

**ADOPTED
WANDANA
STRUCTURE PLAN
1998**

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February 1998**

PREPARED BY THE CITY OF GREATER GEELONG

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FOREWORD

The City of Greater Geelong first exhibited this Public Discussion Document for the Wandana area in October 1995 as a response to determining the most appropriate manner in which the area bounded generally by Scenic Road, the Barwon River, the Outer Freeway Reservation and Barrabool Road could be developed.

Since that time Council has adopted the Urban Growth Strategy and Arterial Roads Study as Council policy directions for next 25 years. These strategies confirm that urban development of the Wandana area is appropriate. This Structure Plan has been updated to reflect these policies.

A revised Structure Plan was exhibited in March 1997 which resulted in the receipt by Council of a total of 11 submissions. The Council has now considered these submissions which have resulted in a number of further modifications being made to the adopted Structure Plan.

Council wishes to pursue further urban development in the Wandana area because it provides an excellent opportunity for attractive high quality residential development in a location which has proven demand and aesthetic appeal. Further, urban growth in this area can be considered to be essentially infill development in close proximity to all urban services and facilities.

Prior to development occurring it will be necessary for more detailed outline development plans to be prepared and for the area to be rezoned through the normal amending planning scheme process.

Neil Savery
Manager, Integrated Planning

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1. INTRODUCTION

In August 1981 the former Geelong Regional Commission, and the former City of South Barwon and the Shire of Barrabool adopted a Structure Plan for the Wandana-Montpellier areas on Geelong's western urban fringe. The 1981 document focussed on the southern Wandana area, which has progressively developed in the intervening years. This Structure Plan has been prepared with regard to the still undeveloped northern parts of Wandana which has been confirmed as a growth area in Council's adopted Urban Growth Strategy. Although the general principles of the original Structure Plan remain valid, the different circumstances applying in the northern area and the lapse of time require a fresh and more detailed assessment.

This *new* Structure Plan aims at guiding development in the best interests of the community, residents and landowners. Its overall philosophy is to maximise the residential development potential of areas relatively close to the centre of Geelong, while also recognising the importance of the landscape and the interface with the Barwon River.

Figure 5 - the Structure Plan Map, shows how development will proceed in the area.

This revision of the 1995 Draft Wandana Structure Plan - Public Discussion Document has been prepared to update the document since its publication for exhibition in November 1995. Since that time the Council has adopted the Urban Growth Strategy and taken into account submissions made to the Draft Wandana Structure Plan March 1997 Revised Public Discussion Document. It is Council's view that:

- Wandana provides an excellent opportunity for attractive high quality residential development in a location which has proven demand and aesthetic appeal;
- Wandana is essentially an in-fill development location;
- Previous commitments and expectations to development were given to owners and developers; and
- Traffic generated by the development is capable of being managed with improvements to the existing arterial road network.

In adopting the Urban Growth Strategy it is recognised by Council that the Structure Plan must clarify the need for:

- the requirement for developer contributions;
- staged rezoning of the area;
- setbacks from Barwon River; and
- provisions by which the western limit to urban growth is to be achieved

2. THE STUDY AREA

Figure 1 outlines the Study Area of this Structure Plan. It is a significant urban fringe in a wider area of some regionally significant natural physical features - the eastern extremity of the Barrabool Hills, the Barwon River valley and the Ceres Lookout. Combined these areas afford views over Geelong and beyond.

Forming the western boundary of the Study Area is the Outer Freeway reservation which has been a feature of the Planning Scheme since its inception in 1981; it has traditionally been considered to delineate the extent of development to the west of urban Geelong. The Barwon River is the northern boundary of the Study Area with Scenic Road the eastern boundary. Barrabool Road forms the southern boundary of the +Wandana Study Area.

Conventional residential development, progressed by the implementation of the 1981 Structure Plan, bounds the area to the south of Barrabool Road, whilst similar development exists to the east of Scenic Road.

The Study Area is held in three major ownerships with the McCann family owning the majority of the area, approximately 163 hectares. The Barrabool Hills Baptist Community Church occupies a prominent 44 hectare site in the central part of the Study Area. A 33.9 hectare property in the vicinity of the River is known as the Mt Brandon Estate. Figure 2 shows the land ownership of the Study Area.

The Study Area is rolling country with some steeper slopes approaching 1:5. There is a dominant ridge line traversing the Study Area from the Montpellier water basins in the north east, to the Ceres Lookout in the south west. Topographically, the Study Area can be split into two main sectors, one north of the main ridge line and one south. The northern portion contains a series of 4 north running ridges and gullies. The terrain similarly varies in the south, with general south easterly and easterly aspects. The interesting and varied topography highlights an obvious outstanding residential development potential. Figure 3 shows the natural features of the Study Area.

Topography ranges from relatively small areas of gently sloping land to areas of steeply sloping gullies. Prominent features are formed by several distinct knolls from which panoramas of the surrounding countryside are spectacular. The eastern edge of the Barrabool Hills and its highest ridgeline, provides a rural backdrop and forms a significant landscape feature visible from the urban areas of Highton, Belmont, Newtown, Geelong West, Fyansford and Ceres.

Whilst parts of the south eastern sector of the Study Area fronting Barrabool and Scenic Roads have developed for residential purposes, the majority of the Study Area remains devoted to rural land uses with a balance between cropping and grazing.

Access to the site is restricted to the eastern (Scenic Road) and southern (Barrabool Road) boundaries, whilst the Barwon river in the north and private property along the Freeway Reservation substantially reduce public access. In the northern half, drainage is to the north, directly into the Barwon River, and in the south, drainage is to the south east and east into the Highton catchment.

With the exception of the residential development in the south eastern parts of the Study Area, the only structures located in the Wandana area north of Barrabool Road are the

Barrabool Hills Baptist Community Church and a hay shed, the Highview homestead and associated service buildings.

Land in the south eastern sector of the Study Area has already been subdivided into residential lots and is mostly either developed or in the process of being developed. This area is typical of the residential development across the Highton and Montpelier areas with larger homes, 2 storey predominance, strong vertical elements, neo-federation style influential in design and a street system predominated by culs-de-sac. Advantage has been taken in the design and orientation of the homes of the views afforded over Geelong and its surrounds. There is an intermixing of unit development in the area which is of a high quality. A new subdivision, known as the Highview Estate, has recently been placed on the market in this area and adjoins Barrabool Road. Provision has been made for the subdivision to connect with further development to the north and west via open space and street links. The layout of the principle features north of the ridgeline needs to be confirmed so that development within existing zoned land south of the ridge can be integrated with long term plans.

Plantations are restricted to some significant stands of eucalypt, pine and cypress towards and on the flat areas of the Mt Brandon section. Soil stability is generally good, with only one gully exhibiting any significant active erosion.

The Study Area is covered by two Collector Districts which also encompass other areas, making assessment of the population characteristics difficult. This is further complicated by the significant changes in development of the area since the last Census in 1991. It is however, possible to estimate the current population of the Study Area by multiplying the number of dwellings by the occupancy rate for urban Geelong as determined by the 1991 Census. This reveals that the population at September 1995 is estimated at 150.

3. A NEW STRUCTURE PLAN

The context for a new Structure Plan is set by various other strategic policies and documents as detailed on the following pages.

3.1.1 Geelong 2010 - A Preferred Future

A significant initiative of the City of Greater Geelong is the 'Geelong 2010 - A Preferred Future' project. 'Geelong 2010' presents some of the major directions and goals envisioned by a broad cross-section of the Geelong community and is enshrined across broad sectoral streams including an ecologically sustainable Geelong and a centre for tourism.

The broad strategic directions identified in the Geelong 2010 report are incorporated into the City of Greater Geelong planning and budgetary process.

3.1.2 Urban Growth Strategy

The Urban Growth Strategy, adopted by Council in December 1996 was prepared to determine the most suitable areas for the accommodation of urban growth until the year 2020, giving effect to several planning principles and objectives. As it applies to the Wandana area, the adopted Urban Growth Strategy includes the Study Area as a location for future urban development.

3.1.3 Arterial Roads Study

Council's Arterial Roads Study adopted in December 1996 identifies the long term arterial road network for the municipality and provides the basis for ongoing traffic management and funding.

Action 13 addresses the Wandana Study Area and states:

"Future residential development at Wandana will generate the need for transport infrastructure which should be further assessed through the preparation of a Development Contributions Plan."

3.1.4 Structure Plan Objectives

Guided by these Strategies these are the objectives on which this new Structure Plan is based:

1. To identify the extent of residential development that should occur within the Study Area and the form of such development.
2. To ensure that urban development can be adequately and economically provided with reticulated services and that development is appropriately staged.
3. To safeguard the Barwon River ecosystem and the enhance its recreational potential.
4. To incorporate in the development of Wandana an integrated system of open space which links to the Barwon River.
5. To define the parameters for a safe and convenient circulation system for all forms of transport, and to minimise the effects of traffic movements outside the Study Area.

6. To identify appropriate locations for commercial and community facilities.

4. IMPLEMENTATION OF OBJECTIVES

4.1. OBJECTIVE 1: EXTENT OF RESIDENTIAL DEVELOPMENT

'To identify the extent of residential development that should occur within the Study Area and the form of such development.'

This objective arises from the circumstances of urban development intended to be located in an undulating and highly visible landscape with a distinctive character, and where significant infrastructure services need to be implemented. The proximity of the Study Area to central Geelong and its attraction for residential development suggest that its potential for residential use should be maximised. This was confirmed in the Urban Growth Strategy, adopted by Council in December 1996.

The Structure Plan intends the major part of the Study Area to be developed for urban purposes. As well as land for housing, land for other urban uses including open space, recreation, commercial and community facilities and service infrastructure will be required.

The requirements of VicCode and the Good Design Guide will be implemented in the preparation of the Outline Development Plan which will prescribe in detail the final design of subdivision of the Study Area. Due to the topography of the area and the need to integrate all urban development elements together, additional guidelines are required.

A range of densities are proposed in the Structure Plan to take account of the topography, the outer freeway reservation and the entrance to Geelong. These are schematic at this stage (low, medium and high density) but will be defined in the Outline Development Plan. This approach balances the need to ensure cost effective utilisation of the limited supply of urban land against the need to design around the topography and features of the area.

Council does not wish to pursue an overlay control to require planning scrutiny for residential development over the bulk of the Study Area as it becomes an unnecessary imposition on both the community and the Council in terms of onerous planning permits requirements for houses, retaining walls, backyard sheds etc. It should be noted that development of much of Highton and Wandana Heights has progressed over the past few years, and with time, the establishment of the landscaping has resulted in a well treed environment which does not overly impose on the views of the Highton and Wandana Heights from other areas of Geelong. Specific attention will be given however, to the Barwon River environs which is discussed in further detail later in the Structure Plan. Further consideration will also be given to the low density residential area north of Barrabool Road where future home owners will need to install tanks for water supply purposes to ensure they can be screened from Barrabool Road.

Recommended guidelines for achieving Objective 1 are described in the following sections:

4.1.1. VicCode and the Good Design Guide

The standards of these documents, which are now incorporated into the Greater Geelong Planning Scheme, will be implemented in the Study Area to encourage urban housing, add urban character, integrated residential streets with open space and allow sensitive

house siting. Due to the slope of the land and the topography of the area, VicCode style road layouts may not be able to be uniformly implemented across the Wandana area, however a proposed road layout indicates that a permeable and 'open' system can be achieved (refer to Figure 4). Culs-de-sac will be kept to a minimum to maintain the permeability of the subdivision and reduce the need for provision of small parks to link the streets. The Outline Development Plan will implement these measures.

4.1.2. Subdivision and Development Guidelines

In addition to the requirements of VicCode and the Good Design Guide these specific measures should be implemented:

- subdivision (and development) to allow retention of significant stands of trees identified on the Structure Plan.
- provision of an integrated system of public open space which links the Study Area with the Barwon River.
- streets to be appropriate design width in accordance with VicCode to minimise cutting and filling, with any necessary batters appropriately planted and cognisant of the land contours.
- drainage lines to be used as additional landscaped areas and drainage facilities to avoid visible concrete structures where possible.
- stormwater discharge to be minimised by limiting areas of impervious surfaces and by incorporating land based absorption, swales and retarding basins.
- subdivision permits to require the retention or provision of top soil on each allotment to ensure future land owners can satisfactorily landscape their properties.

4.1.3. Outline Development Plan

The preparation of an Outline Development Plan will be required prior to subdivision of the Study Area. It will provide the detailed planning for the internal road network and external access points, location of the linked system of open space and drainage reserves, location of community facilities, shops, services and school site, and subdivision layout showing lot sizes and orientations, density and lot yield. Staging of the subdivision and development will be nominated on this plan.

The Outline Development Plan will be prepared by Council with input from the developers of the area and will be finalised prior to any further development of the area proceeding.

4.1.4. Higher Densities

Higher density nodes for multi-residential or higher density development are proposed where appropriate opportunities arise. Land in the vicinity of the proposed commercial and community centre is a preferred location for higher density development, whilst another may be around the Baptist Church site. Others will be encouraged on suitable level sites, which can accommodate higher density development and which enjoy good transport access. Implementation will be through the Outline Development Plan.

4.1.5. Lot Yield

Current average lot yields in Geelong are 10-12 lots per hectare, but with unit development and further subdivision, parts of the Geelong growth areas are achieving higher dwelling densities. Given the special topographical character of the area and a predominance of steeply sloping land (15% plus gradient), much of the land will yield only 10 lots per hectare or less. Other limiting factors to increased densities across the entire Study Area are the setbacks of development from the river, the opportunities for placing commercial and community uses on the higher, flatter land and the need for ample drainage reserves.

Larger lots should be located on slopes greater than 10% which comprise the majority of the land with smaller lots to be created on gentle slopes to avoid significant excavation works. This will be balanced by the development of normal and lower densities on the remainder of the Study Area as notionally shown on the Structure Plan Map and will be included in the Outline Development Plan.

The proposed lot yield from the McCann, Mt Brandon and Baptist Church properties in the Study Area is dependent upon the ultimate density of development, final land area devoted to open space, drainage reserves, commercial/community uses and streets, and existing land uses.

It is expected that the area will yield in the vicinity of 1,800 - 2,000 lots of varying sizes.

4.1.6. Interface of Study Area with Freeway Reservation

The western parts of the Wandana area abut the outer freeway reservation for Geelong. Whilst an investigation of the need for any construction of an outer freeway is part of the Council's Arterial Road Study, any future development of the Wandana area must be cognisant of the potential for some form of arterial road to be constructed along its western boundary. Subdivision and development of the Study Area adjacent to the reservation will therefore require sensitive treatment to negate the effects of any traffic along the proposed route. Future detailed planning of the Wandana area via the Outline Development Plan and detailed road designs will provide the necessary detail to address any noise abatement measures and visual amenity. It is noted that the anticipated density of development abutting most of the freeway reservation is low density, with some areas of public open space also in the vicinity.

Irrespective of if and when an arterial road is constructed within the outer freeway reservation, the western boundary of this subdivision will form the extent of outward urban growth in the Wandana area, ie no further encroachment into the Barrabool Hills will be supported.

4.2 OBJECTIVE 2: SERVICING

'To ensure that urban development can be adequately and economically provided with reticulated services and that development is appropriately staged.'

The major servicing requirement for the area is the construction of sewerage infrastructure to the land north of the ridge traversing the Study Area. Development of the Study Area south of the ridge can be achieved without augmentation of the existing sewerage system.

In terms of infrastructure provision, the most logical and economical staging of development will be to complete development of the southern catchment ie. westward toward the freeway reservation, then commence the northern catchment.

There is currently capacity within the Queens Park sewerage system for a retarded discharge of 50 lots on the Mt Brandon Estate in the northern sector of the Study Area. The developer would be responsible for meeting the costs of the temporary work required and also for a contribution towards the final disposal works. A water supply could be provided to the land from the Montpellier water supply system which can supply up to the 75m AHD contour. It is anticipated that development within this capacity is likely to continue parallel with development of the southern sector of the Study Area.

The extension of services to the north of the ridge will be staged to take account of the economic phasing of infrastructure provision and to coincide with the subdivision staging. Given the large infrastructure costs involved, it is imperative that all contributing developers will be involved.

Overall, no impediments to total development of the Wandana area is anticipated through an inability to serve future areas with either sewer or water although staging of infrastructure works will determine when land is able to be released for development..

4.2.1. Sewer Reticulation

There is some capacity at present in the existing Queens Park sewerage system for development (approximately 50 lots) at the northern end of the Study Area. While this will allow some development to be initiated, ultimately the sewage would be redirected to the sewerage system proposed for north of the ridge line (see below) which will pump back to the Wandana Pump Station.

Therefore, the Wandana pump station in Thornhill Road (at Pepperdine Way) has been designed with sufficient capacity to serve the full development of the Wandana area. Sewage is pumped from there via a pressure main along Thornhill Road to a gravity sewer which connects into the trunk sewer system at Grove Road, Grovedale.

The southern area of Wandana Heights, from the ridge line at Leigh Road south to Barrabool Road, can connect to the existing gravity system which already drains to the Wandana Pump Station.

Land north of the ridge will require major new infrastructure, which will need to be totally funded by developer contributions. As a first stage, a permanent pump station will need to be constructed near Barwon Water's Montpellier water supply basins, at about the 80 metre contour. A new sewer 3 km long will be required from there, south to the Wandana Pump Station in Thornhill Road. Depending upon the subdivision layout, these works could serve up to half of the area north of the ridge. When the lower area is developed, north towards the Barwon River, a second permanent pump station will be required in one of the gullies on the extension of Highett Road, at about the 20 metre contour, and a pressure main pumped from there to the first station. The preliminary estimated cost of these works (2 pump stations and length of rising main) would be about \$2 million.

4.2.2. Water Reticulation

The existing water supply infrastructure can supply a normal gravity service to all land east of the freeway reserve down to the Barwon River ,except for an area located in the southwest corner of the Structure Plan, which is located above the RL136 m AHD contour. That is:

- Montpellier Basins (FSL 102m AHD) can supply all land up to about the 75 AHD contour
- The Highton High Level (HHL) tank (FSL 160m AHD) can supply all land between the 75 and 136 AHD contours.

The area of land above the 136 m contour is one which Barwon Water has consistently maintained cannot be adequately serviced with a normal gravity supply from the HHL tank. This area also extends south of the new Structure Plan boundary of Barrabool Road and includes land surrounding the HHL tank itself. The highest point of this land, north of Barrabool Road, is around the 154 m AHD level.

As stated under Objective 1 the land above the RL136 coincides with the entrance to Geelong on Barrabool Road from Ceres and beyond and is adjacent to the Outer Freeway Reservation. On the basis of planning and aesthetic concerns this area is considered suitable for low density residential development (in the order of 0.4ha sized lots).

While water can be supplied to this area, pressure would not be satisfactory from the present system level available.

Two options are available including an elevated storage tank system either at Wandana or Ceres (20 metres and 15 metres high towers respectively). This option is undesirable due to the aesthetic impact of such structures on the landscape and the potential for further development pressure of land between the Outer Freeway Reservation and Ceres which is against Council policy. The alternative option of individual tank and pumping systems is a feasible means for supplying low density lots with water. This will involve each allotment having its own tank and pump booster which would be fed from a lower pressure gravity supply from a reticulation system. This option may be agreed to by Barwon Water as a temporary solution subject to several conditions including the provision and operation of the tanks and pumps by owners, tanks are of sufficient size, owners enter into a written service agreement with Barwon Water about the nature of the system and the long term obligation of individual property owners connecting and

contributing to a proper water supply, if and when it is constructed as a permanent solution. The conditions would need to be included on land titles etc.. This option does provide a fairly low cost option for temporarily supplying the high level land for the immediate future until such times as a permanent water supply can be installed.

4.3. OBJECTIVE 3: BARWON RIVER ENVIRONS

'To safeguard the Barwon River environs and to enhance its recreational potential.'

North of the major ridgeline all drainage from the area falls steeply toward the Barwon River. Consequently, all stormwater generated by development must be regulated and prevented from affecting the river system by the use of an integrated series of pollution and sediment control devices.

Problems associated with water pollution are varied including the reduction of aesthetic quality and hydraulic efficiency due to excessive weed or algae growth, changes in potential for recreational uses and changes in the diversity and habitat of animal and plant species. The use of drainage or detention basins to capture storm water flow from the developed areas will need to be carefully designed to ensure that the flow is controlled, sediment is captured and pollutants are prevented from entering the Barwon River.

The types of stormwater responses will depend upon the soil type and vegetation of the Study Area, the topography, particularly where the use of roadways as floodways is considered, and the existing natural lines of drainage.

In detail, site selection for detention basins and water quality control ponds depends on many factors including existing water course locations and types; soil types; site topography; critical storm characteristics; position of development site in the catchment; and need for correctly sized areas to suit various recreational uses which may be required in a particular location.

In the Wandana Study Area the location of the gullies will be the primary factor determining reason for the siting of drainage reserves. A detailed system of drainage/retention basins needs to be designed for the Study Area to ensure:

- the highest quality of water entering the Barwon River system;
- maximum opportunity for multiple use of drainage and open space land;
- sufficient capacity to cope with peak storm flows;
- site sensitive design to the landscape;
- integration of public and private management of the facilities;
- sufficient capacity to incorporate significant planting/landscaping; and
- maintenance of habitat.

One of the objectives of the Structure Plan is to enhance the Barwon River environs, which apart from their recreation potential and visual importance, include native grassland and riverine vegetation and industrial archaeological sites. This objective translates into preservation and enhancement of the existing landscape character of the Buckley Falls area and to ensure that new development does not reduce the recreational value and potential of the area or have a detrimental effect on the environment. It is therefore particularly important to achieve a balance between residential and natural environments in the long term planning for the northern parts of the Study Area and the Buckley Falls Park.

There is an opportunity to extend the regional open space system along the Barwon River upstream from Buckley's Falls as far as the Freeway Alignment. This would build upon the extension of the park which has occurred on the north side of the river, and ideally will include access for both pedestrians and cyclists.

The issue of land uses adjacent to the River is addressed by the Buckley Falls Management Plan which was prepared in 1991 by the Department of Conservation and Natural Resources in conjunction with the local Councils, Geelong Regional Commission and Barwon Water. The broad objectives guiding the Management Plan are:

- to conserve and regenerate the terrestrial and aquatic flora and fauna of the Buckley Falls environs;
- to protect the archaeological, historical, cultural and geomorphological sites of significance within the study area;
- to maintain and enhance the visual qualities and identity of the study area;
- to provide and encourage recreational and general use of the area by the community;
- to provide a framework for the future management of the area; and
- to provide an opportunity for public comment and consultation.

In terms of adjacent land uses, the aim of the Management Plan is to ensure new developments along the river corridor are sensitively designed and have minimal impact to encourage existing owners to manage their properties in accordance with the above objectives.

To achieve this, proposed management actions in relation to land within the Study Area (south of the River) aim to limit the extent of building development on the Mt Brandon and Highview properties and require new developments along the river corridor to meet visual guidelines - the relevant extract from the Management Plan is attached as Appendix 1. In general the visual guidelines address subdivision patterns, planting, density of development, undergrounding of services, earth cutting, building materials, finishes and colours, landscaping and fencing. Further, the Masterplan documents an area of 200 metres around the River which is to be free from development, with further areas of low and medium density development beyond this zone (refer to Figure 4 for detail).

As the Buckley Falls environs are developing for passive recreation use, the Council believes the visual integrity of this area is essential to the enjoyment and experience of the area by the community and visitors. As shown by current developments and land uses, the Management Plan identifies that urban encroachment on the river corridor from the Mt Brandon and Highview properties is the greatest threat to maintaining the visual quality and landscape character of Buckley Falls.

Following a coordinated assessment of the potential of the River environs, the Management Plan identifies management actions for the future development and consideration of the land adjoining the River, with rigorous analysis of the 'peninsula' property (Figure 4). As a minimum the Management Plan recommends that all frontages to the River for a depth of at least 50 metres should become incorporated in a public open space reserve to allow continuous public access in this natural environment. It further recommends that the remainder of the Mt Brandon 'peninsular' remain substantially undeveloped, together with all land within 200 metres of the river corridor.

This approach was calculated to protect the visual experience gained from the use of the Park and the various viewing points available to visitors and tourists.

The Management Plan indicates that the 200 metre setback would be privately owned land with houses restricted from establishing within this area through planning controls.

Ongoing maintenance and improvements to the Buckley Falls Park is overseen by an Advisory Committee comprising representatives of Council, Department of Natural Resources and Environment, Barwon Water, Geelong Field Naturalists and the Friends of Buckley Falls. The area of jurisdiction of the Committee covers the Crown land and Council reserves around the confluence of the Barwon and Moorabool Rivers. Any additions to this Park through the creation of new open space reserves along the River will be consolidated with existing public land, with management overseen by the Advisory committee.

Recommended guidelines for achieving this Objective are detailed in the following sections.

4.3.1 Stormwater System

The treatment of stormwater is an important consideration in the Structure Plan and accordingly, implementation of a comprehensive drainage scheme within the Study Area will be required to ensure that the effects of runoff created by development of the Study Area for urban purposes, have minimal effect on the Barwon River in terms of quantity and quality of water discharged, its visible impact and its ecological effect. The Outline Development Plan for the Study Area will detail the intricacies of a stormwater drainage system, and will indicate the staging of the implementation.

4.3.2. Visual Protection - Barwon River Environs

To achieve the objective of the Structure Plan it is proposed that the principles enunciated in the Buckley Falls Management Plan be implemented.

Council's current policy is that it will not support any rezoning proposal which commits land within 200 metres of the River to future residential development. There is neither the need nor the justification to provide for additional residential development in such a sensitive area along the River. Nevertheless, the owners of the Mt Brandon property wish to pursue the opportunity to undertake dense screen planting on the peninsula in the hope of persuading the Council that it would be possible for residential development to occur without any detrimental impact when viewed from the Buckley Falls Park. Whilst Council would not wish to offer any objection to the owners carrying out these landscaping improvements, it is unable to commit a future Council to agreeing to review the existing policy stance.

It is proposed to have a 50 metre public open space reservation along the river frontage. The balance of the 200 metre setback will be maintained in private ownership and building envelopes prescribing the location of building construction; and buildings on the Mt Brandon peninsular property subject to the provisions of the Area of Interest or Landscape Value overlay. Options for use of the setback area include open space or gardens as part of residential properties, hobby farms or land servicing a cluster farm or institutional operation.

Additional tree planting may be required for any residential development in areas prominently visible from the Barwon River open space.

4.4. OBJECTIVE 4: OPEN SPACE PROVISION

'To incorporate in the development of Wandana an integrated system of open space which links to the Barwon River'.

A significant asset of the Study Area is the Barwon River which forms the northern boundary. The scenic nature of the Barwon River environs provides many recreational opportunities not available in other urban areas which should be addressed in the formation of this Structure Plan. As an area identified for significant urban expansion, open space will be required to satisfy the recreation needs of the new population.

Extension of the Buckley Falls Park around the River to include elements of the regional landscape of the Barrabool Hills is an achievable goal which can be detailed and finalised as part of the open space contributions. This has been discussed in the previous section.

With the strategic location of the Wandana area between two major regional open space assets, the Ceres Lookout/Drewan Park and the Barwon River/Buckley Falls, an opportunity exists to develop a comprehensive system of linked open spaces which will integrate these regional assets into the planned residential development of the Study Area. The provision of open spaces in this manner requires careful consideration of its design at the Outline Development Plan and subdivision stages.

The multiple use of drainage reserves for a range of activities, but namely drainage management and open space, is an emerging approach within the development industry and local government. The principles of this are designed to achieve:

- variety in open space;
- distribution throughout area/locality;
- high use ability for recreation;
- maintenance of riparian vegetation and bushland habitats;
- appropriate drainage and hydraulic design parameters to meet intended capacity and intended recreational use;
- consistency in application of planning and design principles; and
- certainty on costs and benefits of provision and maintenance.

By virtue of the natural fall of the Study Area north of the ridge toward the River and the need for a combination of drainage solutions, the dual use of a staged/stepped system of retardation reserves for passive recreation and walking and cycling links is achievable and will connect the residential areas with the Barwon River. However it should be noted that where drainage requirements are the primary function and land is not suited for recreational purposes, it will not be accepted by Council as part of the 5% open space component required to be provided by the developer.

Recommended guidelines for achieving this Objective are outlined below:

4.4.1. Open Space Policy

The City has adopted an Open Space Policy for passive or informal space which establishes the criteria for providing open space, nominates factors to be considered in developing open space and lists actions to be pursued by Council. This Open Space policy is subject to a current major review by the Council and the new policy guidelines will be included in this document if available prior to printing. The new open space policy guidelines will be implemented in the preparation of the outline development plan.

Council will also need to decide whether the Developer Contributions Plan should also address the issue of provision of open space.

4.4.2. Multiple Use Reserves

The opportunity exists to apply the multiple use of drainage reserve principles in the Wandana area where significant drainage solutions will demand substantial areas of land to be set aside for flow retardation and sediment/pollution control. With creative design and sensitive application, some of the drainage reserves can also be incorporated into the open space system for the Study Area. Whilst this may be possible for some drainage reserves, narrow lineal configurations of land that primarily have a drainage function or marginal recreational and amenity value will not be considered as part of open space contributions. The emphasis for open space within the Study Area will be on useable, accessible and attractive areas, rather than on remnant land.

4.4.3. Open Space Linkages

The Structure Plan shows significant public open space and drainage reserves and off road open space links which form the overall system. The arrangement of these spaces makes it possible to achieve an open space network across the Study Area from the Barwon River to the Ceres Lookout and the other developing residential areas south of Barrabool Road. A linked system of public open space throughout the Study Area should aim to provide local parks within walking distance of all dwellings.

The location of schools, shops and community facilities adjacent to the open space system will create the opportunity for people to use the linear path network to arrive at their destination without using roads. Nevertheless, the issue of public safety is the highest priority and as such narrow walkways at the rear of properties will not be favoured.

The location of the collector streets and in some cases the lower order streets, will be a crucial design feature to the overall achievement of the linked open space system.

4.4.4. Community Recreation

Community recreational needs such as built leisure facilities will need to be catered for as the demographic profile and needs assessments of the area becomes apparent. Ideally, these types of facilities should be provided for on appropriate sites in shared spaces related to the commercial centre and school site. The open space network will link to these sites to provide connections throughout the Study Area.

4.5. OBJECTIVE 5: TRAFFIC ISSUES

'To define the parameters for a safe and convenient circulation system for all forms of transport, and to identify the effects of traffic movements outside the Study Area'.

The Structure Plan aims to settle the parameters for the preferred road and other transport infrastructure pattern for the area. The topography of the area and constraints imposed by the surrounding transport pattern create potential access problems which must be resolved. The proposed Freeway will not provide relief to the eastern routes to and from the area, except possibly in the long term, and can not be relied upon.

The particular design elements which will be encouraged are as follows:

4.5.1. Collector Street System

Following a detailed traffic study, a network of collector streets has been designed which provides a public transport route, does not attract through traffic from outside area, and encourages a spread of traffic to identified outlets on Barrabool Road and Scenic Road. This will in turn spread the traffic travelling to the main employment and business centre of Geelong onto the Queens Park Road/Bridge and Barrabool Road/Princes Bridge (Shannon Avenue) routes. Whilst detailed design and road layout of the entire network will be produced in the subsequent Outline Development Plan and subdivision plans, it is intended that the basic road network contained within this Structure Plan be implemented.

The layout of the collector road network with respect to the Baptist Church property is one issue which needs to be subject to further detailed assessment.

4.5.2. Residential Access

Residential development should not have direct frontage access to Barrabool Road and Scenic Road. Residential frontages should not be subject to high traffic flow.

4.5.3. Road Design

Design standards based upon VicCode should be used in the Study Area. In addition, street alignments should minimise earthworks and follow ridgelines provided they are landscaped. The opportunity exists for the major collector streets within the Study Area to be developed with median strips and landscaping.

Reference should also be made to Council's Urban Furniture Design Manual and the Residential Subdivision Guidelines which are currently being produced.

4.5.4. Public Transport

Development should generally be within 400 metres of a designated public transport route - the collector street system should be adequate to meet this requirement. The public transport service is likely to be routed via Highton rather than Newtown because of the limitations created by Queens Park Bridge in the short term; however, this is appropriate in itself since Highton is the nearest Community Shopping Centre to the

Study Area. As the population in the Study Area increases there will be a need to improve service frequency and coverage to cater for the expanding need.

The proposed street layout creates a permeable subdivision and provides the opportunity for the maximum usage for a future bus route. The system is designed for flexibility and a route can be adjusted as each new stage of the subdivision is implemented. A future bus route must correlate with the location of community facilities throughout the Study Area.

4.5.5. Bicycles

Bicycle paths will be incorporated as part of the open space system serving the local community facilities, primary school, commercial destinations and linking open space features (Ceres Lookout and Buckley Falls). Paths segregated from roads and with reasonably gentle gradients will be preferred. The opportunity exists to establish a bicycle track around the Barwon River which would connect the area into the regional bicycle network which extends around the River to the Belmont Common.

4.5.6. Pedestrian Provision

A pedestrian system comprising constructed pathways is required serving all local community and commercial destinations utilising open space wherever possible. Linkages between the residential areas and the Barwon River should be maximised. The possibility to incorporate shared pathways for pedestrian and cycle traffic in the Wandana area should be investigated and incorporated into the Outline Development Plan.

4.5.7. Existing Alignments and Roads

The function, alignment and safety of Highett Road extension, Leigh Road and Orana Road extension should be carefully considered. Intersections of these roads and Barrabool Road with Scenic Road, indicated on Figure 5, need to be upgraded and carefully designed to cope with additional traffic. The best treatment for the intersection of Barrabool and Scenic Roads is a roundabout and funds have been sought to rectify an existing problem intersection.

4.5.8. Arterial Road Network Impacts

The designation of the Study Area as a location for future Urban Growth entailed an analysis of the likely impacts of traffic generated by development, on the existing urban area downstream in the transport catchment.

Several geographic and demographic features are worth noting as having influences on likely future traffic impacts resulting from the development of the Study Area:

- the limited connectivity to other areas of Geelong both east-west and north-south because of the minimal Barwon River crossings and their limited capacity;
- the relative position of the proposed rezoning area, to the major destinations that will attract the bulk of traffic generated by its future development (the CBD, the northern industrial areas and generally east across the river).
- Barrabool Road already acts as an important arterial road and will need to carry additional traffic in the future. This will require an assessment of traffic

management techniques to cater for additional vehicles e.g. at Bellevue Avenue Highton Shopping Centre.

Undoubtedly, the impact of traffic generated by the full development of the Study Area, estimated at 20,000-25,000 vpd, on the adjacent street network will be substantial and needs to be assessed with traffic management works and funding arrangements implemented if unacceptable congestion is to be avoided.

4.5.9. Barwon River Crossings

The single lane Queens Park Bridge presents a constraint to traffic movements into and out of the Study Area. Council has no plans to duplicate the Bridge. However, funding has been sought by Council for the installation of traffic signals at each end of the Bridge to regulate and maximise the traffic flow. Whilst this will improve existing conditions, the natural constraint offered by the Bridge will limit the amount of traffic able to cross the River at this location and may encourage motorists to come and go into the Study Area from the south if they are likely to be subject to lengthy delays at Queens Park bridge. In other words, a deliberate policy of retaining the bridge at its current capacity may well achieve the desired effect of directing traffic out of the Study Area to the south.

The Princes Bridge which also crosses the Barwon River is nearing capacity in peak periods and may itself require upgrading to cope with additional demand. Shannon Avenue is the extension of Princes Bridge leading into the central Geelong areas and will require widening to four lanes for its length to West Fyans Street to cope with future demand. The proposed collector street layout for Wandana focuses more to the south which is likely to direct a significant volume of traffic accessing central and northern Geelong via the Barrabool Road/Shannon Avenue route.

4.5.10. Staging of Development and Traffic Impact Assessment

The staging of development provides Council the opportunity to monitor the impacts of traffic generated by previous stages of development and ascertain the need for both internal and external road network upgrades/modifications and the apportionment of costs to undertake such works. Without consideration given to the impact of further development in the Ceres/Wandana/Highton corridor on the road network outside the Study Area, there will be likely difficulties for such traffic crossing the Barwon River to the Geelong Central Business District and beyond to the Region's primary employment centres in the future. As discussed earlier, the parameters for contributions by the developer to fund traffic improvement works will be included in a Developer Contributions Plan which will be in place prior to future rezonings and subdivision.

During the exhibition of the draft Structure Plan a number of submissions were received from community groups and residents expressing concern about the traffic likely to be generated by residential development of this area and the ability of the existing road network to accommodate the expected increase in traffic. It was submitted that until such time as Council has resolved future traffic management issues it should not be designating Wandana as a future growth area.

In order to ensure these issues were addressed in a professional and independent manner, Council engaged expert traffic consultant Sinclair Knight Merz (who prepared Council's Arterial Roads Study) to assess the traffic effects of the proposed

development. In summary, the Consultant's report assesses potential traffic problems external to the area, methods for quantifying the problem, suggests processes to identify ameliorative measures together with some potential initial costings. A copy of the consultants report is Appendix 2 to this document.

The consultants have identified a methodology for addressing and responding to the future traffic management issues which will arise incrementally as development proceeds over the years. The identified traffic management studies will need to be undertaken in the short term because they will form an essential component in determining proportional developer contributions to the upgrading of the external road network as part of the necessary developer contribution plan.

The Council intends to proceed with on-going traffic management planning for this area along the lines proposed by Sinclair Knight Merz as part of the implementation of this Structure Plan.

4.6. OBJECTIVE 6: COMMERCIAL AND COMMUNITY FACILITIES

'To identify appropriate sites for commercial and community facilities'.

When fully developed the area will require a neighbourhood shopping centre, up to 2,000m² Gross Leasable Area, maternal and child health facilities, kindergartens, play groups, etc and possibly a primary school facility.

Demographic assessment of the developing area will need to be undertaken to develop a community profile upon which the demand and provision of the appropriate community facilities and services can be determined. Conduct of community surveys over time can assess the service requirements of the residents and contribute to the development of a community profile.

4.6.1. Retail Centre Floorspace

The Geelong Region Retail Centre Strategy, 1991, indicates that a basic neighbourhood centre, with up to 500m² Gross Leasable Area, should be provided when the catchment population reaches 2,000. Retail floorspace will grow to 2,000m² when the on ground population reaches 5,000 (see Table 2 below). The Retail Centre Strategy emphasise the importance of the inclusion of a small supermarket for the viability of a Basic Neighbourhood Centre. It is proposed that such a centre in the Wandana Study Area be established in the general location as indicated on Figure 5; it requires direct access to the collector street system to compensate for its location away from arterial roads; must be accessible to other parts of the Wandana area; and must be adjacent to the linked system of public open space.

Table 2:Geelong Region Retail Strategy - Criteria for ..Network Development

	Estimated Initial Threshold Population for Development	Estimated Fully Developed Primary Catchment Population	Estimated Initial Floorspace GLA m ²	Estimated Fully Developed Floorspace GLA m ²
Basic Neigh'hood Centre	2,000	5,000	500m ²	2,000m ²
Neigh'hood Centre	5,000	10,000	2,000m ²	4,000m ²

At the time when a developer is ready to commence the construction and operation of a retail premises the site of the Basic Neighbourhood Centre will be appropriately rezoned to a Business 1 zone.

When the population within the primary catchment increases beyond 5,000, additional retail floorspace up to 4,000m² Gross Leasable Area total may be provided for, as specified by the Geelong Region Retail Centre Strategy, 1991, for a Neighbourhood Centre.

4.6.2. Combined Community/Commercial Centre

The location for the retail centre is equally appropriate for the principal community facilities required for the new and developing community of Wandana - identified on Figure 5. This is central to the Study Area, accessible via the collector street system and can also be accessed through the open space, cycleway and footpath system. Elevated on flat land the site is not prominently visible.

In its submission to the exhibited Draft Structure Plan, the Barrabool Hills Baptist Community Church has indicated it would welcome the shared use of its facilities by the community, an option which will be further considered by Council as part of the preparation of the outline development plan.

4.6.3. School Site

The Directorate of School Education has indicated that a site for a future primary school facility for the Wandana area should be notionally nominated on the Structure Plan Map. As development of the area occurs the Department will continue to assess its needs for the area and the capacity of other schools in the vicinity. The minimum requirements for a school site are:

- 3.5 hectares of land;
- 2 road frontages;
- adjacency to public open space;
- adjacency to bicycle and walking paths;
- site configuration to enable school buildings along an east-west axis;
- one adjacent road to be capable of accommodating indented parking for buses and cars; and
- level-flat site.

Although existing schools may be able to accommodate the additional school population, this would impose a burden on families in the Study Area who would have to travel out of their locality by motor vehicle. It would be preferable to develop a school within the locality provided there is a sufficient pupil catchment to justify its construction.

An ideal location has been shown on the Structure Plan Map. As demand for a school site may not be clearly known for some time, the anticipated location adjacent to the proposed commercial/community centre could conflict with this early staging of subdivision. The resultant effect may require the owner/developer holding a large area of serviced land unable to be developed in the anticipation that a primary school may be required in the long term. Due to the difficulties this may create, an alternative school site location should be chosen on high, flat accessible land north of the ridge within a later stage of subdivision, by which time the need for a primary school within the Study Area will be clarified. It should also be noted that the Baptist Church has indicated that its land may offer a suitable site for the future primary school.

5. THE STRUCTURE PLAN FOR WANDANA

The Structure Plan (Figure 5) has been prepared to guide the development of Wandana into the twenty first century and identifies the policies and guidelines to be used as the basis for future decision making about the area. The implementation responsibilities for these policies and guidelines are also nominated and integral to the ongoing application of these policies. It should be noted that where infrastructure works are required from Council these will be the subject of annual allocations approved in Council's Capital Works Program for the entire Municipality.

This Structure Plan represents the policy of the City of Greater Geelong and will be utilised by the various other Departments and Authorities concerned with the provision of services to the area.

In particular the Structure Plan identifies the following critical areas for further investigation and action:

- Preparation of a Developer Contributions Plan;
- Preparation of an Outline Development Plan;
- Detailed design of public open space and drainage networks; and
- Ongoing lot supply monitoring.

As indicated in this Structure Plan, before development can proceed a Developer Contributions Plan and Outline Development Plan must be prepared which will document staging of future subdivision, servicing plans, drainage management for the catchment, detailed public open space locations, lot sizes and orientations, road layout, traffic management, intersection treatments, capacity for commercial and community facilities, residential densities and other physical and community infrastructure requirements and how these will be funded. These plans will need to be prepared in close liaison between Council and developers.

POLICY	IMPLEMENTATION RESPONSIBILITY
An Outline Development Plan will be prepared and approved prior to future rezonings, subdivision and development proceeding.	Council Developer
Subdivision and development must accord with VicCode 1 and the Good Design Guide.	Council Developer
Higher density development is preferred in central and level locations within the Study Area.	Council Developer
Culs-de -sac will be kept to a minimum to maintain permeability throughout the subdivision.	Council Developer
Subdivision and development will allow retention of significant stands of trees identified on the Structure Plan map.	Council Developer

POLICY	IMPLEMENTATION RESPONSIBILITY	
A 10 year supply of residential zoned land will be maintained and no further rezonings will be considered until the supply falls below this level.	Council	
Detailed planning to address noise abatement & visual amenity issues adjacent to the outer freeway reservation will be undertaken.	Council Developer	
No urban development will be permitted to the west of the Outer Freeway reservation.	Council	
Larger lots will be established on slopes greater than 10%.	Council Developer	
Smaller lots will be established on gentle slopes and flat land.	Council Developer	
A coordinated reticulated sewerage and water system will be installed to the satisfaction of Barwon Water.	Developer Barwon Water	
Infrastructure and services are to be committed at the commencement of each stage of subdivision.	Council Developer	
Each stage of development will allow for future service provision to be made to the next stage.	Council Developer	
Reticulated and infrastructure services will allow appropriate servicing capacity for uses other than residential.	Council Developer Barwon Water	
Land use and development must enhance the Barwon River environs.	Council Developer	
A 50 metre setback Public Open Space reservation will be required along the south side of the Barwon River. The Buckley Falls Park around the Barwon River will be extended.	Council Developer	
Residential development of land within 200 metres of the River and of the Mt Brandon Peninsula is not supported.	Council	
A comprehensive drainage system must be installed. This system must adequately control flow, capture sediments and prevent pollutants entering the Barwon River.	Council Developer Barwon Water	EPA DNRE
POLICY	IMPLEMENTATION	

	RESPONSIBILITY
The multiple use of drainage/detention reserves for recreation will be encouraged as considered appropriate by Council.	Council Developer
Public Open Space will be provided in accordance with Council's Open Space Policy and as shown on the Structure Plan map.	Council Developer
The Public Open Space will be funded through the Developer Contributions Plan and the 5% open space contribution required under the Subdivision Act 1988.	Council Developer
A comprehensive and permeable system of linked open spaces connecting Ceres Lookout and Buckley Falls through Wandana will be developed.	Council Developer
Open space must be provided on land which is useable, accessible and attractive. Narrow lineal configurations of land that primarily have a drainage function or marginal recreation and amenity value will not be considered as part of open space contributions.	Council Developer
Culs-de-sac will be linked by public open space.	Council Developer
A linked system of public open space throughout the Study Area should aim to provide local parks within walking distance of all dwellings.	Council Developer
The collector street network must generally accord with the Structure Plan map and address the requirements of VicCode.	Council Developer
The collector street network will be designed to encourage a spread of traffic to identified outlets on Barrabool and Scenic Roads.	Council Developer
The collector street network will be designed to discourage through traffic from outside the area.	Council Developer
The collector street network must encourage low vehicle speeds and avoid the need for later Local Area Traffic Management plans.	Council Developer
All street alignments must minimise earthworks, follow ridgelines and utilise opportunities to minimise landscape impact.	Council Developer
POLICY	IMPLEMENTATION RESPONSIBILITY

Intersections of the collector street system with Scenic and Barrabool Road will be upgraded to cope with additional traffic.	Council Developer
Collector streets must be capable of providing a suitable public transport route.	Council Developer PTC
Bicycle and pedestrian paths will be incorporated into the road and public open space system.	Council Developer
Paths segregated from roads and with gentle gradients will be preferred.	Council Developer
Residential development will not have direct frontage access to Barrabool and Scenic Roads.	Council Developer
Residential frontages should not be subject to passing high traffic flows	Council Developer
Ongoing traffic management studies to determine the effects of increased traffic on the arterial road network will be undertaken.	Council Developer VicRoads
A Developer Contributions Plan will be prepared to identify the impacts on the arterial road network by the development of Wandana and will prescribe the level of funds to be contributed by the developers.	Council Developer
Traffic signals will be installed at the Queen's Park Bridge.	Council
The Queen's Park Bridge will not be duplicated.	Council
A basic neighbourhood shopping centre will be provided in Wandana.	Developer Council
The basic neighbourhood shopping centre must have direct access to the collector street system, must be accessible to all Wandana and be located adjacent to the public open space system.	Council Developer
Community centre/facilities must be central to the Wandana area and be accessible via the collector street and public open space systems.	Council Developer
POLICY	IMPLEMENTATION RESPONSIBILITY
Built leisure facilities and passive and active open	Council

<p>space must establish on appropriate sites, relate to the commercial/community/school centre, and where possible, maximise the principles of utilising shared spaces.</p>	<p>Developer</p>
<p>A primary school site will be selected at an appropriate location.</p>	<p>Council Developer Directorate of Education</p>