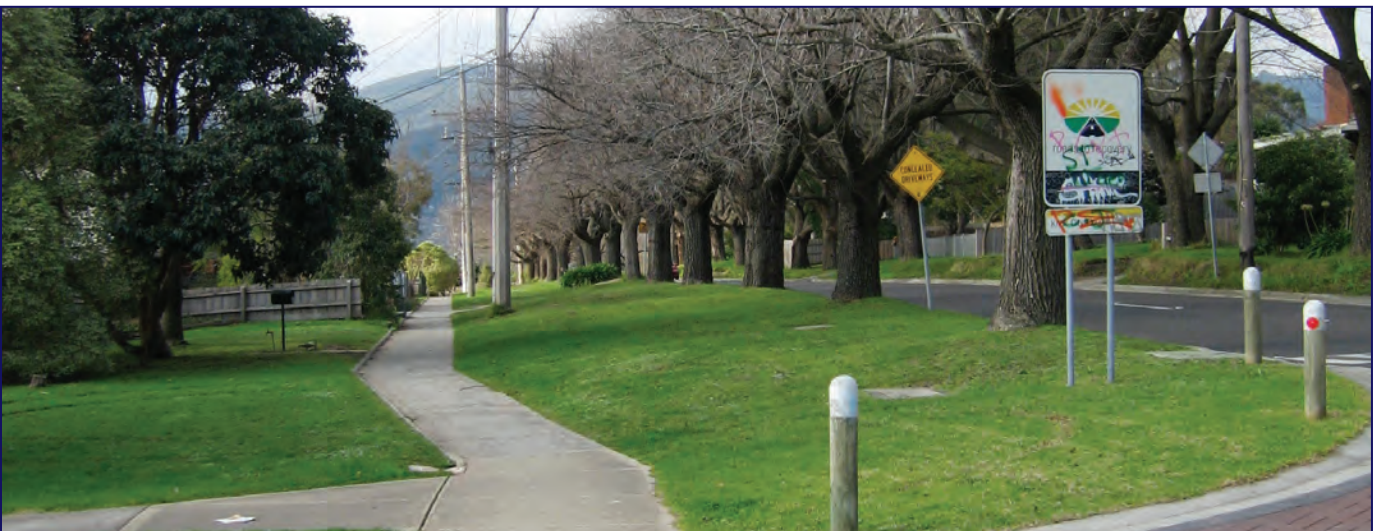
The Knox community is diverse, and Knox has many diverse neighbourhoods. While there are many shared views about what makes a street liveable, there are issues of concern and areas of disagreement. Achieving a shared vision that is sensitive to local issues and values is a challenge.



View east along Burwood Highway showing an established municipality



Recent street projects in Knox have used water sensitive urban design to improve water quality in Knox's waterways. Photograph in Boronia



View of footpath along Blackwood Park Road, Ferntree Gully, with mature exotic trees. A well known street in Knox

2.4

TAKING ACTION FOR LIVEABLE STREETS

Through this *Plan*, the City of Knox has set itself the task of increasing the 'liveability' of all its streets. This is an ambitious goal and will be achieved incrementally.

Close coordination will be required across all the Council departments that play a role in the design, management and maintenance of street environments.

Partnership with the community will help deliver the *Plan*, and opportunities for community action are listed under each theme in Section 4.

Partnerships with other government agencies will also be critical, given the many agencies that have responsibilities for infrastructure within streets. For example, VicRoads is the key State Government road traffic agency, and is responsible for highways, arterial roads and main roads across the State.

Other government agencies have responsibilities that contribute to the liveability of our streets including, urban planning, public health, community development, water infrastructure, public transport and more. Private companies are also involved, especially in relation to power and telecommunications infrastructure.

Through *Vision 2025* and other Council policies many positive directions towards achieving liveable streets are underway, and there is strong community interest in improving local streets. This *Plan* will build on those successes.

Legend

- City of Knox Boundary
- Dandenong Creek open space along corridor
- East Link
- Highways
- Major Roads
- Foothills of Mt. Dandenong

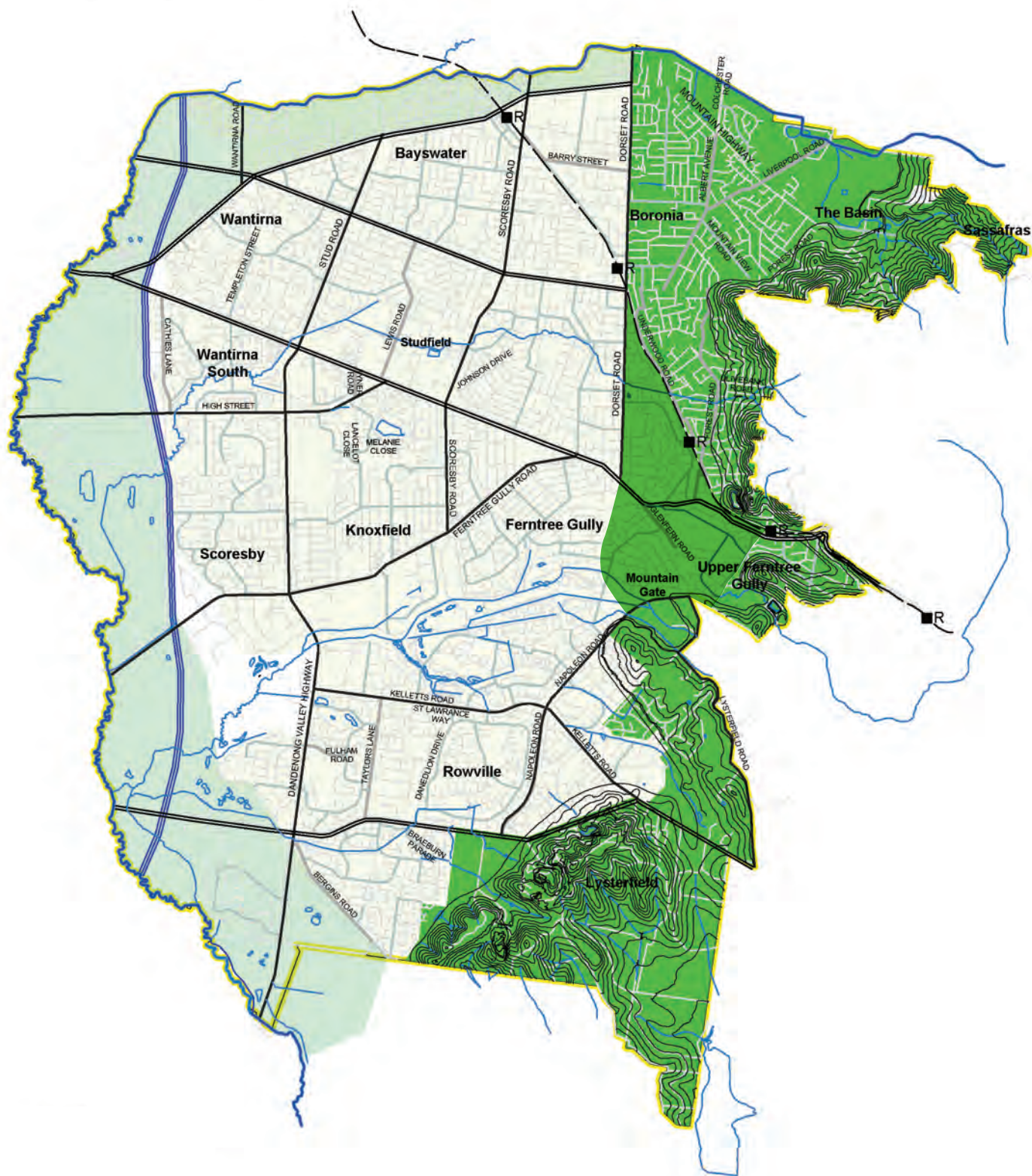


Figure 2: The key natural characteristics bounding the City of Knox

2.5

HOW TO USE THIS DOCUMENT

This document contains four key sections, these are:
Liveable streets design principles;
Liveable streets plan;
Liveable streets design guidelines; and,
Liveable streets action plan.

Together these provide the guidance needed by Knox to implement a liveable streets approach

LIVEABLE STREETS DESIGN PRINCIPLES

The *liveable streets design principles* provide the key concepts that underpin good design for liveable streets.

These principles in Section 4.4 should be used to guide the planning, design, implementation and maintenance of streets in Knox.

LIVEABLE STREETS PLAN

Sections 4.5-4.12 provide the overall plan, structured around seven themes. Under each theme, the context, opportunities and challenges are described and the goal and actions are defined. There are actions for Council and the community.

A summary of the themes, goals and approaches can be found in Section 4.5.

KEY SECTION	SECTION NO.	PAGE
Liveable streets design principles	4.4	45
Liveable streets plan	4.5-4.12	46-145
Liveable streets design guidelines	5	147
Liveable streets action plan	6	229

LIVEABLE STREETS DESIGN GUIDELINES

Section 5 contains design guidelines for each street type in Knox.

Each guideline describes the street type, shows their locations on a map, defines the objectives to be achieved, and establishes design guidelines for a range of key design factors including:

- pedestrian safety and amenity;
- crossovers;
- cycle infrastructure;
- signage;
- lighting and power infrastructure;
- vegetation;
- commercial development;
- residential areas and development; and,
- water sensitive urban design.

The *liveable street design guidelines* provide information for the design and construction of streets.

LIVEABLE STREETS ACTION PLAN

The *liveable streets action plan* in Section 6 provides a four year program for Council actions. The *Action Plan* presents the specific actions, the resources required, partnerships needed (internal and external) and the proposed measures of success.

The *action plan* will be reviewed annually throughout the implementation of the *Plan*. Many of the actions represent a substantial investment of time and energy by Council and community and will require a long-term commitment to enable their completion.

Pilot projects are underway as a method to test and improve on this *Plan*. These findings will be built back into the *Plan* annually. Further projects will be identified as an ongoing process of testing and reflection. Selected pilot projects will be chosen based on ranking in priorities plan, existing programs and community support.

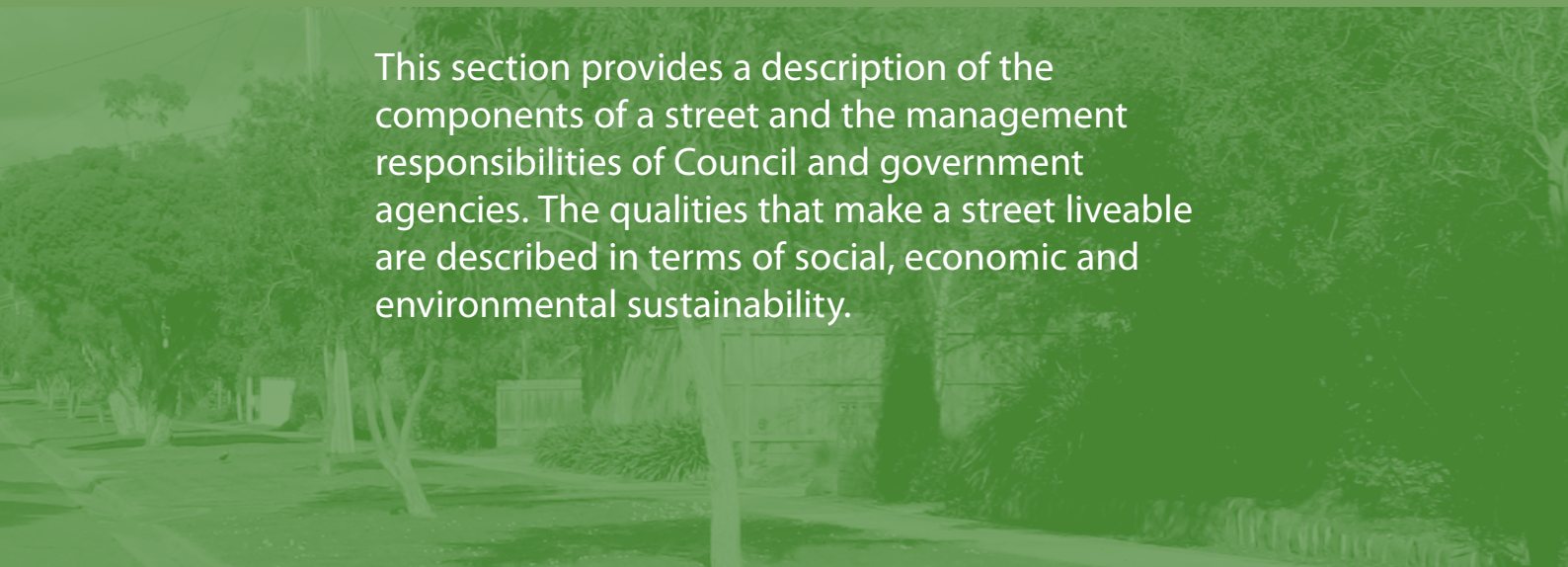
The *action plan* provides the basis for the setting of annual budgets and work programs, and for monitoring achievements.



3

KNOX & LIVEABLE STREETS

This section provides a description of the components of a street and the management responsibilities of Council and government agencies. The qualities that make a street liveable are described in terms of social, economic and environmental sustainability.



3.1 THE ANATOMY OF A STREET

Streets are complex environments that serve many functions, below and above the ground. *Figure 3* illustrates the many physical parts that make up a street.

Streets are places where people travel on foot, by bicycle, bus and car. Residential streets are part of local neighbourhoods. Streets are places for plants and animals to live, for water to recharge the ground, for people to collect the mail, walk their pets, play cricket, football and handball, have a coffee with the neighbour, and paint the fence.

Streets serve businesses, providing travel routes for suppliers and customers, spaces for exchange, and are usually the public face of business.

Streets contain important public infrastructure services including power, telecommunication, water, sewage, stormwater and gas.

In summary, streets do many things for many people, meeting multiple obligations and operating under legal and resource constraints. They also are expected to be beautiful and respond to the local context, connect with other streets and form a wider network.

STREET

In this document, 'street' is used to mean all types of streets and roads. It includes all streets from highways and arterial roads through to residential cul-de-sacs.

A street typology for Knox has been developed based on the classification of roads in the *Knox Road Asset Management Plan* (KCC, 2007) and is illustrated in *Figure 10, page 64 Proposed Street Hierarchy*.

Different types of streets serve different functions. This *Plan* distinguishes between the different types of streets to guide policy and action.

3.2 MANAGEMENT OF STREETS

STREET RESERVE OR EASEMENT

The '*street reserve*' is the land set aside by Council or VicRoads for a roadway, footpaths, infrastructure and landscaping. The street reserve generally is the whole area between the property lines.

CARRIAGEWAY OR STREET PAVEMENT

The '*carriageway*' is the area of the *street reserve* defined as being for the movement and parking of vehicles, typically kerb to kerb.

LANES

'*Lanes*' are the areas of the carriageway defined for vehicle travel. Lanes may be specifically defined for bicycle travel.

NATURE STRIP

The '*nature strip*' is the grassed or planted area of the *street reserve* between the edge of the carriageway and the front property line. Typically this is the area where street trees are planted, and may have a grass, gravel or hard surface. Services such as power, stormwater, sewerage, gas and water supply, and telecommunications are usually on or under the nature strip or the footpath.

FOOTPATH

The '*footpath*' is primarily a pedestrian path along the street, connecting adjacent properties.

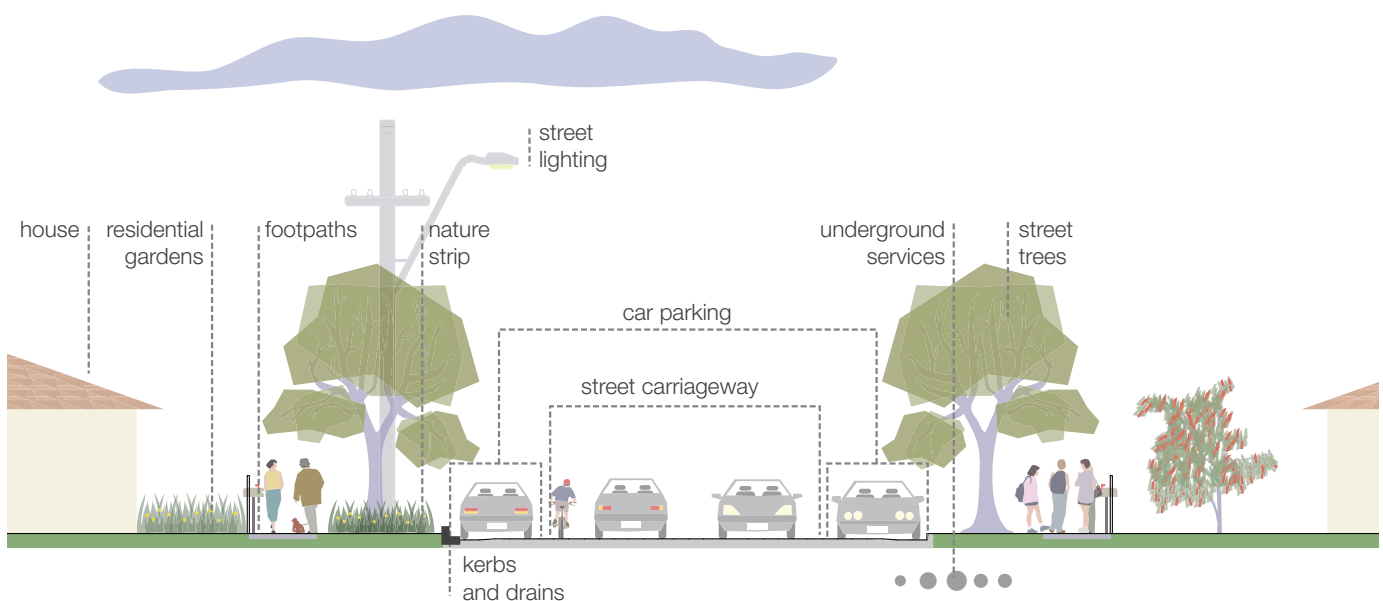


Figure 3: Anatomy of a street

3.2 MANAGEMENT OF STREETS

Streets provide space for many different services for our community. *Figure 4* illustrates how a street is managed and the many different service providers – Council, government and private – that are involved. Each service provider operates within its own legal, policy and budgetary constraints.

VicRoads is the responsible manager for all of the major roads in Knox including highways (e.g. Burwood Highway) and declared main roads (e.g. Stud Road). The EastLink freeway is managed by a private company. All other categories of roads are managed by the City of Knox.

Refer to Section 5.1 for the proposed street type hierarchy, which shows a table of Knox's streets linking the proposed typology to the *Road Asset Management Hierarchy (2007)* and the *Knox Urban Design Framework 2020 (2003)*.

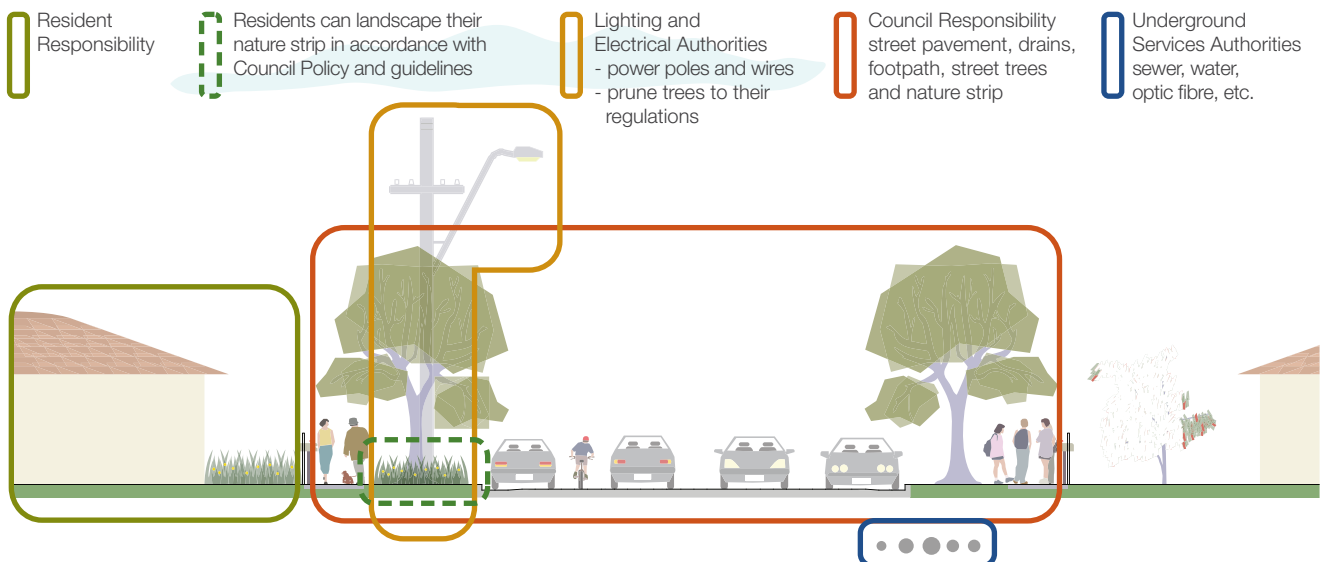


Figure 4: The many functions of a street and responsible authorities

3.3 QUALITIES THAT MAKE A STREET LIVEABLE

The qualities that make a street liveable are briefly described below in terms of social, economic and environmental sustainability – the triple bottom line approach – to measuring organisational and societal success.

These three dimensions of sustainability are important underpinning values for the City of Knox, as expressed in *Knox Vision 2025* (KCC, 2007) and in the *Knox 2008-2014 Sustainable Environment Strategy* (Context, 2008).

These ideas are taken up in more detail in Section 4 in relation to the seven liveable street themes.

SOCIAL SUSTAINABILITY

Social sustainability is about community health, social interaction, local identity and sense of place. There are many ways in which streets contribute to social sustainability.

Health

Streets provide low cost easy opportunities for exercise, such as walking and cycling.

Interaction

Streets provide places for daily and casual interaction with neighbours, community and work colleagues.

Streets provide places for residents and communities to meet and gather, both formally and informally.

Streets that are designed to reduce traffic speeds will enhance safety and encourage people to use streets as places to interact with others.

Sense of place

Streets that connect with local destinations and have legibility created by quality street tree and vegetation planting are useable and high-amenity places.

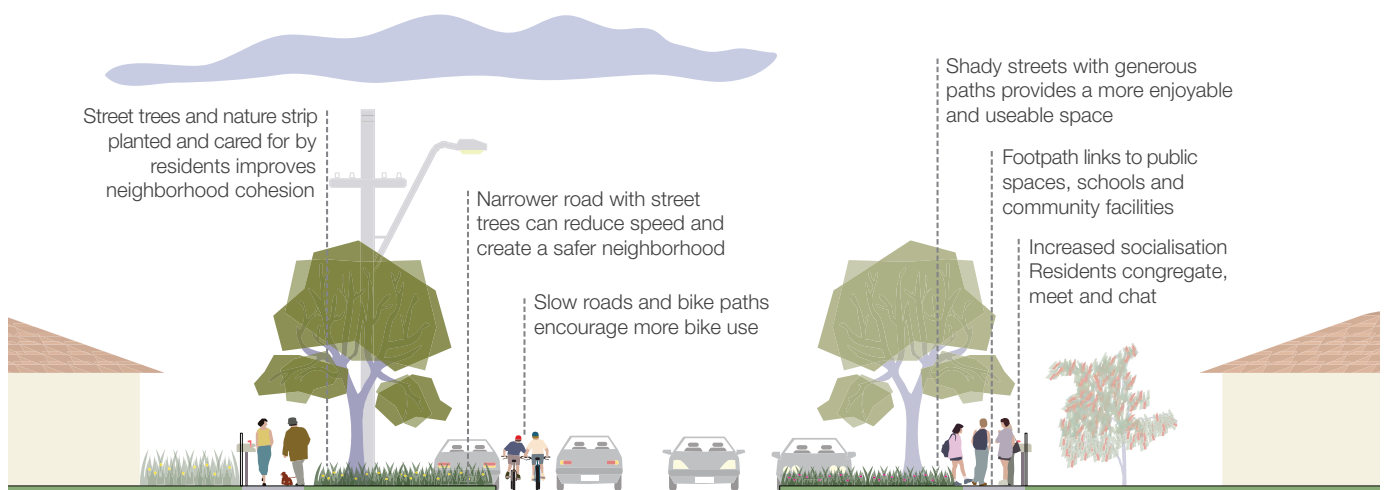


Figure 5: How streets contribute to the community

3.3 DRAFT QUALITIES THAT MAKE A STREET LIVEABLE

ENVIRONMENTAL SUSTAINABILITY

Environmental sustainability is about protecting and enhancing the ecological systems that are vital for life, and living in a way that does not compromise the future.

In relation to streets, environmental sustainability is about street environments that create habitat, support biodiversity, improve the quality of stormwater, and reduce the effects of climate change.

Local climate

Street trees create shade for walkers, houses and street pavements, thereby reducing the overall temperature of a suburb.

In turn, this reduces the energy needed to cool our homes and reduce 'the heat island' created by urban environments.

Street trees can also contribute to reducing wind speeds and the impact of storms.

Habitat

Street trees and plants can contribute significantly to habitat values. The expansion of suburbs into natural areas reduces the space for indigenous flora and fauna, and street plantings can work to enhance local habitat and assist sustainability.

Biodiversity

Biodiversity is a measure of the diversity of living organisms within an ecosystem. The more diverse the area, generally the healthier the ecosystem is as it is capable of supporting a multitude of plants, animals and insects and other life forms. Street vegetation, if varied and well chosen, can ensure that biodiversity is retained and increased in Knox.

Water

Trees, vegetation and water sensitive urban design can reduce the need for expensive water management infrastructure downstream and can improve the water quality in our waterways. By using drought tolerant species and passive irrigation through water sensitive urban design, Knox can retain its 'green and leafy' environment for the next generation.

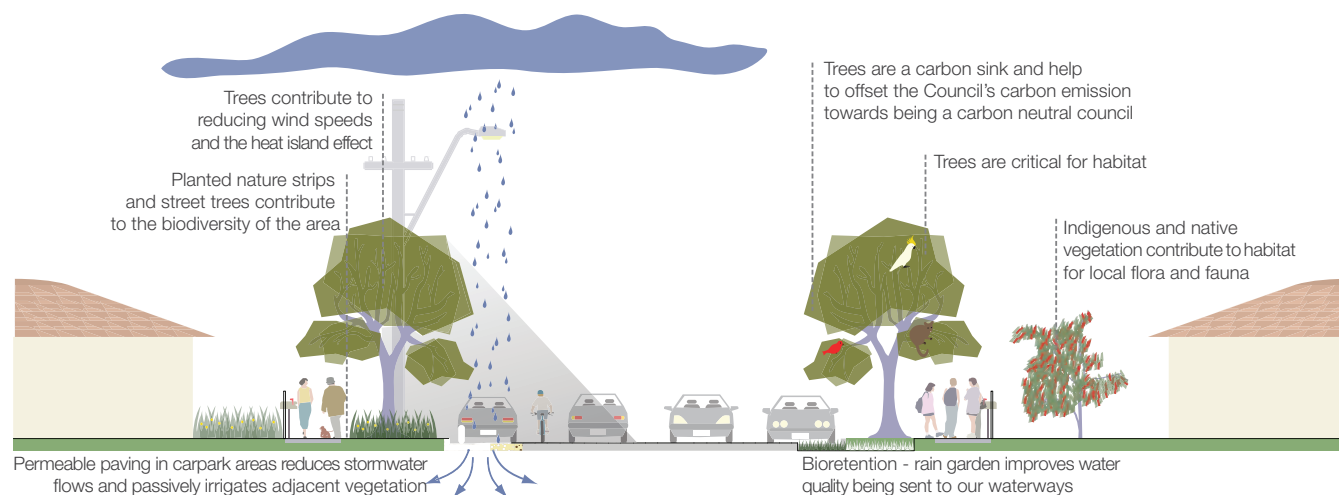


Figure 6: How streets contribute to the environment

ECONOMIC SUSTAINABILITY

Well designed streets can contribute significantly to the attractiveness of commercial and industrial areas for businesses, their customers and employees.

Well designed streets also encourage people to increase their walking and cycling, thereby increasing their health and wellbeing and decreasing the costs of health care across the community.

The *Knox Pedestrian Plan* (David Lock Associates, 2005) establishes a framework of policies and actions to encourage walking.

Amenity and commerce

Shoppers are attracted to shopping areas that are easy to access by foot, bicycle or car, and that offer a high level of amenity. Trees, vegetation, seats, quality pavements and good lighting ensure shoppers are comfortable, and are encouraged to stay longer and return.

Industrial and business estates set within quality streetscapes will help attract higher quality businesses to Knox by creating a better public profile for these businesses and a higher standard of amenity for their employees.

Property values

Property values are influenced by many factors. A significant contributor to the value of a home is the quality of the neighbourhood and street. Good street trees have been shown to increase property values by creating a more unified street character and enhancing the 'green and leafy' image desired by so many Melbournians.

'Walking is a suitable physical activity for most people. Regular walking can help you lose body fat, maintain a healthy weight, improve your fitness and reduce your risk of developing conditions such as heart disease, type 2 diabetes, osteoporosis and some cancers.' (SGV, 2010)

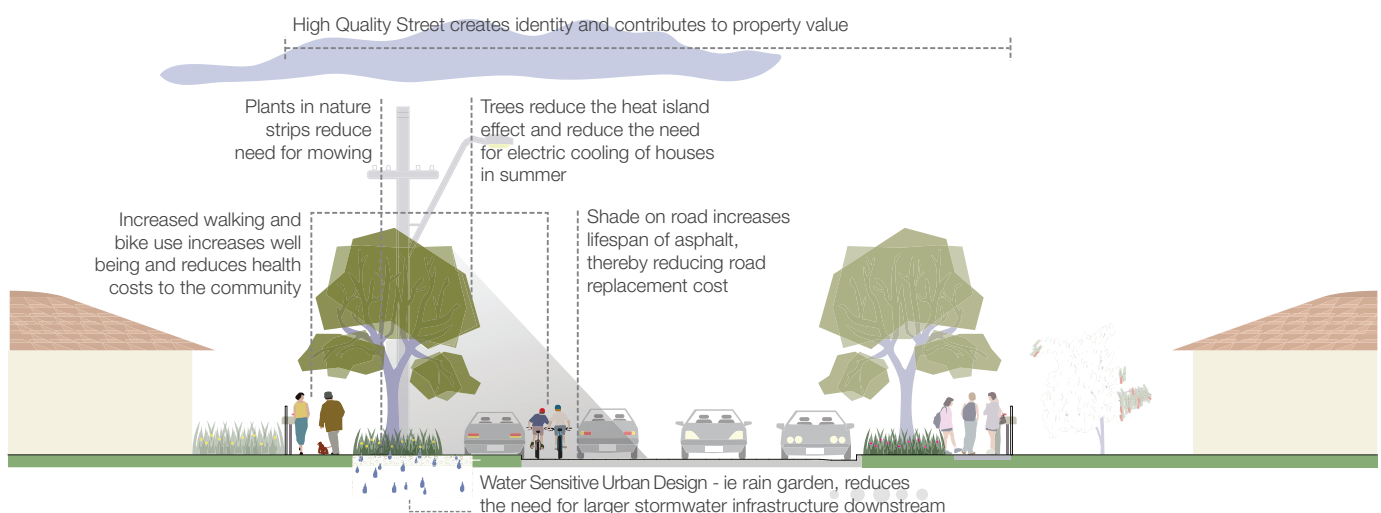


Figure 7: How streets contribute to the economy

3.4 WHAT ARE KNOX'S STREETS LIKE TODAY

THE SIGNIFICANCE OF STREETS IN KNOX

The *Knox City Council Streetscape Policy* (KCC, 2003) says that 'Knox's streetscapes and the trees within the streetscape are regarded as one of Council's greatest assets and contribute to the green leafy image of Knox. This image has been highlighted in a number of Council's strategic documents including the *Corporate Plan* and the *Municipal Strategic Statement* (2009).'

This value statement has been reiterated by community contributions during the consultation undertaken in developing this *Plan*.

SOME KEY FACTS ABOUT STREETS IN KNOX

- About 7% of the area covered by the City of Knox is a street or road – a total of 800 kilometres in length. By comparison approximately 2.9% of Knox is public parkland, as described in the *Open Space Plan* (Robin Crocker & Ass. *et.al*, 2004) this indicates the importance of the street network as part of Knox's public space network;
- The *Open Space Plan* (Robin Crocker & Ass. *et.al*, 2004) identifies linear roads and tree reserves as types of open space. Rowville, Lysterfield, Wantirna and Wantirna South have large proportions of tree or road reserves with greater than 17 sites each. The remaining suburbs of Knox have less than 8 sites each;
- The *Road Asset Management Plan* (KCC, 2007) states that roads and related infrastructure account for approximately 33% or \$1.1bn worth of public assets owned and managed by Knox City Council;
- The street network is nearly 800kms long, slightly less than the distance between Melbourne and Sydney;
- VicRoads is responsible for 95km of major roads including highways, arterials and main roads;
- The City of Knox manages the vast majority of the street network; it is responsible for around 700km of streets that provide access to residential areas, local business, community services and amenities;
- There are over 65,500 street trees within Knox with an estimated value of \$70 million using the Burnley valuation system (KCC, 2003); and,
- Knox streets make a major contribution to the identity and character of the municipality.



View of Knox over the Dandenong Creek corridor towards the foothills of Mt. Dandenong



Talaskia Road in Upper Ferntree Gully, a Council managed street

3.5 COMMUNITY PERSPECTIVES ON LIVEABLE STREETS

Community consultation during the development of the *Plan* revealed a strong interest in the appearance and function of streets across the city.

MOST LIKED STREET QUALITIES

People highly value quiet, green streets where it is easy to get to local facilities. They also value being close to shops, having good neighbours and being close to open space.

Most people like the street they live in now, but many also had ideas about how to improve it.

People don't like speeding cars and large volumes of traffic in residential streets. The amount and speed of traffic is a major issue within the community and seems to be one of the main contributing factors to the degree of happiness people feel regarding their own street.

STREET DESIGN

Responding to a series of images of streets (see 'great street' images below and over) – including commercial areas and residential streets – there was considerable comment about street trees and other greenery. A commercial area without any trees was seen as cold and sterile.

The most popular image was a well-maintained residential street that had street trees, shrubs, and wider nature strips. Wider streets without cars parked in the street were favoured. Footpaths were seen as important. A sense of spaciousness and care in the design of the street was also favoured. Meandering street layouts were also well-liked.

The strongest concern was safety, in particular street plantings that block views of children, bicycles and motor bikes, as well as the lack of footpaths in some examples.



'great street a'



'great street b'

'There are good examples of bicycle lane marking within the City of Yarra, which have not only made bicycle commuting safer, but also increased awareness and volumes of cycling. The City of Yarra has the highest level of cycling of any municipality in Victoria' (City of Yarra, 2010).



'great street c'



'great street d'



'great street e'



'great street f'



'great street g'



'great street h'

3.6 COMMUNITY PERSPECTIVES ON LIVEABLE STREETS

STREET TREES

Street trees attracted a lot of comment, both positive and negative. The type, size and number of street trees were commented on: mature eucalypts were either loved or hated and there were distinct differences of opinion over whether street trees should be native or exotic species.

Mature street trees were strongly valued because they helped create a distinctive neighbourhood character and a pride of place. Similarly all new street plantings were seen as adding character and contributing to the overall quality of the street as well as adding habitat and biodiversity values.

Mature street trees were also valued for their shade and habitat. They were seen as adding to the amenity and to the value of a neighbourhood. Few people said they did not value mature street trees.

While street trees are valued, they are also often seen to cause problems: specific issues include damage to pavements, concerns about the height of trees and obstruction to visibility along a street.

'Single storey suburban homes with garden space and trees. Good spacing and covering of native street trees, good shade, lots of wildlife and clean air. Peacefulness.' – Knox resident on what they like about their street

BEING INVOLVED IN THEIR LOCAL STREET

The majority of people know and like their neighbours. Some people meet socially with their neighbours but an equal amount of people did not.

Although most people know their neighbours, only a quarter of them get involved in activities in their street. Of those who get involved, the most popular activities are football and cricket, riding bicycles and Christmas parties. A small number of people had been involved in local planting projects.

Other neighbourly activities mentioned by individuals included visiting neighbours, clean up days and helping each other out. The amount of traffic in a street was noted as a significant barrier to getting involved.

MOVING AROUND THE NEIGHBOURHOOD

Many people walk to local facilities, mainly to shops and schools, but fewer people cycle. A significant number of people walk and cycle for exercise and health benefits. The majority of people walk on a regular basis with just under half saying that they were walking to local facilities daily and over a quarter walk between one and two times per week.

Distance and time were seen as the barriers to walking and cycling, along with the lack of connecting footpaths.

IMPROVING RESIDENTIAL STREETS

The most desired change to residential streets was slowing cars down. Others desired changes included improving and connecting footpaths, followed by better cleaning and maintenance, better plantings, better lighting, and more off-street parking.

Some other specific improvements included making the streetscape more interesting with seating, colours and public art.

FUTURE STREETS

Asked to imagine their future street, only a small percentage (13%) were completely happy with their streets now, indicating that a large majority wanted some level of change. A quarter of all people wanted more leafy and tree-lined streets, with other changes including tidier streets with less rubbish and no graffiti, less traffic, and fewer cars 'cluttering' the street space.

Asked about 'great streets' in Knox or elsewhere, most examples provided by respondents were tree-lined streets. Other qualities that people liked in 'great streets' included great neighbours, and well-laid out and maintained streets.



Blackwood Park Road, Ferntree Gully, a beautiful, exotic treed avenue



Boronia Road – a 'Bush Boulevard'



Riparian Way, Ferntree Gully a new street where existing mature trees have been incorporated into the street design

4

CREATING LIVEABLE STREETS *THE PLAN*

The *Knox Liveable Streets Plan 2012-2022* will guide Council in all aspects of its street planning, design, development and management activities, and support partnerships between Council, the community and infrastructure agencies.

4.1 OVERVIEW

The *Plan* is based on seven liveable street themes. Each has a clear goal that will be achieved through a number of identified approaches and actions.

A rolling four-year action plan (Section 6) will turn the goals and approaches into real change.

Progress towards each goal will be measured through defined indicators (Section 6).

Liveable streets design guidelines (Section 5) are a key part of the *Plan*. These will guide the Council and the community on the standards to be achieved in future street design.



Typical street in Bayswater with wide nature strips and a variety of native street trees

4.2 LIVEABLE STREETS

Liveable streets are places where people feel proud to live, work and play. The character of a street and the broader neighbourhood are pivotal to the community's sense of place and home.

The Plan promotes seven key themes and benefits together with the triple-bottom-line approach to sustainability and *Knox's Vision 2025* (KCC, 2007).

WHAT LIVEABLE STREETS MEAN IN THESE TERMS

1. Streets as places

Streets should be treated as places for people as well as spaces for vehicles and services. They are places to be enjoyed, places to be lived in. Local streets are a large part of every neighbourhood, and a key element in neighbourhood character.

2. Streets for travel

Streets connect us. They provide a network of footpaths, cycle lanes and roadways that helps us move around our area, and link us to other places.

3. Streets for the environment

Streets are part of our environment. They can play a valuable role in catching and reusing rainwater. Street trees and plants can create habitat links and produce food for people and local wildlife.

4. Streets and the economy

Well designed and attractive streets contribute to economic viability. Liveable streets include the places where we work and shop. Even major roads need to become more liveable through good design.

5. Safe streets

Safe streets are places where we can meet

and play with comfort and without the feeling of danger.

6. Streets for the community

Liveable streets are places where people feel comfortable to be.

7. Streets for infrastructure

Liveable streets are living entities that provide all kinds of services and are infrastructure in themselves. All streets require care and maintenance.

This way of thinking about liveable streets is new and exciting. Knox can take a leadership role in actively delivering this vision.

The streetscape is the visual identity of a neighbourhood and plays an important role in facilitating interaction between residents and creating a community. Well designed streetscapes encourage connection understanding and community spirit among residents. (COA, 2008, pp29)

4.3 VISION

In summary, the vision for liveable streets in Knox is:

- Knox's streets are places that people are proud to call home.
- Liveable streets create connections, between people, for the environment, for infrastructure services and for travelling.
- Liveable streets are sustainable, interesting, diverse and attractive and are places for plants and animals too.
- Liveable streets are attractive streetscapes for residents, shoppers, workers and visitors.
- Liveable streets are safe and happy environments.
- Liveable streets are great places to be and are places for people to rest, socialise and play.
- Liveable streets provide multiple functions and balance the needs of vehicles, pedestrians, cyclists, services, vegetation, infrastructure and access.

Streets should be part of our living space and a common area for the community, equal to the park and footpath... A good street is one in which you can chat with your neighbour without having to shout over traffic noise, or worry about your safety and that of small children (COA, 2008, pp29)

4.4 DESIGN PRINCIPLES

Good design is an essential part of creating liveable streets.

The principles for good street design have been informed by a review of local and international design guidelines. These include:

- *Manual for Streets*, Department for Transport, United Kingdom 2007;
- *Moreland Street Landscape Strategy 1997–2017*, Moreland City Council 1997;
- *City of Salisbury Landscape Plan*, by Hassell, South Australia 2007;
- *Street Design Guidelines*, Landcom, NSW Government 2010; and,
- Commission for Architecture and the Built Environment, United Kingdom (various reports)

The following six principles underpin best practice in liveable street design.

A. STREETS FOR EVERYONE

Streets have multiple uses and users. The needs of all should be catered for. The needs of vehicles should not overtly dominate street design.

B. STREETS AS LINKAGES

Streets should form a well-connected network that offers multiple routes and transport modes to destinations. Add special walking and cycling linkages where possible. Keep urban traffic dispersed, low speed and moving.

C. ACCESSIBLE AND EASY STREETS

Make footpaths that are comfortable. Build narrow carriageways and compact intersections, and make streets that are easier to cross. Design for the diverse access and mobility needs of the community.

D. GREEN STREETS

Green streets contribute to good water management, reduce urban heating, and include trees for shade and as habitat.

E. STREETS AS PUBLIC SPACES

Recognise that streets are a primary component of the public realm, where people can interact and build community.

F. STREETS OF ADEQUATE SIZE

Scale for people, for bicycles and cars together, recognising the function of each type of street.

These principles should be used in conjunction with the *Liveable Streets Design Guidelines* in the planning, design and maintenance of streets in Knox.

4.5 THEMES, GOALS AND APPROACHES

The following table summarises the themes, goals and approaches of the seven themes in this *Plan*.

THEME	APPROACHES
<p>1. STREETS AS PLACES</p> <p>Streets are the public 'face' of an area; they are places in which the community of Knox lives, works and plays. The plan explores how streets help create the character of the city.</p> <p>GOAL To create and strengthen Knox's distinct sense of place through high quality streets</p>	<ol style="list-style-type: none"> 1. Commit to a coordinated Council approach to street design and implementation to ensure best possible infrastructure, community and environmental outcomes 2. Promote and enhance Knox's distinctive urban, suburban and rural landscape identity through the design of its major streets and gateways 3. Enhance Knox's neighbourhood character through integrated street design 4. Support community participation in street activities
<p>2. STREETS FOR TRAVEL</p> <p>This plan explores streets to better serve all modes of travel including walking and cycling, to increase connectivity throughout neighbourhoods, suburbs and the whole City of Knox</p> <p>GOAL To improve the ability of streets to cater for an increase in sustainable transport options in Knox</p>	<ol style="list-style-type: none"> 1. Encourage travel behaviour change by supporting alternative travel modes 2. Make walking a viable choice for residents 3. Make cycling a viable choice for residents 4. Encourage pedestrian use of residential streets by reducing vehicle speed 5. Provide accessible footpaths and crossings 6. Implement shared use zones and home zones in streets to promote walking and cycling
<p>3. STREETS FOR THE ENVIRONMENT</p> <p>Streets for the environment look at ways that streets can care for environmental factors such as flora and fauna, water and shade and the connection they have with Knox's goals for climate change</p> <p>GOAL To improve environmental sustainability of streets in Knox</p>	<ol style="list-style-type: none"> 1. Increase sustainable water use, capture and treatment in streets 2. Improve biodiversity and habitat values through enhancement of Knox's street vegetation 3. Design and implement environmentally sustainable streetscapes

THEME	APPROACHES
<p>4. STREETS AND THE ECONOMY</p> <p>This theme looks at how streets contribute to the economy through retail, industry and business and how they contribute to property value and health costs for residents.</p> <p>GOAL To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities</p>	<ol style="list-style-type: none"> 1. Build the capability of the residents to work collectively to 'populate' the streets to make it a desirable, healthy place to live and work 2. Build capacity of the commercial and retail 'people' to animate the refreshed streetscape 3. Refresh streets in activity centres and neighbourhood shopping strips to enable improved economic outcomes 4. Improve economic longevity of street pavements through appropriate street tree planting 5. Promote walking and cycling activity in Knox streets to reduce community health costs and increase well-being
<p>5. SAFE STREETS</p> <p>This sections looks at ways to activate streets, helping create safer environments for residents and visitors.</p> <p>GOAL To improve the safety of Knox's streets for pedestrians, cyclists and motorists</p>	<ol style="list-style-type: none"> 1. Decrease vehicle speed in residential streets and retail environments 2. Improve pedestrian access and amenity in streets to provide equitable space for non-vehicle movement 3. Provide safe areas for parking of vehicles 4. Create community destinations – reasons to be on the street
<p>6. STREETS FOR THE COMMUNITY</p> <p>In local residential streets, communities can inhabit the street space to create their own sense of place, shaping it with plants, art and activity. In such streets neighbours meet, children play, people are active and involved.</p> <p>GOAL To increase community pride and action in Knox streets</p>	<ol style="list-style-type: none"> 1. Design streets to enable community activity 2. Support community initiatives in streets 3. Streets as places to produce, harvest and share food <p>Note: all actions need to contribute to consistent neighbourhood character</p>
<p>7. STREETS FOR INFRASTRUCTURE</p> <p>This section explores the many types of infrastructure needs that streets provide and house. It investigates maintenance, access and integration with other uses and community needs.</p> <p>GOAL Coordinate street design and maintenance to balance infrastructure and community needs</p>	<ol style="list-style-type: none"> 1. Improve the coordination of street design, works and maintenance between Council, state authorities and utility providers 2. Improve the coordination of street design, works and maintenance across Council 3. Improve the quality of street design 4. Make sustainability a priority for future infrastructure works 5. Ensure a balanced approach to on-street car parking

4.6 STREETS AS PLACES

The streets within Knox help create the character of the city, from the major connecting boulevards and highways through to the narrower residential streets.

Streets are an important part of the public realm. They are the public 'face' of every area. Most importantly, they are the places in which people interact. Streets are much more than just transport corridors, they are the places where the Knox community lives, works and plays.

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

OPPORTUNITIES

- Create a clear and legible urban structure;
- Build community pride;
- Strengthen transport links and nodes; and,
- Create a stronger sense of place for residents.

CHALLENGES

- VicRoads manages most of Knox's main roads and Council needs to coordinate with VicRoads to achieve desired outcomes;
- Traffic on major roads cannot be considered in isolation but rather as part of a broader integrated traffic management system;
- Highly constrained major road easements where the issues of inter-suburban travel and vehicle speed are paramount;
- Little tolerance exists in VicRoads standards to achieve desirable tree and vegetation planting; and,
- Competing interests between streets as places and streets dominated by vehicles. In particular, community and business expectations of on-street car parking.



Zetland in Sydney, a good example of a street with water sensitive urban design and shady native tree planting

APPROACHES

1. Commit to a coordinated Council approach to street design and implementation to ensure best possible infrastructure, community and environmental outcomes
2. Promote and enhance Knox's distinctive urban, suburban and rural landscape identity through the design of its major streets and gateways
3. Enhance Knox's neighbourhood character through integrated street design
4. Support community participation in street activities

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- dynamic services and facilities;
- accessible transport choices;
- sustainable natural environment;
- balanced quality urban development; and,
- prosperous modern economy,

And it is supported by the Vision 2025 commitment to:

- partnering and engaging;
- innovation and excellence;
- effective governance; and,
- social and environmental responsibility.

4.6 STREETS AS PLACES

MEASURE OF SUCCESS

- This *Plan* adopted by 2012 and part of each directorship's yearly planning
- Increase the number of projects guided and assessed by the liveable streets checklist
- Liveable streets design guidelines adopted by 2012
- *Liveable Streets Plan* and its *Action plan* reviewed each year and actions receive funding on an ongoing basis
- Risk management review undertaken and projects can proceed with confidence with Council and VicRoads support
- Dandenong Creek gateways completed by 2018
- Bush boulevards and principle avenues planted by 2022
- Paths into the hills planted in 2027
- Street improvements comply with checklist
- Memorandum of understanding with VicRoads adopted by 2012
- Revision of the *Knox Streetscape Policy* by 2012
- Street improvements comply with checklist and criteria
- Implement three green neighbourhood streets in by 2016
- Collaborative consultation approach with residents and levels of community participation
- Clear easy procedures for community based events and activities available on web and through customer service
- Record number of people who download information and number of activities that occur
- Collaborative consultation approach with residents and level of community participation
- Number of community groups and residents approaching Council for stakeholdership
- Number of community initiated groups increase

Measure of success for community

- Increased number of community initiated street projects in Knox
- Level of community involvement in street projects
- Increased number and extent of edible and gardens for wildlife private gardens

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Knox Urban Design Framework*;
- *Knox Neighbourhood Character Study*;
- *Knox Street Tree Strategy*;
- *Knox Pedestrian Plan*;
- *Knox Nature Strip Policy*;
- *Knox Arts Plan*; and,
- *Melbourne 2030*.



Community project 'Streets for living project', Bayswater

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

OPPORTUNITIES

This section looks at four specific opportunities that will help build a distinctive sense of place:

- Create a clear and legible urban structure;
- Build community pride;
- Strengthen transport links and nodes; and,
- Create a stronger sense of place for residents.

Create a clear and legible urban structure

The structure of an urban area is created by the way that land uses are organised and interconnected. Streets and roads, along with bicycle paths and footpaths, are important connectors between home, work, school and leisure places.

The best urban forms are ones that are well interconnected, accessible and 'legible', where people find it easy to find their way around.

Overall, Knox has a traditional geometric network of grid streets and subdivision patterns across varied topography with wide linear streetscapes and typically large lot land parcels. (KCC, 2005)

Build community pride

Building a strong sense of community pride applies equally from local street communities right through to the community of Knox as a whole.

Community pride creates active participation and a sense of wellbeing.

Strengthen transport links and nodes

Linking neighbourhoods through accessible public transport is a vital part of activating local areas and streets. Building walking and cycling networks is a key component.

Section 4.7 looks in detail at travel and transport in Knox.

Create a stronger sense of place for residents

A sense of identity and belonging improves the social wellbeing and personal health of residents.

Neighbourhood character plays an important role in enhancing a sense of belonging and identity within each local community.

Enhancing a sense of place in each street and neighbourhood is a significant design challenge. Many streets have qualities that are highly valued by the community, but many changes are also being called for. Some of these need to be addressed through a more integrated approach to street design.

The design of each street can add to or detract from the local character. For example, the widths of the street, pavement, nature strip and trees all contribute to the street's appearance, and a consistent design approach can help build streets into neighbourhoods, giving each neighbourhood an interesting and distinctive character.

4.6 STREETS AS PLACES

CHALLENGES

There are some major challenges in building a distinctive sense of place in streets, including:

- Council needs to coordinate with VicRoads to achieve desired outcomes, as VicRoads manages most of the Knox's main roads;
- considering traffic on major roads as part of a broader integrated traffic management system and not in isolation;
- the issues of inter-suburban travel and vehicle speed are paramount but are highly constrained in major road easements;
- little tolerance exists in VicRoads standards to achieve desirable tree and vegetation planting; and,
- competing interests between streets as places and streets dominated by vehicles. In particular, community and business expectations of on-street car parking.

COMMUNITY PERSPECTIVES

The community consultation revealed that:

- most people generally like the street that they live in, but equally most want some changes;
- most people know their neighbours and many get involved in at least some local neighbourly activities, but few so far have actively participated in a street-based improvement project;
- most people want quiet streets, and the desire for less traffic is almost universal;
- most people use and feel connected to local facilities, and many already walk to them; and,
- the design qualities of streets are important. People like streets that are well-designed and maintained, that have street trees, and few cars parked on the street. Wide streets with a sense of spaciousness are liked as are meandering streets.



A collaborative departmental street design workshop, where Council officers used the 'kit of parts' to design a street together

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

ACHIEVING CHANGE

Vision

The streets of Knox will become valued public places, creating and reinforcing a sense of community identity and pride. Connectivity, accessibility and legibility will be enhanced at a local and city-wide level.

Goal

It supports the following ideas in *Vision 2025*:

- Healthy, connected communities;
- Supporting culturally rich and active communities;
- Sustainable natural environment; and,
- Balanced quality urban development.

It is supported by the *Vision 2025* commitment to:

- Partnering and engaging;
- Innovation and excellence; and,
- Social and environmental responsibility.

Approaches

1. Commit to a coordinated Council approach to street design and implementation to ensure best possible infrastructure, community and environmental outcomes
2. Promote and enhance Knox's distinctive urban, suburban and rural landscape identity through the design of its major streets and gateways
3. Enhance Knox's neighbourhood character through integrated street design
4. Support community participation in street activities

4.6 STREETS AS PLACES

ACHIEVING CHANGE

APPROACH 1 – Commit to a coordinated Council approach to street design and implementation to ensure best possible infrastructure, community and environmental outcomes

Action 1.1

Council to commit to the implementation of this *Plan* over the next 10 years with a review every 3 years. Each year clear priorities should be agreed to, budgeted for and implemented

Action 1.2

Ensure each street project is guided and assessed by the liveable streets checklist. Update checklist after a period of use and review

Action 1.3

Adopt the liveable streets design guidelines for all new street design and redesign by Council

Action 1.4

Review *Liveable Streets Plan* and action plan annually to measure success and update where necessary

Action 1.5

Develop a risk mitigation plan of street design, maintenance and community street activities

APPROACH 2 – Promote and enhance Knox’s distinctive urban, suburban and rural landscape identity through the design of its major streets and gateways

Action 2.1

Implement planting and design of Knox’s key streets:

- Dandenong Creek Gateways,
- Bush boulevards,
- Principal avenues,
- Paths into the hills

Action 2.2

Implement the liveable streets design guidelines to achieve the desired character for Knox’s main streets and gateways

Action 2.3

Establish a protocol or memorandum of understanding with VicRoads for non-standard streets to achieve greater liveability

Action 2.4

Revise the *Knox Streetscape Policy (2003)* to include recommendations from the:

- Neighbourhood Character Study;
- Sustainable Environment Strategy;
- Sites of Biological Significance;
- Net Gain Policy;
- Native Vegetation Framework;
- Draft Native Vegetation Generic Integrity Policy;
- Indigenous Roadside Vegetation programme;
- WSUD Strategy;
- Knox Heat Island Effects Study and to
- Develop a Street Tree Management Plan
- Develop a Street Tree Selection Tool
- Conduct a Street Tree Audit to feed into the plans above
- Develop a Nature Strip Planting Application form and process

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

APPROACH 3 – Enhance Knox's neighbourhood character through integrated street design**Action 3.1**

Ensure street design is consistent with Knox's residential design guidelines and the liveable street design guidelines

Action 3.2

Adopt and implement green neighbourhood streets as a priority street type for improving neighbourhood character

APPROACH 4 – Support community participation in street activities**Action 4.1**

Talk to local communities to list the qualities that give their locality a sense of place, and bring their perspectives into the design process and maintenance, in particular for home streets

Action 4.3

Work with community groups to facilitate community involvement in streetscape design and maintenance

Action 4.2

Facilitate and promote street and neighbourhood-based sustainable streets, community events and activities (e.g. street parties, garden clubs, nature strip maintenance groups)

Action 4.4

Encourage community initiated groups to form and be proactive in street design and use

Actions under other themes will also contribute to enhancing streets as places

COMMUNITY ACTIONS – Communities can contribute to this goal by:**Community initiation**

Community groups initiating residential streetscape projects and working with Council to deliver neighbourhood green streets projects

Community participation

Participating in street-based programs to improve the design of local streets including Gardens for Wildlife and 'edible streets' and the design of their garden to enhance neighbourhood character

4.7 STREETS FOR TRAVEL

Traditionally streets have been viewed by government and the community as primarily for vehicles – road space for cars, trucks, buses – both in transit and parked.

This *Plan* challenges this view by considering how streets can better serve other modes of travel, such as walking and cycling, and thereby increase connectivity throughout neighbourhoods, suburbs and the whole City of Knox.

The *Knox Sustainable Environment Strategy* (Context, 2008) points out that the urban structure of Knox – the way the suburbs are laid out – has a major impact on how people can move around. Suburbs that are spread out and connected by large roads and freeways are designed to be ‘car dependent’, highlighting the challenge of change for Knox.

The streets in Knox vary in type and activity. A street typology recognising the role of all forms of movement is an important part of this *Plan*. A new type of street called the ‘Green Neighbourhood Street’ is proposed that balances the needs of pedestrians, bicycle, public transport and car movements.

Some streets carry heavy through traffic while others serve only the residents who live on that street. For example, major arterial roads such as Burwood Highway and Stud Road carry traffic moving through Knox and beyond.

Smaller streets also play important local roles. For example, Albert Avenue in Boronia or Taylors Lane in Rowville are key streets within their suburb, connecting important community facilities such as educational campuses, open space and local shops.

On all these streets, people drive, cycle, walk and use public transport.

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

OPPORTUNITIES

- Increasing connectivity;
- Increasing non-car based travel;
- Walkable communities;
- Equal access; and,
- Creating Green Neighbourhood Streets.

CHALLENGES

- Connectivity is difficult to achieve with suburbs that have been designed around the cul-de-sac model with large roads becoming barriers;
- Reducing trips to work by car when most such trips are to locations outside the municipality;
- Overcoming perceptions about safety and walking in suburban neighbourhoods;
- Providing streets that accommodate the needs of all the community when space is limited and only moderate capital budgets exist; and,
- Upgrading existing streets is dependant on available funds, and road works generally are prioritised according to road safety issues.



O'hay Street, Coburg with an off-road shared path. Cars give way to pedestrians and cyclists at crossing points

APPROACHES

1. Encourage travel behaviour change by supporting alternative travel modes
2. Make walking a viable choice for residents
3. Make cycling a viable choice for residents
4. Encourage pedestrian use of residential streets by reducing vehicle speed
5. Provide accessible footpaths and crossings
6. Implement shared use zones and home zones in streets to promote walking and cycling

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- dynamic services and facilities;
- accessible transport choices;
- sustainable natural environment;
- balanced quality urban development; and,
- prosperous modern economy.

And it is supported by the Vision 2025 commitment to:

- partnering and engaging;
- innovation and excellence;
- effective governance; and,
- social and environmental responsibility.

4.7 STREETS FOR TRAVEL

MEASURE OF SUCCESS

- Refer to *Knox Pedestrian Plan*, *Knox Bicycle Plan* and *Knox Integrated Transport Plan* success indicators
- Implement 3 Green Neighbourhood streets in 5 years
- 10 hotspots identified in the Knox Pedestrian Plan improved and additional hotspots identified
- All newly constructed roads have at least one footpath
- Shared use zones implemented in key pedestrian priority locations in commercial and residential areas
- Candidates for home zones identified, prioritised and two home zones implemented in five years

Measure of success for community

- Implementation of prototype
- Increase in pedestrian activity and social connectivity within home zone area
- Increase in perceptions of safety
- Increase in number of pedestrians and cyclists
- Number of people observed using pause points



Crossing point, South Yarra showing the road raised to pedestrian level and paved in the foot path material, to prioritise pedestrians

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Knox Integrated Transport Strategy*;
- *Knox Pedestrian Plan*;
- Knox Structure Plans (Boronia, Bayswater, and Mountain Gate) for proposed shared use streets;
- *Knox Access and inclusion Plan for People with Disabilities*;
- Knox Bike Strategy; and,
- Knox Sustainable Environment Plan (Approach 6.1 Improve Walkability and Cycle ability).

OTHER USEFUL REFERENCES

- *Manual for Streets*, Department for Transport, England and Wales;
- *Mothers living well Bayswater community plan*; and,
- <http://www.homezones.org>.

‘Where dysfunctional street patterns already exist in place, new linkages can be created. Although it is rarely possible to retrofit new streets in established neighbourhoods, it is often possible to make use of natural land features, utility corridors, waterways and other open space to create walking and bicycling trails.’ (Burden D., 2001)

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

OPPORTUNITIES

This section looks at five opportunities that would help enhance the use of streets for all modes of travel:

- Connectivity;
- Increasing non-car based travel;
- Walkable communities;
- Equal access; and,
- Creating Green Neighbourhood Streets.

Connectivity

Melbourne 2030 (SGV, 2005) advocates the development of local and regional nodes for shopping, community facilities, employment and recreation. These nodes can then support nearby increases in residential density. Connectivity is a key in enabling this strategy to work.

The benchmark maximum desirable walkable distance to local shops and facilities, including public transport, is 400 metres. As the distance increases, people are more likely to drive.

The *Knox Integrated Transport Plan* (KCC, 2004) found that most people in Knox rely almost entirely on a car as their main mode of transport. In the community consultation for this *Plan*, Knox people said that they walked to local facilities, mainly to shops and schools, a few times a week, but fewer people cycled. Distance and time are the main barriers to increased walking.

Looking across the municipality, about half of Knox residents have community facilities within 400 metres walking distance (see *Figure 8 Pedestrian Connectivity*).




Connectivity is also about vehicle movements. A typical suburban street pattern has a hierarchy of streets where vehicles move from the local street to a collector road and out onto major roads. This is based on the primary movement being by car from home in a 'dormitory' suburb to workplaces located some distance away.

Often local streets are closed to through traffic to protect the amenity of the street and lower vehicle numbers.

In this *Plan*, the focus is on increasing connectivity for vehicles, foot and bicycle travel, while enhancing the liveability of all streets. For example, this could mean creating new links between streets where an opportunity arises. The result would be decreased traffic funnelling onto one main street and a more even flow of traffic within neighbourhoods. As well, such links would serve pedestrians and cyclists, bringing local facilities closer (in travel distance) to home.

This *Plan* includes a street typology and proposes design treatments to enhance connectivity. The typology is in Section 5.1, and is illustrated on *Figure 9 VicRoads and Council Streets Asset Management Hierarchy* and *Figure 10 Proposed Street Hierarchy*.

Legend

-  City of Knox Boundary
-  400m zone
-  Local facility

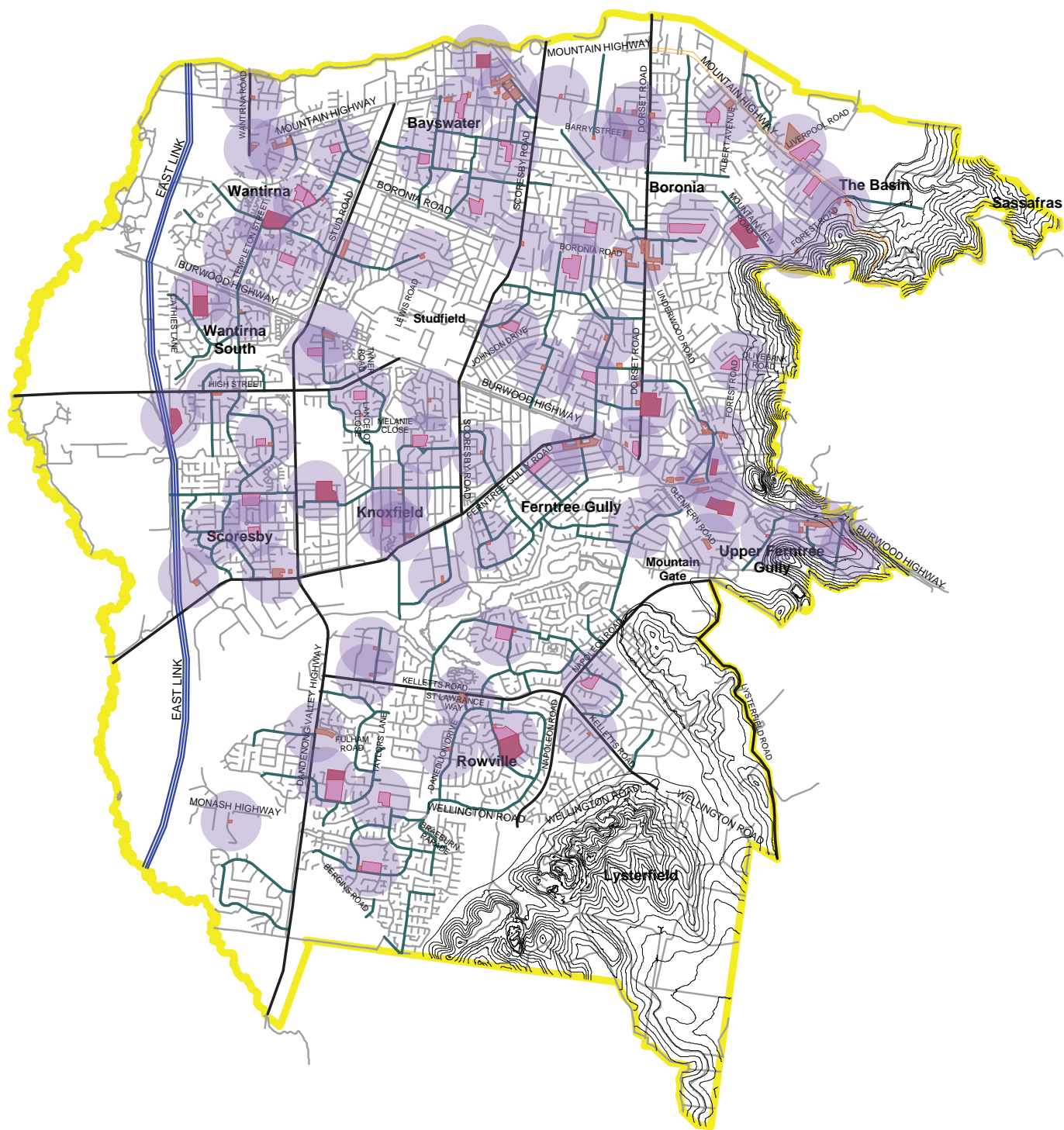






Figure 8: Pedestrian Connectivity, showing the residential areas that have local facilities within a 400m radius (typical walking distance).

Legend

-  City of Knox Boundary
-  East Link
-  VicRoads

Knox City Council Streets

-  Link Road
-  Collector Road
-  Industrial Road
-  Access Road
-  Unsealed Road

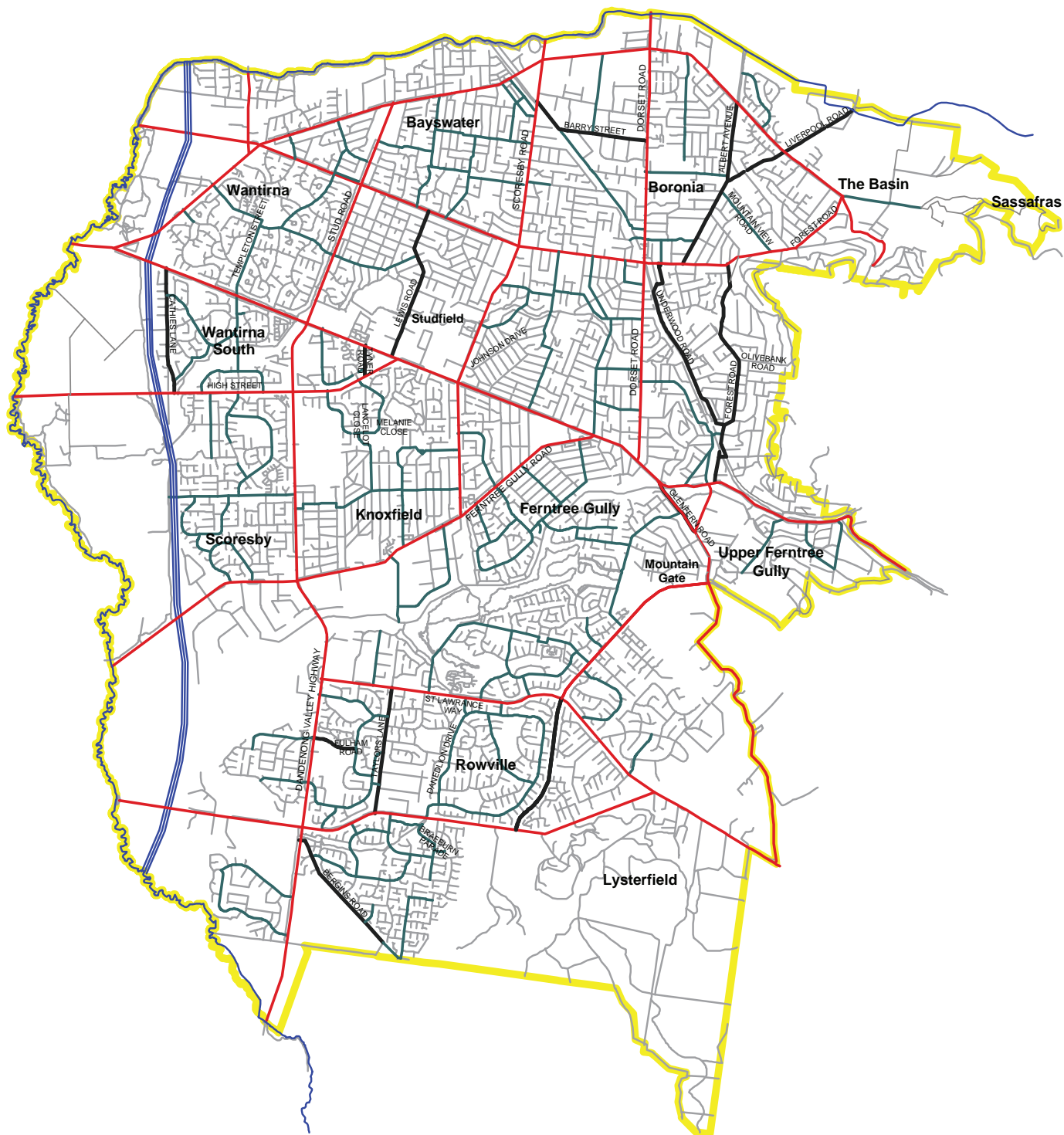


Figure 9: VicRoads and Council Streets Asset Management Hierarchy

Legend

- City of Knox Boundary
 - Principle Avenues
 - East Link
 - Paths into the Hills
 - Dandenong Creek Gateways
 - Community Link Streets
 - Bush Boulevards
 - Neighbourhood Green Streets
 - all Residential Streets
- For the following streets, refer individual maps
- Industrial Streets
 - Shopping Streets and
 - all Residential Streets



Figure 10: Proposed Street Hierarchy

4.6 STREETS FOR TRAVEL

OPPORTUNITIES

Increasing non-car based travel

Integrated transport means interlinking all of the different ways people move around their neighbourhood, travel across Knox and beyond. It means building a more diverse array of travel options including walking, cycling, public transport, and car use, and working towards the seamless integration of these modes. This is a substantial task, and Knox is not alone in tackling it.

The liveable streets concept seeks to make streets more attractive, safe and interesting places for travel on foot and by bicycle. It does this through recognising the importance of easy access to public transport nodes and local services, and by shifting the emphasis from streets for vehicles to streets for all modes of travel. As a result, traffic congestion can be reduced and public transport, walking and cycling can become more viable choices for residents.

Most journeys to work made by Knox people are by car, and most as the driver (79% of these journeys). Only small numbers walk (1.6%), catch public transport (1.6%) and cycle (1.3%) (ABS, 2006). This reflects the nature of the City of Knox.

MODE	KNOX (%)	MELBOURNE (Average %)
Car/as driver	69.6	62.1
Car/as passenger	5.0	5.2
Motorbike	0.4	0.4
Truck	1.5	1.1
Taxi	0.1	0.2
Train	4.5	7.1
Bus	1.0	1.3
Tram	0	2.0
Bicycle	0.4	0.8
Walk	1.0	2.4
Other	16.4	17.4

Figure 11: Modes of travel to work
Source: Knox Integrated Transport Plan 2004

'Adding modes to a transport system improves mobility and accessibility and development opportunities.' (Layman, 2009)

Increasing cycling

The City of Knox has the most extensive shared path network in Victoria. These networks connect with natural features of the municipality, chiefly the Dandenong Creek Valley. In comparison, there are few designated commuter cycle routes.

There is an opportunity to increase the uptake of cycling for short and longer journeys within Knox by increasing both off-road and on-road networks. The *Knox Bicycle Plan* (KCC, 2008) seeks to make cycling a realistic travel choice for all Knox residents.

Liveable streets can assist by supporting the creation of more interconnected networks, enabling access from home, shops and work to bicycle and shared paths and by enabling safer cycling. For example, cyclists need clearly marked lanes so that they can ride safely on-road.

4.7 STREETS FOR TRAVEL

OPPORTUNITIES

Accessing public transport

Knox is poorly served by public transport. *Figure 12*, public transport catchment in Knox, shows 1km radius zones around train stations and 400m radius zones around bus routes.

There is only one rail line serving the north-east of the municipality. Richard Layman, urban revitalisation advocate and consultant, Washington, USA., says 'One line doesn't do it. You need a system of connected lines and a density of stations. That's the key difference in all of the systems constructed from the 1960s forwards.' (Layman, 2009)

The City of Knox has been actively advocating a range of public transport initiatives (KCC, 2003) including:

- Rail extension to Rowville from either Huntingdale or Glen Waverley and terminating at a transport interchange in Rowville
- SmartBus Service along Stud Road is essentially complete from Dandenong Station to Ringwood Station; will involve upgrade of Stud Road to three lanes in places to ensure reliable operation of bus services.
- Burwood Highway tram extension from Vermont South to Knox City to link a new Knox City transport interchange with the Stud Road SmartBus Service and local feeder bus services
- Development of a transport interchange at Stud Park Shopping Centre To link Stud Road SmartBus service and rail line terminus with local feeder bus services
- Upgrade Ferntree Gully Station to premium Station status – complete.




- Improve bus service levels
Improve service levels in relation to bus route service spans and operating frequency. For example: extending operating hours to 6am and 10pm, 7 days a week; increasing weekday frequency to 15 minute intervals in the peak, and 30 minutes at other times.
- Bus Route Review
Implement recommendations of the examination of existing local routes for accessibility and functionality.

CASE STUDY / CITY OF YARRA

There are good examples of bicycle lane marking within the City of Yarra, which have not only made bicycle commuting safer, but also increased awareness and volumes of cycling. The City of Yarra has the highest level of cycling of any municipality in Victoria (City of Yarra, 2010)

'Providing first class bike infrastructure will help maximise bike use in Yarra which will ease congestion and reduce carbon emissions in our city... Many of these projects not only benefit cyclists, but pedestrians too, which encourages more residents to leave their cars at home and choose healthy and more sustainable forms of transport' (City of Yarra, 2010)

Legend

-  City of Knox Boundary
-  1km zone from train station
-  400m zone along bus route

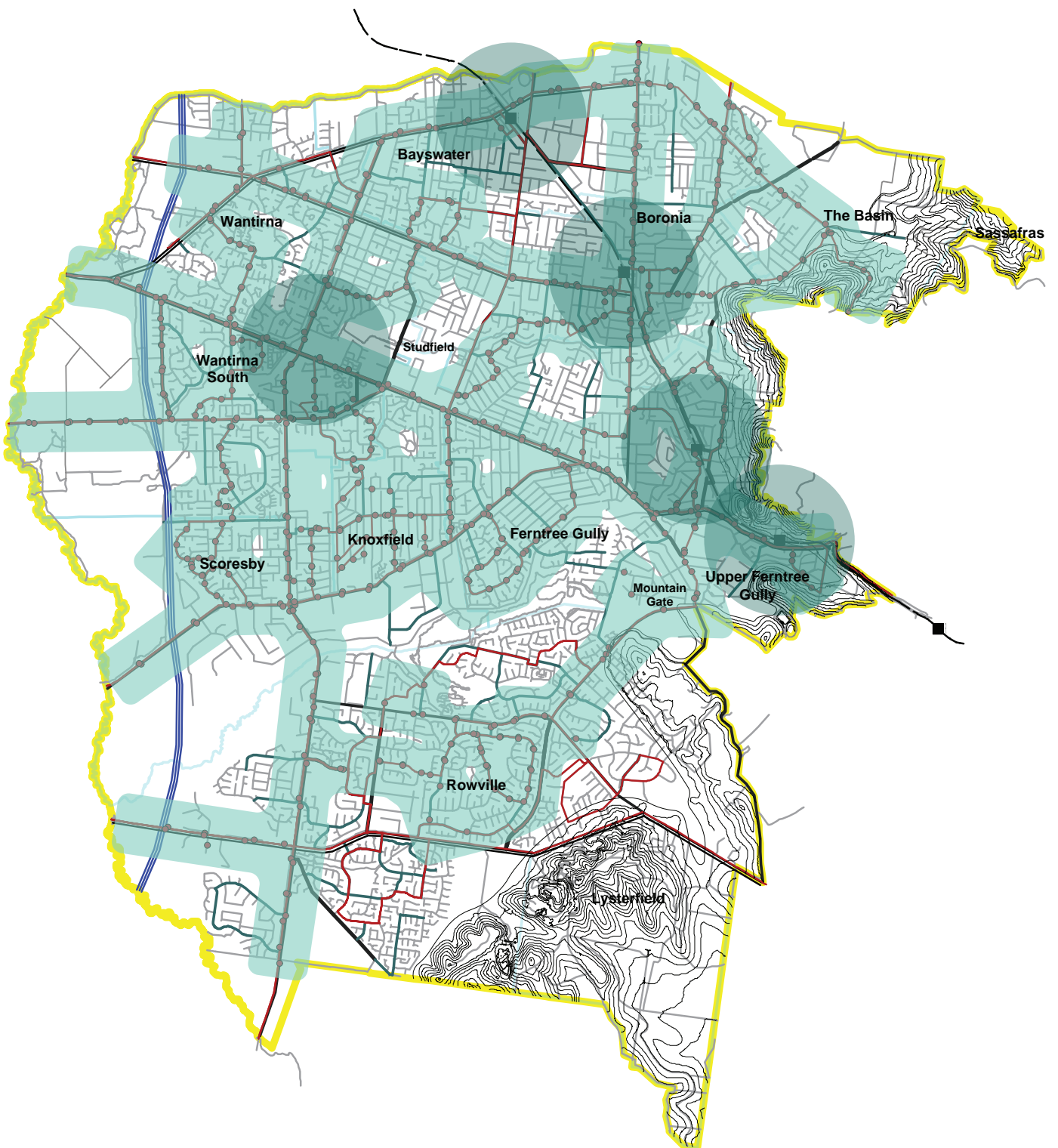


Figure 12: Public transport catchment in Knox

4.7 STREETS FOR TRAVEL

OPPORTUNITIES

Walkable communities

Liveable streets can help create walkable communities – neighbourhoods where walking and cycling is safe and enjoyable. Liveable streets help people get to local facilities.

The *Knox Pedestrian Plan* (David Lock Associates & PBAI, 2005) identifies the main characteristics of a walkable environment as being interesting and attractive, feeling safe, offering frequent opportunities to meet, sit and rest (with infrastructure such as signage and seating), creating a continuous link between major destinations, and being comfortable and easy to use for all.

Walking offers both community and personal benefits. As a mode of transport it is accessible, affordable and equitable. Walking creates more social interaction, improved fitness, and increased on-street safety. *The Knox Pedestrian Plan* (David Lock Associates & PBAI, 2005) identified the following benefits:

- a deeper level of engagement between people and their surroundings, stemming from enhanced opportunities to interact with other people and a greater awareness of things that can only be appreciated on foot (or on bicycle) such as bird song, the texture and colour of autumn leaves and spring blossom;
- older people retain their independence for longer;
- a lower rate of illness, directly through activity and indirectly through reduced pollution and accidents;
- a higher degree of social inclusion and community engagement; and,
- drivers increasingly consider, and are more aware of, pedestrians.

Many Knox residents already walk to local facilities, and the development of more liveable streets will enhance the quality of streets as walking environments.

Equal access

Ensuring that everyone can use local streets is important, and requires particular attention to the design of details that can otherwise become a barrier to equal access. By creating streets as spaces that everyone can use, people are able to maintain greater personal independence. This will become increasingly important in an ageing community.

Equal access means considering those who have limitations on their mobility. This may mean that they use a walking device (walking frame), a wheelchair, or an electric scooter. Scooters have the same rights to footpaths and obligations as pedestrians.

Equal access also means considering the needs of those with young children: for instance in prams or pushers, on tricycles or tag-along bicycles.

Achieving equal access means paying attention to the quality of footpaths and pedestrian areas, designing crossings to accommodate wheelchairs, scooters, prams and the like, and in busier locations widening footpaths to allow easier passing. Other desirable attributes in the pedestrian environment include features such as resting points and seats with backs.

‘Towns and portions of towns identified as neighbourhoods must be planned and assembled to walking scale. Towns are built of many intact neighbourhoods. History has proven that a distance of a quarter mile (400m, or 5 min. walk) radius forms the near perfect place for people to interact.
(Burden D., 2001)

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

Creating Green Neighbourhood streets

An opportunity that arises from the need to build connectivity, increase non-car based travel, and create walkable communities and equal access is the development of a new street type – ‘*green neighbourhood streets*’. A series of streets across Knox could become a set of green neighbourhood streets. These would primarily be collector streets in residential neighbourhoods that provide key links to facilities such as local shops, schools and parks. Green neighbourhood streets would provide high quality shade, seating and cycle routes to promote inter-neighbourhood walking and cycling and to reduce the number of car trips to local facilities. The design guidelines that would transform streets into green neighbourhood streets are contained in Section 5.10, *Liveable streets design guidelines*.



Forest Road, The Basin with an on-road cycle lane



Mountain Highway, The Basin with an off-road shared path

4.7 STREETS FOR TRAVEL

CHALLENGES

There are some major challenges in enhancing the use of streets for all modes of travel, including:

- connectivity is difficult to achieve with suburbs that have been designed around the cul-de-sac model with major roads becoming barriers;
- reducing trips to work by car when most such trips are to locations outside the municipality;
- overcoming perceptions about safety and walking in suburban neighbourhoods;
- providing streets that accommodate the needs of all the community when space is limited and only moderate capital budgets exist; and,
- upgrading existing streets is dependant on available funds, and road works generally are prioritised according to road safety issues.

Each opportunity also presents some challenges, these include:

Connectivity

- The post-1970s street patterns common throughout Knox, with many cul-de-sacs, combined with residential estates having limited interconnections, limit opportunities to move easily between adjoining areas.

Non-car based travel

- Distances between work and home make travel alternatives such as cycling and walking impractical.
- Limited number of commuter bicycle paths currently exist.
- Limited public transport options restrict choice for those who want to reduce car use.

Walkable communities

- Community perceptions of safety in neighbourhoods.
- Community perception of a lack of time to walk, especially to accompany children to school.

Equal access

- The scale of the redesign and improvements needed to achieve equal access across Knox.
- The increasing need to provide electric power points in public spaces for recharging of electric scooters.

Green neighbourhood streets

- Retrofitting of existing streets to the design needed for green neighbourhood streets will require funds beyond traditional street upgrades.



Shared street, Main Street, Broadmeadows, showing various materials to decrease driver speed

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

COMMUNITY PERSPECTIVES

Community consultation revealed that:

- speeding traffic and the associated safety issues within their neighbourhoods is a major concern;
- better pedestrian crossing points, and changes that will slow down traffic are desired;
- many people walk to local facilities, although fewer cycle, with distance and time available being the main barriers;
- footpaths are important and streets without footpaths are less liked and used; lack of connecting footpaths is seen as a barrier to walking to local facilities; and,
- streets are valued as play spaces and neighbourhood activities, and the amount of traffic is a barrier to participation.

'The neighbourhood environment should offer pleasant walking and cycling opportunities where the landscape is engaging, distinct and offering differing user amenity such as shade, seating opportunities and vegetation... thus creating rich and stimulating street environments that are safe and easy to access influencing the propensity to walk (DFT, 2007b)⁷

ACHIEVING CHANGE

Vision

Liveable streets offer greater equality between vehicles, pedestrians and cyclists. They are safer and more interesting places, enhancing the journey and increasing the attractiveness of walking and cycling.

Goal

It supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- dynamic services and facilities;
- accessible transport choices;
- sustainable natural environment;
- balanced quality urban development; and,
- prosperous modern economy.

It is supported by the *Vision 2025* commitment to:

- partnering and engaging;
- innovation and excellence;
- effective governance; and,
- social and environmental responsibility.

Approaches

1. Encourage travel behaviour change by supporting alternative travel modes
2. Make walking a viable choice for residents
3. Make cycling a viable choice for residents
4. Encourage pedestrian use of residential streets by reducing vehicle speed
5. Provide accessible footpaths and crossings
6. Implement shared use zones and home zones in streets to promote walking and cycling

4.7 STREETS FOR TRAVEL

ACHIEVING CHANGE

APPROACH 1 – Encourage travel behaviour change by supporting alternative travel modes

Action 1.1

Make better provision for cyclists and pedestrians in streets and open spaces to support increased take-up of walking and cycling as an alternative to car travel for short (5 min.) and medium (15 min.) journeys

Action 1.2

Improve the number and amenity of pedestrian and cyclist links between neighbourhoods and key attractions.

Refer to *Knox Pedestrian Plan*, *Knox Bicycle Plan* and *Knox Integrated Transport Plan*

Action 1.3

Improve pedestrian and cyclist connections to public transport nodes, by improving the safety and comfort of the journey and facilities at waiting points – e.g. at bus stops, road crossings – through increased seating, shelter, safety, shade

APPROACH 2 – Make walking a viable choice for residents

Action 2.1

Walking trips to schools, shops and community facilities by the footpath to be made safe and more accessible with the introduction of green neighbourhood streets. See Section 5 *Liveable Street Design Guidelines*

Action 2.2

The 10 hotspots identified in the Knox Pedestrian Plan should be extended to include all key pedestrian generators such as schools and shops

Action 2.3

Align capital and maintenance works with the *Knox Footpath and Shared Path Asset Management Plan*

Action 2.4

Ensure a separation (via nature strips and planting) between the carriageway and pedestrian pathways to increase comfort and safety

Action 2.5

Implement Knox walkable school programs and support programs, for example a 'walking school bus' program.

Refer to *Knox Pedestrian Plan*, *Knox Bicycle Plan* and *Knox Integrated Transport Plan*

Action 2.6

Ensure adequate pedestrian lighting in key pedestrian streets as identified in the *Knox Pedestrian Plan*

Action 2.7

Implement footpaths on at least one side of the street and preferable both sides of the street

APPROACH 3 – Make cycling a viable choice for residents

Action 3.1

Design and implement a network of commuter bike routes in accordance with the recommendations of the *Knox Bicycle Plan*

Action 3.2

Indicate entrances to bike paths through signage or artwork, and implement signage on bike paths with distance markers to destinations such as shopping centres

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

APPROACH 4 – Encourage pedestrian use of residential streets by reducing vehicle speed**Action 4.1**

Provide road pavement treatments to highlight a non-car dominated space and encourage drivers to slow down

Action 4.2

Ensure carriageway widths for vehicles meet the minimum safety and legislative requirements

APPROACH 5 – Provide accessible footpaths and crossings**Action 5.1**

Provide accessible crossings to all streets

Action 5.3

Provide seats with backs and arm rests along streets and at pedestrian pause points

Action 5.2

Determine appropriate widths of footpaths to facilitate pedestrian movement in commercial and residential environments (e.g. minimum 1.4 metres for residential streets and 2.5 metres for commercial streetscapes), as defined in the *Footpath and Shared Path Asset Management Plan*

APPROACH 6 – Implement shared use zones and home zones in streets to promote walking and cycling**Action 6.1**

Identify streets in residential and commercial areas which have the capacity to become shared use zones and prioritise for implementation

Action 6.2

Identify through the *Knox Pedestrian Plan* those streets that are likely candidates for home zone treatment and prioritise

Actions under other themes will also contribute to enhancing integrated travel in streets.

COMMUNITY ACTIONS – Communities can contribute to this goal by:**Home Zones**

Communities to work with Council to implement a prototype home zone

Walking School Bus

Communities to promote and utilise walking and cycling to school programmes

Shared Use Zones

Communities to work with Council to implement shared use zones

Pause Points

Communities to promote and utilise pause points

4.8 STREETS FOR THE ENVIRONMENT

The streets of Knox provide a large proportion of the open space in the City. They provide the leafy green character which is a distinctive and desired aspect of Knox.

As open space, caring for streets also carries an environmental obligation to manage and reuse the water that falls on them, to respect the flora and fauna that have found a home there, and to address the effects that streets can have on the environment.

Knox City Council's goals for climate change adaptation and mitigation (greenhouse action) are to reduce greenhouse gas emissions, improve air quality and to be well prepared for climate change. (Context, 2008)

GOAL

To improve environmental sustainability of streets in Knox.

OPPORTUNITIES

- Creating a green and leafy character;
- Saving water;
- Enhancing the local ecology; and,
- Reducing environmental impacts.

CHALLENGES

Creating a green and leafy character

- Trees and above ground powerlines compete for space.
- Trees and car parking compete for space.

Saving water

- Retrofitting WUSD to roads as part of capital works requires coordination with existing services and existing road usage.

Enhancing the local ecology

- The aesthetics of indigenous vegetation are not always appreciated.
- Attitudes towards indigenous trees are generally unfavourable in the Knox community.

Mitigating climate change

- Introduction of edible streetscapes requires management of streets in partnership with the community to ensure success.



Mountain Highway, Boronia showing a roadway Site of Biological Significance

APPROACHES

1. Increase sustainable water use, capture and treatment in streets
2. Improve biodiversity and habitat values through enhancement of Knox's street vegetation
3. Design and implement environmentally sustainable streetscapes

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- sustainable natural environment; and,
- balanced quality urban development.

And it is supported by the Vision 2025 commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental responsibility.

4.8 STREETS FOR THE ENVIRONMENT

MEASURE OF SUCCESS

- Ensure links to WSUD strategy, identify opportunities for water reuse and recycling
- Revise the *Knox Street Tree and Nature Strip Policy* by 2011
- Incorporated into revised *Knox Street Tree and Nature Strip Policy*
- Increase in number of trees planted annually
- Review Council's street lighting policy by 2012
- Design and implement one edible street prototype
- Two edible streets created by the community in five years
- Installation of tree pits for water quality, tree health and drainage solutions
- Implement a care for your street tree program

Measure of success for community

- Number of WSUD treatments that are being accessed

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Water Sensitive Urban Design Guidelines for the City of Knox, 2002*
- *Knox City Council Streetscape Policy, 2003*
- *Knox Neighbourhood Character Study*
- *Gardens for Wildlife*
- *Sustainable Environment Strategy 2008/2018*
- *Greenhouse Action Plan*
- *Knox Open Space Plan*
- *Municipal Strategic Statement*
- *Foothills Policy*
- Site of Biological Significance
- Net Gain Policy
- Native Vegetation Framework
- Draft Native Vegetation Generic Integrity Policy
- Vegetation Removal and Pruning
- Council employed tools for ESD policy:
 1. 'STEPS' (Sustainable Tools for Environmental Performances Strategy) by the City of Moreland; and
 2. Sustainable Design Score Card, by the City of Port Phillip.
- Policy 'A' - General Nature Strip Areas
- Policy '8' - Nature Strips and Special Circumstances.

OTHER USEFUL REFERENCES

- *Register of Significant Trees by the National Trust*
- Australian Conservation Foundation
- Victorian Local Sustainability Accord
- Refer also *Melbourne 2030*, Policy 5.5.

GOAL

To improve environmental sustainability of streets in Knox.

OPPORTUNITIES

This section looks at four specific opportunities that will help enhance the environment and sustainability of streets:

- Creating a green and leafy character;
- Saving water;
- Enhancing the local ecology; and,
- Reducing environmental impacts.

Creating a green and leafy character

The City of Knox is surrounded by the large landscape features of the Dandenong Creek Valley and Mount Dandenong. Several creeks punctuate the municipality and there are significant areas of rare and endangered flora and fauna.

These areas of natural beauty are great resources for the region and contribute significantly to the 'green and leafy' image of Knox.

Each suburb and neighbourhood within Knox has a distinct vegetative quality. For example, parts of Rowville and Boronia have street plantings of small trees and shrubs, while in Ferntree Gully tall trees dominate.

The character of commercial, industrial and retail areas is also strongly influenced by the presence of different types of vegetation.

Shade

Shade is crucial in the Australian outdoor environment. It provides relief from direct sunlight, cooler microclimates and reduces the accumulation of heat in pavements and buildings (the heat island effect).

Street trees

Trees can have a very large impact on a street's quality, according to their scale, number and character. Street trees contribute to the skyline and views throughout Knox, and are therefore important contributors to the neighbourhood's wider landscape, creating benefits well beyond a single street.

Trees and climate

Trees in streets mitigate the effects of climate change by reducing greenhouse gasses. Trees provide protection from rain, sun, and heat for pedestrians and cyclists.

Street trees' ability to reduce the heating of pavements through the shading of those pavements, and to thus reduce the heat island effect, is well documented in not only a recent report for Knox Council on the subject (Cardno Grogan Richards, 2009), but also by Buden (2008) in his article '*Benefits of Urban Street Trees*' and by Dr G.M. Moore (2009) in his article '*Urban Trees: Worth more than they cost*'.

Street trees can contribute to the reduction in stormwater discharge to waterways, in particular during large storm events, and reduce consequent flooding.

'Trees have important symbolic values for people, the different kinds of trees convey different ideas and ideals... The various species are "read" differently within the cultural context of heritage, both as something we inherit and as something we create.'
(Shepherd, 1992)²

4.8 STREETS FOR THE ENVIRONMENT

OPPORTUNITIES

Trees and local ecology

Trees can support locally native species, contribute to local biodiversity, provide wildlife corridors and enhance native remnant bushland values.

Trees and neighbourhood character

Community consultation shows the presence of street trees to be one of the most significant contributing factors to the liking of a street and neighbourhood. Trees contribute to a street's visual interest, screen and soften the effects of utility and lighting poles, and with gardens create the 'green and leafy' image of Knox.

Further information on these issues can be found in:

- Cardno Grogan Richards, 2009, *Analysis of the Heat Island Effects*, section 5.3, for Knox City Council;
- Hassell, 2007, *City of Salisbury Landscape Plan*, South Australia; and,
- Moore, 2009, 'Managing Trees in a Changing Environment' and 'Urban Trees: Worth More Than They Cost', Burnley College, University of Melbourne.

Nature strips

The humble nature strip is an iconic feature of the Australian suburban streetscape. Varying in design and appearance, nature strips reflect both the character of the local area and its residents, provide space for social interaction and street tree planting. Nature strips absorb rainwater and reduce storm water run off; and visually soften the effect of hard streetscape elements such as roads, footpaths, driveways, fences and buildings.

Nature strips are an important component of Knox's street environment. The nature strip creates a safe public walking area, and provides an easement for service infrastructure (including electricity, water, gas and telecommunications).

Most importantly, nature strips are designed to complement the neighbourhood's landscape setting and create a space for street tree planting.

In Knox, many residents are keen to plant out their nature strips. Their reasons include:

- the lack of rainfall to keep the grass green;
- desire for low maintenance drought tolerant planting;
- to create a greener, softer and more natural looking environment;
- to enhance the resident's property and the appearance of the streets;
- to restrict the parking of vehicles; and,
- to control erosion where a steep nature strip exists.

Nature strip plantings add beauty to streetscapes, provide habitat, biodiversity and help activate the space as local residents get involved. Nature strips can become a creative extension of front gardens.

Well-maintained nature strips add to the appearance and presentation of the neighbourhood and can bring economic benefits to business and property owners.

Median, verge and roundabout plantings suffer from extra pressures, including temperature fluctuations, excess carbon dioxide levels, higher amounts of airborne particulate matter, soil compaction, less permeable soil area and constricted root zone area (Hassell, 2007).

'The nature strip is public land, although it is accepted practice that residents maintain the nature strip areas and provide water to street trees during periods of warmer weather. Most residents within the City of Knox regard the nature strips as an extension of their own garden.' (KCC, 2003)

GOAL

To improve environmental sustainability of streets in Knox.

Appropriate tree selection

Street trees are overwhelmingly desired by residents throughout Knox. However, the chosen species of tree remains a hot topic.

Knox City Council wants to plant indigenous trees wherever possible to increase biodiversity and enhance the natural landscape (Context, 2008). However, Council acknowledges that other species, including exotics, may be more appropriate in some neighbourhoods.

The *Neighbourhood Character Study* (Mike Scott & Assoc. et. al. 1999) recommends specific vegetation types for different neighbourhoods based on the heritage and perceived amenity of that locality.

Other factors that should influence street tree selection include the nature of adjacent conditions and spaces, maintenance costs and threats from weeds and pests such as the Elm Leaf Beetle.

Tree selection should involve assessing local character, understanding the environment and historical context, and consulting the local community so as to ensure that street tree selection meets short, medium and long term objectives. Planning parameters, associated infrastructure works and maintenance regimes must be clearly defined.

Retrofitting a 'natural' ecology into an established built up area is difficult and often inappropriate. The street landscape should be designed to create a new ecology appropriate to the houses and infrastructure present and enhanced by taking up opportunities for water harvesting, the reintroduction of appropriate indigenous plant species to support native fauna, and other environmental and community measures. The streetscape should aim to operate in a way where it is 'part of the natural cycles of the local environment.' (COA, 2008)



Water sensitive urban design treatment in a carpark



Planted nature strip



Nature strip in Knox

4.8 STREETS FOR THE ENVIRONMENT

OPPORTUNITIES

Saving water

Water is a valuable resource. Knox is located in a relatively high rainfall area within the greater metropolitan region. A lot of water falling on hard surfaces goes straight into stormwater drains rather than naturally filtering through the ground.

Liveable streets provide a great opportunity to collect, clean and filter water before it enters the creek and river systems.

Water Sensitive Urban Design

Water Sensitive Urban Design (WSUD) is a strategy designed to retain and re-use stormwater, and reduce the negative impacts of our urban development on the natural water cycle. WSUD aims to design urban environments to match more closely the original water cycle that occurred pre-development (*Water Sensitive Urban Design Guidelines* of the City of Knox).

Implementation of WSUD also contributes to the beautification of streetscapes through planting and soft material choices and allows the passive irrigation of plants and turf.

The benefits of WSUD include:

- improving urban stormwater quality, primarily by reducing the levels of pollutants and nutrients (gross pollutants, suspended solids, metals, toxic organics, oils and surfactants, nutrients, micro-organisms and oxygen demanding chemicals); and,
- reducing the amount of stormwater, i.e. reducing the frequency and amount of water that runs-off.

Retrofitting WSUD into all street types would create substantial environmental benefits.

Appropriate WSUD treatments that could be applied to existing and new streets include:

- 'rain gardens' – specifically constructed garden beds with associated filter media in the soil profile – located in nature strips and at the edge of carriageways;
- passive irrigation of nature strips and trees by redirecting storm water runoff from roads;
- permeable surfaces that allow rainwater to penetrate the soils beneath; and,
- local collection, treatment and harvesting of stormwater for open space and garden watering.

Refer to *Water Sensitive Urban Design Guidelines of the City of Knox* (Murphy Design Group et. al, 2002) for definition of appropriate WSUD treatments for streets and the *Water Sensitive Urban Design (WSUD) – Interim Policy, 2010*. (KCC, 2010)

'The impact of suburban development on the vegetation structure of a region is dramatic. The modified landscape is a mosaic of buildings, gardens, parks and highly fragmented patches of original habitat.'

(Davis and Glick, 1978), (Taylor, 1987)

GOAL

To improve environmental sustainability of streets in Knox.

Enhancing the local ecology

Knox has a wealth of natural systems and sites of special interest and conservation value. It is vital to enhance and extend these systems so as to not lose the local ecology and biodiversity.

Streets have the ability to contribute positively to the natural environment locally and on a regional scale. As Melbourne grows, remnant environments diminish and the pressure on remaining environments increases. Streets can provide much needed habitat for indigenous flora and fauna and contribute to the biodiversity of Knox.

The *Knox Sustainable Environment Strategy* (Context, 2008) lists a number of approaches and indicators in its ambition to improve biodiversity and health of ecosystems.

Where vegetation is planted at sites of Biological Significance, local provenance stock must be used.

Reducing environmental impacts

The Australian Conservation Foundation's *'Consumption Atlas'*, (ACF, 2010) maps the pattern of consumption and its environmental impact across Australia.

In Knox, each person (on average):

- creates 18.45 tonnes of greenhouse gases (the Victorian average is 19.73 tonnes); (See Figure 13)
- uses 735,000 litres of water directly and indirectly in goods and services (the Victorian average is 750,000 litres) (See figure 14); and,
- uses 6.065 hectares of land to supply their lifestyle demands (the Victorian average is 6.03. hectares). (See figure 15)

Local streets offer some opportunities to reduce these impacts.

WSUD/SWH for Local Government

Presented By:
Rod Wiese
Principal Engineer, STORM CONSULTING PTY. LTD.

STORM CONSULTING
www.stormconsulting.com.au

- Introduction to WSUD
- Drivers for WSUD/SWH
- Evolution of stormwater management
- Sustainable examples
- WSUD Toolbox
- Case studies
- General discussion

Title slide for 'bench marking' workshop with Council. By Rod Wiese, Storm Consulting

4.8 STREETS FOR THE ENVIRONMENT

OPPORTUNITIES

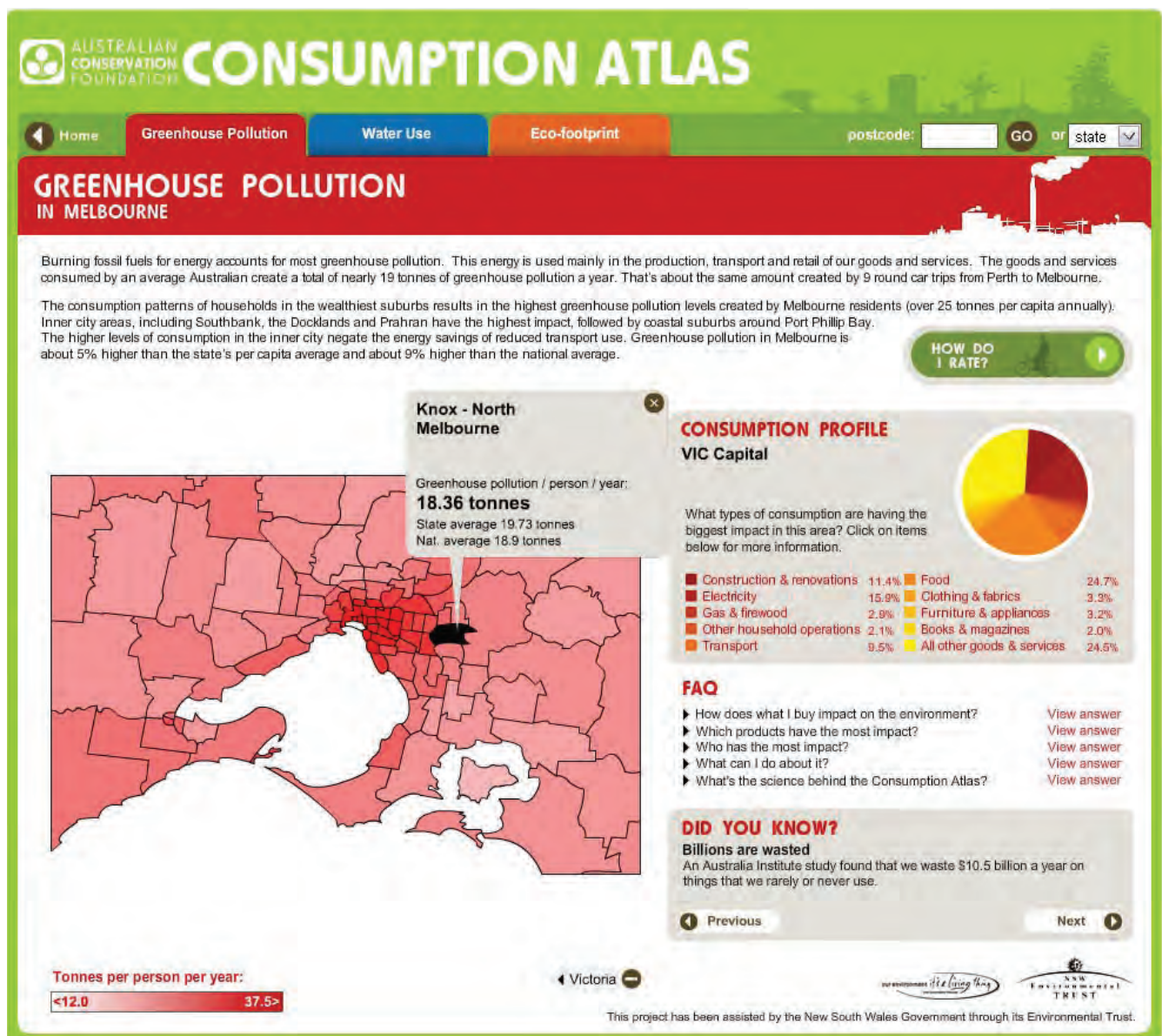


Figure 13: Consumption Atlas: Greenhouse Pollution (Knox)

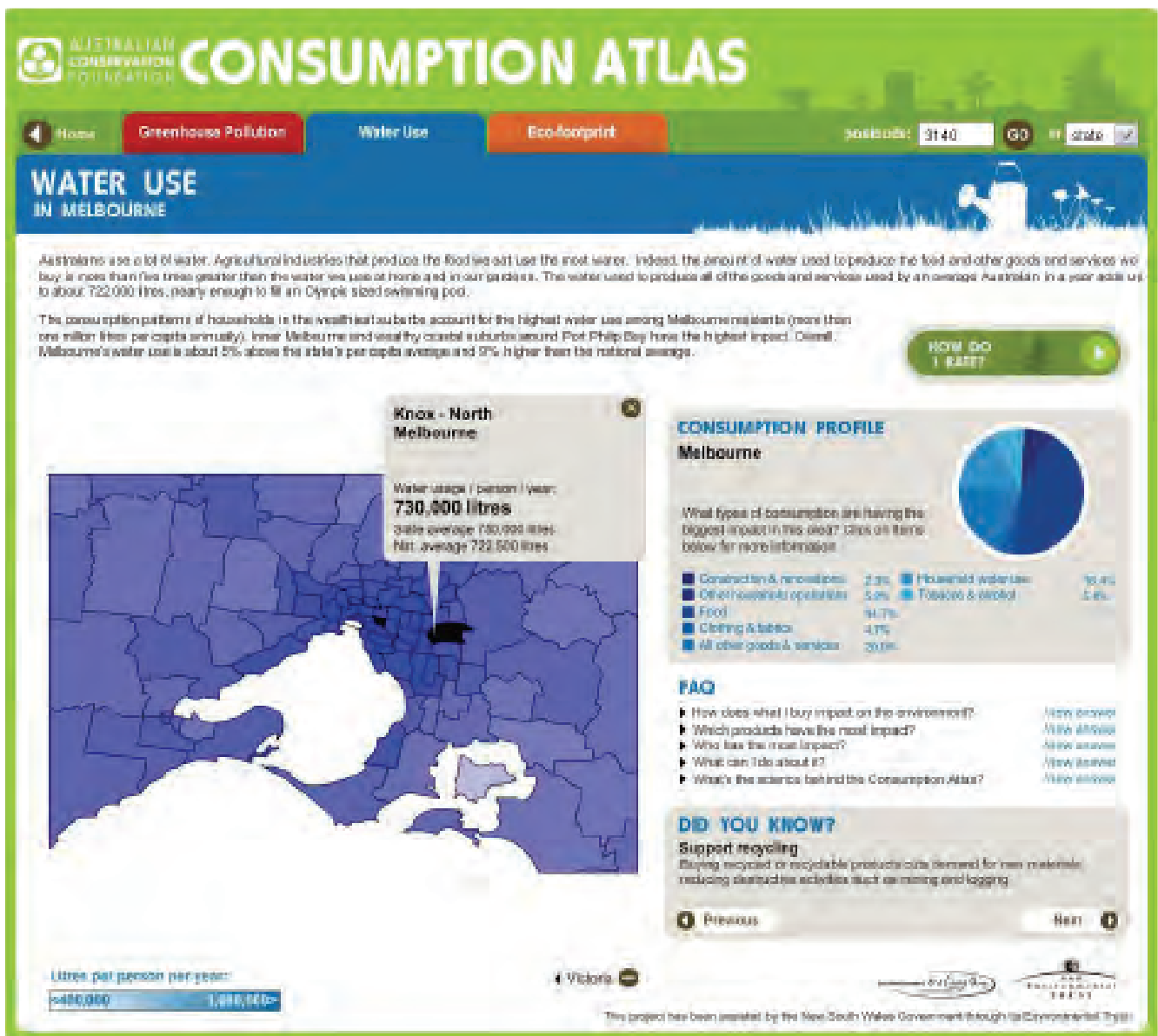


Figure 14: Consumption Atlas: Water Use (Knox)

4.8 STREETS FOR THE ENVIRONMENT

OPPORTUNITIES

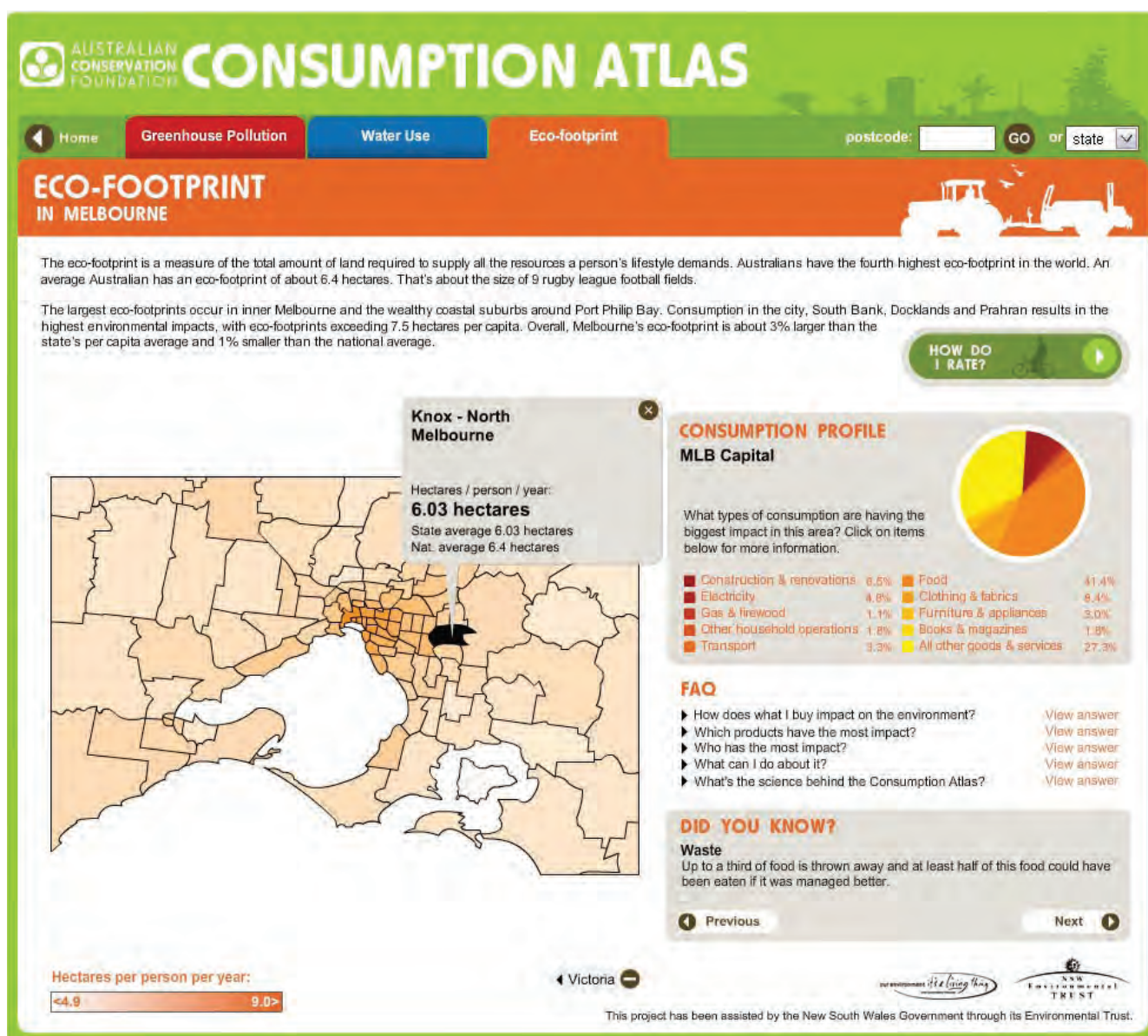


Figure 15: Consumption Atlas: Eco-Footprint (Knox)

GOAL

To improve environmental sustainability of streets in Knox.

Wind

Wind power can be collected in different ways. Small, domestic sized turbines can be placed on homes or in streets. Large industrial scale turbines are usually located away from residential areas.

The potential to include small-scale wind turbines in streets is worth further research by Knox City Council.

Solar lighting

Knox streets are lit at night to provide illuminated and safe travel routes for traffic, cyclists and pedestrians. The *Pedestrian Plan* (David Lock Assoc. et. al, 2005, see *Table 7.1.3*) provides guidelines on pedestrian lighting. Lighting is a major energy use in the city.

Knox can reduce long-term energy for lighting by installing solar collectors, and by adopting other sustainable lighting forms.

High levels of artificial lighting in the city reduce the opportunities for people to appreciate the night sky and can impact on nocturnal species. Better lighting design can maintain safety but reduce over-lighting and energy wastage.

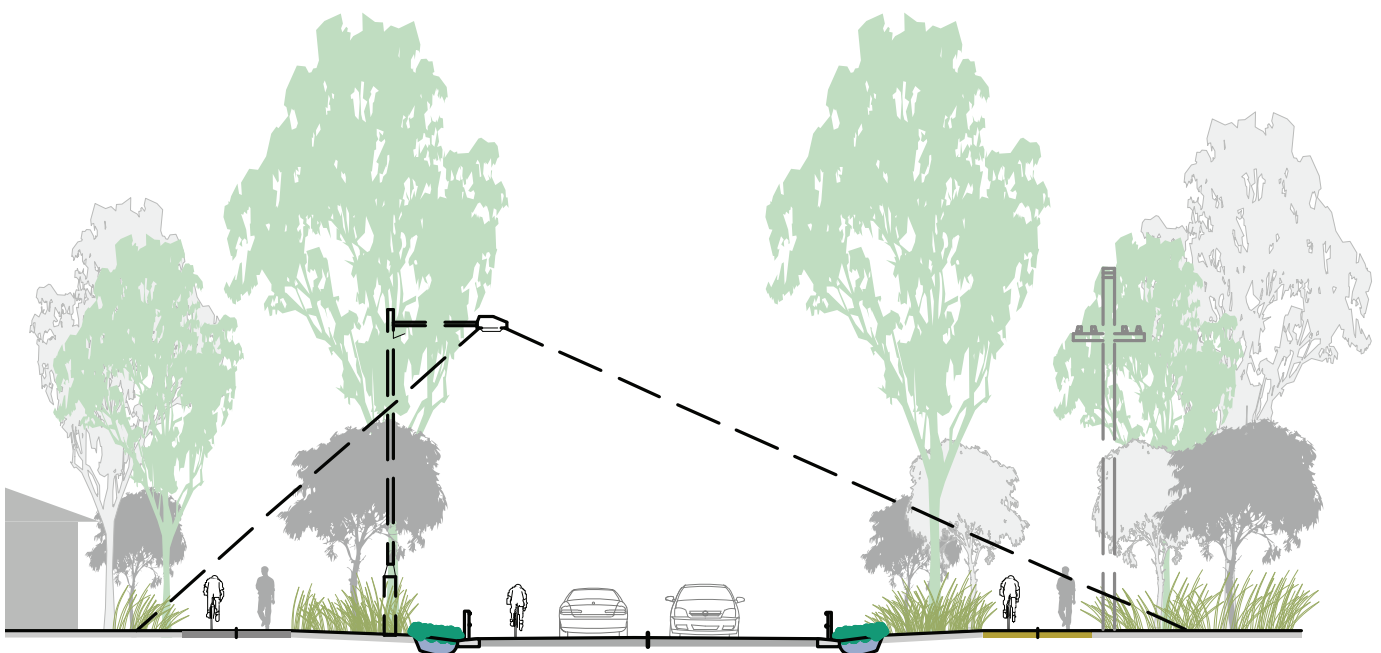


Figure 16: Section showing the street lighting illuminating the pedestrian path

4.8 STREETS FOR THE ENVIRONMENT

OPPORTUNITIES

Edible streetscapes

Streets can provide spaces for small-scale local food production to help reduce the amount of land, water, fertiliser and transport needed to produce food brought in from elsewhere. Fruiting street trees are the most obvious example of how to achieve food production in a street. The nature strip could also be used to produce vegetables.

Urban food production also allows distribution of locally grown food, at farmers markets for example. Food growing and markets should be considered a valuable part of activating public open spaces.

The Victorian Eco Innovations Lab (VEIL) has produced a map and database which locates community gardens, market gardens, public spaces and householders who produce food. (See Figure 17)

The VEIL Map acts as a database for people to base the design of new products & services. Refer to www.communitywalk.com/veil-map for locations.

The heat island effect

Large areas of pavement and buildings collect and retain heat from the sun. This subsequent release of heat increases average local temperatures. This effect is known as the 'heat island effect'.

Selection of street materials and planting with trees that will achieve an extensive canopy are common approaches to reducing heat gain, as is the employment of WSUD which allows for evapo-transpiration.

Legend

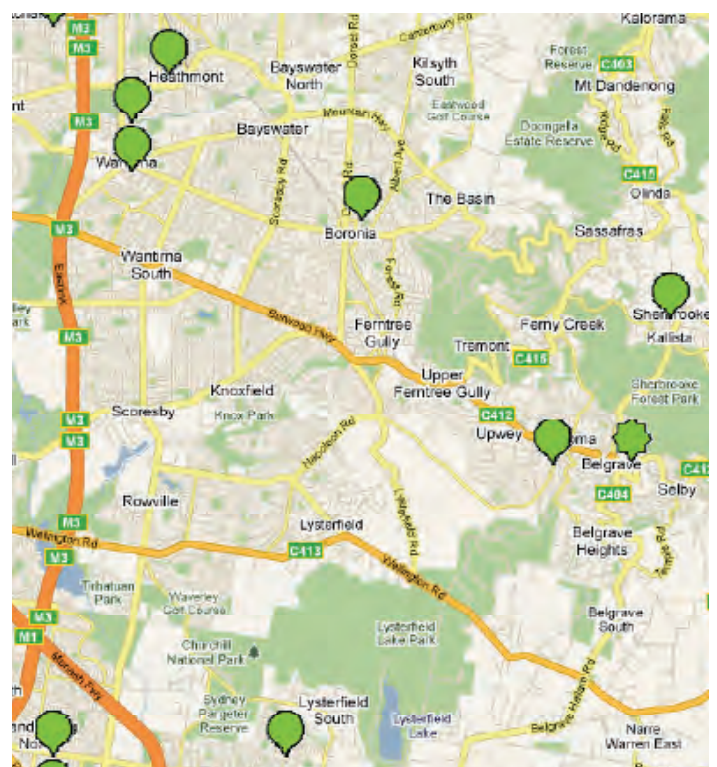


Figure 17: VEIL Community Map (Knox)

GOAL

To improve environmental sustainability of streets in Knox.

CHALLENGES

Challenges are also associated with each of the outlined opportunities to create streets for the environment.

Creating a green and leafy character

- Trees and above ground powerlines compete for space.
- Trees and car parking compete for space.

Saving water

- Retrofitting WUSD to roads as part of capital works requires coordination with existing services and existing road usage.

Enhancing the local ecology

- The aesthetics of indigenous vegetation are not always appreciated.
- Attitudes towards indigenous trees are generally unfavourable in the Knox community.

Mitigating climate change

- Introduction of edible streetscapes requires management of streets in partnership with the community to ensure success.

COMMUNITY PERSPECTIVES

Community consultation revealed that:

- tree-lined streets are judged as the most attractive streets by Knox people;
- there are very different views about native trees and exotic trees;
- other plantings along streets are also strongly liked, but residents agree that careful design is needed to ensure they don't block views of children and cyclists; and,
- trees, while loved and seen as a valuable asset in a local street, are also recognised as causing a variety of problems.

ACHIEVING CHANGE

Vision

Liveable streets will embrace natural ecosystems and work towards creating a sustainable landscape that offers habitat, water, sun, shade, food, flora and fauna and actively adds to the sustainability of the neighbourhood.

Goal

It supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- sustainable natural environment; and,
- balanced quality urban development.

It is supported by the *Vision 2025* commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental responsibility.

Approaches

1. Increase sustainable water use, capture and treatment in streets
2. Improve biodiversity and habitat values through enhancement of Knox's street vegetation
3. Design and implement environmentally sustainable streetscapes

4.8 STREETS FOR THE ENVIRONMENT

ACHIEVING CHANGE

APPROACH 1 – Increase sustainable water use, capture and treatment in streets

Action 1.1

Incorporate Stormwater Quality Improvement (SQUID) and Water Sensitive Urban Design (WSUD) – into all new streets as per current best practice guidelines as published by Melbourne Water, CSIRO and Monash University

Action 1.2

Coordinate SQUID/WSUD works with *Knox Road Asset Management Plan*, *Knox WSUD Strategy* and capital works programme to ensure incorporation into all works

Action 1.3

Implement SQUID/WSUD through the street network as opportunities arise, based on the *Liveable Streets Design Guidelines*

Action 1.4

Capture stormwater on a street scale and allow residents to use it

APPROACH 2 – Improve biodiversity and habitat values through enhancement of Knox's street vegetation

Action 2.1

Revise the *Knox Street Tree and Nature Strip Policy* as separate policies to include recommendations from the:

- Neighbourhood Character Study;
- Sustainable Environment Strategy;
- Sites of Biological Significance;
- Net Gain Policy;
- Native Vegetation Framework;
- Draft Native Vegetation Generic Integrity Policy;
- Indigenous Roadside Vegetation programme;
- WSUD Strategy;
- Knox Heat Island Effects Study and to
- Develop a Street Tree Management Plan
- Develop a Street Tree Selection Tool
- Conduct a Street Tree Audit to feed into the plans above
- Develop a Nature Strip Planting Application form and process

Action 2.2

Revise the *Knox Street Tree and Nature Strip Policy* to include:

- A valuation method for street trees that includes economic, habitat and amenity values
- Recommendations from the Bushfires Royal Commission

Action 2.3

Increase street tree planting across the municipality to provide shade and reduce summer heat gain

Action 2.4

Review Council's street lighting policy to preserve views of the night sky and respond to the needs of nocturnal species. This should take into account community safety issues and Australian standards

GOAL

To improve environmental sustainability of streets in Knox.

APPROACH 3 – Design and implement environmentally sustainable streetscapes

Action 3.1

Promote the development of edible streetscapes within the *Street Tree and Nature Strip Policy*

Action 3.2

Design and implement one edible street prototype

Action 3.3

Use appropriate vegetation in conjunction with maintenance in fire prone areas to reduce fire risk and balance environmental outcomes

Action 3.4

Develop a palette of materials for street construction that will enhance the environmental sustainability of the street. Incorporate this materials palette into the *Liveable Streets Design Guidelines* and apply to all new street works

Action 3.5

Investigate the feasibility of wind collectors within public recreational spaces and in streets

Action 3.6

Implement solar lighting for pedestrian path and shared path lighting

Action 3.7

Educate residents about the contribution that street trees make to environmental sustainability and involve them in programs to care for their local street trees. Undertake through a “care for your street tree” program that distributes brochures about how to care for your street tree to each resident

Action 3.8

Educate residents regarding safe use of treated stormwater. Identify opportunities where streets can contribute to wildlife corridors or connect sites of biological significance. Particularly important in foothills area close to the national parks

Action 3.9

Use porous paving adjacent to significant trees when constructing streets and repairing footpaths

Actions under other themes will also contribute to enhancing integrated travel in streets.

COMMUNITY ACTIONS – Communities can contribute to this goal by:

Participation

Getting involved when their street is being redesigned, and working with Council to implement improvements

Instigation

Initiating a local activity in their street such as Gardens for Wildlife or edible streetscapes

Maintenance

Care for their street nature strips and vegetation through maintaining their street tree, not parking on nature strips and disposing of rubbish responsibly

Stormwater use

Utilisation of detained water from WSUD treatments for residential purposes such as gardening and car washing

4.9 STREETS AND THE ECONOMY

The streets within Knox provide routes for distributing goods and services and are the locations for retail, business and industry. Well designed and attractive streets contribute to commercial viability: they create distinctiveness, offer comfortable environments for workers and customers, and reduce energy costs.

In residential areas, high-quality streets, especially those with good street trees, will enhance property values.

Well designed streets also encourage people to walk and cycle more, increasing individual health and wellbeing and decreasing health costs across the community.

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

OPPORTUNITIES

- Enhancing property values;
- Recognising the financial value of street trees;
- Gateways;
- Enhancing commercial and industrial streets;
- Reducing energy costs; and,
- Improving health and well-being.

CHALLENGES

- To ensure appropriate street trees are planted to increase the neighbourhood character and amenity.
- Gateway designs can create too much diversity in a neighbourhood and are not always well integrated into streetscape character;
- Long term maintenance of gateways is not always adequate;
- Gateways may rely on feature walls and structures rather than trees and vegetation which bring other benefits;
- Gateways may create the perception of a gated, exclusive community;
- To promote pedestrian and cycle ways in conjunction with providing for vehicles in commercial and industrial streets;
- To educate and communicate to business the benefits of pedestrians and a high quality streetscape;
- To reduce energy costs though increased street tree planting and other shade structures despite restrictions in the availability of space in and around commercial and retail environments;
- To educate the community on the benefits of walking and cycling, and to inspire a community in which vehicle travel is entrenched and dominant for even small trips.



Alchester Village Shopping Centre, The Basin

APPROACHES

1. Build the capability of the residents to work collectively to 'populate' the streets to make it a desirable, healthy place to live and work
2. Build capacity of the commercial and retail 'people' to animate the refreshed streetscape
3. Refresh streets in Activity Centres and neighbourhood shopping strips to enable improved economic outcomes
4. Improve economic longevity of street pavements through appropriate street tree planting
5. Promote walking and cycling activity in Knox streets to reduce community health costs and increase well-being

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- sustainable natural environment;
- balanced quality urban environment; and,
- a prosperous, modern economy.

And it is supported by the Vision 2025 commitment to:

- innovation and excellence;
- stewardship of finances and assets; and,
- social and environmental sustainability.

4.9 STREETS AND THE ECONOMY

MEASURE OF SUCCESS

- Visible signs of community maintaining their nature strips
- Increase in community street groups
- Increased resources in the 2010/11 budget to implement a 'no net loss' of street tree numbers
- Achieve 'no net loss' of tree numbers
- Increased number of streets being planted because of community initiated action, and increase in treed streets
- All new gateway elements are designed according to *Liveable street design guidelines*
- Trader associations for each shopping precinct
- Undergrounding of powerlines in key activity centre main streets undertaken by 2015
- Each retail and business precinct has adequate street trees, footpaths, pedestrian seating, bins and cycle hoops
- All new public car parks to achieve minimum standards of: shade trees, appropriate WSUD treatments, and pedestrian paths
- All traders have applied for a street trading permit and all retail areas have 1.2m clear space along building frontage
- Ensure street trees provide shade to road pavements where possible
- Implement three green neighbourhood streets in five years
- Number of kilometres of improved amenity along paths
- Community initiated street events increase

Measure of success for community

- Community initiated street tree planting increased
- Increase in shop frontage upgrades
- Trader associations for each shopping precinct

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Municipal Strategic Statement*
- *Knox Healthy Ageing Strategic Plan 2009-2013*
- *Off to a Flying Start, an Early Years Plan for Families with Children Aged from Birth to Twelve Years: Snapshot 2005-2008*
- *Integrated Transport Plan, Alternatives in Motion*



Childers in Queensland, an example of parking and street tree balance in a shopping street

'A streetscape that looks inviting is more likely to encourage people to live there, increasing demand and property prices.' (COA, 2008)

'A general reduction in quality of life and property value has resulted from overly high urban traffic speeds.' (Burden, 2001)

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

OPPORTUNITIES

This section looks at six specific opportunities that would help build recognition of the economic benefits of liveable streets:

- Enhancing property values;
- Recognising the financial value of street trees;
- Gateways;
- Enhancing commercial and industrial streets;
- Reducing energy costs; and,
- Improving health and well-being.

Enhancing property values

Property values are based on a large number of factors. One significant contributor to the value of a home or commercial property is the neighbourhood and street character. Liveable streets will enhance property values by increasing the desirability of that street as a place to live, work and conduct business.

In Knox, residential streets with higher traffic volumes are disliked, while well-designed and maintained 'green and leafy' residential streets are strongly preferred.

At the neighbourhood scale, creating an interesting and distinctive landscape character can enhance commercial and residential precincts. For example, a 'gateway', such as a planting or works of public art, can create a strong entry point to an area, defining neighbourhood boundaries and creating a sense of arrival.

Recognising the financial value of street trees

Street trees are a significant contributor to the appearance of a street, especially where they are the dominant or a unifying element.

Several methods have been developed to assess the financial value of street trees. By one such method, the *2003 Knox Streetscape Policy* (KCC, 2003) estimated the total value of Knox's 65,000 street trees as in excess of \$70 million (in 2003).

'Good street tree cover can increase property values, due to a unified and "green and leafy" image that is desirable.' (COA, 2008)

'The US Forestry Service documents that a single urban tree pays back US\$58,000 individual dividends to a community.' (Burden, 2001)

4.9 STREETS AND THE ECONOMY

OPPORTUNITIES

Gateways

In general, gateways can be described as landscape and architectural elements located at the entrances to residential or business estates or precincts and that mark the transition into the place.

Gateways for residential, commercial and industrial estates can provide a positive sense of identity.

Typically gateways include a signage or naming element, a wall, trees and planting beds. If designed well and in scale with the surrounding neighbourhood they can provide a positive identifying element in the neighbourhood. At their worst they can date one year after being installed, dominate the streetscape, and instil a perception of a gated community.

However, gateways offer an important opportunity to name, mark, brand, promote and differentiate a particular precinct or neighbourhood.

Enhancing commercial and industrial areas

As Melbourne becomes denser, major Activity Centres and local shopping areas will become important focal points. Good urban design and liveable streets are a vital investment in the future.

The attractiveness of commercial and retail areas is an important factor in their economic success.

Customers are drawn to accessible and attractive shopping areas. Trees and plants, shade, seats and quality pavements are needed to cater for shoppers, encouraging them to stay longer and to return. Active frontages along the street – rather than blank walls – will increase safety and encourage use. Section 5 defines specific principles and guidelines to guide the development and enhancement of these areas.



Mountain High Centre, Bayswater showing distinct planters at the entrance



Nicholson Street, Footscray, trees and parking share the street

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

Knox has two main types of shopping areas:

- Major shopping centre destinations such as Knox City, Boronia Shopping Centre and Stud Park, that serve a large catchment, often outside of the municipality, as well as local shoppers; and,
- Local shopping areas that primarily serve local residents and have a much smaller catchment.

Each type of shopping area can benefit by building its own character and distinctiveness. The concept and principles behind liveable streets can be effectively used to enhance the attractiveness of all shopping areas.

The same is true of industrial estates where high quality urban design, and streets based on liveable street principles, will attract businesses and customers, and create better working environments.

Connectivity within and between commercial and residential areas is another important design consideration. Shared paths, for example, can increase walking and cycling by offering easy access to local shops, other facilities and public transport. Larger shopping destinations also need to be well connected by foot and cycle paths, and have good public transport interchanges and facilities. *Melbourne 2030* (SGV, 2005), the *Knox Sustainable Environment Strategy* (Context, 2008) and the *Pedestrian Plan* (David Lock Assoc. et. al., 2005) all recognise the importance of connectivity.

Adequate provision for cyclists to lock bicycles and for pedestrians to rest will increase the likelihood that people will walk or cycle to shopping destinations.

Many shopping, commercial and industrial areas have vast and unattractive car parks that offer little shade or amenity for users. Parking areas can be easily designed differently, with lots of shade, trees, garden beds and water sensitive urban design features to recover and reuse rain. Increased amenity will add value to a retail shopping area.

Reducing energy costs

Increasing shade protection to buildings, pavements and car parks through large trees, shrubs, shade structures and other design techniques will lessen heat build up in summer and reduce the need for energy-intensive air-conditioning. This will save money, reduce greenhouse gas emissions and create more liveable public spaces.

Reducing health costs

This kind of activity is a type of preventative action against illness. Our health system and economy benefit, with increased productivity and less resources spent in hospitals and in health centres.

'Shoppers report being willing to pay nine to twelve per cent more for goods and services in districts having a quality urban forest. Rental rates of commercial office properties were about seven per cent higher for sites having a quality landscape that included trees.' (Wolf K., 2005)

'Respondents (to a visual survey on road types and settings) indicated psychological inferences based on landscape character. The 'green' community was characterised as being a more appealing place for shoppers, including positive merchant traits and product quality. A greener place was also judged to be a more favourable environment for new business.' (Wolf K., 2006)

4.9 STREETS AND THE ECONOMY

CHALLENGES

Challenges are also associated with each of the opportunities outlined.

Enhancing property values

The key challenge here is to ensure appropriate street trees are planted to increase the neighbourhood character and amenity. Such trees are ones that will not require significant amount of maintenance on either them or adjacent infrastructure.

Gateways

The key challenges in creating a positive and character enhancing gateway is:

- to avoid eclectic styles, themes and dated designs that create too much diversity in a neighbourhood;
- when gateways are constructed by developers and passed to Council to maintain, long term maintenance is not always adequate;
- gateways are not always well integrated into the streetscape character and look like 'stand alones';
- some gateways rely on feature walls and structures rather than trees and vegetation which bring other benefits such as ecological, shade etc.; and,
- the potential for gateways to be used to create the perception of a gated, exclusive community, which is counter to the idea of a connected neighbourhood.

Enhancing commercial and industrial streets

Commercial, and in particular industrial, areas are dominated by vehicles and vehicle parking. The key challenge in this environment is to promote pedestrian and cycle-ways in conjunction with providing for vehicles.

In the commercial and retail environment, more education and communication is needed to promote to business the benefits of pedestrians and a high quality streetscape.

Reducing energy costs

The key challenge to reducing energy costs through increased street tree planting and other shade structures, is predominantly the availability of space in and around commercial and retail environments. In general, this available space is shared between trees, car parks and service access.

Reducing health costs

Reducing health costs is a significant government and community agenda item. The challenge is to educate the community in the benefits of walking and cycling, and to inspire a community in which vehicle travel is entrenched and dominant for even small trips.

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

COMMUNITY PERSPECTIVES

Community consultation revealed that:

- commercial streetscapes without trees were seen as cold and sterile; and,
- trees were recognised as adding to property values in residential streets, and scored highly on attractiveness.

ACHIEVING CHANGE

Vision

Public spaces within shopping, commercial and industrial areas will enhance the economic and environmental sustainability of these areas, attracting business, customers and employees.

Goal

It supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- sustainable natural environment;
- balanced urban environment; and,
- a prosperous, modern economy.

It is supported by the *Vision 2025* commitment to:

- innovation and excellence;
- stewardship of finances and assets; and,
- social and environmental sustainability.

Approaches

1. Build the capability of the residents to work collectively to 'populate' the street to make the place a desirable, healthy place to live and work
2. Build capacity of the commercial and retail 'people' to animate the refreshed streetscape
3. Refresh streets in Activity Centres and neighbourhood shopping strips to enable improved economic outcomes
4. Improve economic longevity of street pavements through appropriate street tree planting
5. Promote walking and cycling activity in Knox streets to reduce community health costs and increase well-being

'Walking is a suitable physical activity for most people. Regular walking can help you lose body fat, maintain a healthy weight, improve your fitness and reduce your risk of developing conditions such as heart disease, type 2 diabetes, osteoporosis and some cancers.' (SGV, 2010)

4.9 STREETS AND THE ECONOMY

ACHIEVING CHANGE

APPROACH 1 – Build the capability of the residents to work collectively to ‘populate’ the streets to make them desirable, healthy place to live and work

Action 1.1

Create and encourage ownership and pride. Support and allow residents to plant their own trees and shrubs on nature strips

Action 1.2

Enable appropriate community action through education programs, distribution of guidelines for street based activities, provision of Council grants to groups and in-kind support

Action 1.3

Revise *Knox Street Tree and Nature Strip* Policy as separate policies, to include a valuation method for street trees’ economic, habitat and amenity value. This will help promote the economic value of street trees and how they contribute to residential desirability

Action 1.4

Targeted street tree planting: streets ranked at a higher priority if they have no street trees currently, if the residents in the street approach Council as a collective, or if the planting will have a large impact on the surrounding area

Action 1.5

Encourage new developments to implement well designed and appropriate threshold and gateway treatments to residential areas to increase desirability. Refer to Liveable Street Design Guidelines

APPROACH 2 – Build capacity of the commercial and retail ‘people’ to animate the refreshed streetscape

Action 2.1

Council to support traders to develop cohesive traders associations in order to work together to improve their shopping streets

Action 2.2

Based on trader interest, willingness and drive, develop a priority plan for refreshing shopping streets

Action 2.3

Develop a templates toolbox that can be used by traders to develop ideas for enhancing the commercial and pedestrian capacity of their shopping street

Action 2.4

Develop a matching funding program for shopping streets and traders associations

APPROACH 3 – Refresh streets in Activity Centres and neighbourhood shopping strips to enable improved economic outcomes

Action 3.1

Assess the potential for undergrounding powerlines in key shopping areas and defined Activity Centres to improve the liveability of selected streets and areas

Action 3.2

Implement minimum amenity standards including shade, bins, seating, threshold treatments and pedestrian pavements to retail and business precincts, progressively improving the public realm for all

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

Action 3.3

Establish car park design standards, based on Liveable Streets Design Guidelines and *Knox WSUD Policy*, and apply to all public car parks (including those associated with retail and commercial developments)

Action 3.4

Make allowances for street trading (goods for sale, A-frames), particularly on wide paths in shopping areas. Allowance of 1.2m clear spaces along building frontage as required by local law

APPROACH 4 – Improve economic longevity of street pavements through appropriate street tree planting

Action 4.1

Plant appropriate street trees that provide shade to road pavements helping to increase their longevity through reduced exposure to heat

APPROACH 5 – Promote walking and cycling activity in Knox streets to reduce community health costs and increase well-being

Action 5.1

Enact green neighbourhood streets to increase walking and cycling in local areas

Action 5.2

Increase pedestrian and cycle amenity to make journeys more desirable with a priority on links to major destinations points such as open space, community hubs, schools and shopping precincts

Action 5.3

Promote street and neighbourhood community events to build a local sense of identity and connection. Develop clear and easy procedures for community members to run these events

Actions under other themes will also contribute to enhancing the economic value of streets

COMMUNITY ACTIONS – Communities can contribute to this goal by:

Residents Initiated Activities

Communities identifying opportunities to improve the street tree planting and nature strips in their local streets

Trader Initiated Activities

Traders can improve their shopping area by upgrading their shop frontages

Traders to develop cohesive traders associations in order to work together to improve their shopping area

4.10 SAFE STREETS

Safe streets are places where people feel comfortable to dwell or move through. This is often achieved where higher numbers of people are active within the streets, for instance walking the dog or gardening.

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

OPPORTUNITIES

- To reduce traffic speeds to improve safety for vehicle users.
- To improve pedestrian safety.

CHALLENGES

- Negotiating with VicRoads to arrive at a memorandum of understanding that supports the principle of street trees along Knox's main roads and streets;
- Effectively researching and trialling different traffic calming techniques to reduce speed in primarily residential streets;
- Implementing a shared use space in Knox when there is no local benchmark to follow. Shared space will be a new model for the community and Council;
- Ensuring that lighting for increased pedestrian safety does not conflict with other Council policies; and,
- Balancing available funds with priority safety works across the entire road network.



A paved street in Knox that suggests a pedestrian priority and slow vehicle speed

APPROACHES

1. Decrease vehicle speeds in residential streets and retail environments
2. Improve pedestrian access and amenity in streets to provide equitable space for non-vehicle movement
3. Provide safe areas for vehicle parking
4. Create community destinations – reasons to be on the street

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- supporting culturally rich and active communities; and,
- access transport choices.

And it is supported by the Vision 2025 commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental sustainability.

4.10 SAFE STREETS

MEASURE OF SUCCESS

- Traffic counts showing speed reduction and reduced accidents
- Increased number of shared use zones
- No new streets have ongoing speeding issues
- Increase in footpaths
- Increase in pedestrians and cyclists
- Priority lighting projects in *Knox Pedestrian Plan* undertaken
- Reduction in reported crimes and complaints to police and safer communities group within Council
- Reduction in reported crimes and complaints to police and safer communities group within Council
- Each suburb having their own Mothers Living Well program
- Reduction in complaints to Council and increased pedestrian activity
- Vehicles parked legally and safely
- Minimal ongoing use of nature strips for residential parking
- Fewer complaints recorded
- Streets designed in accordance with *Liveable Streets Design Guidelines*
- Increased pedestrian activity on streets

Measure of success for community

- Increase in community reporting of issues
- Active neighbourhood watch groups across Knox
- Increase activity in streets
- Less reported complaints about private vegetation
- Increase in gardening as a recreational activity

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Knox Pedestrian Plan*, which recommends specific design responses in relation to safety. See in particular, table 7.1.2: Social Street Principles
- *Knox Integrated Transport Plan*
- *Road Asset Management Plan*
- *Footpath and Shared Path Asset Management Plan*

OTHER USEFUL RESOURCES

- *Urban Trees and Traffic Safety: Considering US Roadside Policy and Crash Data*
- *Melbourne 2030*, Policy 5.3, Improve community safety and encourage neighbourhood design that makes people feel safe. Refer to Initiatives 5.3.1 through 5.3.5

'The common thread in the new approach to traffic engineering is a recognition that the way you build a road affects far more than the movement of vehicles. It determines how drivers behave on it, whether pedestrians feel safe to walk alongside it, what kinds of businesses and housing spring up along it.'

(McNichol, 2004)

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

OPPORTUNITIES

This section looks at two specific opportunities to create safer streets:

- reducing traffic speed to improve safety for vehicle users; and,
- improving pedestrian safety.

Reducing traffic speed to improve safety

The reduction of speeding traffic is a key issue in making streets liveable. The safety of pedestrians, cyclists and vehicle occupants is crucial to the development of liveable streets.

Speeding cars are often seen within wide, quiet streets as drivers have a wide field of vision and are inclined to speed up. Unfortunately, wide quiet streets are also considered highly desirable by Knox residents.

Vehicle Speed

Regarding the potential economic benefits of traffic calming, the *TDM Encyclopaedia* (no year) notes the following:

- traffic calming creates economic revitalisation and increases residential and commercial property values;
- traffic calming creates more attractive environments, reduces vehicle speeds and increases safety for pedestrians, cyclists, drivers and other users of the streets. This is good for business;
- traffic calming encourages local residents to buy in their own neighbourhoods and also attracts customers from a wider area due to reduced travel times, hassle and cost. Traffic calming can also help people live less car-dependent lifestyles;
- most businesses are concerned about the quality and quantity of customer parking and access for delivery trucks; and,
- traffic calming projects often require only minimum 'down time' for construction, and most do not require investment from business owners.

Each street needs to be designed in response to different parameters, including vehicle speed, traffic volumes, driver behaviour, technical constraints, along with community perceptions and the local context. In residential and school areas, for example, it is particularly important to decrease the speed of traffic.

There are two distinct and potentially conflicting approaches to the design of streets for speed reduction.

1. Clear zones: This approach, used by VicRoads, advocates removing obstacles that an errant vehicle may encounter. This approach is enforced on major arterials but is not desirable or appropriate when applied to the full measure for higher speed roads, and within lower speed suburban streets. The removal of all obstacles adjacent to the street carriageway can reduce the ability of the driver to judge their own speed.
2. Behavioural design: as discussed by McNichol (2004), this approach proposes that by changing the design of the environment it is possible to change driver behaviour.

Curvy lines, trees and other objects are brought closer to the carriageway and sometimes different road surface treatments (such as paving) are used at the threshold. This design approach narrows the field of view and alerts the driver to a smaller scaled environment which requires slower speeds.

4.10 SAFE STREETS

OPPORTUNITIES

Safety and Roadside Vegetation

The debate concerning roads and safety and the impact of roadside vegetation is both ongoing and one in which many authorities and community groups have taken serious interest.

The strict application of current VicRoads and AusRoads standards to Knox's VicRoads-controlled roads would entail a significant reduction in future tree planting along Knox's major roads. Many of Knox's main roads would have a 5-8 metre 'no go zone' for trees (or trees with a calliper (trunk) larger than 200mm diameter. This suggests that future street tree planting will either not be possible or at best minimal in the space remaining.

The key issue for increasing street tree planting in Knox's main roads is negotiation with VicRoads to firstly develop a memorandum of understanding on the future design of all Knox's main roads, and secondly, on a street by street basis, to negotiate a higher quality landscape outcome. Installation of crash barriers between the road and trees is a visually undesirable outcome.

It is not part of the scope of this study to review in detail the VicRoads and AusRoads standards that guide the design and maintenance of roads in Knox. However, it is within this study's scope to highlight the many benefits of the 'behavioural design' approach were it to be applied to a significant majority of the streets of Knox. Many of the components of the behavioural design approach are not incompatible with VicRoads standards.

Research undertaken in Australia and overseas provides much evidence for the effectiveness of more passive treatments to reduce vehicle speed or speeding in streets.

This evidence includes:

- Urban street trees create vertical walls framing streets, and a defined edge, helping motorists guide their movement and assess their speed (leading to overall speed reductions). Street tree safety comparisons show a reduction in both run off the road crashes and overall crash severity when street tree sections are compared with equivalent treeless streets (Burden, 2008).
- A study in Toronto Canada found that street landscape improvements reduced accidents by 5% to 20% (generating significant public cost savings) and boosted pedestrian use of urban arterials (Rosenblatt Naderi 2003) (Wolf and Bratton, no year).
- Brain injury resulting from hitting a narrow object such as a tree or pole was found to vary 'strongly with speed, with brain injury 5.5 times more likely in 100-110km/h zones compared with 40-60km/hr zones' (Royal Auto, 2007).
- The government response to the *Road Safety Committee Inquiry into Crashes Involving Roadside Objects*, (October 2005) recommends that Victorian road authorities consider the use of earth, gravel shrubs and other frangible vegetation as a means of slowing out-of-control vehicles as they travel across roadsides, thereby reducing object severity.

'It is important that both the actual and perceived safety for users is addressed. If people feel that a particular route or public transport facility is unsafe, and should only be used when absolutely necessary, it is not a legitimate transport choice.' (KCC, 2004)

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

Improving Pedestrian Safety

Shared spaces and pedestrian priority

A shared space is a street being shared between cars, pedestrian and bicycles on an equal basis and generally on a single surface or level pavement. Shared spaces are appropriate for low volume streets where pedestrians outnumber motor vehicles and where it is difficult to have a separate pedestrian pavement. They are also useful in areas where there are a high number of pedestrians and their movements crossing streets need to be prioritised over vehicles.

Research into shared use spaces has demonstrated potential for reduced vehicle and pedestrian accidents. Shared use zones encourage slower traffic and force drivers to increase their awareness of pedestrians. Refer Section 4.11 *Streets for the Community* for additional information.

Lighting

Lighting is vital to night time safety on Knox's streets, especially at intersections. To increase street usage, it is critical to improve lighting for pedestrians for those streets which connect with public transport, community facilities and retail areas.

The *Knox Pedestrian Plan* identifies the appropriate lighting for pedestrians on streets.

Passive surveillance

A key principle for safety in our communities is passive surveillance. Passive surveillance means the casual watching of pedestrians and drivers by the neighbourhood and individual householders.

Consequently, streets that encourage walking and slow driving, both day and night, provide additional surveillance and increased community safety.

Streets that encourage activities such as play, and gardening on nature strips also encourage indirect surveillance on streets.

Crime Prevention through Environmental Design

Crime Prevention Through Environmental Design (CPTED) is a design-based approach for public spaces intended to minimise opportunities for crime while enhancing the quality of the physical environment for both comfort and enjoyment.

Safety on public transport

The *Knox Integrated Transport Plan* says 'for people to choose public transport, a safe environment needs to be provided. Safety, and the perception of safety, should encompass all aspects of a public transport journey – to facilities, waiting times for services, the travel experience and disembarkation.'

Relevant principles of good design recommended in The *Knox Integrated Transport Plan* (2004) include:

- lighting and maintenance along footpaths and in carparks;
- safe crossing facilities;
- integration of transport with land use;
- minimising concealment opportunities at embarkation points;
- lighting at stations and bus stops; and,
- providing detailed and accurate service information.

Maintenance and surface quality

Surface quality and consistency are important factors in the safety of carriageways and footpaths.

Maintenance of footpaths to help remove cracking and lifting, for example, will reduce the risk of tripping.

4.10 SAFE STREETS

CHALLENGES

Challenges are also associated with each of the outlined opportunities to create safe streets.

Reducing traffic speed and increasing safety

The key challenges to reducing traffic speeds and increasing street tree planting on streets include:

- negotiation with VicRoads to arrive at a memorandum of understanding that supports the principle of street trees along Knox's main roads and streets; and,
- effectively researching and trialling different traffic calming techniques to reduce speed in primarily residential streets.

Improving pedestrian safety

The key challenges to improving pedestrian safety include:

- implementing a shared use space in Knox when there is no local benchmark to follow. Shared space will be a new model for the community and council; and,
- ensuring that lighting for increased pedestrian safety does not conflict with other Council policies.

Maintenance and surface quality

The key challenges to improving maintenance and surface quality includes:

- balancing available funds with priority safety works across the entire road network.

COMMUNITY PERSPECTIVES

Community consultation revealed that:

- traffic volumes and speeds are a major issue and concern for residents, and are a major contributing factor to the enjoyment of residential streets;
- people prefer wider streets with street trees and minimal on-street car parking;
- well designed streets are strongly favoured; and,
- risks to children, pedestrians and cyclists were recognised in some street designs.

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

ACHIEVING CHANGE

Vision

Safe streets are places where people feel comfortable to dwell or move through. They are places where we do not feel threatened by speeding vehicles or isolated spaces.

Goal

It supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- supporting culturally rich and active communities; and,
- access transport choices.

It is supported by the *Vision 2025* commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental sustainability.

Approaches

1. Decrease vehicle speeds in residential streets and retail environments
2. Improve pedestrian access and amenity in streets to provide equitable space for non-vehicle movement
3. Provide safe areas for vehicles parking
4. Create community destinations – reasons to be on the street



Safe street in Footscray. Small speed humps reduce speed



Shared use space, Springthorpe Estate, Macleod

4.10 SAFE STREETS

ACHIEVING CHANGE

APPROACH 1 – Decrease vehicle speeds in residential streets and retail environments

Action 1.1

Work with LATM (Local Area Traffic Management) plans to improve problematic streets with treatments that will reduce vehicles speeds

Action 1.2

Identify potential shared use zones and implement a program of pilot studies into different areas. For example short streets, school streets, residential courts, transport hubs and within key Activity Centres
See also Theme: Streets for Travel

Action 1.3

Ensure all new and upgraded streets are designed to reduce vehicle speed and increase pedestrian safety

APPROACH 2 – Improve pedestrian access and amenity in streets to provide equitable space for non-vehicle movement

Action 2.1

Implement footpaths to at least one side of streets and preferably to both sides
See also Theme: Streets for Travel

Action 2.2

Enact green neighbourhood streets to promote bike and pedestrian travel
See also Theme: Streets for Travel

Action 2.3

Implement safety lighting as set out in the *Knox Pedestrian Plan* with a review to ensure appropriate sustainability and environmental outcomes

Action 2.4

Apply CPTED (Crime Prevention Through Environmental Design) principles to all new capital works projects and public transport structures

Action 2.5

Encourage residents to improve the safety of their homes, through clear sightlines between street and front door

Action 2.6

Expand the *Mothers Living Well* program across all suburbs. This program encourages walking and playing in public spaces

Action 2.7

Ensure adequate maintenance of footpaths, as per *Knox Footpath and Shared Path Asset Management Plan*

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

APPROACH 3 – Provide safe areas for parking of vehicles**Action 3.1**

Educate residents on legal parking options, ie on the road, not on the footpath or nature strips

Action 3.2

Mark parking lanes on wider streets

Action 3.3

Ensure all new streets provide minimum width for car parking with car parks housed in landscape outstands. Refer to the *Liveable Streets Design Guidelines*

APPROACH 4 – Create community destinations –reasons to be on the street**Action 4.1**

Work with communities and planning permit applications to increase the number of interesting destinations in residential streets, such as gardens of interest, artwork, places for play, meeting places and pause points

Actions under other themes will also contribute to promoting safe street streets.

COMMUNITY ACTIONS – Communities can contribute to this goal by:**Community reporting**

Community members identifying opportunities for improved driver and pedestrian safety

Neighbourhood watch

Becoming active in neighbourhood watch type activities

Activities

Actively using the street

4.11 STREETS FOR THE COMMUNITY

Liveable streets are places where the community actively uses the spaces. Walking, cycling, play, gardening and talking to a neighbour are all indicators of a successful street in a neighbourhood.

Most of Knox's streets are residential streets. All these streets could become more liveable by designing them as community spaces.

There are a number of community led initiatives within Knox that are building the liveability of streets.

This theme explores a range of well-established ways to enhance the use of streets as community spaces, and discusses some of the challenges involved.

GOAL

To increase community pride and action in Knox streets

OPPORTUNITIES

- Community orientated streets, including:
 - Shared use zones;
 - Home zones (Woonerfs); and,
 - Play and local movement.
- Pedestrian prioritisation in Activity Centres;
- Putting the 'nature' back into nature strips and gardens;
- Public art in streets; and,
- Gateways.

CHALLENGES

- Implementing shared use spaces and home zones in the City of Knox where there exists no local benchmark to follow;
- Increasing pedestrianisation in Activity Centre areas sometimes requires a reduction in on-street car parking;
- Educating and promoting the benefits of planted nature strips, in particular indigenous and edible vegetation;
- Ensuring that nature strips are planted in accordance with the proposed Nature Strips Policy;
- Encouraging and supporting residents in maintaining their nature strip's planting;
- Ensuring public art is not creating a driver or pedestrian safety problem; and,
- Ensuring that public art is well integrated into the street and the street's character.



Community initiated project, The Basin

APPROACHES

1. Design streets to enable community activity
2. Support community initiatives in streets
3. Streets as places to produce, harvest and share food

Note: all actions need to contribute to consistent neighbourhood character

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- culturally rich and active communities;
- sustainable natural environment; and,
- balanced quality urban development.

And it is supported by the Vision 2025 commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental responsibility.

4.11 STREETS FOR THE COMMUNITY

MEASURE OF SUCCESS

- Priority list of home zones by 2012
- Two home zone prototypes implemented in 5 years
- By 2012 communities have been involved in the planning and design of at least 3 green neighbourhood streets
- Templates and toolbox are available to the community by 2012
- Increased dog walking in residential streets
- Streamlined process and checklist for community street events by 2012
- Increased number of community based programs in Knox
- 3 community arts projects annually
- Matching community grants program established by 2015
- Design and implement one edible street prototype
- 2 edible streets created by the community in 5 years
- Increase in private edible gardens

CURRENT PROGRAMS, PLANS AND POLICIES

The following programs, plans and policies will help achieve this goal:

- *Knox Pedestrian Plan*, which recommends specific design responses in relation to safety. See in particular table 7.1.2: Social Street Principles, also refer here for seating recommendations;
- *Knox Integrated Transport Plan*;
- *Road Asset Management Plan*; and,
- *Footpath and Shared Path Asset Management Plan*.
- *Knox City Council Arts Plan*

OPPORTUNITIES

This section looks at five specific opportunities that would help create streets that work as community spaces:

- Community orientated streets, including: Shared use zones; Home zones (Woonerfs); and, Play and local movement.
- Pedestrian prioritisation in Activity Centres;
- Putting the 'nature' back into nature strips and gardens;
- Public art in streets; and,
- Gateways.

'The success of a home zone can be judged by the extent to which the people who use the street or live there recognise the need for the scheme and take ownership of it. Such ownership largely depends upon effective community participation and involvement at all stages' (DFT, 2005)

GOAL

To increase community pride and action in Knox streets.

Community Orientated Streets

Shared Use Zones

Shared use zones are areas where pedestrians, cyclists and vehicles share the roadway.

Shared use zones can be used in commercial, retail and residential areas that have a low traffic volume or highly controlled traffic speeds.

There is a direct connection between traffic speeds in residential streets and liveability – as speeds increase ‘neighbourhood liveability ratings decline’ (Online TDM Encyclopaedia 2007).

A shared use zone creates a space where traffic is slowed, making a street safer and more inviting.

Shared space under Victorian Road Rules states that:

- Cars at all times need to give-way to pedestrians.
- That a pedestrian must not move directly into the path of a driver and must not unreasonably obstruct the path of any driver or another pedestrian.

In traditional street layouts, footways and carriageways are separated by a kerb. In a street with a shared surface, this demarcation is absent and pedestrians and vehicles share the same surface.

The key aims are to:

- encourage low vehicle speeds;
- create an environment in which pedestrians can walk, or stop and chat, without feeling intimidated by motor traffic;
- make it easier for people to move around; and,
- promote social interaction.

Home zones (Woonerfs)

Home zones (originally pioneered in the Netherlands and known as Woonerfs) strike a balance between vehicles and everyone else who uses the street – pedestrians, cyclists, business people and residents. Home zones reclaim local streets from the car, improve safety and return peace to neighbourhoods that are becoming overwhelmed with speeding traffic (<http://www.homezones.org>).

In Knox, the home zones idea could be extended into designated streets where pedestrians have priority over vehicles. Residential streets, especially those that are not through roads or are short in length, are well suited to this concept.

The design of a home zone has been defined by Appleyard (1981) as a space that includes:

- a ‘gateway’ to announce to drivers that they are entering a home zone;
- curves to slow vehicles;
- amenities such as trees and play equipment –these also act to slow traffic;
- no kerbs;
- intermittent parking so cars do not form a continuous barrier; and,
- a speed limit of around 16km/hr.

Refer to *Section 5 Liveable Streets Design Guidelines* and the *Knox Pedestrian Plan* for specific recommendations and design guidelines.

4.11 STREETS FOR THE COMMUNITY

OPPORTUNITIES

Play and local movement

Playing street cricket and other games with neighbours within the street is certainly less prevalent now than 20 years ago. There are many reasons for this change, but among the most significant, are concerns for both children's safety in relation to 'stranger danger' and accidents with vehicles.

The potential for outdoor play with neighbours increases both activity on the street and passive surveillance, making the street a safer environment. Play actively increases social networking within the local community, leading to other positive community outcomes and encouraging community initiated activities such as community gardens. Children also have greater opportunity to explore their local natural environment and develop respect for it.

Destinations

In developing the community's bonds to its neighbourhood and locality, it is important to create facilities and destinations that reflect the values and interests of that community's individuals. These places may be at the local shops, scout hall, library or school.

These places are important to the neighbourhood and need to be well designed, enhance the locality, and be well cared for.

Getting to these places is also important. The approach of Green Neighbourhood Streets recommended in this Plan is designed to provide key routes that safely connect community facilities and that will become the focus for community activity and identity.

Pedestrian prioritisation in Activity Centres

A key principle of Melbourne 2030 is the idea of Activity Centres – locations where increased residential density is combined with services and employment hubs. Activity Centres are located strategically across Melbourne.

Knox Central is designated as a principal Activity Centre. The core area is the commercial and industrial land located along Burwood Highway between Stud Road and Scoresby Road. In response to the need to protect the amenity and quality of the precinct's residential surrounds, Knox City Council has developed the *Knox Central Urban Design Framework (2005)*.

Knox also has 4 Major Activity Centres: Bayswater, Boronia, Mountain Gate, and Rowville/Stud Park, and each of these offers opportunities to combine new development with renewal of streets to enhance liveability.

The Melbourne 2030 Activity Centre Design Guidelines emphasise the importance of creating street life, a sense of place, high quality design of public spaces, and connectivity (SGV, 2005).

The primary type of new development occurring in Knox is medium density mixed-use and medium density residential.

The increased population density that will form around Knox's Activity Centres will place pressure on the existing open spaces and streetscapes. Streets in these areas will need to accommodate more daily use and increased demand for more casual recreation space for residents.

Streets in Activity Centres will become the focus for debates about how new development responds to the existing neighbourhood character. Street redesign can assist with integration and create opportunities to provide high quality streetscapes suited to increased densities and mixed uses.

GOAL

To increase community pride and action in Knox streets.

Putting the 'nature' back into nature strips and gardens

The minimum setback of houses from the street is determined by the planning scheme, and the position and outlook of the house by the owner. Most of residential Knox is already developed, and in many areas the setback is consistent across neighbourhoods. The setback of houses along a street creates the overall urban form and gives character to a street and neighbourhood.

The nature strip is also an important part of the streetscape.

Front yards are often spaces that are not used as much as the backyard because they lack privacy. On the other hand, front yards are part of the streetscape and are places where neighbours can interact as part of a street community.

Programmes such as 'Gardens for Wildlife' often hold demonstrations or open gardens and curate community events and activities. Whole streets have been dedicated to these spaces.

Likewise, the idea of edible streetscapes is catching on in many areas, focusing on food gardening in public spaces and streets, and with the produce available for all to share.

'Mothers Living Well' is a three year health promotion project exploring ways to enhance the wellbeing of mothers in Bayswater and Bayswater North. This project takes a broader approach to neighbourhoods, creating activities designed to build community connections and increase physical activity. Initiatives include street parties, upgrading of footpaths, and community art projects.



An edible street community project

4.11 STREETS FOR THE COMMUNITY

OPPORTUNITIES

Public art in streets

Community art and public art within the streetscape can create landmarks, areas for interaction conversation, and involvement (KCC, 2010)

Knox Placemakers is a Council-based initiative to create or strengthen a sense of place through artists and the community working together to design, create and install art that has a sustainability focus and will enhance public places in Knox .

Gateways

There are many gateways within the Knox municipality. These range from major entrances to the City – for example the Dandenong Creek Gateways, to the smaller gateways that mark the entrance to suburbs, business parks, shopping destinations and neighbourhoods.

For example, Boronia Shopping precinct has planting and unique signage.

Siemens Offices along Mountain Highway in Bayswater offer a distinctive gateway to their building.

Gateways help define boundaries of places and create landmarks that are associated with different communities.

For more on gateways, refer to the 'streets for economy section'.



Boronia Shopping precinct sign



Gardens for wildlife

GOAL

To increase community pride and action in Knox streets.



Siemens Offices showing a planted gateway and frontage to Mountain Highway, Bayswater

4.11 STREETS FOR THE COMMUNITY

CHALLENGES

Challenges are also associated with each of the outlined opportunities to create streets that work as community spaces.

Community orientated streets

Implementing shared use spaces and home zones in the City of Knox where there is no local benchmark to follow, will require education and community capacity building. Shared space will be a new model for community and Council to embrace.

Pedestrian prioritisation in Activity Centres

Increasing pedestrianisation in activity centers areas sometimes requires a reduction in on-street car parking. This reduction should be managed in conjunction with wider precinct car parking strategies to ensure appropriate capacity is provided across the entire centre rather than being managed on a street by street scale.

Putting the 'nature' back into nature strips and gardens

The main challenges with this opportunity are:

- educating and promoting the benefits of planted nature strips, in particular indigenous and edible vegetation;
- ensuring that nature strips are planted in accordance with the proposed Nature Strips Policy; and,
- encouraging and supporting residents in maintaining their nature strips planting.

Public art in streets

Public art in streets is a vital process for including local culture and community groups into the broader community, and for commenting on the broader neighborhood.

The challenges with public art in streets are:

- ensuring it is not creating a driver or pedestrian safety problem; and,
- that it is well integrated into the street and the street's character. Public art can easily become 'plonk art' where the art is treated like an object and is not developed as an integrated component of the broader street design.

Gateways

Refer to the Economy of Streets section

GOAL

To increase community pride and action in Knox streets.

COMMUNITY PERSPECTIVES

City of Knox community consultation has revealed that:

- people value quiet green streets where it is easy to get to local facilities;
- people don't like speeding cars and traffic in residential streets;
- street trees are valued, but often cause problems;
- people like having trees and plantings in the street because they enhance the street character, provide habitat and support biodiversity;
- most people know their neighbours, but only a quarter get involved in activities in their street;
- of those who get involved, the most popular activities are football and cricket, riding bicycles and Christmas parties;
- many people walk to local facilities – shops and schools – but fewer cycle. Distance and time are seen as the barriers to walking and cycling, along with the lack of connecting footpaths; and,
- the most desired change to residential streets is improving and connecting footpaths, followed by better cleaning and maintenance, better plantings, better lighting and fewer cars.

ACHIEVING CHANGE

Vision

In local residential streets, communities use street space to create their own sense of place, shaping it with plants, art and activity.

In such streets neighbours meet, children play, people are active and involved. Everyone feels safe.

Goal

It supports the following ideas in *Vision 2025*:

- healthy, connected communities;
- culturally rich and active communities;
- sustainable natural environment; and,
- balanced quality urban development.

It is supported by the *Vision 2025* commitment to:

- partnering and engaging;
- innovation and excellence; and,
- social and environmental responsibility.

Approaches

1. Design streets to enable community activity
2. Support community initiatives in streets
3. Streets as places to produce, harvest and share food

Note: all actions need to contribute to consistent neighbourhood character

4.11 STREETS FOR THE COMMUNITY

ACHIEVING CHANGE

APPROACH 1 – Design streets to enable community activity

Action 1.1

Develop a priority list of achievable home zones in Knox based on current list provided by the *Pedestrian Plan (2005)*
See also Theme: Streets for Travel

Action 1.2

Based on community interest and willingness to participate, develop a prototype for a home zone
See also Theme: Streets for Travel

Action 1.3

Initiate community consultation of the green neighbourhood streets in identified priority suburbs. Green neighbourhood streets primary function is to increase community use of key streets in each Knox suburb

Action 1.4

Develop templates and toolbox that can be used by residents to develop ideas for enhancing the community capacity of their street

Action 1.5

Promote dog walking in neighbourhood streets. Dog walking promotes community socialisation and improves the mental and physical health of the community.

Refer to the *Knox Domestic Animal Management Plan*

APPROACH 2 – Support community initiatives in streets

Action 2.1

Work with community groups to establish local street and neighbourhood events focused on creating streets as community spaces

Develop a simplified process and checklist for the community

Action 2.2

Support and promote specific community based programs including 'Gardens for Wildlife', 'Mothers Living Well' and edible streetscapes

Council to provide training, modest resources, education and publications

Action 2.3

Identify potential opportunities for community art programs in local streets

Action 2.4

Develop a matching community grants program and guidelines which provides matching funding and resourcing to improve their street

GOAL

To increase community pride and action in Knox streets.

APPROACH 3 – Streets as places to produce, harvest and share food**Action 3.1**

Work with community groups and residential street groups to create edible streets and private edible gardens

Actions under other themes will also contribute to enhancing community spaces in streets.

COMMUNITY ACTIONS – Communities can contribute to this goal by:**Community Groups**

Develop a local community group of interested residents to work with Council to identify opportunities and to improve community spaces and activities in their streets

Community involvement in street design

Getting involved when their street is being redesigned, and working with stakeholders and Council to implement improvements

Community Newsletter

Develop a community newsletter of local activities

Initiate a local activity

In their street such as;

- Gardens for Wildlife
- Edible streetscapes
- Walking tour of edible gardens
- Walking tour of gardens for wildlife
- 'Walking pool system' with people in your street.
- Encourage a 'count the birds competition' in your street
- Develop a 'barter with your neighbours system' e.g. walk their dogs in return for lemons off their tree
- Run a garden competition in your street
- Parent supervised play groups in local playgrounds
- Adopt a street tree program

4.12 STREETS FOR INFRASTRUCTURE

Streets provide a network of infrastructure and services. Vital services such as power, gas and water supply, drainage, sewerage and telecommunications infrastructure are all located within the street reserve. These infrastructure services all need to be maintained and at times upgraded, and require access by their associated authorities.

Streets provide access for public and private services such as postal and other deliveries, collection of rubbish and recycling, emergency vehicles and street sweepers. Streets need to be designed to take into account the needs of such services.

Streets also contain 'travel' infrastructure: the roadway (for vehicles and cyclists), footpaths, and on-street car and bicycle parking areas.

Finding space for this range of infrastructure is a significant challenge, especially in older streets where the infrastructure has developed incrementally over many years.

Streets are not just for infrastructure. Finding space for trees, for example, is often constrained by the existing infrastructure, achieving a less than optimal outcome for residents and for infrastructure authorities. New approaches to integrated design are needed. The cycle of infrastructure renewal can provide opportunities for this to happen.

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

OPPORTUNITIES

- Introducing integrated water management.
- Designing for services and infrastructure.
- Integrating on-street car parking.
- Improving road and footpath assets.
- Coordinating an approach to trees and infrastructure.

CHALLENGES

- Providing WSUD or SQIUD treatments to traditional street design and construction will require support from the community and the provision of additional design resources compared to traditional street design projects.
- The location of underground and above ground services can severely limit opportunities to plant trees. This can limit the desired 'leafy and green' streetscape character.
- Education promoting nature strips as places not intended to be used for car parking.
- Working with limited budgets across the entire street network to achieve both safety and amenity works.



Mountain Highway at Bayswater – view to train level crossing. A street dominated by vehicles and services

APPROACHES

1. Improve the coordination of street design, works and maintenance between Council, state authorities and utility providers
2. Improve the coordination of street design, works and maintenance across Council
3. Improve the quality of street design
4. Make sustainability a priority for future infrastructure works
5. Ensure a balanced approach to on-street car parking

VISION 2025

This goal supports the following ideas in *Vision 2025*:

- dynamic services and facilities;
- sustainable natural environment; and,
- balanced quality urban development.

And it is supported by the Vision 2025 commitment to:

- innovation and excellence;
- effective governance;
- stewardship of finances and assets; and,
- social and environmental sustainability.

4.12 STREETS FOR INFRASTRUCTURE

MEASURE OF SUCCESS

- Powerline undergrounding priority plan by 2015
- Missing links footpaths built as per *Knox Pedestrian Plan* action list
- All new streets designed to enable optimum street tree growth

CURRENT PROGRAMS, PLANS AND POLICIES

- The following programs, plans and policies will help achieve this goal:
- Knox Integrated Transport Plan;
- Road Asset Management Plan;
- Footpath and Shared Path Asset Management Plan; and,
- Knox City Council Road Management Plan.

OPPORTUNITIES

This section looks at five specific opportunities that will help achieve a good balance between infrastructure and community. These are:

- introducing integrated water management;
- designing for services and infrastructure;
- integrating on-street car parking;
- improving road and footpath assets; and,
- coordinating an approach to trees and infrastructure.

Introducing integrated water management

Streets contain three water-related services: water supply, stormwater drainage and sewerage.

Water and sewerage infrastructure

Water supply and sewerage infrastructure systems are generally contained within the street reserve, often below the road pavement or nature strip.

Replacement and repair of these two services can impact on a street, especially when excavation or tree removal is required to access these services.

Planned programs of replacement and repair may create opportunities to improve service placement and other aspects of street design and layout. Emergency repairs do not offer this opportunity.

‘Over time the city infrastructure is renewed. This cycle takes approximately 75 years for a typical suburb, though inner city suburbs are being renewed at a faster rate of 35-40 years. This provides an opportunity to retrofit the built environment in an ecologically sustainable matter.’
(Melbourne Water, WSUD Case Studies)

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.



A street with a central swale to capture and clean the storm water from the carriageway, Springthorpe, Macleod

Using stormwater effectively

Managing stormwater effectively is the second component to integrated water management.

Rainfall on a street runs into the gutter and then into stormwater pipes below the street. From there, the stormwater is generally piped through 'drains' into the local creek system, and eventually into Port Phillip Bay.

New approaches to stormwater involve retaining and using this water locally, recognising that it is a valuable resource. These new approaches are generally referred to as 'water sensitive urban design' or WSUD.

Knox has recently begun promoting SQUID. SQUID stands for stormwater quality in urban design. In effect, Knox is saying that treating storm water should be an integrated, designed approach – not just insertions of rain gardens into streetscape works.

Water sensitive design can be incorporated into both existing and new streets and can, for example, redirect water to irrigate nature strips and street trees. WSUD actions are discussed under the Section 4.8 *Streets for the environment theme*.

Liveable streets harness stormwater by collecting, cleaning and using it for passive irrigation before releasing any excess back into the drainage network.

Stormwater drainage infrastructure requires regular maintenance and repair, and the upgrading of Knox's drainage capacity is planned to take place over the next ten years. Introduction of WSUD and other water management systems can help reduce the need for future stormwater capacity upgrades.

The table below compares construction costs of WSUD compared to conventional drainage design.

Comparison of WSUD and conventionally designed drainage works at Lynbrook Estate (based on a typical 160m length of road covering 7 lots). See the City of Knox's Water Sensitive Urban Design Guidelines (p29).

4.12 STREETS FOR INFRASTRUCTURE

OPPORTUNITIES

CONVENTIONAL DESIGN			
5 X side entry pits	@ \$	929.46/pit	= \$ 4,647.30
76 x 1m: 300 diameter drainage pipe	@ \$	45.87/1m	= \$ 3,486.12
60 x 1m: 375 diameter drainage pipe	@ \$	61.21/1m	= \$ 3,672.60
24 x 1m: 450 diameter drainage pipe	@ \$	71.39/1m	= \$ 1,713.36
7 x standard house drain to pipe	@ \$	227.11/hd	= \$ 1,589.77
160 x 1m kerb and channel	@ \$	26.74/1m	= \$ 4,278.40
7 x driveway lay backs	@ \$	141.94/lay back	= \$ 993.58
TOTAL			AUS \$ 20,381.13

WATER SENSITIVE URBAN DESIGN			
1 x swale side entry pit	@ \$	1400.00/pit	= \$ 1,400.00
24 x 1m: 300 diameter drainage pipe	@ \$	45.87/1m	= \$ 1,100.88
7 x swale house drain and pit	@ \$	766.50/hd&pit	= \$ 5,365.50
160 x 1m swale trench and turf	@ \$	26.09/1m	= \$ 4,174.40
160 x 1m kerb	@ \$	21.71/hd	= \$ 3,473.60
7 x swale lay back	@ \$	159.25/lay back	= \$ 1,114.75
64 m ² pavement	@ \$	18.21/m ²	= \$ 1,165.44
738 m ³ earthworks cut	@ \$	4.90/m ³	= \$ 3,616.20
TOTAL			AUS \$ 21,410.77

Table 5.1 Comparison between WSUD and Conventionally design Drainage works at Lynbrook Estate (based on typical 160m length of road covering 7 lots).
Source: Lloyd, Wong & Poter, 2000

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

Designing for services and infrastructure

Streets need to be designed so that services such as post and other deliveries, garbage and recycling collections, and emergency vehicles, can access every street easily and safely.

It is both important and necessary to clearly define the specific requirements of these services in order to facilitate good street design: typically this means defining minimum road dimensions, turning areas, and suitable grades.

Built infrastructure – pipes, cables, poles, signs, hydrants – distribute water, power, gas, and telecommunications services. Newly built streets typically have all these services underground, including electricity. Older streets typically have electricity and telecommunications services above ground.

The position of these services within the street reserve can limit the potential for nature strips, street trees and other vegetation. The best approach is to contain all services beneath the footpath or edge of carriageway, providing an area of nature strip within which street trees can grow unimpeded.

Clearance requirements for overhead lines also limit opportunities for tree planting. Undergrounding of electricity and telecommunications can enable planting of larger street trees, improving the street amenity.

Service authorities have the right to access their infrastructure for upgrading, maintenance and repair. This right needs to be recognised in street and infrastructure design. Where pavements and other surfaces need to be dug up, the usual approach is to 'make good' the pavement. Such an approach does not necessarily replace the pavement with identical material. Over time this can lead to an ugly, patchwork surface. Current legislation gives Council little control over the final outcome.

Lighting

Street lighting creates a safer environment. Good lighting design can help reduce energy use, improve the distribution of light, and reduce adverse impacts such as glare and spill-over light into adjoining properties. Retaining views of the night sky and accommodating the needs of nocturnal species are also important considerations for good lighting design.

Actions in relation to street lighting and the environment are addressed in *Streets for the environment* (Section 4.8).

Integrating on-street car parking

The effective integration of on-street car parking is critical. In each street, the road reserve needs to achieve a balance between the needs of vehicles, cyclists and pedestrians.

City of Knox community consultation revealed that people like the appearance of streets where there is no on-street parking. And yet some on-street parking is inevitable in residential streets, in retail areas and at transport nodes.

The safety of all street users needs to be considered in the design of on-street parking. For example, it is not desirable to have angled parking where there are on-road cycle lanes as it reduces cyclist safety. Council has endorsed a new *Indented Car Parking Policy*, that should be referred to for new guidelines.



Bus lane on Stud Road

4.12 STREETS FOR INFRASTRUCTURE

OPPORTUNITIES

Improving road and footpath assets

Our streets are constantly being maintained, upgraded and renewed. Asphalt is re-laid, kerbs replaced, footpaths and crossings installed. Ongoing maintenance of all of Council's road and footpath assets is essential to maintain quality, useability and to respond to increasing development intensity where and when that occurs.

Knox City Council is custodian of 707km of local roads comprising road surface, road pavement and kerb and channel assets, with a total replacement value of more than \$325 million (KCC, 2007), with additional streets being developed in the south-east of the municipality. The upkeep and upgrading of streets in Knox is a significant capital cost and represents 30% of Knox's total budget. Despite that expenditure, the current levels of funding only allow for 1.3% of the road pavement to be renewed annually, considerably less than the desirable replacement rate according to the Road Asset Management Plan.

Safety concerns determine priorities for capital works improvements to roads. Council has a series of asset management systems to ensure the safety of streets and pavements used by vehicles, bicycles and pedestrians.

Knox has approximately 1200km of footpaths. Generally, older suburban areas have wide road reserves and concrete footpaths on both sides of the road, semi-rural areas often have either no footpaths or just simple gravel paths, and new residential areas often have a footpath on one side of the road only. In addition there are around 70km of shared paths maintained by Knox within public reserves and along railway and creek corridors (David Lock and Ass., in association with PBAI, 2005)

Knox City Council has defined standards for managing footpaths, based on two classifications: footpaths that access commercial and retail places and footpaths that serve local residents and small businesses.

When major capital works are planned, the opportunity exists to introduce new integrated water management measures (WSUD), to review and replace street trees, to upgrade cycle and pedestrian infrastructure and to introduce new ideas such as home zones, pause points, edible streetscapes and more.

CLASSIFICATION	COUNCILS CURRENT APPROACH TO MANAGING FOOTPATHS
Footpaths that are commercial access routes	Undertake annual hazard inspections Programmed update for DDA compliance Encourage sealed pavements with low defect tolerances Service with paths on both sides of the road
Footpaths that are local access routes	Undertake hazard inspections Both sealed and unsealed surfaces are appropriate options It is appropriate to service low use areas either with paths on one or both sides of the road

Table 5.6.6 Council management of footpaths

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

Coordinated approach to trees and infrastructure

Streets and trees work together to provide a safe, healthy and high amenity environment.

Street trees should be chosen to maximize amenity benefits while ensuring no damage is caused to street infrastructure.

In the past, inappropriate street tree selection has caused some damage to infrastructure: for example clogged drains, cracking of pavement, kerbs and drainage systems, and excessive shedding of leaves or seeds on paths.

In new and upgraded streets, the street infrastructure should be designed to allow for the growth of the tree and its root system, so that the end result is a healthy mature tree and undamaged infrastructure.

Maintenance of street trees is essential to ensure healthy and well-formed trees. Such maintenance includes pruning and shaping, inspection, watering or irrigation, and the removal of tree litter and prunings.

Street trees can help improve the longevity of asphalt surfaces through providing shade. Sunlight accelerates asphalt's aging processes.

'No matter whether we consider arterial roads, rail corridors or even those bike corridors that exist, there is much to be said for an integrated plan of retrofitting that would optimise personal and vehicle safety, user convenience and aesthetic considerations'.
(Russell, 2007)

4.12 STREETS FOR INFRASTRUCTURE

CHALLENGES

There are some major challenges to re-balancing the needs of infrastructure and the community. These include:

- providing WSUD or SQUID treatments to traditional street design and construction will require support from the community and the provision of additional design resources compared to traditional street design projects;
- the location of underground and above ground services can severely limit opportunities to plant trees. This can limit the desired 'leafy and green' streetscape character;
- education promoting nature strips as places not intended to be used for car parking; and,
- working with limited budgets across the entire street network to achieve both safety and amenity works.

COMMUNITY PERSPECTIVES

City of Knox community consultation revealed that:

- street trees are regarded as valuable contributors to the quality of a street, but that in many instances trees also cause some problems;
- litter is an issue of concern, including litter from trees;
- wider, well-designed and well-maintained streets with no on-street parking are the most favoured;
- the amount and speed of traffic in residential streets is the most significant issue for most people;
- footpaths are strongly favoured and streets with a footpath on one side received negative comments; and,
- lack of an interconnecting footpath network was one barrier to walking to local facilities.



Shared space in Canberra with water sensitive urban design treatment gardens

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

ACHIEVING CHANGE

Vision

In streets for infrastructure, there is room for trees to grow amongst under ground services. All forms of movement are safely accommodated in the street and environmentally sensitive measures are integrated with infrastructure systems.

Goal

It supports the following ideas in *Vision 2025*:

- dynamic services and facilities;
- sustainable natural environment; and,
- balanced quality urban development.

It is supported by the *Vision 2025* commitment to:

- innovation and excellence;
- effective governance;
- stewardship of finances and assets; and,
- social and environmental sustainability.

Approaches

1. Improve the coordination of street design, works and maintenance between Council, state authorities and utility providers
2. Improve the coordination of street design, works and maintenance across Council
3. Improve the quality of street design
4. Make sustainability a priority for future infrastructure works
5. Ensure a balanced approach to on-street car parking. Refer to Councils indented car parking policy.

4.12 STREETS FOR INFRASTRUCTURE

ACHIEVING CHANGE

APPROACH 1 – Improve the coordination of street design, works and maintenance between Council, state authorities and utility providers

Action 1.1

Develop a priority plan for undergrounding of overhead power lines to improve visual amenity in main shopping streets and built up residential areas. Priority plan should be based on feasibility and value for money assessment

Action 1.2

Develop a priority plan for undergrounding of overhead power lines in fire hazard areas. This requires coordination with relevant authorities and subject to State Government review and Bushfire Royal Commission recommendations

Action 1.3

Coordinate between service authorities and Council's works programs to ensure works are undertaken in the best sequence

APPROACH 2 – Improve the coordination of street design, works and maintenance across Council

Action 2.1

Periodic reviews of all capital works to ensure best value for money and recommendations made to improve

Action 2.2

Ensure all works identified in the *Knox Road and Footpath* and *Shared Path Asset Management Plans* are reviewed on a yearly basis of with this *Plan*

APPROACH 3 – Improve the quality of street design

Action 3.1

Develop a priority street renewal plan incorporating the Liveable Street Design Guidelines where appropriate

Action 3.3

Build the missing footpath links identified in the *Knox Pedestrian Plan*

Action 3.2

Ensure maintenance principles and requirements inform the design process and final physical outcomes

Action 3.4

Ensure consistency of speed control measures and other road treatments across the municipality

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

APPROACH 4 – Make sustainability a priority for future infrastructure works**Action 4.1**

Design of new streets must incorporate all requirements such as road widths and adequate nature strip width for required trees. A holistic approach to the design process

Action 4.2

Facilitate the consideration of integrated water managing systems (ie SQUID and WSUD) in all new and retrofitting streetscape works. Refer to draft *Knox WSUD Plan*

APPROACH 5 – Ensure a balanced approach to on-street car parking**Action 5.1**

Ensure the design and location of on-street car parking is responsive to the needs of pedestrians and cyclists and the space requirements for street tree and nature strip planting. Refer to Knox Planning Policy in regards to car parking requirements on streets

Actions under other themes will also contribute to promoting safe street streets.

COMMUNITY ACTIONS – Communities can contribute to this goal by:

Reporting promptly any issues with their street to Council

Work with Council in the maintenance of their streets. For example 'adopt a street tree program' and mowing their nature strip



5

LIVEABLE STREETS DESIGN GUIDELINES

This section contains guidelines for the design of new and existing streets. The guidelines are separated into street types based on the street categories of the *Knox Road Asset Management Plan*.

The guidelines are in text and illustrative form with before and after sections to illustrate the designs.

Refer to Section 6 *Implementation* for the implementation process and action plan.

5.1 MANAGEMENT & STREET TYPES IN KNOX

The streets of Knox are managed by two main authorities, VicRoads and Knox City Council. Within the City of Knox various departments work together to plan, build, maintain and manage the streets.

VICROADS MANAGED STREETS

VicRoads manages all the main streets throughout Knox City. In these instances the City of Knox is a stakeholder and works with VicRoads to provide safe and amenable road environments.

VicRoads streets include:

Declared highways:

- Burwood Highway;
- Dandenong Valley Highway (Stud Road)
- Burwood Highway to Dandenong Creek;
- Monash Highway (Wellington Road)
–Dandenong Creek to Stud Road

Declared Main Roads within the City of Knox are as follows:

- Stud Road
- Croydon Scoresby Road
- Dorset Road
- Boronia Road
- Ferntree Gully Road
- High Street Road
- Kelletts Road
- Lysterfield Road
- Napoleon Road
- Wantirna Road
- Wantirna-Sassafras Road (Mountain Highway)
- Wellington Road

CITY OF KNOX MANAGED STREETS

The streets managed by the City of Knox can be described as all streets within the municipality other than privately owned roads and those managed by VicRoads.

Legend

- City of Knox Boundary
- East Link
- VicRoads

Knox City Council Streets

- Link Road
- Collector Road
- Industrial Road

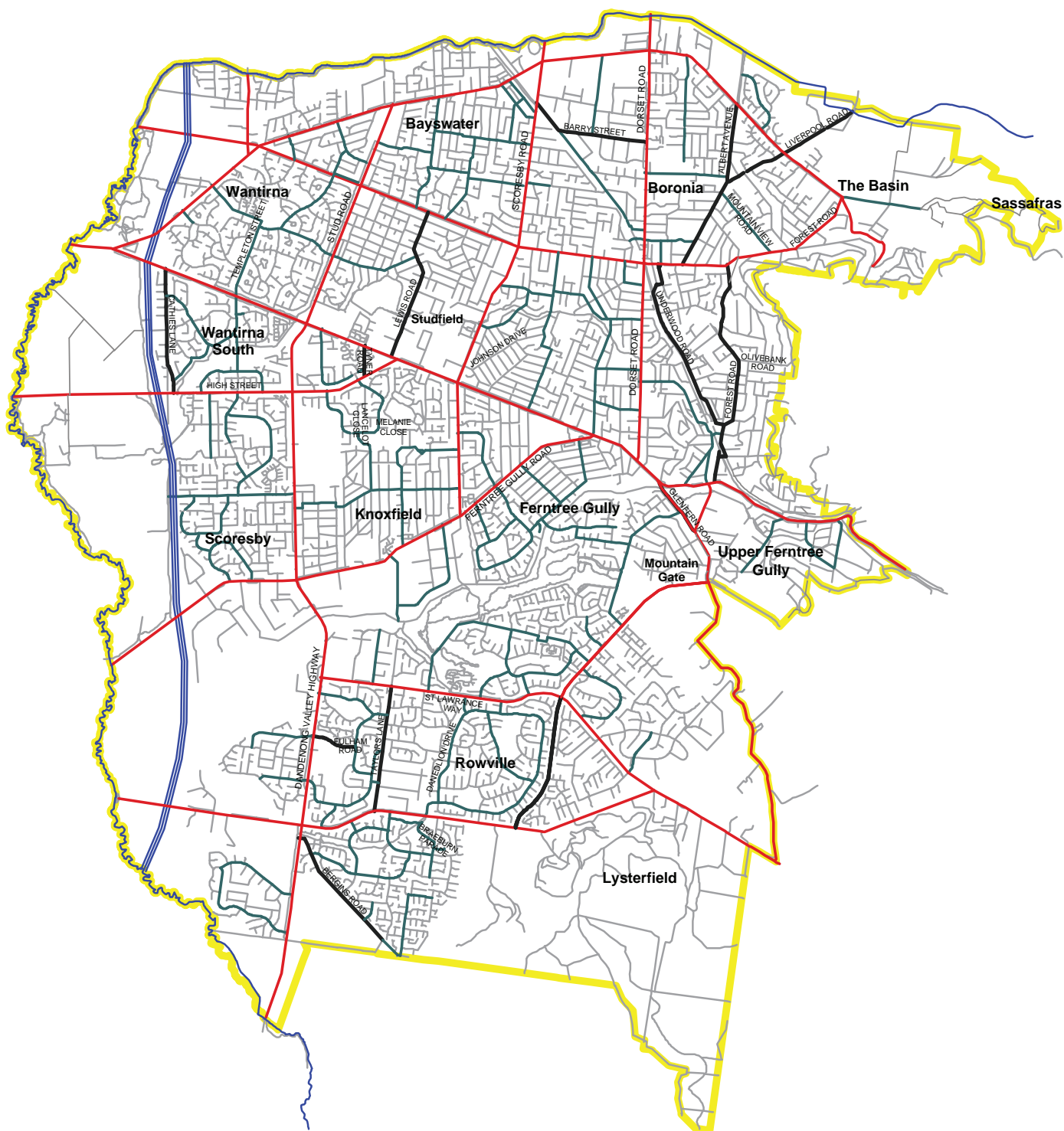


Figure 1: Map of VicRoads and Council Streets and Asset Management Hierarchy

5.1 MANAGEMENT & STREET TYPES IN KNOX

PROPOSED STREET TYPES HIERARCHY

The proposed street type hierarchy builds on the Road Asset Management Hierarchy and the Knox Urban Design Framework 2020, by addressing all scales of streets within the municipality.

The Knox Urban Design Framework 2020 recommends major street types:

- Dandenong Gateways;
- Bush Boulevards;
- Principle Avenues; and
- Path into the Hills

This Plan builds on these types by including:

- Community Link Streets;
- Neighbourhood Green Streets;
- Industrial Streets;
- Shopping Streets;
- Residential Foothill Streets;
- Residential Bush Suburb Streets;
- Residential Garden Suburb Streets;
- Residential Garden Court or Villa Court Streets; and
- Residential Home Zones Streets.

These street types reflect on the six character areas within the city, as identified by the City of Knox Neighbourhood Character Study (1999) and subsequent guidelines in the Knox Urban Design Framework 2020.

Legend

- City of Knox Boundary
- Principle Avenues
- East Link
- Dandenong Creek Gateways
- Bush Boulevards
- Paths into the Hills
- Community Link Streets
- Neighbourhood Green Streets
- For the following streets, refer individual maps
- Industrial Streets
- Shopping Streets and
- All Home Street types



Figure 2: Proposed Street Types Hierarchy

5.1 MANAGEMENT & STREET TYPES IN KNOX

PROPOSED STREET HIERARCHY

Type	Streets	City of Knox Road Asset Management Plan Category	Owner/ Authority	Posted Speed Limit Traffic
Freeways	Eastlink	Declared state highways	Eastlink	100km/h
Bush Boulevards	Stud Road Monash Highway (Wellington Road) Ferntree Gully Road Burwood Highway Boronia Road Mountain Highway	Declared state highways and main roads	VicRoads	60-80km/h
Dandenong Creek Gateways	Boronia Road Burwood Highway Fern tree Gully Road Wellington Road Stud Road	Declared state highways and main roads and others	VicRoads	60-80km/h
Principal Avenues	Kelletts Road Napoleon Road Dorset Road High Street Road Scoresby Road Wantirna Road Albert Avenue Colchester Road Liverpool Road	Declared state highways and main roads Link roads	VicRoads City of Knox	50-80km/h 50-80km/h
Paths into the Hills	Mountain Highway Boronia Road / Forest Road Burwood Highway (east of Dorset Road) Wellington Road (east of Kelletts Road)	Declared state highways and main roads and others	VicRoads	50-80km/h

Type	Streets	City of Knox Road Asset Management Plan Category	Owner/ Authority	Posted Speed Limit Traffic
Community Link Streets	Bergins Road Taylors Lane Napoleon Road Fulham Road Glenfern Road Forest Road Underwood Drive Lewis Road Tyner Road Barry Street Cathies Lane	Link roads	City of Knox	50-80km/h
Neighbourhood Green Streets		Collector roads	City of Knox	50-60km/h
Industrial Streets		Industrial roads	City of Knox	50-60km/h
Shopping Streets	Fulham Road (Link Road) Braeburn Parade St Lawrence Way Any other street in which a commercial or retail focus occurs.		City of Knox	50-80km/h
Residential Foothills		Access roads and unsealed roads	City of Knox	40km/h
Residential Bush Suburbs		Access roads	City of Knox	40km/h
Residential Garden Suburb		Access roads	City of Knox	40km/h
Residential Garden Court or Villa Court		Access roads	City of Knox	40km/h
Residential Home Zones		Access roads	City of Knox	40km/h

5.2 LIVEABLE STREETS CHECKLIST

This checklist should be used to guide and assess the quality of all street projects, from large scale highway works to small scale residential streetscapes. The checklist should be filled out by the project officer and be reviewed by all associated cCouncil departments.

PLANNING PRINCIPLES	COMPLIANCE
<p>Community consultation Appropriate community consultation in the planning, design and construction of the project has and will be taking place.</p>	<input type="checkbox"/>
<p>Intra-Council consultation The project has involved the collaboration or review of all other relevant Council departments.</p>	<input type="checkbox"/>
<p>City Development</p> <ul style="list-style-type: none"> • Open Space and Landscape Design • Urban Design • Arborists • Sustainability <p>Engineering & Infrastructure</p> <ul style="list-style-type: none"> • Traffic Planning • Asset Management • Maintenance <p>Community services</p> <ul style="list-style-type: none"> • Community Wellbeing • Access and Equity • Community Safety • Arts and Culture 	<input type="checkbox"/>
<p>Community Participation Is this project a possible candidate for community involvement? Have the community been encouraged to participate and initiate street design activities?</p>	<input type="checkbox"/>

DESIGN PRINCIPLES	COMPLIANCE
<p>Inclusive design People are placed at the heart of the design so that no one person or function dominates the street design process. Integrate the widest range of people and functions into the street design. Design of the streets to encourage social interaction.</p>	<input type="checkbox"/>
<p>Accessible design The street is accessible to all types of people.</p>	<input type="checkbox"/>
<p>Safety for pedestrians The safety of pedestrians is paramount.</p>	<input type="checkbox"/>
<p>Appropriate vehicle speeds The design promotes reduced vehicle speeds.</p>	<input type="checkbox"/>
<p>Carriageway width The appropriate minimum carriageway width is chosen –ie. the carriageway width should be no wider than required.</p>	<input type="checkbox"/>
<p>Integrated water management A holistic view of water management in the project. On-street water sensitive urban design treatments where possible.</p>	<input type="checkbox"/>
<p>Street trees Street trees are to be appropriate (ie to consider habitat, shade, height, soil conditions) and the maximum number are to be planted. (Refer to <i>Action Plan</i>. Council to develop a street tree selection tool.</p>	<input type="checkbox"/>
<p>Nature strips Investigate alternatives to grass such as indigenous vegetation, amenity planting and edible plants.</p>	<input type="checkbox"/>

5.2 LIVEABLE STREETS CHECKLIST

DESIGN PRINCIPLES	COMPLIANCE
<p>Local character The street design is to be sympathetic to local character.</p>	<input type="checkbox"/>
<p>Footpath width Footpath width is to be appropriate for existing and potential foot traffic.</p>	<input type="checkbox"/>
<p>Maintenance and longevity Consider materials for ease of maintenance and improved longevity.</p>	<input type="checkbox"/>
<p>Provision for access Provide only minimum provision for vehicles access and car parking.</p>	<input type="checkbox"/>
<p>Public art Consider opportunities for public art in the streetscape design.</p>	<input type="checkbox"/>
<p>Clutter The street is to have minimal road-related signage and wayfinding signage is to be kept clear and simple.</p>	<input type="checkbox"/>
<p>Standards and legislative requirements Ensure all works comply with Australian Standards and associated standards as per Road Management Act.</p>	<input type="checkbox"/>
<p>Service coordination Ensure design and works are coordinated with all service authorities.</p>	<input type="checkbox"/>
<p>Maintenance Consider the maintenance of the street, nature strip planting, street trees and infrastructure.</p>	<input type="checkbox"/>

5.3 GENERAL GLOSSARY FOR DESIGN GUIDELINES

TERM	MEANING
Approach sight distance	The distance required for a driver to perceive markings or hazards on the road surface and to stop.
Car stopping sight distance	The distance required for a car driver to perceive an object on the road and to stop before striking it.
Crossfall	The slope at right angles to the alignment of the surface of any part of a carriageway.
Design speed	The speed adopted for the design of each element of the road.
Grade	The rate of longitudinal rise or fall of a carriageway with respect to the horizontal, expressed as a percentage.
High speed road	A road with off-peak operating speeds in the range 90-110km/h.
Hinge Point	The point on the cross section about which the pavement is rotated for superelevation development.
Intermediate speed road	A road with off-peak operating speeds in the range 70-90 km/h.
Low speed road	A road with off-peak operating speeds below 70 km/h.
Nature strip	Strip of land planted with grass or shrubs, or grassed strip of land between the front boundary of a residential block and the edge of the road.
Profile	The shape of a pavement surface measured in a vertical plane, along a specified horizontal alignment.
Road reserve	The road reserve includes the road, nature strip, and footpath.
Safe intersection sight distance	The distance required for a driver on a major road to observe a vehicle entering from a side road, and to stop before colliding with it.
Tree reserve	The area of a verge reserved for trees.
Verge	The cleared level space bordering the edge of a sealed road, or a grassed strip of land between the front boundary or a residential block and the edge of the road.

5.4 GENERAL GUIDELINES

The general guidelines are elements that are common to all street types. These items have been listed here for clarity, and to avoid repetition.

COMMUNITY INVOLVEMENT

The community is encouraged to be a participant in the activation and design of streets.

Refer to *Section 6 Implementation for community actions*.

MATERIAL SELECTION AND MAINTENANCE

Material selection is a key element in all street types. Materials will need to respond to character types of areas and surrounding function.

All materials should consider their sustainability, lifecycle, use, maintenance and availability.

New technology can be tested in streets by Council. These items could include emerging sustainable technologies such as road bumps that produce energy.

Other sustainable technologies should be phased into all streets once reliability and maintenance strategies have been addressed. These include solar lighting, permeable pavements and e-crete.

SERVICE AND INFRASTRUCTURE REQUIREMENTS

Service and infrastructure maintenance requirements need to be accounted for in all street design and material selection.

- Adequate space for vehicles to move through and turn around where necessary should be included from the outset.
- Busses, emergency vehicle access, street sweepers, rubbish trucks and waste collection are amongst critical service vehicles that need regular access across all street types.

SIGNAGE

- Prevent the intrusion of advertising signs into key view lines, green open space and valued creek valleys.

LIGHTING AND POWER (COMMON GUIDELINE)

- Control glare and light spill of light sources
- Place all new and, where possible, existing power and communications cables underground.
- Ensure that all pedestrian paths are lit.

WSUD AND SQUID

Water sensitive urban design and stormwater quality in urban design.

- Install appropriate WSUD treatments.
- Meet best practice for holding water.
- Designed in conjunction with Melbourne Water.

DESIGNED TO PASSIVELY IRRIGATE ALL VEGETATION.

- Where WSUD and guard rails are present, ensure the guard rail is on the kerb edge to allow safe maintenance to WSUD behind guard.
- Utilize permeable paving adjacent to significant trees when constructing streets.

GUARD RAILS AND WIRE ROPE

- Where WSUD and guard rails are present, ensure the guard rail is on the kerb edge to allow safe maintenance to WSUD behind guard.
- Guard rail and wire rope have different structural and material make-up. Consideration should be given to the amount of deflection required and the possibility of screening guardrail with vegetation.

REDEVELOPMENT OF RESIDENTIAL AREAS

- Encourage redevelopment of residential properties to be orientated to address the street frontage.
- Encourage visual interaction between the street and front gardens. E.g. no or low front fences.
- Encourage the vegetation of nature strips with Council guidance of plant and material types.

SPEED SLOWING DEVICES

Devices such as speed humps installed to slow vehicles needs to be constant across areas to streamline design for vehicles and maintenance.

PLANS AND POLICIES

Refer to relevant structure plans including the Boronia Structure Plan, Bayswater Activity Centre and the Mountain Gate Structure Plan.

Refer to relevant strategies and policies as noted throughout this Plan.

INDENTED PARKING

The community place great importance on the value of the nature strip as it makes a significant contribution to Knox's 'green and leafy' image. As such indented parking should only be considered where there is a significant net community benefit such as the provision of on-streets cycle lanes as shown in the following figure. Existing street trees and planting should not be removed for indented car parking.

5.5 DANDENONG CREEK GATEWAYS

AUTHORITY

VicRoads

STREETS

Boronia Road
Burwood Hwy
Ferntree Gully Road
Wellington Road
Stud Road

DESCRIPTION

Dandenong Creek Valley is a broad corridor of green space, separating Knox from adjoining suburbs. As the major streets listed above pass over the valley, this view forms the gateway to the municipality.

GOALS

- To maximise the visual landscape impact of the Dandenong Valley at Knox's entrances.
- To welcome residents and visitors to the City of Knox through its unique geographical location and character.



Dandenong Gateways are located along the Dandenong Creek Corridor

Legend

- Dandenong Creek gateways



Figure 3: Location of Dandenong Creek gateways

5.5 DANDENONG CREEK GATEWAYS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Provide 'transparent' (wire rope) balustrades on bridges to maintain views across the creek corridor.
- Where possible, provide a landscape buffer between vehicle movement and footpaths to improve pedestrian amenity.

Cycle Infrastructure

- Promote on-road bicycle lanes in conjunction with VicRoads to provide safe and direct travel corridors for cyclists.

Sightlines

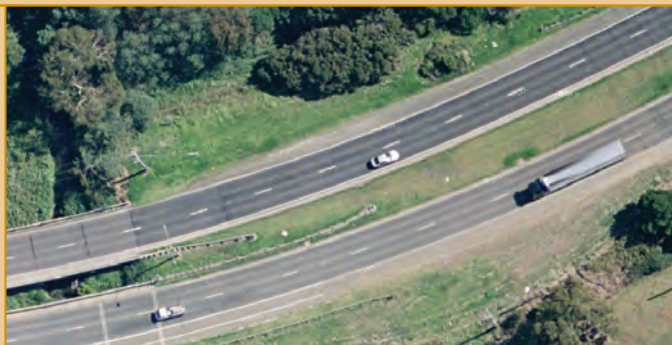
- Where possible protect view lines into the adjacent or surrounding open space and creek lines, which are Council's visual landmark and gateway into the municipality.

Vegetation

- Integrate the landscape character of the Dandenong Creek corridor into the planting and road design.
- VicRoads safety offset zones may restrict the proximity of planted vegetation to the road. Therefore utilise adjacent open spaces to achieve desired effect.
- Retain and protect indigenous trees and plant new indigenous vegetation including canopy trees.
- Do not plant trees in formal rows –instead respond to naturalistic characteristics of the creek.
- Understorey material must enable clear views.

Water Sensitive Urban Design

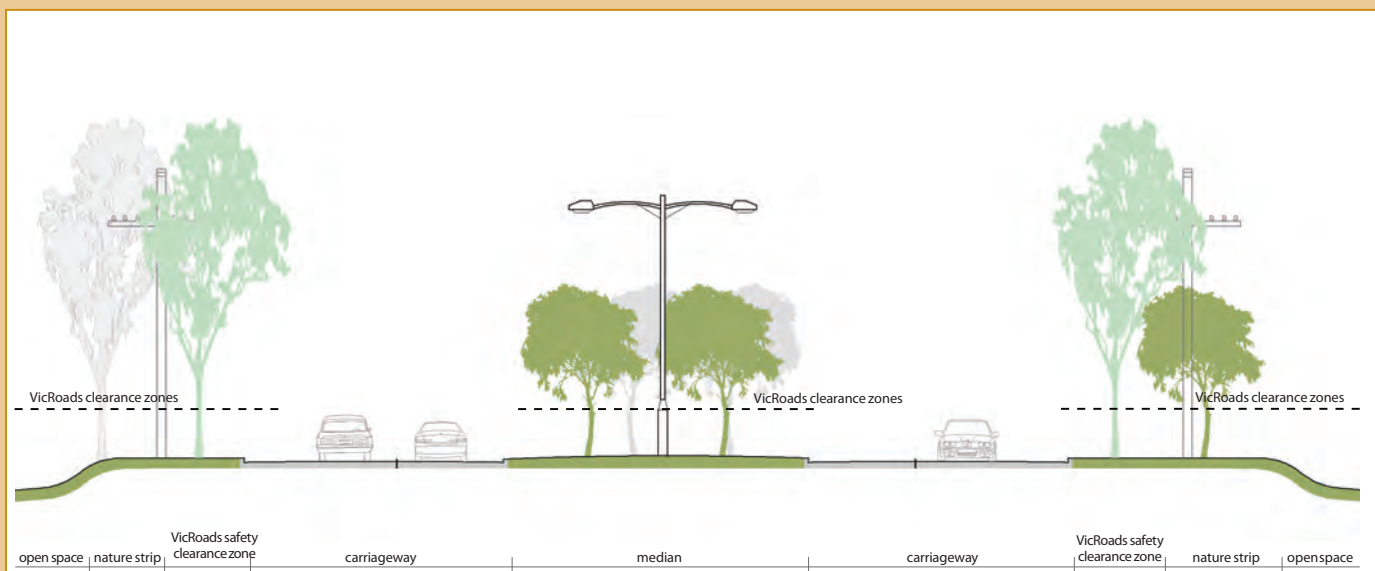
- Install WSUD features along roads to ensure that water is treated before it enters the creek system.



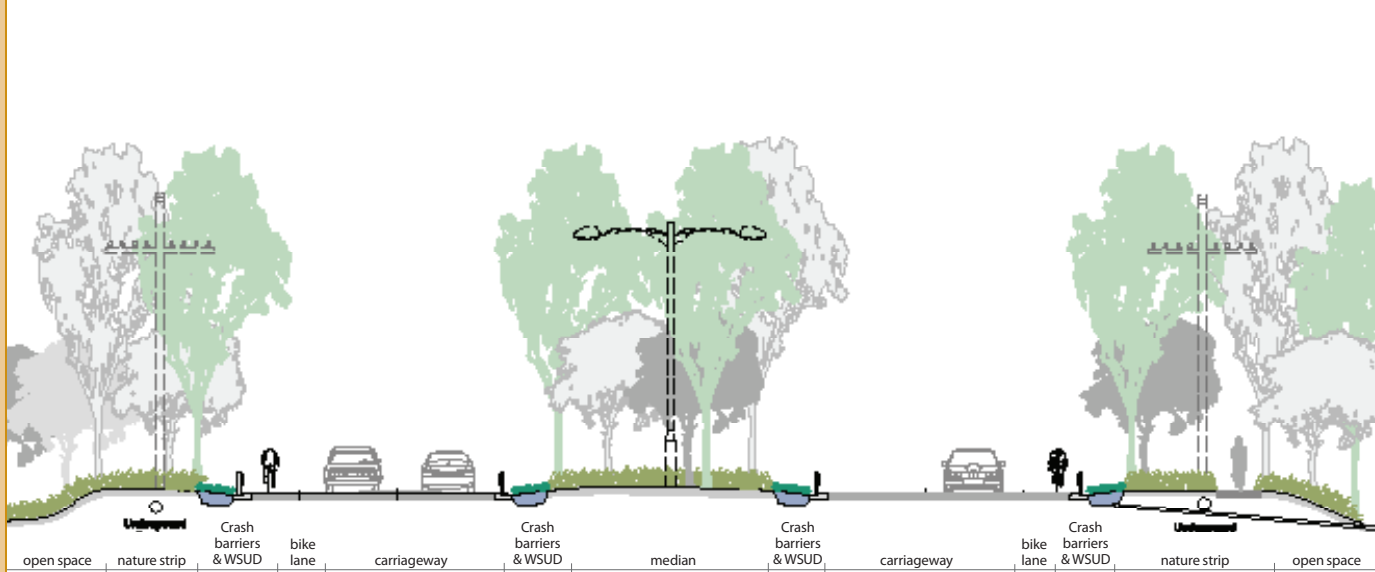
Ferntree Gully Road



Ferntree Gully Road



Typical cross-section of existing gateway.



Proposed cross-section of gateway.

5.6 BUSH BOULEVARDS

AUTHORITY

VicRoads

STREETS

Stud Road
Monash highway (Wellington Road)
Ferntree Gully Road
Burwood Highway
Boronia Road
Mountain Highway

DESCRIPTION

Knox's bush boulevards are arterial roads which all run east-west with the exception of Stud Road which runs north-south. They are usually three lanes wide in each direction, dual carriageway and with a wide road reservation.

GOALS

- To create a visually appealing corridor that expresses the transition in landscape character from that of the edge of the suburbs to that of the Dandenong Ranges foothills.
- To establish recognisable streets for orientation and community pride in its municipality
- To provide amenable major traffic routes throughout the municipality.



Boronia Road

Legend

- Bush boulevards
- Path into the hills



Figure 4: Location of bush boulevards (and their continuation as paths into the hills)

5.6 BUSH BOULEVARDS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Develop shared paths in vegetated road reserves to provide pleasant and direct travel corridors for pedestrians and cyclists.
- Connect pedestrian networks (footpaths and shared paths) from bush boulevards into the surrounding streets.
- Implement consistent bus shelters and seating across the municipality.

Crossovers

- Promote shared driveways and access points onto main roads to reduce the number of access points.

Cycle Infrastructure

- Establish on-road bicycle lanes in conjunction with VicRoads to provide safe and direct travel corridors for cyclists.
- Where possible provide shade for shared paths.

Signage (common)

- Prevent the intrusion of advertising signs into key view lines (Refer planning policy)

Commercial Development

- Create a distinguishable edge for activity centres through formalised plantings of understorey vegetation, furniture and quality pavements. (Refer place management)

Redevelopment of residential areas

- Encourage redevelopment of residential properties to be orientated to address the roadway frontage. This may require negotiation with VicRoads and the installation of service roads.
- Screen residential backs or inappropriate development with tree and shrub planting.
- Refer planning policy

Vegetation

- Retain and protect indigenous trees and plant new indigenous vegetation including canopy trees and understorey species.
- Utilise clean-trunked trees that enable views to commercial sites and greater road safety.
- Where powerlines prevent large trees, plant formal rows of small trees under or beside power easements.

VicRoads Regulations

- Work with VicRoads on each landscape master plan and design to ensure safety offsets are met.
- Negotiate with VicRoads to maximise the amount of available area for planting and tree planting, through use of guard rails. Preference should be for wire rope rails as these provide a higher quality visual character.



Indicative images showing how a bush boulevard might look, with increased bicycle connections and additional planting.

Typical changes in width and adjacent land uses for a bush boulevard.
 Ferntree Gully Road is here used as an example.



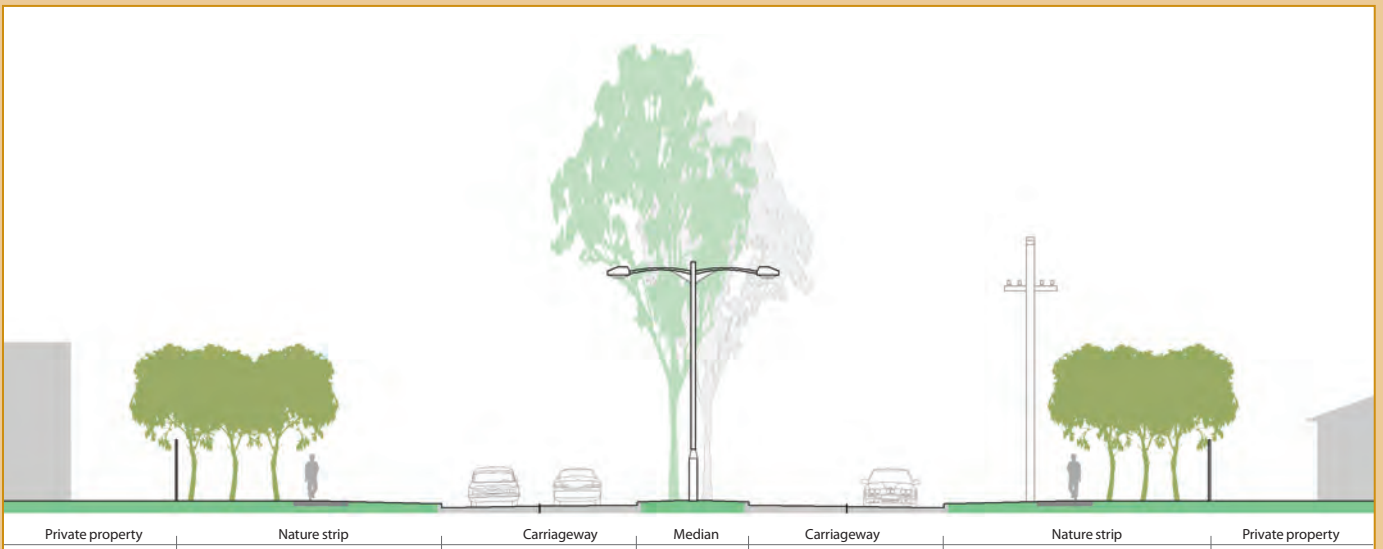
Commercial



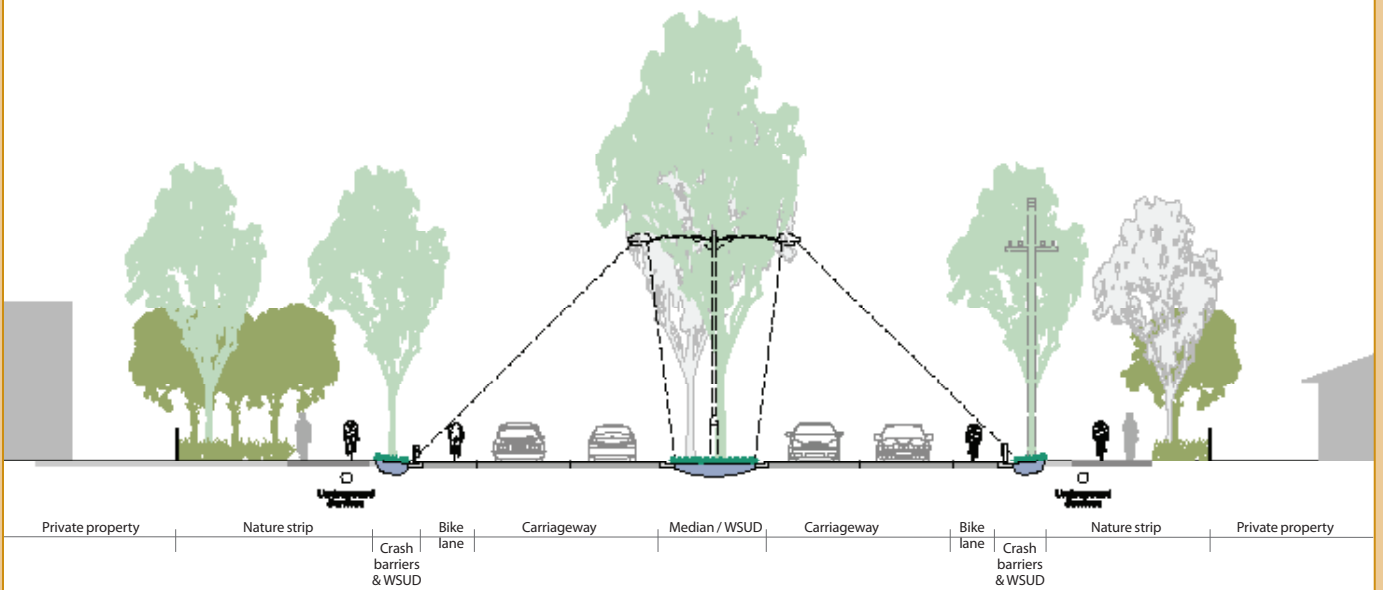
Residential



Foothills



Typical cross-section of existing dual carriageway bush boulevard.



Proposed cross-section of dual carriageway bush boulevard.

5.6 BUSH BOULEVARDS

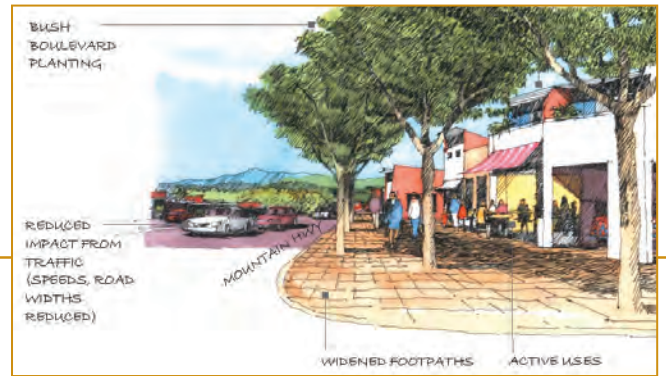


Image from *The Pedestrian Plan* (2005)

Bush boulevards are well developed along Mountain Highway. The exotic trees of the central median in general do not fit the street type, however in this instance they do not detract from the overall concept.



Mountain Highway

This is a good example of the challenges in creating bush boulevards in activity centres and shopping strips. The nature strip and medians are very narrow, there is extensive infrastructure and many access points to be incorporated.



Mountain Highway at Bayswater

Planting distances no longer supported by VicRoads guidelines. Future tree plantings will either be required to be 8m back from the road, or crash barriers will have to be installed.

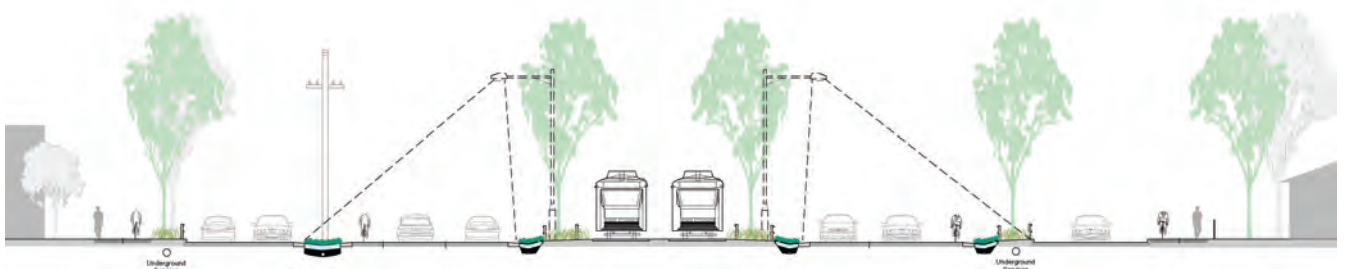


Boronia Road

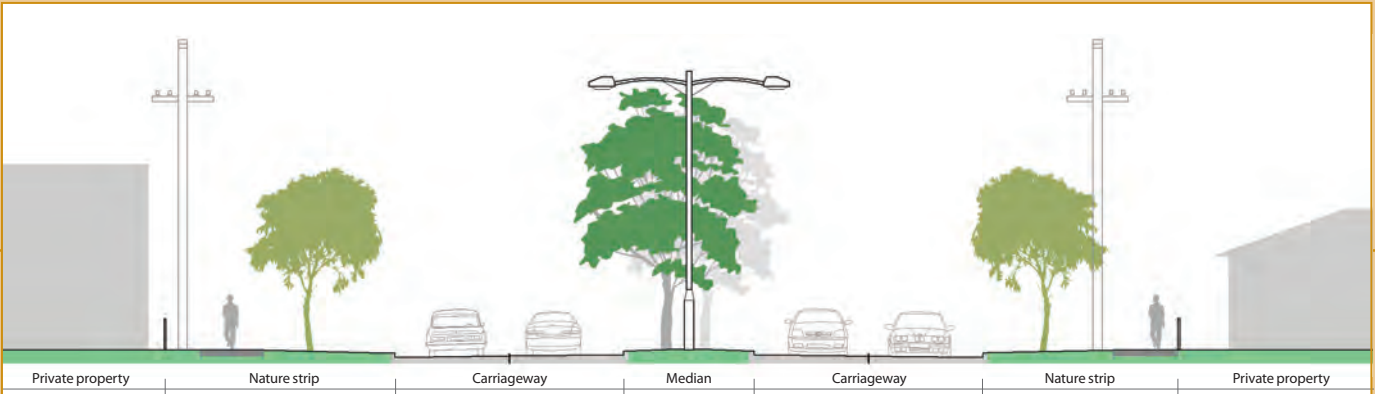
Stud Road is the only north-south oriented bush boulevard. Many parts of Stud Road have only limited street planting.



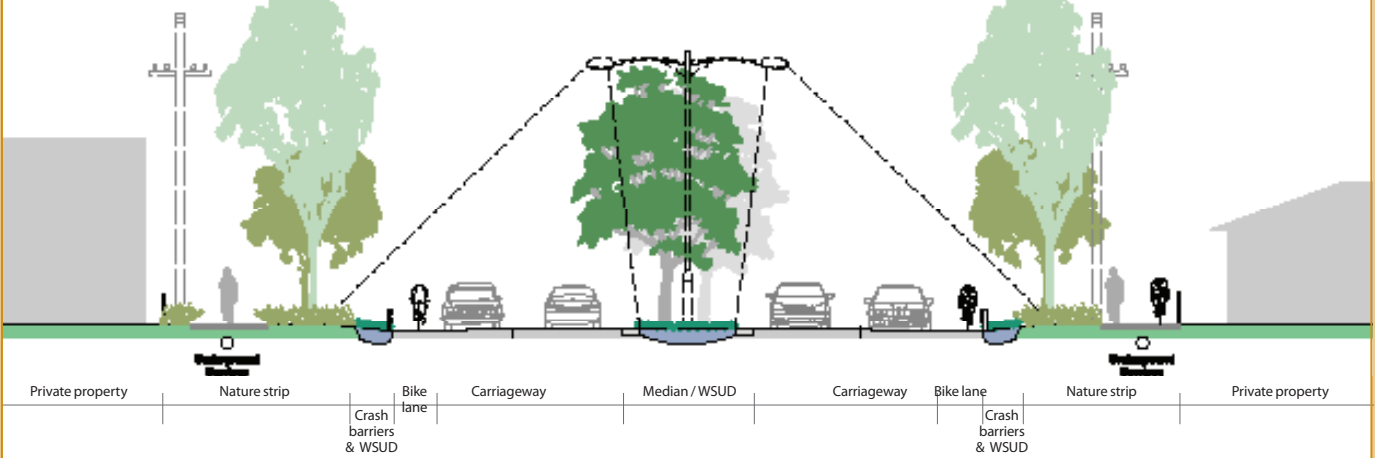
Stud Road



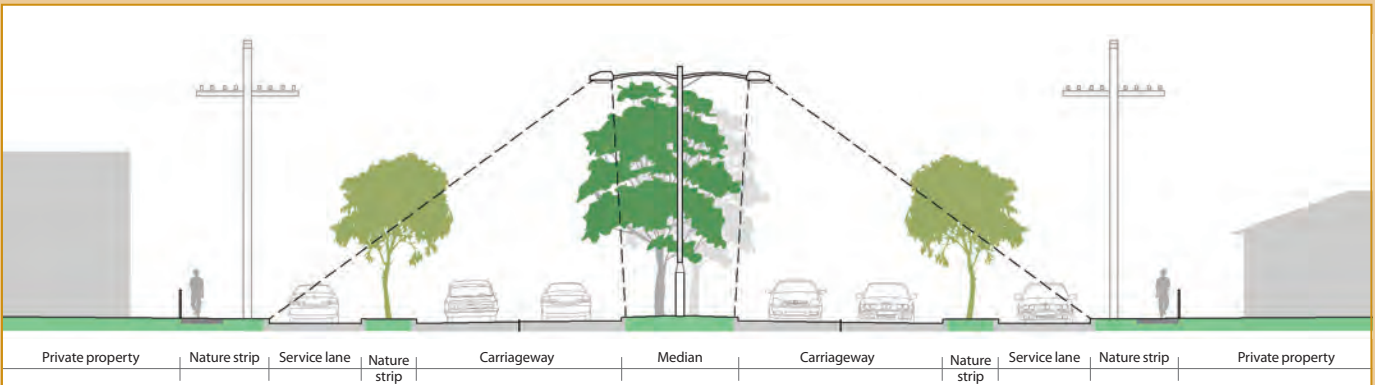
Indicative proposed cross-section – including potential tram extension to Knox City.



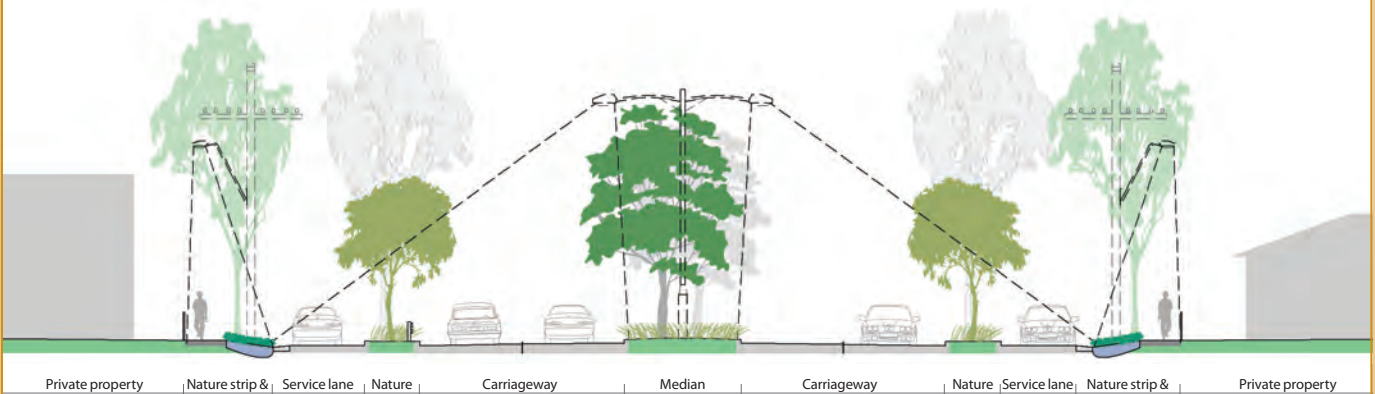
Typical cross-section of existing dual carriageway bush boulevard in commercial and residential area.



Proposed cross-section of dual carriageway bush boulevard in commercial and residential area.



Typical cross-section of existing dual carriageway bush boulevard with service lane in commercial and residential area.



Proposed cross-section of dual carriageway bush boulevard with service lane in commercial and residential area.

5.7 PRINCIPAL AVENUES

AUTHORITY

VicRoads and Knox City Council

STREETS - VICROADS

Kelletts Road
Napoleon Road (North of Kelletts Road)
Dorset Road

High Street Road
Scoresby Road
Wantirna Road

STREETS – KNOX CITY COUNCIL

Albert Av
Colchester Road
Liverpool Road
Napoleon Road (South of Kelletts Road)

DESCRIPTION

Principal avenues are major roads that usually have two lanes in each direction and are usually single carriageway (no central median), with a narrow easement.

GOALS

- To achieve consistent avenue planting along all main roads to enhance Knox's leafy green image and provide better amenity for pedestrians, cyclists, traffic commuters and residents.
- To establish recognisable streets for orientation and community pride in its municipality.
- To provide high amenity secondary traffic routes throughout the municipality.



Kelletts Road, a Principal Avenue

Legend

- Principal Avenues - VicRoads
- Principal Avenues - Council

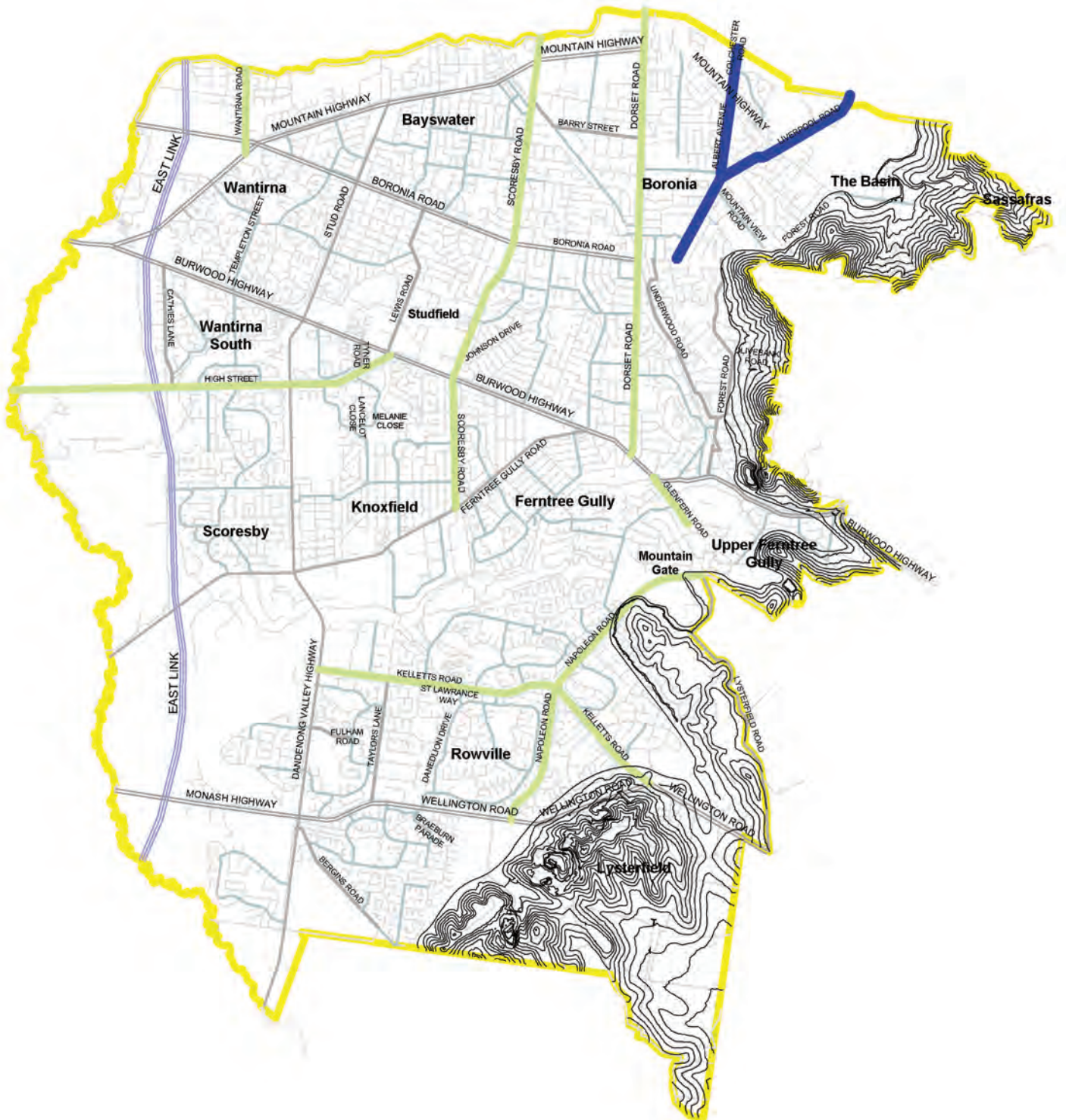


Figure 5: Location of Principle Avenues

5.7 PRINCIPAL AVENUES

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Improve paths in vegetated road reserves and nature strips, to provide pleasant environment for pedestrians.
- Connect pedestrian networks.
- Implement consistent bus shelters and seating along roads.
- Provide safe crossing points.

Cycle Infrastructure

- Establish on-road bicycle lanes in conjunction with VicRoads to provide safe and direct travel corridors for cyclists. It may be necessary to widen some carriageways to allow for dedicated bike lanes on road.
- Where possible develop an off-road shared path system.
- Cross reference with the pedestrian plan

Crossovers

- Minimise the number of driveways and access points onto main roads

Commercial Development

- Create a distinguishable edge for activity centres through understorey planting and furniture.

Redevelopment of Residential Areas

- Encourage redevelopment of residential properties to be orientated to address the roadway frontage. This may require negotiation with VicRoads and the installation of service roads.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees to form consistent avenues where possible.
- Plant suitable small trees in formal rows adjacent to, or beside, power easements.
- Utilise clean trunked trees that enable views to commercial sites and greater road safety.
- Install understorey vegetation to provide visual barriers to traffic from residential frontages.

VicRoads Regulations:

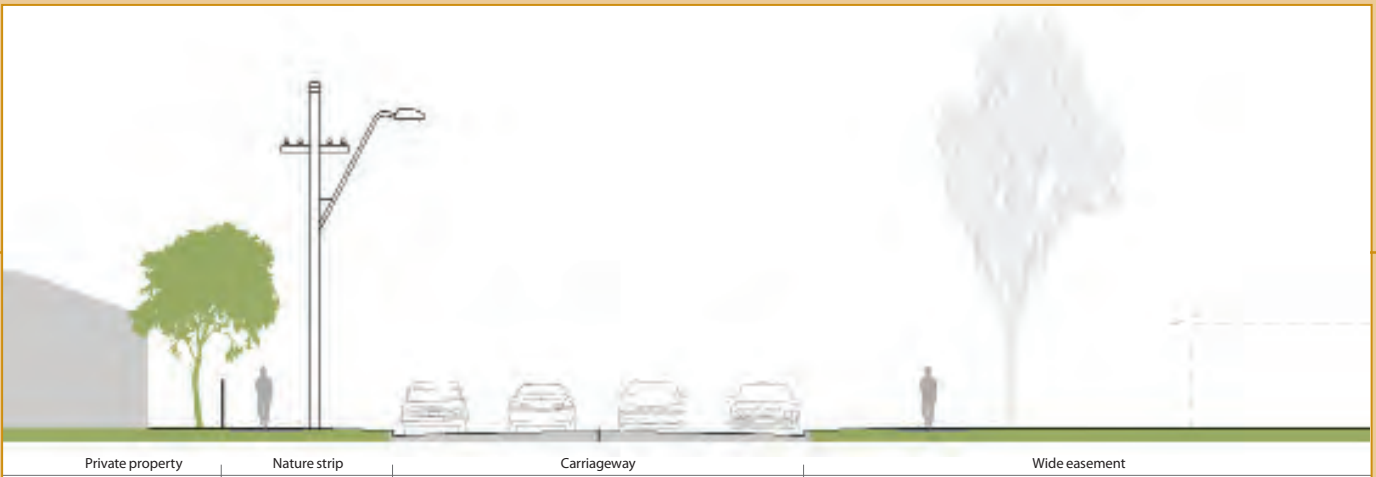
- Work with VicRoads on each landscape master plan and design to ensure safety offsets are met.
- Negotiate with VicRoads to maximise the amount of available area for planting and tree planting, through use of guard rails. Preference should be for wire rails as these provide a higher quality visual character.



Napoleon Road, a Principal Avenue in Knox



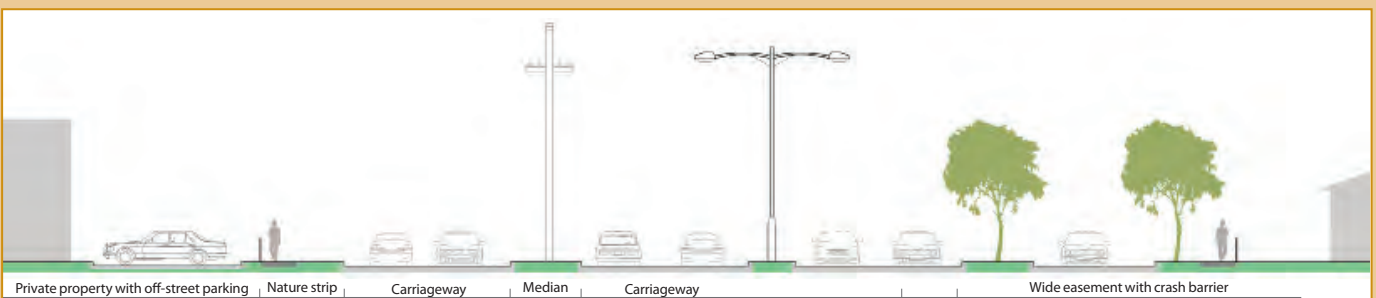
Wellington Road – Monash City Council - a good example of consistent tree planting



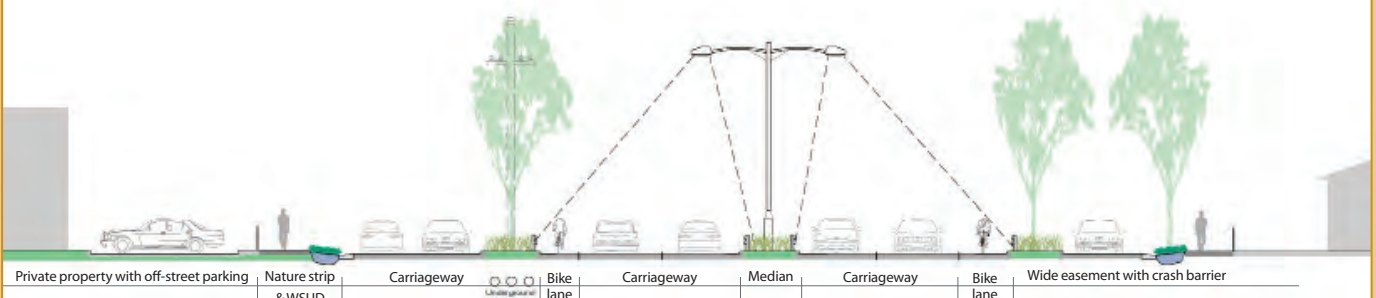
Typical cross-section of an existing residential, principle avenue with a wide easement.



Proposed cross-section of a residential, principle avenue with a wide easement.



Dorset Road: cross-section of existing road with service lane, in a commercial and residential area.



Dorset Road: proposed Cross-section with service lane, in a commercial and residential area.

5.8 PATHS INTO THE HILLS

AUTHORITY

VicRoads

STREETS

Mountain Hwy
Boronia Road
Forest Road
Burwood Hwy (east of Dorset Road)
Wellington Road (east of Kelletts Road)

DESCRIPTION

Paths into the Hills are main roads which connect the suburban areas to the Dandenong Foothills. They have a single carriageway usually with one lane of traffic in each direction. Adjacent roadside verges contain remnant vegetation and revegetated areas of local and significant species of flora.

GOALS

- To integrate the road into the indigenous landscape character of the Dandenong Ranges and reinforce the distinctive character of the area.
- To establish recognisable streets for orientation and community pride in its municipality.
- To provide amenable secondary traffic routes throughout the municipality.



Mountain Highway, a path into the hill



Forest Road, The Basin



Burwood Highway (east of Dorset Road)

Legend

- Paths into the hills - bush
- Paths into the hills - rural



Figure 6: Location of paths into the hills

5.8 PATHS INTO THE HILLS

DESIGN GUIDELINES

Carriageway

- Integrate alignment and edge treatment with consideration to the topography.
- Prevent road widening for motorised travel – restricting carriageway to minimum requirements.
- Minimise the number of driveways and access points onto main roads, using shared roads where possible.

Pedestrian Safety and Amenity

- Improve shared path systems in verges with appropriate material choices.
- Connect pedestrian networks to residential areas and areas of open space.
- Implement consistent bus shelters and seating along roads.

Signage

- Incorporate interpretative and educational signage for pedestrians at key significant sites.

Cycle Infrastructure

- Provide well vegetated shared paths along both sides of the road where possible.
- Where shared paths are not possible or appropriate, establish on-road bicycle lanes in conjunction with VicRoads to provide safe and direct travel corridors for cyclists.

Commercial Development

- Create a distinguishable edge for activity centres through formal planting, furniture and easy and visual access for motorist and pedestrians.

Residential Areas

- Provide a thick buffer of indigenous vegetation to residential frontages.

Vegetation

- Retain and protect indigenous trees and understorey planting.
- Plant suitable small trees and vegetation adjacent to, or beside, power easements as agreed with power authority.

VicRoads Regulations

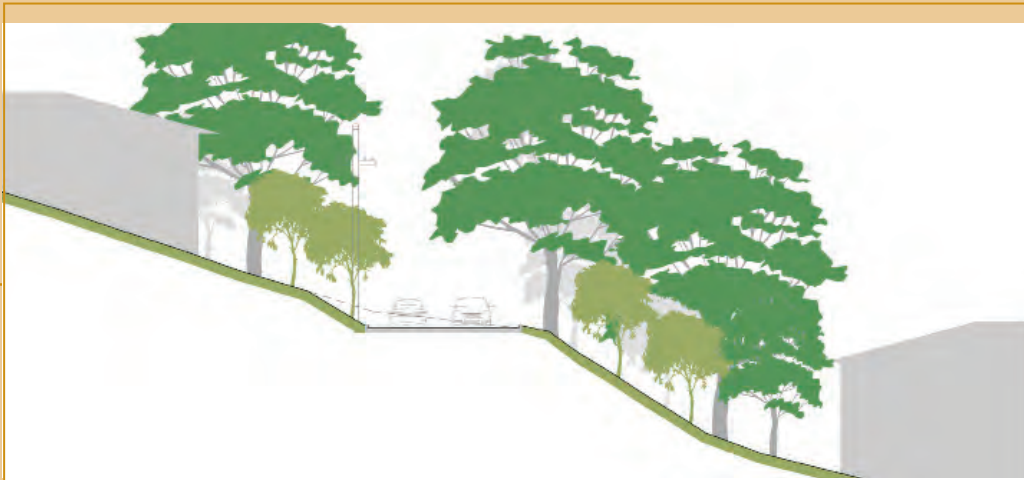
- Work with VicRoads on each landscape master plan and design to ensure safety offsets are met.
- Negotiate with VicRoads to maximise the amount of available area for planting and tree planting, through use of guard rails. Preference should be for wire rails as these provide a higher quality visual character.



Typical Cross Section - Residential Frontage



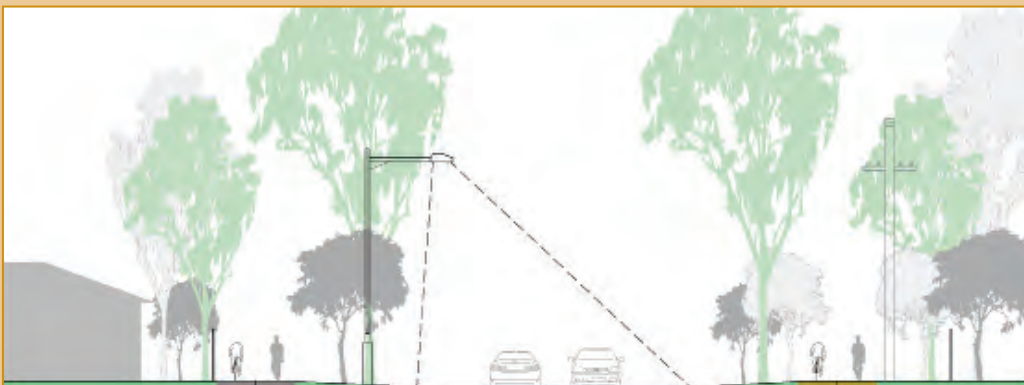
Proposed Cross Section - Residential Frontage with Bike Lane and Gravel Path



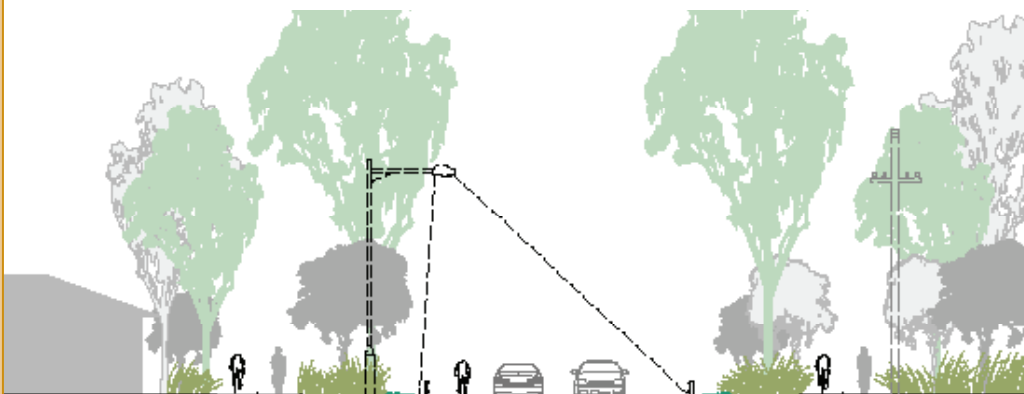
Typical cross-section of existing path into the hills in steep terrain.



Proposed cross-section of path into the hills in steep terrain, with additional foot path and trees and under ground power



Typical cross-section of existing path into the hills with a wide easement and trails.



Proposed cross-section of path into the hills with a wide easement and trails, showing WSUD, guard rails and planting

5.9 COMMUNITY LINK STREETS

AUTHORITY

Knox City Council

STREETS

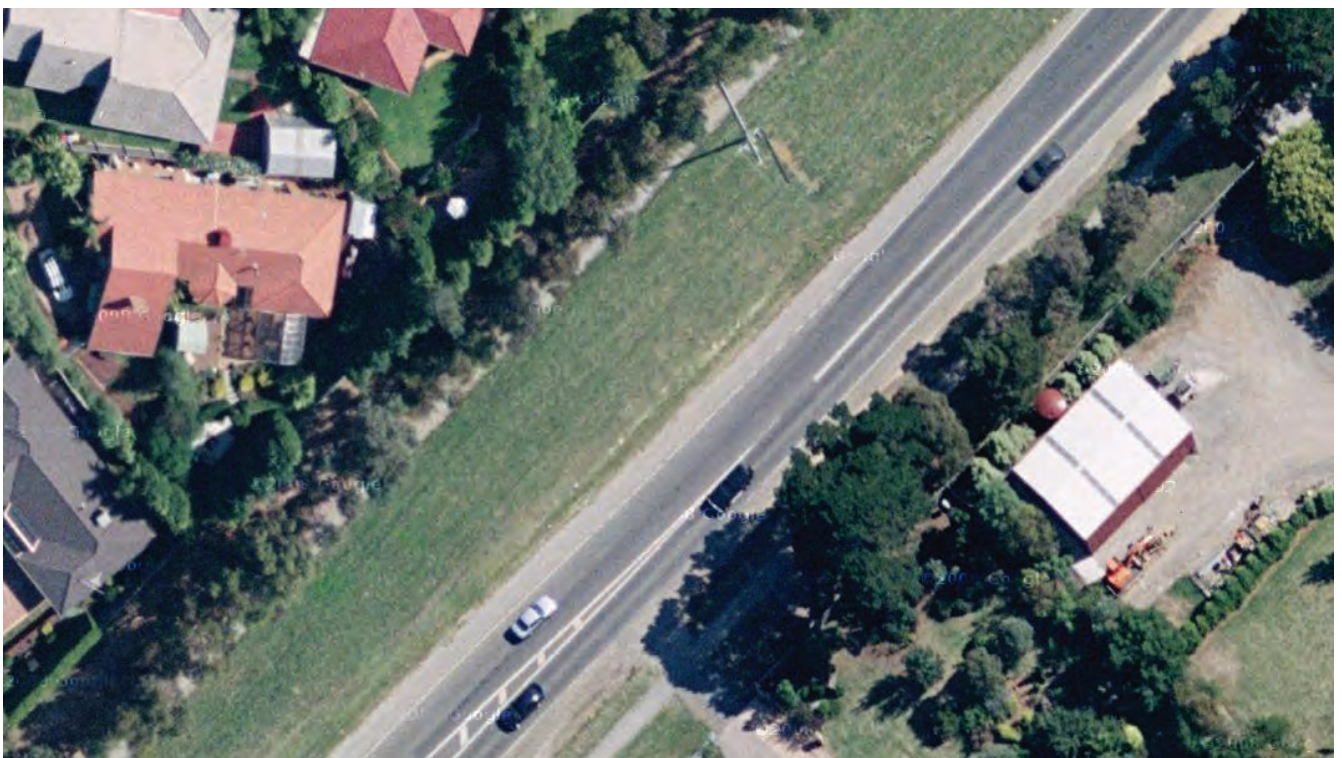
Bergins Road
 Taylors Lane
 Napoleon Road
 Fulham Road
 Glenfern Road
 Forest Road (South of Boronia Road)
 Underwood Road
 Lewis Road
 Tyner Road
 Barry Street
 Cathies Lane
 Albert Avenue
 Forest Road
 Liverpool Road

DESCRIPTION

Community link streets are roads that connect adjoining suburbs. They are single carriage way roads where the easement varies in width.

GOALS

- To provide safe and pleasant connections between suburbs and establish strong local identity through vegetation choices.
- To connect home with surrounding facilities, destinations and friends. To promote local distinctiveness and identity.
- To provide amenable linking traffic routes throughout the municipality.



Napoleon Road - a proposed Community Link Street

Legend

Community link streets



Figure 7: Location of Community Link Streets

5.9 COMMUNITY LINK STREETS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Ensure all Community link streets have safe pedestrian access through provision of footpaths to both sides of street and adequate lighting.
- Improve nature strips and verges to provide pleasant environments for pedestrians
- Connect to pedestrian networks.
- Implement consistent bus shelters and seating along roads.
- Create pocket parks and pause points at appropriate locations to increase pedestrian amenity.

Crossovers

- Minimise the number of driveways and access points onto main roads, using shared access driveways where applicable. This allows for larger areas of nature strip and reduces infrastructure costs.

Cycle Infrastructure

- Establish on-road bicycle lanes to provide safe and direct travel corridors for cyclists. It may be necessary to widen the carriageway to achieve this. Where networks are part of the Principal Bike Network (PBN) coordinate with VicRoads.

- Alternatively, provide an off-road cycle option by realigning kerbs to allow a footpath to both sides and a shared path to one.
- Where possible establish shared path systems in a vegetated environment.

Shopping Areas

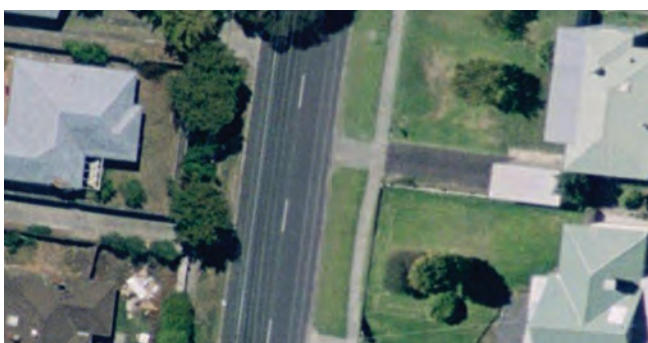
- Create a distinguishable edge for shops through understorey planting, furniture and maintaining clear views to buildings.

Vegetation

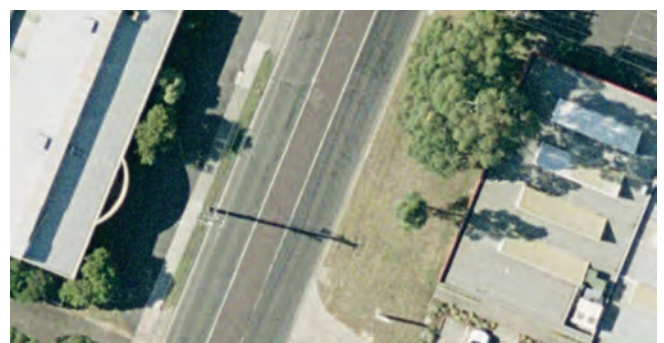
- Retain and protect indigenous trees and plant new indigenous canopy trees to form consistent avenues where possible.
- Plant suitable small trees in formal rows adjacent to, or beside power easements.

Indented Parking

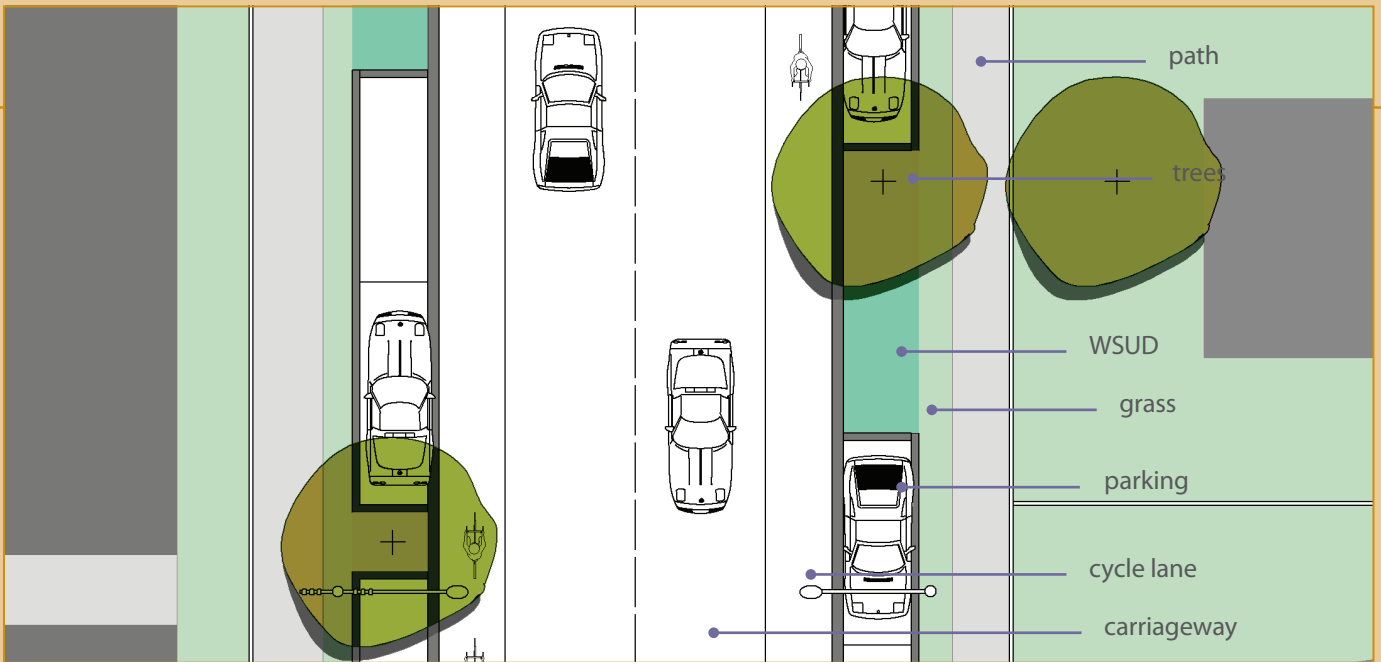
The community place great importance on the value of the nature strip as it makes a significant contribution to Knox's 'green and leafy' image. As such indented parking should only be considered where there is a significant net community benefit such as the provision of on-streets cycle lanes as shown in the following figure. Existing street trees and planting should not be removed for indented car parking.



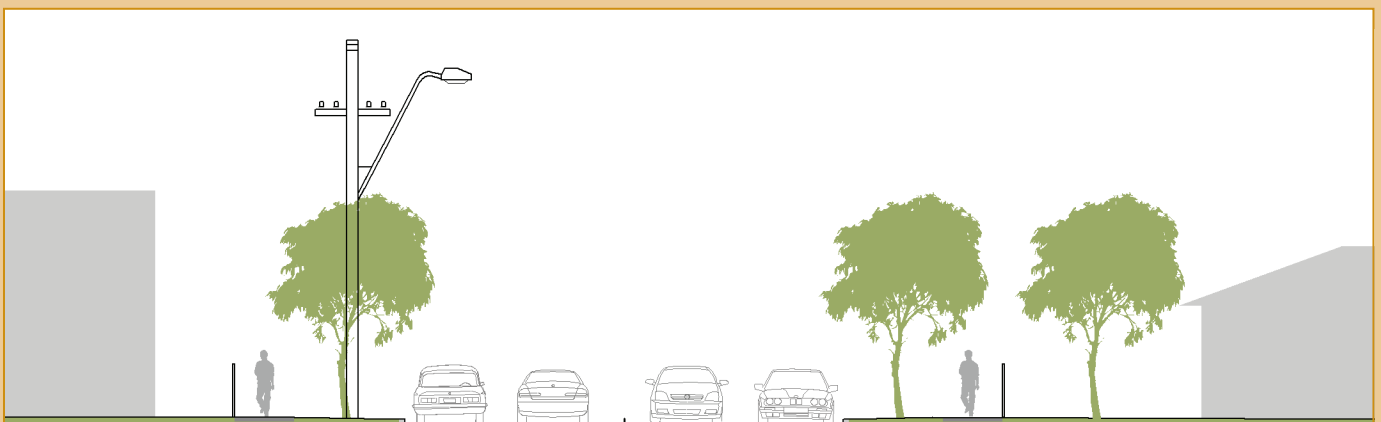
Forest Road, Ferntree Gully



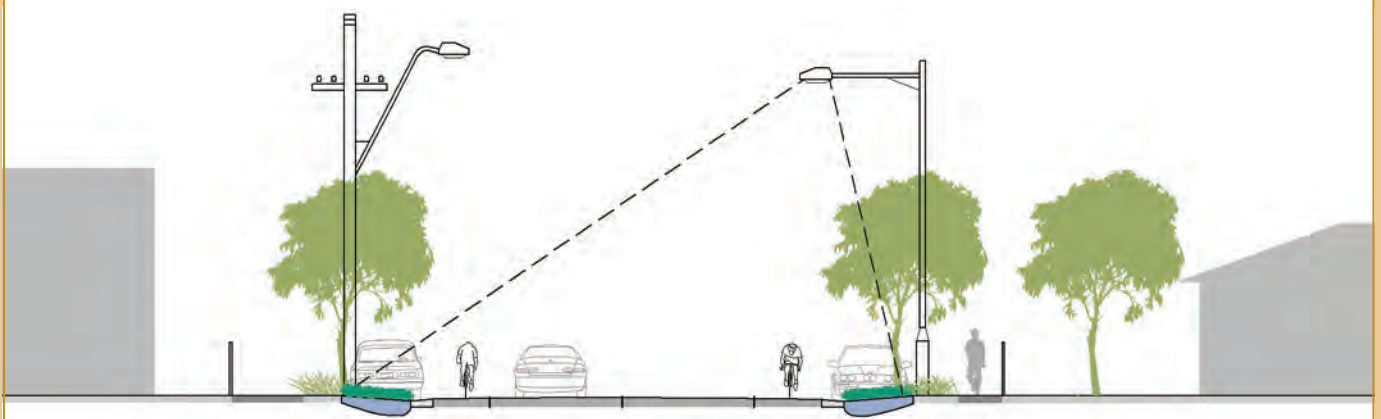
Lewis Road, Wantirna



Indicative plan of proposed community link street



Typical cross-section of existing community link street in residential area and with on-street parking.



○ ○ ○
Underground
Services

Proposed cross-section of community link street in residential area and with on-street parking.

5.10 NEIGHBOURHOOD GREEN STREETS

AUTHORITY

Knox City Council

STREETS:

Numerous streets across the municipality.

DESCRIPTION

Green neighbourhood streets are the collector roads within suburbs that connect neighbourhoods together. They connect homes with schools, shops, parks and community facilities.

GOALS

- To enable easy and safe connections throughout the neighbourhood to schools and other community facilities.
- To create a strong sense of place through tree and vegetation choice and through pocket park and pause points.
- To create an active community street that connects community facilities such as preschools, milk bars and community hubs.



O'Hea Street, Coburg a good example of a Neighbourhood Green Street

Legend

- Green neighbourhood streets
 - Primary school
 - Secondary school
- Recreational facilities
 - Open space
 - Shopping locations



Figure 8: Location of neighbourhood green streets and proximity to community facilities

5.10 NEIGHBOURHOOD GREEN STREETS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Ensure all green neighbourhood streets have safe pedestrian access on both sides of the street through footpaths or shared paths.
- Improve paths in nature strips and verges to provide pleasant environments for pedestrians.
- Connect pedestrian networks.
- Implement consistent bus shelters and seating along streets.
- Create pocket parks and pause points at appropriate locations to increase pedestrian amenity.
- Increase pedestrian crossing points where the pedestrian has priority. This can be done through raising the pedestrian crossing to footpath level and through change of surface material at these points.
- Pedestrian crossing points should be installed at all street intersections between a green neighbourhood street to a residential or home street. The carriageway turning radius should be minimised to force traffic to slow at turning points. Low understorey planting can be installed to highlight the carriageway width, but clear sightlines should be maintained.
- Raised pedestrian pavements on cross roads.

Carriageway, Intersection and Cycle

Infrastructure

- Minimise the number of driveways and access points onto main roads, using shared access driveways where applicable. This allows for larger areas of nature strip and reduces infrastructure costs.
- Narrow carriageways to one lane each way.
- Provide outstands to mark parking areas and provide additional planting and potential WSUD space.
- Provide an off-road cycle option by realigning kerbs to allow a footpath to both sides and a shared path to one.
- Alternatively, establish on-road bicycle lanes to provide safe and direct travel corridors for cyclists. It may be necessary to widen the carriageway to achieve this. Where networks are part of the Principal Bike Network (PBN) coordinate with VicRoads.

Recommended Design Configurations

- One lane traffic each way.
- Wide nature strips to accommodate street tree planting.
- Water sensitive urban design treatment beds on either side of street.
- Potential for central planted median if a wide street easement.
- On-road bike paths.
- Potential for off-road shared pathway on one side of road (see example, O'Hea Street).
- Small pedestrian pause points and pocket parks at regular intervals (approx. 100m) along street.
- Porous paving to be used in parking areas.
- Design a narrow intersection to reduce wide sweep paths.

Shopping Areas and other areas of note

Create a distinguishable edge for shops through understorey planting, furniture and parking areas that are attractive, tree planted and shady.

- Allow opportunity for cafés and outside spaces to be utilised within street easement and widened footpath.
- Provide bike parking facilities.

Redevelopment of Residential Areas

- Encourage redevelopment of residential properties to be orientated to address the street frontage.
- Encourage visual interaction between the street and front gardens.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees to form consistent avenues where possible.
- Refer to the Neighbourhood Character Study, Street Tree Policy and Nature Strip Policy for appropriate tree species selection.
- Plant suitable small trees in formal rows adjacent to, or beside power easements.

Examples of neighbourhood green streets

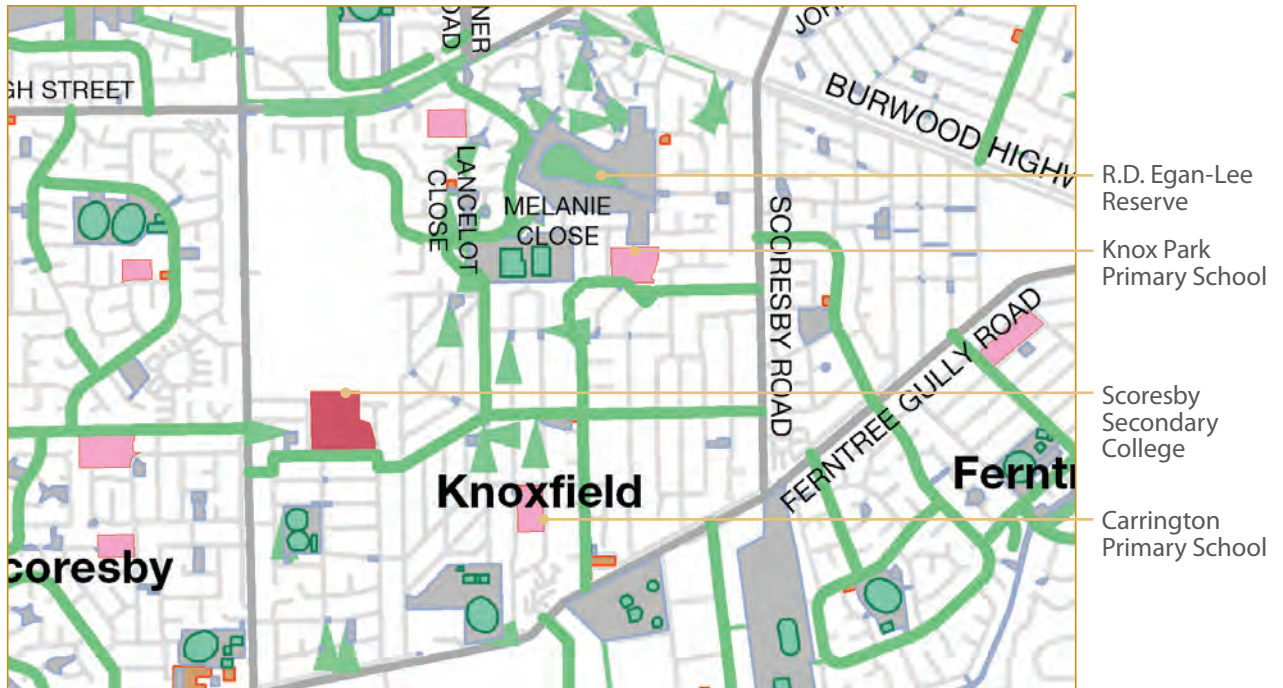


O'Hea Street, Coburg showing an off-road shared path, footpath and rain garden in mulched nature strip



Victoria Park, Sydney showing a wide footpath and central planted swale

5.10 NEIGHBOURHOOD GREEN STREETS

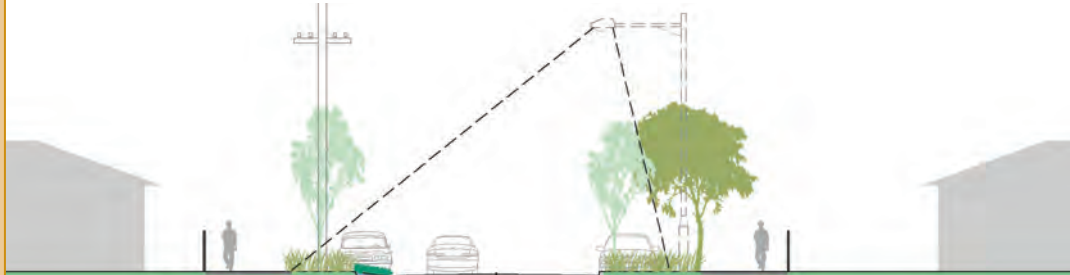


Plan of Neighbourhood Green Streets and how they link homes with key local community facilities and shopping





Typical cross-section of existing garden suburb street.



Proposed cross-section of garden suburb street.



Typical cross-section of existing villa court.



Proposed cross-section of villa court.



Typical cross-section of existing bush suburb street.



Proposed cross-section of bush suburb street.

5.11 HOME STREETS – GENERAL

AUTHORITY

Knox City Council

STREETS

Numerous streets across the municipality.

DESCRIPTION

Home streets are streets which service local access to homes. They are single carriageway streets, with enough room for parking, nature strips and footpaths.

Home street types within this design guide section have been grouped according to character areas outlined in the City of Knox Neighbourhood Study (1999) and the Knox Urban Design Framework 2020.

These guidelines build on and reinforce these two documents.

GOALS

- To create safe and accessible streets where pedestrian and bike use is prioritised and a strong sense of local character is expressed.
- To live in a safe, connected and friendly environment where there is a community spirit expressed through interaction within the street
- To provide amenable traffic access to residential homes.
- To create home zones in those streets that have the appropriate level of traffic to provide the highest quality community access street.



A typical home street in Bayswater



A proposed home street showing planted nature strips, a paved pedestrian crossing and a bike lane on road

Legend

Homel Streets



Figure 9: Location of home streets

5.11 HOME STREETS – GENERAL

GENERAL DESIGN GUIDELINES

Community involvement

Refer to Section 6 Implementation for community actions.

Pedestrian Safety and Amenity

- Improve the overall design of streets to be pedestrian friendly.
- Give pedestrians and cyclists priority and discourage vehicles speeding.
- Enable pedestrians to walk safely with crossing opportunities.
- Ensure street trees provide adequate shade for pedestrians.
- Provide driveway crossovers of only minimum width.
- Maintain and establish clear sightlines between house entrances and the street, to provide visual surveillance of the street to maximise neighbourhood safety.

Carriageway Design

- Design the width of the street carriageways to relate to traffic volume and ensure carriageway widths are no wider than necessary.
- Narrow carriageways through outstands for street tree planting and water sensitive urban design treatment beds.
- Make pavements that are porous or modular where possible to encourage stormwater infiltration.

Cycle Infrastructure

- Do not separate cycle paths when traffic levels are lower.
- Establish shared zones where bikes and pedestrian have priority. Refer to Austroad and VicRoad standards for specific criteria for implementation.

Redevelopment of Residential Properties

- Encourage redevelopment of residential properties to be oriented to address the road way frontage.
- Encourage visual interaction between the street and front gardens.

Lighting and Power

- Underground existing and proposed services, as this removes unsightly powerlines and allows unimpeded tree growth.
- Control glare and light spill of light sources to residential frontages.
- Ensure all pedestrian paths are safely lit while retaining views of the night sky and accommodating the needs of nocturnal species.

Vegetation

- Regularly space tree planting on both sides of the street to give it identity.
- Retain and protect indigenous trees and plant new street tree to be consistent with the Neighbourhood Character Study.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy, for appropriate species of understorey vegetation.
- Plant suitable small trees in formal rows adjacent to, or beside power easements.
- Improve nature strips through vegetation planting.
- Refer to the Liveable streets checklist

Water Sensitive Urban Design

- Install WSUD features along roads to ensure that water is treated before it enters the creek and river system.

Legend

Knox character precincts

- Foothills
 - Bush suburban
 - Rural parkland
- Garden suburban
 - Garden court
 - Villa court

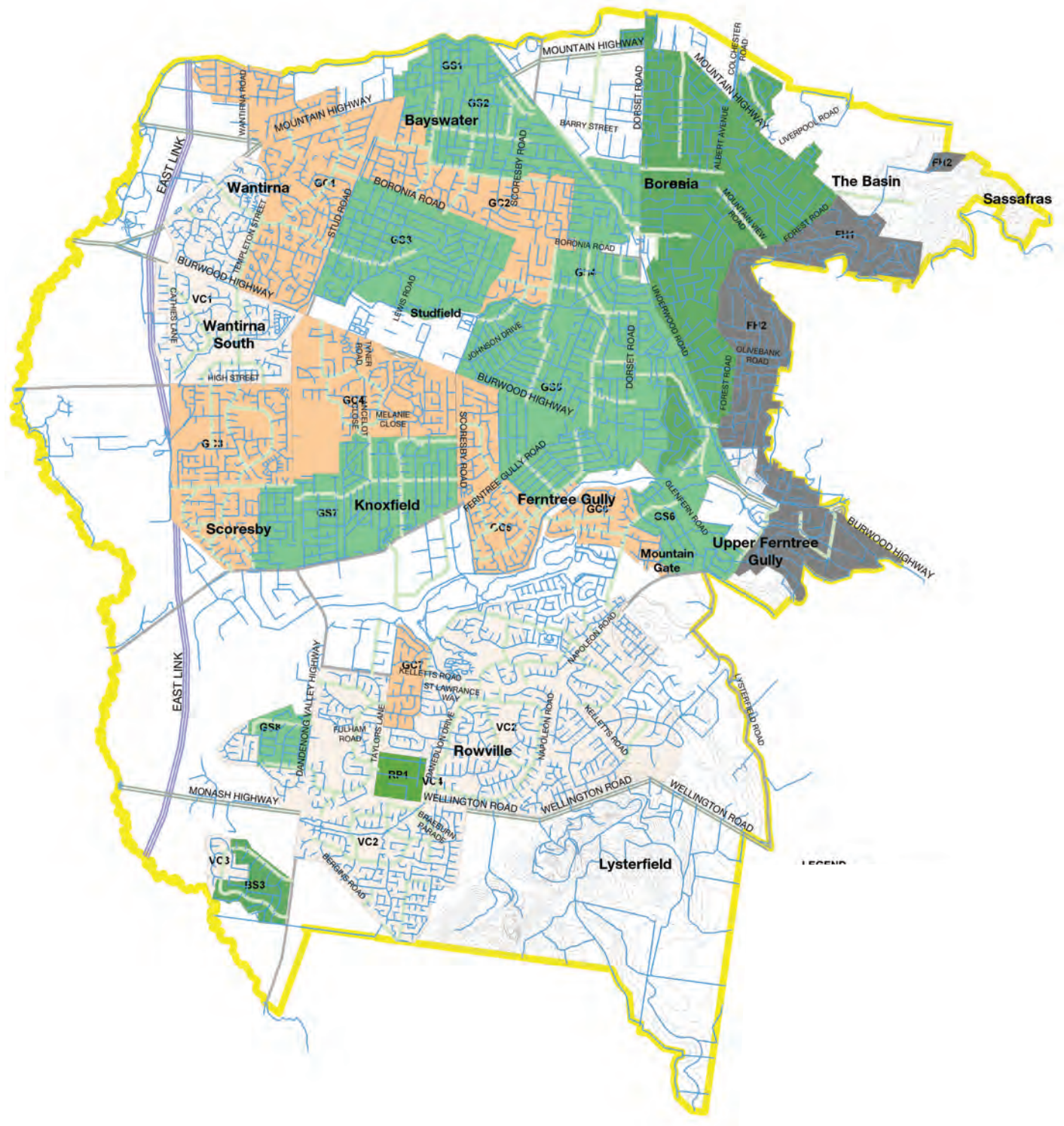


Figure 10: Residential streets and neighbourhood character

5.12 HOME STREETS – COURTS

AUTHORITY

Knox City Council

DESCRIPTION

Home courts are streets which service access to homes. They are single carriageway streets, with no through access for vehicles. They may have a large central island that may contain vegetation, parking and play facilities.

GOALS

- To create a unique small neighbourhood public space within the street easement.
- To maximise the space for pedestrians, play and vegetation.
- To create a shared or home zone.



A court in Knox

Legend

Residential Streets

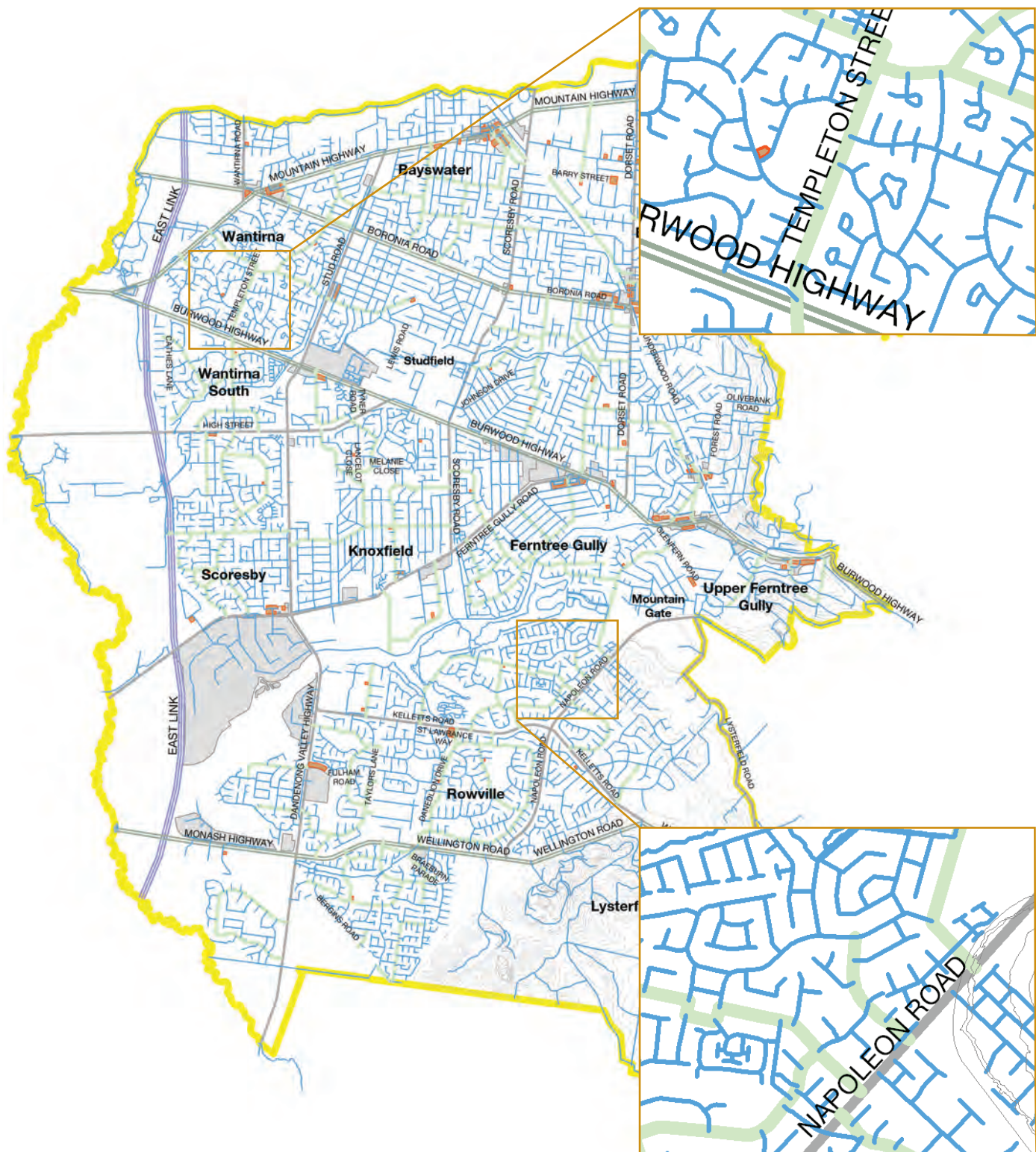


Figure 11: Home streets — courts are closed streets located throughout the municipality, enlargement of Wantirna and Rowville

5.12 HOME STREETS – COURTS

DESIGN GUIDELINES

Carriageway / Parking

- Remove car parking from central island.
- Narrow carriageway to minimum width.
- Utilise porous paving systems around central island.

Cycle Infrastructure

- Establish shared zones where bikes and pedestrians have priority.

Vegetation

- Maximise the amount of indigenous planting in central green to provide additional biodiversity and habitat in the neighbourhood.

Kerbs

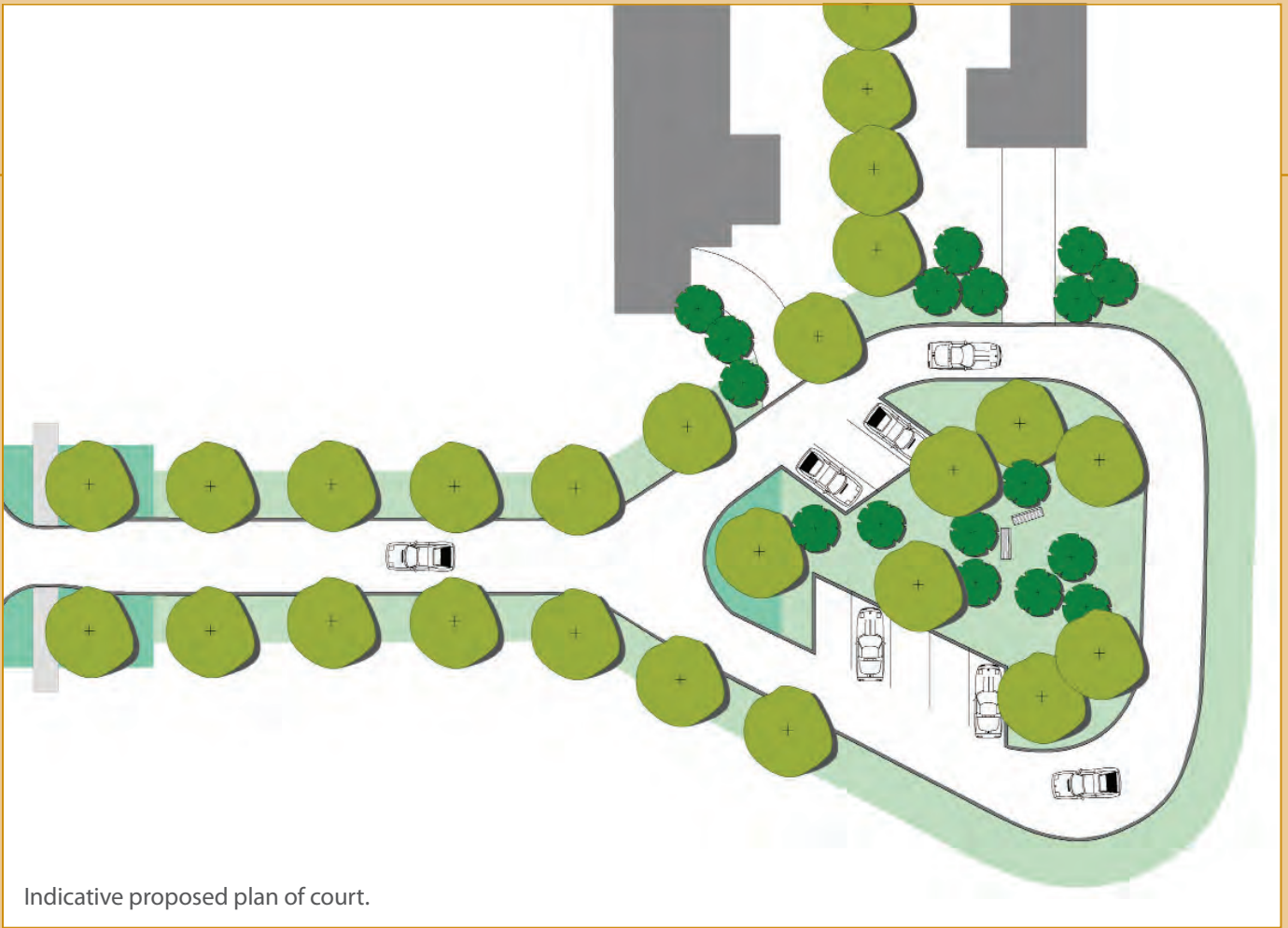
- Provide upstand kerbs to prevent off-road car parking in central public space.

Management and Maintenance

- Establish and negotiate joint community and Council management and maintenance.



A court in Knox



Indicative proposed plan of court.



Typical cross-section of existing court.



Proposed cross-section of court, with planting, seating and trees.

5.13 HOME STREETS – RESIDENTIAL FOOTHILLS

AUTHORITY

Knox City Council

DESCRIPTION

Residential foothill streets usually have a narrow carriageway. Often the streets can be windy and steep, with substantial tree coverage and vegetation.

GOALS

- To retain the indigenous vegetated coverage and low-key natural character of the area.
- To integrate the larger street, verges and gardens to create a bushland character so that homes are truly amongst the hills.
- To provide through the street easement a significant area for indigenous biodiversity and habitat.



Basin-Olinda Road

Legend

■ Foothills residential street



Figure 12: Location of residential foothill streets

5.13 HOME STREETS – RESIDENTIAL FOOTHILLS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Many foothill streets do not have formal pedestrian pathways and so the road becomes the pedestrians means of travel. Where this is unsafe, encourage pedestrian pathways of informal appearance.
- Provide gravel footpaths where nature strips and existing planting allow.
- Improve the overall design of streets to be pedestrian friendly, through minimised carriage way widths and a curvilinear alignment of the street.

Carriageway

- Retain the character of the informal street edges through use of unsealed edges, swales and roll-over kerbs.
- Include kerbs only when site constraints require their use, ie. for particular drainage solutions, or the protection of nature strips.
- Ensure that native vegetation is retained along the edge of the street during design, construction and maintenance.
- Do not clear verges for parking or paving.
- Utilise porous paving adjacent to significant trees when constructing streets.

Cycle Infrastructure

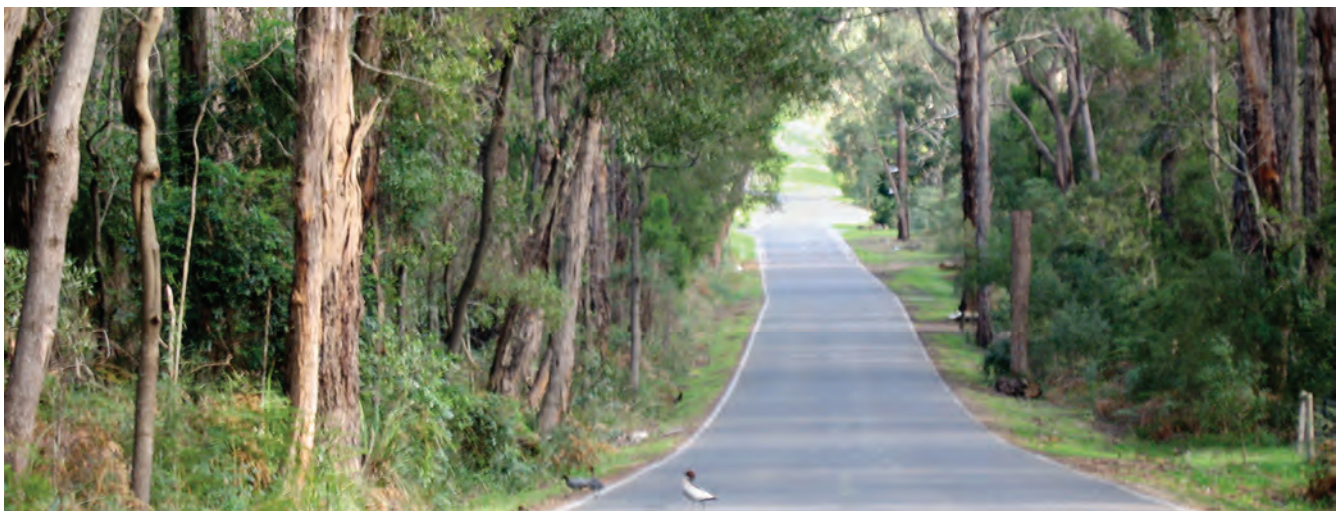
- Do not separate cycle paths as traffic levels are low.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees.
- Where existing trees are not present, match planting of new trees and understorey to the naturalistic layouts of the original bushland.
- Blend plantings with those within adjacent bushland gardens.

Nature Strips

- Plant only indigenous species within nature strips.



Basin Olinda Road showing flush kerbs



Basin Olinda Road, showing rollover kerbs



Typical cross-section of existing residential foothills street.



Proposed cross-section of residential foothills street.

5.14 HOME STREETS – BUSH SUBURBS & RURAL PARKLAND

AUTHORITY

Knox City Council

DESCRIPTION

Bush suburb streets and rural parkland streets are characterised by frequent stands of high canopy indigenous and native vegetation and park-like landscape with occasional pockets of large native and exotic trees.

GOALS

- To retain the vegetated coverage and low-key infrastructure character of the area.
- To integrate the larger street, verges and gardens and create a bush-park character, so that homes are set within a green leafy environment.



Though not in a bush suburb, Riparian Way illustrates the character of a bush suburb street

Legend

- Bush Suburbs
- Rural parkland



Figure 13: Location of residential foothill streets

5.14 HOME STREETS – BUSH SUBURBS & RURAL PARKLAND

DESIGN GUIDELINES

Carriageway

- Retain the character of informal or curved street alignments.
- Use kerbs with minimal visual impact through the continued use of roll-over kerbs.
- Introduce less formal and asymmetrical arrangements of street elements if street reconstruction is required.
- Include kerbs only when site constraints require their use, ie. for particular drainage solutions, or the protection of nature strips.
- Utilise porous paving adjacent to significant trees when constructing streets.

Cycle Infrastructure

- Do not separate cycle paths as traffic levels are low.

Vegetation

- Ensure that native vegetation is retained along the edge of the street during design, construction and maintenance.
- Retain and protect indigenous trees and plant new indigenous canopy trees to be consistent with the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy.
- Where existing trees are not present, match planting of new trees and understorey to the naturalistic layouts of the original bushland.
- Blend plantings with those within adjacent bushland gardens.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy for appropriate species of understorey and tree.
- Plant suitable small trees adjacent to, or beside power easements.



Springthorpe Estate, Bundoora, showing incorporation of existing mature trees into street design.



Typical cross-section of existing bush suburb and rural parkland street.



Proposed cross-section of existing bush suburb and rural parkland street. For a diagram of parking and outdoors see section 5.9 community

5.15 HOME STREETS – GARDEN SUBURB

AUTHORITY

Knox City Council

DESCRIPTION

Garden suburb streets have Carriageways that are generous and small scaled street tree planting.

GOALS

- To enhance the indigenous and native character of the area with frequent stands of large native and exotic trees.
- To create a safe and pedestrian friendly environment.
- To create a sense of place consistent with the green and leafy image of Knox.



Bona Vista Road

Legend

Garden Suburb

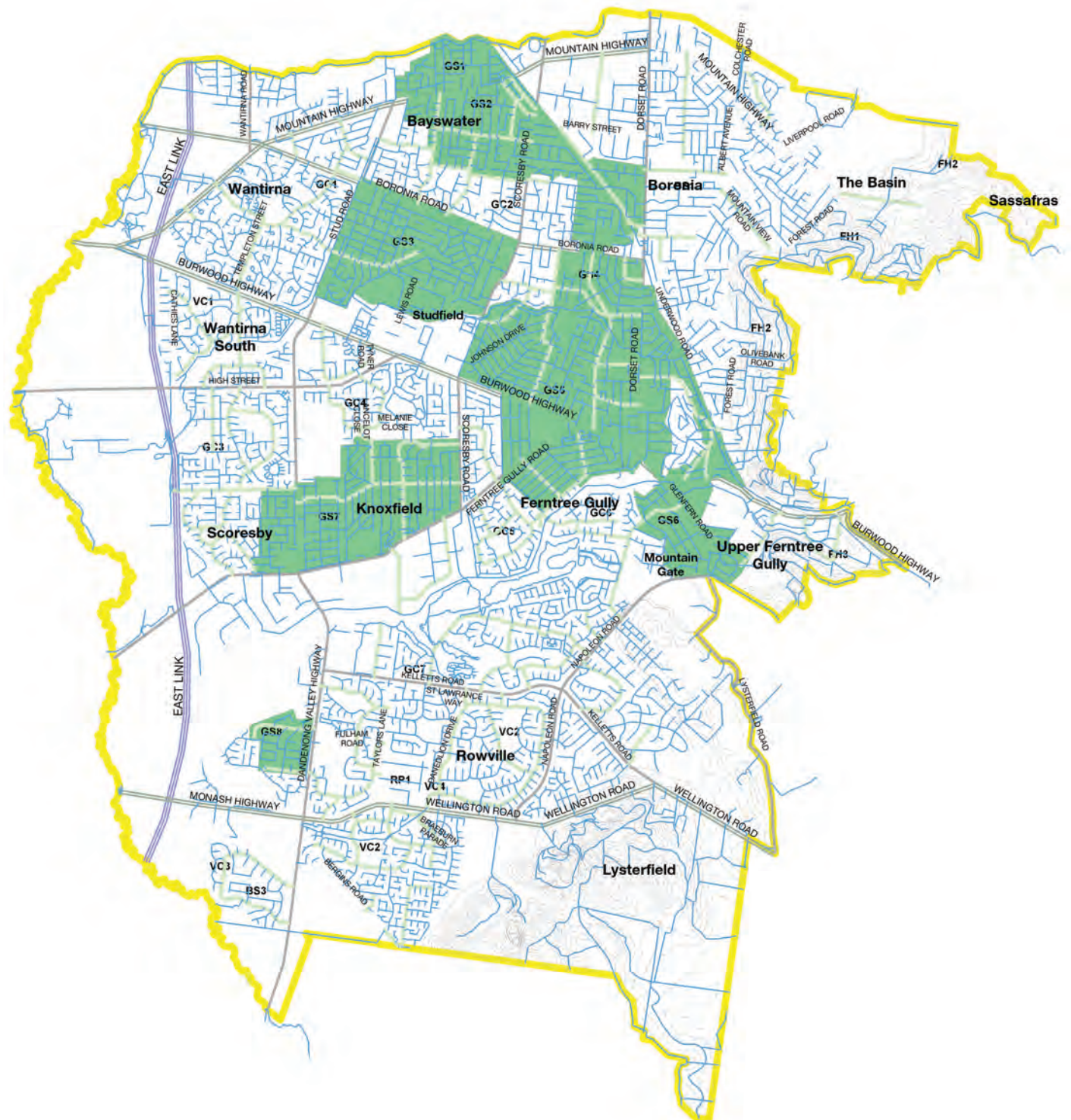


Figure 14: Location of garden suburb streets

5.15 HOME STREETS – GARDEN SUBURB

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Improve the overall design of streets to be pedestrian friendly. This can be done through narrower carriageways.
- Improve nature strips through vegetation planting.
- Improve shade.
- Connect pedestrian and shared path networks into the bush boulevards.
- Provide safe crossing points for pedestrians with raised crossings and a different surface paving material.

Carriageway

- Narrow the carriageway to one lane in each direction.
- Install planting and WSUD outstands and allow car parking in-between.
- Utilise porous paving adjacent to significant trees when constructing streets.
- Maintain the formal alignment and symmetry of the street.

Cycle Infrastructure

- Do not separate cycle paths as traffic levels are low.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees to be consistent with the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy.
- Where existing trees are not present, match planting of new trees and understorey to the naturalistic layouts of the original Dandenong Creek corridor and foothills.
- Use a single dominant tree species for the whole street.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy for appropriate species of understorey and tree.
- Plant suitable small trees adjacent to, or beside power easements.



Armstrong Road



Typical cross-section of existing garden suburb street.



Proposed cross-section of garden suburb street. refer to 5.9 community, for a diagram of parking and outstands.

5.16 HOME STREETS – GARDEN COURT & VILLA COURT

AUTHORITY

Knox City Council

DESCRIPTION

Suburban residential streets have grassed nature strips and small street tree planting. They are single carriageway streets, with no through access for vehicles.

GOALS

- To enhance the indigenous and native character of the area.
- To create a safe and pedestrian friendly environment.
- To create a sense of place consistent with the green and leafy image of Knox.



Knox garden and villa court street

Legend

- Garden Court
- Villa Court



Figure 15: Location of garden courts and villa courts

5.16 HOME STREETS – GARDEN COURT & VILLA COURT

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Improve the overall design of streets to be pedestrian friendly. This can be done through narrower carriageways.
- Improve nature strips through vegetation planting.
- Improve shade.
- Connect pedestrian and shared path networks into collector and principal roads.
- Provide safe crossing points for pedestrians with raised crossings and a different surface paving material.

Carriageway

- Narrow the carriageway to one lane in each direction.
- Install planting and WSUD outstands and allow car parking in-between.
- Utilise porous paving adjacent to significant trees when constructing streets.
- Maintain sealed carriageways with roll over kerbs and informal curvilinear layouts.

Cycle Infrastructure

- Do not separate cycle paths as traffic levels are low.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees to be consistent with the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy.
- Where existing trees are not present, match planting of new trees and understorey to the naturalistic layouts of the original Dandenong Creek corridor and foothills.
- Use a single dominant tree species for the whole street in informal and clumping arrangements.
- Prudently consider the use of exotic trees in relation to the context of the street's surrounds, creating thresholds, gateways and key planting areas.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy for appropriate species of understorey and tree.
- Plant suitable small trees adjacent to, or beside, power easements.



Typical cross-section of existing garden court or villa court.



⊙ ⊙ ⊙
Underground
Services

Proposed cross-section of garden court or villa court.

5.17 HOME STREETS – HOME ZONES

AUTHORITY

Knox City Council

DESCRIPTION

Home zones are residential streets that have a low volume of traffic, or which have no through access for vehicles. These streets are being targeted to become shared spaces, where the street arrangement will be slightly changed to privilege the pedestrian and cyclist over the car.

Home zones are residential areas designed with streets to be places for people, instead of just for motor traffic. By creating a high-quality street environment, home zones strike a better balance between the needs of the local community and drivers. Involving the local community is the key to a successful scheme. Good and effective consultation with all sectors of the community, including young people, can help ensure that the design of the individual home zones meet the needs of the local residence.

Home zones are distinguished from other streets by having signed entry and exit points, which indicate the special nature of the street.

In existing streets, it is essential that the design of the home zone involves significant participation by local residents and that equal access for all is provided.

Home zones' principle for inclusive design

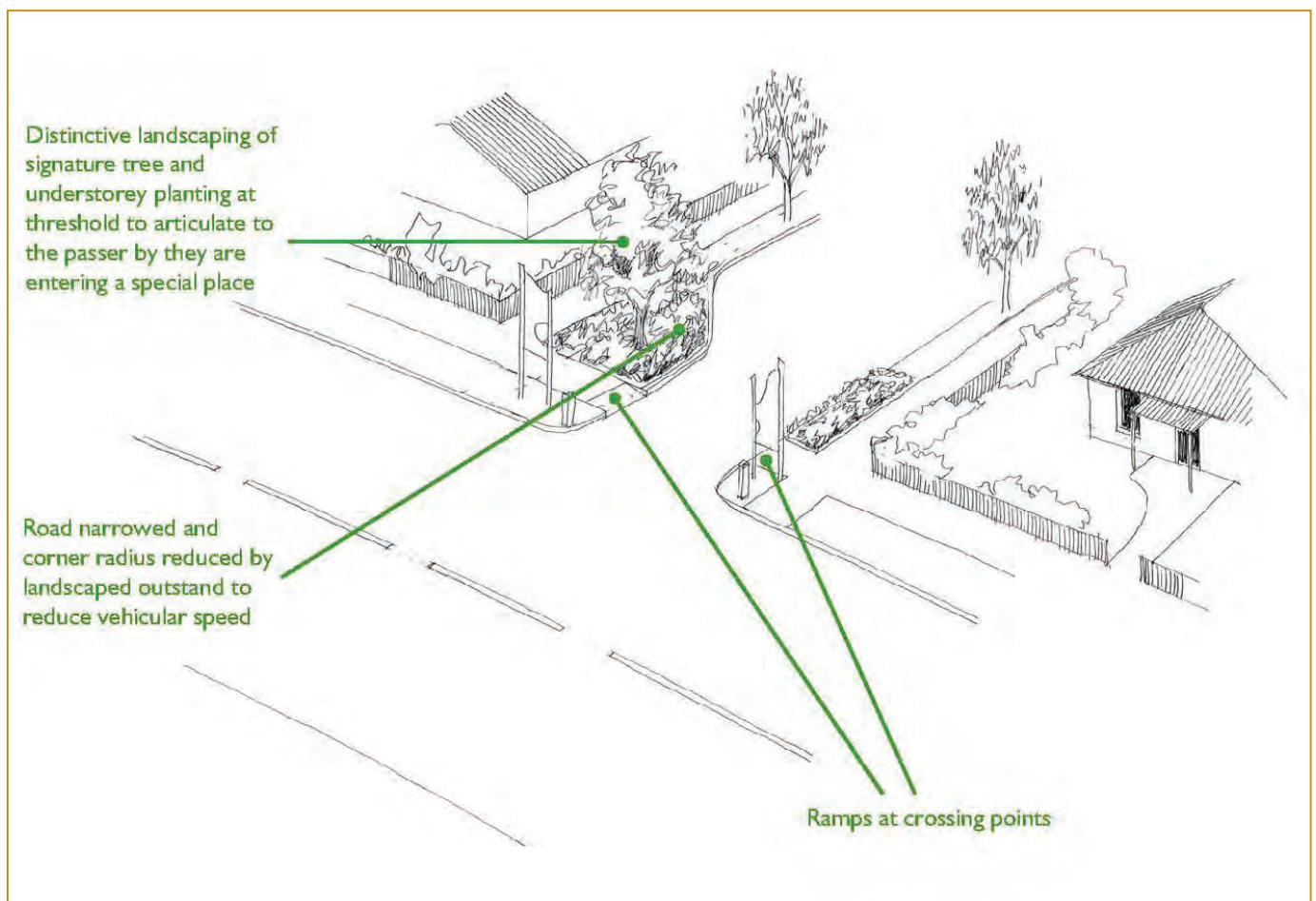
- Places people at the heart of the design process.
- Acknowledges diversity and difference.
- Offers choice where a single solution cannot accommodate all users.
- Provides flexibility in use.
- Provides higher quality environments.

GOALS

- To create a 'home zone' of safe streets which are inhabitable and friendly for neighbours and children.
- To slow the speed of cars and provide activity on the street.



Springthorpe Estate, Bundoora. Example of a basic home zone treatment.



Knox Pedestrian Plan. Example of a threshold to a home zone treatment.
Source, Knox Pedestrian Plan Workbook, 2005

5.17 HOME STREETS – HOME ZONES

DESIGN GUIDELINES

- Improve planting through vegetation strips and insertions.
- Improve shade.
- Where possible have passive surveillance from residences facing the street.

Carriageway

- Create a shared pavement treatment that services pedestrians, traffic and cyclists, with no grade separation.
- Narrow carriageway
- Tree planting at each corner: threshold
- Remove raised footpaths
- Created planted areas
- Changes in materials rather than devices such as speed humps to slow traffic
- Create sharp bends

Signage

- Signed entry and exist points.

Vegetation

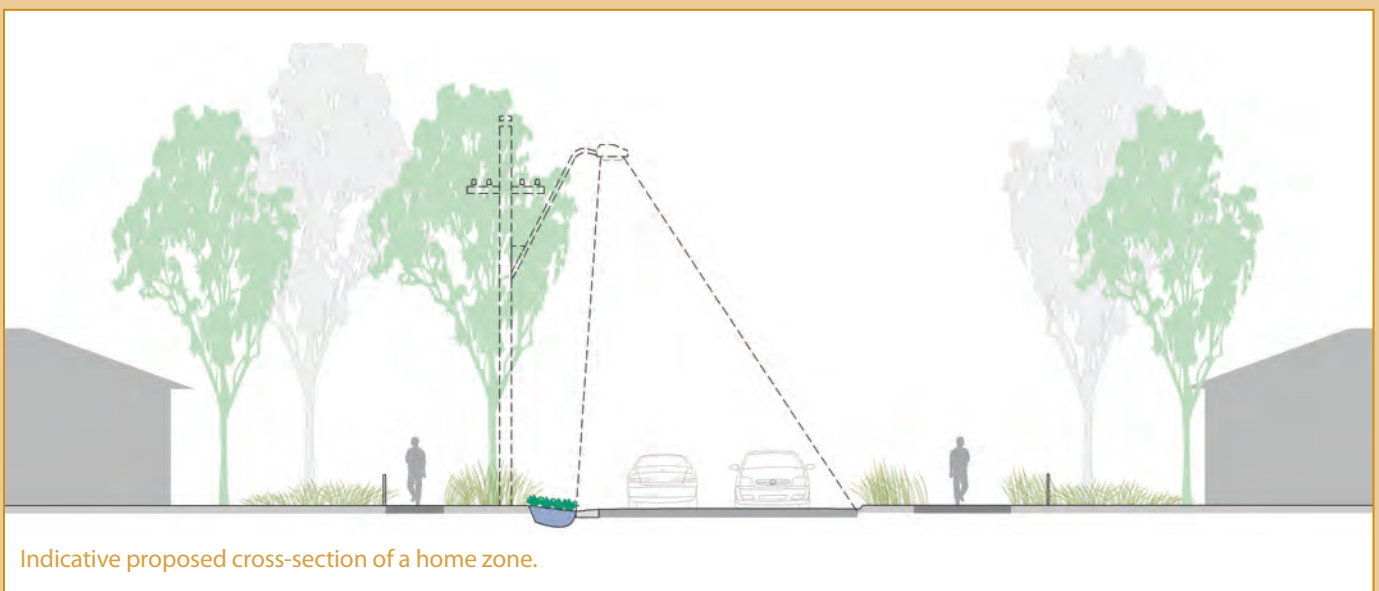
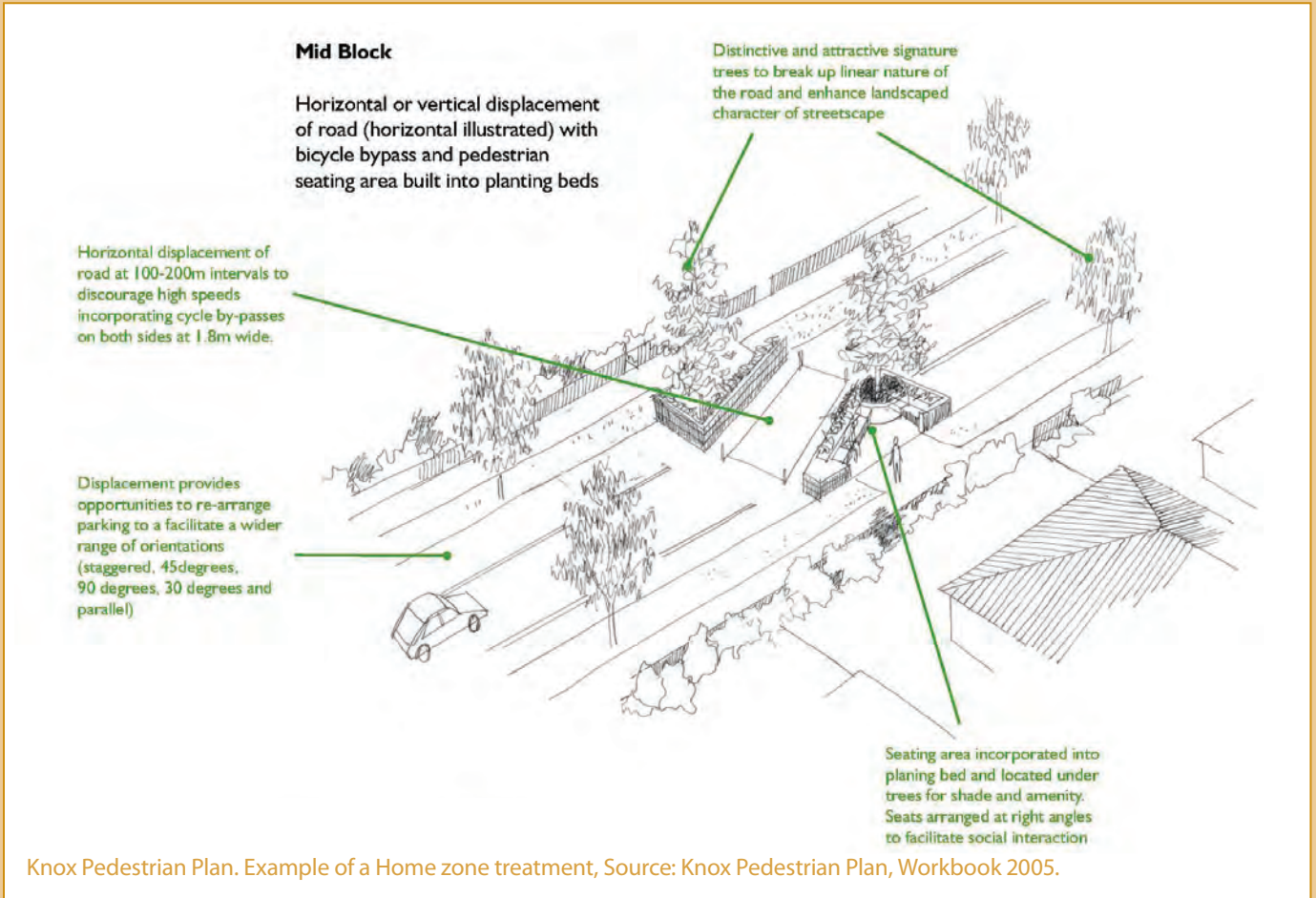
- Retain and protect indigenous trees and plant new indigenous canopy trees to be consistent with the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy.
- Prudently consider the use of exotic trees in relation to the context of the street's surrounds, creating thresholds, gateways and key planting areas.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy for appropriate species of understorey and tree.
- Plant suitable small trees adjacent to, or beside, power easements.



Typical court in Knox that has the potential to become a home zone.



Low-volume streets, such as Walting Grove above, are excellent candidates for home zones.



5.18 INDUSTRIAL & BUSINESS PARK STREETS

AUTHORITY

Knox City Council

DESCRIPTION

Industrial streets are wide, single carriageway streets that allow for heavy vehicle movement.

GOALS

- To increase vegetation and canopy cover throughout to provide a pleasant working environment.
- To improve the economic sustainability of the street.



Typical older-style industrial street, with narrow nature strips and medium sized street trees.

Legend

Industrial and business parks



Figure 16: Location of main industrial and business park streets

5.18 INDUSTRIAL & BUSINESS PARK STREETS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Ensure all industrial and business park streets have safe pedestrian access on both sides of the road.
- Improve paths in nature strips and verges to provide a pleasant environment for pedestrians.
- Connect pedestrian networks.
- Implement consistent bus shelters and seating along roads.
- Create pocket parks and pause points at appropriate locations to increase soft amenity and allow break-out spaces for workers.

Carriageway

- Increase outstands and reduce amount of parking.

Cycle Infrastructure

- Establish on-road cycle paths.

Vegetation

- Retain and protect indigenous trees and plant new indigenous canopy trees to form consistent avenues where possible.
- Refer to the Neighbourhood Character Study, and the Street Tree and Nature Strip Policy for appropriate species.
- Plant suitable small trees in formal rows adjacent to, or beside power easements



A business park street bereft of street tree planting.



Preferred quality street frontage. Large street trees with native and drought tolerant understorey planting. Views to building are retained.



- Nature strips without shade trees
- No ground level planting
- No water sensitive urban design treatments

Existing typical street in an industrial area.



- Continuous planting of street trees
- On-road bike path
- Ground level planting
- Water sensitive urban design

Image demonstrating improved car parking and pedestrian zone.

5.19 SHOPPING STREETS

AUTHORITY

VicRoads and Knox City Council

DESCRIPTION

Streets or parts of streets where the main focus is retail and commercial activity.

GOALS

- To create streets that provides easy pedestrian access, amenity, and a high quality environment for shopping and commercial activity.
- To create places where activities associated with café's, market stalls and the like, and sitting and relaxing can be integrated to commercial frontages.
- To balance traffic, safety and pedestrian amenity.



Mixed commercial street with good quality street trees and low ground planting.

Legend

Shopping areas



Figure 17: Location of main shopping streets.

5.19 SHOPPING STREETS

DESIGN GUIDELINES

Pedestrian Safety and Amenity

- Pedestrians should have clear and safe access points across streets and to shops.
- Footpaths should be generous and be provided with seating opportunities, shade and vegetation.

Carriageway

- Where commercial and retail centres are located on major streets, investigate the reduction of speed limits through activity centres to improve pedestrian safety, reduce the impact of through traffic and to create a sense of arrival and departure to the centre.
- Where commercial and retail centres are located on major streets, investigate the reduction of lanes through the activity centre to slow traffic provide a safer pedestrian environment and enable the provision of a combination of widened footpaths, service lanes, increased on-street parking and bike lanes.
- Minimise and simplify traffic routes through parking and at off-street shops, for example by introducing one way traffic systems.
- Turning radii should be minimal to encourage slow movement of vehicles.
- Tree, WSUD and garden bed planting should be incorporated into parking and verge design to reduce the visual severity of road pavement, to provide shade, and to treat water.

Cycle Infrastructure

- Establish a clear and designated space for cyclists to move along and through a shopping area, and minimise crossing points.
- Provide adequate bike storage and parking facilities.

Shopping Areas

- Create a distinguishable edge for shops through understorey planting, furniture and attractive and shaded parking areas.
- Allow each shopping area to develop its own character through planting material and furniture.
- Allow opportunity for café/outside space to be utilised within road easement.

Vegetation

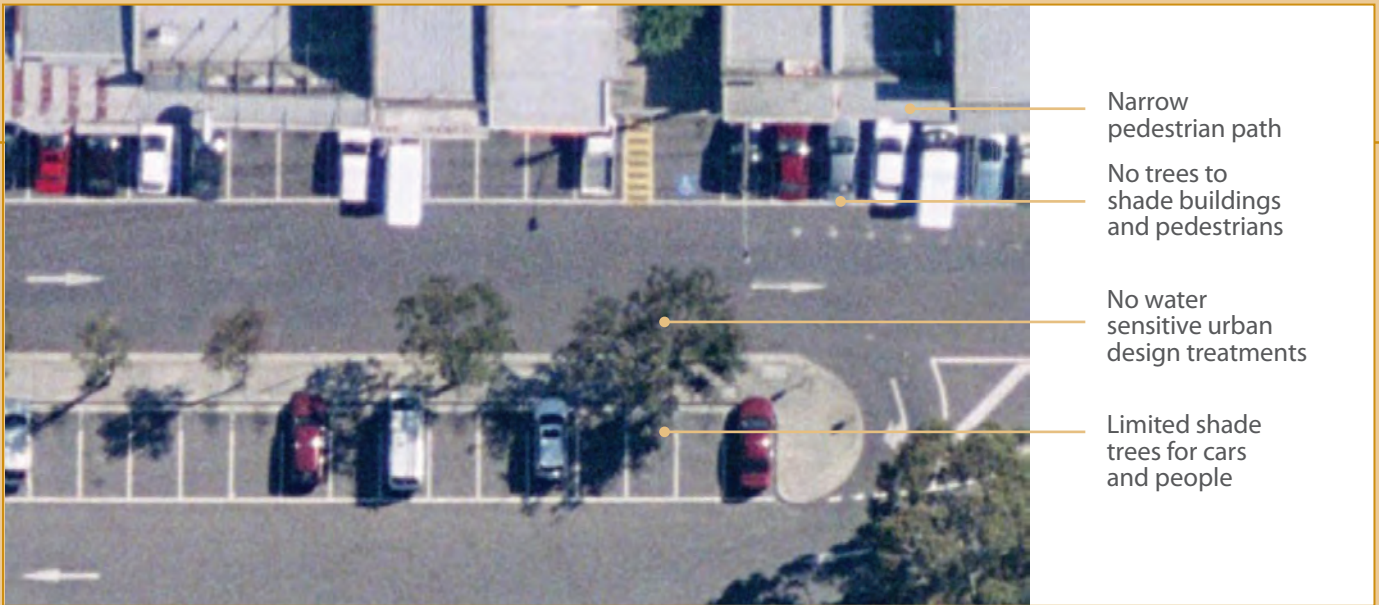
- Create formal or informal stands of clear-trunked trees to allow for good shade coverage and clear view to commercial fronts.
- Vegetation should be carefully considered to buffer patrons from vehicle movement, without obstructing view.
- Plant suitable small trees in formal rows adjacent to, or beside, power easements.
- Where applicable create outstands for larger tree planting.



Typical mixed commercial street. Lack of street tree planting and low ground planting.



Mountain Highway, Bayswater. Limited amenity with narrow pavement alongside major highway and no room for larger trees.



Existing typical car park and street of a shopping centre.



Indicative plan of improved car park and pedestrian zone.



Boronia car park was retrofitted with water sensitive urban design and new street trees.

5.20 ENTRANCES & GATEWAYS

AUTHORITY

VicRoads and Knox City Council

DESCRIPTION

A special treatment within the streetscape alerting people that they are entering a new area or space.

GOALS

- Gateways must be integrated into their immediate and local context, being respectful of the 'sense of place' that exists or that is desirable
- Gateways should be a noticeable elements that carry a sense of amazement or discovery.
- Consider community integrated art. -Refer to the Knox City Council *Art Plan* (2003)
- For a gateway treatment to be successful, it needs to be visible. Consider location, size and form, and impression of 'belonging to its site and context.
- A gateway treatment needs to be easy to maintain and cost effective.
- Gateways should not 'date' a place by being overly architectural
- Gateways should not exclude people, but rather welcome people in.



Large entry walls and planting to Sovereign Crest estate in Knox.

Legend

- City of Knox Boundary
- East Link
- VicRoads

Knox City Council Streets

- Link Road
- Collector Road
- Industrial Road

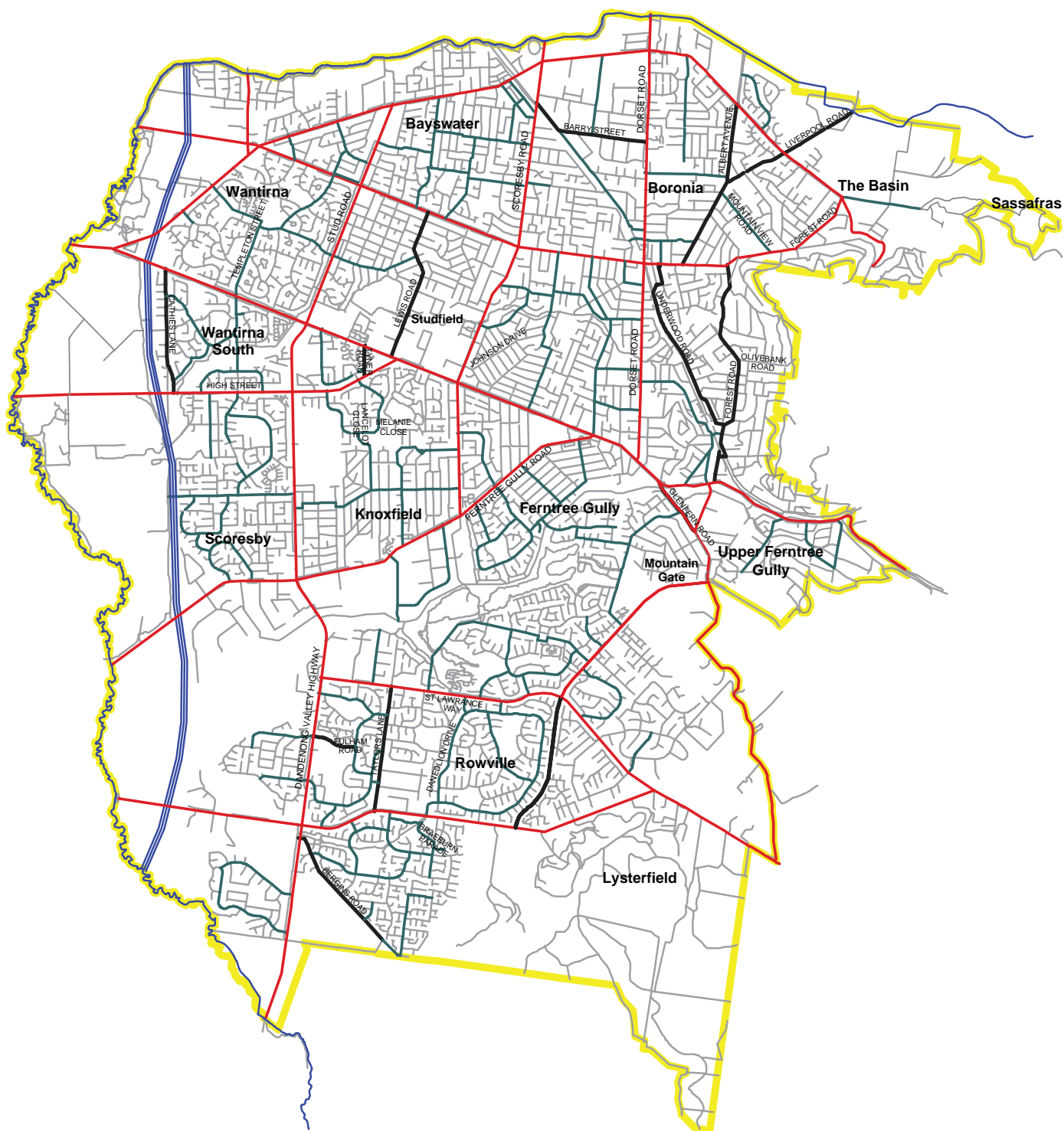


Figure 18: Entry treatments can be located throughout the municipality on different street types

5.20 ENTRANCES & GATEWAYS

DESIGN GUIDELINES

Integration into the immediate and local context

- Research into the place -immediate, local and regional context should be investigated .
- The local neighbourhood character and the Knox municipal character should be considered when designing a gateway.
- Municipal gateways should be treated on a large scale. Refer to the Dandenong Creek Gateways section. Consider also Knox identity and branding guidelines.
- Main Shopping precincts can be treated on a large scale, often operating on Bush Boulevards and Principal Avenues.
- Smaller shopping precincts, industrial estates and business parks, can respond more effectively at a slower vehicle speed and for pedestrians. Consider threshold treatments such as low walls and densely planted beds with canopy trees.
- Residential areas should create a welcoming feeling, not a gated community impression. Planting, low walls and good street trees are successful gateways into neighbourhoods
- Consider community integrated art.
- Refer to the Knox City Council *Art Plan* (2003)

Visibility

- For a gateway treatment to be successful, it needs to be visible. Consider location, size and form, and impression of 'belonging to its site and context.

- Where commercial and retail centres are located on major streets, investigate the reduction of speed limits through activity centres to improve pedestrian safety and reduce the impact of through traffic.
- Bring threshold planting such as large sized trees close to the carriageway, where possible.
- Consider the spatiality of a gateway rather than just a visual impact. A sense of arriving at an entrance, or moving through a threshold, can slow traffic speeds and alert passers by that they are entering a new space.

Materiality

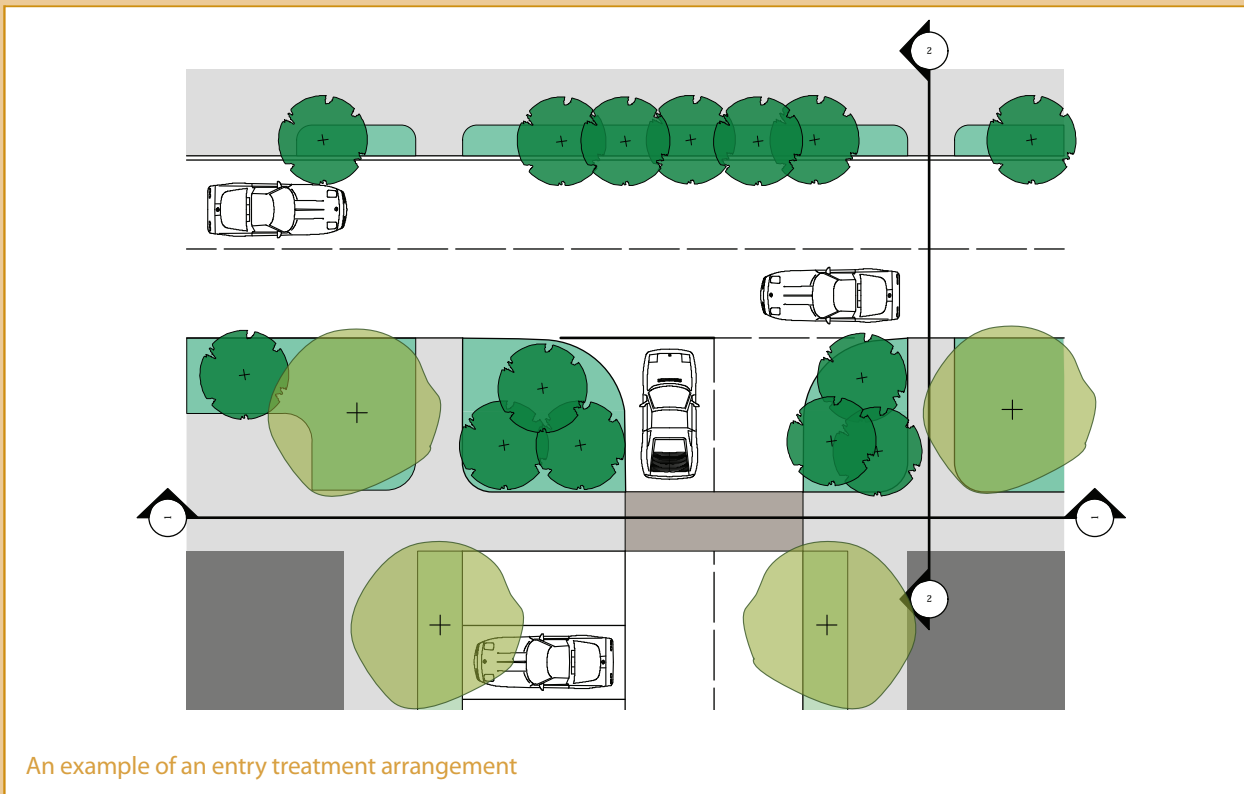
- Gateways can be ephemeral, engaging with natural, elemental, shadows, and time.
- Vegetation should be considered as a gateway element, as it is in keeping with the desired character of the municipality.
- Create formal or informal stands of clear-trunked trees to allow for good shade.
- Create low scaled walls or built structures.
- Emphasise with mounding and planting.
- Choose local materials for pavements, mulch beds etc.
- Discourage large walls.
- Discourage 'fashionable' or overly architectural statements.
- Encourage materials that are easy to maintain, are robust and cost effective.



Gateway planting to Riparian Way in Ferntree Gully



Entry planting to Wantirna Mall Shopping Centre car parking



An example of an entry treatment arrangement



Section 1: Indicative proposed cross-section of an entry treatment



6

IMPLEMENTATION

The *Liveable Streets Plan* will be implemented over the next ten years. There should be periodic review of the actions to assess achievement, appropriateness and value.

The key component of the Plan's implementation is the four year action plan. A significant component of this action plan is the prioritisation of actions and task for the first years.

6.1

FOUR YEAR ACTION PLAN

This action plan provides direction on actions that will be undertaken in the first four years of the life of this *Plan*. The action plan presents goals, approaches and actions, resources required, partners who are essential to the action and success measures.

A series of actions are presented. Each action is intended to be a significant body of work which may take several years to complete. Within some actions, high priority tasks are also listed.

An action is a discrete piece of work that can be completed in a limited amount of time and which will contribute to the completion of an approach.

FUNDING FOR THIS ACTION PLAN

Approval of the *Plan* does not mean Council has committed budget to its implementation.

Funding for priority tasks will be sought by Council, both from internal funds and external funding opportunities.

Further budget will be allocated in following years as a part of the rolling action planning process.

They also are expected to respond to the local context, connect with other streets and form a wider network.

6.2 STREETS AS PLACES ACTION PLAN

APPROACH	COUNCIL ACTIONS	
<p>Approach 1</p> <p>Commit to a coordinated Council approach to street design and implementation to ensure best possible infrastructure, community and environmental outcomes</p>	Action 1.1	Council to commit to the implementation of this <i>Plan</i> over the next 10 years with a review every 3 years. Each year clear priorities should be agreed to, budgeted for and implemented
	Action 1.2	Ensure each street project is guided and assessed by the Liveable Streets Checklist. Update checklist after a period of use and review
	Action 1.3	Adopt the Liveable Streets Design Guidelines for all new street design and redesign by Council
	Action 1.4	Review <i>Liveable Streets Plan</i> and action plan annually to measure success and update where necessary
	Action 1.5	Develop a risk mitigation plan of street design, maintenance and community street activities

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Capital Works program	Council directorates: <ul style="list-style-type: none"> • Engineering and Infrastructure • City Development • Community Services 	<ul style="list-style-type: none"> • <i>Plan</i> adopted by 2011 and part of each directorship's yearly planning
	1	Capital Works program managers	<ul style="list-style-type: none"> • Traffic and Transport • Sustainability • Project Delivery 	<ul style="list-style-type: none"> • Number of projects guided and assessed by the Liveable Streets Checklist
	1	Capital Works and City development	<ul style="list-style-type: none"> • Engineering infrastructure • Sustainability • Asset Protection • Parks Services • Local Laws • City Development 	<ul style="list-style-type: none"> • Adopted by 2011
	1	Sustainability	<ul style="list-style-type: none"> • All directorates 	<ul style="list-style-type: none"> • <i>Liveable Streets Plan</i> and Action plan reviewed each year and actions receive funding on an ongoing basis
	2	Governance and Assett strategy	<ul style="list-style-type: none"> • VicRoads 	<ul style="list-style-type: none"> • Risk management review undertaken and projects can proceed with confidence with Council and VicRoads support

6.2 STREETS AS PLACES ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 2</p> <p>Promote and enhance Knox's distinctive urban, suburban and rural landscape identity through the design of its major streets and gateways</p>	<p>Action 2.1 Implement planting and design of Knox's key streets:</p> <ul style="list-style-type: none"> Dandenong creek gateways Bush boulevards Principal avenues Paths into the hills <hr/> <p>Action 2.2 Implement the Liveable Streets Design Guidelines to achieve the desired character for Knox's main streets and gateways</p> <hr/> <p>Action 2.3 Establish a protocol or memorandum of understanding with VicRoads for non-standard streets to achieve greater liveability</p> <hr/> <p>Action 2.4 Revise the <i>Knox Street Tree</i> and <i>Nature Strip Policy</i> as separate policies to include recommendations from the:</p> <ul style="list-style-type: none"> Neighbourhood Character Study; Sustainable Environment Strategy; Sites of Biological Significance; Net Gain Policy; Native Vegetation Framework; Draft Native Vegetation Generic Integrity Policy; Indigenous Roadside Vegetation programme; WSUD Strategy; Knox Heat Island Effects Study and to Develop a Street Tree Management Plan Develop a Street Tree Selection Tool Conduct a Street Tree Audit to feed into the plans above Develop a Nature Strip Planting Application form and process
<p>Approach 3</p> <p>Enhance Knox's neighbourhood character through integrated street design</p>	<p>Action 3.1 Ensure street design is consistent with Knox residential design guidelines and the Liveable Streets Design Guidelines</p> <hr/> <p>Action 3.2 Adopt and implement green neighbourhood streets as a priority street type for improving neighbourhood character</p>

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Capital works program	<ul style="list-style-type: none"> • Sustainability • Construction Group • Traffic and Transport • Parks Services 	<ul style="list-style-type: none"> • Dandenong creek gateways completed in five years • Bush boulevards and principle avenues planted in 10 years • Paths into the hills planted in 15 years
	1	Engineering Infrastructure, Sustainability	<ul style="list-style-type: none"> • Parks Services • Asset Protection • City Strategy • Local Laws 	<ul style="list-style-type: none"> • Street improvements comply with checklist
	3	Engineering Infrastructure	<ul style="list-style-type: none"> • Sustainability • Local Laws 	<ul style="list-style-type: none"> • Memorandum adopted by 2012
	1	Sustainability and Parks services	<ul style="list-style-type: none"> • Parks 	<ul style="list-style-type: none"> • Revision of the <i>Knox Street Tree and Nature Strip Policy</i> by 2011
	1	Engineering Infrastructure, City Strategy	<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Street improvements comply with checklist and criteria
	1	Engineering Infrastructure, City Strategy	<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Implement 3 green neighbourhood streets in 5 years.

6.2 STREETS AS PLACES ACTION PLAN

APPROACH	COUNCIL ACTIONS	
Approach 4 Support community participation in street activities	Action 4.1	Talk to local communities to list the qualities that give their locality a sense of place, and bring their perspectives into the design process and maintenance, in particular for home streets
	Action 4.2	Facilitate and promote street and neighbourhood-based sustainable streets, community events and activities (e.g. street parties, garden clubs, nature strip maintenance groups)
	Action 4.3	Work with community groups to facilitate community involvement in streetscape design and maintenance
	Action 4.4	Encourage community initiated groups to form and be proactive in street design and use

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	3	Traffic and Transport Community Wellbeing	<ul style="list-style-type: none"> • Sustainability • Engineering Infrastructure • Community 	<ul style="list-style-type: none"> • Collaborative consultation approach with residents and levels of community participation
	2	Traffic and Transport Community Wellbeing Sustainability	<ul style="list-style-type: none"> • Local laws • Community Programs • Parks services • Asset strategy • Community 	<ul style="list-style-type: none"> • Clear easy procedures available on web and through customer service • Record number of people who download information and number of activities that occur
	1	Traffic and Transport Community Wellbeing	<ul style="list-style-type: none"> • Sustainability • Asset Protection • Community • Parks services 	<ul style="list-style-type: none"> • Collaborative consultation approach with residents and level of community participation • Number of community groups and residents approaching Council for stakeholdership
	1	Community Wellbeing	<ul style="list-style-type: none"> • Sustainability • Community 	<ul style="list-style-type: none"> • Number of community initiated groups

6.2 STREETS AS PLACES ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Community initiation</p> <p>Community groups initiating residential streetscape projects and working with Council to deliver</p>	3, 4, 5	<ul style="list-style-type: none"> • Sustainability • Community Wellbeing 	<ul style="list-style-type: none"> • Number of community initiated street projects in Knox
<p>Community participation</p> <p>Participating in street-based programs to improve the design of local streets including Gardens for Wildlife and 'edible streets' and the design of their garden to enhance neighbourhood character</p>	3, 4, 5	<ul style="list-style-type: none"> • Sustainability • Community Wellbeing 	<ul style="list-style-type: none"> • Level of community involvement in street projects • Number and extent of edible and gardens for wildlife private gardens • Increase in amenity and maintenance of private gardens

GOAL

To create and strengthen Knox's distinct sense of place through high quality streets

6.3

STREETS FOR TRAVEL

ACTION PLAN

APPROACH	COUNCIL ACTIONS	
<p>Approach 1</p> <p>Encourage travel behaviour change by supporting alternative travel modes</p>	Action 1.1	Make better provision for cyclists and pedestrians in streets and open spaces to support increased take-up of walking and cycling as an alternative to car travel for short (5 min.) and medium (15 min.) journeys
	Action 1.2	Improve the number and amenity of pedestrian and cyclist links between neighbourhoods and key attractions. Refer to <i>Knox Pedestrian Plan</i> , <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i>
	Action 1.3	Improve pedestrian and cyclist connections to public transport nodes, by improving the safety and comfort of the journey and facilities at waiting points – e.g. at bus stops, road crossings – through increased seating, shelter, safety, shade
<p>Approach 2</p> <p>Make walking a viable choice for residents</p>	Action 2.1	Walking trips to schools, shops and community facilities by the footpath to be made safe and more accessible with the introduction of green neighbourhood streets See Section 5 <i>Liveable Street Design Guidelines</i>
	Action 2.2	The 10 hotspots identified in the Knox Pedestrian Plan should be extended to include all key pedestrian generators such as schools and shops
	Action 2.3	Align capital and maintenance works with the <i>Knox Footpath and Shared Path Asset Management Plan</i>
	Action 2.4	Ensure a separation (via nature strips and planting) between the carriageway and pedestrian pathways to increase comfort and safety
	Action 2.5	Implement Knox walkable school programs and support programs, for example a 'walking school bus' program Refer to <i>Knox Pedestrian Plan</i> , <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i>
	Action 2.6	Ensure adequate pedestrian lighting in key pedestrian streets as identified in the <i>Knox Pedestrian Plan</i>
	Action 2.7	Implement footpaths on at least one side of the street and preferable both sides of the street

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Traffic and Transport		<ul style="list-style-type: none"> Refer to <i>Knox Pedestrian Plan</i>, <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i> success indicators
	2	Traffic and Transport		<ul style="list-style-type: none"> Refer to <i>Knox Pedestrian Plan</i>, <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i> success indicators
	1	Traffic and Transport Sustainability		<ul style="list-style-type: none"> Refer to <i>Knox Pedestrian Plan</i>, <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i> success indicators
	2	Traffic and Transport		<ul style="list-style-type: none"> Implement 3 green neighbourhood streets in 5 years
	3	Traffic and Transport		<ul style="list-style-type: none"> 10 hotspots improved and additional hotspots identified
	2			<ul style="list-style-type: none"> Asset Strategy, Footpath and Shared Path Asset Management Plan
	3	Traffic and Transport	<ul style="list-style-type: none"> VicRoads 	
	2	Traffic and Transport	<ul style="list-style-type: none"> Community 	<ul style="list-style-type: none"> Refer to <i>Knox Pedestrian Plan</i>, <i>Knox Bicycle Plan</i> and <i>Knox Integrated Transport Plan</i> success indicators
	2	Traffic and Transport	<ul style="list-style-type: none"> Service Authority eg. SP Ausnet 	
	1	Construction Group and Urban planning	<ul style="list-style-type: none"> Traffic and Transport 	<ul style="list-style-type: none"> All newly constructed roads have at least one footpath

6.3 STREETS FOR TRAVEL ACTION PLAN

APPROACH	COUNCIL ACTIONS	
Approach 3 Make cycling a viable choice for residents	Action 3.1	Design and implement a network of commuter bike routes in accordance with the recommendations of the <i>Knox Bicycle Plan</i>
	Action 3.2	Indicate entrances to bike paths through signage or artwork, and implement signage on bike paths with distance markers to destinations such as shopping centres
Approach 4 Encourage pedestrian use of residential streets by reducing vehicle speed	Action 4.1	Provide road pavement treatments to highlight a non-car dominated space and encourage drivers to slow down
	Action 4.2	Ensure carriageway widths for vehicles meet the minimum safety and legislative requirements
Approach 5 Provide accessible footpaths and crossings	Action 5.1	Provide accessible crossings to all streets
	Action 5.2	Determine appropriate widths of footpaths to facilitate pedestrian movement in commercial and residential environments (or example, minimum 1.4 metres for residential streets and 2.5 metres for commercial streetscapes), as defined in the <i>Footpath and Shared Path Asset Management Plan</i>
	Action 5.3	Provide seats with backs and arm rests along streets and at pedestrian pause points
Approach 6 Implement shared use zones and home zones in streets to promote walking and cycling	Action 6.1	Identify streets in residential and commercial areas which have the capacity to become shared use zones and prioritise for implementation
	Action 6.2	Identify through the <i>Knox Pedestrian Plan</i> those streets that are likely candidates for home zone treatment and prioritise

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Traffic and Transport	<ul style="list-style-type: none"> Bicycle Victoria 	<ul style="list-style-type: none"> Increase in the number of seats on streets
	3	Traffic and Transport	<ul style="list-style-type: none"> Bicycle Victoria Strategic Planning Marketing and Communications Sustainability 	
	3	Project Delivery	<ul style="list-style-type: none"> Traffic and Transport 	
	3	Project Delivery	<ul style="list-style-type: none"> Traffic and Transport 	
	1	Project Delivery	<ul style="list-style-type: none"> Traffic and Transport Healthy Ageing Community Wellbeing 	
	3	Construction Group	<ul style="list-style-type: none"> Traffic and Transport Healthy Ageing Community Wellbeing 	
	1	Sustainability Parks services	<ul style="list-style-type: none"> Traffic and Transport Healthy Ageing Community Wellbeing 	
	2	Traffic and Transport	<ul style="list-style-type: none"> Bicycle Victoria 	<ul style="list-style-type: none"> Shared use zones implemented in key pedestrian priority locations in commercial and residential areas
	2	Traffic and Transport	<ul style="list-style-type: none"> Community Wellbeing Sustainability Healthy Ageing 	<ul style="list-style-type: none"> Candidates for home zones identified, prioritised and 2 home zones implemented in 5 years

6.3 STREETS FOR TRAVEL ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Home Zones</p> <p>Communities to work with Council to implement a prototype home zone</p>	6		<ul style="list-style-type: none"> • Implementation of prototype • Increase in pedestrian activity and social connectivity within home zone area • Increase in perceptions of safety
<p>Shared Use Zones</p> <p>Communities to work with Council to implement shared use zones</p>	6		<ul style="list-style-type: none"> • Implementation of prototype • Increase in pedestrian activity and social connectivity within home zone area • Increase in perceptions of safety
<p>Walking School Bus</p> <p>Communities to promote and utilise walking and cycling to school programmes</p>		<ul style="list-style-type: none"> • Partner - Travel Smart, see www.travelsmart.gov.au/schools/schools2.html 	<ul style="list-style-type: none"> • Increase in number of pedestrians and cyclists
<p>Pause Points</p> <p>Communities to promote and utilise pause points</p>			<ul style="list-style-type: none"> • Number of people observed using pause points

GOAL

To improve the ability of streets to cater for an increase in sustainable transport options in Knox.

6.4 STREETS FOR THE ENVIRONMENT ACTION PLAN

APPROACH	COUNCIL ACTIONS	
Approach 1 Increase sustainable water use, capture and treatment in streets	Action 1.1	Incorporate Stormwater Quality Improvement (SQUID) and Water Sensitive Urban Design (WSUD) – into all new streets as per current best practice guidelines as published by Melbourne Water, CSIRO and Monash University
	Action 1.2	Coordinate SQUID/WSUD works with <i>Knox Road Asset Management Plan</i> and capital works programme to ensure incorporation into all works
	Action 1.3	Implement SQUID/WSUD through the street network as opportunities arise, based on the <i>Liveable Streets Design Guidelines</i>
	Action 1.4	Capture stormwater on a street scale and allow residents to use it

GOAL

To improve environmental sustainability of streets in Knox.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Engineering, Draft WSUD plan	<ul style="list-style-type: none"> • Sustainability • Place Management • Asset Management 	<ul style="list-style-type: none"> • Ensure links to WSUD strategy, identify opportunities for water reuse and recycling
	1	Engineering	<ul style="list-style-type: none"> • Sustainability • Place Management • Asset Management 	<ul style="list-style-type: none"> • Ensure links to WSUD strategy, identify opportunities for water reuse and recycling
	1	Engineering	<ul style="list-style-type: none"> • Sustainability • Place Management • Asset Management 	<ul style="list-style-type: none"> • Ensure links to WSUD strategy, identify opportunities for water reuse and recycling
	3	Engineering	<ul style="list-style-type: none"> • Sustainability • Place Management • Asset Management 	<ul style="list-style-type: none"> • Ensure links to WSUD strategy, identify opportunities for water reuse and recycling

6.4 STREETS FOR THE ENVIRONMENT ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 2</p> <p>Improve biodiversity and habitat values through enhancement of Knox's street vegetation</p>	<p>Action 2.1</p> <p>Revise the <i>Knox Street Tree and Nature Strip Policy</i> to include recommendations from the:</p> <p><i>Neighbourhood Character Study;</i> <i>Sustainable Environment Strategy;</i> <i>Sites of Biological Significance;</i> <i>Net Gain Policy;</i> <i>Native Vegetation Framework;</i> <i>Draft Native Vegetation Generic Integrity Policy;</i> Indigenous Roadside Vegetation programme; <i>WSUD Strategy;</i> <i>Revegetation Plan;</i> <i>Knox Heat Island Effects Study</i></p> <p>Develop a Street Tree Management Plan</p> <p>Develop a Street Tree Selection Tool</p> <p>Conduct a Street Tree Audit to feed into the plans above</p> <p>Develop a Nature Strip Planting Application form and process</p>
	<p>Action 2.2</p> <p>Revise the <i>Knox Street Tree and Nature Strip Policy</i> to include:</p> <ul style="list-style-type: none"> • A valuation method for street trees that includes economic, habitat and amenity values • Recommendations from the Bushfires Royal Commission
	<p>Action 2.3</p> <p>Increase street tree planting across the municipality to provide shade and reduce summer heat gain</p>
	<p>Action 2.4</p> <p>Review Council's street lighting policy to preserve views of the night sky and respond to the needs of nocturnal species. This should take into account community safety issues and Australian standards</p>

GOAL

To improve environmental sustainability of streets in Knox.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Sustainability Parks	<ul style="list-style-type: none"> • safety risk and well being • asset preservation and urban planning 	<ul style="list-style-type: none"> • Revise the Knox Street Tree and Nature Strip Policy by 2012
	1	Sustainability	<ul style="list-style-type: none"> • Parks 	<ul style="list-style-type: none"> • Incorporated into revised Knox Street Tree and Nature Strip Policy
	1	Parks	<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Increase in number of trees planted annually
	3	Engineering	<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Review Council's street lighting policy by 2012

6.4 STREETS FOR THE ENVIRONMENT ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 3</p> <p>Design and implement environmentally sustainable streetscapes</p>	<p>Action 3.1 Promote the development of edible streetscapes within the <i>Street Tree and Nature Strip Policy</i></p>
	<p>Action 3.2 Design and implement one edible street prototype</p>
	<p>Action 3.3 Use appropriate vegetation in conjunction with maintenance in fire prone areas to reduce fire risk and balance environmental outcomes</p>
	<p>Action 3.4 Develop a palette of materials for street construction that will enhance the environmental sustainability of the street. Incorporate this materials palette into the <i>Liveable Streets Design Guidelines</i> and apply to all new street works</p>
	<p>Action 3.5 Investigate the feasibility of wind collectors within public recreational spaces and in streets</p>
	<p>Action 3.6 Implement solar lighting for pedestrian path and shared path lighting in neighbourhood streets</p>
	<p>Action 3.7 Educate residents about the contribution that street trees make to environmental sustainability and involve them in programs to care for their local street trees. Undertake through a “care for your street tree” program that distributes brochures about how to care for your street tree to each resident</p>
	<p>Action 3.8 Educate residents regarding safe use of treated stormwater. Identify opportunities where streets can contribute to wildlife corridors or connect sites of biological significance. Particularly important in foothills area close to the national parks</p>
	<p>Action 3.9 Use porous paving adjacent to significant trees when constructing streets and repairing footpaths</p>

GOAL

To improve environmental sustainability of streets in Knox.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	2	Sustainability	<ul style="list-style-type: none"> • Parks 	
	2	Sustainability	<ul style="list-style-type: none"> • Local residents & fruit growers • Parks Services 	<ul style="list-style-type: none"> • Design and implement one edible street prototype • 2 edible streets created by the community in 5 years
	3	Sustainability	<ul style="list-style-type: none"> • Community safety, • Emergency management • CFA 	
	2	Sustainability	<ul style="list-style-type: none"> • Parks • Engineering • Asset Protection 	<ul style="list-style-type: none"> • Installation of tree pits for water quality, tree health and drainage solutions
	3	Sustainability	<ul style="list-style-type: none"> • Recreation 	
	2	Sustainability	<ul style="list-style-type: none"> • Integrated Transport, • Travelsmart 	
	1	Sustainability Parks Services	<ul style="list-style-type: none"> • City Planning 	<ul style="list-style-type: none"> • Implement a care for your street tree program
	2	Project Delivery	<ul style="list-style-type: none"> • Sustainability • City Planning 	
		Engineering Infrastructure		

6.4 STREETS FOR THE ENVIRONMENT ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Participation</p> <p>Getting involved when their street is being redesigned, and working with Council to implement improvements</p>			<ul style="list-style-type: none"> Greater participation and in put from residents during design process
<p>Instigation</p> <p>Initiating a local activity in their street such as Gardens for Wildlife or edible streetscapes</p>		<ul style="list-style-type: none"> Gardens For Wildlife Knox Environment Society 	
<p>Maintenance</p> <p>Care for their street nature strips and vegetation through maintaining their street tree, not parking on nature strips and disposing of rubbish responsibly</p>			<ul style="list-style-type: none"> Reduction in the number of complaints and fines in relation to rubbish dumping and parking on nature strips
<p>Stormwater use</p> <p>Utilisation of detained water from WSUD treatments for residential purposes such as gardening and car washing</p>	1.4		<ul style="list-style-type: none"> Number of WSUD treatments that are being accessed

GOAL

To improve environmental sustainability of streets in Knox.

6.5 STREETS AND THE ECONOMY ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 1</p> <p>Build the capability of the residents to work collectively to 'populate' the streets to make it a desirable, healthy place to live and work</p>	<p>Action 1.1 Create and encourage ownership and pride. Support and allow residents to plant their nature strips</p>
	<p>Action 1.2 Enable appropriate community action through education programs, distribution of guidelines for street based activities, provision of Council grants to groups and in-kind support</p>
	<p>Action 1.3 Revise <i>Knox Street Tree and Nature Strip Policy</i> to include a valuation method for street trees' economic, habitat and amenity. This will help promote the economic value of street trees and how they contribute to residential desirability</p>
	<p>Action 1.4 Targeted street tree planting: streets ranked at a higher priority if they have no street trees currently, if the residents in the street approach Council as a collective, or if the planting will have a large impact on the surrounding area</p>
	<p>Action 1.5 Encourage new developments to implement well designed and appropriate threshold and gateway treatments to residential areas to increase desirability. Refer to <i>Liveable Street Design Guidelines</i></p>
<p>Approach 2</p> <p>Build capacity of the commercial and retail 'people' to animate the refreshed streetscape</p>	<p>Action 2.1 Council to support traders to develop cohesive traders associations in order to work together to improve their shopping</p>
	<p>Action 2.2 Based on trader interest, willingness and drive, develop a priority plan for refreshing shopping streets</p>
	<p>Action 2.3 Develop templates toolbox that can be used by traders to develop ideas for enhancing the commercial and pedestrian capacity of their shopping street</p>
	<p>Action 2.4 Develop a matching funding program for shopping streets and traders associations</p>

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	2	Parks Services	<ul style="list-style-type: none"> • Sustainability • Asset Protection • Marketing and communication 	<ul style="list-style-type: none"> • Visible signs of community maintaining their nature strips
	2	Traffic and Transport	<ul style="list-style-type: none"> • Community • Residents • Community Wellbeing 	<ul style="list-style-type: none"> • Increase in community street groups
	1	Sustainability Parks Services	<ul style="list-style-type: none"> • Residents • VicRoads 	<ul style="list-style-type: none"> • Increased resources in the 2010/11 budget to implement a 'no net loss' of street tree numbers • Achieve overall increase in trees
	1	Parks Services	<ul style="list-style-type: none"> • Strategic Planning • Sustainability • VicRoads 	<ul style="list-style-type: none"> • Increased number of streets being planted because of community initiated action, and increase in treed streets
	2	Strategic Planning City Planning	<ul style="list-style-type: none"> • Housing developers 	<ul style="list-style-type: none"> • All new gateway elements are designed according to <i>Liveable Street Design Guidelines</i>
	1	Economic Development	<ul style="list-style-type: none"> • Parks Services • Sustainability 	<ul style="list-style-type: none"> • Trader associations for each shopping precinct
	2	Place Management	<ul style="list-style-type: none"> • Economic Development 	<ul style="list-style-type: none"> • Priority plan developed
	2	Economic Development	<ul style="list-style-type: none"> • Traders 	<ul style="list-style-type: none"> • Tool box developed and communicated to traders
	3	Economic Development	<ul style="list-style-type: none"> • Traders 	<ul style="list-style-type: none"> • Programme developed

6.5 STREETS AND THE ECONOMY ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 3</p> <p>Refresh streets in activity centres and neighbourhood shopping strips to enable improved economic outcomes</p>	<p>Action 3.1 Assess the potential for undergrounding powerlines in key shopping areas and defined Activity Centres to improve the liveability of selected streets and areas</p>
	<p>Action 3.2 Implement minimum amenity standards including shade, bins, seating, threshold treatments and pedestrian pavements to retail and business precincts, progressively improving the public realm for all</p>
	<p>Action 3.3 Establish car park design standards, based on <i>Liveable Streets Design Guidelines</i> and <i>Knox WSUD Policy</i>, and apply to all public car parks (including those associated with retail and commercial developments)</p>
	<p>Action 3.4 Make allowances for street trading (goods for sale, A-frames), particularly on wide paths in shopping areas. Allowance of 1.2m clear spaces along building frontage as required by local law</p>
<p>Approach 4</p> <p>Improve economic longevity of street pavements through appropriate street tree planting</p>	<p>Action 4.1 Plant appropriate street trees that provide shade to road pavements and help increase their longevity through reduced exposure to heat</p>
<p>Approach 5</p> <p>Promote walking and cycling activity in Knox streets to reduce community health costs and increase well-being</p>	<p>Action 5.1 Enact green neighbourhood streets to increase walking and cycling in local areas</p>
	<p>Action 5.2 Increase pedestrian and cycle amenity to make journeys more desirable with a priority on links to major destinations points such as open space, community hubs, schools and shopping precincts</p>
	<p>Action 5.3 Promote street and neighbourhood community events to build a local sense of identity and connection and develop clear and easy procedures for community members to run these events</p>

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	2	Place Management	<ul style="list-style-type: none"> • Electrical suppliers • Traders 	<ul style="list-style-type: none"> • Undergrounding of powerlines in key activity centre main streets undertaken by 2015
	2	Place Management	<ul style="list-style-type: none"> • Development • Traders 	<ul style="list-style-type: none"> • Precinct has adequate street trees, footpaths, pedestrian seating, bins and cycle hoops
	2	Project Delivery	<ul style="list-style-type: none"> • Traders • Parks Services • Sustainability 	<ul style="list-style-type: none"> • All new public car parks to achieve minimum standards of: shade trees, appropriate WSUD treatments, and pedestrian paths
	2	Local laws	<ul style="list-style-type: none"> • Economic Development • City Planning • Traders • Community 	<ul style="list-style-type: none"> • All traders have applied for a street trading permit and all retail areas have 1.2m clear space along building frontage
	2	Parks Services	<ul style="list-style-type: none"> • Sustainability • City Planning • Strategic Planning 	<ul style="list-style-type: none"> • Ensure street trees provide shade to road pavements where possible
	3	Traffic and Transport	<ul style="list-style-type: none"> • Community, • Traders 	<ul style="list-style-type: none"> • Implement 3 green neighbourhood streets in 5 years
	1	Sustainability	<ul style="list-style-type: none"> • Traffic and Transport 	<ul style="list-style-type: none"> • Number of kilometres of improved amenity along paths
	2	Economic Development Community Wellbeing	<ul style="list-style-type: none"> • Community • Traders • Marketing and communication; • Culture and leisure • Sustainability 	<ul style="list-style-type: none"> • Community initiated street events increase

6.5 STREETS AND THE ECONOMY ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Residents Initiated Activities</p> <p>Communities identifying opportunities to improve the nature strips in their local streets</p>	1		<ul style="list-style-type: none"> • Community initiated street tree planting increased • Community initiated nature strip planting and maintenance increased
<p>Trader Initiated Activities</p> <p>Traders can improve their shopping area by upgrading their shop frontages</p>	3	<ul style="list-style-type: none"> • Gardens For Wildlife • Knox Environment Society 	<ul style="list-style-type: none"> • Increase in shop frontage upgrades
<p>Traders to develop cohesive traders associations in order to work together to improve their shopping area</p>	2		<ul style="list-style-type: none"> • Trader associations for each shopping precinct

GOAL

To build and advocate for quality streets that attract, retain and enhance business and workers, families and communities.

6.6

SAFE STREETS ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 1</p> <p>Decrease vehicle speeds in residential streets and retail environments</p>	<p>Action 1.1 Work with LATM (Local Area Traffic Management) plans to improve problematic streets with treatments that will reduce vehicles speeds</p>
	<p>Action 1.2 Identify potential shared use zones and implement a program of pilot studies into different areas. For example short streets, school streets, residential courts, transport hubs and within key Activity Centres See also Theme: Streets for Travel</p>
	<p>Action 1.3 Ensure all new and upgraded streets are designed to reduce vehicle speed and increase pedestrian safety</p>
<p>Approach 2</p> <p>Improve pedestrian access and amenity in streets to provide equitable space for non-vehicle movement</p>	<p>Action 2.1 Implement footpaths to at least one side of streets and preferably to both sides See also Theme: Streets for Travel</p>
	<p>Action 2.2 Enact green neighbourhood streets to promote bike and pedestrian travel See also Theme: Streets for Travel</p>
	<p>Action 2.3 Implement safety lighting as set out in the <i>Knox Pedestrian Plan</i> with a review to ensure appropriate sustainability and environmental outcomes</p>
	<p>Action 2.4 Apply CPTED (Crime Prevention Through Environmental Design) principles to all new capital works projects and public transport structures</p>
	<p>Action 2.5 Encourage residents to improve the safety of their homes, through clear sightlines between street and front door</p>
	<p>Action 2.6 Expand the 'Mothers Living Well' program across all suburbs. This program encourages walking and playing in public spaces</p>
	<p>Action 2.7 Ensure adequate maintenance of footpaths, as per <i>Knox Footpath and Shared Path Asset Management Plan</i></p>

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Project delivery	<ul style="list-style-type: none"> Local community Traffic and transport Public transport authority 	<ul style="list-style-type: none"> Traffic counts showing speed reduction and reduced accidents
	1	Engineering, Sustainability, Assets, Strategic Planning, Traffic and transport	<ul style="list-style-type: none"> Local community, Parks 	<ul style="list-style-type: none"> Increased number of shared use zones
	3	Planning, Subdivisions, Engineering	<ul style="list-style-type: none"> Planning permit applicants sustainability 	<ul style="list-style-type: none"> No new streets have ongoing problematic speeding issues
	2	Project Delivery	<ul style="list-style-type: none"> Construction Group Traffic and Transport 	<ul style="list-style-type: none"> Increase in footpaths
	1	City Planning Sustainability Project delivery Traffic and transport	<ul style="list-style-type: none"> Parks Services Strategic Planning 	<ul style="list-style-type: none"> Increase in pedestrians and cyclists
	2	Engineering		<ul style="list-style-type: none"> Priority lighting projects in <i>Knox Pedestrian Plan</i> undertaken
	2	Community Safety Capital works project managers	<ul style="list-style-type: none"> Local community 	<ul style="list-style-type: none"> Reduction in reported crimes and complaints to police and safer communities group within Council
	3	Community Safety	<ul style="list-style-type: none"> Local community Marketing and communications 	<ul style="list-style-type: none"> Reduction in reported crimes and complaints to police and safer communities group within Council
	2	Community and Engineering, KCHS development	<ul style="list-style-type: none"> Local community 	<ul style="list-style-type: none"> Each suburb having their own Mothers Living Well program
	1	Asset Operations, Parks, Construction group	<ul style="list-style-type: none"> Local community 	<ul style="list-style-type: none"> Reduction in complaints to Council and increased pedestrian activity

6.6 SAFE STREETS ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 3</p> <p>Provide safe areas for parking of vehicles</p>	<p>Action 3.1 Educate residents on legal parking options, ie on the road, not on the footpath or nature strips</p>
	<p>Action 3.2 Mark parking lanes on wider streets</p>
	<p>Action 3.3 Ensure all new streets provide minimum width for car parking with car parks housed in landscape outstands. Refer to <i>Liveable Streets Design Guidelines</i></p>
<p>Approach 4</p> <p>Create community destinations – reasons to be on the street</p>	<p>Action 4.1 Work with communities and planning permit applications to increase the number of interesting destinations in residential streets, such as gardens of interest, artwork, places for play, meeting places and pause points</p>

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	2	Traffic and transport and Local laws	<ul style="list-style-type: none"> Local community, VicRoads Marketing and communications 	<ul style="list-style-type: none"> Vehicles parked legally and safely Minimal ongoing use of nature strips for residential parking
	1	Traffic and transport, Project delivery Local laws	<ul style="list-style-type: none"> VicRoads 	<ul style="list-style-type: none"> Fewer complaints recorded
	1	City Planning	<ul style="list-style-type: none"> Planning permit applicants 	<ul style="list-style-type: none"> Streets designed in accordance with <i>Liveable Streets Design Guidelines</i>
	2	City Planning Traffic and transport Sustainability Community Wellbeing	<ul style="list-style-type: none"> Local community Planning permit applicants culture and leisure 	<ul style="list-style-type: none"> Increased pedestrian activity on streets

6.6 SAFE STREETS ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Community reporting</p> <p>Community members identifying opportunities for improved driver and pedestrian safety</p>	1.1, 1.3, 3.1		<ul style="list-style-type: none"> Increase in community reporting of issues
<p>Neighbourhood watch</p> <p>Becoming active in neighbourhood watch type activities</p>			<ul style="list-style-type: none"> Active neighbourhood watch groups across Knox
<p>Activities</p> <p>Actively using the street</p>	4.1		<ul style="list-style-type: none"> Increase activity in streets
<p>Maintenance</p> <p>Educate and encourage residents to keep footpaths clear of foliage</p>	2.5, 2.7		<ul style="list-style-type: none"> Less reported complaints about private vegetation
<p>Gardens</p> <p>Encourage garden beautification and blending into streetscape to provide interest for pedestrians</p>	2.5	<ul style="list-style-type: none"> Gardens for Wildlife 	<ul style="list-style-type: none"> Increase in gardening as a recreational activity

GOAL

To improve the safety of Knox's streets for pedestrians, cyclists and motorists.

6.7

STREETS FOR THE COMMUNITY

ACTION PLAN

APPROACH	COUNCIL ACTIONS
<p>Approach 1</p> <p>Design streets to enable community activity</p>	<p>Action 1.1 Develop a priority list of achievable home zones in Knox based on current list provided by the <i>Knox Pedestrian Plan</i> See also Theme: <i>Streets for Travel</i></p>
	<p>Action 1.2 Based on community interest and willingness to participate develop a prototype for a home zones See also Theme: <i>Streets for Travel</i></p>
	<p>Action 1.3 Initiate community consultation of the green neighbourhood streets in identified priority suburbs. Green neighbourhood streets primary function is to increase community use of key streets in each Knox suburb</p>
	<p>Action 1.4 Develop templates and toolbox that can be used by residents to develop ideas for enhancing the community capacity of their street</p>
	<p>Action 1.5 Promote dog walking in neighbourhood streets. Dog walking promotes community socialisations and improves mental and physical health of the community. Refer to the <i>Knox Domestic Animal Management Plan</i></p>
<p>Approach 2</p> <p>Support community initiatives in streets</p>	<p>Action 2.1 Work with community groups to establish local street and neighbourhood events focused on creating streets as community spaces</p> <p>Develop a simplified process and checklist for the community</p>
	<p>Action 2.2 Support and promote specific community-based programs including Gardens for Wildlife, Mothers Living Well and edible streetscapes</p> <p>Council to provide training, modest resources, education and publications</p>
	<p>Action 2.3 Undertake 3 community arts projects annually within local streets, based on the Knox Placemakers community artists model</p>
	<p>Action 2.4 Develop a matching community grants program and guidelines which provides matching funding and resourcing to improve their street</p>
<p>Approach 3</p> <p>Streets as places to produce, harvest and share food</p>	<p>Action 3.1 Work with community groups and residential street groups to create edible streets and private edible gardens</p>

Note: all actions need to contribute to consistent neighbourhood character

GOAL

To increase community pride and action in Knox streets.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	2	Traffic and Transport	<ul style="list-style-type: none"> • Sustainability • Strategic Planning 	<ul style="list-style-type: none"> • Priority list of Home zones by 2012
	1	Traffic and Transport	<ul style="list-style-type: none"> • Sustainability • Strategic Planning 	<ul style="list-style-type: none"> • Two home zone prototypes implemented in 5 years
	1	Traffic and Transport Sustainability	<ul style="list-style-type: none"> • Parks Services • Project Delivery 	<ul style="list-style-type: none"> • By 2012 communities have been involved in the planning and design of at least 3 green neighbourhood streets
	2	Community Wellbeing	<ul style="list-style-type: none"> • Sustainability • Gardens for Wildlife • Culture and leisure 	<ul style="list-style-type: none"> • Templates and toolbox available to the community by 2012
	1	Local Laws		<ul style="list-style-type: none"> • Increased dog walking in residential streets
	2	Community Wellbeing Traffic and Transport	<ul style="list-style-type: none"> • Safety, Risk and Wellbeing , • Culture and leisure • Sustainability 	<ul style="list-style-type: none"> • Streamlined process and checklist for the community street events by 2012
	2	Community Wellbeing	<ul style="list-style-type: none"> • Sustainability • Marketing and communications 	<ul style="list-style-type: none"> • Increased number of community base programs in Knox
	1	Sustainability Community Wellbeing	<ul style="list-style-type: none"> • Community Groups • Culture and leisure 	<ul style="list-style-type: none"> • 3 community arts projects annually
	4	Community Wellbeing	<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Matching community grants program established by 2015
	3	Sustainability	<ul style="list-style-type: none"> • Parks Services 	<ul style="list-style-type: none"> • Design and implement one edible street prototype • 2 edible streets created by the community in 5 years • Increase in private edible gardens

6.7 STREETS FOR THE COMMUNITY ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Community Groups</p> <p>Develop a local community group of interested residents to work with Council to identify opportunities to improve community spaces and activities in their streets</p>	1.2, 2.1		
<p>Community involvement in street design</p> <p>Getting involved when their street is being redesigned, and working with stakeholders and Council to implement improvements</p>	2.1, 3.3		
<p>Initiate a local activity</p> <p>In their street such as;</p> <ul style="list-style-type: none"> • Gardens for Wildlife • Edible streetscapes • Walking tour of edible gardens • Walking tour of Gardens for Wildlife • 'Walking pool system' with people in your street. • Encourage a 'count the birds competition' in your street • Develop a 'barter with your neighbours system' e.g. walk their dogs in return for lemons off their tree • Run a garden competition in your street • Parent supervised play groups in local playgrounds • Adopt a street tree program 		<ul style="list-style-type: none"> • Gardens for Wildlife • Knox Environment Society • Friends groups 	<ul style="list-style-type: none"> • Increase community networks; • Increased activity in streets; • A feeling of greater sense of belonging
<p>Community Newsletter</p> <p>Develop a community newsletter of local activities</p>			

GOAL

To increase community pride and action in Knox streets.

6.8 STREETS FOR INFRASTRUCTURE ACTION PLAN

APPROACH	COUNCIL ACTIONS	
<p>Approach 1</p> <p>Improve the coordination of street design, works and maintenance between Council, state authorities and utility providers</p>	Action 1.1	Develop a priority plan for undergrounding of overhead power lines to improve visual amenity in main shopping streets and built up residential areas. Priority plan should be based on feasibility and value for money assessment
	Action 1.2	Develop a priority plan for undergrounding of overhead power lines in fire hazard areas. This requires coordination with relevant authorities and subject to State Government review and Bushfire Royal Commission recommendations
	Action 1.3	Coordinate between service authorities and Council's works programs to ensure works are undertaken in the best sequence
<p>Approach 2</p> <p>Improve the coordination of street design, works and maintenance across Council</p>	Action 2.1	Periodic reviews of all capital works to ensure best value for money and recommendations made to improve
	Action 2.2	Ensure all works identified in the <i>Knox Road and Footpath</i> and <i>Shared Path Asset Management Plans</i> are reviewed on a yearly basis of with this <i>Plan</i>
<p>Approach 3</p> <p>Improve the quality of street design</p>	Action 3.1	Develop a priority street renewal plan incorporating the <i>Liveable Streets Design Guidelines</i> where appropriate
	Action 3.2	Ensure maintenance principles and requirements inform the design process and final physical outcomes
	Action 3.3	Build the missing footpath links identified in the <i>Knox Pedestrian Plan</i>
	Action 3.4	Ensure consistency of speed control measures and other road treatments across the municipality

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	4	Place Management	<ul style="list-style-type: none"> • Sustainability • Power utilities 	<ul style="list-style-type: none"> • Undergrounding priority plan by 2015
	2	Sustainability	<ul style="list-style-type: none"> • State Government, • power utilities 	<ul style="list-style-type: none"> • All power lines in high hazards fire ares to be under grounded by 2015
	1	Capital works program managers		
	Ongoing	Capital works program		
	1	Traffic and Transport		<ul style="list-style-type: none"> • Missing links footpaths built as per Knox Pedestrian Plan action list
	2	Sustainability	<ul style="list-style-type: none"> • Strategic Planning 	
	1	Capital works program managers	<ul style="list-style-type: none"> • Parks Services • Asset Protection • Operations Centre 	
	1	Traffic and Transport		
	1	Project Delivery	<ul style="list-style-type: none"> • Sustainability • Traffic and transport 	

6.8 STREETS FOR INFRASTRUCTURE ACTION PLAN

APPROACH	COUNCIL ACTIONS	
<p>Approach 4</p> <p>Make sustainability a priority for future infrastructure works</p>	<p>Action 4.1</p>	<p>Design of new streets must incorporate all requirements such as road width and adequate nature strip width for required trees. A holistic approach to the design process</p>
	<p>Action 4.2</p>	<p>Facilitate the consideration of integrated water managing systems (ie SQUID and WSUD) in all new and retrofitting streetscape works. Refer to draft <i>Knox WSUD Plan</i></p>
<p>Approach 5</p> <p>Ensure a balanced approach to on-street car parking</p>	<p>Action 5.1</p>	<p>Ensure the design and location of on-street car parking is responsive to the needs of pedestrians and cyclists and the space requirements for street tree and nature strip planting. Refer to Knox Planning Policy in regards to car parking requirements on streets</p>

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.

	PRIORITY	Council Responsibility	Internal & External Stakeholders	MEASURE OF SUCCESS
	1	Urban Planning, Traffic and Transport Sustainability	<ul style="list-style-type: none"> • Planning permit applicants 	<ul style="list-style-type: none"> • All new streets designed to enable optimum street tree growth
	1	City Planning Project Delivery		
	1	Urban Planning	<ul style="list-style-type: none"> • Planning permit applicants 	

6.8 STREETS FOR INFRASTRUCTURE ACTION PLAN

COMMUNITY ACTIONS Communities can contribute to this goal by:	Links to Council Action Nos.	Key partner community groups (if any)	Measure of success for community
<p>Reporting promptly any issues with their street to Council</p>			
<p>Work with Council in the maintenance of their streets. For example “adopt a street tree program” and mowing their nature strip</p>			

GOAL

Coordinate street design and maintenance to balance infrastructure and community needs.



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APPENDIX



POLICY CONTEXT

STATE GOVERNMENT POLICY FRAMEWORK

Planning for all of Melbourne, Victorian State Government

Policy directions specifically relevant to this strategy are:

- Transport and managing congestion: Implement 'Keep Melbourne Moving' to deliver traffic management and road network improvements to alleviate congestion, and deliver new walking and cycling infrastructure to provide more transport choice.
- Improved Planning and design for sustainable communities – which emphasises the importance of well designed and sustainable built environments and coordinated planning
- Prioritising actions to support a rapid modal shift over the next five years from car to public transport – tram, train/ or bus – and walking and cycling.
- Make Melbourne, the surrounding cities and town and critical infrastructure more resilient to climate change impacts.
- Land-use and transport: Land-use planning guides urban form, street and neighbourhood layout, solar orientation of lots, diversity of development and building type. All these factors influence the amount of energy used to run a home or building, and the choices we make on whether to walk or drive to the local shops. Practical transport choices must also be supported by infrastructure improvements in the metropolitan area that encourages walking, cycling and use of public transport.
- The government will develop urban design standards that build on the 'Neighbourhood Principles' in Melbourne 2030 to promote walkable and less car-dependent communities in both existing and newly developing areas

Melbourne 2030

- Policy 5.3 – Improve community safety and encourage neighbourhood design that makes people feel safe. 'Concerns about safety may restrict people's mobility and levels of activity and may exclude them from some places, particularly at night. 'Perceptions of safety have an influence on travel choice'.
- Policy 5.5 – Promote excellent neighbourhood design to create attractive, walkable and diverse communities. Melbourne 2030 intends that neighbourhoods should be created as integrated and interconnected communities, not just as subdivisions; See also Neighbourhood Principles.
- Reduce dependence on car use because public transport is easy to use, there are safe and attractive spaces for walking and cycling, and subdivision layouts allow easy movement through and between neighbourhoods;
- Environmentally friendly development that includes improved energy efficiency, water conservation, local management of stormwater and waste water treatment, less waste and reduced air pollution.

CITY OF KNOX POLICY FRAMEWORK

The following policies are strategic, outlining the vision for the City of Knox. Below are noted the key points that relate to Knox streetscapes:

Vision 2025

The recent plan 'Vision 2025' describes the Knox community's hopes and aspirations for the future. The Vision directly influences the decisions and actions that the Council undertakes to move towards a sustainable future for the municipality. The Vision aims to simultaneously pursue social equity, economic prosperity and environmental sustainability. The key themes articulated by the community are summarised as:

- Healthy, Connected Communities;
- Culturally Rich and Active Communities;
- Dynamic Services and Facilities;
- Accessible Transport Choices;
- Sustainable Natural Environment;
- Balanced Quality Urban Development;
- A Prosperous, Modern Economy

Sustainable Environment Strategy

The Sustainable Environment Strategy is a high level document developed by Knox City Council to guide the Council's ambition of achieving a sustainable city within a sustainable environment. The document focus's on a number of themes, all of which contribute to and guide the design of liveable streetscapes. These themes include biodiversity; water quality; community engagement; waste minimisation; sustainable planning and development; integrated transport and climate change mitigation and adaptation.

Municipal Strategic Statement (MSS)

Key elements of the MSS are:

Clause 21.05 Promoting the identity and image of Knox

Overview/Objective:

- The attractive, green, leafy, lifestyle image which Knox presents contributes significantly to the popularity of Knox as a residential and business address. Maintenance and enhancement of this image is important in order to retain and attract business and residents.
- To retain and enhance valued character elements of Knox, in particular the 'green, leafy image' of urban areas and the rural image of non-urban areas, which give the community a sense of identity and make Knox an attractive place to live and do business in.

Relevant Strategies / Actions

- Maintain and enhance the "green leafy" character of public open space.
- Maintain and enhance a high standard of urban design along major roads and entries ("gateways") to the municipality.
- Maintain and enhance a high standard of visual amenity in industrial, business and restricted retail sales areas.
- Undertaking Council initiated landscape works at major gateways to the municipality.

POLICY CONTEXT

CITY OF KNOX POLICY FRAMEWORK

Clause 21.06 Making better use of urban facilities and services

Overview/Objective:

The City of Knox is a well regarded and sought after residential and business address.

Relevant Strategies / Actions

- Maintaining a high standard of urban design and amenity in industrial precincts, and business parks designed for businesses seeking a high profile location.
- Ensuring that a high level of residential amenity is provided in residential areas.

Clause 21.08 Recognising and Protecting Significant Natural Features and Cultural Heritage

Overview/Objective:

- Knox contains important habitats for flora and fauna and plays an important role in maintaining natural processes in the broader region. The importance of Knox's natural assets has been documented in a number of state, regional and local studies. The local community values the natural flora and fauna of Knox and sees its preservation and enhancement important.

Relevant Strategies / Actions

- Ensuring best practice environmental management be used in the design, construction and operation of drainage systems to reduce impacts on surface waters and ground water.
- Ensuring development be designed and managed to minimise the impact of urban storm water runoff on waterways, in accordance with any best practice environmental management guidelines approved by relevant statutory authorities.
- Encouraging the retention of remnant native vegetation for its habitat and other ecological values, particularly where the vegetation is located:
 - Along creek valleys.
 - Along linear reserves.
 - In the vicinity of the Dandenong Ranges National Park.
 - In the vicinity of other parks and reserves.

Clause 21.09 Enhancing the Potential for Lifestyle and Cultural Activities in the Community

Overview/Objective:

- To encourage the provision of places where there is a strong community focus and where the community can carry out their domestic, business, leisure or social life.

Relevant Strategies / Actions

- Promote mixed uses and higher density housing around Activity Centres.
- Preparing urban design guidelines which promote safe, interactive spaces.

Clause 21.10 Facilitating Effective Transportation and Movement in the Municipality

Overview/Objective:

- Facilitating effective movement of both people and goods in Knox is important in social, economic and environmental terms.
- To reduce dependence on private cars for travel.
- To achieve good access by all modes of movement to all Activity Centres and community facilities within the City.

Relevant Strategies / Actions

- Promote higher density housing and mixed uses within walking distance to community and commercial facilities including major public transport nodes.
- Plan for an integrated movement system that assists the economic vitality and development of the City.
- Encouraging new development to connect to the bicycle/pedestrian trail system.
- Encouraging trails to link with the key public transport network.
- Investigating means of re-designing inappropriate street patterns.
- Encouraging provision of safe and sheltered transport stops.
- Encouraging improved access to public transport for people with restricted physical mobility.
- Installing traffic calming works where appropriate.

POLICY CONTEXT

CITY OF KNOX POLICY FRAMEWORK

Local Planning Policy 22.01 Dandenong Foothills

Relevant Objectives:

- Protect and enhance the metropolitan landscape significance of the Dandenong Foothills and maintain uninterrupted view lines from within the municipality and vantage points in metropolitan Melbourne by ensuring that all buildings and works are sensitively designed and sited to sit below the dominant tree canopy height.
- Promote the maintenance and improvement of the continuous closed tree canopy by allowing enough open space within new development for the retention of existing canopy vegetation and growth of new canopy vegetation.
- Maintain the low density residential character of the landscape areas by ensuring that preferred subdivision patterns and lot sizes are retained.
- Protect the rural environments of The Basin and the Lysterfield Valley and Lysterfield Hills.
- Ensure that new buildings, works and landscaping in The Basin and the Lysterfield Valley and Lysterfield Hills protect the physical and visual amenity of the open pastoral setting.

Relevant Strategies / Actions

Lysterfield Valley and Lysterfield Hills Rural Landscape

- Buildings and works be designed and sited to ensure that the rural landscape character is maintained and enhanced.
- Indigenous trees and understorey vegetation be retained and protected.
- A minimum of 80% of all new vegetation (both canopy trees and under storey) be indigenous.

Dandenong Foothills: Foothills Backdrop and Ridgeline Area'

- The design and siting of buildings, works and landscaping protects and enhances the visual dominance of vegetation, including canopy trees and native under storey plants, to ensure that:
 - There is a continuous vegetation canopy across residential lots and roads.
 - The significant landscape character of the area is protected and enhanced by retaining existing vegetation and planting indigenous canopy and under storey vegetation.
- Indigenous trees and under storey vegetation be retained and protected.
- A minimum of 80% of all new vegetation (both canopy trees and under storey) be indigenous.

The Basin Rural Landscape

- Indigenous trees and under storey vegetation be retained and protected.

Lysterfield Urban/Rural Transition and Lysterfield Valley Contributory Area

- Roads be aligned to provide an edge to the urban area and provide public access to reserves, parkland and views.
- Streets connect with adjoining development and provide informal street treatments incorporating indigenous vegetation and rollover kerbing.
- Indigenous trees and under storey vegetation be retained and protected.

Local Planning Policy 22.07 Neighbourhood Character

Relevant Analysis of Precincts:

Garden Court Character Precincts

Analysis:

- Planted street trees are generally medium height and formally arranged, with some informally or irregularly planted.

Statement of Desired Future Character

- Low scale dwellings set within an open landscape with, in some areas, occasional pockets of large native trees.

Villa Court Character Precincts

Analysis:

- Street trees are usually formally arranged, and are small and establishing at present.

Statement of Desired Future Character:

- Predominantly large scale dwellings set within an open garden setting.

Garden Suburban Character Precincts

Analysis:

- Planted street trees are generally medium height; sometimes formally arranged and
- Sometimes informally or irregularly planted. Nature strips are frequently wide.

Statement of Desired Future Character:

- Low scale dwellings set within an open landscape with occasional large native trees and
- In some precincts large stands of native and exotic trees.

Rural Parkland Character Precinct

Analysis:

- Trees in the public domain are informally occurring, and appear to be extensions of the private plantings or remnant indigenous trees.

Statement of Desired Future Character:

- Low scale dwellings set within a park-like landscape with occasional pockets of large native and exotic trees.

Bush Suburban Character Precincts

Analysis

- Planted street trees are generally medium height and informally or irregularly planted.
- In some streets the public area planting is indistinguishable from the private.

Statement of Desired Future Character

- Dwellings located within frequent bands of high canopy indigenous and native vegetation, creating a vegetation dominated backdrop.

Foothills Character Precincts

Analysis:

- Vegetation dominates the streetscape.
- Frequent native high canopy indigenous trees and planted Eucalypts, sometimes forming a closed canopy.
- Planted street trees are rare, with the public planting being remnant indigenous vegetation in a natural setting.

Statement of Desired Future Character

- Varied but often low scale buildings placed behind a heavily vegetated streetscape with a continuous flow of bush vegetation spread across private and public property.

POLICY CONTEXT

CITY OF KNOX POLICY FRAMEWORK

Streetscape Policy

In some instances, the nature strips are very generous, in some instances up to ten (10) metres in width, with the footpath being centrally placed. In these situations, residents have extended their landscaping up to the footpath.

Most naturestrips are provided with a concrete footpath to provide for the safe movement of pedestrians. Often vegetation from residents' properties is seen to grow over the footpath area, which can present a hazard to pedestrians when using the footpath.

A number of residents within the City of Knox have undertaken landscaping to their nature strip areas.

This landscaping often includes for structures such as letterboxes. This has been undertaken for practical purposes, as the "Postie" will not deviate from the footpath to deliver the mail (i.e. drive down a driveway to place mail in a letterbox situated on the property boundary).

In other situations, the nature strips have been landscaped for a reason of practicality for the resident or for public safety. These types of situations include;

- Where the resident is disabled and is unable to maintain a grassed nature strip area.
- Where there is a steep and hazardous batter or embankment associated with the nature strip.
- Where there are erosion problems caused by a slope.

Whilst in a number of cases permission has been sought from Council to undertake landscaping, in most cases it has been determined that no permission has been provided.

Any landscaping within the streetscape is ultimately the responsibility of Council, even if it has not been placed by Council.

Whilst Council would not wish to restrict opportunities for residents to enhance their environment, Council has to be mindful of the risk that this landscaping could present to members of the community and, ultimately, the risk exposure to Council if an injury should occur and a claim is made.

Given that Council owns and is responsible for the land that contains nature strips, then even if a resident is permitted to landscape the nature strip, the liability risk would still ultimately rest with Council. This risk is considered to be at higher level than if the nature strip was just grassed.

Further, in a number of instances residents have planted their own trees in the nature strip or tree reserve. This has involved in some cases, the removal of the Council planted species with a species of the residents own preference. In a number of instances the trees selected are not in keeping with the character of the surrounding landscape setting and streetscape environment and, based on the growing characteristics of the tree, will cause substantial damage to Council infrastructure such as paths, kerb and channel and the infrastructure of service authorities, including water, gas and electricity. In these situations approval has not been sought and, if it had been, would not have been provided.

POLICY CONTEXT

RELEVANT KNOX STRATEGIES AND PLANS

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSAPES PLAN
<p>Knox Vision 2025</p> <p>Vision 2025 describes the Knox community's hopes and aspirations for the future. It addresses a range of questions.</p> <p>Vision 2025 is described around seven key themes which have been articulated by the community for the community.</p> <ul style="list-style-type: none"> • Healthy, Connected Communities • Culturally Rich and Active Communities • Dynamic Services and Facilities • Accessible Transport Choices • Sustainable Natural Environment • Balanced Quality Urban Development • A Prosperous, Modern Economy 	<p>Relevant Goals:</p> <ul style="list-style-type: none"> • Healthy connected communities, with people working jointly toward the goals of sustainability; • People feeling physically, spiritually and emotionally connected to their neighbourhood through greater access to open space and nature, and through collaborative community activity; • Open spaces which are shared safe places that increase community cohesion and wellbeing through positive social interactions; • Support for sustainable living. Within all sectors of the community, the norm will be conservative use of energy and water, waste minimization and enhancement and protection of the natural environment; • Knox will have a green and leafy image <p>Relevant Key Initiatives:</p> <ul style="list-style-type: none"> • Establishing cycling as a transport mode of choice. • Delivering strategic main road infrastructure including the Dorset Road extension, the Kelletts Road duplication, the Wantirna Road Bridge widening, the Dorset Road widening and the Bayswater Bypass. • Achieving a 25% reduction in water use by Council by 2015 where alternative water sources such as grey water, storm water and rain water are used. • Planting of a minimum of 100,000 trees in public spaces per year until 2025 to enhance natural habitats, open spaces and bush boulevards. • Creating a seamless tree canopy stretching from the Dandenong Valley to the tip of the Dandenongs. • Maximising design standards for the urban and landscape environment through the encouragement of quality design.

STRATEGIES AND PLANS

RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN

Knox Urban Design Framework

Sets out an urban design vision, framework and policy for the future of Knox. It is a design tool that provides physical interpretations of local visions and strategies. It focus's on managing change and setting new directions for integrated development of the urban environment.

This document provides a series of design guidelines for streetscapes that provide a strong basis for this Plan.

Establishes key urban design objectives strategies, actions and design guidelines for whole of Knox.

Relevant key areas include:

- Activity Centers and Working Environments,
- Activity Centre Vitality
- Pedestrian Friendly Environments
- Commercial Strips
- Industrial Areas
- Transport Corridors
- Bush Boulevard
- Gateway Route
- Principal Avenue
- Path into the Hills
- Rail Corridor
- Scoresby Corridor
- Residential Environments
- Knox Neighbourhood Character Study
- Public Domain Planting
- Improve Layouts for Walking

Knox City Council 2008/2018 Sustainable Environmental Strategy

The Environment Strategy is a high level document developed by Knox City Council to guide the Council's ambition of achieving a sustainable city within a sustainable environment. The document focus's on a number of themes, all of which contribute to and guide the design of liveable streetscapes.

Key Themes and Goals:

- Biodiversity (protection of habitat, flora and fauna). To improve biodiversity and health of ecosystems
- Water (conservation and quality). To create healthy and productive water systems
- Community Engagement and Leading by Example. To lead an engaged and empowered community
- Waste Minimisation. To reduce waste and improve product lifecycles
- Integrated Transport. To develop integrated, sustainable transport systems that provide multiple, connected transport choices
- Climate Change Mitigation and Adaptation (greenhouse action). To reduce greenhouse gas emissions, improve air quality and be well prepared for climate change

POLICY CONTEXT

RELEVANT KNOX STRATEGIES AND PLANS

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN
<p>Access and inclusion Plan for People with Disabilities</p> <p>The vision for this plan is for Council to be responsive, innovative and energetic in developing an accessible and inclusive community that embraces people with disabilities. Council seeks to ensure that all Knox residents can participate in, and contribute to community life with independence, equity and dignity.</p> <p>The plan outlines a range of objectives and actions. These are based on the premise that the main issues affecting people with disabilities on a daily basis are interconnected and require a number of initiatives to address them effectively.</p>	<p>Objectives:</p> <ul style="list-style-type: none"> • An Accessible Community: • Physical Access, Information Provision, Transport, Employment • an Inclusive Community: Organisational culture, Civic Life, Advocacy, Recreation, Arts and Culture • a Supportive Community: Council and Community Services
<p>Knox Bicycle Plan</p> <p>The plan visions that the City of Knox will, through well planned bicycle networks and programs, increase the use of bicycles for commuting and recreation in a safe, convenient and sustainable manner for residents and visitors.</p>	<ul style="list-style-type: none"> • To reduce the reliance on and use of cars for transport to work, school, shopping and recreation. • Provide well designed shared paths and on-road lanes that link the Knox communities to public transport, Activity Centres and recreation areas as well as regional destinations. • Plan to further reduce casualty crashes through well designed infrastructure and increase driver awareness of cyclists through pavement markings and signs. • To advocate that VicRoads provide on-road lanes as part of the Principal Bike Network and ensure that all new road works and or the introduction of bus lanes incorporate provision for bicycles.

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN
<p>Knox Integrated Transport Plan</p> <p>The development of the Knox Integrated Transport Plan recognises that trying to provide for continuous traffic growth is both unwarranted and unsustainable. Any efficient and equitable transport network requires legitimate travel alternatives. The purpose of the KITP is to bring the key elements of individual transport strategies together, so future transport projects can be developed, assessed and delivered within a common framework.</p>	<ul style="list-style-type: none"> • Ensure that all transport projects include an assessment of integration opportunities with other transport modes; • Create a safe and connected environment, which will encourage patronage onto public transport services throughout Knox; • Increase the use of cycling to account for 5% of all trips; • Provide accessible on-road and off-road networks that provides for safe and continuous travel throughout the municipality; • Ensure the needs of cyclists are taken into account through all infrastructure planning and design phases; • Embrace all opportunities to develop cycling links; • Deliver full DDA compliance on designated principal pedestrian corridors by 2015; • Maximise resident access to a connected path network; • Provide a safe, economical and continuous VicRoads network for the movement of goods and people, whilst maintaining local amenity and connectivity; • Provide a comprehensive range of public transport and pedestrian improvements as part of the Mitcham-Frankston Integrated Transport Corridor
<p>Water Sensitive Urban Design (WSUD) Guidelines for the City of Knox</p> <p>The Guidelines for WSUD have been developed in response to the Knox 2001/2010 Sustainable City Plan and the embodied mission statement.</p>	<ul style="list-style-type: none"> • Summarise the environmental issues around urban stormwater management; • Outline the benefits of incorporation of WSUD principles; • Provide guidance for the implementation and maintenance of WSUD principles in new and existing environments; and • Provide indicative details of adoption by council in order to include WSUD principles in new and existing developments.

POLICY CONTEXT

RELEVANT KNOX STRATEGIES AND PLANS

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN
<p>Road Asset Management Plan</p> <p>The Road Asset Management Plan focuses on forward planning of the road network through strategic and operational techniques of management. It considers all lifecycle requirements and set out a management approach to obtain optimal return on its investment in road asset.</p>	<ul style="list-style-type: none"> • Risk management, compliance and integration; • Meeting community outcomes; • Embed sustainability principles within road delivery and management processes; • Improving the management processes; • Emphasise the interdependency of decision makers across the asset lifecycle; • Integrate delivery of capital programs to realize construction efficiencies; • Reduce reactive maintenance costs by encouraging a shift toward proactive preventative maintenance practices and timely road surface renewal; • Review road design, construction and renewal standards to deliver an increase in asset life, meet sustainable resource use objectives and minimize adverse impacts on natural environment; • Delivering financial sustainability; • Introduce more strategic methods for prioritisation of asset renewal and upgrade projects
<p>Knox City Council Streetscape Policy</p> <p>The Streetscape Policy provides a strategic and practical framework for Council and the community with regard to the management, protection and care of assets within the streetscape and in particular, the selection and management of street trees. The development of this Policy was intended to establish guidelines for all stakeholders and the community as to the objectives and priorities for management of the Streetscape into the future.</p>	<ul style="list-style-type: none"> • Street tree management • Street tree selection • Precinct Character Area Policy Guidelines • Landscaping of Nature Strips

STRATEGIES AND PLANS

Neighbourhood Character Study

The Neighbourhood Character Study is a detailed investigation into physical characteristics of Knox. It forms a collection of guidelines to aid Council in development controls that safeguard the important characteristics of special areas, and define, in a less prescriptive manner, what is acceptable across the municipality in terms of new types of higher density development, and more broadly in maintaining and enhancing particular recognised identities of streetscapes.

RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETS CAPES PLAN

Recommendations:

- Vegetation Protection Overlays;
- Specific and detailed Design guidelines to each character area;
- Coordinated Design Policies, That a project be initiated to establish coordinated design policy for all works in the public domain of residential areas, including street trees, traffic management devices, paving, kerb and channel and overhead and underground services, taking into account the variations of local character described in this study.

POLICY CONTEXT

RELEVANT KNOX STRATEGIES AND PLANS

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN
<p>Footpaths and Shared Path Asset Management Plan</p> <p>The Knox municipality has an extensive shared pathway network, extending over 1250km. (1204km footpath, 70km shared path) This plan has been developed in response to the maintenance and establishment of this asset valued at \$94,536,000 in replacement terms in 2003/04. Sound asset management practices will ensure that Knox continues to meet the needs of current and future generations in a sustainable manner.</p>	<p>Council is committed to providing accessible connected communities within Knox and employing strategies to ensure sustainable sound stewardship of the footpath and shared path networks;</p> <p>Council has recognized the importance of providing health and environmental transport alternatives within the community;</p>

STRATEGIES AND PLANS	RELEVANT GOALS AND ACTIONS FOR LIVEABLE STREETSCAPES PLAN
<p>Knox Pedestrian Plan</p> <p>The Knox Pedestrian Plan's vision is to enhance the walkability of Knox. It accepts that increased levels of walking within a neighbourhood create greater benefits for the community, and can also measure an area's 'liveability' and social inclusiveness. The Plan makes focus on ten 'hotspots' with specific issues and recommendations for each. In this way the recognised benefits that walking provides to the environment and the community can be monitored and then expanded into areas of Knox.</p>	<p>Related objectives of the pedestrian plan include:</p> <ul style="list-style-type: none"> • To facilitate walking as both a method of travel (walking as a means to an end) and walking as leisure/ recreational activity (walking as an end in itself); • To stimulate more residents to choose walking as their preferred mode of travel for a variety of daily trips; • To provide a clear and long-term vision for the development of an integrated pedestrian network for the municipality. This will encourage a modal shift towards this active and sustainable transport option; • To identify opportunities to promote and encourage walking throughout the municipality through the promotion of safe neighbourhood design and interesting streetscapes that encourage an attractive walking environment; • To tailor different environments to different needs where appropriate, for example, a recreational route may have different characteristics to a commuting route; • To assist in the establishment of a network of safe and enjoyable pedestrian routes for the widest range of community members, in particular: commuters, recreational walkers, school children and older persons; • To integrate walking with other appropriate transport infrastructure to enable people to combine walking with cycling or public transport. <p>Specific Recommendations / Actions:</p> <ul style="list-style-type: none"> • Footpath construction priorities identified • Design Guidelines for Major and Minor pedestrian pause places • Milestone signage options • Home Zones and recommended Home Zones locations • Physical improvements for: <ul style="list-style-type: none"> • Knox City • Fountain gate • Stud park • Wantirna Mall • Bayswater • Boronia • Ferntree Gully • Upper Ferntree Gully • Dandenong Creek and Blind Creek

STUDIES AND INFORMATION

EXISTING ROAD CLASSIFICATION

VicRoads Managed Roads

ROAD HIERARCHY CLASSIFICATION	ROADS
Declared State Highways	<ul style="list-style-type: none"> • Burwood Highway. • Dandenong Valley Highway (Stud Road) - Burwood Highway to Dandenong Creek. • Monash Highway (Wellington Road) - Dandenong Creek to Stud Road.
Declared Main Roads	<ul style="list-style-type: none"> • Boronia Road • Brenock Park Drive • Burwood Hwy • Croydon - Scoresby Road (Bayswater and Scoresby Roads) • Dorset Road • Ferntree Gully Road • Forest Road (Boronia Road to Mountain Hwy) • Glenfern Rd (Brenock Park Dr to Napoleon Rd) • High Street Road • Kelletts Road • Lysterfield Road • Napoleon Road (Lysterfield Road to Kelletts Road) • Stud Road • Wantirna Road • Wantirna-Sassafras Road (Mountain Highway) • Wellington Road

EXISTING ROAD CLASSIFICATION

City of Knox Managed Roads

ROAD HIERARCHY CLASSIFICATION	CURRENT FUNCTIONS / FEATURES
Link Roads	<ul style="list-style-type: none"> • Efficiently channel traffic through the Municipality • Carry traffic between major commercial, industrial and residential areas • Link VicRoads arterial roads • Provide for through traffic movements and heavy vehicle use
Collector Roads	<ul style="list-style-type: none"> • Provide connectivity to commercial and residential areas from Link Roads or directly from the VicRoads arterial network • Concentrate locally generated traffic to an outlet • Provide direct access to the local road network without acting as a through traffic route • Carry local traffic to shops, schools, commercial districts, hospitals, sporting and other local facilities.
Industrial Roads	<ul style="list-style-type: none"> • Service local light industrial as concentrated in small areas that tend to be adjacent to VicRoads arterial roads • Channel traffic through an Industrial Zone
Access Roads	<ul style="list-style-type: none"> • Provide access to abutting residential properties/and or fire truck access • Public amenity, safety and aesthetic aspects of these constructed roads take priority over speed and ease of movement of vehicles.
Unsealed Roads	<ul style="list-style-type: none"> • Generally have a gravel/crushed road surface • May function as Link, Collector or Access Roads.



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