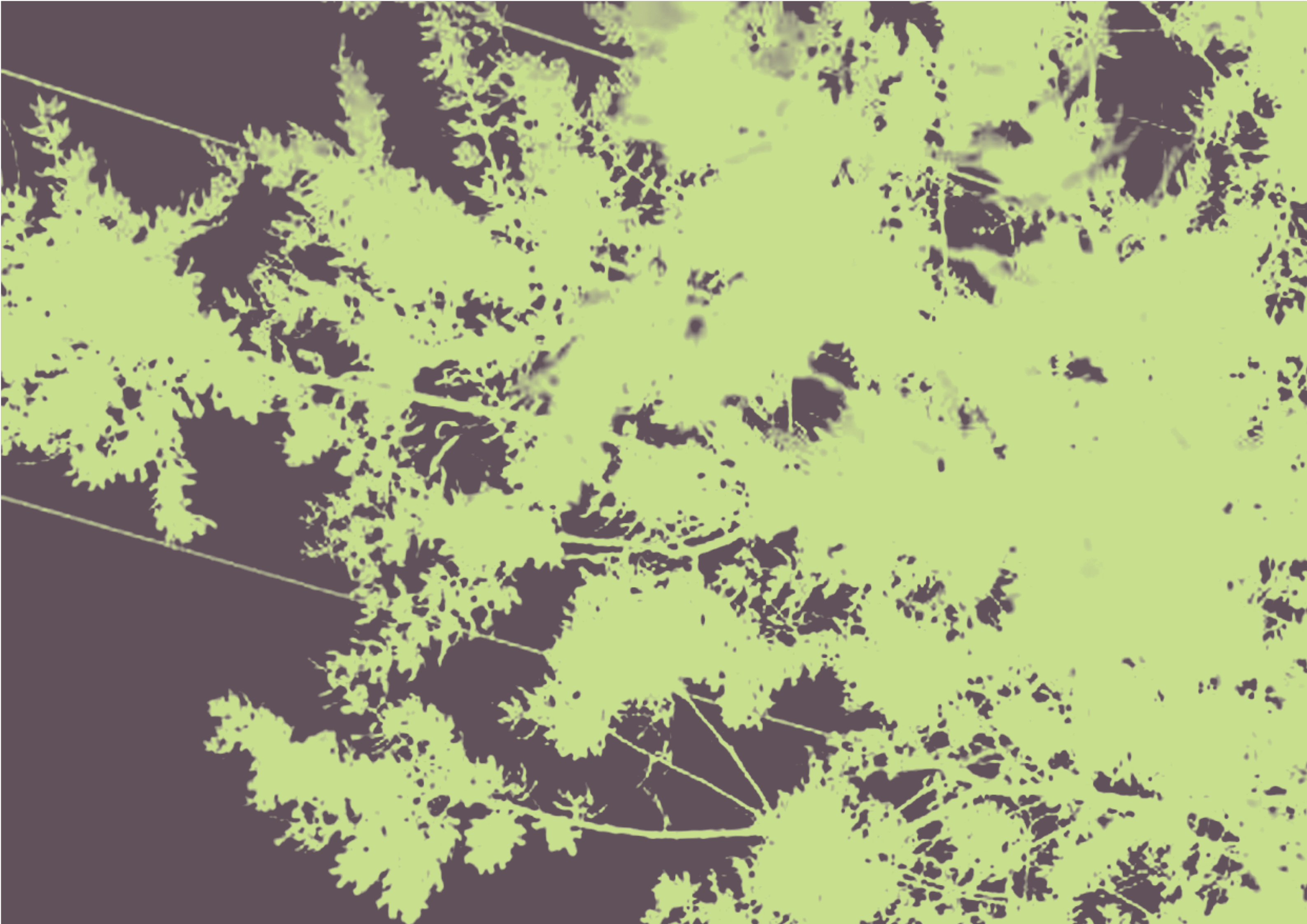




THE GREENBOOK

GREENSBOROUGH PRINCIPLE ACTIVITY CENTRE PLAN
EXHIBITION VERSION

GREENSBOROUGH AND PARTNERS
OCTOBER 2006





greensborough
principal activity centre plan

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In consultation with the Banyule City Council

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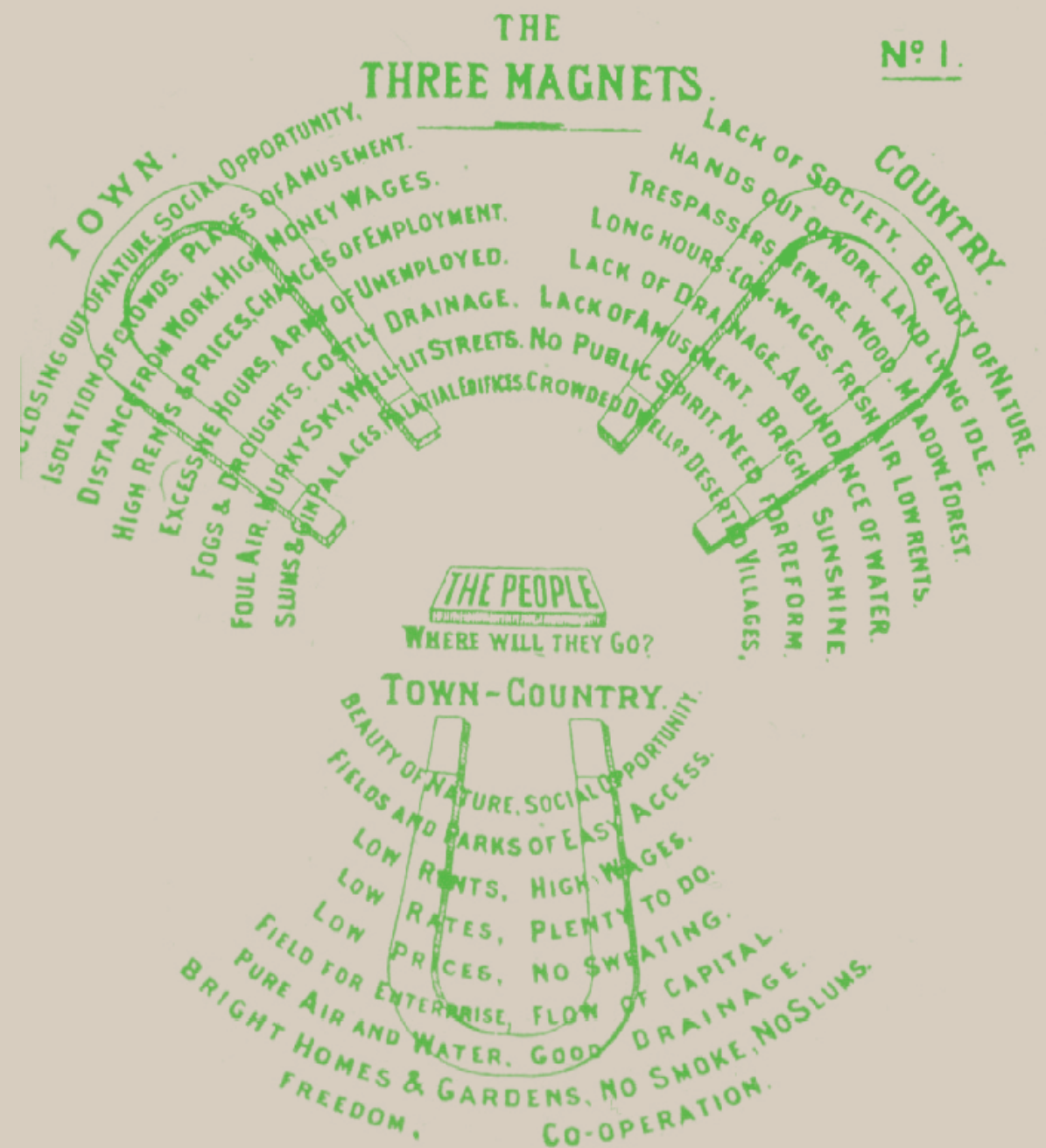
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“ If one can make a blanketing statement about the character of these (future) cities, it is that they will be literally green. This proposition might seem both too obvious and too simple. But an abundance of greenery in cities will be the mark of their efficiency and progress in the future. For virtually every issue that cities confront, nature has an answer. Our new urban gardens - ubiquitous on every horizontal - will supply us with oxygen, sequester carbon dioxide, control our temperatures, provide habitat for our fellow creatures, offer us food, grow construction materials, calm our gaze, and instrumentalise our autonomy. This condition must become the default. Our lives depend on it, on the incorporation of a universal we have always had.” **Michael Sorkin**



The Three Magnets, 1898
 Ebenezer Howard, original proponent of the Garden City urban living strategy

Introduction

The Greensborough Principal Activity Centre Plan (The Plan) is the culmination of an extended period of consultation undertaken by the City of Banyule. This began in 2002 and 2003 with the development of a structure plan for the centre. This programme of consultation, which is ongoing, has been put in place to ensure that the concerns, issues and desires of the community of Greensborough are incorporated in the plan.

The GPAC Plan incorporates three main elements: a structure plan, an urban design framework (UDF) and a transport plan incorporating parking precinct plans. Together these components describe the conditions and requirements for the future development and growth of Greensborough.

Grow, Renew, Sustain

Greensborough is well placed to develop as one of Melbourne's most desirable urban centres, able to provide its community with a range of residential, recreational, retail and commercial opportunities. The Greensborough Plan is also geared towards expanding the town's appeal to visitors and patrons from well beyond the boundaries of both Greensborough and the City of Banyule.

The plan is predicated on the simple platform of growth, renewal and sustainability.

Growth will be organised around a strategic approach to expanded commercial, retail and residential development that recognises the strengths and weaknesses of the existing town centre. It will include additions to the existing retail base, provision of high quality, integrated civic and commercial facilities, and identified sites for medium and higher density residential development within the town centre.

Growth will also be controlled and coordinated to ensure that capital investment in the town centre delivers urban and civic outcomes commensurate with both the Council's and the community's aspirations for an improved and enlivened Greensborough town centre.

The concept of **renewal** in Greensborough acknowledges that the existing Greensborough town centre requires significant intervention and recognition of forces which have degraded the quality of the town's urban environment. Renewal will include a rejuvenated Main Street, a new civic community heart for the town centre, the provision of new recreational, aquatic and entertainment facilities, new impetus for commercial investment and expanded and integrated retail development east and west of Main Street.

A **sustainable** Greensborough means:

- a town which begins to invest strategically in its physical infrastructure, including buildings, transport, energy supply and water collection, according to environmentally sustainable applied design principles
- a town designed and planned to achieve civic and community outcomes including community engagement, civic events and cultural activity
- a town designed and planned to create and sustain new commercial opportunities and position itself as an important metropolitan commercial hub

The Plan also provides a framework for public sector investment in Greensborough. It facilitates a detailed planning process where community aspirations and minimum performance criteria for new development can inform all future investment in the town centre.



Glossary of Terms

COLAB	- Collaborative Workplace occupied by Banyule City Council
Greensborough Walk	- New public realm linking Main Street with Flintoff Street, providing connections to Greensborough Plaza, RALC and COLAB and incorporating the Town Square
DDO	- Design and development overlay
GPAC	- Greensborough Principal Activity Centre
PDP	- Priority Development Panel
PDZ	- Priority Development Zone
RALC	- Regional Aquatic Leisure Centre
The Plan	- The Greensborough Plan (This document: also known as the GPAC Plan or 'The Green Book')
The Plaza	- Greensborough Plaza Shopping Centre
Indicative Development	- The plan drawing showing indicative development outcomes for the GPAC
UDF	- Urban design framework

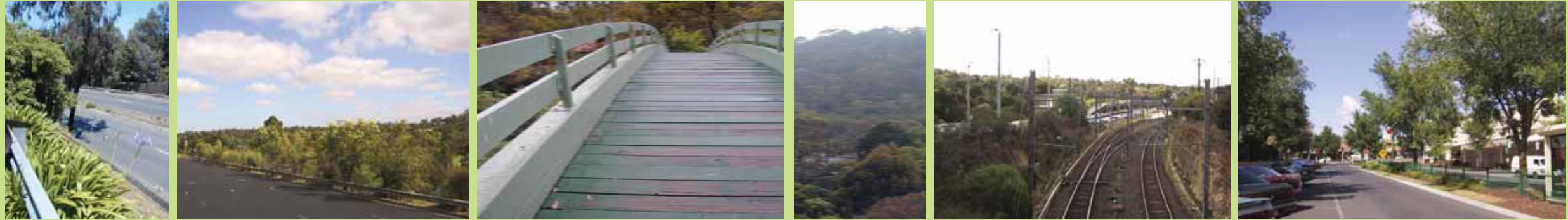
About Greensborough



Main Street, Greensborough, 1889.

This painting hung in the Redcliffs home of the late Walter West for nearly 60 years, and is currently in the possession of his daughter, Mrs J. Cramp of Geelong.





A brief history

The Wurundjeri occupied the Greensborough region for many thousands of years before European settlement, and continued to live in campsites for some time after the Europeans arrived.

In 1836, Joseph Tice Gellibrand and a party of men from the Port Phillip Association explored the area which ultimately became known as the municipality of Banyule. In 1838 government surveyor Robert Hoddle surveyed the area and created three Parishes extending from Fitzroy northwards to beyond Diamond Creek: Greensborough is contained within this area. The section comprising most of present day Greensborough was purchased by Henry Smythe who, in 1841, sold it to Edward Green. Green was a squatter, soldier and mail contractor, and the person whom Greensborough was ultimately named after.

Squatters followed Green into the area in order to take advantage of verdant pastureland in the valleys around Greensborough, and life was difficult for these early settlers. Winter floods and summer bushfires frequently destroyed property, crops and stock, and bushrangers and horse stealers were common. Feelings of isolation were exacerbated by the dreadful condition of the roads, and home was often a tent or shanty, hastily constructed and far from comfortable.

Miners, labourers, trades people and small farmers settled in the villages around Greensborough. The discovery of gold in the early 1850s brought a large number of hopeful miners to the area. However, compared to the rich fields at Ballarat and Bendigo gold finds in the region were limited and the rush soon lost momentum.

In 1859 the Greensborough Road District was formed and by 1868 Greensborough had an Anglican church with a primary school (1855), a hotel, a post office and a store. The local population at this time was approximately 200 people, while the immediate area's population was approximately 670.

In January 1875 the Road Board District amalgamated with the Heidelberg Shire. This move was motivated by the Roads Board's difficulties in maintaining the roads around Greensborough. A state primary school replaced the Anglican school in 1878, while Greensborough continued to be primarily an agricultural area. In 1902 the railway line was extended from Heidelberg to Eltham and a station was built at Greensborough. The township's estimated population at this time was about 270.

After the railway extension there was a steady population growth, but despite this the area remained predominantly rural. From the 1920's to the late 1930's undeveloped sites in Greensborough were used for much-needed housing, with the proximity to Melbourne considered a benefit. In 1933 when Greensborough's population was around 1,000 it was a picturesque township at the centre of a vibrant horticultural district. The township had a bank branch, a hall, a park and a golf course.

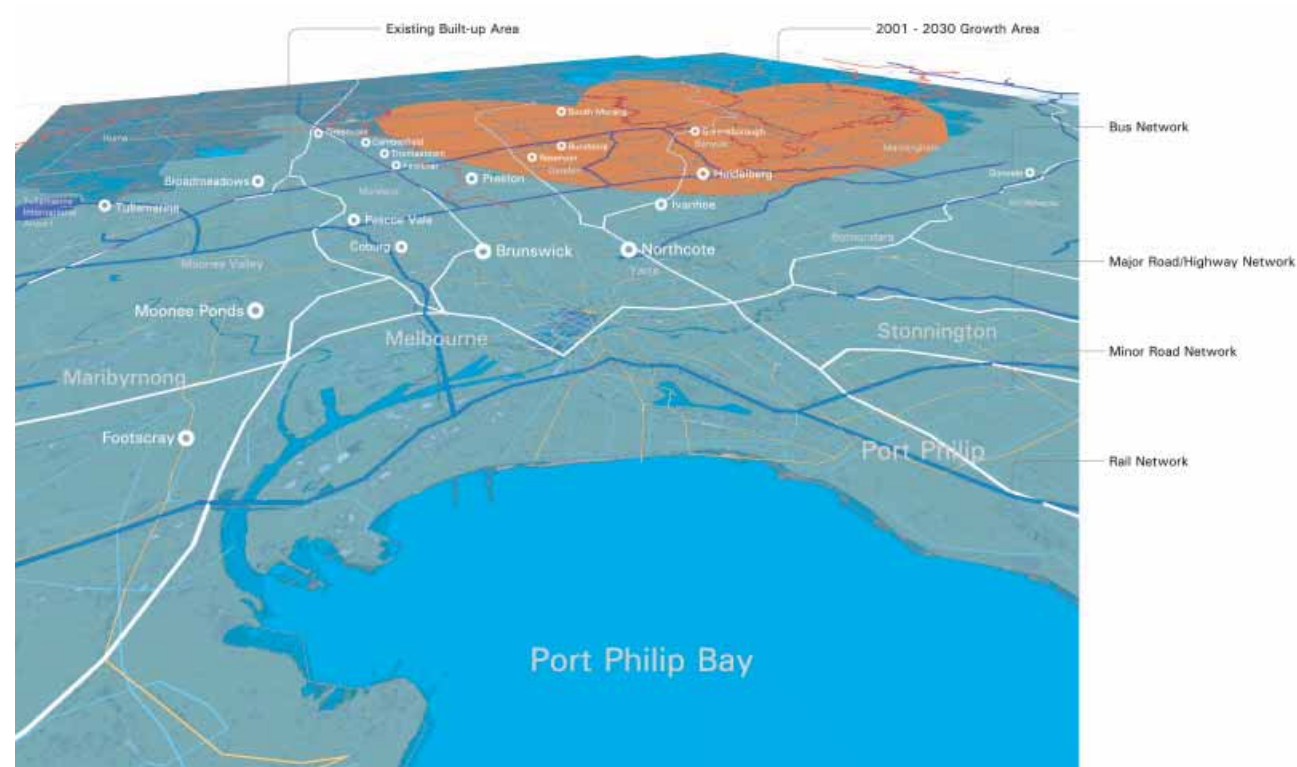
In 1942 the Diamond Valley Community Hospital was opened in Greensborough, and in 1961 a referendum favoured severance of the Greensborough and Diamond Valley region from the City of Heidelberg. This resulted in the Diamond Valley Shire being created in 1965, and it located its offices on the outskirts of Greensborough.

Since the 1960's, Greensborough has experienced sustained growth. Schools were opened in nearby Watsonia (1959 and 1962), as well as the Greenhills primary school in 1962. In 1994 Greensborough town became part of the City of Banyule, with half of suburban Greensborough in Banyule and the other half in the Shire of Nillumbik to the north. Growth has continued to this day, and the population has steadily increased.*

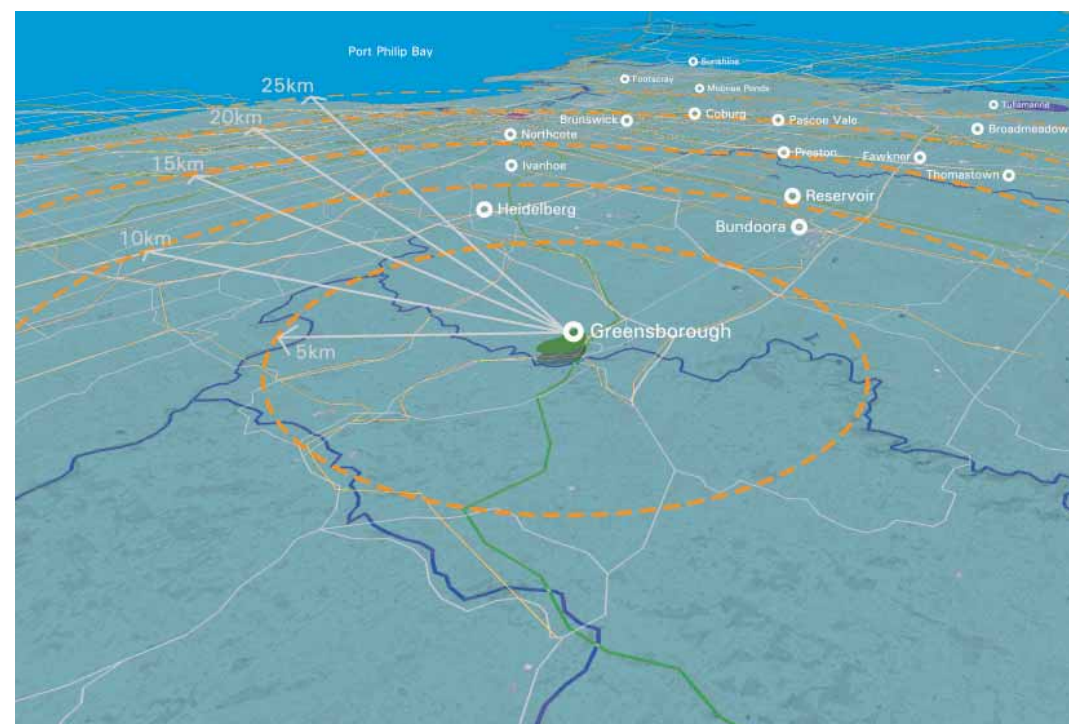
**Facts and figures in this section were drawn from the following sources:*

<http://www.banyule.vic.gov.au/Content.aspx?TopicID=677>

<http://www.arts.monash.edu.au/ncas/multimedia/gazetteer/llist/greensborough.html>



Aerial View from the Port Phillip Bay showing Greensborough's relationship to greater Melbourne



Aerial View from the North of Greensborough showing relationship to greater Melbourne

The Greensborough Principal Activity Centre

Identified in the State Government Strategy Melbourne 2030 as a Principal Activity Centre, the Greensborough Principal Activity Centre (GPAC) is the central activities district and heart of the suburb of Greensborough. It is characterised by retail and commercial space, combined with some residential properties, across various locations to the north of Grimshaw Street. Low density residential properties predominate south of Grimshaw Street.

Melbourne 2030 defines Principal Activity Centres as having or aspiring to:

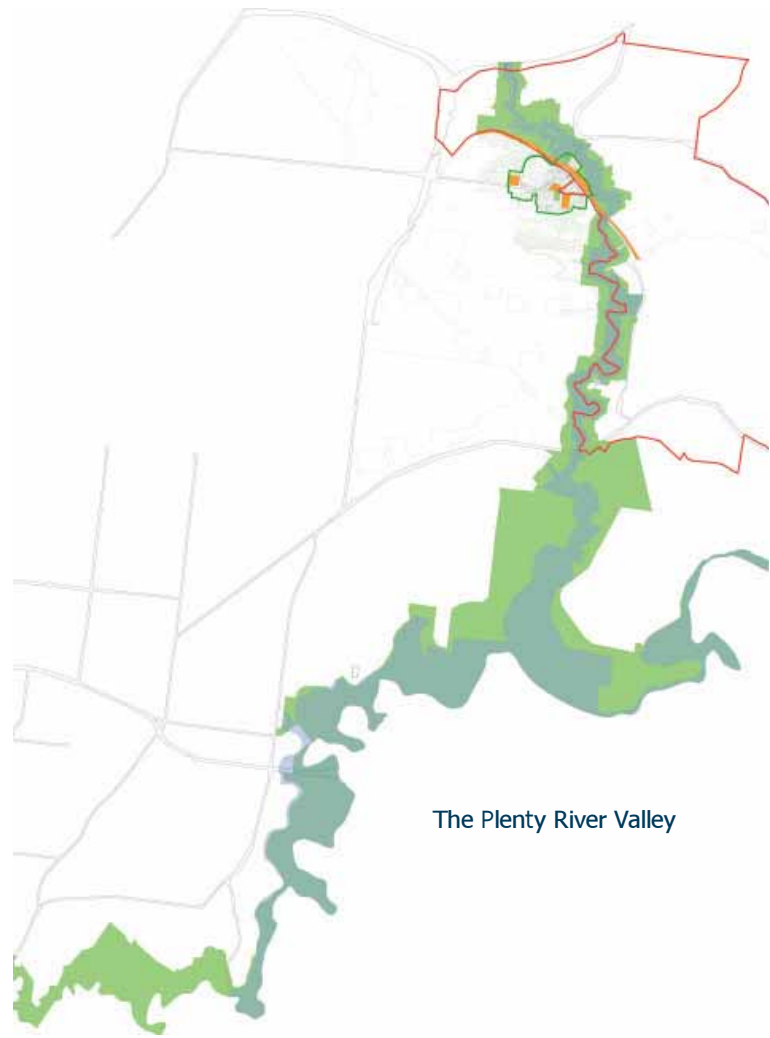
- a mix of activities that generate high numbers of trips, including business, retail, services and entertainment
- being generally well served by multiple public transport routes (being mainly on the rail network), and on the Principal Public Transport Network or capable of being linked to that network
- a very large catchment covering several suburbs, and attracting activities that meet metropolitan needs
- the potential to grow and support intensive housing developments without conflicting with surrounding land uses

- Melbourne 2030, pp.47

In addition to meeting these benchmark requirements, Greensborough has other unique and positive aspects. It is positioned in direct relation to the green setting of the Plenty River Valley and has a unique topography that allows beautiful views across the valley. The majority of the area encompassed by the GPAC line falls within a 400 metre, 5 minute walkability radius and its connection to greater Melbourne is already strong, with a rail link located at the northern border of the GPAC area.

Greensborough is also home to an established mix of retail premises including a major shopping centre, Greensborough Plaza, in the West Main Street Precinct that draws residents from a wide catchment area. With the area of the Plenty Valley, encompassing South Morang and Mernda, identified as a Melbourne 2030 growth area, Greensborough has the potential to draw on these future population reservoirs, given the right mix of services and diversity of attractions.

The Plan is concerned with enhancing these positive attributes and delivering a structure within which these aspirations can be attained.



The Plenty River Valley

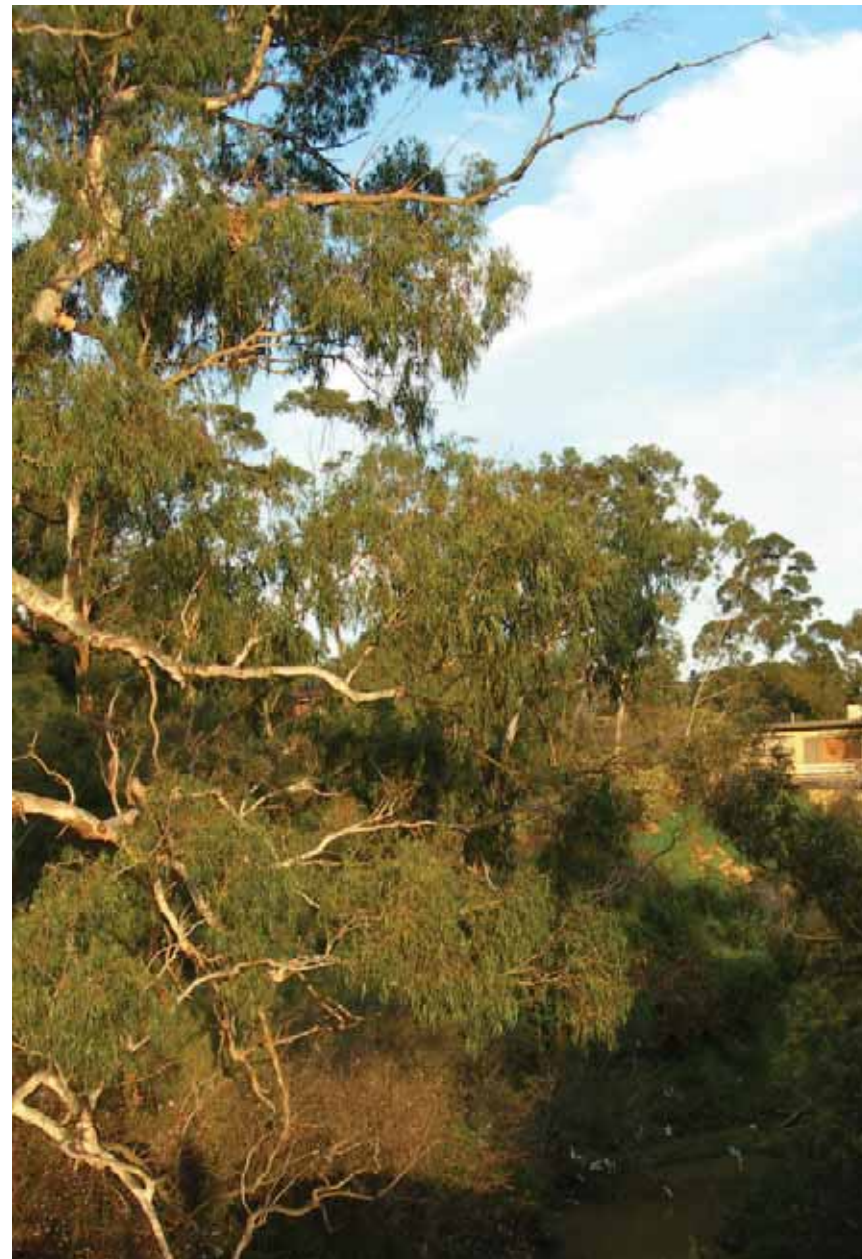
*GreenEdge - A hill town's link to ecology and landscape
Greensborough's physical qualities, public space network (existing and projected), activity mix, transport infrastructure and distinctive identity form the basis of the town centre's unique development potential - the model, green urban village.*



— The GPAC boundary



Context and Environmental Analysis



The context and environment of the Greensborough Principal Activity Centre have been analysed to define the strengths and weaknesses of the existing town and to establish starting points of the development of a new urban framework.

Town centre boundaries

The boundary of the GPAC follows a circuit around the Centre, traversing residential streets to the south and west, skirting the Greensborough Plaza to the north (the Circuit), and then cutting a sweeping line along the Plenty River Valley to the east. It reflects the strong natural boundary of the Plenty River Valley to the north, reinforced by the railway cutting and the ring road, and a desire to incorporate existing residential areas to the south into a future, consolidated mixed use town centre.

Statement of character

The character of the GPAC is informed by a balance of urban, suburban and riparian environments. The town centre is poised upon a hill with extensive views of the green landscape of the Plenty River Valley. The views of the surrounding hills also give an appealing, distinctive quality to the place. This outlook and setting makes Greensborough unique in the context of metropolitan Melbourne, presenting a topography and landscape setting not readily associated with the city.

Greensborough Plaza is the major activity hub of the town centre, which dominates the north-eastern quadrant of the GPAC. The Plaza forms a major attractor to the Centre, and it has historically drawn people away from Main Street and into the interior of the mall. Finding a strategy for the coexistence of Main Street and the Plaza is a high priority in the planning process, and will have a direct impact on the character of a visit to the Centre.

Physical description

The hilly topography of the GPAC makes walking appear challenging, but the GPAC is still highly compact and walkable, even though precincts are largely disconnected. Better design of traffic infrastructure and the pedestrian network will enhance the pedestrian experience of the GPAC.

The special topographical character of the place needs to continue to be evident in the resulting environment. Main Street traverses both the high and low points of this topography, from the retail strip at the higher level down into the Plenty River Valley, beyond which it joins up with Diamond Creek Road.

Existing residential densities around the GPAC are typically low, with houses and units nestled in the abundant greenery of well-established gardens. Residential properties are generally concentrated in the southern and western areas within the GPAC boundary, and in the surrounding urban fabric around the whole perimeter.

The Plenty River Valley cuts a swathe through the surrounding residential expanse, wrapping around the north-eastern and northern parts of the GPAC boundary. The Plenty River Valley is well utilised by people for sporting, active and passive recreational purposes, but it could be better integrated with the Town Centre.

The northern part of the GPAC is dominated by the Greensborough Plaza shopping centre. A major entrance to the Plaza is located on Main Street, and extensive areas of parking are located to the north, incidentally commanding excellent views.

The eastern edge of the GPAC sees the ground fall away, with a large drop on the alignment of the railway lines. Access to the station presents a substantial challenge in any consideration of the GPAC.



Entries and Gateways

Entry to the Centre cuts across the GPAC boundary at key points. The most dramatic of these is the eastern arrival, the sweeping descent into the Plenty River Valley and again up the hill, travelling from Diamond Creek Road onto Main Street.

The entry along Grimshaw Street from the west is less dramatic, and is marked by continuous powerlines on the Street forming a visually unappealing entry to the Town Centre. This route feeds indirectly into Main Street at the western end, which veers to the north east.

Natural systems

The Plenty River and the river valley corridor form the major natural systems associated with the GPAC.



The river valley is a site of regional environmental significance and is part of the important wildlife corridor between the Plenty Gorge and the Yarra River. The vulnerable swift parrot has been recorded in yellow box trees in the area, and the river is critical to the movement of platypus and native fish. The existing native vegetation requires protection and enhancement which will contribute to the recreational appeal of the river valley.

This riparian landscape is a tremendous asset of the GPAC, and is well utilised by the community. It also provides visual relief, forming a green backdrop to the views from the Town Centre. The views to the north and north east are particularly expansive. The River itself forms an excellent recreation corridor.

Traffic and road network

Traffic effectively divides the GPAC along the Grimshaw/Main Street axes, each of which carry fast-moving traffic. Traffic conditions around the Circuit also form a 'hard' boundary to the northern edge of the GPAC, whereas to the south the GPAC line moves through quieter residential secondary streets.

To improve the pedestrian experience of the GPAC it is logical to consider limiting faster and heavier traffic to the perimeter roads, particularly around the Circuit to the north, connecting Grimshaw on the west with Main Street on the east.

Public transport infrastructure

Greensborough is serviced by both bus and train infrastructure. Bus movement is currently directed along Main Street, resulting in high traffic levels on this Street and the creation of an environment hostile to pedestrians. The level and direction of bus traffic has demanded the erection of a barrier down the median strip of the Street to control pedestrian movement.

Access to the Station is a major issue for residents of Greensborough, and services are infrequent and poorly connected, with low reliability and poor connection to bus services. With its colossal stair and non-compliant ramps the station is unsuitable for aged, infirm or disabled users. Any consideration or reconfiguration of the Station must confront the issue of levels and equitable access directly.

Summary

The weaknesses of the urban environment of the GPAC will be directly addressed in the Plan. These include the challenge of achieving access across the picturesque but hilly terrain, the lack of pedestrian paths and links, disconnection at key points such as the railway station, the over-prioritisation of vehicle movement across the GPAC and the lack of a distinct and coherent urban and architectural character.

The strengths of the GPAC are the abundant natural systems and green spaces, the views afforded by the hilly topography and the general economic and social vitality of the centre. These strengths will be reinforced in the Plan, which takes advantage of the critical mass of activities in the GPAC to create a series of vibrant new public spaces. These spaces, tied together by a new network of pedestrian paths, will see Greensborough transformed.

The Vision

A Diverse, Civic, Greener Greensborough



The Greensborough Principal Activity Centre will be famous for its extraordinary natural attributes, an urban area connected to the natural beauty of the Lower Plenty River Valley. New development will provide visual linkages as well as an extension of the green landscape between the Valley and the activity centre.

A “Green Edge” will define the centre’s entrances and reflect the landscape setting, while greenery and landscaping treatments throughout will provide both cohesiveness and define the role of parts of the centre. The activity centre will be recognised for its sense of community, sustainability and connectivity to and within the centre. A coherent public realm will be created with new public spaces including the centrally located town square, where people of all ages can meet, relax or enjoy public events.

Health and wellbeing will be the focus of the transformed centre with the Aquatic Centre, spa facilities and a host of health and wellbeing services being accommodated in the centre. The diversity of higher density mixed use development will cater for the varied needs of the Greensborough population, including providing new opportunities for people to live in the centre. The centre will provide expanded retail, commercial, entertainment, leisure and civic uses to serve the needs of the local and regional area.

Visitors and residents will be encouraged to walk the centre or use public transport rather than use their cars.



Walkability Radius from Main Street





Destination Drivers

Destination Points

Greensborough's Attractions

The Plan incorporates important destination drivers, such as:

- Leisure shopping areas – where it's fun, even just to look
- Highly interactive sports experience
- Places for public events
- Spaces in which to relax

In a world that's increasingly commoditised and homogenised the renewed Greensborough will provide a point of difference. It already possesses retailers that provide unique shopping experiences not to be found elsewhere in Melbourne. The renewed Greensborough will have experiential and interactive leisure facilities integrated into the Centre.

The renewed Greensborough will meet the diverse needs of its population. Greensborough's people, drawn together by the range of experience it offers, will be the essential vitality of Greensborough. At the same time, the feeling of safety and 'homeliness' so prized by the community will still be there. Young and old, family or individual, resident or visitor, worker, shopper, fun-seeker, or people wanting just to hang out, they'll all discover things not found in any other

Regional Centre.

For business owners the benefit will be Greensborough's strong draw as a destination. A village that can't sustain itself commercially doesn't feel as positive as people would like and certainly won't guarantee its long term viability. The Plan seeks to create a mixed-use environment where economic viability is driven by high levels of patronage across a range of activities, from shopping and swimming to actually living in the town centre.

The Structure Planning Process

Objectives of the structure planning process

The Greensborough Plan will meet a broad spectrum of objectives that can be loosely categorized as social, economic and environmental. A summary of each is provided below.

Social Objectives Include

- Improved liveability including safety, convenience, comfort and aesthetics within the GPAC. This objective has been met at every level of the plan, from broad strategies down to the visualizations of potential development across the GPAC.
- Increased opportunities for social interaction and focal points for the community. The Plan provides for a range of new social gathering points and promenades throughout the GPAC.
- Protection of and contribution to the area's natural, historical and cultural heritage. The Plan identifies key heritage aspects of Greensborough's historic urban and regional role.
- Improved accessibility of a wide range of services and facilities. The Greensborough Plan creates a stronger and more natural network of services and facilities, encouraging better access by vehicle, public transport, freight transport and on foot.
- Good relationships to surrounding development, land uses and landscapes. The 'edges' of the GPAC have been respected in the plan and defined by broad tree plantings. This marks the boundary of the GPAC, which supports intensification of uses suitable to adjoining land uses and landscapes.
- Improved transport choice for all users, through the strengthening of transport networks and the shaping of the urban environment to support sustainable transport choices.
- Improved public health through good planning, through the creation of inherently healthy urban environments with good access to daylight, fresh air and views of greenery and distant vistas.

Economic Objectives Include

- Contributing to the economic effectiveness of the network of centres, providing wide community benefit. The Greensborough described in the Plan will be a vital economic centre, able to attract commercial and residential investment in competition and partnership with the network of other centres.
- The promotion of urban form that minimizes overall land and transport requirements. The Greensborough Plan promotes a consolidation of use and density that will allow growth without placing undue additional stress on land and transport requirements. More efficient land use and infrastructure provision characterize the plan.
- Improved freight movement and business logistics. The consolidation of transport and freight movement and delivery in the GPAC will lead to a more efficient logistical infrastructure. The creation of a revitalized civic centre will help improve business vitality, which in turn will positively influence employment opportunities within the GPAC.

Environmental Objectives Include

- Encouragement of urban transport systems and user movement patterns that limit pollution from fossil fuels. A significant portion of Greensborough's PAC has been engineered to encourage a culture of vehicle use. By prioritizing pedestrian movement and the more effective use of public transport infrastructure the Greensborough Plan will encourage systems and patterns of movement that rely less on the use of fossil fuels.
- Improve energy efficiency in building design, siting and layout. The siting and massing of proposed development patterns within the Framework Plan take into account efficient energy use and the creation of climatically sound urban spaces.

Consultation methodology

The Plan is predicated on a methodology of broad consultation through a variety of channels and means, including:

- Continual input from the Greensborough Community Consultative Committee, a cross section of residents, traders and community representatives
- Community presentations and workshops throughout the period of the planning process
- Presentations to councillors and senior council officers and other levels of government
- a whole-of-government approach across local, state and federal tiers and departments

This has ensured that the concerns of the broadest possible cross section of the community are accommodated in the Plan.

The Structure Plan



Overview



Intersection of Main Street and Greensborough Walk



Aquatic Centre & Collaborative Workplace

The revised Greensborough Structure Plan provides a detailed strategic basis and instrument for integrated town centre redevelopment. It highlights the underlying attributes of Greensborough both as an important activity centre and an urban hub with unusual natural attributes that are at times not understood, or appreciated, by the community outside of Greensborough. The Structure Plan provides a framework for the redevelopment of strategic precincts within the town centre, and identifies other opportunities for reshaping the city and re-establishing pedestrian networks and urban environments which characterise great city centres.

The Structure Plan is also underpinned by detailed analysis of existing transport, traffic and parking infrastructure. It recommends new traffic management measures, parking policies and public transport initiatives that are more conducive to good long-term urban design outcomes, and which will support sustainable redevelopment in the town centre. The Plan has also been subject to extensive stakeholder consultation and analysis, as detailed above.

Critically, the plan provides a robust roadmap and catalyst for considered development and consolidation of Greensborough's town centre. It includes strict development requirements for key sites within the town centre and effectively establishes a framework for facilitating good development outcomes and preventing poor ones. In essence, certain strategic sites will only be developed if the right development outcome is being achieved for the city.

The implementation plan includes a range of publicly funded projects which will both contribute to the long-term renewal of Greensborough's public realm and encourage private investment in the redevelopment of central Greensborough. The plan also contains an outline of public-private partnership development which will capitalize on local and state government assets within the town centre. Government property assets will form the basis of alternative "whole-of-government" development strategies which build on opportunities across transport, leisure, affordable housing, education and training.

Above all, the Structure Plan makes possible the change in land uses, densities and the physical form of the GPAC to allow it to achieve a form of 'critical mass' for the community, based on sustainable growth and design principles.

The Structure Plan:

- Maximises opportunities for living, working, shopping and relaxing; it assembles land holdings for higher and better use;
- It will help strengthen people's sense of the identity of the place they share;
- It will lead to an environment that is more attractive and stimulating; it will make the GPAC complement and help revitalise adjacent areas;
- It will make a crucial contribution to the creation of an economically and socially sustainable community with high quality facilities, affordable housing options, good public transport and improved commercial and retail opportunities.

The Greensborough Plan builds on the 11 key principles of the Local Structure Plan 2003, expanding on the themes identified there. The 11 principles of the previous Local Structure Plan 2003 were:

- 1 Maximising environmental improvement
- 2 Promoting a sustainable traffic and transport network
- 3 Maximizing mobility and access for all
- 4 Maximising economic prosperity
- 5 Maintaining an aquatic centre
- 6 Ensuring superior urban design outcomes
- 7 Ensuring social equity and youth development
- 8 A new focus on health and wellbeing
- 9 Provision of new residential opportunities
- 10 Better place management and governance for the GPAC
- 11 Ensuring a civic role and function for the GPAC

These principles have been refined to create the following 7 Key Principles of the Greensborough Plan. The new Key Principles are:

- 1 Sustainability
- 2 Innovative urban design
- 3 Diversity
- 4 Ease of movement and connectivity
- 5 Greener Greensborough
- 6 The Public Realm
- 7 An integrated Centre

The following section provides a more detailed explanation of these principles.

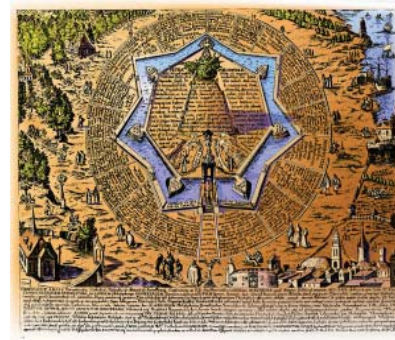
The Defined City Edge - Water



The Defined City Edge - Wall



The Defined City Edge - Wall + Water



The Green Edged City



The 7 key principles of the Greensborough Plan

Sustainability

Objectives

- Incorporate sustainability principles in the design, demolition, construction and use of development in Greensborough Principal Activity Centre.
- Establish long term environmental sustainability outcomes to be achieved by use and development within Greensborough Principal Activity Centre.
- Encourage integration of transport to help facilitate increased use of public transport, support walking and cycling and reduce use of cars.

Strategies

- Require new development to address the Environmental Sustainability Principles Guidelines (included in the Greensborough Principal Activity Centre Plan) to demonstrate where appropriate sustainability measures are addressed by the development.
- Encourage a diverse range of residential development at strategic locations within the centre to assist Council to meet its targets for increased residential development within activity centres.
- Develop the Collaborative Workplace building and the Aquatic and Leisure Centre as sustainable office and recreation environments.
- Create a new Town Square that will be a civic heart of the transformed Greensborough providing positive economic, social, cultural and public spaces outcomes for the community.
- Require new development to address social sustainability principles including improving health and wellbeing, improving access for all modes of transport, facilitating social inclusion, providing high amenity spaces and maximising user comfort and satisfaction.

Innovative urban design

Objectives

- Transform Greensborough through innovative urban design that is unique, site specific, diverse, understandable and adaptable.

Strategies

- Encourage high quality urban design that is responsive to and reinforces the locally distinctive topography, features, characteristics and landscape of the centre.
- Encourage highest density built form in locations which have the greatest access to public transport and where building design can ensure significant amenity impacts on existing residential areas outside the activity centre are minimised.
- Promote high quality and distinctive built form outcomes on prominent corner and infill sites (see Key Development Sites identified on the Structure Plan)
- Require the "visual bulk" of new development to respond to the grain of the existing urban environment, such as the small scale rhythm of the subdivision along Main Street should be respected and reflected in the "visual bulk" of new development.
- Encourage building forms which can accommodate a variety of uses and changes of uses throughout the life cycle of the building.
- Promote the provision of gateways, landmarks and focal points throughout the centre.
- Encourage buildings to be designed to take advantage of views and vistas towards the nearby Plenty River Valley and parklands.
- Improve signage and way finding in the activity centre.
- Discourage applications for subdivision of existing sites that are not associated with a development proposal that supports the objectives of this Scheme for the Greensborough Principal Activity Centre.
- Encourage consolidation of land to facilitate the creation of viable development sites.

Diversity

Objectives

- Foster a culture of health and wellbeing within Greensborough.
- Maximise opportunities to incorporate a diverse range of residential housing options within the Greensborough Principal Activity Centre.
- Maximise opportunities for a broad range of well designed and integrated buildings incorporating land uses to support the vitality and functioning of the area including entertainment, leisure, culture, community uses, office, retail and housing.

Strategies

- Encourage a mixed use environment where economic vibrancy is driven by high levels of patronage across a variety of activities, ranging from shopping to swimming to living in the centre.
- Encourage uses that cater for the health and well being of the community to locate within the activity centre.
- Encourage an increased main street retail along the avenues and central spine of the centre.
- Encourage a range of residential housing types to attract a diverse mix of people to live in the centre.
- Ensure that residential development is of a high quality design with good internal amenity for occupants.



Ease of movement and connectivity

Objectives

- Promote a sustainable traffic and transport network and maximise mobility for all.

Strategies

- Implement the improvements to mobility and access identified on the Greensborough Principal Activity Centre Movement and Connectivity Plan.
- Implement the Parking Precinct Plan for the activity centre.
- Develop a modal interchange to improve access, transfer and amenity for users of train and bus services to ensure that public transport is a more attractive, viable and easy alternative to using a car.
- Develop an Integrated Transport Plan for the activity centre.
- Give priority to pedestrian movements within the centre by creating a new pedestrian network and rationalising the vehicle network without compromising the viability of commercial and retail interests or essential traffic flow.
- Reorder traffic systems to create a ring road bypassing the improved pedestrian territory of the centre, especially Main Street.
- Create a network of major pedestrian routes within and around the activity centre.
- Improve the efficiency and accessibility of public transport systems in the centre in respect to train and bus services.

A Greener Greensborough

Objectives

- Create a greener Greensborough by providing green spaces within and around the Activity Centre.

Strategies

- Create physical and visual links between the Plenty River Valley and the activity centre to provide an extension of the green landscape into the centre.
- Implement the landscape improvements in accordance with the "Greening Greensborough Landscape Design Principles."
- Ensure extensive landscaping and planting of indigenous canopy trees throughout the centre.

Public realm

Objectives

- Promote the civic role and function of the Greensborough Principal Activity Centre.
- Support place management and governance that promote an improved and vibrant public realm.
- Ensure that the design of public spaces provides social equity and promotes youth development.

Strategies

- Create a series of new public spaces across the centre, each with a distinctive character and scale, the largest being the centrally located Town Square and Greensborough Walk.
- Ensure that public spaces are designed to accommodate people of all ages, and are places where people feel safe to meet, play or just watch the world go by.
- Provide spaces and places for young people to engage in recreation and leisure, and provide healthy and safe environment for young people to spend time together.
- Ensure the public realm is coordinated and presents a cohesive, attractive and safe environment.

An Integrated Centre

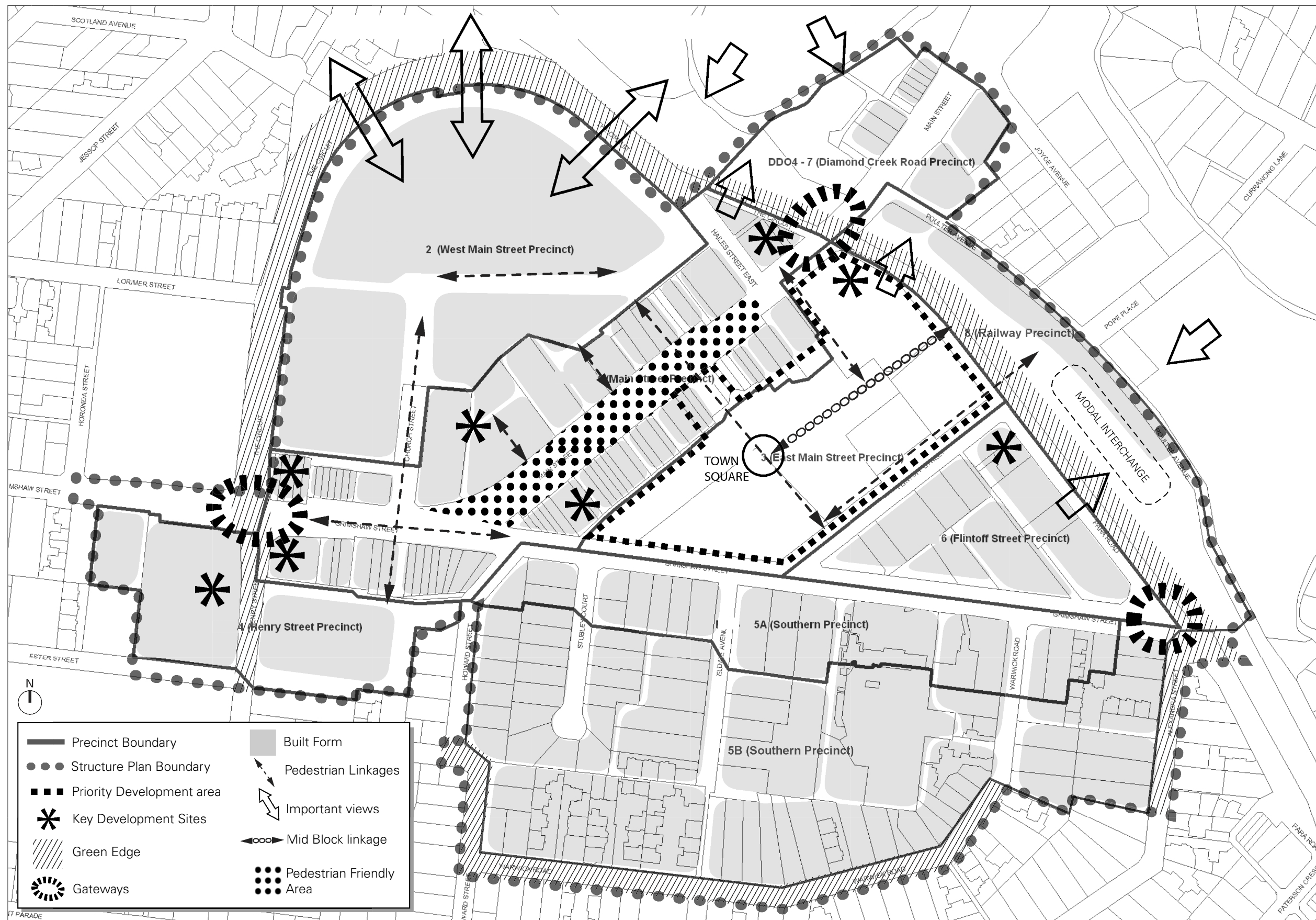
Objectives

- Ensure an integrated centre that is legible, easy to navigate and connected for pedestrians

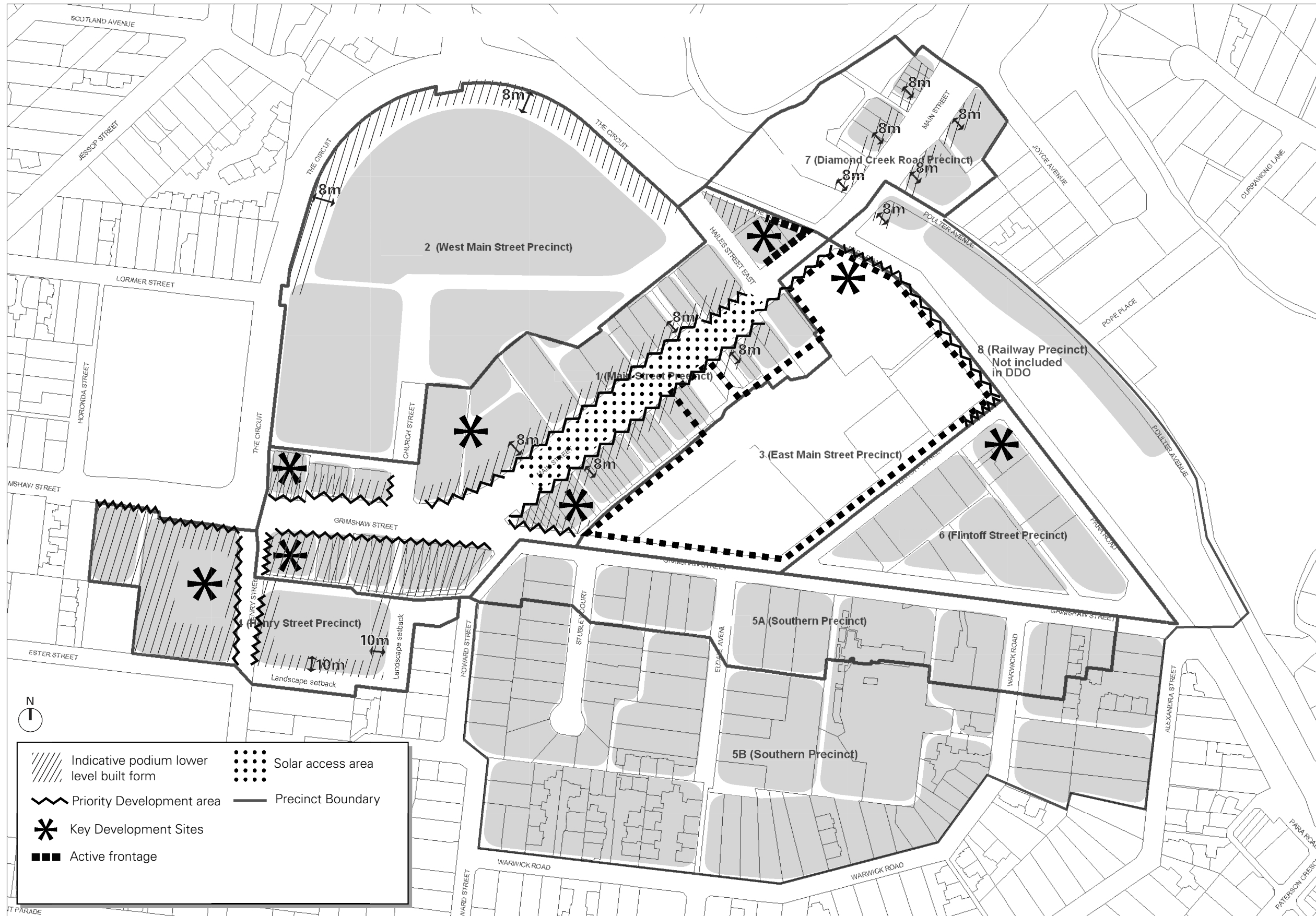
Strategies

- Create way-finding structures and signage to help pedestrians 'read' the centre and use the network connections.
- Restructure transport and traffic to facilitate ease of use and safety with regards to pedestrians.
- Remove the fence separating the two halves of Main Street in conjunction with amended bus traffic conditions to ensure community safety.

Structure Plan



Built Form Outcomes



Movement & Connectivity Plan



Indicative Development Outcomes



- 1 Main Street
- 2 Greensborough Walk
- 3 New Link To Greensborough
- 4 Town Square
- 5 Regional Aquatic Leisure Centre
- 6 Collaborative Workplace
- 7 Transport Interchange
- 8 Future Residential Opportunities

Greening Greensborough Plan



- 1 The Circuit
- 2 Grimshaw Street
- 3 Main Street
- 4 Greensborough Walk
- 5 Town Square
- 6 Flintoff Street
- 7 Para Road

Greening Greensborough: Landscape Design Principles

Main Street

The design for Main Street shall create a welcoming civic spine to Greensborough, beginning and terminating with high quality public spaces. An urban landscape vision, that integrates pavement designs, street trees, furniture, lighting and signage to reinforce Main Street's iconic identity within Greensborough. Principle features include:

- Improve the pavements, using high quality materials to create a cohesive and uniform redevelopment of the streetscape that gives Main Street a unique and distinctive identity.
- Consider the retention and extension of existing Elm tree plantings.
- Create wider pavements, particularly on the southern side of the road to encourage pedestrian use and on street activity.
- Create spaces that encourage the spill out of activities along the street including cafes, markets and street stalls.
- Emphasise the view and visual connection to the greater landscape of the surrounding Plenty River Valley.

Greensborough Walk & Town Square

The Greensborough Walk and Town Square shall be designed as Greensborough's civic heart, with a range of landscape features and attractions that will make this a true town square that the local community can identify with.

Principal features include:

- A landscape that is connected to the aquatic centre and the public realm of Main Street and Flintoff Street.
- A landscape space that is flexible enough to accommodate a wide range and scale of public events.
- Spaces that are usable in all weather conditions, providing shade in summer and shelter in winter.
- A landscape that complements Greensborough's role as a key civic space.
- A landscape that is a showcase of environmental best practice and reflects the environmental values of the community and council.
- A landscape that is integrated with the adjacent building developments to ensure connectivity and active edges to all adjacent developments.
- A landscape that provides a safe place for all people, at all times. Consideration must be given to crime prevention through the design of this environment. Ensuring that the space is well lit at night, that there is good public surveillance and no areas of potential entrapment.
- The design of the landscape must allow for equal and equitable access for all people.

The Circuit

The Circuit shall be an important landscape development that frames the retail core of Greensborough, provides a memorable driving experience and suitable interface with the adjacent residential areas.

- The streetscape shall build upon the existing streetscape character of paths, lawn and generous avenue plantings.
- It shall relate and visually connect to the broader indigenous landscape of Greensborough.
- It shall be a consistent landscape treatment for the entire length of the road.

Flintoff Street

The streetscape for Flintoff Street shall reflect the important pedestrian connection it will provide from the train station to the proposed town square and Grimshaw Street.

- To reinforce pedestrian priority, a visually strong streetscape will be developed that builds upon the large existing native trees within the street.
- It shall be a well detailed streetscape that contributes to the overall greening of Greensborough, which should include wider pedestrian paths, avenue planting, integrated lighting and street furniture.

Para Road and Railway Connection

Although Para Rd is an extension of the Circuit, its landscape treatment should be developed as an extension of the river parklands. Principal features may include:

- Informal street tree planting with understory treatment, using indigenous species, that brings the Plenty Valley landscape up to the edge of the central precinct.
- Creating strong pedestrian links from Flintoff Street to the station and the adjacent parklands.
- Creating strong landscape connections with Main, Flintoff and Grimshaw Streets.

Grimshaw Street

Grimshaw Street shall be developed to reinforce its entry / gateway experience to Greensborough and its connection to Main Street and The Circuit. In particular the design of the street should provide a unifying theme whilst responding to the changing topography, land uses and civic address of the street.

- It shall be composed of a landscape treatment that relates and visually responds to changing character adjacent to The Circuit, Flintoff Street, and Main Street.
- Extensive tree planting to contribute to the overall greening of Greensborough.
- Avenue planting that visually connects to the surrounding landscape of the Plenty River Valley.

A Sustainable Landscape Approach

The Greensborough site is an important redevelopment opportunity to demonstrate areas of best practice in sustainable design. It offers an important opportunity to create a place to live and work that is fully designed in a sustainable manner.

Embodied Energy

The material used for the construction of the public domain shall have a low embodied energy and be selected not only on its impact on this site, but also in consideration to the environment from where the material is sourced.

Objectives for the development shall include:

- Assessment of proposed materials embodied energy.
- Investigation of using alternate recycled materials.
- Amelioration and reuse of site soils where possible.
- Reuse and recycling of onsite material where possible.

Integration of landscape and Urban Development

The landscape and urban development shall be integrated to achieve a higher level of sustainability.

Objectives for the development shall include:

- Ensuring the public realm landscape allows solar access for buildings.
- Incorporation of roof gardens where appropriate.
- The potential of food production in gardens.
- Integration of water collection and recycling systems for both buildings and landscape.
- The integration of landscape elements in the fabric of the built form where appropriate.

Water Sensitive Urban Design

Establishing a best practice approach to storm water treatment and potential reuse.

Objectives for the development shall include:

- Collection and storage of roof runoff and surface run off from paved urban spaces.
- The polishing of this water through the use of bio-retention swales and filters.
- Establishing an infrastructure that allows for recycled water to be reused in buildings and in the public landscape.
- Stormwater reuse for irrigation where required.

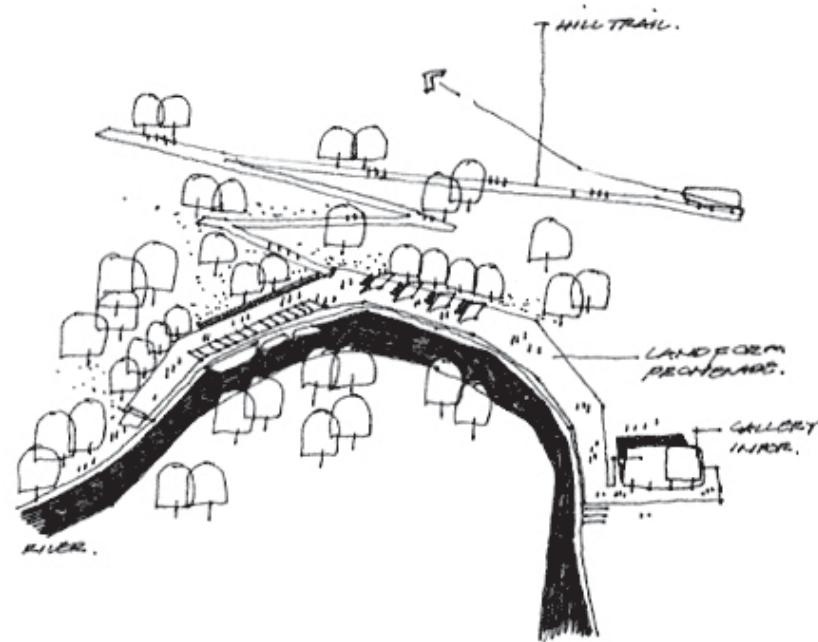
Recurrent Cost

In the design of the public open space, consideration should be given to the long term running and maintenance costs of the urban landscape.

Objectives for the development shall include:

- Use of highly durable pavement surfaces and materials in the public realm.
- Setting a long design life for public structures.
- Creation of low maintenance lawn and garden areas.
- Selection of drought tolerant plant species.
- Selection of low maintenance plant species.

Urban Design Framework



The Plenty River Valley
The Plenty River Valley is a principal recreational asset of Greensborough, with opportunities for improved interfaces with the water's edge and new paths and connections through the parkland spaces.

The structure of the UDF

The GPAC has been divided into eight main precincts: West Main Street Precinct, East Main Street Precinct, Main Street Precinct, Diamond Creek Road Precinct, Henry Street Precinct, Flintoff Street Precinct, the Railway Precinct and the Southern Precinct. Additional components include: the GPAC line that creates a transitional zone between the GPAC, the surrounding suburban areas, the Plenty River Valley; and the key entry gateways to GPAC.

Key sites and projects

The structure planning process has identified a series of key sites and projects, the most significant of which are listed here.

- Revitalised Main Street
- Greensborough Walk and Town Square
- Collaborative Workplace
- Aquatic Centre
- Church Square
- New retail and entertainment facilities
- Educational facilities
- Railway station and transport interchange

These sites and projects are addressed in the design guidelines and commentary which follow the precinct guidelines.

Placemaking

The guidelines that follow have developed from principles of placemaking endorsed by the British Commission for Architecture and the Built Environment (CABE), noting that:

"Successful streets, spaces, villages, towns and cities tend to have qualities in common. The fundamental qualities of successful places, which all development must contribute to, [include]:

- Character – a sense of place and history: A place that responds to and reinforces locally distinctive patterns of development and landscape.
- Continuity and enclosure – clarity of form: A place where public and private space are clearly distinguished.
- Quality of the public realm – sense of wellbeing and amenity: A place with public spaces and routes that is lively and pleasant to use.
- Ease of movement – connectivity and permeability: A place that is easy to get to and move through.
- Legibility – ease of understanding: A place that has a clear image and is easy to understand.
- Adaptability – ease of change: A place that can change easily.
- Diversity – ease of choice: A place with variety and mixed uses."

Built Form

Built form in the GPAC will be created to meet the following performance criteria, as delineated in the RFP documentation. The following points must be considered in the creation of any new development:

- There will be appropriate variations and transitions in height from low scale development interfaces of the GPAC site, through to the centre and along major boulevards.
- Overshadowing of adjacent residential properties is to be minimized.
- Designers must take advantage of the topography and adjust levels accordingly.
- Taller elements must be carefully sited to ensure that they do not diminish the amenity of nearby residential properties and streets.
- The character of proposed developments must be designed to respond to the grain of the existing urban environment. That is, where there is an existing small-scale rhythm of subdivision and built form character, such as along Main Street, this should be respected and reflected in the design of proposed development.

Materiality

The Greensborough town centre enjoys a unique landscape setting that dramatically sets it apart from other regional and suburban town centres.

The architecture of the existing town centre, however, generally makes little contribution to its identity and particular sense of place.

Proponents and developers of new buildings in Greensborough will be required to demonstrate their response to the town's exceptional landscape and environmental qualities. This will include built form responses which articulate and respond appropriately to sloping development sites, and material selection and use which is part of a considered and coherent palette relevant to the Greensborough environment.

Relevant considerations for material use and selection include:

- Natural and traditional building materials and finishes including stone, masonry and timber.
- The use of complementary and contrasting materials together with a "natural" material base.
- The use of low maintenance, naturally weathering materials and finishes.
- Subtle, "natural" colour palettes.
- A range of colour palettes complementary to the surrounding context.
- The integrated use of green landscaping in development.
- The provision of a finer grain or texture on larger scale building forms and elements such as masonry or brick modules on larger wall panels.
- The provision of additional building layers or "skins" such as sun screens and verandahs.
- The innovative use of contemporary building materials to achieve aesthetic outcomes consistent with other material guidelines.

Desired future character

The desired future character of Greensborough is of a city transformed into a green city, both literally and figuratively. The edges of the GPAC will be defined by a 'green edge', a border of trees that circumnavigates the GPAC, broadening into forest and parklands in the Plenty River Valley corridor.

Transition into the GPAC will be marked by a series of Gateways, landscape elements. These Gateways will be located on the major vehicular routes into the GPAC, marking these routes as axes of importance.

Within the GPAC boundary the renewed Greensborough will provide a hierarchy of public spaces ranging from the generous Greensborough Walk and landmark Town Square, and the 'high street' experience of Main Street down to more intimate spaces such as Church Place. With the traffic network in the GPAC modified to encourage perimeter-oriented access, pedestrians will be better accommodated and able to move more easily about the City. Main Street will no longer mark a division in the GPAC, with pedestrians given priority over vehicles and central barriers to pedestrian movement removed.

The City will be known for its leisure facilities, including a world-class aquatic and leisure centre. Other specialist retail tenancies and personal services outlets will support this identity, which will also be emphasized by the large number of parks, green spaces and other recreational facilities. Greensborough will have an active, healthy population.

People attracted to the vibrant, healthy Greensborough will be given many new and different opportunities to live in the GPAC, with housing of all types and sizes provided across the town. Apartments, houses, townhouses and shop-top housing will be combined with home offices and mews style dwellings, providing a rich mix.

Sustainable design will be showcased at Greensborough, in terms of sustainable urban design and the design of individual buildings. The new Collaborative Workplace Building, which is a government, commercial and community use office building, and the Regional Aquatic and Leisure Centre will both be key sustainable projects. They will utilize a range of techniques, technologies and systems, both active and passive, to create sustainable environments.

Precincts and Design Guidelines

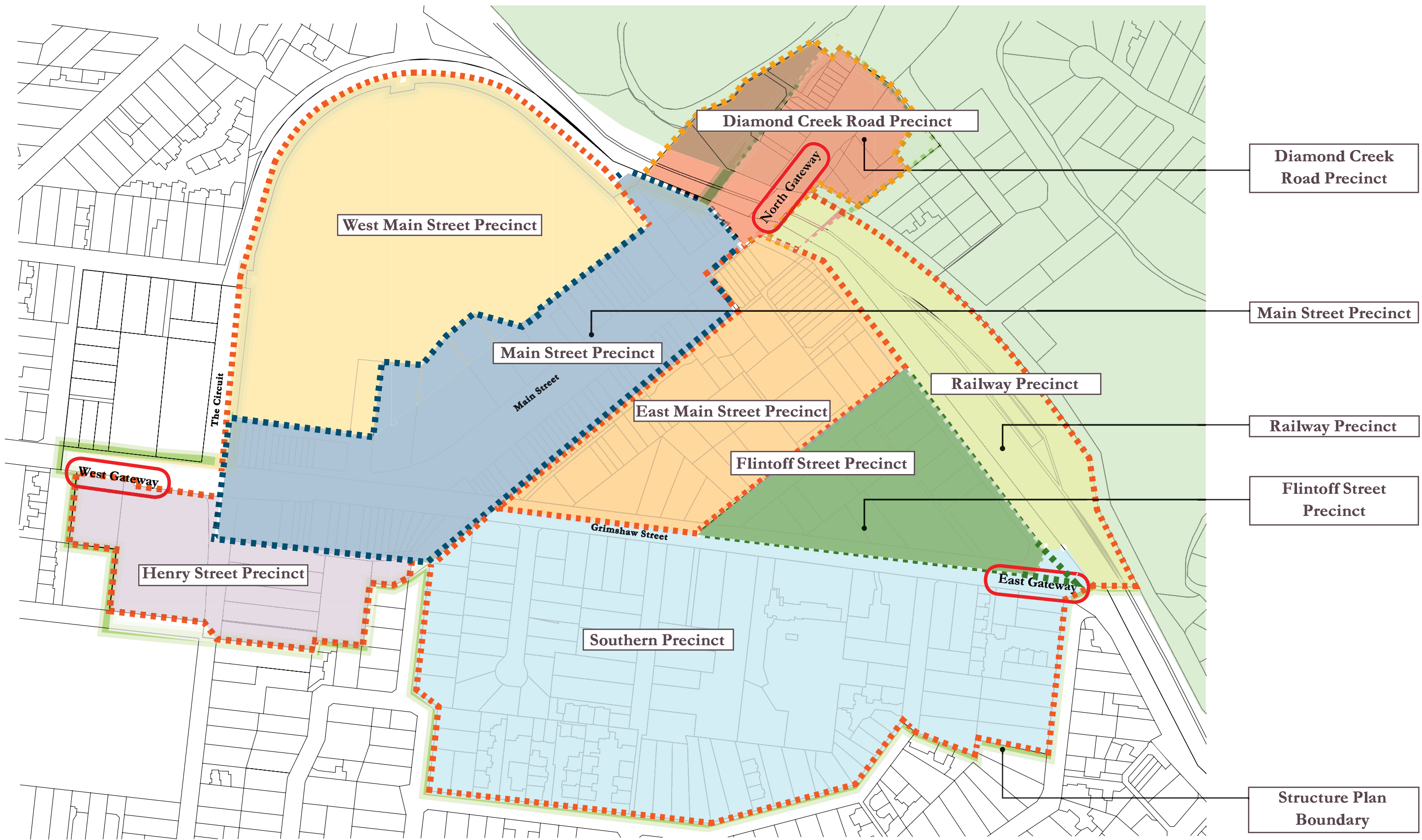
This portion of the plan focuses on desired urban outcomes for the Greensborough Principal Activity Centre. It is divided into general guidelines for all precincts, and specific guidelines for each precinct.

The urban design guidelines address a precinct's desired future character in relation to its adjacent precinct and the broader context of a vision for Greensborough as a whole. They identify desired character, preferred uses, development and design principles, maximum allowable building heights, traffic management and parking precinct plans and articulate strategies for achieving the desired outcomes.

General Design Objectives for GPAC

- To encourage high quality urban design that is responsive to and reinforces the locally distinctive topography, features, characteristics and landscape of the area.
- To ensure the height of future development responds to the desired future scale and character of the precinct within the activity centre.
- To ensure that building setbacks achieve the desired spatial proportion of the street, define the street edge and provide a high amenity for users of the street.
- To ensure that pedestrian routes, streets, footpaths and open spaces interact with and are overlooked by buildings.
- To promote active frontages to streets, walkways and public spaces.
- To promote high quality and distinctive built form outcomes on prominent corner, gateways and infill sites.
- To ensure key community nodes and pedestrian streets have good access to sunlight, weather protection and clear pathways linking elements.
- To maintain and improve the provision and integration of quality public spaces, including streets, laneways, the town square and other public spaces.
- To encourage buildings to be designed to take advantage of views and vistas towards and within the activity centre and the nearby Plenty River Valley and parkland.
- To improve signage and way finding measures for users of the activity centre.







Main Street precinct

The Main Street Precinct is arguably the most important of all the precincts, forming the heart of the GPAC and tying together the other adjacent precincts. Subsequently the revitalisation of Greensborough will be driven by the measures taken and standards set in Main Street.

Vision

Main Street Precinct will be a vibrant place with a range of activities attracting people over longer periods during the day and evening. Streetscape works and reduction of through traffic will create a pleasant, attractive pedestrian environment where active uses, such as cafes, shops and retail will be encouraged to “spill out” onto the street in places. The precinct will also develop as a cohesive pedestrian spine allowing people to easily connect to adjoining precincts, the railway station and Plenty River Valley parkland.

Objectives

- To ensure that Main Street retains the character and characteristics of a main street retail strip with a high priority on pedestrian access and amenity along the street.
- To ensure development along the Main Street is of a pedestrian scale, and vertical articulation to building forms.
- To maintain and encourage safe and easy pedestrian movement between Main Street to/from the West Main Street and East Main Street Precincts, the Plenty River Valley parkland and from the railway station to the top of Main Street.
- To provide linkages between Main Street and the surrounding areas including open space networks and housing.
- To provide for the physical and functional integration of Main Street with the new Greensborough Walk and Town Square to the southeast, and to the Greensborough Plaza to the northwest.
- To encourage the types of uses that will establish Main Street as an alternative kind of experience to the Greensborough Plaza Shopping Mall and East Main Street precinct, such as boutique and specialty retail and restaurants/cafes.

- To allow for new forms of housing (i.e. shop top housing and residential apartments) that will take advantage of the broad range of services, public transport, amenities and features of the area, creating a dynamic centre with day and night activities.
- To encourage all buildings to have active and transparent shopfronts at ground level to allow for natural surveillance of the street.
- To facilitate commercial investment in the precinct through the development of new shopfronts and tenancies on Grimshaw Street.

Built Form Character

Building heights within the Main Street Precinct have been established to preserve a lower height at the frontage, with zero lot setback up to four levels forming a continuous frontage at street level. Beyond this higher building form is allowed, with setbacks preserving the appearance of the street and allowing the penetration of winter sunlight into the street, on the southern footpaths. All frontages must be activated and facing the street, with no ‘blanked-out’ facades at street level. Verandahs incorporated into the facades of buildings will provide protection from the weather and increase the comfort of pedestrians moving along the busy shopping strip.

Additional height is permitted on key development sites, as indicated on the Structure Plan. These sites are at important strategic locations at the entry to the activity centre. It is expected that new development at gateway locations will be significant landmark buildings that as well as providing additional height will also feature excellence in design as a fitting entry point to the activity centre. The additional height permitted on these sites will also facilitate increased opportunities for incorporating residential development in the Precinct.

Aspirations for the Main Street Precinct

Sustainability

- Finding the correct urban design ‘equation’ for Main Street will help establish the conditions for sustainable economic investment. This will take four principal forms: retail and services spending; retail business investment; service business investment and residential property investment. Balancing factors across these four types of investment will help establish the conditions for a sustainable economic future.
- Ensuring that young people have suitable facilities and amenity across the GPAC will help reduce the boredom that can lead to anti-social behaviour among youth. Revitalised urban spaces on Main Street will be designed to be robust but also lively and overlooked, to encourage friendly social groupings.

Innovative Urban Design

- Main street will establish new strategies for the integration of the ‘high street’ strip shopping experience with that of the nearby Greensborough Plaza, a challenge in urban design terms. Establishing urban design solutions that create a complementary relationship between the two very different experiences will help ‘unlock’ Main Street.

Diversity

- Main Street shall represent a particular type of retail outlet, favouring fresh food, cafes and restaurants, florists, bakeries and other types of vendor, as discussed above. These types of retail outlet will complement the services relating to health and wellbeing focused on the Regional Aquatic & Leisure Centre, and will establish Main Street as an alternative kind of experience to the Greensborough Plaza.
- Main street will be the site of new residential premises, which could take a range of forms including ‘shop-top’ housing. Residents will take advantage of the broad range of services, amenities and features of the revitalised GPAC, and will be able to live comfortably without a car.

Ease of Movement and Connectivity

- To maintain a bus stop within main street in an improved design configuration.
- Two additional principal traffic measures will be undertaken on Main Street: the street will be reshaped to favour pedestrian movement and ease of crossing; and other vehicle traffic will be redirected away from Main Street as a through street, around the GPAC’s perimeter roads.

A Greener Greensborough

- New street tree plantings along Main Street will help transform it into a green urban ‘artery’, where pedestrians are given priority.

Public Realm

- Main Street will be an urban ‘high street’ in the civic sense, a public tree-lined avenue that is a source of civic pride. By being tied into the network of pedestrian links and spaces across the GPAC Main Street will become more than just a shopping strip.

An Integrated Centre

- To ensure Main Street is an active interface between the adjoining precinct (particularly East and West Main Street) and that pedestrian movement across the street and from the railway station to the top of Main Street is maximised.
- To provide for linkages between main street and the surrounding area including open space networks and housing.
- The integration of Main Street with the new Greensborough Walk and Town Square to the southeast, and to the Plaza to the northwest, will be key strategies employed in the refurbishment of Main Street. These criteria will help determine the nature of the pedestrian network, and the materiality and legibility of the urban environment. Main Street will be the centrepiece of a broader urban network.



West Main Street precinct

West Main Street is characterised by being heavily built up, generally dominated by the Greensborough Plaza shopping mall.

Vision

West Main Street Precinct will continue to provide key retail services within the centre including anchor retail stores, entertainment and commercial services. Connections and integration with the Main Street and East Main Street Precinct and the railway station will be improved. New development in the northern quadrant will maximise views and access to the Plenty River Valley where appropriate.

Objectives

- To integrate the Greensborough Plaza Shopping Mall, Main Street and East Main Street activities to help create a diverse experience for visitors to the Greensborough Principal Activity Centre.
- To improve the West Main Street Precinct's connection to the broader pedestrian network, particularly between Main Street and the East Main Street precincts, the railway station and the Plenty River Valley Parkland, in order to encourage visitors to walk rather than rely on cars.
- To encourage new mixed-use development within the northern quadrants of the West Main Street Precinct.
- To improve pedestrian movements across The Circuit to provide better access to the recreation facilities of the Plenty River Valley.
- To encourage any new higher buildings to be designed to maximise views from and between these higher buildings to the Plenty River Valley.
- To ensure new development provides a well designed podium level edge treatment to The Circuit.
- To ensure new development minimises impacts on the amenity of Main Street pedestrian areas and other public spaces.

Built Form Character

New development within this precinct will have a greater focus on providing improved links to the rest of the activity centre including Main Street, the railway station and the Plenty River Valley parkland to the north. New landscape works will also allow better coordination and cohesion with landscaping treatment within Main Street.

Higher levels of development can be supported within the majority of the Precinct subject to ensuring the amenity of Main Street and Grimshaw Street are not adversely impacted upon. The north quadrant will be developed with a zero setback to The Circuit but careful design will ensure that higher levels are stepped back from the street to minimize the impact of the scale of development. The frontage facing onto The Circuit is to provide an attractive interface for pedestrian, passing traffic and residents living opposite. New development will take advantage of the views of the Plenty River Valley and will be designed to allow for views towards the activity centre from the valley.

Aspirations for the West Main Street Precinct

Sustainability

- The provision of recreational spaces and activities suitable for young people will help promote a culture of health and wellbeing, and offer an alternative gathering space to the Greensborough Plaza.

Innovative Urban Design

- The challenge posed by the West Main Street Precinct is one of the integration of the Greensborough Plaza with new uses such as residential/ mixed use development. The site to the immediate north of the Plaza, currently a carpark, is a site identified as having residential development potential above podium level, with an excellent outlook over the Plenty River Valley. Mediation of a harsh ground level condition, dominated by heavy vehicle traffic around the Circuit, will be a characteristic of a successful urban design solution.
- New development will ensure that views from the valley back towards the precinct will provide an interesting backdrop.

Diversity

- The Greensborough Plan supports the introduction of mixed uses in the West Main Street precinct, which will lead to increased diversity for this part of the GPAC.

Ease of Movement and Connectivity

- The Circuit will operate as a ring road, effectively allowing traffic to flow around the GPAC rather than through Main Street and the town centre. Parking for new residential buildings will be contained on the lower levels, with dwellings over.
- Improving and emphasising the West Main Street Precinct's connection to the broader pedestrian network in the GPAC will encourage visitors and new residents in the precinct to walk rather than rely on their cars. The provision of passive and active recreational space in the nearby precincts will also encourage a culture of healthy living. A direct pedestrian connection from new mixed-use premises to the Plenty River Valley corridor will give residential properties a valuable amenity.

A Greener Greensborough

- New street tree plantings along the Circuit and Main Street will help transform the GPAC into a green urban environment, where pedestrians are given priority. Roof gardens in new development will create a green roofscape in the GPAC, further contributing to the greening of Greensborough, as will the implementation of a broad spectrum of sustainability objectives.

The Public Realm

- The ongoing economic viability of Greensborough Plaza is of importance to the GPAC, but there must also be a balancing of commercial spaces against truly public civic spaces in the GPAC. This is of particular importance in the West Main Street Precinct, which is dominated by the Greensborough Plaza.

An Integrated Centre

- The integration of the Plaza and Main Street is a key objective of the Plan. The Plaza is predominantly an internal shopping experience, while Main Street offers an open-air shopping experience and civic promenade. Uses that take advantage of the different and complementary nature of these two experiences will help create a diversity of experience for visitors to the GPAC.



East Main Street precinct

East Main Street is characterised by a sloping topography, and is situated between the railway precinct and the body of Main Street. Many of the new features of the Greensborough PAC will be located in East Main Street Precinct, focused on the new Greensborough Walk and Town Square.

Vision

The East Main Street Precinct will be the focus of retail, civic, residential, health and wellbeing, leisure, entertainment and community activities within the centre. The precinct will accommodate anchor retail functions, and contain a significant residential component. A new, landscaped town square will function as a key public space for the centre, where people can sit, gather and participate in community events.

Objectives

- To enhance the public realm by creating new public spaces (including a town square) that are safe, attractive and interesting places for people to meet or to move through.
- To support a mixture of uses with active frontages such as restaurant/cafes, retail, civic and community facilities at pedestrian levels, and uses with non-active frontages such as residential and office uses located at upper levels.
- To promote local arts and cultural venues and local cultural identity through the inclusion of public art within public spaces and within new developments.
- To encourage higher density residential development to take advantage of the access to services and public transport and to increase the diversity of housing choice within Banyule.
- To encourage pedestrian movement between the precinct, Main Street Precinct, the West Main Street Precinct and the railway station.
- To ensure new development minimises the impact on the amenity of Main Street pedestrian areas and other public spaces.

Built Form Character

The East Main Street precinct provides Greensborough with a unique opportunity to develop an integrated, mixed use city block that incorporates community, retail, commercial, recreational, leisure and residential uses. A high priority for this precinct is the development of a new town square which will become the focus of civic activities within the activity centre. Careful attention will be required to ensure adjoining use and spaces provide active and interesting interfaces that complement this important community space.

The proposed Priority Development Zone and the associated Development Plan have been structured to support opportunities for future higher density residential development on designated sites within the precinct.

New development will need to take the sloping topography of the land into account allowing for sub-floor and above ground development. Like the West Main Street Precinct built form is organised around an extended podium base, the upper height of which is defined by a series of public spaces linked to Main Street. Above the podium a series of development envelopes have been defined to accommodate a range of uses and activities, including residential development. Heights in this precinct are controlled to maintain appropriate scale relationships to public spaces and adjoining streets including Main Street, Flintoff and Grimshaw Streets. New development will also be designed to take advantage of the views of the Plenty River Valley and address the views back into the precinct from the valley.

The street frontage is to be ultimately developed with commercial frontage facing Para Road and Flintoff Street and the upper level provided with a treated facade to screen the deck carpark. The street edge of Para Road and Flintoff Street is to be maintained in a manner that enables an active frontage to be provided at street level in the future.

Aspirations for the East Main Street Precinct

Sustainability

- The Collaborative Workplace building and the Aquatic Centre will employ passive and active systems to achieve ecologically sustainable design (ESD).
- To promote local arts and cultural venues and local cultural identity through the inclusion of art and cultural spaces within the adjoining new buildings.
- In addition to becoming a civic and urban public space, the Greensborough Walk will be designed to function well from a retail standpoint, helping secure a sustainable economic future for Greensborough.
- The Plan aims to support mixed use development with activated commercial, retail and community facilities at pedestrian level and residential, office and community facilities at upper levels.

Innovative Urban Design

- The East Main Street Precinct features the Greensborough Walk and Town Square the heart of a revitalised Greensborough. Arranged around the Town Square is a series of functions that will bring life into the civic space.

- The Plan aims to provide for a public town square as a central focus for the activity centre.

The Town Square is to include:

- well landscaped green spaces
- public accessibility
- opportunity for meeting spaces
- provision of public art
- active frontages for surrounding buildings.

Diversity

- New residential development will be introduced to the East Main Street Precinct, bringing animation and life to Greensborough Walk, the Town Square and nearby streets.
- Residential diversity must be well distributed through the development to enhance the vibrancy and safety of the precinct.

Sustainable Traffic and Transport

- The management of traffic in the East Main Street Precinct consists primarily of the management of parking and service vehicle movement in relation to the Greensborough Walk, Town Square and associated retail, commercial and community facilities (ie: aquatic centre).
- Links between bus and rail services and the Town Square are also of primary importance, and consideration of accessibility issues will play a major role in the redevelopment of the East Main Street Precinct.
- The Plan aims to encourage well designed car parking facilities which do not dominate other uses and minimise hard paved at grade parking, to be located beneath the substantive built form.

A Greener Greensborough

- Key projects within the East Main Street Precinct will contribute to the greening of Greensborough, in particular the sustainable office building on the Town Square. This building will contain many active and passive systems and design features including full northern aspect, winter gardens, natural ventilation, and good natural lighting.
- Landscape treatments will rely heavily on new greenery, including in parts of the Town Square.

The Public Realm

- While the ongoing economic viability of Greensborough Plaza is of importance to the GPAC, there must also be a balance of commercial spaces against truly public civic spaces in the GPAC. The Town Square and Greensborough Walk is the most significant new public space being created in the revitalisation of Greensborough, creating a forecourt to the Collaborative Workplace and a new gathering space for visitors and residents.
- In the East Main Street Precinct this objective is represented by the integrated approach to the design of the key public space, the Greensborough Walk, the Town Square and the facilities and amenities associated with it. The creation of a new Regional Aquatic & Leisure Centre will be a key destination within the precinct, as will the ecologically sustainable Collaborative Workplace Building.

An Integrated Centre

- The proposed transformation of the East Main Street Precinct is the key to the integration of the town centre. This precinct contains the Town Square and Greensborough Walk, which will create a focus for a broader network of pedestrian paths radiating across the GPAC. The design of the connection between the Town Square and Main Street will be of vital strategic importance in the activation of the space, as will the connection between the new Aquatic Centre and the Town Square.
- The Plan also aims to provide for a high quality pedestrian connectivity with the railway precinct and associated intermodal interchange.



Henry Street Precinct

The Henry Street Precinct describes a smaller area to the immediate south of Grimshaw Street, on the western side of the GPAC.

Vision

The Henry Street Precinct will provide an attractive entry to the centre and transition from the southern residential area to the commercial heart. Redevelopment of the car park will provide a well-designed mixed use development that manages its interface with residences to the south to minimise overlooking and overshadowing. The supermarket will continue to complement the range of convenience retail services in the centre.

Objectives

- To facilitate the redevelopment of the Council-owned Henry Street car park site as medium density mixed use development including residential development.
- To create new connections between the car park redevelopment site and Grimshaw Street to improve links to Main Street shopping strip.
- To encourage retention of rear access to shops located on Grimshaw Street.
- To improve the streetscape character through landscape upgrade works, including new street tree plantings, favouring native and indigenous species.

Built Form Character

The Henry Street Precinct is characterised by large potential development parcels with sensitive interface to residential properties to the south. New development is to be designed to protect the amenity of the adjoining residences with higher development stepped back from this sensitive interface. New development will be required to improve links through to the shops on Grimshaw Street and to consider the incorporation of verandahs into the frontages facing Grimshaw Street and Henry Street to provide protection from the weather and improve the comfort for pedestrians moving along the street.

Two gateway sites have been identified by the Structure Plan on the south east and south west corners of Grimshaw Street and Henry Street. The gateway site on the south east corner of Grimshaw Street and Henry Street will be built up to a certain level, while the gateway site located on the south west corner of Grimshaw Road and Henry Street could accommodate additional height stepped back from the adjoining streets. Both sites are at important strategic location at the entry to the activity centre. It is expected that new development at these gateway locations will be a significant landmark buildings featuring excellence in design.

Aspirations for the Henry Street Precinct

Sustainability

- The park and sports field will be retained and improved through the creation of better links to the rest of the GPAC.
- By encouraging less reliance on cars the urban design of the Henry Street Precinct will help contribute to a culture of walking in the GPAC. Passive and active recreational facilities will also be maintained, further contributing to the culture of the place.
- The Plan promotes sustainable levels of new mixed-use development in the precinct, and ongoing commercial investment.

Innovative Urban Design

- The Henry Street Precinct contains a mix of uses including a supermarket, a senior citizen's centre and a recreational park and oval. The urban design solution to the Henry Street Precinct will forge new pedestrian links between the precinct and Main Street, providing greater accessibility to the facilities in the Precinct.

Diversity

- The Precinct contains a park and active recreation space well suited to youth activities. The creation of low cost housing will help maintain a balance of social equity in the Precinct.
- The Greensborough Plan will focus on increasing higher density mixed-use development in the Henry Street Precinct, in particular on the Council owned Henry Street carpark site without compromising neighbouring residential areas. More direct pedestrian links between this new residential and mixed-use development and Main Street will be provided. Housing densities in general are to be increased over time, providing more opportunities for residents to live in walking distance from the town centre.

Ease of Movement and Connectivity

- Traffic in the Henry Street Precinct is generally of low volume, feeding the low-density housing in neighbourhood streets. Grimshaw Street is the exception to this, carrying higher volumes from the west in to the heart of Greensborough. Providing better pedestrian access across Grimshaw Street and to bus services will be a high priority of the Plan.

A Greener Greensborough

- New street tree plantings will create a 'green line', forming part of a continuous green edge that defines the GPAC. This line will establish a sense of boundary, defining an interior and exterior for the GPAC. As discussed above, the park and sporting ground will be retained and improved, continuing to provide excellent amenity for residents and visitors.

The Public Realm

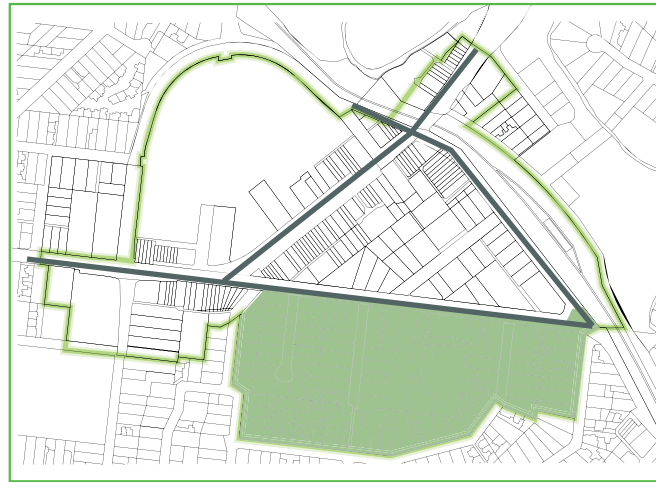
- The Park provides important civic amenity to the urban environment, and will be improved and maintained. Creating new pedestrian links through the precinct, particularly those connecting to parkland and the recreational facilities, will be a high priority.

An Integrated Centre

- Pedestrian paths linking the Precinct to Main Street will help integrate the precinct with the town centre. This will encourage people to walk into town, rather than use their cars.

Place Management and Governance

- An integrated approach to the development of the Henry Street Precinct will see increased utilisation of the improved park and sporting ground, and improvement of senior citizen's services.



Southern precinct

The Southern Precinct is primarily taken up with low density residential properties.

Vision

Over a number of years the larger blocks within the Southern Precinct will be redeveloped for medium density residential development to take advantage of the close access to the activity centre and public transport. Residential properties along Grimshaw Street will be encouraged to be consolidated and redeveloped as medium density mixed use developments with a medical centre focus providing better integration of car park areas and signage.

Objectives

- To encourage medium density housing forms that respect the interface with surrounding residential areas, and the interface with the activity centre.
- To improve pedestrian and bicycle connections with the pedestrian and cycling network around the activity centre.
- To provide safe and easy pedestrian access across Grimshaw Street.
- To ensure residential properties are designed to provide natural surveillance by addressing the street and overlooking public space.
- To encourage residential properties on Grimshaw Street to be consolidated and redeveloped for medium density mixed use development with a medical centre focus, particularly in the vicinity of the former Diamond Valley Hospital. Urban Design Guidelines to be developed by Council will guide the design outcomes including the interface with Grimshaw Street and adjoining residential properties and better integration of car parking and signage into the overall development.
- To improve the streetscape character through landscape upgrade works, including new street tree plantings, emphasizing native and indigenous species.

Built Form Character

The Southern Precinct is characterized by low density residential development. Housing densities are encouraged to increase over time, as part of the organic growth of the Town Centre. New development should provide articulated and activated frontages to streets and public spaces allowing for natural surveillance of streets and generally enlivening of the public realm.

Residential properties facing to Grimshaw Street will be encouraged to be consolidated and redeveloped for medium density mixed use development with a focus on medical uses. Council will be undertaking further strategic work to develop Urban Design Guidelines to provide direction on the interface with the East Main Street Precinct and adjoining residential properties, better integration of car parking and signage and connections to the rest of the activity centre.

Aspirations for the Southern Precinct

Sustainability

- By encouraging walking and less reliance on cars the design of the Southern Precinct will help contribute to a culture of health and wellbeing in the GPAC. The location of professional office suites relating to health and wellbeing services in the Precinct will also help contribute to this objective.
- The presence of professional suites will help contribute to the economic wellbeing of the Precinct. The Plan promotes sustainable levels of such development in the Precinct.

Innovative Urban Design

- The Southern Precinct is dominated by a mix of residential properties, primarily low density with a limited amount of medium density development, and the former Diamond Valley Hospital site. An increase in residential densities across the precinct will be implemented in the Plan.

Diversity

- The proximity of the Southern Precinct to the East Main Precinct will mean that spaces and facilities for youth are easily accessible. The inclusion of low cost housing will help maintain a balance of social equity in the Precinct.
- Higher density residential development will be introduced to the Southern Precinct, in accordance with Melbourne 2030 objectives. Higher density housing will be designed to be sensitive to the existing streetscape and character of the Southern Precinct.

Ease of Movement and Connectivity

- Traffic in the Southern Precinct is generally low volume on suburban streets, with the exception of Grimshaw Street, which forms the northern boundary to the Precinct. Sustainable traffic objectives will involve maintaining the low volumes on suburban streets whilst reducing the volume of traffic on Grimshaw Street, redirected around the GPAC via The Circuit.

A Greener Greensborough

- Revised street plantings in the public landscape of the Southern Precinct will help contribute to a greener Greensborough. This will be a part of broader revisions and improvements of the public landscape across the GPAC.

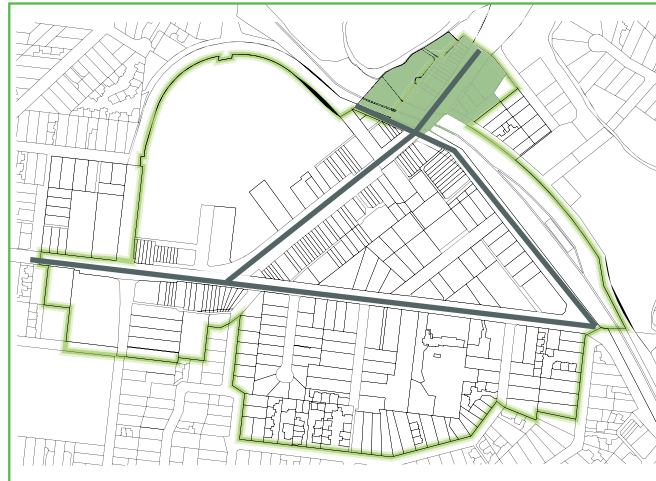
The Public Realm

- Public space in the Southern Precinct is limited generally to pedestrian paths and footpaths. Ensuring that these public spaces are maintained and safe at all hours is a high priority in the Plan.

An Integrated Centre

- Improved pedestrian pathways leading to and from the Southern Precinct will help integrate the Centre for pedestrians. Greensborough's new public urban spaces will be better linked to the Southern Precinct, which is the GPAC's primary existing residential quarter. Pedestrian links to the medical services hub, in particular, will be enhanced.





Diamond Creek Road Precinct

Diamond Creek Road is the eastern entry to the GPAC, sweeping down into the Plenty River Valley and up the hill where it effectively becomes Main Street.

Vision

The Diamond Creek Road precinct will have improved connections to Main Street, the railway station and the Plenty River Valley. New development will provide an attractive entry to the activity centre. New development will also complement the landscape character of the adjoining Plenty River Valley with greater emphasis on improving views of the development when view from within the Valley parkland. The mix of peripheral retail and commercial activity along Diamond Creek Road will be maintained.

Objectives

- To improve the pedestrian experience of the precinct through undertaking works to increase indigenous planting, provide shade and shelter, widening of footpaths, providing improved connections to adjoining open space areas and improved signage to help people get around.
- To encourage development to be sympathetic to the surrounding landscape of the Plenty River Valley.
- To encourage a range of commercial and mixed uses.

Built Form Character

Building heights within the Diamond Creek Road Precinct have been established to preserve a lower height at the frontage, with zero lot setback up to three levels forming a continuous frontage at street level. Beyond this higher building form is allowed, with setbacks preserving the appearance of the street and allowing the penetration of winter sunlight into the street, on the southern footpaths. All frontages must be activated and facing the street, with no 'blanked-out' facades at street level.

New development will be required to pay greater attention to the interface with the adjoining Plenty River Valley taking advantage of the views of the parkland and providing an attractive interface with the Valley parkland.

Aspirations for the Diamond Creek Road Precinct

Sustainability

- A programme of tree planting on Diamond Creek Road will help improve the environment of the precinct, as will the narrowing of the Road at key points to create a better pedestrian environment.
- Improving pedestrian links throughout the GPAC, including additional pedestrian crossings, will help improve the vitality of the town centre, contributing to the creation of a sustainable economic future.

Innovative Urban Design

- Diamond Creek Road traverses the Plenty River Valley, cutting an important route through the Valley and linking active and passive recreation facilities back to the town centre. The principal challenge for the Diamond Creek Road Precinct is to provide better pedestrian links along the Road despite the high traffic volumes experienced there.

Diversity

- Diamond Creek Road will be improved for pedestrians, encouraging more people to walk from the surrounding hill area to the east of the GPAC, into town. This will help contribute to the diversity of the experience of visiting Greensborough's PAC.

Ease of Movement and Connectivity

- Diamond Creek Road carries high traffic volumes, and is engineered to prioritise vehicles over pedestrians. Modification of the Road may see a reduction in lane numbers and a subsequent widening of the Road, combined with a programme of tree planting, creating a more pedestrian-friendly experience.
- Improving and emphasising the Diamond Creek Road Precinct's connection to the broader pedestrian network in the GPAC will encourage visitors and new residents in the precinct to walk rather than rely on their cars. Better pedestrian access to passive and active recreational space in the Plenty River Valley will also encourage a culture of health and wellbeing.
- The key to good place management and governance is an integrated approach to the issues that shape the urban environment. In this case traffic volume, and its impact on the urban environment, is of primary concern. Good management of the existing recreational resources is also a high priority, with higher levels of patronage likely to flow on from better pedestrian linkages.

A Greener Greensborough

- Maintaining the green nature of the Diamond Creek Road Precinct will be a high priority, including the introduction of more greenery in improved footpath and verge areas.

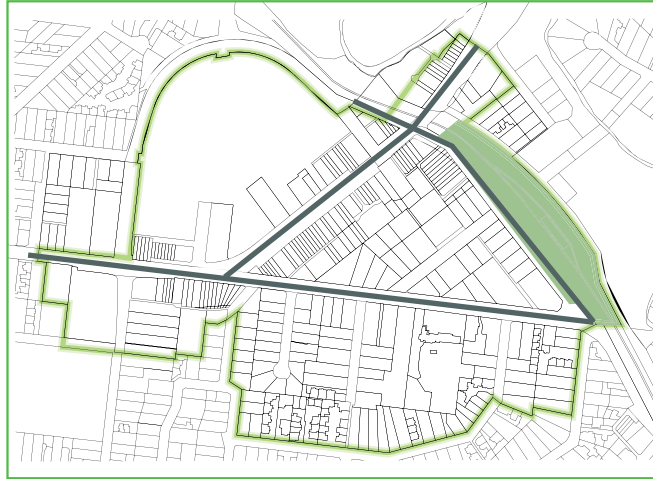
The Public Realm

- The promenade from the town centre to the Plenty River Valley will become an experience unique to Greensborough, an important urban experience that is a defining feature of the town centre. In this way the experience of traversing the Plenty River Valley takes on a civic function, part of the broader experience of visiting Greensborough, and not merely a matter of convenience.

An Integrated Centre

- The creation of a more pedestrian-friendly northern entry to the GPAC will help integrate the town centre with the surrounding urban environment, linking across the Plenty River Valley. Walking from the town centre to the sports field or the river recreational facilities will become a pleasurable and safe experience.





Railway Precinct

The Railway Precinct is located on the immediate east of the GPAC, adjacent to the EcoForest Precinct.

Vision

The railway precinct will be enhanced by the development of a Modal Interchange to provide improved access, transfer and amenity for users of rail and bus services. Opportunities for limited commercial uses associated with the interchange will be explored to widen the range of good and services available at this convenient location. Good urban design solutions will address the difficulties with the topography of the land providing improved access between the precinct and the rest of the activity centre. Underutilised surplus railway land will be redeveloped for higher density housing to take advantage of public transport services and the close proximity of the activity centre.

Objectives

- To encourage increased use of public transport services.
- To encourage the development of a Modal Interchange for rail and bus services.
- To improve connectivity between the station to the rest of the activity centre, particularly Main Street and the Plenty River Valley parkland.
- To improve the pedestrian access to the station, including for people with a disability.
- To improve the appearance and design of the station building and surrounds.
- To investigate development that maximises the operation of the station, while accessing views of the Plenty River Valley and surrounding hills, including opportunities for higher density residential development on land surplus to public transport requirements.

Built Form Character

New development within the precinct will include a modal interchange for rail and bus services. The modal interchange will provide improved access, transfer and amenity for users of public transport users within the activity centre. Good urban design solutions will address the difficulties with the topography of the land to improve access to the rest of the activity centre, particularly Main Street.

It is intended that further strategic work will be undertaken to identify sites within the precinct that are surplus to public transport needs that can be developed for higher density residential development. No height limits have been placed within the precinct but it would be expected that new development will be designed to take advantage of the views of the Plenty River Valley and provide an appropriate interface when viewed from the residential properties to the east of the railway.

Aspirations for the Railway Precinct

Sustainability

- Improving transport links and pedestrian access to the Station will help build and maintain a sustainable Greensborough, as part of the collection of activity centres linked by Melbourne's transport network.

Innovative Urban Design

- The Plan demands an innovative solution for the connection between the railway and the rest of the GPAC. This aspiration is made more difficult due to height of the escarpment.

Diversity

- The Plan aims to explore the options for residential development in the railway precinct, in particular, medium and higher density development.

Ease of Movement and Connectivity

- Improving intermodal connections, and the connection between the rail precinct and the central GPAC, will help contribute to the creation of a sustainable transport network. Managing the interface between pedestrian and vehicle flows will be a high priority.

A Greener Greensborough

- The Plan encourages revision of the landscape surrounding the Station, including the improvement of the soft landscaping. There is an opportunity to introduce new greenery on the embankment as well.

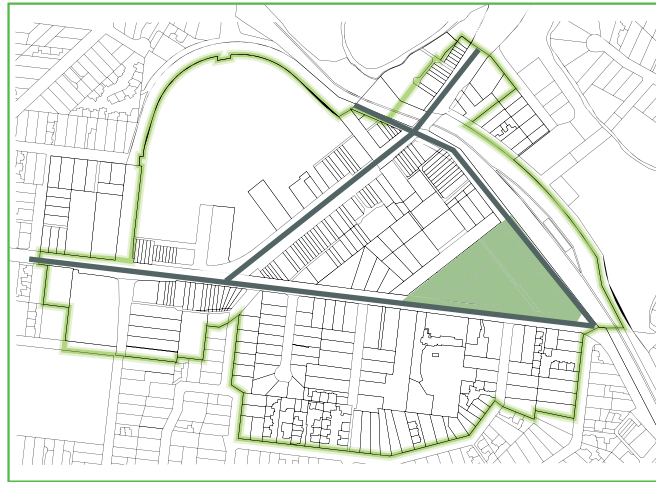
The Public Realm

- Improving the accessibility and design of the Station will contribute to the public realm of Greensborough, providing an attractive pedestrian link between the centre of the GPAC and the Station.

An Integrated Centre

- Any improvements to the Station precinct and surroundings will help contribute to the creation of a fully integrated centre, especially with intermodal links between rail and bus services.
- Modal interchange to provide connection between modes of transport.





Flintoff Street Precinct

The Flintoff Street Precinct is located on the eastern edge of the GPAC, adjacent to the East Main Street Precinct.

Existing conditions

The Flintoff Street precinct will be the focus of high density, well designed office development with some opportunities for incorporating residential uses. Development will be integrated with the key pedestrian routes and be designed to maximise views of the Plenty River Valley. The design of buildings and quality of landscaping will reflect the important commercial role of the precinct. Buildings will also be sensitively designed to ensure they do not create an imposing structure when viewed from the Valley.

Objectives

- To encourage development of high density commercial and residential buildings in the precinct.
- To provide improved connections to major pedestrian routes.
- To encourage development to take advantage of the views to and from sites within the precinct.

Built Form Character

The built form character of the Flintoff Street Precinct is designed to establish higher and lower levels of increased-density mixed use office and residential development, with height limited in relation to existing parcels of residential development. The higher development permitted within the adjoining East Main Street Precinct establishes a benchmark which allows for higher buildings along Flintoff Street. Para Road has also been identified as a frontage where higher development would be appropriate over time. New development should provide articulated and activated frontages to streets and public spaces allowing for natural surveillance of streets and generally enlivening of the public realm.

Aspirations for the Flintoff Street Precinct

Sustainability

- Sustainable levels of residential development in this precinct will help contribute a neighbourhood of a different character to the GPAC.
- New developments will be encouraged to have sustainable design features and systems.

Innovative Urban Design

- The integration of higher density development with the scale of existing residential dwellings will require innovative urban design solutions.
- Respecting existing streetscapes and interfaces will be a high priority, with buildings stepping up where they will have minimal amenity impacts.

Diversity

- The Plan aims to explore the options for mixed use development in the Flintoff Street precinct, in particular, medium and higher density residential development and professional businesses.

Ease of Movement and Conenctivity

- The creation of stronger links to the rail and bus services is a high priority of the plan, as is the management of the interface between pedestrian and vehicle flows is a high priority.

A Greener Greensborough

- The Flintoff Street Precinct will be subject to the creation of improved streetscapes with increased tree plantings in the public and the private realms.

The Public Realm

- The Public Realm will be characterised by improved pedestrian linkages, leading to a better integrated centre. Streetscapes will be improved to create more pedestrian-friendly experiences, especially along the boundaries of the subprecinct.

Key Urban Element: Greening Greensborough

The creation of a new public ground plane, extending out from the proposed Town Square will create a pedestrian haven in the new urban environment of Greensborough. This space will be comprised of connecting surfaces and greenery.

At a broader scale Greensborough will be transformed into a green urban oasis by the improvement of the public landscape, the introduction of new street tree plantings and appropriate high quality paving treatments. New development will contain green elements integrated with the architecture, in the form of terrace, balcony and roof gardens, and areas of vines covering building surfaces. Greensborough will become more 'green' through the implementation of passive and active sustainable systems in new development, exemplified by the Collaborative Workplace Building and the Regional Aquatic and Leisure Centre.



Main Street: A green haven

Key Urban Element: Pedestrian Network

The GPAC will be characterized as an environment where the pedestrian is given priority, where walking is given precedence over the use of vehicles. This will be achieved through the implementation of an improved network of public pedestrian paths, in both new and existing developments and neighbourhoods. It will also be implemented through upgraded landscape surfaces and design across the GPAC.

Links between the Greensborough Plaza shopping mall, Main Street and the new facilities clustered around the Town Square will be designed for accessibility, and for passive safety at all hours of the day and night. Links from the Railway Station to the new Town centre and Greensborough Walk will be equally accessible and legible in the urban environment.

It will also be characterised by pedestrian crossing across roads to provide links between the precincts and into surrounding residential areas.



The pedestrian is made the priority in the transformed greensborough

Key Urban Elements: Greensborough Walk & Town Square

The new Town Square and Greensborough Walk will be the new civic heart of the transformed Greensborough, an urbane public piazza suitable for casual meeting, promenading and public gatherings and events. The Town Square and Greensborough Walk is flanked by a mix of uses including retail, office space, medium or higher density residential and a new regional aquatic and leisure centre.

Civic and community functions

The Eastern Precinct is envisaged as the main civic focus for the township of Greensborough and within this precinct the primary outdoor civic space will be the Town Square and Greensborough Walk.

A commercial office building directly adjacent to the Town Square will provide Greensborough with modern, contemporary office space. The ground floor of this building is envisaged as an extension to the civic plane provided by the common. Tenancies at ground level may capitalise on the northerly aspect and the public outdoor space.

Recreational functions

The main urban design outcomes for the Town Square are the creation of an accessible, pedestrian friendly, activated space that is fully integrated with the major community aspects of Greensborough.

The Town Square will provide for a variety of recreational possibilities from more casual activities to weekend markets, outdoor cinema events, performances, local festivals and other diverse community events. The Town Square will also be directly linked to the Greensborough Aquatic Centre with the main Aquatic Hall conceptualised as an extension to the Common and the water spaces of the Aquatic Centre being extended into the Common.

Retail + Mixed Use functions

Lifestyle, health and wellbeing services and products will help reinforce the shopping experience offering a mix of retailing and commercial programs unique in Greensborough. Consistency with the thematic idea of Greensborough as a centre of health, fitness and wellbeing must be considered at all times.

Design for public safety

Safety and passive surveillance of the Town Square is important making the mix of retail, residential and commercial programming integral to creating a positive, well utilised space. Residential development adjacent to the Town Square is essential to the creation of a precinct that is 'alive' at all hours of the day. Leisure, recreational and entertainment oriented uses that extend the hours of activation of the Town Square are seen as imperative for good place making in this area. The provision of a safe, well lit series of spaces leading to the Town Square and the design and lighting levels of the square itself are primary considerations of any design.

Place Management

Place management of the Town Square will seek to generate positive economic, social, cultural and public space and amenity outcomes through the integrated design of the square and associated facilities. Integration with the broader public space network, design for public safety and design for vibrant activity will help ensure that Greensborough Walk truly functions as the heart of a renewed Greensborough.







Indicative Artist's impression of Main Street

Key Urban Element: Main Street

The renewal of Main Street in the Greensborough Principal Activity Centre must be structured in response to a range of factors. These key factors include improved pedestrian amenity, the calming of traffic movement, the integration of bus services with the pedestrian realm and the role of main street retail and non-retail uses, and the potential for increased residential presence in the heart of the GPAC.

Pedestrian Amenity & infrastructure amendments

Main Street is currently geared to the rapid movement of traffic, in particular the passage of buses. In the interests of creating a safer pedestrian environment the Street has been divided down the middle by a fence that effectively separates the north western and south eastern sides of the Street.

Bus use of Main Street will be integrated with the needs of pedestrians with the creation of bus drop off zones at each end of the street. Central to this will be bus patron's access to the plaza and rest of the centre. Traffic calming measures will free up Main Street to become more pedestrian-oriented, allowing people to safely cross the Street at more than one point. This strategy underpins the future renewal of life on the street.

Landscape upgrade

The existing landscape will be upgraded to reflect the renewed role of Main Street as a premier public and retail space. Creating a material and thematic consistency between Main Street and a broader network of pedestrian paths, both existing and new, will improve the quality and experience of the public realm in Greensborough, and form the basis of a newly walkable and accessible town centre.

Planting and vegetation will be an integral element contributing to the local ecosystem, as well as being attractive and appropriate, with the objective of improving the biodiversity of the GPAC, as well as delivering improved environmental amenity in the town centre. Native species and indigenous species will be a priority in the selection and detailed design process.

The Role of Main Street Retail and Non-Retail Uses

Retail premises on Main Street will be designed to create a unique and distinctive shopping experience, complementary and in contrast to that offered by Greensborough Plaza. Retail activity on Main Street should take advantage of the lifestyle benefits of shopping in the fresh air on a 'High Street', as part of the local neighbourhood, and distinct from shopping within a shopping mall.

Lifestyle, health and wellbeing services and products will help reinforce the Main Street shopping experience. The development of a variety of fresh food vendors, restaurants and cafés will also be encouraged on Main Street, taking the opportunity to contribute to making the neighbourhood distinctive and lively. Consistency with the thematic idea of Greensborough as a centre of health, fitness and wellbeing must be considered at all times.

Residential development opportunities

Consistent with the specific intentions of both the Local Structure Plan and broader Melbourne 2030 strategies, residential premises above shops and near to Main Street will be a primary consideration of any major development application. New residential development on Main Street will bring another dimension to the life of the town centre, bringing it alive at all hours and not just during trading times. An increase in housing densities will help make for a safer and more vibrant Main Street and GPAC in general.

The form that the housing ultimately takes will be dependent on a range of factors, but one relevant type that presents itself is 'shop-top' housing, suitable for smaller households or people who don't own a car. It is important that the qualities of the housing stock should reflect the special semi-rural character of Greensborough in terms of the amenity offered, the views possible and the appropriateness of the architectural language employed.

The Transport Plan

Greensborough is a suburb located 17 km north-east of Melbourne, situated on the Plenty River. It is an important centre in Melbourne's north east, servicing the Diamond Valley and Eltham regions and providing a gateway to these environmentally sensitive areas.

Greensborough's development to date has been fragmented. Change has been a reaction to a series of events, such as the development of the Greensborough Plaza, which have not provided an integrated approach to transport.

This section outlines the key transportation strategies to achieve better integration and functionality for the Centre. At a broad scale only, this report identifies existing problems and issues with high level strategies to address them.

The purpose of this plan is to:

- review current and future transport conditions.
- identify problems and issues.
- develop a broad set of principles which will form the basis of an integrated transport strategy.

Sections 1.1 and 1.2 outline the policy and strategy context and sections 1.3 to 1.6 discuss problems and issues, identifying options to address Greensborough's transport needs for each mode. Section 1.7 summarises the general principles to be used in developing an integrated transport strategy for Greensborough.

1.1 Policy Context

The Statewide and more localised planning principles for transport have been summarised in this section.

1.1.1 Melbourne 2030

Melbourne 2030 provides a strategy for growth and development across Victoria over a thirty year period. The emphasis of the plan is on sustainable growth. It is an initiative of Melbourne 2030 that an integrated transport plan be prepared for all new major residential, commercial and industrial developments, and develop guidelines for developers and councils that emphasise sustainable transport outcomes, including provision for:

- setting mode split targets
- managing access and egress
- defining parking requirements (including setting maximum rather than minimum provision)
- supporting public transport use
- encouraging access by cyclists and pedestrians

This document provides an overall strategy that will ultimately feed into the integrated transport strategy.

1.1.2 Liveability Statement

The Victorian State Government's transport liveability statement, entitled "Meeting our Transport Challenges", was released in May 2006. The statement proposes the following transport improvements:-

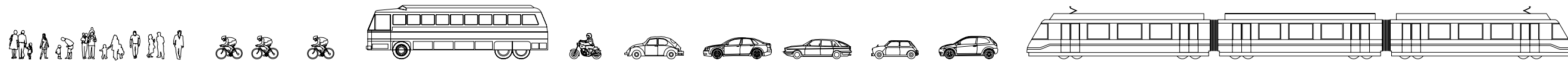
- Major new Smart Bus routes supported by improved local bus services to connect with the rail network and create a grid of radial, arterial and orbital routes within and between suburbs and across the city.
- Substantial boost in Melbourne's rail network, including improvements to peak period services, reduction in rail congestion and overcrowding.
- Major improvements to Melbourne's public transport services including new trains and trams, more services and a new high-tech train control centre.
- First class public transport for provincial Victoria.
- Upgrade to Victoria's arterial road network.
- Boost capacity and reduce congestion on the Monash-West Gate corridor.
- Addressing transport safety to make rail services safer and more secure.
- Public transport to be more accessible for people with restricted mobility and provide free travel on Sundays for Seniors.
- Financial reserve associated with meeting our transport to ensure future governments can continue to finance major transport infrastructure projects over the coming decade.

The statement expects a number of changes within the next 12 months including:-

- Increased services on trains and trams.
- New timetables to help synchronise trams, trains and buses and provide better connection across the city.
- Park and ride facilities expanded at a range of locations to provide easier access to the metropolitan rail network.

Initiative	Broad Strategy and Funding	Improvements associated with GPAC
Local projects	\$70 million over 10 years to extend the Principle Bicycle Network in metro Melbourne and regional Victoria	Proposed bicycle tracks includes considering routes along Grimshaw Street, Main Road, and Para Road subject to further investigation
	\$15 million over four years for Councils to develop and implement 'demonstration projects' that support sustainable transport options, such as walking paths and bike tracks to encourage greater use of public transport	No individual projects named however opportunity to explore the development of community transport strategies. Funding likely to be allocated via a Grant Funding application process
Promoting smarter, healthier travel choices	\$135 million to promote greater use of public transport and to encourage people to walk and cycle on shorter, local trips	Government to continue the TravelSmart program to offer sustainable transport information and support to Victorians. Over the next 4 years TravelSmart will encourage a substantial increase in public transport use and a reduced reliance on cars
Rail Infrastructure	\$2 billion for increasing rail line capacity including the duplication of track between Westgarth and Clifton Hill	Clifton Hill Loop Reversal and duplication of track between Westgarth and Clifton Hill (both projects to commence 2008-2011) may increase the potential for improved services on the Hurstbridge line
	\$800 million for new trains, throughout metro and regional Victoria	Commencing 2010-2011, new trains to meet the demand for additional trains created by improvements in track capacity. Expansion of the fleet to operate additional services to address overcrowding
	\$97 million to extend services during peak hours and provide an additional hour of service on Friday and Saturday nights	New 2007 timetable to be developed involving operational changes that will enable extra services to be added in peak periods. Potential for extra services on the Clifton Hill corridor. Two additional services on the Hurstbridge rail line on weekend nights, resulting in last trains leaving the city between 1am and 1.25am, with trains running with passengers until 2.15am
	\$126 million to upgrade transport interchanges. This funding will be provided to projects that have been identified by local government and which are supported by local strategic planning. Particular focus to be given to areas which will be newly serviced by the SmartBus program	Potential for funds to be allocated to the Greensborough Modal Interchange and Green and yellow Orbital SmartBus servicing the GPAC
	\$90 million to 5000 park and ride spaces over 10 years, with funding to commence in the next 6 months	Locations for park and ride facilities are not yet confirmed. Watsonia Rail Station could be included as a priority park and ride location, which could assist in managing GPAC commuter parking demands
	Premium station upgrades proposed to commence in 2006-2007, including Greensborough Rail Station. Investigate whether park and ride facility at Watsonia Rail Station should also include consideration of a premium station upgrade	Improved parking and facilities at Watsonia could support operations at Greensborough and provide more space for a modal interchange
	\$250 million improvements to access paths, ramps, surface, handrails and grabrails, stairs and tactile ground surface indicators for rail, tram and bus safety upgrades	Potential support for Greensborough Rail Station Improvements
Bus	\$660 million over 10 years to support the development of cross-town SmartBus routes, including the Red orbital Route to Heidelberg to commence in 6 months	The SmartBus expansion aims to reduce congestion and meet the changing needs and requirements of suburban commuters, students and shoppers. The Green and yellow Orbital Route serves the GPAC, the most appropriate route to the Greensborough rail station needs to be determined
	\$650 million over 4 years to introduce new bus routes and extend operating hours and introduce more frequent bus services on 250 existing bus routes	Potential for service upgrades and higher frequencies on selected routes to be investigated for GPAC
	Bus priority at traffic lights	Potential to be investigated for GPAC

Meeting our Transport Challenges, Connecting Victorian Communities - funding relevant to the development of the GPAC (information provided by Banyule for Banyule, and summarised relevant for GPAC)



1.1.3 Local Structure Plan

The Transport Plan has been developed to complement the overall Greensborough Plan, which is outlined in this document.

Ensuring superior urban design outcomes

The principle is to create a vibrant, attractive, functional and safe environment for users of the Centre.

Maximising economic prosperity

The principle that the GPAC enhances its role as the primary community centre in the north-east metropolitan region, that has an enhanced sense of place, and provides for the economic well-being of its residents, and the residents of the region.

Promoting a sustainable traffic and transport network

The principle is that new development must demonstrate how it will consolidate parking and provide mobility and transit options for all users of the Centre. This principle will be implemented by developing an integrated transport plan, a car parking strategy and multi-modal interchange.

Maximising mobility and access for all

The principle will be implemented by optimising connectivity of the street system, using contemporary urban design techniques to create a people scaled public domain, improving access for pedestrians to and within the Centre, making the streetscape more pedestrian friendly, lighting pedestrian paths and providing easy-to-read directional signage for pedestrians and motorists.

Providing new residential opportunities

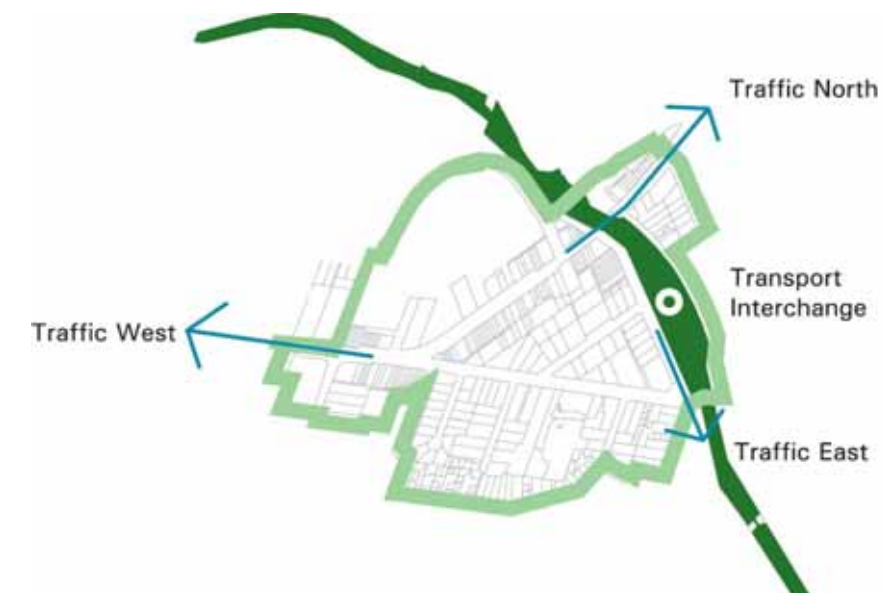
This aspect of the Structure Plan promotes higher density residential development in and around the Greensborough Town Centre.

A number of studies have been commissioned by Council over the last five years with an aim to improve the general environment in Greensborough and the City of Banyule. These previous reports have been reviewed as part of the preparation of this report. The key findings from the studies have been highlighted in the following section.

The Structure Plan recommends a new integrated approach that incorporates a walkable centre, high-level traffic management, parking and public transport strategies conducive to the newly released "Meeting Our Transport Challenges" statement and good long-term urban design outcomes, which will support sustainable redevelopment in the town centre. Specifically, it applies a different emphasis and approach to movement systems that might be simply represented by the following hierarchy:

- Walking
- Cycling
- Public transport
- Service vehicles
- Private vehicle

Above all else, the structure plan is organised around an integrated approach to these systems which provides fresh emphasis on achieving good urban outcomes conducive to the development of a lively, mixed-use urban centre.



1.2 Strategy Context

The Meeting Our Transport Challenges statement discusses a number of proposed actions relevant to the Greensborough Centre, which will help deliver lasting economic, social and environmental benefits. Initiatives proposed by the State Government are highlighted below:-

- A world class lifestyle – transport links contribute greatly to liveability and will play an important role in creating a world class lifestyle for all Victorians. Improved liveability is proposed through better planning, major improvements to public transport services and promoting more sustainable travel choices.
- Accessible, connected communities – improved transport between communities will facilitate access to jobs and services, family and friends. It is proposed to better connect communities by providing new public transport services in growing suburbs and creating better cross-town connections in Melbourne.
- Safe and secure transport – a safe, reliable transport system that people have confidence in using is vital to Victoria's future economic prosperity and liveability – it is proposed to continue to place high priority on transport safety by investing in safety assets across the transport network and focusing strongly on road safety.
- Cutting congestion – congestion must be managed to reduce its economic, social and environmental impacts. The government is introducing a range of measures to manage congestion, including making public transport a more attractive and viable travel option, and encouraging people to make more sustainable travel choices.
- Planning for the future – essential to leaving future generations of Victorians with the flexibility to respond to the economic, social and environmental challenges that they will face. It is proposed to plan carefully for the future by finding better ways to integrate urban, land-use and transport planning over the next 25 years.

Infrastructure investments proposed within the Meeting Our Transport Challenges statement for middle and outer metropolitan suburbs, including Greensborough, include SmartBus, Local Bus Service Improvements, Improvements to Modal Interchanges and more Park & Ride Facilities, Bicycle and Pedestrian Network Improvements and Rail Network Capacity Upgrades.

1.2.1 City of Banyule Road Safety Strategy

Council prepared the road safety strategy for implementation between July 2000 to June 2003 with the aim of improving the safety for all people who travel on roads and paths within the City of Banyule.

The key aims of the strategy were:

- Provide strong direction, leadership, co-ordination and service in road safety, for the benefit of all residents and visitors to the City of Banyule.
- Schools to take a lead role in road safety; students to travel to and from school safely; and well targeted traffic safety education implemented throughout each student's primary and secondary schooling.
- Implement traffic management actions to create safer roads and neighbourhoods in Banyule.
- The safe restraint of young children in vehicles, appropriate supervision of and safe behaviour by young children when they are walking, cycling or playing.
- Improve pedestrian safety and accessibility, and actively encourage walking as an alternative to car travel for short trips in Banyule.
- Improve bicycle safety and accessibility and encourage cycling as an alternative to car travel.
- Encourage safer driving practices through a range of co-ordinated activities and actions.
- Help people who are older or who have disabilities to travel safely and independently using the road and path network.

1.2.2 Greensborough Shopping Centre (Activity Centre)

Streetscape Masterplan

This study highlighted the basic theme that Greensborough has tried to adopt to date, acknowledging four major attributes:

- The Plenty River
- Endangered flora and fauna
- Exceptionally high level of Disability Impaired Users
- Past history of Aboriginal inhabitants

Whilst this general theme of planning was approved, the following recommendations were made for future development:

- Provide strong access linkages between the shopping centre and railway station.
- Improve the lighting of public laneways.
- Establish development guidelines to better integrate the public car parks to the rear of the shops.

The report was adopted by Banyule City Council in May 2000.

1.2.3 Access Audits Australia

An access appraisal was undertaken in August 1999 within the shopping precinct including Main and Grimshaw Streets in Greensborough. The audit did not include the interior of the Greensborough Plaza.

The aim of the report was to highlight to Council the issues that may restrict access to the commercial centre by certain users including:

- Path gradients and cross slope should be kept to a minimum with gradual transition where necessary.
- A lack of continuous accessible path of travel (a continuous step free route linking key areas that can be safely negotiated by people with disabilities). The edge of this path of travel should be clearly defined, with contrasting material if appropriate.
- Irregularities in pavement surface can pose a serious hazard to a mobility impaired user.
- The definition of appropriate areas for pavement activity (trading/ table and chairs) helps to keep a clear line of travel.

Key recommendations of the report included:

- Provide a consistent pavement where possible and establish a regular pavement inspection/ maintenance programme.
- Provide contrasting paving/ tactile surface where pedestrian/ vehicle conflict exists.
- Establish defined outdoor trading areas.
- Council ensures appropriate access is provided for people with disabilities at bus stops, the railway station and between these transport points and the GPAC.

1.2.4 Greensborough Shopping Centre (Activity Centre)

Car Parking Management Plan

This parking study was undertaken by Council in late 1999 to review car parking to ensure the most appropriate management exists. The study included parking surveys over three days in August. Findings of the study suggest the following:

- parking demand/ supply has not altered significantly since the previous December 1997 study.
- At the time of the surveys, the Activity Centre had approximately 6,200 parking spaces available to employees and the public.
- the largest car park for retail usage is in the Plaza, which was recorded as having a peak demand of 4.2 spaces per 100 sqm.
- overall the total study area parking demand (which includes commuter parking) was 5 spaces per 100 sqm.

The study and its findings are still considered current by Council.

1.2.5 Greensborough District Centre Travel Survey

This study was undertaken in June 1996 to develop a better understanding of Greensborough Centre visitor's behaviour and attitudes. Surveys were undertaken in eighteen locations across the Centre.

Findings of this earlier study suggest the following:

- 50% of respondents stated their main reason for visiting the centre was shopping.
- the average time for the majority of visitors to spend in the Centre was two and a half hours.
- 43% of respondents accessed the Centre by private car, 15% were car passengers, 21% were bus passengers, train passengers and walking.
- the need for a centralised transport interchange for both bus and train passengers was highlighted as a future improvement.
- car parking was the main dislike of respondents, particularly the access and egress from the Plaza car park.
- traffic issues in Main Street were highlighted as an issue by respondents, in particular the conflict between pedestrians and vehicles.



1.2.6 Banyule Integrated Transport Study

This document was prepared in 2003 and sets out a vision for transport across the City for 2003-2013.

The overall objectives of the Banyule Integrated Transport Strategy were to provide:

- Reduced environmental impacts from travel in the municipality, particularly from road-based transport.
- A safe and efficient road network throughout the City that addresses the needs of residents in terms of access and amenity, while allowing for the effective flow of traffic through the municipality.
- A comprehensive, safe, efficient and well patronised public transport service.
- A safe network of bicycle routes, which encourage cycling as an alternative to other forms of road transport and as a recreational pursuit.
- Safe and efficient pedestrian access through the City, including recreational walking trails.
- Appropriate location of land uses which can be accessed by sustainable transport alternatives to the private vehicle.

In relation to roads and traffic management, Council aims to:

- Provide for safe and efficient road traffic movements through the City, and to and from other municipalities.
- Provide a safe and efficient road network throughout the City that addresses the needs of residents in terms of access and amenity while allowing for the effective flow of traffic throughout the municipality.
- Provide an efficient freight network through the municipality within a metropolitan context, whilst protecting the amenity of the City.
- Improve road safety in Banyule.
- Reduce the use of local streets by through traffic and reduce traffic speed, to improve safety in local streets and to improve the amenity of residential areas abutting local streets.

The key public transport aims as defined in the strategy are to:

- Ensure public transport services meet the demands of all users for peak, off-peak, commuter and other travel, and are flexible, coordinated and convenient.
- Maximise the use of the existing public transport system.
- Improve coordination and cooperation between different public transport modes.
- Provide mobility options for all residents, particularly those who do not have access to a car, and are isolated from the bus and rail services.

The key cycling objectives of the strategy are to:

- Review and implementation of Municipal Bicycle Strategic Statement.
- Promotion and encouragement of the availability and benefits of a well-defined bicycle infrastructure network.
- Resolution and implementation of the Principal Bicycle Network.
- Provision of safe and continuous north-south and east-west commuter bicycle routes.

The pedestrian objectives of the strategy are:

- Provision of safe and equitable pedestrian access within activity centres and to community facilities and generally throughout the municipality.
- Improvement of access and permeability for people with disabilities.
- Provision of recreational pathways.
- Promotion of walking and pedestrian safety issues.

The key car parking issues in Banyule were summarised as:

- The provision and management of safe and adequate 'on' and 'off' street parking within the municipality.
- The relationship between car parking and urban development.
- Parking at the residential interface.
- Trader parking at shopping centres.
- Commuter parking at railway stations and modal interchanges.
- Parking provision for people with disabilities.

The main land use and transport issues were highlighted as:

- The influence of land use planning on travel demand, travel patterns and the mode of transport.
- The existing urban form and structure in Banyule supports car dependence.
- Existing State and Banyule policies support higher densities of development in close proximity to public transport routes and integrated transport nodes.

1.2.7 Greensborough Transport Modal Interchange Study

Undertaken in 1999, this study undertook feasibility and concept work on a modal interchange in Greensborough.

Based on discussions with stakeholders, the following criteria was considered necessary to meet the future needs of the interchange:

- 10 – 12 sawtooth bus bays
- 7.0 metre wide minimum bus bay plus aisle
- 16 metre bus bays
- 5.0 metre wide bus traffic lanes
- metre wide minimum pedestrian aisles
- 3 space taxi storage rank
- 3 space 'Kiss N Ride' zone for private vehicle drop off in Para Road
- 3 Disabled Parking spaces
- Direct pedestrian access
- Elimination of private vehicle movements through the bus interchange area

Four options were prepared for the interchange facility. None of these initiatives has been implemented.

'Meeting Our Transport Challenges' refers to a number of infrastructure investments for middle and outer metropolitan suburbs including GPAC, such as:

- Improvements to Modal Interchanges and more Park and Ride Facilities
- Bicycle and Pedestrian Network Improvements
- Tram and Bus Priority Upgrades
- Local Bus Service Improvements
- SmartBus

1.3 Pedestrians

The majority of people who visit the GPAC walk for at least part of their trip, whether it is to or from a bus or train, from a car park to an office, or for the duration of the entire trip. A key focus of the transport plan is to give priority to pedestrians and to promote the walkability of the town centre.

A study undertaken by Rodney Tolley of the Centre, titled *Improving Walkability and Wayfinding (2005)*, refers to five characteristics that are internationally accepted as focal points of pedestrian planning, summarised below:

- connected – it must be easy for people to walk from place to place without meeting dead ends or impossible/ dangerous road crossings.
- convenient – routes should be as direct as possible without unnecessary detours and stops. Pedestrian facilities and the places people want to reach on foot need to be clearly identifiable and well signposted.
- comfortable – footpaths need to be well maintained and wide enough for the use they get. They also need to be well lit and provide protection from the weather.
- convivial – pedestrian routes need to be friendly, attractive and interesting.
- consciousness – an awareness of pedestrians as users of the street needs to be promoted, and concern for their well-being and safety fostered amongst other road users.

All development and planning decisions within the GPAC should aim to follow these five guidelines when considering issues for pedestrians. Furthermore, ease of access for people with disabilities will be promoted in GPAC by ensuring that the transition between footpaths and roads is both easy and safe.

1.3.1 Pedestrian Connectivity

As recommended in the Rodney Tolley 'Improving Walkability and Wayfinding' study, improved pedestrian integration is central in the vision for Greensborough. The town centre will be re-developed with a pedestrian oriented focus, improving orientation by providing a safe and visually attractive pedestrian environment within the GPAC.

Improved connectivity within the GPAC will be complemented by enhanced linkages to the surrounding areas, in particular to the proposed transport interchange. At the present time pedestrian connectivity across the GPAC is poor and is not helped by the undulating terrain. The terrain factor, combined with the fragmented nature of the development means pedestrian integration across the Centre is limited at the present time. This section focuses on the existing pedestrian connectivity issues, highlighting the problems and potential strategies for improved integration.

Main Street is at the heart of the commercial centre within the GPAC and it is fronted by commercial premises along its length. However the existing focus on Main Street is given to vehicular movements, with sub-standard pedestrian facilities. There is currently a fence which runs along the median of Main Street, which was constructed in an attempt to improve safety along the street because people, in particular students, ran across the street to catch buses. However the fence forms a physical barrier for pedestrians, currently restricting the free flow of movement between the eastern and western precincts.

Both the bus lane, which runs down the middle of the road and the angle parking on the east side of the street act as additional pedestrian safety hazards. In particular the current parking arrangements are not desirable as angle parking poses a greater risk to pedestrians than parallel parking.

Pedestrian connectivity into the GPAC from the surrounding area is somewhat restricted and the undulating terrain makes access difficult for the mobility impaired members of the community. In particular connectivity between the railway station and the town centre is poor. This adds to the perception of the station being remote from the town centre.

There are currently no controlled crossing points over Grimshaw Street between the East Main Street precinct and the former hospital and residential areas to the south of this, providing opportunities for significant pedestrian improvements as attention is focused on the needs of the pedestrian. Similarly there are no mid-block connections across Flintoff Street.



1.3.2 Pedestrian Desire Line & Crossings

Pedestrians require clear, open and attractive zones within the precinct with a network of routes linking them and the perimeter of the precinct. Any future works within the GPAC should aim to develop highly integrated pedestrian networks between and throughout the different precincts, with a focus on access to residential areas, public transport nodes and the streets. These are indicated in Figure 1.

The following initiatives are recommended to improve pedestrian facilities:

- Focus the lifestyle economy along Main Street, develop a sense of lifestyle by widening the existing footpath on Main Street, where appropriate, to allow pedestrians to move around freely.
- Better integrate the buses into Main Street to improve the pedestrian environment and open up the street.
- Create an identifiable pedestrian-oriented urban space, the 'creative common' as a focal point for pedestrian activity.
- Provide continuity of weather protection.
- Ensure new car parking facilities provide appropriate provision for pedestrian, bicycle and vehicular access.
- The provision of adequate crossing facilities, both at intersections and mid-block, in particular along Main Street, Para Road, Grimshaw Street, Flintoff Street and the Circuit.
- The implementation of additional controlled crossings along Main Street south of Diamond Creek Road.
- Ensure provision of suitable pram crossings in Main Street to maximise pedestrian movements.
- Improve linkages from the Centre to surrounding reserves and parks, such as a pedestrian link across The Circuit between McDonalds Restaurant and Whatmough Park.
- Improve signage and way finding.
- Provide active street frontages the abutting primary pedestrian paths.

1.3.3 Universal Access Requirements

In order for people with disabilities to have the same opportunities as others to participate in community life it is important that the services and facilities provided to the community address the access requirements of people with disabilities. The Disability Services Commission promotes community access through education, information, publications and support. The GPAC will embrace these principles and promote access for all across the precinct.

1.4 Bicycles

Melbourne 2030 recognises the importance of providing safe, attractive and continuous bicycle routes and facilities, on and off-road as an integral part of new and existing urban development. The vision for Greensborough builds on the Melbourne 2030 values and seeks to promote the use of bicycles as an alternative to the car and ensure links to the surrounding bicycle network, such as the Plenty Valley and Yarra Trails. This is a sustainable mode of transport that additionally aids health and wellbeing.

There are differing needs between commuter and recreational cyclists and facilities for both types of cyclists should be catered for in future planning. Commuter cyclists want to travel to the same places that car drivers do. The principle bicycle network is shown in Figure 2. As stated in Melbourne 2030, this will be completed and will form the core of the cycling facilities in the GPAC. It is recommended these are complemented by the additional routes, as indicated in Figure 2. All new detailed road and pavement design should assume dedicated cycle provision on either shared footpaths or road pavements.

Highly visible and secure bicycle nodes should be provided at the major urban spaces located around the town centre and at major community and commercial facilities included in the development. Bicycle parking should be complemented by end of trip facilities such as showers and lockers at all commercial premises. The landscape of Greensborough and its hinterland is very attractive to recreational cyclists and provides an opportunity for the area to be promoted as a cyclists' centre for northern Melbourne. This promotion will aim to attract cycling teams and clubs on weekend recreational rides, and support Greensborough's growing reputation as an urban centre.

1.5 Public Transport

Meeting our Transport Challenges represents the biggest single investment in the transport system undertaken by a Victorian Government. Over the next 10 years the Government will inject an unprecedented \$10.5 billion into the state's transport network – delivering a wave of new projects to ensure that Victoria remains one of the most liveable places in the world.

Melbourne 2030 set a target of increasing public transport usage to 20% by 2030. This target will be achieved through a combination of improvement measures such as reliability, ease of use and amenity. The middle and outer metropolitan areas are the key focus for the improved services, and Greensborough falls into this category.

The fundamental accessibility principle for the GPAC is the promotion of sustainable transport. Within this context, this section discusses the opportunities to improve public transport access and reduce the reliance on the private car.

Public transport includes trains, buses, trams, taxis, community transport and the infrastructure associated with these modes. The overriding public transport objective is to increase patronage, and reduce traffic congestion, thereby reducing the road infrastructure requirements and improving the viability of public transport services. More widely, encouraging the use of public transport contributes to limiting greenhouse gas emissions. In line with Banyule City Council's transport strategy, the following public transport objectives are at the forefront of the GPAC's transport plan:

- maximise the use of the existing public transport system.
- improve co-ordination and co-operation between different public transport modes.
- provide mobility options for all residents, particularly those who do not have access to a car, and are isolated from the bus and rail services.

One of the central aims of re-development within Greensborough is to co-locate the train and bus stations in order to make access more attractive and convenient, thereby encouraging the use of public transport. The overall strategy for public transport is shown in Figure 3.

1.5.1 Rail

The GPAC is currently relatively well served by public transport. Connex operates train services along the Hurstbridge line running Melbourne bound trains every 10 minutes during the peak and every 20 minutes through the day. The services currently suffer relatively poor time keeping, however, even without major infrastructure upgrades outside those mentioned in 'Meeting Our Transport Challenges', there is significant scope for improvement. The single track section between Greensborough and Hurstbridge is one of the contributing factors to the poor time keeping of services since it limits the opportunity to make up any lost time when delays are incurred.

Greensborough railway station is currently located on the fringe of the Activity Centre with undesirable access to the Centre due to steep gradients and undulating topography. There is currently a poorly defined pathway between the centre and the railway station which offers no protection from the weather. The perceived remoteness of the station from the Centre discourages access including the elderly and mobility impaired.

In addition, in order to access the station, pedestrians need to cross Para Road. This is a busy road and adds to the perceived remoteness of the station by acting as a barrier to it. Whilst there are traffic signals and a pedestrian crossing at Para Road/Flintoff Street, many people currently cross in uncontrolled mid-block locations which presents a safety concern.

1.5.2 Bus Services & Facilities

The SmartBus is a fast bus service offering more frequent services and longer operating hours to Melbourne's middle and outer suburbs. SmartBus Green and Yellow Orbital Routes will service GPAC. The benefits of SmartBus include:

- A better quality service
- A more accessible service
- A more sustainable service

GPAC is also well served by bus routes providing access to the local residential areas and wider connections to destinations throughout north and east Melbourne. Regular (every 30 minutes) connections are provided to Box Hill, Glenroy, Eltham, Broadmeadows, St Helena, and Northland.

The majority of bus services currently operate on a one way loop around Greensborough via Main Street, Grimshaw Street and Para Road. A number of services which interchange at Greensborough do so in Main Street creating significant conflict with the pedestrian activity across the street, and other road users including parking and loading activities. Only one route terminates in Main Street and it has its own bus stop and therefore doesn't clog up the main bus stop. At the other key stop alone, buses terminate at the station. There are actually three 'timing' or 'hold' points for buses around Greensborough on Street but not at the Main Street stop.

At present some of the buses stop along Para Road, near the railway station. However the integration between the two modes is limited, as are the passenger facilities at the bus stop. Improved connectivity between the two modes would significantly benefit passengers.

1.5.3 Interchange Facilities

Various proposals have been prepared for the development of a bus-rail interchange facilities at Greensborough. The most recent of these was a report prepared in 2000 by McGauran Soon, Ove Arup and Rider Hunt, titled Greensborough Transport Modal Interchange. This report proposed the construction of a new deck between the existing railway station and the north-east edge of Para Road, providing an area for buses to manoeuvre and drop-off/pick-up passengers. Plans prepared for this option indicated the existing Flintoff Street/ Para Road intersection was the most appropriate location to provide access to the new facility. This scheme was foremost about creating functional resolution of the modal interchange and its integration with the Railway Station and Activity Centre infrastructure, and provide a new gateway to the station precinct.

The development of the modal interchange should explore the capacity to maximise the number of layovers occurring outside the GPAC. This will ensure that the interchange effectively utilises available land resources to maximise the frequency and connectivity of bus and rail services rather than using valuable land space to encourage stop overs to occur longer than what is required.

Locating bus layovers outside the GPAC will eliminate the inefficient use of valuable land space. This approach for the GPAC is based upon the Christchurch Modal Interchange, which is understood to be operating successfully and efficiently.



1.5.4 Other Modes

There are currently limited taxi rank facilities within the GPAC. At present there is a rank along Main Street. The provision of an additional taxi rank in close proximity to the station is suggested.

In summary, the key principles of the Urban Design Framework, which seek to promote the use of sustainable modes of transport, including public transport are as follows:

- Provide an integrated transport network via transport interchange facilities.
- Promote the 'walkability' of the town centre, by giving priority to pedestrians.
- Ensure accessibility for all.

The following is a series of options to be considered with the aim of improving the public transport facilities within Greensborough, thereby increasing its usage and promoting sustainable transport.

- Provide a high quality transport interchange facility on a deck across the existing rail tracks/ station.
- Activate the station platform/ concourse by including land uses which will provide 24 x 7 activity and so ensure passive surveillance/security.
- Provide improved connectivity between the station and the Centre by the provision of direct pedestrian access to both Main Street and the town square.
- Ensure accessibility to the station conforms to DDA requirements.
- Upgrade existing bus stop infrastructure in accordance with the appropriate design guidance.
- Provide bus stops at appropriate intervals throughout the GPAC.

An initial consideration to recommend relocating the existing railway station platforms to the north west to allow improved accessibility to Main Street concluded this would be problematic. The existing track curves, leading from the station to the north west, which restricts the location of the platform as curvilinear platforms are a passenger safety hazard due to restricted driver visibility at the rear of trains. Improved pedestrian access to the station is a less costly solution than relocating the platforms to the north west.

1.6 Traffic

1.6.1 Road Hierarchy

In the early 1990's the Greensborough Bypass and Metropolitan Ring Road were constructed and have contributed to alleviating some through traffic from the centre of Greensborough. More recently construction works have commenced to duplicate the Greensborough Bypass, over the Plenty River, which will provide additional capacity for through traffic. However Greensborough not only provides an important gateway to the north-eastern region but is a destination in its own right and as such will continue to experience relatively high traffic volumes with a proportion of these being through-trips.

Over the years Council have created a circulatory-perimeter road network to address the through and local traffic issues and in particular to reduce traffic through the centre of Greensborough.

To the west and north the perimeter road network consists of primary arterial roads, Grimshaw Street, west of The Circuit, The Circuit including Hailes Street East and Main Street north of Hailes Street East.

While to the east and south the perimeter road network includes secondary arterial and local roads such as Grimshaw Street east of The Circuit, Para Road and Flintoff Street.

The intersections of Grimshaw Street with Flintoff Street and Para Road have been configured to effectively create a one way system for through traffic, with west bound traffic utilising Grimshaw Street between Para Road and Flintoff Street and east bound traffic utilising Flintoff Street to access Para Road.

The redistribution of traffic to the perimeter road network enabled Main Street to be downgraded, with the available road space allocated to buses and parking.

Configurations of these key roads within the centre of Greensborough are as follows:

- Main Street north of The Circuit varies in width with a minimum four lane divided configuration that provides access to the Diamond Valley and Hurstbridge areas.
- Grimshaw Street generally has a four lane cross section with localised widening at signalised intersections to provide turning lanes. Grimshaw Street links Para Road to Plenty Road Bundoora and provides access to the Greensborough bypass – Heidelberg and the northern and western suburbs.
- Para Road varies in width from four lanes to two lanes and provides access to Eltham and Lower Plenty areas. Para Road frequently becomes congested in the peak periods particularly around the light industrial area between Sherbourne Road and the Plenty River Bridge.
- The Circuit is a four lane divided road linking Main Street to Grimshaw Street on the perimeter of the GPAC.
- Main Street is a two way street with a dedicated bus lane running through the centre in a south westerly direction.

1.6.2 Through Traffic

Through traffic is defined as traffic that either originates from or is destined to areas outside the GPAC, but travels through the GPAC without stopping.

Despite reductions over the past ten years, the GPAC still experiences significant through traffic. The Greensborough by-pass does provide for longer distance travel, however current capacity constraints limit this function. As mentioned previously the current works to upgrade the Greensborough by-pass will enhance its ability to cater for through traffic, however access to neighbouring suburbs such as Watsonia, Montmorency, St Helena and Eltham will continue to generate significant movement through the GPAC.

Within the GPAC the following roads perform significant through traffic functions:

- Grimshaw Street
- The Circuit
- Para Road
- Main Street north of Hailes Street East

In the east-west direction there are two alternative routes for through traffic:

- Grimshaw Street, Flintoff Street, Para Road
- The Circuit, Para Road

From the west to the north the alternative routes are:

- Grimshaw Street, Main Street
- The Circuit

There is opportunity to improve the legibility of the road network through the establishment of a more detailed road hierarchy that defines street function and the implementation of street design/ traffic management and signage to reinforce that function.

To improve the operation of the road network it is proposed to:

- Create a right turn lane on the north approach of the intersection of Flintoff Street and Para Road and lengthen the left turn lane from Flintoff Street to Para Road.
- Modify the intersection of The Circuit / Para Road / Main Street to create an additional right turn lane on the south approach of Para Road.
- Increase the capacity of The Circuit / Grimshaw Street / Henry Street intersection by widening Henry Street to provide a four lane cross-section, lengthening the right turn lane from Grimshaw Street to The Circuit and widening the northern leg of The Circuit to provide an additional left and through traffic lane.
- Signalisation of the intersection of Grimshaw Street and Para Road providing fully directional movements.



1.6.3 Access Requirements

A strategy needs to be established to provide good access to all precincts within the GPAC.

The strategy should include:

- The identification of parking requirements.
- Investigation of real time advisory signage for parking availability at major car parks.
- Identification for required capacity on major access roads – The Circuit, Para Road, Grimshaw and Flintoff Streets.
- Appropriate street design to balance the needs for pedestrians and traffic.
- Access requirements to service the commercial premises within the GPAC.

1.6.4 Main Street

As its name implies, Main Street was historically the primary commercial road in Greensborough. Its diagonal alignment is determined by the location of the railway overpass road bridge. In the 1970s, as part of the development of Greensborough Plaza Shopping Centre, The Circuit was constructed around the northern edge of the commercial area, providing an alternative route for through-traffic and a high capacity access route for the Greensborough Plaza's multi-storey car park.

As a result Main Street had its vehicular traffic role scaled back, so it now provides only:

- bus stops and taxi ranks.
- angle parking along the shops on the south-east side.
- a limited role in local car and truck traffic circulation.

The traffic works associated with this have resulted in a relatively complex arrangement at the Main Street/ Para Road/ Hailes Street intersection. The historical development and improvements of this intersection have resulted in a small number of businesses being located in an 'island' in the middle of the intersection.

The existing arrangement along Main Street means the street at the heart of the GPAC divides the area in half. Improved pedestrian connectivity is integral to the Design Framework and further downgrading of Main Street, giving more of the road space to pedestrians, is considered essential to the integration of the precinct as a whole. Localised parking would still be permitted along Main Street, providing street activity, convenient access – in particular for the mobility impaired - and casual surveillance of the street.

Possible options to improve the Main Street environs include the following:

- Investigate the feasibility of re-aligning the Main Street/ Para Road/ Hailes Street intersection allowing a direct right turn from Main Street to The Circuit.
- Create thresholds at the entry points to Main Street to alert drivers they are entering a local street.
- Investigate the relocation of the primary bus stops from Main Street. Retain convenient stops at either end of Main Street within an improved streetscape with greater priority given to pedestrians and cyclists.
- Introduce restrictions of access times for delivery vehicles to the street or provide alternate rear loading.

1.6.5 Grimshaw Street

Grimshaw Street currently experiences high traffic volumes with a combination of local and through traffic. The intersections of Grimshaw/ The Circuit and Grimshaw/ Main Streets can become congested during peak commuter and shopping periods. Clearly it would be desirable to reduce through traffic volumes through the GPAC.

Based on the principles outlined in section 1.6.2, Grimshaw Street would still provide an important route for local traffic access and circulation within the GPAC via the signalisation of the intersection Grimshaw Street and Para Road.

1.6.6 Service Vehicle Access

Service vehicle accessibility is essential both in terms of the commercial functionality of the town and minimising congestion. Where appropriate off street service access will be encouraged since this minimises congestion. Access will be necessary along Main Street although this could be restricted to certain times of the day.

	Objective	Preferred Strategy	Issues
Traffic			
Through Traffic	Minimise regional through traffic	Support VicRoads Metro Strategy including Greensborough by-pass with traffic management and signage measures to discourage Greensborough as an alternative route	Limited opportunities
Local	Manage & minimise negative environment & capacity effects Provide safe access to and within the GPAC	Promote primary through routes and car park access locations to the perimeter road system Modify/increase capacity at the intersections of The Circuit/Main Street/ Para Road and the The Circuit / Grimshaw Street	Requirements to accommodate additional traffic along The Circuit Cost & geometric constraints of modifying the intersection at Main Street / Para Road Traffic management & intersection control to reinforce the local road heirachy
GPAC Parking	Manage parking efficiently to provide adequate capacity and minimise circulation	Precinct wide parking strategy Invertigate real time information signage to efficiently direct motorists Consider relocating long term parking to underutilised area	Some car parks eg Henry Street need to be better connected to commercial precinct
Servicing	Minimise conflict between servicing commercial premises and other traffic Provide adequate parking and manoeuvring	Provide off street service access where appropriate, maximise service access behind Main Street shops Provide separate service access where possible for East Main Street precinct	Main street will still require some service vehicle access, consider application of time limits
Taxis	Provide taxi ranks close to key destinations within GPAC	Provide taxi ranks along Main Street & at the transport interchange	Provision near interchange and Main Street
Public Transport	Provide convenient interchange between transport modes	A transport interchange with improved pedestrian access to GPAC, taxi ranks & bicycle storage facilities	Cost associated with construction Investigate a segregated pedestrian crossing over Para Road Interchange requires 'activation'
Buses	Provide convenient access to major activity areas	Integrate bus service requirements with needs of pedestrians	Location of bus stops, in particular near the Plaza car park on Grimshaw Street
Trains	Provide good accessibility to GPAC	Provide level access to East Main Street precinct and Main Street Investigate grade separated pedestrian crossing of Para Road	Cost and constraints associated with pedestrian access Requires ATS to be implemented
Pedestrians	Provide convenient and safe access between GPAC and surrounding residential, medical and sporting precincts Provide safe and convenient access between and within precincts	Street design on local access roads that prioritise pedestrian needs – Main Street and Grimshaw Street Provide level access through lifts, ramps or escalators between station and west and east precincts Provide controlled or grade separated pedestrian access across Para Road and The Circuit Provide signage for pedestrians Provide multiple access points between East Main Street precincts	Provision for buses, such as bus lanes and priority signalisation Cost Station constraints and costs Ability to integrate Main Street shops and East Main Street development
Bicycles	Provide good access to facilities at key activity nodes within GPAC	Encourage cycling to & within GPAC Develop the principal bicycle network	Provide improved storage facilities, bicycle lanes, and priority signalisation

Table 1.2



1.7 Parking Assessment

Parking is a vital component of an integrated transport system. As outlined in the Banyule City Council's Integrated Transport Strategy, the provision and management of parking in Banyule:

'should no longer attempt to meet unrestrained demand, but rather work with other initiatives to reduce the attractiveness of using private vehicles and increase the use of more sustainable means of mobility... A general reduction of parking provision at trip destinations and origins is a crucial element in the range of actions required to achieve the objectives of this strategy. Parking will serve adjacent land use but not contribute to increasing private travel'.

The following parking assessment summarises and presents the findings of the broader parking study for the GPAC area prepared by Grogan Richards Pty Ltd titled 'Greensborough Principle Activity Centre (GPAC) Parking Study'.

Existing Parking Supply and Demand

Grogan Richards prepared an inventory of the existing on and off street car parking spaces. The inventory aimed to record all parking that could be used by the public and patrons undertaking business or visiting GPAC. Precincts were defined within the GPAC, principally due to land uses and geography, refer Figure below.

A total parking supply for each individual precinct is shown in the following table, as well as a break down of the corresponding precinct on and off street parking supply.

The off street car parking supply comprises a number of distinct categories including:

- Council owned public car parks such as components of the Henry Street car park and components of the Eastern Precincts. This is shown as Public A in the table below.
- Privately owned parking available to the public, for instance the Plaza, Safeway supermarket, KFC and the Amcal Chemist and adjacent tenancies. This is shown as Public B in the table below.

- Private staff parking spaces include secured spaces and informal parking located at the rear of shops.
- The vacant land/informal gravel car park shown as E2 below is located at the corner of Flintoff Street and Para Road. It should be noted that observations indicate the land is predominately utilised for parking by rail commuters and accommodates approximately 80 vehicles.

The table below incorporates all available parking to enable a true representation of car parking demand to be determined later in this report.

Precinct	On-Street Supply	Off-Street Supply		Total Public Parking Supply	Approx Private Staff (including informal supply)	Total
		Public A	Public B			
A – Safeway Shopping Centre	0	0	221	221	0	221
B – Greensborough Primary School	53	0	0	53	0	53
C – Henry Street Precinct	0	359	14	373	16	389
D – Greensborough Plaza	11	0	2,826 ¹	2837	39	2,876
E ₁ – Eastern Precinct	52	655 ²	18	725	175	900
E ₂ – Eastern Precinct including gravel car park	0	Approx 80	0	80	0	80
F – Stublely Court Area	54	0	8	62	0	62
G – Medical Precinct	29	0	224	253	0	253
H – Residential/Office Area	51	16	0	67	0	67
I – Residential/Commercial Area	31	0	23	54	0	54
J – Greensborough Train Station	54	230	0	284	0	284
K – Mixed Commercial Uses	37	0	83	120	0	120
L ₁ – RSL Precinct south of railway	7	0	22	29	0	29
L ₂ – RSL Precinct north of railway	9	0	66	75	0	75
Total	388	1,340	3,505	5,233	230	5,463

¹ Includes 2,804 spaces within The Plaza

² Includes basement level parking not available Mon-Fri

The table illustrates there is the ability to park a total of 5,233 vehicles within publicly accessible spaces within the study area. A further 230 private spaces are available within informal and designated areas for private tenant /staff use equating to a total provision of 5,463 spaces.

In order to determine the peak parking demand within GPAC, parking surveys were undertaken by Counters Plus Pty Ltd on Friday the 7th and Saturday the 8th of April 2006. The surveys recorded car space occupancy at one hour intervals from 7:00am to 10:00pm, within each of the precincts as shown in the figure overleaf. Further surveys were also undertaken on Friday and Saturday the 11th and 12th of August 2006 for the Business Zone 1 area.



GPAC Parking Precincts

Considering the total GPAC parking inventory the Friday peak occupancy occurred at 12pm when 4,274 car spaces were occupied (including parking demand within private parking areas) equating for an average study area peak occupancy of 78%. On Saturday, peak occupancy for the entire study area was recorded at 12noon with 3,554 occupied spaces (including parking demand within private parking areas) equating to 65% occupancy.

Development of the Henry Street and Eastern Precinct

Future redevelopment of the Henry Street and Eastern Precinct car parks is proposed. These car parks are located within Precinct C and Precinct E of the GPAC parking inventory, respectively. Any redevelopment of the Henry Street and Eastern Precinct must include the reinstatement of the existing parking supply for existing uses. The reinstatement of spaces should be provided at an adequate rate to accommodate the existing parking demands.



Parking Rates

A separate parking study for GPAC prepared by Grogan Richards provides a basis for the reduced parking rates that will be incorporated into the Parking Precinct Plan.

Shared Parking Opportunities

Opportunities for the shared use of car parking between different land uses within an activity centre can reduce the total car parking demand. In mixed use developments it is common for land uses to have different peak car parking demands. It is of note that the reduced rates derived for GPAC take into account the sharing of spaces.

Long Term Parking

One method to regulate the long term parking demand is to ensure that all long term parking be managed and specific areas be allocated. This will ensure that prime parking areas are available for visitors to the centre. In addition this will help to reduce the volume of traffic circulating within the car parks as additional prime spaces will be available.

Parking for special user groups

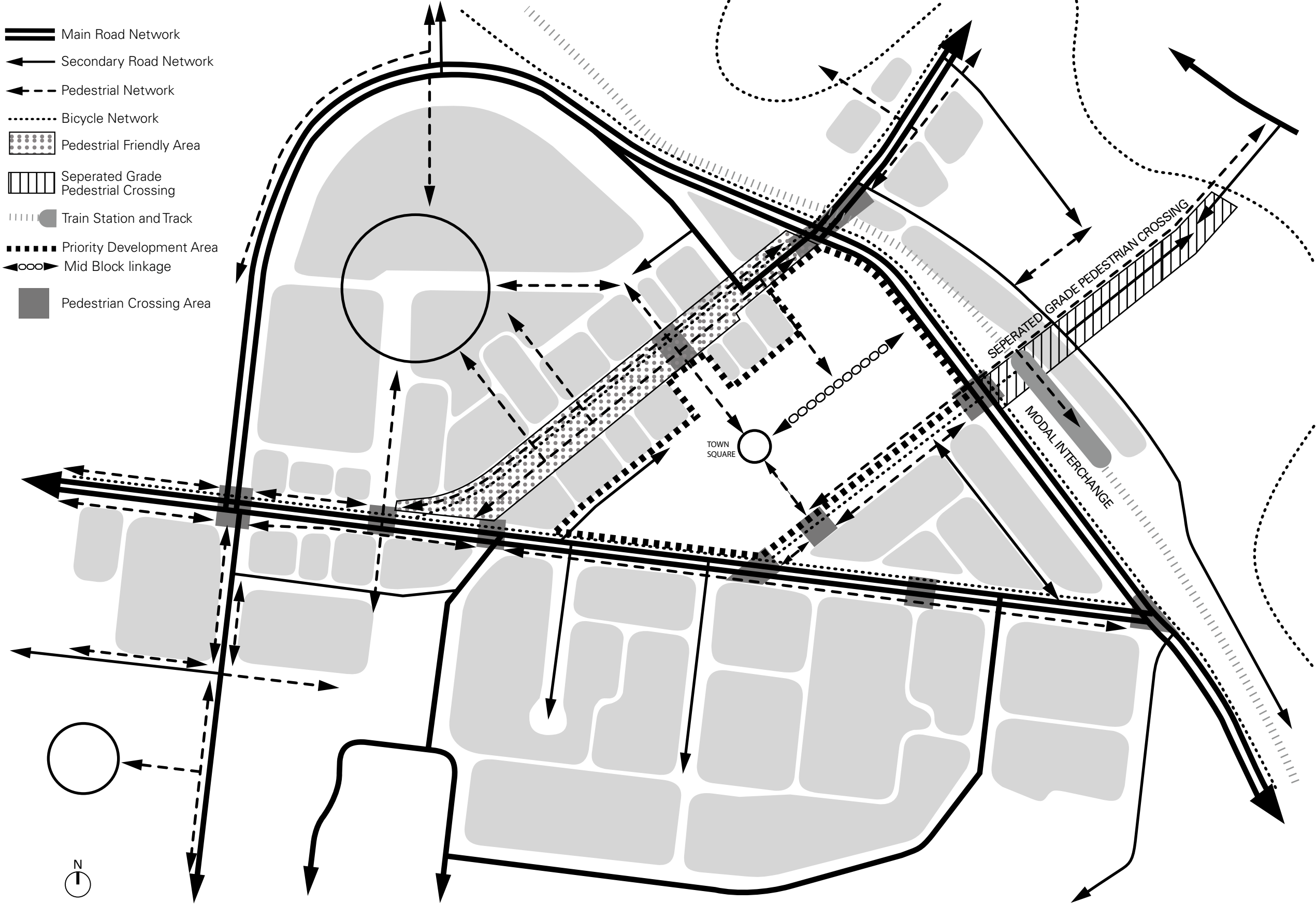
The number of parking spaces specifically allocated for people with disabilities should be calculated using the total number of spaces provided as part of any development.

The rates as specified within the Australian Standard 2890.1 – 1993 should be assumed as the 2004 standard is still in draft format. This standard specifies a 1% requirement. These spaces should be conveniently located near pedestrian routes or main building entrances.

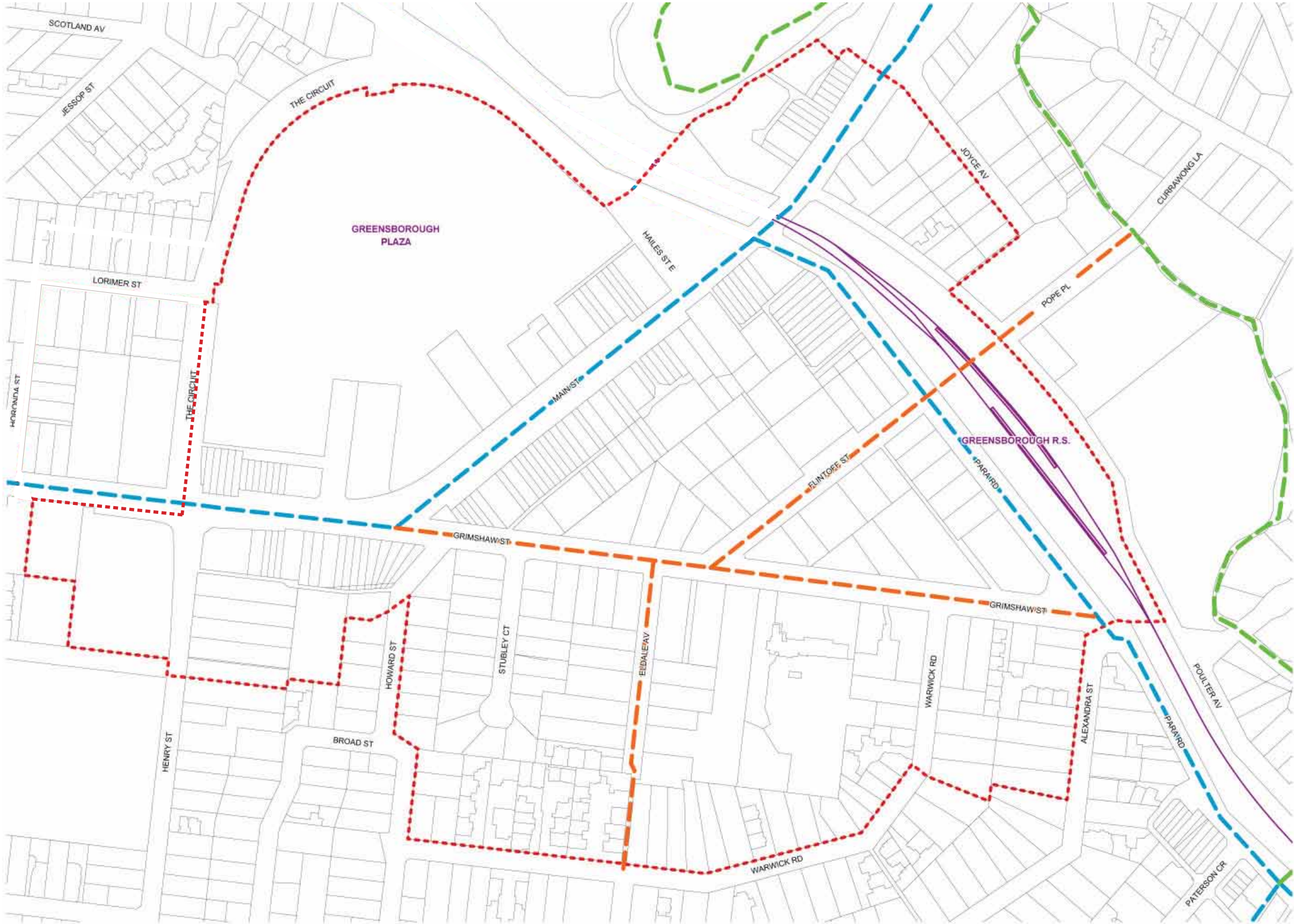
Future Transport Opportunities

There are clearly a number of opportunities which exist to improve transport within the Greensborough Principal Activity Centre and surrounding area into the future. Some of these may be related to individual projects such as the redevelopment of the East Main Street Precinct whilst others will be pursued to facilitate overall improvements in the functioning of the activity centre such as the proposed intermodal transport interchange at the Railway Station. A list of possible transport related initiatives requiring further investigation is included as an additional appendix.

Movement and Connectivity Plan

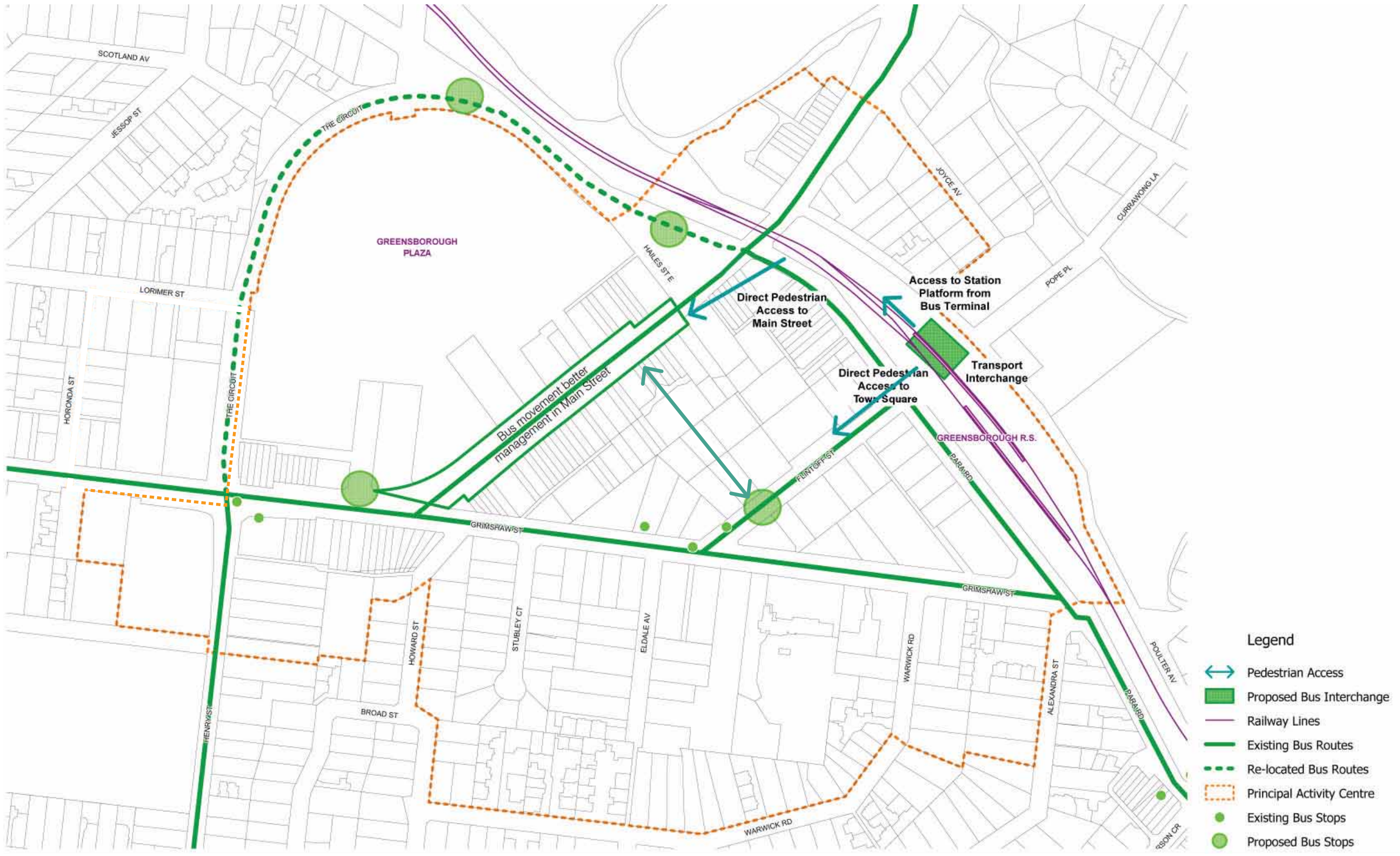


Bicycle Network



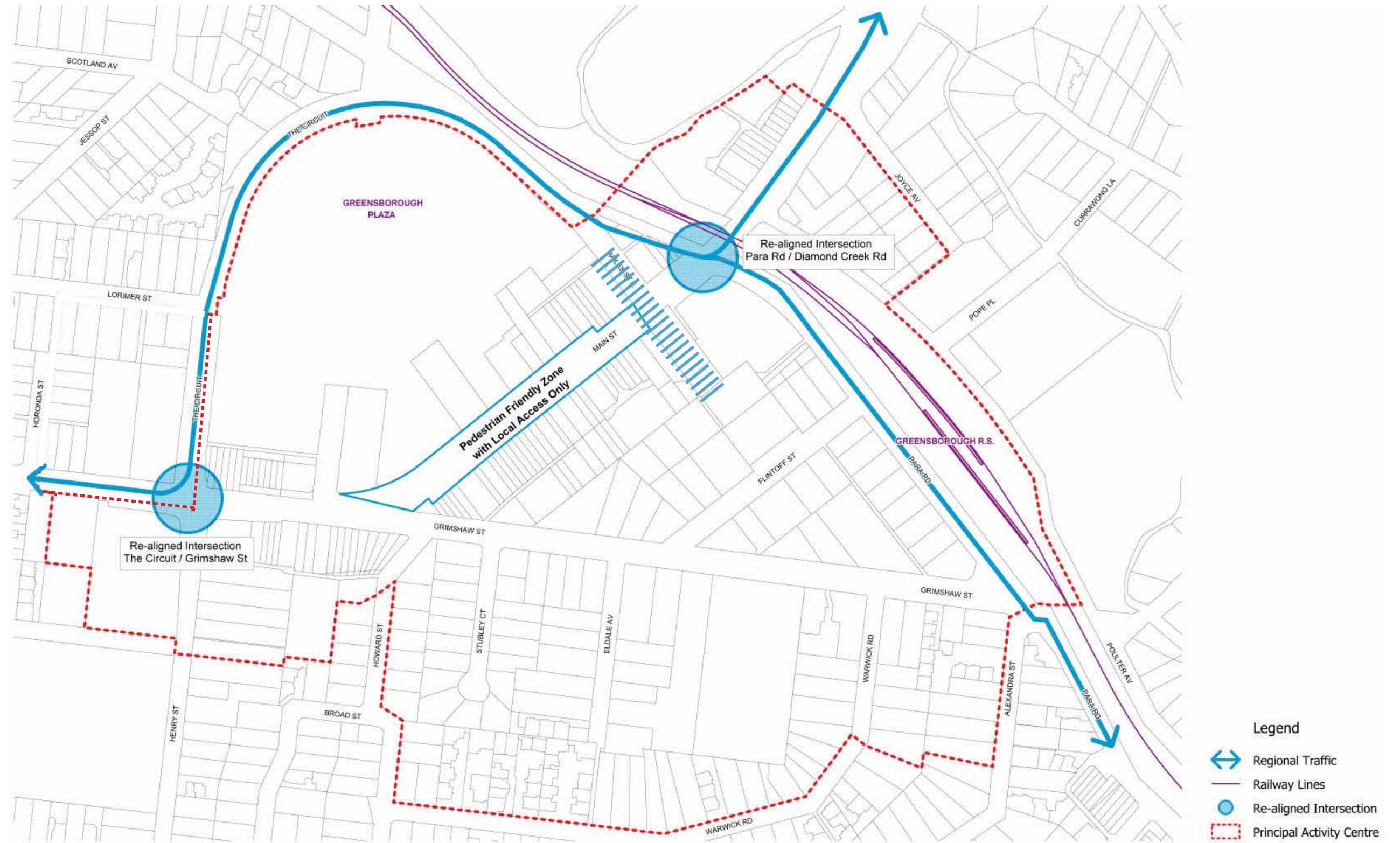
- Legend**
- On-Road PBN
 - Off-Road PBN
 - Other Paths
 - Railway Lines
 - ... Principal Activity Centre

Public Transport



- Legend**
- Pedestrian Access
 - Proposed Bus Interchange
 - Railway Lines
 - Existing Bus Routes
 - Re-located Bus Routes
 - Principal Activity Centre
 - Existing Bus Stops
 - Proposed Bus Stops

Traffic



- Legend**
- Regional Traffic
 - Railway Lines
 - Re-aligned Intersection
 - Principal Activity Centre

Sustainability

Introduction

This report sets out the key local and regional sustainability issues to which the development should respond and from which the specific performance objectives and specific design responses are to be developed. The key ESD opportunities of the project will be to:

- Minimise peak electrical demand through the use of demand management technologies and energy efficient design.
- Minimise the emissions of greenhouse gases through energy efficient plant installations and energy efficient design.
- Reduce or eliminate pollutant substances such as Ozone depleting refrigerants.
- Construct the precinct from materials which minimises the impact on the environment.
- Maintain and operate the development to reduce or minimise harmful effects on people and the natural environment.
- Optimise the opportunity for on site retention and use of water.
- Facilitate effective waste reduction and management.

The process to achieve this involves the setting of "project targets" based on benchmark environmental criteria for the individual buildings and the site as a whole. "Desired targets" are the environmental standards the project will strive for; these targets are achieved through project "pathways", these being;

- External funding grants
- Whole of Life studies
- Design efficacy, such as exceeding our own goals
- Technology change opportunities

Sustainability issues relevant to Greensborough

Comprehensive consultation with Banyule City Council is required to ascertain the Sustainability issues relevant to the local area. From initial research:

- Storm water is at capacity (Local waterways are full; Big localized floods are beginning to be a regular feature in the area; concerns about local water fauna such as frogs and platypuses that still breed naturally in a few spots).
- Water resources are stretched.
- Traffic is a significant issue.
- Effective waste management and recycling is needed.
- Non indigenous flora (Big push in area to eliminate all non indigenous trees and plants) has had a significant effect on the area.
- Social issues around youth and access need to be addressed.
- Concerns about access to open space.

Sustainability issues relevant to Victoria

The Victorian Government and the Environment Protection Authority (EPA) see key issues relating to Sustainability and the built environment as including;

- Energy consumption and associated greenhouse emissions
- Water consumption.
- Stormwater pollution.
- Transportation.
- Waste.

A number of tools and policies have been developed in Victoria which are of relevance including: EPA Vic Sustainability Covenants, EPA Vic Eco-footprints, Melbourne City Council Zero Emissions Policy.

Process Implementation

The figure below outlines the process requirements for the project for the adoption of the Sustainability Guidelines.

Process Pathways

A process pathway is a method which allows the project to reach its peak sustainability goals. It is an ongoing process which will be analysed and tracked through the project to ensure the sustainability goals are met.

Prior to setting any sustainability goals for the project baseline figures or benchmarking of the environmental criteria is required. Benchmarking will be undertaken for the four distinct areas;

- Aquatic Building
- Colab (Office) Building
- Residential Building
- Retail Building.


Due to the varying operations of all the building types different methods for benchmarking in all four buildings will be undertaken.

An assessment and rating system is being developed for the development of the East Main Street Precinct project to enable each element of the development to be benchmarked for sustainable environmental, social and economic/financial performance. The system will facilitate decision making through the design phase of the development to assist in the maximisation of efforts to reach the desired sustainability targets. The assessment system has the potential to be developed into a mixed use development triple bottom line benchmarking system. The assessment system has key performance indicator inputs for design and operational factors in environmental, social and economic/financial performance. The efforts to develop the assessment system have been supported and funded by Sustainability Victoria.

The Colab and Residential Buildings can be readily analysed using existing industry tools such as Greenstar and First Rate to benchmark their environmental performance.

Greenstar is currently developing an environmental rating system for retail buildings which will be used to assess the environmental performance of the retail component of the project.

Benchmarking for the aquatic centre will be a different task again in that there is no Greenstar type tool or historical benchmarking data available. Hence, in this area benchmarking will involve computational energy modelling to analyse options. This involves building computational models of different systems for the centre and simulating the energy usage of these different systems over a typical year. In this way the energy savings of these different systems can be analysed.



Once benchmark or “project targets” are set for the sustainability aspects of each of the buildings ways of achieving the “desired target” can begin. The process by which we get to these “desired targets” is by “process pathways” outlined above.

External Funding Grants

External funding grants are opportunities available to the project whereby the project applies to external bodies such as, Australian Greenhouse Office, Sustainability Victoria and the like for financial assistance in areas where it can be demonstrated that the project is leading that way with regard to environmental issues.

Whole of Life Studies

The whole of life process is one which embraces Life Cycle Assessment tools and broadens them to consider buildings or projects holistically in such a way that their environmental impact is considered from conception to demolition. The whole of life approach is an effective tool where design tools such as Greenstar are not available to assess the environmental impact of a building. In this case a whole of life approach could be considered for the aquatic centre to ensure its environmental objectives are met.

Design Efficacy

Design efficacy is the process where by efficiencies in the design are achieved due to development of the design. This natural progression allows a clearer understanding of ways to achieve sustainability goals and the actual outcomes.

Sustainability Guidelines

The objective of Sustainability Guidelines is to provide a framework around which the performance objectives of the development can be declared and the efforts of the project team can be measured and reported. The form of the proposed guidelines on the next page is similar to those developed for other Lend Lease projects but is modified to specifically address the local and regional issues identified to date.

A prioritising exercise is useful to enable trade offs between objectives to be achieved where economic resources are limited. This would be the next immediate step.

Ecological Footprint

The notion of the ecological footprint is useful in communicating, in a visual form, the scale of the impacts of proposed developments. An eco-footprint is a measure of the productive land and water required to produce all the resources consumed and to assimilate all the waste produced by a particular building. It is useful to provide some insight into the links between consumption and its associated environmental impact.

The Victorian division of the EPA has developed an eco-footprint calculator which will be used as the indicator to performance for the development; (see Appendix 2 for an example).

Benchmarking

Aquatic Building

	Sustainability Aspect	Project Target	Desired Target
A	Management and Operations	Adopt ESD Guidelines	
B	Greenhouse Mitigation	20% improvement on baseline	30% improvement on baseline
C	Energy Conservation	20% improvement on baseline	30% improvement on baseline
D	Water Conservation	20% improvement on baseline	30% improvement on baseline
E	Stormwater Run-off	Eliminate	
F	Indoor Daylight Quality	Best in Class	10% improvement on Best in Class
G	Transportation Emissions and Accessibility	20% improvement on baseline	30% improvement on baseline
H	Project Eco-efficiency (Eco-Footprint)	20% smaller than baseline	30% smaller than baseline
I	Waste from Construction and Operations	>50% improvement on Baseline	>75% improvement on Baseline
J	Sustainable Economics	>5% less operating costs	>10% less operating costs

Note

- Baselines will be calculated by modelling project performance in the absence of historical data.

Colab Building

	Sustainability Aspect	Project Target	Desired Target
A	Management and Operations	Adopt ESD Guidelines	
B	Greenhouse Mitigation	3 Star ABGR	4.5 Star ABGR
C	Energy Conservation	3 Star ABGR	4.5 Star ABGR
D	Water Conservation	3 Star ABGR*	4.5 Star ABGR*
E	Stormwater Run-off	Eliminate	
F	Indoor Daylight Quality	Best in Class	10% improvement on Best in Class
G	Transportation Emissions and Accessibility	20% improvement on baseline	30% improvement on baseline
H	Project Eco-efficiency (Eco-Footprint)	20% smaller than baseline	30% smaller than baseline
I	Waste from Construction and Operations	>50% improvement on Baseline	>75% improvement on Baseline
J	Sustainable Economics	>5% less operating costs	>10% less operating costs

Note

- Baselines will be calculated by modelling project performance in the absence of historical data.
- * ABGR Water was released on 4 April 2006 and will become the new benchmark for water conservation

Residential Building

	Sustainability Aspect	Project Target	Desired Target
A	Management and Operations	Adopt ESD Guidelines	
B	Greenhouse Mitigation	5 star home energy rating	10% improvement on 5 star rating
C	Energy Conservation	20% improvement on baseline	30% improvement on baseline
D	Water Conservation	20% improvement on baseline	30% improvement on baseline
E	Stormwater Run-off	Eliminate	
F	Indoor Daylight Quality	Best in Class	10% improvement on Best in Class
G	Transportation Emissions and Accessibility	10% improvement on baseline	20% improvement on baseline
H	Project Eco-efficiency (Eco-Footprint)	20% smaller than baseline	30% smaller than baseline
I	Waste from Construction and Operations	>50% improvement on Baseline	>75% improvement on Baseline
J	Sustainable Economics	>5% less operating costs	>10% less operating costs

Note

- Baselines will be calculated by modelling project performance in the absence of historical data.

Retail Building

	Sustainability Aspect	Project Target	Desired Target
A	Management and Operations	Adopt ESD Guidelines	
B	Greenhouse Mitigation	5 star home energy rating	10% improvement on 5 star rating
C	Energy Conservation	20% improvement on baseline	20% improvement on baseline
D	Water Conservation	20% improvement on baseline	30% improvement on baseline
E	Stormwater Run-off	Eliminate	
F	Indoor Daylight Quality	Best in Class	10% improvement on Best in Class
G	Transportation Emissions and Accessibility	10% improvement on baseline	20% improvement on baseline
H	Project Eco-efficiency (Eco-Footprint)	20% smaller than baseline	30% smaller than baseline
I	Waste from Construction and Operations	>50% improvement on Baseline	>75% improvement on Baseline
J	Sustainable Economics	>5% less operating costs	>10% less operating costs

Note

- Baselines will be calculated by modelling project performance in the absence of historical data.



Implementation

The statutory planning framework is an integral part of the implementation of the Greensborough project. Major changes to the existing statutory planning framework will be required to achieve the project's objectives for a single, comprehensive, planning approval framework for Greensborough that gives effect to:

- The Structure Plan;
- The Urban Design Framework;
- The Transport Plan;
- and
- The Parking Precinct Plan.

The current zones and overlays within Greensborough have been reviewed. It is intended to change the zones that apply to land within the Greensborough Principal Activity Centre to reflect the structure plan to address any mismatches based on the strategic or preferred land use pattern rather than the existing land use pattern. The "built form" overlays have also been reviewed to ensure that they are consistent with the built form objectives identified in the Structure Plan, and the Urban Design Framework and to ensure consistency in planning terms with regard to built form across the GPAC area.

Priority Development Zone (PDZ)

The use of the Priority Development Zone (PDZ) (refer to page 24) provides an alternative option to a range of differing zones (such as business, residential, public use, mixed use etc) that apply within the Greensborough Principal Activity Centre.

The purpose of the PDZ is to:

- Implement policy;
- Recognise or provide for the use and development of land for projects and areas of State significance;
- and
- Provide for a range of uses and development of land in accordance with a plan incorporated in the planning scheme.

The PDZ requires a schedule (objectives, precincts, uses, application requirements and decision guidelines) to be prepared that is specific to the project. A schedule to the PDZ will be prepared that reflects the Structure Plan and the Indicative Development. A statutory form of these plans or the plans themselves and other relevant material from the Integrated Transport Plan and the Parking Precinct plan will also be incorporated into the Banyule Planning Scheme as the "incorporated plan" required by the PDZ.

Planning permit applications that are generally in accordance with the incorporated plan are exempt from notice and third party review rights to the Victorian Civil and Administrative Tribunal. This provides much more certainty around future development outcomes and recognises Greensborough's State significance as a designated Principal Activity Centre. Before these changes are made, the Structure Plan, UDF and other plans for Greensborough will be reviewed as part of a consultation process to ensure that stakeholders are informed and have the opportunity to comment.

The Greensborough plan includes specific development and infrastructure projects in the eastern precinct such as the new aquatic and leisure facility, new commercial offices and improvement works at the northern intersection of Main Street and Para Road. It is intended that the PDZ will provide a streamlined planning approval process for such projects. However, the detailed plans will be available for public comment as part of the assessment process.

The UDF will contribute to a comprehensive approach to the centre as a whole and will be implemented through the Banyule Planning Scheme as part of the planning framework.

An appropriate Residential Zone will be maintained in locations within the Greensborough Principal Activity Centre where medium to higher density residential development is encouraged to support other activities and public transport. Consideration will be given to the need to encourage residential development at medium or higher densities to make optimum use of the facilities and services available and to encourage residential development that respects the neighbourhood character. Where residential development is proposed, guidelines will be developed through a consultation process to address building height, setbacks from the street frontage, opportunities for natural surveillance of public spaces and appropriate interface treatments with existing residential uses and commercial uses.

The selected and appropriate use of the Residential Zones will provide a clear direction about the future use of the land in a way that supports and implements the Greensborough Plan.

The Parking Precinct Plan

It is intended that the Parking Precinct Plan will be an incorporated document in the Banyule Planning Scheme with a reference in the Greensborough Principal Activity Centre Local Policy.

Conclusion

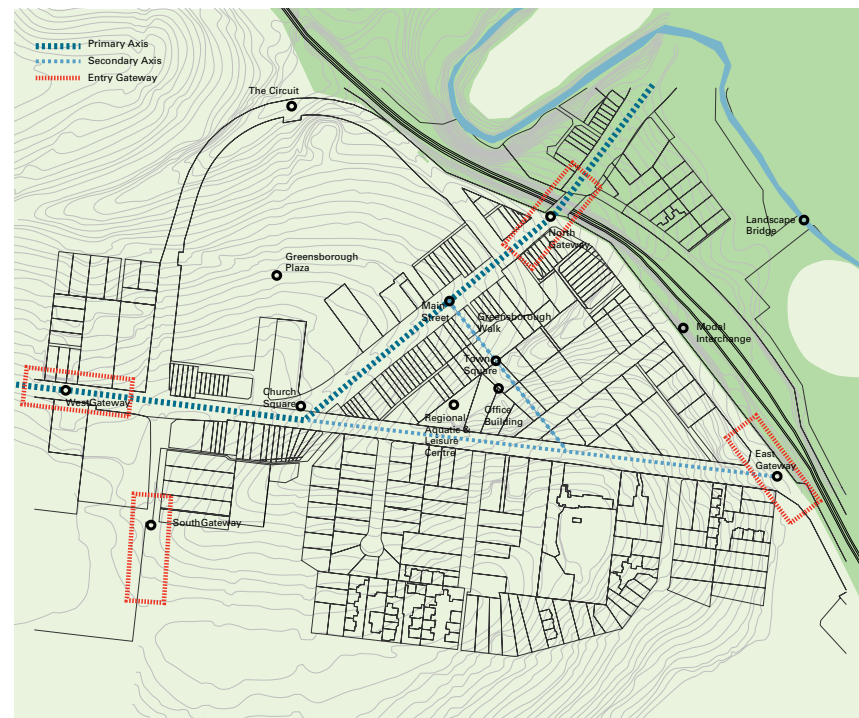
The use of the PDZ and Incorporated Plan supported by objectives in the MSS and the Greensborough Principal Activity Centre Local Policy will provide a comprehensive and flexible planning framework to implement the Greensborough Plan.

The ability to respond to new opportunities that contribute to the vision for Greensborough must be provided so that a dynamic and evolving planning and design environment is brought into being. Streamlining the planning approvals process for developments within an agreed framework will reduce planning risk and delay and encourage new private investment to support public investment.

The proposed changes to the current statutory planning controls for the Greensborough Principal Activity Centre will be subject to an extensive consultation process that will involve the community and other stakeholders. This process will ensure that stakeholders affected by the proposed changes have the opportunity to participate in the development of the vision for the future of the Greensborough Activity Centre and the policies and controls that will shape its development.



Planning Framework



Prominent Axes and Entry Gateways

This portion of the Plan focuses on background issues in relation to Greensborough's existing planning framework.

The options for implementing the Plan will be considered in the context of the zones and overlays available in the Victoria Planning Provisions. Within this context, the Plan is a single, comprehensive, innovative and flexible planning approval framework to guide individual planning decisions. Over time the aggregate of these decisions will implement the vision for the future Greensborough in a way that responds to change but keeps faith with the principles underpinning the vision.

The planning framework will provide direction and certainty for the Council, the community and developers. However, while the Banyule Planning Scheme is a powerful implementation tool, there are other implementation strategies that will also contribute to the success of Greensborough. These strategies include, for example, securing funding for improvements to public transport infrastructure; implementing public art programs and urban design improvements to public spaces, and releasing strategic development sites to catalyse growth in a precinct or to kick off a development phase.

The Greensborough Plan will be expressed in the following documents:

- The Structure Plan which is a refinement of the eleven strategic principles developed in earlier work;
- The Urban Design Framework;
- The Transport Plan;
- The Parking Precinct Plan, and
- More detailed plans for development projects in East Main Street Precinct.

While the Structure Plan offers a context for change and growth, the Indicative Development Outcomes Plan identifies Greensborough's potential based on the current parameters of the town centre and its surrounds. The Indicative Development is a continually evolving document that is based on the principles outlined in the Structure Plan and the Urban Design Framework.

The following sections provide a quick summary of the relevant policies and the options to achieve the project's planning approval and implementation outcomes.

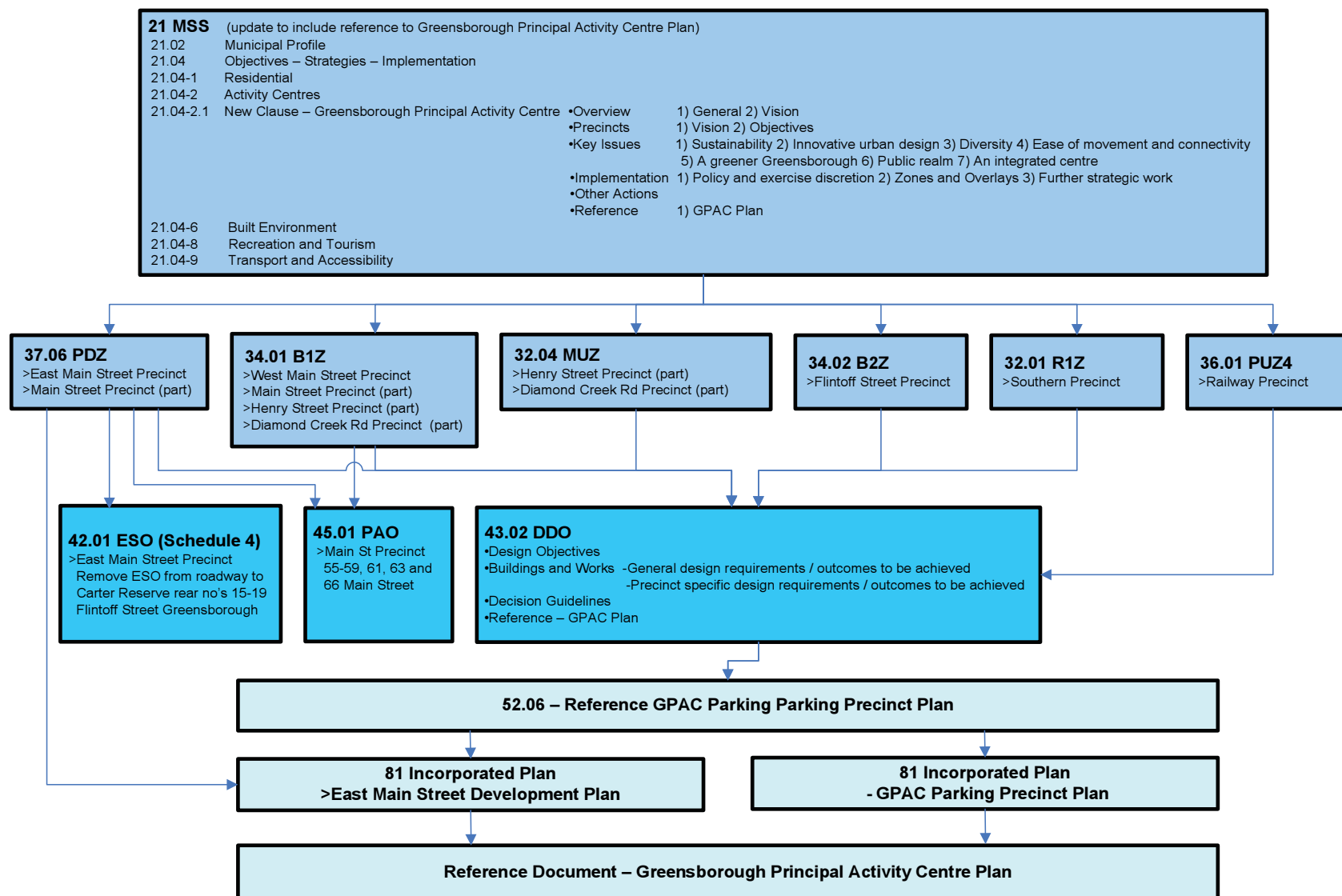
State Planning Policy Framework – Melbourne 2030 Activity Centres

The vision and objectives for Greensborough are consistent with and supported by the State Planning Policy Framework and Melbourne 2030. Greensborough is a designated Principal Activity Centre in Melbourne 2030. Such centres are second only to Melbourne's CBD in terms of their strategic importance. It is identified as a focus for services, employment and social interaction and a place capable of accommodating change to perform an enhanced regional role that builds on its attributes and positions it for the future.

Such centres are intended to provide a balanced range of services and facilities for a regional catchment including retail, office, community facilities, employment, and tourist-entertainment-recreation facilities supported by higher density residential development and public transport. Sustainability is a key objective, and Greensborough is well placed to develop and implement this principle, because of its unique environmental setting, the availability of public transport and opportunities for walking and cycling as alternatives to the car.

Most directions in Melbourne 2030 are relevant to the future planning, design and development of Greensborough. Direction 1 – a more compact city is directly relevant. This direction envisages Greensborough as a location where new development will be encouraged and concentrated, including new commercial development, community facilities, and a range of housing forms and densities. Greensborough will be a place of high quality urban design with improved access to public transport.

Greensborough Principal Activity Centre Plan – Planning Scheme Amendment Framework



Other key objectives in Melbourne 2030 for all activity centres that are particularly relevant to Greensborough include:

- Broadening the mix of uses appropriate to the type of centre and the needs of the population served;
- Encouraging economic activity and business synergies;
- Improving access by walking, cycling and public transport to services and facilities for the local and regional population;
- Providing focal points for the community;
- Supporting the Principal Public Transport Network; and
- Reducing the number of private vehicle trips by concentrating activities that generate high numbers of trips in highly accessible locations.

Clause 12- Metropolitan Development in the Banyule Planning Scheme provides specific objectives and strategies for Metropolitan Melbourne to implement Melbourne 2030. The clause addresses the strategies for Principal Activity Centres and in particular the opportunities to accommodate ongoing investment and change in retail, office, service and residential markets.

The Greensborough project provides the opportunity to demonstrate to key stakeholders, in particular the State Government, the practical implementation of the Melbourne 2030 directions and policies at the local level.

Activity Centre Design Guidelines

The State Planning Policy Framework sets out design principles in Clause 19.03 that must be addressed in the design of urban spaces and buildings. The policy framework includes reference to the Design Guidelines for Activity Centres which must be considered in preparing activity centre structure plans and in assessing the design and built form of new development in activity centres.

The design principles include: context; public realm; landmarks; views and vistas; pedestrian spaces; heritage; consolidation of sites and empty sites; light and shade; energy and resource efficiency; architectural quality; and landscape architecture. The Activity Centre Design Guidelines have been developed to assist planners and designers in applying these principles to create high-quality activity centres.

The Guidelines are structured around the following design elements:

- Urban structure;
- Stations and interchanges;
- Street design;
- Public spaces;
- Building design;
- Malls and large stores;
- Higher density housing;
- Car parking.

The assessment of the structure plan and UDF developed for Greensborough will demonstrate how the guidelines and design objectives for the project have been applied. Future development proposals within Greensborough will have to address Clause 19.03, the Activity Centre Guidelines and the design objectives developed for precincts within Greensborough.

Guidelines for Higher Density Residential Development, 2004

The Guidelines for Higher Density Residential Development have been developed to assist planners and designers apply design principles to proposals for higher density residential development. The Guidelines promote high quality public amenity and good design.

The guidelines are structured around the following design elements:

- Urban context;
- Building envelope;
- Street pattern and street edge quality;
- Circulation and services;
- Building layout and design;
- Open space and landscape design.

The guidelines are most useful in the development and assessment of individual development proposals in areas identified for medium to higher density development in Greensborough's Structure Plan and Indicative Development.

Safer Design Guidelines for Victoria, 2005

Design for public safety is also a significant issue for Greensborough. The Safer Design Guidelines for Victoria 2005 aim to minimise the opportunity for crime and reduce the fear of crime for people using private and public space.

The Guidelines are based on the following aims:

- To maximise visibility and surveillance of the public realm;
- To provide safe movement, good connections and access;
- To maximise activity in public spaces;
- To clearly define public and private space responsibilities;
- To manage public space to ensure that it is attractive and well used.

The Structure Plan and the Indicative Development developed for Greensborough address public safety issues. These Guidelines should also be used to develop and assess individual development proposals for Greensborough.

Banyule Planning Scheme

The Structure Plan and the Urban Design Framework developed for Greensborough provide the strategic rationale for amendments to the Banyule Planning Scheme. The major elements are discussed below.

Local Planning Policy Framework

The Municipal Strategic Statement (MSS) identifies Greensborough as:

- The major commercial centre in Banyule, serving the north-east region of outer metropolitan Melbourne;
- and
- One of the three primary focus areas for office development. In this regard Greensborough has good access to main roads, public transport, proximity to an established shopping centre, good accessibility to other businesses and a suitable workforce.





The current strategic objectives in the MSS for Greensborough will be updated to identify its status as a Principal Activity Centre and to support and provide strategic justification for the changes to the statutory planning framework as they are developed in later stages of the project.

Changes to the Banyule Planning Scheme to implement the Structure Plan, the Indicative Development, Urban Design Framework, the Integrated Transport Plan, the Parking Precinct Plan and individual development plans will be developed in consultation with Council and other stakeholders.

A strategic objective for the project is to provide a single, comprehensive and integrated planning framework for the future development of Greensborough that provides direction and certainty for Council, the community and developers. This will be clearly identified in the MSS.

The status of the Greensborough “documents” (incorporated documents and reference documents) will be addressed in a local policy to be developed for the Greensborough Principal Activity Centre. The local policy will express the vision for Greensborough, identify the strategic principles underpinning the vision and the key objectives that Council will consider when assessing planning approvals in the future.

The policy is critical in relation to implementing matters such as sustainability, urban design and architecture, safety, quality of the public realm and the preferred mix of land uses, which are not readily able to be implemented through the zones and overlays in the planning scheme.

An innovative and flexible statutory planning framework supported by objectives in the MSS and clear policy that reflects the vision for the centre will provide genuine guidance for all stakeholders, including the community, in the planning and development of Greensborough. The statutory planning framework will balance certainty and flexibility to enable the evolution of Greensborough in response to emerging opportunities over time, but in the context of an agreed vision that builds on the centre’s attributes and avoids the problems of unplanned change.

Zones and overlays

The existing pattern of zones and overlays in Greensborough reflect, to some extent, the established patterns of land use in Greensborough. However, the analysis of the zone and overlay provisions that apply to Greensborough indicates that a range of different controls apply within the centre.

The application of the Business 1 Zone to the retail core of the centre and the Business 2 Zone to the large office precinct adjacent to Flintoff Street reflects the existing land uses within the centre. However, the location of the Business 2 Zone does not reflect the office precinct identified in the April 2003 Local Structure Plan. The Business 1 Zone and Business 2 Zone provide for a wide range of land uses including shops, offices and residential uses.

The Public Use Zone identifies land used for a public purpose within the centre. These areas include the former Diamond Valley Hospital site, the swimming pool, the Greensborough Railway station and the primary school. The Public Use Zone reflects the existing and past land uses rather than the strategic potential use of some of this "public use" land.

Most of the land south of Grimshaw Street and east of Henry Street is currently zoned Residential 1. There is a small area of Mixed Use Zone on the east side of the railway line south of Main Street. Grimshaw Street and The Circuit are in a Road Zone Category 1 reflecting their status as part of the arterial road network. The Business 2 (Greensborough District Centre Office Precinct) is subject to a Design and Development Overlay (DDO4).

In summary, the design objectives of DDO4 encourage a high quality of urban design, offering variety, interest, safety and convenience. The DDO includes height, setback, plot ratio and car parking requirements (5 spaces per 100sqm of GLFA) drawn from siting and design guidelines developed in 1992. It is timely to review the DDO4 and the guidelines in the context of the Urban Design Framework and the Structure Plan prepared for Greensborough.

The area on the east side of Para Road is also subject to a Design and Development Overlay "(DDO8)- Plenty River East Neighbourhood Character". In summary, the design objectives of DDO8 seek to maintain the heavily vegetated character of the area.

Most of the area on the east side of Poulter Avenue is also subject to the Environmental Significance Overlay Schedule 1- Yarra River, Plenty River and Darebin Creek.

There are two small areas of Environmental Significance Overlay Schedule 4- Significant Trees and Areas of Vegetation in Greensborough. One area is located on the corner of Eldale Avenue and Grimshaw Street and the other is located on the corner of Flintoff Street and Para Road. In these areas, a planning permit is required to remove, destroy or lop any identified significant tree or vegetation. Part of the Eldale Avenue site is also subject to the Heritage Overlay (HO102) that identifies Ashmead House as a heritage place. The Heritage Overlay triggers a planning permit for demolition, external alterations to the building and tree removal.

The Environmental Audit Overlay (EAO) applies to the small area of land zoned Mixed Use on the south side of Main Street, east side of Poulter Avenue. The EAO requires a Statement or Certificate of Environmental Audit to be provided before the land may be used for a sensitive use (residential use, child care centre, pre-school centre or primary school).

The Land Subject to Inundation Overlay (LSIO) applies to the flood plain along the Plenty River. The LSIO applies to part of the Business 3 Zone located between the river and Main Street, east of Poulter Avenue. The purpose of the Business 3 Zone is to encourage the integrated development of offices and manufacturing industries and associated commercial and industrial uses. However the Business 3 Zone, at the Plenty River end of Main Street, does not position Greensborough as the major higher order commercial centre for the region. In this zone, residential uses and most kinds of shops are prohibited.







Vale of Heidelberg, John Skinner Prout, 1847

Next Steps

The GPAC Plan outlines an exciting future for Greensborough, based on the key principles of *growth*, *renewal* and *sustainability*. Together these three factors inform all aspects of the Plan.

Growth refers to the growth of the economy, the population and the physical environment in every sense, from the increase in density and numbers to the improvement of the public realm and civic realm. Economic growth will be encouraged by a vibrant new retail and commercial landscape. Growth is also a motif for the literal greening of Greensborough: the future of Greensborough will be growing and green, a place of health and wellbeing.

Renewal is the core outcome of the Planning process. Greensborough will be renewed through the implementation of the Plan, which outlines improvements at every level of the GPAC. An increased residential focus will bring renewal to the Centre, introducing a new generation of residents to a revitalized and restored urban environment.

Sustainability measures underpin all aspects of the Plan. It applies in terms of broad social and economic sustainability objectives down to the detailed design of key buildings in the urban environment, for example, the Regional Aquatic and Leisure Centre and the Collaborative Workplace. Sustainable principles will be a mandatory requirement of all new development, including passive solar design of buildings and public spaces.

The underlying vision enunciated in the Plan will provide the essential structure for the future development of this vibrant and special place. Greensborough will be transformed.





APPENDICES





The Sustainability Guidelines

The Sustainability Guidelines set out the sustainability goals and the method for achieving the goals within the Greensborough Project.

The Sustainability Guidelines sets out the key local and regional sustainability issues to which development should respond and from which the specific performance objectives and specific design responses are to be developed.

There are a number of key specific objectives of the Guidelines, listed below:

- To minimise peak electrical demand through the use of demand management technologies and energy efficient design. Energy efficient design will be demanded of all new development in the GPAC, including key major building projects.
- To minimise the emissions of greenhouse gases through energy efficient plant installations and energy efficient design
- To reduce or eliminate pollutant substances such as Ozone depleting refrigerants
- To construct the precinct from materials which minimize the impact on the environment, and through building detailing and specification minimize waste in the construction process
- To construct, maintain and operate the development to reduce or minimise harmful effects on people and the natural environment, including specifying materials with low toxicity through off-gassing.
- To optimise the opportunity for on-site harvesting, retention and use of water
- To facilitate effective waste reduction and management in the operation of the development.

The process to achieve this involves the setting of “project targets” based on benchmark environmental criteria for the individual buildings and the site as a whole. “Desired targets” are then set which are the environmental standards the project will strive for; these targets are achieved through project “pathways”, these being;

- External funding grants
- Whole of Life studies
- Design efficacy, i.e. exceeding our own goals
- Technology change opportunities

The Guidelines provide a detailed discussion of the above topics.

Building Precinct Sustainable Initiatives

Cogeneration

Combined heat and power (CHP) is the generation of thermal and electrical energy in a single process. In this way, optimum use can be made of the energy available from the fuel. CHP installation can typically convert between 80% and 90% of the energy in the fuel into electrical power and useful heat. This compares very favourably with conventional power generation which has delivered energy efficiency of around 30%.

Applications of CHP for building services generally use small scale CHP. Small-scale units have electrical outputs of up to about 1 MW, and usually come as packaged units based on gas-fired reciprocating engines, with all components assembled ready for connection to a building's central heating and electrical distribution systems.

To be most cost effective, there needs to be a use for the heat and power from a CHP system. Hence the assessment of heating, cooling and electrical requirements will be required as a first step exercise.

The value of the electricity and heat produced by the CHP unit is greater than that of the fuel consumed. In particular, the value unit of the electricity can be up to five times that of a unit of heat. So as long as the difference offsets capital and maintenance costs, savings are made. In order to maximize savings from the initial investment, running hours should be as long as possible.

Cost Benefits of CHP

The main benefits are as follows:

- Overall energy costs can be reduced
- Savings on electricity should more than offset the increase in fossil fuel (usually gas) requirements.
- Further savings from reduced maximum demand charges can also be made.

Environmental Improvements

The more efficient use of fuel:

- Reduces emissions of the principal greenhouse gas CO₂ thus helping to reduce the risk of global warming
- Reduces the emission of SO₂, the major contributor of acid rain
- Helps to conserve the world's finite energy sources

Increased security of power supply

- CHP unit can continue to supply partial power should the grid fall, and conversely the grid can provide power when the CHP unit is out of operation
- Offsetting capital expenditure
- Capital expenditure on CHP can be reduced by offsetting it against plant costs that are avoided, i.e. standby generation and/or boiler replacement costs.

Financing options

A range of alternative financial arrangements exist including:

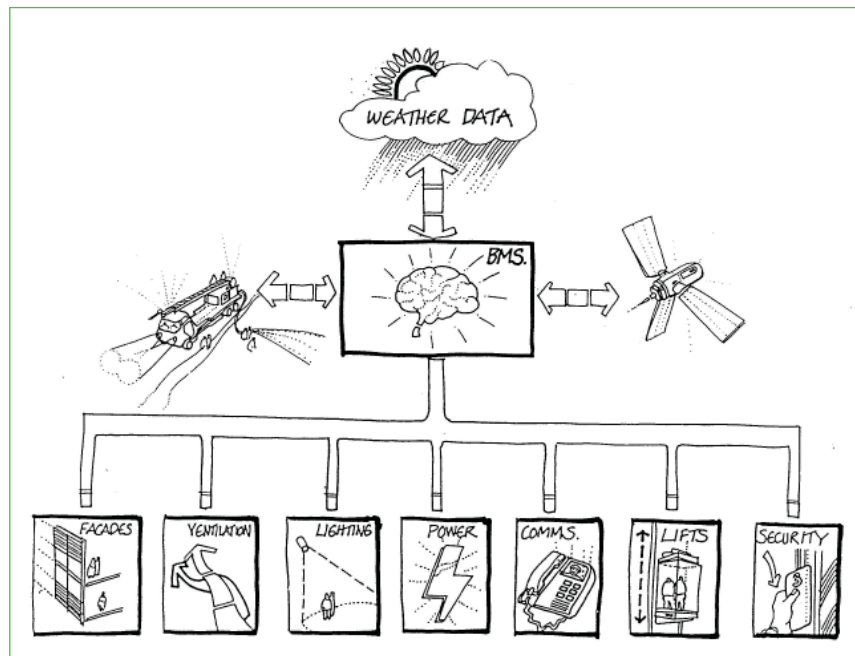
- Capital purchase;
- Equipment supplier Finance (ESF), where the capital is provided by the equipment supplier. This is typically for the site that does not have funds available and is looking for a straight forward 'one-stop' approach to CHP
- Build Own Operate Transfer (BOOT), where an organization finances the installation and contracts out its energy services. The organization takes full financial risk for the capital cost and negotiates an energy supply contract with the hospital to supply chilled and hot water. At the end of a specified period of time the organization can transfer the installation to the hospital. If the contract is open ended the contract arrangement is known as a BOO scheme (Build Own Operate)

Under both ESF and boot schemes, maintenance costs are generally included.

Energy Efficiency

- Central high efficiency chilled water and heating water plant.
- Variable speed primary chilled water and heating water circuits.
- High efficiency cooling towers operating at depressed wet bulb temperatures of 24°C to dramatically increase the efficiency of chillers.
- Low energy metal halide external lighting operated with BMS and daylight sensors.
- Winter westerly wind breaks using indigenous vegetation.
- Promotion of summer breezes between buildings to reduce façade load.
- Performance based carpark ventilation solution to improve air quality and reduce energy consumption.
- Provision of daylight wells and painting the underground carpark ceiling and walls white to reduce light fittings and energy consumption.
- Occupancy sensors can be installed to operate underfloor carpark lighting from the security lighting level to occupied lighting level.
- Centralised Building Management System to provide coordinated operation of entire site.
- Photovoltaic power generation to serve the public lighting system
- Full BMS with energy management functions





Building management systems will provide distinct energy management and control functions

Water Efficiency

- Provision of rainwater harvesting
- Stormwater harvesting
- Investigation into sewer mining
- Blackwater treatment plant for cooling tower usage.

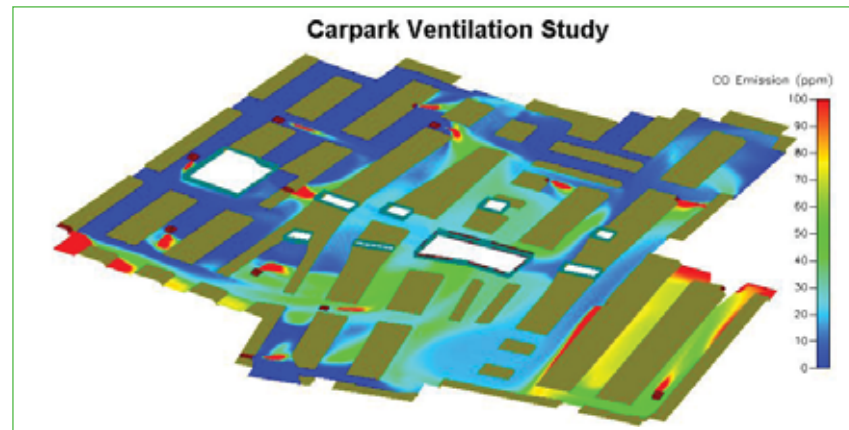
Performance Based Design

Areas where performance based design can be applied to improve the performance, design and running efficiency of systems it will be applied.

Performance based design involves thermal, daylight, energy and Computational Fluid Dynamics (CFD) modelling or a combination of these methods.

Areas this would be considered for include;

- CFD modelling of the carpark to minimise ventilation requirements
- Thermal and CFD modelling of areas where natural ventilation or mixed mode are considered
- Daylight modelling to strategic areas in all area
- Energy modelling to all areas
- Thermal and CFD modelling to the aquatic centre.



Performance based carpark ventilation design provide significant savings in energy consumption

Aquatic Building

General Description

The aquatic building has the potential to consume the majority of the power for the site and therefore is critical in the scheme to ensure a low energy solution.

The aquatic building will aim to achieve an equivalent 5 stars in accordance with the Green Star scheme. This will be achieved through the application of passive design initiatives such as mixed mode air conditioning and the abundance of natural light to the spaces.

Occupant comfort is one of the main factors affecting the success of any building and the promotion of maximum daylighting and naturally ventilated mixed mode areas will provide occupants with an amenity.

Mechanical Services

- High performance glazing will reduce solar heat gain and increase visible light to occupied spaces.
- Structures will be constructed airtight to minimise infiltration.
- Shading will be provided to the northern and western façade to eliminate summer solar gain from mid-season to summer. The eastern and northern façades will promote winter passive morning warm-up.
- Walls, roofs and floors will be provided with high standards of insulation.
- Efficient after-hours operation will be provided through the use of positive shut-off of air conditioning to separate zones during out-of-hours operation.
- The atrium spaces will be conditioned through the use of relief air from the occupied floors thereby providing a transitional zone with minimal energy consumption.
- Mixed mode air conditioning will be provided allowing occupants the benefit of natural ventilation to dedicated areas when the ambient conditions are favourable.

Electrical Services

- Energy efficient lighting throughout providing a significant reduction on the building air conditioning load.
- Perimeter daylighting.
- Light-shelves on the northern façade to promote daylighting to the perimeter zone spaces to reduce energy consumption through minimising lighting energy consumption.
- Lighting control systems to minimise the inappropriate use of lights when they are not required and provide out-of-hours lighting control.
- Occupancy sensors located in common areas switch off lighting when not required.
- Low energy metal halide external lighting operated with Building Management Systems and daylight sensors.



Daylighting to atriums provide significant visual benefits to occupants

Collaborative Workplace

General Description

The commercial office buildings have the potential to consume the majority of the power for the site and therefore are critical in the scheme to ensure a low energy solution.

The commercial building will aim to achieve 4.5 stars in accordance with the ABGR scheme. This could be achieved through the application of passive design initiatives such as mixed mode air conditioning to dedicated areas, the abundance of natural light to the offices from the atrium spaces and the use of low energy chilled beam technology. The application of passive and active low energy design initiatives will ensure the commercial buildings will be capable of providing high levels of comfort with minimal energy consumption.

Occupant comfort is one of the main factors affecting the success of any building and the promotion of maximum daylighting, chilled ceiling technology and naturally ventilated mixed mode break-out areas will provide occupants with a high level of amenity.

Mechanical Services

- The system will be capable of easily achieving the 4.5 Star greenhouse gas rating with the potential to achieve 5 Stars.
- Dedicated Outdoor air supply plant to each office building.
- CO2 monitoring will control outdoor air rates to occupied spaces thereby ensuring a fresh environment with minimum energy consumption.
- High performance glazing will reduce solar heat gain and increase visible light to occupied spaces.
- Structures will be constructed airtight to minimise infiltration.
- Shading will be provided to the northern and western façade to eliminate summer solar gain from mid-season to summer. The eastern and northern façades will promote winter passive morning warm-up.
- Walls, roofs and floors will be provided with high standards of insulation.
- Efficient after-hours operation will be provided through the use of positive shut-off of air conditioning to separate zones during out-of-hours operation.
- Mixed mode air conditioning will be provided to dedicated zones allowing occupants the benefit of natural ventilation to dedicated areas when the ambient conditions are favourable.

Electrical Services

- Maximising daylighting into the perimeter zones and through the use of atria.
- Energy efficient T5 lighting throughout provide a significant reduction on the base building air conditioning load and allow tenants the ability achieve a 4.5 Star ABGR tenancy rating.
- Lighting zoning and switching which allows for areas to be isolated and or control to perimeter daylighting.
- Light-shelves on the northern façade to promote daylighting to the perimeter zone break-out spaces to reduce energy consumption through minimising lighting energy consumption.
- Lighting control systems to minimise the inappropriate use of lights when they are not required and provide out-of-hours lighting control.
- Occupancy sensors located in common areas switch off lighting when not required.
- Low energy metal halide external lighting operated with BMS and daylight sensors.

Residential Buildings

General Description

The residential building will be designed with a primary emphasis on passive conditioning. The design is predicated on the ability of each apartment not require air conditioning. In this way it is anticipated that each of the apartments will be capable of maintaining comfortable conditions through energy efficient passive means.

This will be achieved through the inherent design characteristics of each of the apartments, these include dual orientation providing full cross flow natural ventilation to allow passive night cooling and effective daytime breezes and the provision of window shutters to provide full solar block-out yet effective ventilation.

Reverse cycle water cooled air conditioning can be provided to meet the commercial requirements of the development.

To meet the low energy consumption requirements, strategies such as low energy lifts, occupant sensing lighting to common areas and naturally ventilated toilet areas will be considered.

Mechanical Services

- Provision of cross flow ventilation to all apartments.
- Natural ventilation to toilet areas where achievable.
- Airtight structures to minimise infiltration.
- Promotion of early morning winter sun penetration into apartments on eastern facades through effective shading design.
- Full shading to the northern and western façade to eliminate summer solar gain from mid-season to summer.
- High levels of wall, roof and floor insulation.
- High efficiency water cooled reverse cycle packaged air conditioning to apartments with day/ night operational strategies to reduce electrical demand.
- All windows will be provided with shutters. These are standard issue in Europe to block out sun, provide insulated air gap in winter and can allow air flow through them at night when shut. In addition these units provide excellent security and shutout of daylight and noise.



Electrical Services

- Energy efficient lighting in common areas.
- Provide occupancy sensors to switch off lighting in common areas.
- Occupancy sensors to operate underfloor carpark lighting.
- Low energy metal halide external lighting operated with BMS and daylight sensors.
- Energy efficient 3 Star white goods.

Hydraulics

- Gas boosted solar hot water.

Retail Centre

General Description

The retail component of the development will also incorporate ESD principles. The cinema complex will be provided with an innovative low energy system well suited to the high ceilings and occupancy levels.

The cinema can be provided with a displacement system which will supply air at low level at elevated temperatures of 20°C. Warm air from occupants and lights rises in plumes to high level before it is relieved directly to outdoors.

The system promotes the use of 100% outdoor air due to the low volumes of air involved.

On the air intake side, the use of a thermal labyrinth will provide greater energy savings and reduce plant capacity. By cooling the labyrinth at night the stored thermal mass will provide direct pre-cooling of the incoming air during the peak daytime temperature.

The use of extensive skylights will provide an abundance of daylight within the subterranean space to provide occupants with connectivity with outdoors and reduce reliance on electric lighting.

Mechanical Services

- Provision of displacement ventilation to cinema.
- Thermal labyrinth serving the cinema air handling plant. The use of the ground can provide beneficial thermal mass for summer air intake and protection from cold winter winds.
- 100% outdoor air supply to the occupied public spaces.
- Provision of high levels of wall, roof and floor insulation.

Electrical Services

- Energy efficient lighting in common areas.
- Provide time-switch control of lighting in common areas

Indoor Environment Quality

The environmental comfort of the occupants will be optimised through the incorporation of features such as:

- CO2 monitoring and control of outdoor air rates.
- Natural lighting to perimeter zones will be subject to occupant VDU usage.
- Visual connectivity to external environment through maximum access of occupants to the façade or atrium.
- Improving the acoustic performance.

Waste Minimisation

Construction waste minimisation strategies will be included as an integral part of the design process. The key principles are:

- Standardisation of building dimensions to standard material/module dimensions
- Maximisation of off-site pre-fabrication of building materials
- Accurate quantification of material requirements
- Specification of exact requirements to supplier
- Minimisation of packaging of materials delivered to site
- Adequate space allocation for waste segregation

Operational waste will be considered throughout the design process.

Material Selection

Where applicable environmentally responsible material selection will aim to maximise:

- Use materials with the least environmental impact
- Use products that originate and/or are made from/with local materials and are manufactured locally
- Design and build for de-construction, re-use, adaptation, and recycling
- Minimise use of materials that off-gas chemicals during use and manufacture
- Selection of natural materials that use less synthetic chemicals, and can be returned to the natural environment without harm.
- Use structural steel with a high level of recycled content
- Use concrete with a high level of recycled flyash
- Use materials with low levels of volatile organic compound off-gassing.

The following is a list the types of environmentally friendly materials that will be considered for use for the development.

Asphaltic Concrete Flooring/Paving

Asphalt mix utilising crumbled rubber using scrap tyres, polymer modified and de-vulcanised rubber. Rubber is added from the vulcanisation process as liquid form to bitumen. The result is asphalt paving that lasts about twice as long as conventional asphalt due to its inherent resistance to wear.

Glassphalt

Hot mix where crushed glass is used to replace a portion of aggregate in asphalt concrete (Colour mix glass). The advantage of crushed glass is mainly in its processing cost, which includes reduced aggregate requirements, avoids landfill and reduces transportation costs.

Cement with Fly Ash content

By-product from burning coal, fly ash can be used as a sand replacement. Fly ash performs very well as part of cement, but requires the full 28 days curing time to gain its full strength.

Low-VOC Paints, sealers, stains

Water based acrylic paints that meet requirements for low VOC coatings and contain no formaldehyde, petroleum based solvents or other toxins.

Acoustic Ceiling Tiles

Perlite content ceiling tiles with no VOC emissions and contains no man made mineral fibres, naturally non flammable and anti-microbial. Post industrial recycled perlite content is also recyclable.

Carpet tiles

Post industrial recycled nylon content face fibre, reusable tiles.

Carpet base

Post industrial recycled rubber

Linoleum sheet flooring

Natural material components with minimal VOC's, natural anti microbial characteristics using post industrial recycled content, natural and renewable resource composition.

Ceramic tiles

Glass and clay content tiles, inherently inert, and no VOC emissions. Seventy percent of post industrial and post consumer recycled glass bottles are recyclable.

Cellulose insulation

Blow-in cellulose insulation manufactured without formaldehyde, newspapers with soy ink, non hazardous fire retardant and contains no man made mineral fibres. Post consumer newsprint fibre and recyclable.

Fibreboard

Medium density MDF manufactured without formaldehyde. Pre consumer recycled wood residual and recyclable.

Softwood Timbers

Readily available pine radiate preferred. Avoid using toxic wood finishes and detail sanding.

Gypsum wall board

Post industrial recycled gypsum content, 100% recycled content paper face fibre and recyclable.

Toilet partitions

Solid plastics manufactured without formaldehydes. Pre-consumer and post-consumer plastic bottles and recyclable plastics are preferred.

Masonry wall with render

Cement render colour impregnated using natural materials such as earth dye. Masonry block work cold process is not energy intensive and produces blockwork of ranging sizes and is fire resistant.

Steel Sheet roofing

Colorbond sheeting cold rolled to shape preferred over hot rolling process.

In general the materials proposed in this section are readily available from local manufacturers and should be considered in preference to selecting virgin materials.

Operations and Maintenance

Requirements to ensure the facility continues to achieve a 4.5 Star ABGR rating include:

- Quarterly controls calibrations must be continued to be carried out after the end of the defects liability period
- Computer rooms which serve mainly electronic traffic from outside the building must be separately metered using utility class meters.
- Computer rooms which serve mainly electronic traffic from outside the building must be air conditioned using the condenser water loop and separately metered using utility class meters.
- Any out sourced retail type facilities such as café or gym must be air conditioned using the condenser water loop and separately metered using utility class meters.

Materials

Minimising resource depletion through appropriate material selection provides ongoing benefits to the environment. Strategies to minimise virgin material depletion include:

- Use of recycled content in steel and concrete.
- Minimise the use of PVC materials.
- Use of plantation or recycled timber for finish or construction purposes.

Emissions

Minimising pollutants of any source from the precinct will play a major role in achieving high environmental credentials. Strategies which will be considered include:

- Use of ozone friendly refrigerants with low global warming potential.
- Minimisation of rainwater run-off.
- Minimisation of sewer inflow through the use of grey water systems or water minimisation strategies.
- Reduction of light pollution through appropriate lighting design.

Construction Phase ESD

Key environmental impacts associated with construction issues include:

Acoustic Environmental / Noise Control

Adequate acoustic conditions during construction activities will be required to minimise.

General Air Quality / Dust Control

Minimising dust and pollutants from burning or vehicles, provision of dust control fences, revegetation of temporary stock piles.

Construction Indoor Air Quality Management Plan

Develop management plan to monitor good IAQ throughout construction process.

Sediment and Water Control

Control the quality of surface water leaving the site through provision of straw bales, silt stop fencing, sedimentation basin, stockpiling of top soil, appropriate location of vehicle refuelling depots.

Waste Management

Prepare waste management plan to ensure waste minimisation through provision of waste separation facilities for recycling, minimising packaging, designated concrete wash down areas, avoiding burning.

Site Dirt / Mud on Roads

Minimising pollution and land development impacts from the site through provision of wheel wash down facilities.

Site Transport Management

Develop site transport management plan to control and minimise construction traffic access.

Hazardous Waste Management

Prevent site contamination through providing designated chemical and fuel storage areas, reporting requirement of all spillages, preparation of site emergency response plan and site emergency plan, preventing bulk storage of fuel or hazardous chemicals on-site.

Protection of Site Biodiversity

Minimise damage to the remaining biological diversity of the site through identifying species of conservation significance, placing protective fencing around significant trees, minimise loss of top soil and maintain a weed removal process.

Heritage Management

Limit impact of construction site on heritage areas through identifying heritage sites and developing methodology to protect heritage aspects.

Materials Selection

Minimise the use of construction materials that deplete natural resources through specifying the use of sustainable materials with recycle of component, setting minimum targets by weight of renewable materials, minimising the use of PVC and specifying the use of local vs overseas products.

Operational Phase ESD

Key environmental impacts associated with operational issues include:

Waste Management Plan

Providing verification of continual adherence to the intent of the design through water meter monitoring, benchmarking and investigating further water saving technologies.

Erosion and Sediment Control Plan

Providing verification and continual adherence to the intent of the design through ongoing inspection of erosion and sediment measures as installed during construction phase to ensure regular maintenance.

Flora and Fauna

Providing verification and continual adherence to the intent of the design to minimise the impact of the facility on the flora and fauna through implementing ongoing ecological monitoring to prevent damage, implement weed and pest control measures and conducting ecological surveys.

Indoor Air Quality (IAQ) Performance

Providing verification and continued obligation to maintain high indoor air quality over time through regular calibration of air conditioning plant, auto-monitoring and replacement of filtration and calibration of CO2 sensors.

Indoor and Chemical Pollutant Source Control

Provide verification to design obligations in avoiding exposure of building occupants to hazardous materials through continuous inspection of storage areas and adhering to hazardous storage standard requirements.

Acoustic Environment / Noise Control

Providing ongoing verification and assessment of building noise to verify system operation is in accordance with design specification through occasional monitoring.

Optimise Energy Performance

Minimise ongoing energy consumption through providing ongoing energy monitoring and setting benchmarks and targets.

Ozone Depletion

Where refrigerants with ODP values above zero are installed providing ongoing monitoring of leakage rates. Replace with improved products when they become available.

Conclusion

Appendix 1 – Aquatic Centre Task Appreciation

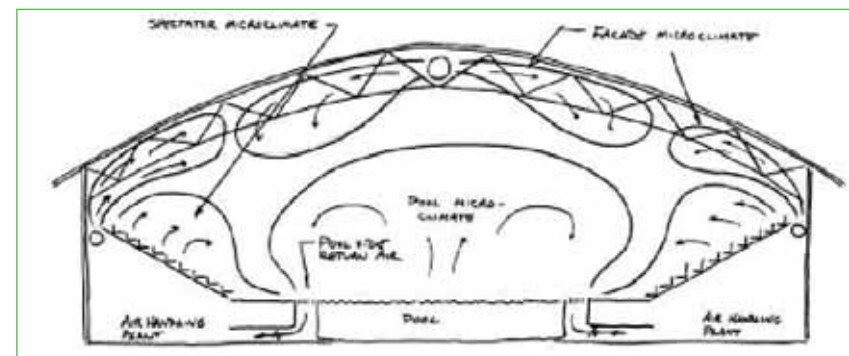
Designing an air conditioned enclosure for an internal swimming pool is challenging. The factors that need to be considered are complicated and need careful detailed analysis. Indeed pool facility designs have come a long way in the past few years. Products now on the market allow the designer to maintain comfortable conditions within the enclosure whilst heating the pool simultaneously. This provides the benefits of significant energy savings.

The desirable water temperature of most indoor pools is 28°C. This temperature provides the swimmer with a neutral heat balance when exercising - appearing not too hot and not too cold. The air temperature within the pool enclosure needs to be many things to many people. Firstly it is desirable to reduce the evaporation rate from the pool water surface. This is the greatest consumer of energy from the centre. To minimise this evaporation it is desirable to increase the humidity and temperature of the zone directly above the water surface.

Secondly, the facade structure can be constantly subjected to the corrosive atmosphere of the chlorine laden moist air in a pool facility. This corrosive environment will quickly deteriorate the internal facade unless designed correctly. Ideally, the internal surface of the facade should be protected by supplying a thin film of clean filtered conditioned air across it at all times thereby reducing the potential for contact between the structure and the pool air. This also reduces the likelihood of condensation on the internal surface of the facility.

The third requirement is to provide a comfortable environment to the spectators. Whereas the swimming area air temperature should be maintained at 26°C to 27°C to provide comfort for the bathers, the spectators will potentially be fully clothed and require an air temperature of 22°-24°C with a maximum relative humidity of 60%.

A pool enclosure designed to operate with a mixed mode micro-climate strategy will provide significantly better comfort conditions to occupants and use considerably less energy if designed correctly.

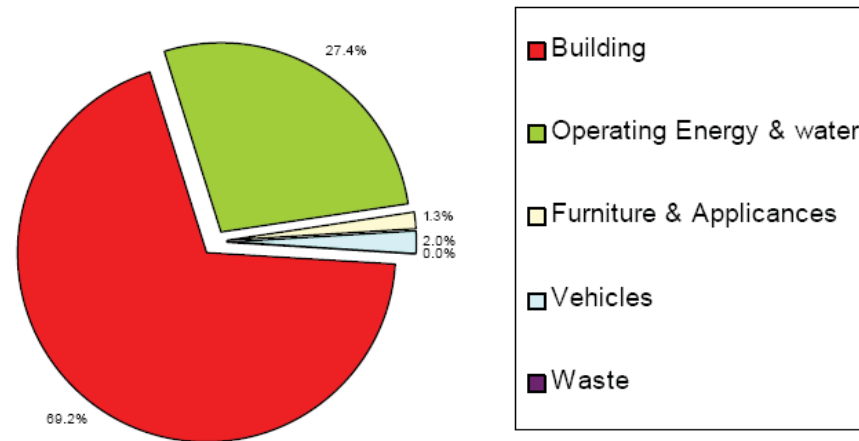


Typical Pool Facility Micro Climate Strategy

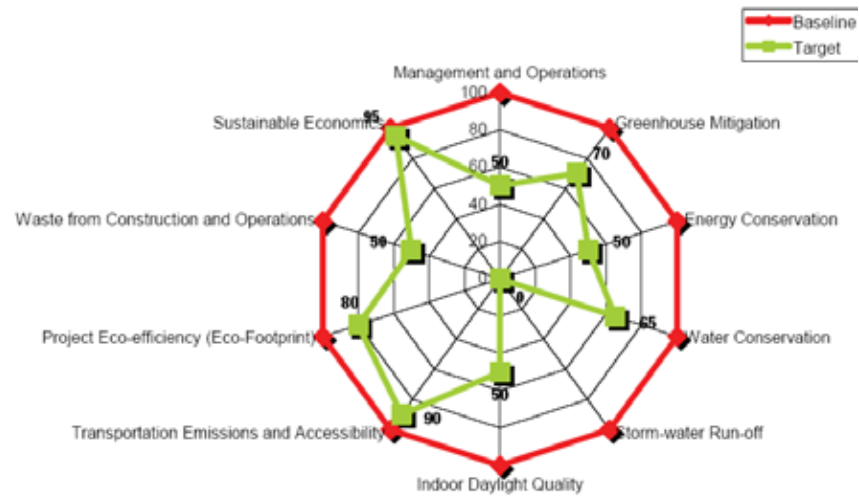
Appendix 2 – Eco Footprint Example

Below are two different methods for collation

Typical - Eco Footprint



Alternatively, the eco-footprint can be a graphical representation of the Sustainability Guidelines, shown below.



Data Management Checklist	
Office	
1. The area of your office	
2. Identify how many storeys the office has	
3. The expected life of the building in years	
4. The ground area occupied by the building	
5. The area of associated driveways, grounds etc	
6. The number of employees working in the office	
7. Office electricity consumption per year	
8. Office natural gas consumption per year	
9. Office water consumption per year	
10. % Energy sourced from green power	
Food	
Expenditure on the following:	
11. Catering and business lunches	
12. Beer + wine spirits	
13. Milk	
14. Tea/Coffee/Sugar/Biscuits etc	
Travel	
The number of trips to work using the following modes of transport:	
15. Private car alone	
16. Private car with car pool	
17. Public Transport	
18. Motor Cycle/ Scooter	
19. Cycle/ Walk	
20. Company Car	
The types of company vehicles and expenditure on fuel:	
22. Vehicle Types, fuels and ages	
23. Total Fuel Bill	
The number of trips for business using:	
24. Public Transport	
25. Taxi	
No. of flights taken per year or flight destinations	
26. Aeroplanes - Domestic - trips per year	
27. Aeroplanes - International - trips per year	
28. Destinations	
Goods	



Appendix 3 – Background Benchmarking Information

Preliminary Energy Benchmarking Report

This report has been developed in order to establish a benchmark for the proposed East Main Precinct development in terms of energy consumption and greenhouse gas performance. This benchmark is critical in determining stretch targets in these aspects for the proposed development. Data in relation to the operating energy and greenhouse efficiency of retail sites in Australia is scarce.



Retail Centres Figure 3: Retail centres in Australia

The data used to develop the benchmarks for energy are based on nineteen retail centres around Australia. Of these 8 are located in NSW, 5 in Victoria, 4 in Queensland and 1 in both the Northern Territory and the ACT. The location of these centres is broadly indicated in Figure 1. Data available for each of the retail centres for energy usage in the financial year 2001/2002 has been gathered. This data has been used to establish the information discussed throughout this report.

Energy

5.2.1 Australia Figure 2 illustrates the energy intensity (MJ) by end-use per square metre of total GLA for the Lend Lease managed retail centres in Australia. In general the maximum energy intensity was found to be 794 MJ/m² (QLD) and the minimum 259 MJ/m² (NSW), with a national average of 509 MJ/m². These figures indicate that the maximum energy intensity in Australia is more than 300% greater than the minimum energy intensity. Although there are a number of factors that may affect the energy intensity, well thought-out design strategies and ESD initiatives can result in significant savings in energy consumption. This corresponds to substantial dollar savings and reduced

greenhouse gas emissions. In order to ensure that the proposed development is as efficient in this regard as possible, the design strategies and ESD initiatives implemented at the more efficient centres will be investigated and applied to East Main Precinct development where appropriate. Figure 2 also illustrates that air conditioning of common mall and specialties areas contributes to the majority of the energy consumption in all retail centres. Lighting and power also contributes to a large proportion of energy consumption. This information is useful in establishing the design strategies that will have the greatest impact on the reduction of energy consumption in the proposed East Main Precinct development.

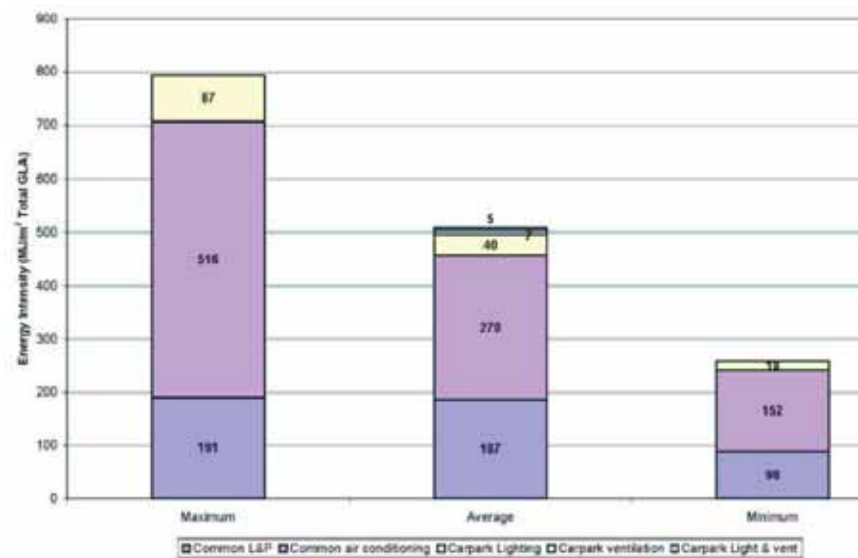


Figure 4: Maximum, minimum & average energy intensity by end-use per m² total GLA for Australia wide Lend Lease managed retail centres Y2001/2002

Victoria

Although looking at the national energy intensity is useful in developing benchmarks, state figures provide more critical information in this regard. This can be attributed to a number of factors, predominantly climate, which plays a significant role in the energy consumption of a retail centre in respect to air conditioning requirements. Lend Lease operates 5 retail centres in Victoria, all of which are located in Melbourne (Figure 3). As these centres are in relatively close vicinity of one another, a comparison is very useful to determine benchmark energy intensity for the proposed East Main Precinct development.



Figure 5: Retail centres, Melbourne, Victoria

Figure 4 illustrates the energy intensity of the five retail centres in Victoria. On average, Victorian retail centres rate significantly better than the national averages. This is indicated by the average energy intensity per m² of total GLA in the Victorian centres being 500 MJ/m² (~12% lower than national average). The maximum energy intensity for the state is 565 MJ/m² (Case Study 1) and the minimum for the state is 325 MJ/m² (Case Study 5), which is also the second lowest in Australia. However the majority (3 out of 5) of the Victorian retail centres have significantly higher energy intensities (greater than 525 MJ/m²).

The figures above indicate that the maximum energy intensity in Victoria is almost 175% greater than the minimum energy intensity. This is a significant variance considering the close proximity of the centres and indicates that through the implementation of a number of key design strategies and ESD initiatives, the proposed East Main Precinct development has the potential to head the list in regards to being the most the energy efficient of Lend Lease operated retail centres in Australia.

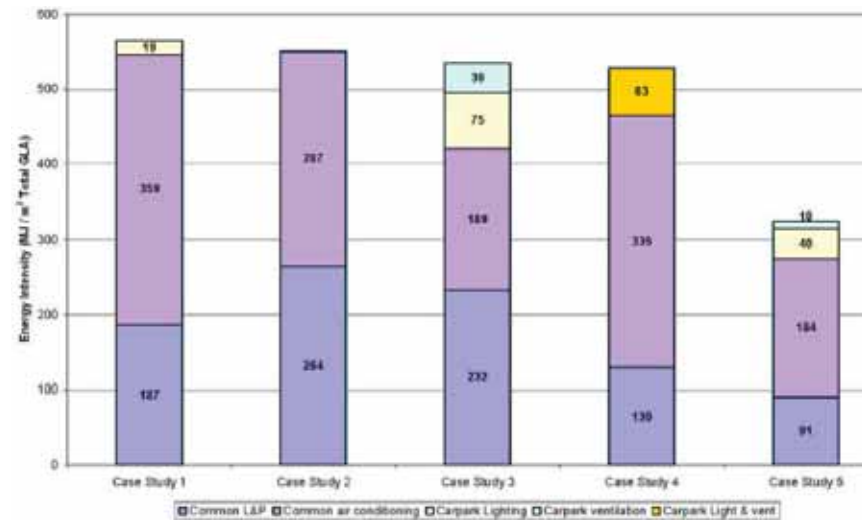


Figure 6: Energy intensity by end-use per m2 total GLA for Lend Lease managed retail centres in Victoria Y2001/2002

As with the national end-use breakdown, the majority of Victorian centres generally consume close to or greater than half of their energy in air conditioning of common mall and specialties. Lighting and power of common areas is the other major consumer of energy in these centres.

Similar to the energy consumption analysis in the previous section, an analysis of the greenhouse performance for retail centres can be conducted based on the data gathered for these centres and current state greenhouse gas coefficients.

Australia

Figure 5 illustrates the greenhouse gas emissions (GGE) per square metre of total GLA for the retail centres in Australia. In general the maximum GGE were found to be 218 kg CO2e/m2 (QLD) and the minimum 70 kg CO2e/m2 (NSW), with a national average of 145 kg CO2e/m2. Although the locations of the maximum and minimum values are identical to those for the energy intensity, the order from highest to lowest for the other retail centres has changed significantly. This is a result of the varying greenhouse gas coefficients between states, with Victoria currently possessing the highest coefficient. These figures indicate that the maximum GGE in Australia is more than 310% greater than the minimum GGE. There are a number of design strategies and options as well as ESD initiatives that will result in significant reductions in GGE. In order to ensure that the proposed development has the greatest greenhouse performance, the design strategies and ESD initiatives implemented at the centres with the greatest greenhouse performance will be investigated and applied to East Main Precinct development where appropriate.

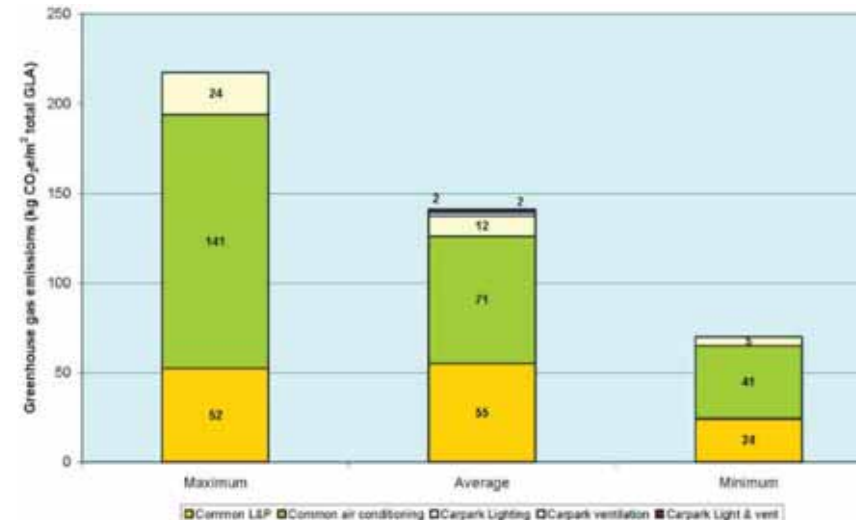


Figure 7: Maximum, minimum & average greenhouse gas emissions per m2 total GLA for Australia-wide Lend Lease managed retail centres Y2001/2002

Victoria

Figure 6 illustrates the GGE of the five retail centres in Victoria. On average, Victorian retail centres rate slightly worse than the national averages. This is attributed to Victoria having a greenhouse gas coefficient of 1.444 kg CO2e/kWh electricity used (next highest is Queensland with 0.986 kg CO2e/kWh). The poorer greenhouse performance of Victorian retail centres is indicated by the average GGE per m2 of total GLA in the Victorian centres being 172 kg CO2e/m2. The maximum GGE for the state is 197 kg CO2e/m2 (Case Study 1) and the minimum for the state is 109 kg CO2e/m2 (Case Study 5), which is also the sixth lowest in Australia. However the majority of the Victorian retail centres have significantly higher GGE (in the range of 177 to 197 kg CO2e/m2).

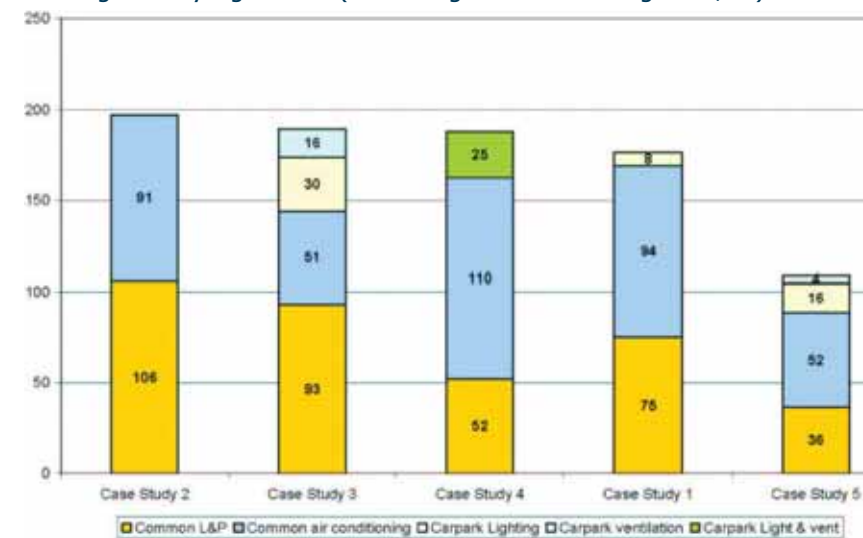


Figure 8: Greenhouse gas emissions per m2 total GLA for Victorian Lend Lease managed retail centres

The following design attributes and features are considered critical in maximising the efficiency and greenhouse performance of the proposed East Main Precinct development retail centre:

- Common area lighting system
 - BMS linked and metered
 - Separate circuits for cleaning and security
 - Photoelectric control cells to all lights
 - Dimmable ballasts to lights near skylights and linked to controls
 - Push-time controls for cleaning – no control over-ride
- Air conditioning
 - Variable air volume
 - Natural gas heating
- Carpark lighting
 - Photoelectric control
 - Solar powered lights
- Other
 - Installation of highly efficient appliances (refrigerators, freezers, ovens, etc) in all tenancies
 - Implementation of education program for tenants to encourage efficient energy use
 - Strict control of tenant fitout

The implementation of these design attributes and features is necessary in determining the proposed target energy intensities and greenhouse gas emissions provided in the following section.

Based on the information discussed throughout this report to date and the understanding that the proposed development is to similar in layout to one of the centres in Sydney, it is possible to propose some target energy intensities for the development. These target energy intensities also increase the greenhouse performance of the proposed development.

Broadly speaking, the three energy end-uses at the proposed East Main Precinct development are common lighting and power, common air conditioning and carpark lighting (Figure 7). A total target energy intensity for these end-uses of 245 MJ/m² of total GLA is proposed. More specifically, a target energy intensity of 90 MJ/m² is proposed for common lighting and power. This figure is lower than that for the similar centre in Sydney as this centre has indicated that the control switches for after hours operation are not operating optimally and there are other areas for improvement in this regard. Therefore the figure is based on the energy intensity for lighting and power at the centre with the minimum energy intensity, which is a single level centre in NSW.

It is proposed that an energy intensity target of 150 MJ/m² be set for air conditioning of the common mall areas and specialties (common air conditioning). This is in line with the energy intensity for this end use of the most efficient centres and is lower than that at the similar centre in Sydney as centre management has indicated that there are a number of areas for potential improvement in regards to common air conditioning.

Although there is a significant area of carpark that requires lighting, the energy intensity for this end-use can be significantly reduced by installing solar powered lights with photoelectric sensing. However, even with these lights it is proposed that the target energy intensity be set at 5 MJ / m². This figure is based on the current energy intensity for standard carpark lighting at a similar centre in Sydney and the assumption that solar power lights will reduce energy consumption by 70% compared to standard carpark lighting.

Table 1 provides a summary of the proposed targets and indicates the percentage reduction in energy intensity compared to the national averages for Lend Lease managed retail centres. As indicated in Table 1, by achieving the targets proposed here, the energy intensity for the proposed centre will be reduced by 52 % when compared to the national average.

End Use	State Avg (MJ/m ² GLA)	Proposed Target (MJ/m ² GLA)	% Reduction
Common light + power	187	90	52%
Common air con	270	150	45%
Carpark lighting	40	5	87%
Carpark ventilation	7	0	100%
Carpark light + vent	5	0	100%
Total	509	245	52%

Table 3: Proposed energy intensity targets

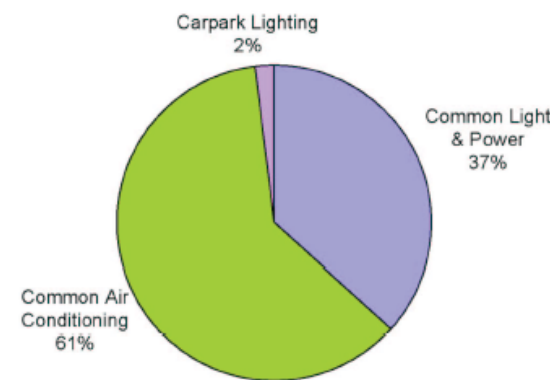


Figure 9: Proposed target energy intensities for Caroline Springs

These targets would place the proposed East Main Precinct development retail centre at the top of the list in terms of energy efficiency for the benchmark retail centres. In regards to greenhouse performance, the targets identified above would result in GGE of approximately 90 kg CO₂e/m². Although this is the best greenhouse performance of the retail centres in the Victoria, it is the second best in Australia due to the higher greenhouse gas coefficients in Victoria. Nevertheless, this figure can be further reduced by investigating opportunities for the use of green power and renewable energy on site. Furthermore, it is proposed that gas be used where possible in the place of electricity. This has not been considered in establishing the GGE figure. Therefore this is a conservative figure and could be potentially reduced by a minimum of 20% by taking these factors into account.

Preliminary Water Benchmarking Report

This report has been developed in order to establish a benchmark for the proposed East Main Precinct development in terms of water consumption. This benchmark is critical in determining stretch targets in these aspects for the proposed development.

Retail Centres

A sample of five retail centres has been used to define the benchmark performance discussed in this report. Of these 8 are located in NSW, 5 in Victoria, 4 in Queensland and 1 in both the Northern Territory and the ACT. However, unlike the energy benchmarking report, data regarding water consumption is not currently available for all these centres. Nevertheless, the data has been collected for 5 of these centres (4 NSW, 1 Victoria) and is useful in assisting to develop a benchmark and targets for water consumption at the proposed East Main Precinct development. It must be noted that the water consumption figures discussed here are for potable water only as there is no recycled water or stormwater usage at these centres. Of the 5 centres for which data was available, the average water consumption for the financial year 2001/2002 per m² of total GLA was found to be 2.92 kL/m². Furthermore, as illustrated in Figure 8, the maximum of the centres was 3.66 kL/m² (VIC 1), while the minimum was 2.17 kL/m² (NSW 4). This is a considerable variance, with the maximum figure almost 170% greater than the minimum. This indicates that there is great potential for significant dollar savings by implementing well thought-out design features and ESD initiatives.

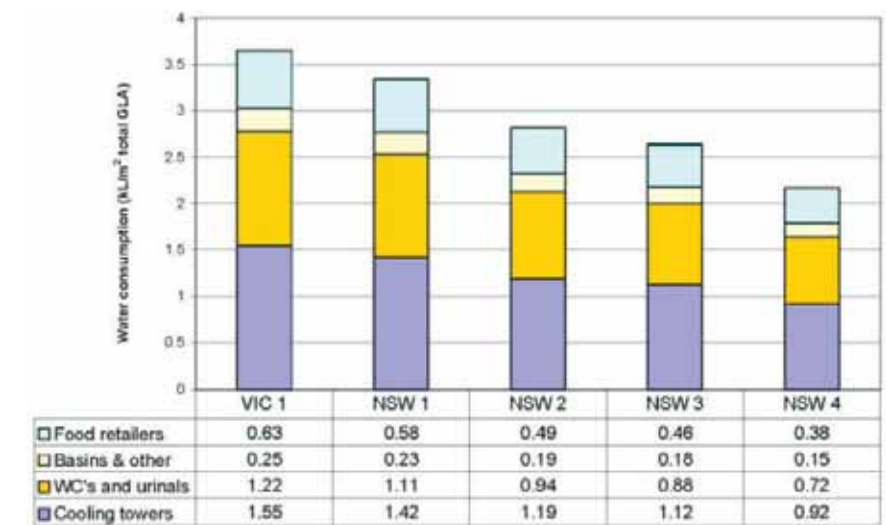


Figure 10: Water consumption per m² total GLA for 5 retail centres in Australia Y2001/2002

Figure 8 also indicates the end-uses for water in the 5 retail centres for which data was available. A general trend is present across all these centres, that is that water consumption based on a per m² of total GLA basis, is greatest in cooling towers, followed by water closets and urinals, food retailers and basins and other. This breakdown of end-use water consumption is particularly important to establish the potential areas for rainwater and recycled water use. For example, the majority of water is used in cooling towers and water closets and urinals for which potable water is not required. Using recycled water or collected rainwater for these end-uses is likely to result in significant long-term economic savings and immediate environmental benefit.

Key design attributes and ESD initiatives

The following design attributes and features are considered critical in maximising the water efficiency of the proposed Greenedge retail centre:

- Installation of 4A and 5A water rated taps (in hand basins and kitchen basins), urinals and toilet suites. An approximate calculation has indicated that this could result in a saving of approximately 30% when compared to installing 3A water rated fixtures.
- Provision for rainwater collection and re-use from roof areas and outside impermeable areas. This requires that outside impermeable areas be constructed with materials that allow the re-use of rainwater (i.e. not asphalt or bitumen which result contain high levels of PCBs) for irrigation and in cooling towers and toilet suites (pans) and urinals. Approximations of the rainwater that could be collected based on the roof area and impermeable area of the proposed development as well as the average annual rainfall for the Sunbury Melton region are provided in Table 2. Some of the potential end-uses for this water are also included here.

	Approx. rainwater collection p.a. (kL)	Proposed end-use
Roof	2,200	Toilet suites and urinals
Carpark and other outdoor impermeable area	10,500	Passive irrigation

Table 4: Rainwater collection and proposed end-uses

Investigate other uses for rainwater collected on site. For example, it may be possible to use this water for cleaning purposes such as hosing down of dock and trade waste areas. Fire suppression may also be another area in which the use of rainwater would be suitable.

- Recycling of water used at the proposed development or use of recycled water from a nearby recycled water treatment plant may be a possibility. Water from cooling towers may be able to be re-used for this same purpose or for use by WCs and urinals. Furthermore, the Sunbury Melton Recycled Water Project may provide a valuable opportunity for the development to make use of recycled water.
- Education programs (signs, leaflets, booklets, workshops, etc) should be implemented to encourage tenants to use water efficiently.

Proposed target water consumption

Based on the data gathered and analysed as well as the design attributes and ESD initiatives discussed in this report, it is possible to propose target water consumption figures on a per m² of total GLA basis.

For cooling tower water consumption, the figure is taken as zero as it is not proposed that cooling towers be installed at the centre. That is the air conditioning system being proposed is an air-based system, thus eliminating the consumption of water for this end-use.

Water consumption targets for other end-uses have been determined by reducing the average of the other retail centres by 35%. This is based on the information provided previously that by installing 4A or 5A water rated fixtures, water consumption could be reduced by approximately 30% when compared to 3A rated fixtures. An extra 5% reduction is added based on the assumption that not all these centres have 3A water rated fixtures (i.e. some fixtures are likely to be 1A or 2A water rated). This approach resulted in water consumption of 0.63 kL/m², 0.33 kL/m² and 0.13 kL/m² for WCs and urinals, food retailers and basins and other end-uses respectively.

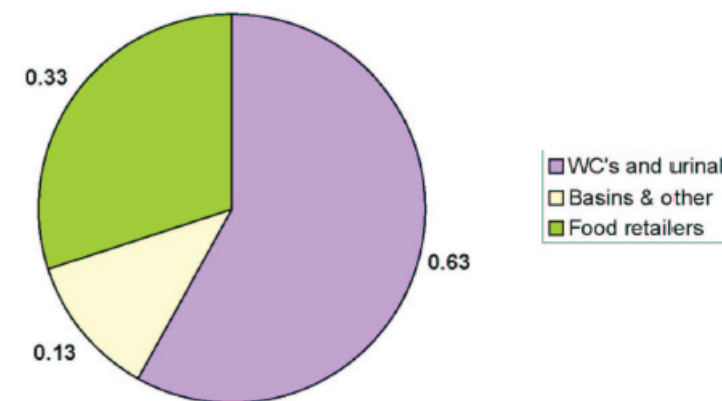


Figure 11: Proposed target water consumption per m² total GLA for Caroline Springs

The targets established for each end use (Figure 2), result in a total water consumption of 2.10 kL/m². However, the actual need for potable water may be considerably less than this. By using recycled water and collected rainwater in WCs and urinals. This results in potable water consumption in the order of only 0.5 kL/m². By achieving this target, there are likely to be significant long-term economic benefits and substantial immediate environmental benefits.

Appendix 4 – Sustainability Options Checklist

Aquatic Building

Option	Environmental Benefit	Capital Cost	Pathway	Evaluation Criteria
Management and Operation				
Greenhouse Mitigation				
Energy Conservation				
Installation of VSDs on pumps	Reduced pumping energy	\$5000	LCA	simple payback 2.5yrs
Water conservation				
Storm Water Run-off				
Indoor Daylight Quality				
Transportation Emissions and Accessibility				
Waste from Construction and Operations				
Sustainable Economics				

