



G21 Regional Growth Plan IMPLEMENTATION PLAN

NOVEMBER 2013

PLANNING & SERVICES PILLAR

SHAPING OUR REGION – IMPLEMENTATION PLAN

G21 IS THE FORMAL ALLIANCE OF GOVERNMENT, BUSINESS AND COMMUNITY ORGANISATIONS, WORKING TOGETHER TO IMPROVE PEOPLE'S LIVES IN THE GEELONG REGION

The G21 region is diverse in its physical, social and economic characteristics. This diversity inevitably brings with it a range of strengths across the region, but also presents some challenges. Through the directions of the G21 Region Plan and implementing project work of G21's pillar groups we are cooperatively working with all levels of government to ensure the region has the capacity to build on its strengths and manage the challenges. The adoption of the G21 Regional Growth Plan by our five G21 councils in 2012 and its launch by the Minister for Planning in April 2013 has established a clear land use planning framework to manage the region's future growth.

The completion of the Implementation Plan for the G21 Regional Growth Plan places the region in the best position to clearly articulate and plan for the key infrastructure needed to support the region's long term growth directions and its economic diversification potential. The Plan builds on and is linked to other key G21 strategies including the Economic Development Strategy, Public Transport Strategy, Health and Wellbeing Plan and the Regional Sports Development Strategy

The Implementation Plan provides a unique perspective to holistically identify the range of key regional level infrastructure to create more sustainable communities, build on the region's competitive strengths to grow jobs, economic activity and investment while addressing challenges such as disadvantage, skill levels, health and public transport levels.

The residential and industrial land supply data including the innovative online land supply monitoring tool, strategic housing action plan and Further Investigation Area analysis will provide the G21 councils, agencies and others with important tools to undertake localised strategic planning for housing and employment land growth and infrastructure sequencing.

I acknowledge the efforts and contributions made by many people in the development of this Implementation Plan including the in-house project team, the Project Steering Group and Technical Reference Group members, G21 councils, state government department and agency representatives, infrastructure and service providers, project consultants for their inputs and the broader community for their feedback through a range of consultation activities.

The completion of the G21 Regional Growth Plan Implementation Plan is but a first step. It is not intended to be a static document - its actions and further work priorities identified require implementation, ongoing commitment and advocacy.

G21 looks forward to this challenge.

Elaine Carbines

Chief Executive Officer
G21 - Geelong Region Alliance

CONTENTS

	EXECUTIVE SUMMARY	2			
	GLOSSARY	6			
1.0	INTRODUCTION	8			
1.1	IMPLEMENTING THE G21 REGIONAL GROWTH PLAN	9			
1.2	DEVELOPING THE IMPLEMENTATION PLAN	10			
1.3	TAKING A LONGER TERM VIEW	11			
1.4	STRUCTURE OF THE PLAN	11			
2.0	PLANNING FOR INFRASTRUCTURE	12			
2.1	INTRODUCTION	13			
2.1.1	Developing the Infrastructure Plan	13			
2.1.2	Sequencing and prioritising infrastructure	14			
2.1.3	Subregions	15			
2.1.4	Regional infrastructure overview	16			
2.1.5	Explanation of infrastructure schedules and maps	18			
2.1.6	Funding	18			
2.2	TRANSPORT	19			
2.2.1	Key challenges and opportunities	19			
2.2.2	Road	20			
2.2.3	Rail	20			
2.2.4	Public transport services	21			
2.2.5	Active transport	22			
2.2.6	Further work priorities	22			
2.3	UTILITIES	30			
2.3.1	Key challenges and opportunities	30			
2.3.2	Water supply	30			
2.3.3	Sewerage	31			
2.3.4	Stormwater drainage and flooding	31			
2.3.5	Electricity	31			
2.3.6	Gas	32			
2.3.7	Telecommunications	32			
2.4	COMMUNITY FACILITIES	39			
2.4.1	Key challenges and opportunities	39			
2.4.2	Education and training	39			
2.4.3	Health	40			
2.4.4	Arts and culture	41			
2.4.5	Emergency services and justice	41			
2.4.6	Sport and recreation	41			
2.4.7	Waste management	42			
	2.5 BUSINESS AND TOURISM	49			
	2.5.1 Key challenges and opportunities	49			
	2.5.2 Airports	49			
	2.5.3 Ports and harbours	50			
	2.5.4 Agriculture	50			
	2.5.5 Urban precincts	51			
	2.6 ENVIRONMENT	56			
	2.6.1 Key challenges and opportunities	56			
	2.6.2 Current projects and strategies	57			
	2.6.3 Critical projects	58			
	2.6.4 Further work priorities	58			
	2.7 CRITICAL PROJECTS FOR A REGION OF 500,000	61			
3.0	LAND SUPPLY AND STRATEGIC HOUSING INCENTIVES	62			
3.1	INTRODUCTION	63			
3.2	STRATEGIC HOUSING INCENTIVES	63			
3.2.1	Barriers to growth	63			
3.2.2	Incentives Action Plan	64			
3.3	LAND SUPPLY	78			
3.3.1	Supply	78			
3.3.2	Adequacy	82			
3.3.3	Land supply reporting	83			
4.0	PLANNING FOR LONGER TERM GROWTH	84			
4.1	INTRODUCTION	85			
4.2	FURTHER INVESTIGATION AREA ANALYSIS OVERVIEW	86			
4.3	FUTURE GROWTH AREA OUTCOMES	95			
4.3.1	Taking the 'next step' in planning for new communities	95			
4.3.2	Community infrastructure provision	97			
4.3.3	Community design	97			
4.3.4	Housing diversity	97			
4.3.5	Site specific considerations	98			
4.4	NEXT PLANNING STEPS	102			
4.4.1	Timing	102			
4.4.2	Out of sequence considerations	102			
4.4.3	One growth area or two?	103			
4.4.4	Phasing	104			
4.4.5	Detailed planning	106			
5.0	REVIEW	108			
5.1	IMPLEMENTATION PLAN REVIEW	109			
	REFERENCES AND ACKNOWLEDGEMENTS	110			

EXECUTIVE SUMMARY

Having the right infrastructure in place along with sufficient land supply and housing strategies to support the needs of a growing population and job creation will be critical for the future liveability and prosperity of the G21 region.

The *G21 Regional Growth Plan* (Growth Plan) provides a strategic land use and growth framework to manage population growth of the region to 500,000 by 2050. The Implementation Plan aims to build on the work of the Growth Plan by:

- identifying the critical infrastructure required to support the housing and employment growth directions of the region and provide a program for its optimal delivery
- providing land supply data and incentives for achieving strategic housing outcomes to support infrastructure and settlement planning
- identifying key considerations and a pathway for the planning of longer term growth areas.

The Implementation Plan seeks to do this in the context of the G21 Vision and the Growth Plan's nine principles and recommended land use directions.

The Implementation Plan has been developed by the G21 Geelong Region Alliance's Planning and Services Pillar in partnership with state government departments and agencies.

The Implementation Plan will be an important planning tool for the G21 region. It identifies funding priorities for critical infrastructure and will be used by project partners and other service providers and agencies to plan future infrastructure and service provision.

Taking a longer term view

The Implementation Plan has a 35 year outlook to 2050. Taking a long term view requires consideration of more sustainable thinking and practices in the context of future challenges and opportunities, including climate change and variability, increasing energy costs, food security, technology advancement and the economy, as well as societal changes around accessing jobs, education, health and other services.

Where possible the Implementation Plan has endeavoured to consider the impact of these changes on the region's planning for the future and provide a basis for reviewing directions to ensure the plan is able to adapt and respond to a changing world.

Supporting documents

The Implementation Plan is supported by:

- a *Background Report* which includes more detailed analysis and project methodology elements underpinning the key directions of the Implementation Plan
- *Residential and Industrial Land Supply reports* and a web based land supply reporting tool

and informed by:

- a *Strategic Housing Incentives Action Plan*
- a *Land Supply Background Paper*.

Planning for Infrastructure

Strategic investment in infrastructure has the capacity to be transformational from an economic, social and environmental perspective. It can drive investment and productivity, provide new employment opportunities, improve community health and wellbeing, address disadvantage and lower carbon emissions.

The development of a regional and subregional level infrastructure plan has provided a consolidated picture of the infrastructure required to support and drive the region's growth directions and address infrastructure barriers or gaps critical to the region reaching its potential, achieving its vision and broadening its contribution to the growth of the state and nation.

Developed through infrastructure provider and key stakeholder consultation and analysis of major strategies and project proposals, the infrastructure plan provides a program for infrastructure investment which will achieve the highest and best value for the region in terms of supporting jobs growth, a vibrant economy and building on existing infrastructure investments and the region's competitive advantages.

The infrastructure themes cover:

Transport	road, rail, public transport and active transport
Utilities	water and sewerage, drainage, gas and electricity, and telecommunications
Community	education and training, health, arts and culture, sport and recreation, emergency services and justice, waste management
Business	airports, ports and harbours, agriculture, major urban precincts
Environment	National, State and Regional Park assets.

Around 240 infrastructure projects have been identified to support growth of the region consistent with the Growth Plan directions.

In addition to improving transport links to Melbourne and adjoining regions, the **critical projects** that will be catalytic in supporting the region's growth towards a population of 500,000 include:

- Connection of the Geelong Ring Road to the Bellarine Peninsula
- Geelong Ring Road and rail freight connections to Geelong Port and GREP
- Major upgrades of the Great Ocean Road and key connecting routes to the Princes Highway
- Geelong Port shipping channel access and berthing improvements
- Avalon Airport precinct development and rail link.

These are complemented by a number of other key projects including:

- Princes Highway duplication to Colac
- Midland Highway duplication to Bannockburn
- Upgrades to key transport links from Geelong to growth areas in Armstrong Creek and Torquay/Jan Juc
- Public Transport regional network development and service enhancements
- Potable water trunk line connection to Lethbridge intensive agriculture node
- Redevelopment of GPAC
- Portarlington Safe Harbour development
- Apollo Bay harbour precinct developments.

A number of potentially transformational projects that have not undergone rigorous business case development are the focus of **further work** priorities:

- Road and rail freight connections to Ring Road, Port and GREP options study
- Geelong stabling yards relocation options study
- Colac bypass land use planning and route designation
- Development of a Geelong Integrated Transport Plan
- Development of a next generation waste management and resource recovery plan
- Preparation of a Central Geelong Master Plan.

The following three **potential future projects** provide the next tranche of infrastructure projects or support the Growth Plan outcomes:

- Development of a **Geelong Integrated Transport Plan**
- **Geelong Digital Roadmap** implementation
- Development of a **Regional Natural Assets and Open Space Strategy**.

Strategic housing incentives and land supply

Having incentives to support key strategic housing outcomes including sufficient residential and industrial land supply in the right locations is important for providing future housing and employment land and supporting housing diversity, choice and affordability.

The Growth Plan identified a number of key objectives and outcomes for future housing provision in the region:

- providing greater housing choice to meet the changing needs of households
- encouraging medium to high density living in identified precincts and supporting urban regeneration initiatives
- supporting the timely development of identified short to medium term growth areas and further longer term housing growth in Colac and Winchelsea
- ensuring adequate supply of residential and employment land in the right locations to meet future growth needs.

Consultants Urban Enterprise and Spatial Economics were engaged to assist in the identification of strategic housing incentive actions and development of land supply reports to inform the Implementation Plan directions.

Key barriers or challenges identified for achieving strategic housing outcomes include:

- **infrastructure** - availability, timely delivery and adequacy
- **development viability** - market demand, land and development costs and level of local amenity
- **planning for growth and land supply** - impacts of constraints on capacity, limited diversity of housing stock, land assembly challenges
- **development approval and planning processes** - currency of strategic planning, adequacy of resources, processes and time frames.

DRAFT LAND SUPPLY REPORTS HAVE BEEN DEVELOPED FOR G21 MUNICIPALITIES FOCUSING ON THE MAJOR POPULATION CENTRES

A range of strategic actions have been identified to address these issues including:

- **regional initiatives** - targeted at the wider G21 region and ensuring that the common strategic housing growth challenges are addressed across planned growth and urban renewal areas. These include regular land supply monitoring and key infrastructure provision
- **urban renewal and regeneration initiatives** - providing specific localised actions to stimulate development and targeted investment in identified areas. These include post code campaigns and particular area coordination and delivery mechanisms
- **growth area initiatives** - specific targeted actions required to ensure that land release and housing growth is supported where and when it is required. These include key supporting infrastructure provision, land assembly support, detailed strategic planning and housing diversity planning tools.

Land supply reports have been developed for G21 municipalities focusing on the major population centres. These reports provide current land supply data for residential and industrial land stocks.

The reports indicate that the region has a healthy level of residential land supply including a diverse composition of development, multiple active development fronts and a competitive land development environment, as well as a reasonable diversity of product. The City of Greater Geelong has around 18 years of zoned and 14 years of identified but unzoned land supply based on current housing development activity and population growth figures. Centres such as Torquay/Jan Juc and Bannockburn have around 13 years zoned supply, and Colac around 18 years.

The housing supply data suggests that some of the identified planned growth areas for Bannockburn and Torquay will need to be rezoned shortly and land supply levels regularly monitored in active growth centres.

Further Investigation Areas

The Growth Plan identified two Further Investigation Areas (FIAs) or 'strategic opportunity areas' to the north and west of Geelong, to be examined for their potential to provide capacity for the G21 region to grow to and beyond 500,000 people and respond to higher growth rates in the future.

An analysis of these two areas indicates that both these areas have the potential to provide for significant growth, of around 60,000 people, more than is required for the foreseeable future. Each area has a number of constraints and limitations which can be managed. Each area also offers a number of significant opportunities to increase employment, enhance existing communities or provide significant environmental benefits and key recreational linkages.

The Implementation Plan concludes that only one FIA is required to meet the foreseeable medium to long term growth needs of Geelong. The Implementation Plan does not identify which FIA should be the next major growth area that proceeds to the growth area planning stage. This is an on-balance consideration for the City of Greater Geelong. It is intended that the analysis and recommendations of the Implementation Plan assist the City of Greater Geelong in making that decision.

The Implementation Plan identifies major consequences of 'out of sequence' development and over-availability of land supply across multiple growth fronts. The Implementation Plan confirms that the FIAs will serve a medium to long term growth role for Geelong, which at current land supply and take up rates indicate could be around 20 years away.

Because growth rates can change quickly in response to key policy or major investment decisions, the specific timeframe for the development on an FIA will need to be reviewed in the context of regular land supply reports examining take up in existing and identified future supply areas and major urban policy directions such as the Metropolitan Planning Strategy.

In terms of future planning of one of the FIAs, the Implementation Plan identifies the need to take the 'next step' when it comes to planning future communities, particularly those at the edge of existing urban areas. This is important to ensure future infrastructure delivery is efficient and cost effective, that sustainable communities are created and that broader community and economic benefits can be provided.

The Implementation Plan also includes a number of suggested responses relating to:

- developing a **Sustainability Plan** to provide urban areas incorporating the principles of zero carbon, zero waste, sustainable water and transport and improved environmental outcomes
- community planning and design
- providing housing choice and affordability including development of a **Housing Diversity Plan**
- coordinating infrastructure provision through the development of an **Integrated Infrastructure Delivery Plan**
- identification of site specific considerations for each FIA
- next planning steps including timing, detailed planning and planning process support mechanisms.

Review

In order to ensure the Implementation Plan remains current and able to adapt to new information and changing priorities it is suggested that:

- the Plan be reviewed every three years with the Infrastructure Plan project list updated annually
- the land supply data is regularly updated to inform future planning.



Artist's impression, Woodhead Architects. AFFRIC building, Deakin University Waurn Ponds campus

TERMS USED IN THIS DOCUMENT

Broadhectare land /

New development on greenfield sites (sites that have not been used for urban development before) on the edge of an established urban area

Development Contribution Plan /

Development contributions are payments or in-kind works, facilities or services provided by developers towards the supply of infrastructure required to meet the future needs of a particular community, of which the development forms part.

District Towns /

The towns of Bannockburn, Colac, Drysdale/Clifton Springs, Lara, Leopold, Ocean Grove, Torquay/Jan Juc, and Armstrong Creek

Established urban area /

Land Supply term used to describe the existing urban area which broadly follows township boundaries excluding rural residential areas and broadhectare. The established urban area includes dispersed infill (small dwelling projects usually on residential zones) and major infill (large projects commonly greater than 10 dwellings) and redevelopment sites.

Further Investigation Areas /

Areas identified in the Growth Plan with potential for medium to longer term growth

Growth Plan/G21 Regional Growth Plan /

The G21 Regional Growth Plan provides a strategic planning framework for growth of the region to 500,000 people by 2050

G21 Geelong Region Alliance /

The formal alliance of government, business and community organisations working together to improve the lives of people within the G21 region across five municipalities - Greater Geelong, Colac Otway, Surf Coast, Queenscliffe and Golden Plains

Infrastructure Plan /

A regional level plan to provide critical infrastructure to support population and employment growth consistent with the Growth Plan

Precinct Structure Plan /

Master plans for whole communities

Regional/subregional /

A term applied to the Infrastructure Plan covering either the G21 region or one of seven subregions: Urban Geelong (including Armstrong Creek), Bellarine Peninsula, Lara, southern Golden Plains (including Bannockburn, Lethbridge, Inverleigh and Teesdale), Winchelsea (including Moriac), Torquay (including Anglesea and Lorne), Colac (including Birregurra, Forrest and Apollo Bay)

Rural residential supply /

Land zoned Low Density Residential (LDRZ) or Rural Living (RLZ)

Urban Geelong /

Encompasses the adjacent urban areas between the Armstrong Creek Urban Growth Area, the Geelong Ring Road and Corio Bay.

Vision 2 /

Provides strategies for revitalisation for Central Geelong, building on Waterfront Geelong - Vision 1

1.0

INTRODUCTION

The G21 Regional Growth Plan - Implementation Plan provides a foundation for delivering key infrastructure, developing planning policy and future growth area planning to support the directions of the Growth Plan



The G21 Regional Growth Plan - Implementation Plan aims to provide information, direction and a plan for critical infrastructure provision to support the key population growth directions of the G21 Regional Growth Plan.

1.1 IMPLEMENTING THE G21 REGIONAL GROWTH PLAN

The *G21 Regional Growth Plan* (Growth Plan) provides a framework to manage the growth and land use pressures of a population of over 500,000 residents to 2050. It seeks to do this by ensuring growth is managed in a way which protects, and builds on, the region's strengths, unique character and significant natural and man made assets. Well planned growth will provide greater housing choice, diverse employment opportunities, improved health and wellbeing, and efficient utilisation and provision of infrastructure.

The key directions of the Growth Plan (see Map 1) include:

- directing residential growth to Urban Geelong, including higher density housing at key nodes
- supporting the growth of the District Towns of Bannockburn, Colac, Drysdale/Clifton Springs, Lara, Leopold, Ocean Grove and Torquay/Jan Juc, as well as Armstrong Creek
- growing Colac and Winchelsea to larger sized settlements
- identifying two Further Investigation Areas (FIAs) to the north and west of Geelong to accommodate medium to longer term growth
- strengthening the economy and creating jobs in the above centres; in tourism and agricultural activity nodes; at Geelong Port, Avalon Airport and Geelong Ring Road Employment Precinct (GREP); in identified employment nodes at Deakin University/ Marcus Oldham College Waurin Ponds; and through other G21 Priority Projects.

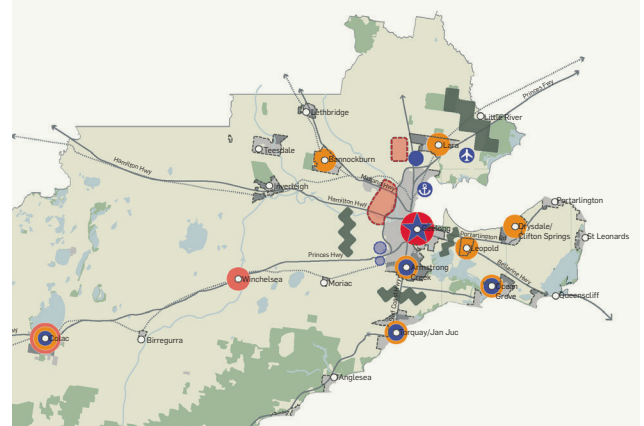
The Growth Plan identifies the need for the provision of critical regional level infrastructure to support the Growth Plan directions, including growth of major employment sectors such as industry and commerce, health and education, agriculture and tourism. This includes (see Map 2):

- transport networks, including road and rail, ports and airports
- utilities, including energy, water and sewerage
- communications infrastructure, including the National Broadband Network.

The Growth Plan also identifies the need for an Implementation Plan to support and progress the key directions around infrastructure planning, land supply and housing choice and Further Investigation Areas.

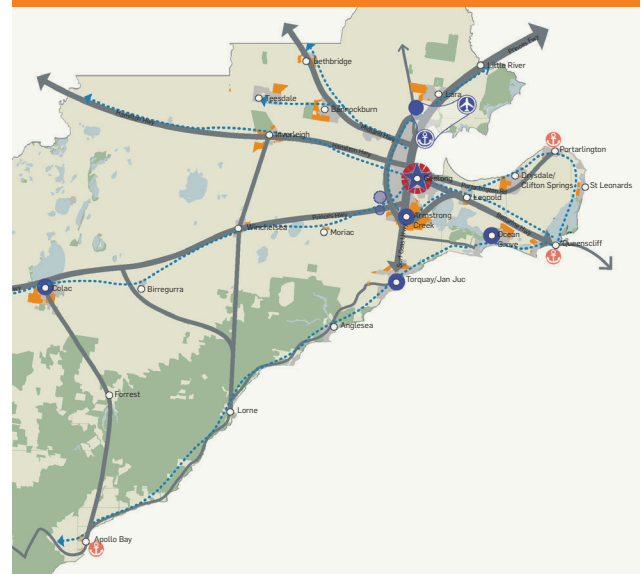
The Implementation Plan is an important planning tool for the G21 region. It provides information and directions and identifies funding priorities for critical infrastructure that can be used by project partners and other service providers and agencies to plan for future growth areas, infrastructure roll out and service provision.

MAP 1 / SETTLEMENT AND EMPLOYMENT GROWTH



Section of G21 Regional Growth Plan Settlement and Employment Growth Directions Map

MAP 2 / KEY INFRASTRUCTURE DIRECTIONS



Section of G21 Regional Growth Plan Key Infrastructure Directions Map

1.2 DEVELOPING THE IMPLEMENTATION PLAN

The Implementation Plan applies to the same area covered by the Growth Plan including the municipalities of City of Greater Geelong, the Borough of Queenscliffe and the Shires of Surf Coast, Colac Otway and Golden Plains (southern portion only).

The Implementation Plan project has been managed by the five G21 councils in partnership with the Victorian state government including the Departments of Transport, Planning and Local Infrastructure, Environment and Primary Industries; and State Development, Business and Innovation; Barwon Water, Vic Roads and regional advocacy group the Committee for Geelong.

The Implementation Plan has been developed following three stages of consultation with key infrastructure providers, service authorities and stakeholders in the Further Investigation Areas and the broader community, refer **Figure 1**.

The Implementation Plan focuses on four elements which support the key settlement and infrastructure directions of the Growth Plan:

- a plan for the sequencing and provision of key regional infrastructure
- providing detailed residential and industrial land supply information for the region, municipalities and key centres
- identifying incentives to deliver key strategic housing outcomes
- providing a detailed analysis of and directions for the identified Further Investigation Areas.

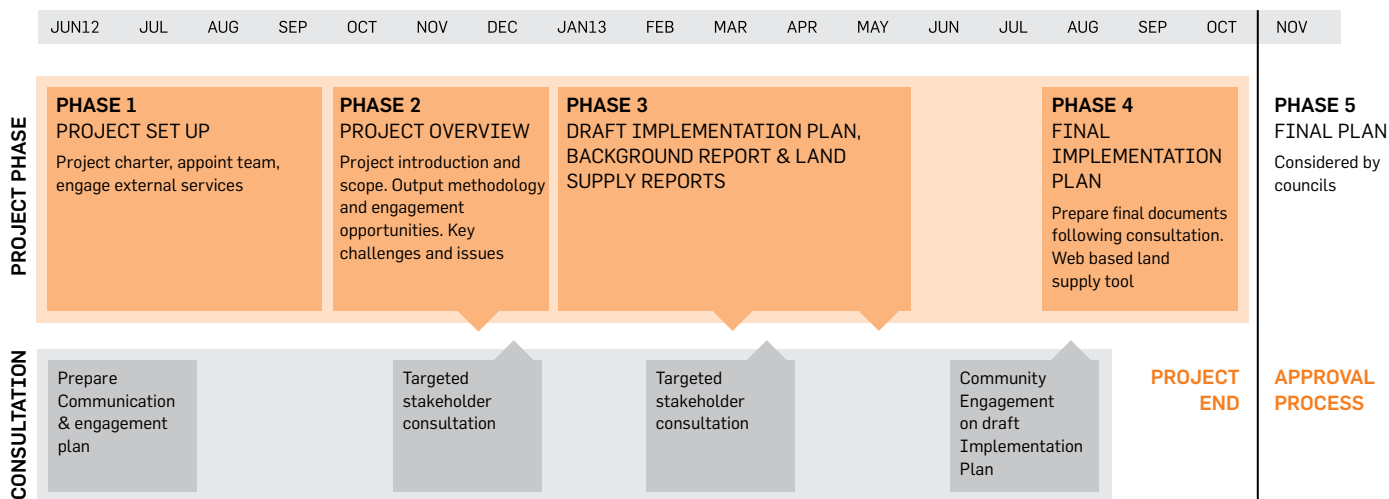
The Implementation Plan has been guided and informed by:

- the Growth Plan’s directions and, in particular, its Vision and Principles
- The Geelong Region Plan
- current projects, including G21 Priority Projects
- the need for a plan which can be sufficiently adaptable and responsive to changes in the environment, economy and society over the next 30 to 40 years.
- community feedback and submissions.

As far as possible, the Implementation Plan has endeavoured to account for and integrate with a wide range of current projects and strategies under development including:

- the *Metropolitan Planning Strategy* and the adjoining regions’ Regional Growth Plans
- G21 Priority Projects
- G21 Pillar Projects such as the Economic Development Strategy, Regional Transport Plan review, Public Transport Strategy and the Regional Health and Wellbeing Plan
- state government transport projects under construction such as the Princes Highway duplication and the Regional Rail link
- state government transport planning projects and studies including the Geelong - Werribee corridor, Avalon Airport Rail Link, Grovedale Station, Victorian Freight and Logistics Plan, Network Development Plan - Metropolitan Rail
- Victorian Coastal Strategy review and the development of Regional Coastal Action Plans and Regional Catchment Strategies.

FIGURE 1 / PROJECT TIMELINE



1.3 TAKING A LONGER TERM VIEW

The Implementation Plan has a 35 year outlook to 2050. Taking a long term view requires consideration of more sustainable thinking and practices in the context of future challenges and opportunities. These include climate change and variability, increasing energy costs, food security and technology advancement, a changing economy, as well as societal changes around accessing jobs, education, health and other services.

Where possible the Implementation Plan has endeavoured to consider the impact of these changes on the region's planning for the future and provide a basis for reviewing directions to ensure the plan is able to adapt and respond to a changing world.

1.4 STRUCTURE OF THE PLAN

The Implementation Plan (this document) consists of:

Section 1 Introduction

Section 2 Planning for regional infrastructure

Section 3 Land supply and strategic housing incentives

Section 4 Planning for longer term growth

Section 5 Review

While presented as separate sections, the content and directions of Sections 2 - 4 have significant linkages and interactions. Regional infrastructure priorities will depend on the timing and sequencing of new growth areas. The land supply data is a key tool for measuring strategic housing outcomes and understanding trigger points for new infrastructure provision and the appropriate timing of new growth areas.

The Implementation Plan is supported by:

- a *Background Report* which includes more detailed analysis and project methodology elements that underpin the key directions of the Implementation Plan

- *Residential and Industrial Land Supply reports*

and informed by:

- a *Strategic Housing Incentives Action Plan*
- and a *Residential and Industrial Land Supply Background Paper*.

G21 VISION

The Geelong region is Australia's most desirable destination for living, visiting, working and investing; it is renowned for its vibrant cohesive community, exceptional physical environment and vigorous economy.

PRINCIPLES FOR REGIONAL GROWTH

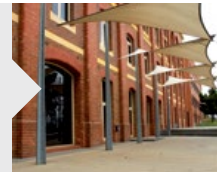
1

OPTIMISE
INFRASTRUCTURE
AND CONSOLIDATE



2

DIVERSITY,
KNOWLEDGE
AND INNOVATION



3

UNIQUE AND
CONNECTED
COMMUNITIES



4

PROTECT, RESTORE
AND ENHANCE OUR
UNIQUE ENVIRONMENT



5

FOOD, WATER
AND ENERGY
SECURITY



6

LIVE, WORK AND
PARTICIPATE
LOCALLY



7

BUILD OUR
ECONOMY



8

ACCESSIBLE
TRANSPORT
CHOICES



9

BALANCED,
CONSISTENT AND
COLLABORATIVE
APPROACH





2.0

PLANNING FOR INFRASTRUCTURE

A framework for planning of future infrastructure provision is critical in ensuring that the G21 region can respond to the challenges and opportunities associated with growth

Strategic investment in infrastructure has the capacity to be transformational from economic, social and environmental perspectives. It can support increased investment, productivity and innovation, provide skilling and new employment opportunities, improve community health and wellbeing, and address disadvantage.

2.1 INTRODUCTION

2.1.1 Developing the Infrastructure Plan

The Growth Plan identifies that the effective planning of infrastructure is crucial for managing growth pressures and for driving and supporting future growth consistent with the strategic growth directions. The critical infrastructure needs identified are those that facilitate growth in key job sectors, build on existing competitive advantages, help to move people and goods efficiently and address existing gaps or needs.

The Infrastructure Plan provides a consolidated picture of the infrastructure required to support and drive the region's growth and address infrastructure capacity issues or gaps critical to the region reaching its potential, and broadening its contribution to the growth of Victoria and the nation.

The Infrastructure Plan provides a program for infrastructure investment that will achieve the greatest value for the region in terms of supporting employment growth, a vibrant economy and building on existing infrastructure investments and competitive strengths.

This section of the Implementation Plan focuses on identifying the critical pieces of infrastructure at a regional and subregional level. Local level infrastructure, while important, is not examined in the Implementation Plan unless it is critical to facilitating growth of an identified District Town.

The following sections focus on the respective infrastructure themes:

Transport	road, rail, public transport and active transport
Utilities	water and sewerage, drainage, gas and electricity, and telecommunications
Community	education and training, health, arts and culture, sport and recreation, emergency services and justice, waste management
Business	airports, ports and harbours, agriculture, major urban precincts
Environment	National, State and Regional Park assets

The five themes provide a basis for consolidation of like projects; however, many projects fall across themes such as those associated with ports, airports and waste. The identified theme projects should not be looked at in isolation, rather as a totality of projects which have significant cross benefits and interrelationships. For example, having good transport options and telecommunications infrastructure is important for business as well as the way in which health and education services can be provided or accessed, which in turn supports a range of environmental, social and community health outcomes.

Each theme includes:

- a summary of key theme and sub theme **challenges and opportunities**
- **Current investments and strategies** - relating to infrastructure investment and planning
- **Critical projects** - these are generally short term priority projects that analysis shows to be catalytic or game changing; they have the potential to drive investment and activity, provide a broad range of regional benefits and support other important local and regional projects. They are also key to supporting the directions of the Growth Plan. Note: critical projects across themes are not necessarily comparable in terms of regional contribution.
- a **project schedule** identifying theme projects, current status, timeframes and indicative costs
- **Further work priorities** - a number of projects identified in the project schedules have the potential to be transformational but require significant scoping and background work to raise them to implementable status. A limited number of projects have been identified as priorities for further work over the next one to three years for scoping, options development, and possible detailed planning/design and business case development
- **Suggested responses** for action for projects not identified in the project schedule but which may result in the identification of future infrastructure projects and that will inform future Implementation Plan reviews
- **Future projects** - potential future projects which address major infrastructure or strategy gaps that will result in the identification of future infrastructure projects and inform Implementation Plan reviews.

2.1.2 Sequencing and prioritising infrastructure

Infrastructure projects have been identified through an understanding of:

- the infrastructure required to support planned growth areas consistent with the sequencing of growth identified in the Growth Plan and subsequent growth area mapping, at the regional and subregional level. These needs have been identified through discussions with key infrastructure and service providers
- review of key strategies such as the G21 Economic Development Strategy and G21 Priority and Pillar Projects.

The *Background Report* outlines the methodology used for developing the Infrastructure Plan and process for identifying and determining project priorities. It also provides more detailed descriptions of individual projects and a summary of benefits. Projects have been identified through analysis and consultation and include those indicated in the Growth Plan.

The key factors considered in developing project priorities were:

- **Economic impact** in terms of job growth, increased investment, productivity and innovation, and building on competitive strengths
- **Social impact** in terms of building skills, improving health and wellbeing, addressing disadvantage and community building
- **Environmental impact** in terms of contribution to the protection, restoration and enhancement of the environment; and support for sustainable outcomes
- **Infrastructure importance** considers the critical nature of infrastructure and ability to build on existing infrastructure to offer additional capacity and flexibility
- **Regional impact** extent - regional, subregional, district or local. In most instances local projects have not been considered unless they are critical to facilitating the growth of an identified District Town
- **G21 project status** as a Priority or Pillar project
- **Level of support** and funding from government and/or the private sector
- **Level of planning** or project readiness in terms of the extent of planning or business case development.

G21 PRIORITY PROJECTS

Sixteen projects are nominated as priority projects for the G21 Geelong Region Alliance and are actively promoted to stakeholders, including all levels of government.

The 2013 priority projects are:

- Addressing disadvantage
- Apollo Bay Harbour Precinct
- Armstrong Creek Urban Growth Area
- Avalon Airport, including international terminal
- Convention and Exhibition Centre
- Geelong Centre for Emerging Infectious Diseases
- Geelong Future Cities project
- Geelong Ring Road connections to the Bellarine Peninsula
- Geelong Ring Road Employment Precinct
- Great Ocean Road upgrade
- G21 Regional Trails network
- Headquarters for the NDIA
- Portarlington Safe Harbour
- Regional Research and Information Centre
- Transport links to Melbourne
- Yarra Street Pier reconstruction

Details on these projects can be found at www.G21.com.au

GAME CHANGERS

The *G21 Economic Development Strategy* identifies five 'game changers' for further investigation. The game changers build on the region's competitive advantages:

1. Completion of the Ring Road with Surf Coast, Bellarine Peninsula, Bannockburn and Colac connections
2. Geelong City Centre reactivation
3. Coordinated delivery of critical infrastructure to support growth
4. Globally significant innovation and research centre
5. The G21 region is open for business.

The strategy can be found at www.G21.com.au

2.1.3 Subregions

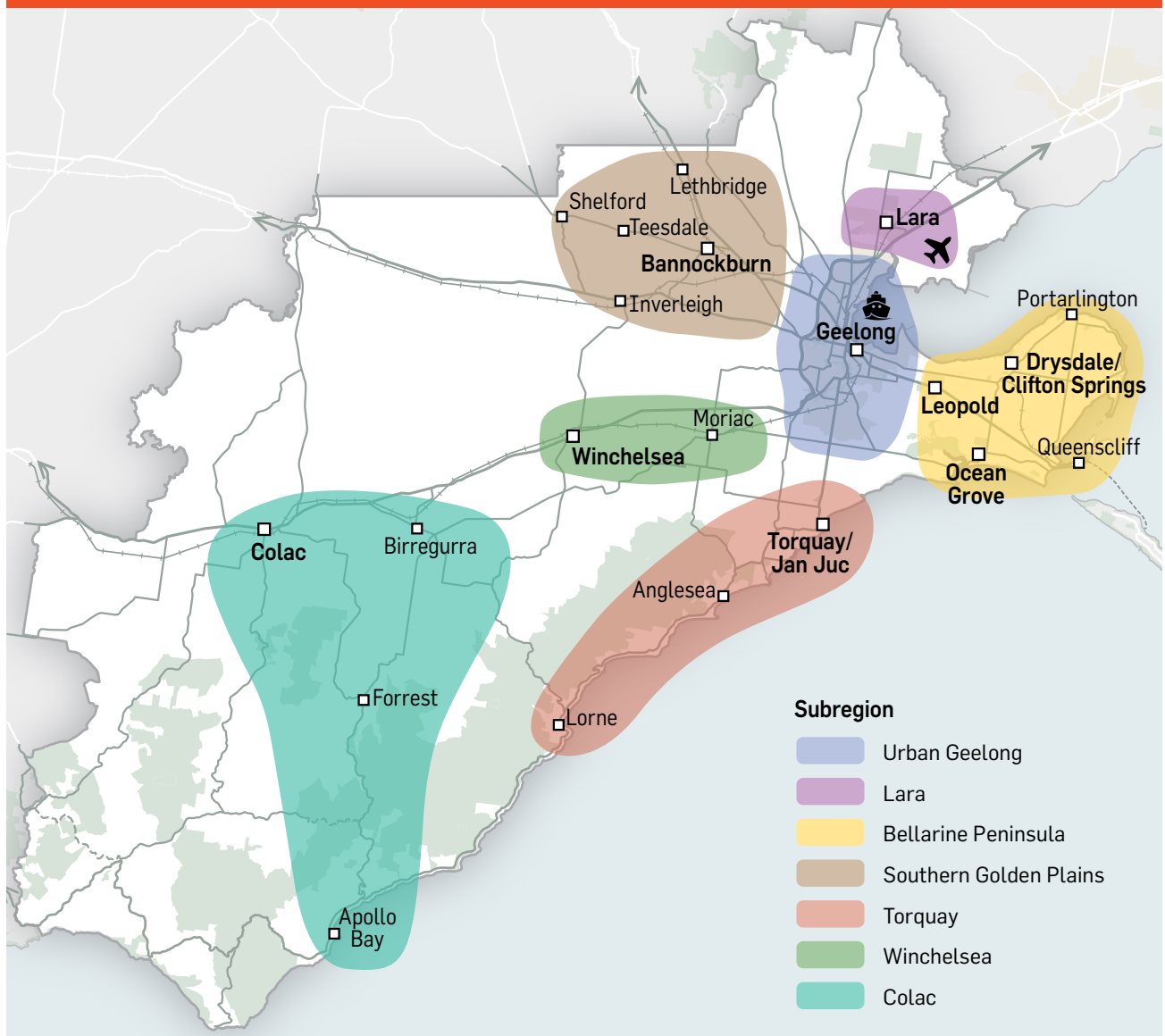
The Infrastructure Plan focuses on projects which can have a transformational impact on the region and support growth outcomes envisioned in the Growth Plan. It does not identify projects which are primarily local in nature unless they are critical to driving growth in the identified District Towns. The Plan does, however, consider projects which, while not having an across-G21 regional effect, are important at a subregional level and will drive and support identified growth.

To capture projects at the subregional level, the region is divided into seven distinct subregions based on groups of closely interconnected towns and areas, as shown on **Map 3**.

The seven subregions identified include:

- Urban Geelong, including Armstrong Creek and the two Further Investigation Areas
- Bellarine Peninsula including the District Towns of Drysdale/Clifton Springs, Leopold and Ocean Grove
- Lara, including Avalon Airport
- Southern Golden Plains including the towns of Bannockburn, Lethbridge, Inverleigh, Teesdale, Shelford and Batesford
- Torquay/Jan Juc, including Anglesea and Lorne
- Winchelsea, including Moriac
- Colac including Birregurra, Forrest and Apollo Bay.

MAP 3 / SUBREGION MAP



OVER 80 PER CENT OF GROWTH ACTIVITY THROUGHOUT URBAN GEELONG IS DISPERSED INFILL

2.1.4 Regional infrastructure overview

This section summarises the growth/settlement patterns within each of the seven designated subregions and their associated infrastructure gaps and needs. The planned growth areas are identified in Appendix A of the Background Report, which sets out the rationale for planning of infrastructure that is dependent on growth area sequencing and efficient rollout.

The reference to ‘planned infrastructure’ in this section relates to the infrastructure projects identified in the Infrastructure Plan rather than specific government commitments.

Regional

Regionally, growth is directed towards larger settlements: urban areas of Geelong, District Towns and seweried towns on key transport corridors; and a limited amount to other seweried and unseweried towns and areas. Growth in urban areas and District Towns is a mix of infill and conventional broadhectare residential, with some low density and rural residential on settlement outskirts. Larger settlements are linked by major roads/highways (and sometimes rail), are serviced by networks of reticulated water, sewer and (often) natural gas, and host a variety of community services. While such infrastructure forms foundations for growth, this comes with the need to augment, replace or extend infrastructure. At the regional level, this includes major highway duplication and rail/public transport links, energy generation and transmission, waste disposal facilities and open space corridors. Many coastal settlements experience substantial visitor growth in peak periods, which places strains on existing infrastructure capacity.

Urban Geelong

Over 80 per cent of growth activity throughout Urban Geelong is dispersed infill. The remainder consists of high density residential in Central Geelong and conventional residential in several other discrete locations such as Fyansford and Corio. The Urban Geelong area is reasonably well served by its roads but public transport is infrequent and indirect rendering it inconvenient to commuters. Links between the Geelong Ring Road, the GREP and Geelong Port from Geelong and the south-west do not provide a high level of service and add to congestion and supply chain inefficiencies. There are some gaps in health and education, particularly in Corio/Norlane, as well as a need for more sports and recreation and arts/cultural facilities to serve the growing population of the city.

To counter these deficiencies, improvements to road and rail links to/from Geelong Port and GREP are planned, as are rail service improvements between Geelong and southern Geelong (Grovedale) in conjunction with

the opening of the Regional Rail Link in 2016 and the reorganisation of bus routes to better suit commuters and students. Trade training and expanded health and community facilities are envisaged for Corio/Norlane that complement ongoing investments in education and health in Central and southern Geelong.

There are also important sports, arts/culture and business/tourism precincts intended for Central Geelong. Upgrades to water supply, sewer, electricity and gas are planned in conjunction with this growth. In the Armstrong Creek growth area, physical and community infrastructure has been designed in step with development of the area up to 2040. To account for the additional traffic to Armstrong Creek from urban Geelong, several road upgrades and a reservation for a future rail service are envisaged.

Lara

Residential growth in Lara consists of several infill and broadhectare areas of mainly conventional residential development. The largest is the West Lara growth area which accounts for around 50 per cent of total lot supply. The area is reasonably well served by roads, although the Station Lake Road level crossing is a traffic bottleneck which is likely to worsen with the advent of the Regional Rail Link. There are also some community facility provision issues that will be exacerbated with further growth. Included in the Lara subregion is Avalon Airport, which has recently been nominated for international airport status. This could signal much increased international traffic in addition to its growing domestic air traffic.

Planned infrastructure includes the rail crossing grade separation and new community and health facilities. At Avalon Airport, a passenger rail link is planned that will also include reservation capacity for future rail freight to serve the precinct, a potential intermodal freight interchange and future port facilities expansion to Port Wilson. A new terminal building and local road improvements are planned. Upgrades to water supply, sewer, drainage, power and gas are planned in conjunction with growth. South of Lara, road, drainage and water supply works are planned for the growing industrial area of the GREP.

Bellarine Peninsula

The Bellarine Peninsula subregion includes the District Towns of Leopold, Drysdale/Clifton Springs and Ocean Grove, whose planned growth consists of dispersed infill (around one third) and conventional broadhectare residential (around two thirds). For the towns of Portarlington, Indented Head, St Leonards, Barwon Heads and Point Lonsdale, growth is mainly dispersed infill with limited broadhectare residential development, save a significant broadhectare area in St Leonards.

Towns are quite well served by arterial roads to and from Geelong and between centres, although pressures are emerging in and around the District Towns of Drysdale (busy High Street) and Ocean Grove (busy Grubb Road from Bellarine Highway). Bus services are infrequent and indirect rendering them undesirable to commuters. There are severe pressures on the gas network and an emerging need for community facilities in Drysdale/Clifton Springs and Ocean Grove to serve major growth taking place.

Planned infrastructure includes a duplication of Grubb Road, bus service improvements, gas augmentation works, water supply and sewer upgrades and the provision of community facilities in District Towns, particularly for health and early years. Also planned is the Portarlington Safe Harbour project and Queenscliff ferry terminal facilities upgrade. Geelong Ring Road connections to the Bellarine Peninsula are envisaged with the staged connection of the Ring Road to Barwon Heads Road and ultimately to Portarlington Road.

Southern Golden Plains

The southern portion of the Golden Plains Shire subregion includes the District Town of Bannockburn and the smaller unsewered satellite towns of Lethbridge, Inverleigh, Teesdale, Shelford and Batesford. The majority of planned growth will occur in Bannockburn, around 60 per cent of lots, and is almost all broadhectare large conventional residential situated on the periphery of the township. Growth in the small towns is exclusively low density or rural residential that is characteristic of unsewered towns. Intensive agriculture is planned around Lethbridge and the junction town of Gheringhap is envisaged as a transport and industrial hub.

The satellite towns are well linked to Bannockburn via fairly direct roads and to Geelong via the Hamilton and Midland Highways, the latter which are also major freight routes. Rail lines to Bannockburn, Lethbridge and Inverleigh are freight only and public transport is too infrequent for commuting. Due to rapid growth, Bannockburn is experiencing pressures on its road and drainage infrastructure. Despite its growth the town is not yet gas reticulated.

Planned infrastructure includes highway upgrades, road and drainage upgrades in Bannockburn town centre, and a heavy vehicle route investigations. Public transport improvements envisage the reopening of the Geelong-Ballarat rail link which will make commuting by train from Bannockburn possible; planned community facilities include a K - 12 school and an emergency services facility. Reticulated gas is planned for Bannockburn, as are water supply and sewer upgrades and provision of a potable water trunk line for intensive agriculture near Lethbridge subject to government funding.

Torquay

The Torquay subregion includes the District Town of Torquay/Jan Juc and the sewered towns of Anglesea, Aireys Inlet/Fairhaven and Lorne. Planned growth is almost entirely located in Torquay, consisting mostly of conventional broadhectare residential, over 90 per cent, in the north and north-west growth areas. The town of Torquay is relatively well serviced by roads but with growth there will be more pressure on main roads towards Geelong. Lack of frequent direct bus services to Geelong limits commuting options. Torquay also experiences gas shortages and pressure on community facilities due to its growth. The Great Ocean Road requires improvements to keep pace with visitation and tourism activity.

Planned infrastructure in Torquay includes community facilities (early years, library and sporting), gas supply boost, and electricity, water supply, sewer and recycled water upgrades. Upgrades are required for Anglesea Road towards Geelong and there are long term plans to extend the planned rail link from Armstrong Creek and Geelong to Torquay. Other infrastructure needs in the subregion include a major tourist precinct in Lorne, upgrade of the Deans Marsh-Lorne Road and utilisation of recycled water in the Thompson Valley to service agricultural production.

Winchelsea

The Winchelsea subregion includes the sewered town of Winchelsea and the small unsewered town of Moriac. Planned growth is almost entirely in Winchelsea and is overwhelmingly broadhectare conventional residential with a small amount of infill; Moriac is almost exclusively low density residential. Transport links to Winchelsea and Moriac include the Princes Highway, which is currently being duplicated and good connections to the north. The Warrnambool rail line runs through both towns but only three passenger trains operate per day (stopping at Winchelsea only), which is insufficient for commuting. Winchelsea is not yet gas reticulated, hampering further employment growth.

Planned infrastructure for Winchelsea includes water supply upgrades, gas provision and a community health hub. Railway station infrastructure at Winchelsea and reinstatement of the closed railway station at Moriac are also planned in conjunction with improved services on the Warrnambool rail line.

Growth of Winchelsea to a population of 10,000 residents is a strategic aim of the Growth Plan; in this scenario, additional water supply and sewer upgrades will be required.

GROWTH OF COLAC TO A POPULATION OF 20,000 RESIDENTS IS A STRATEGIC AIM OF THE GROWTH PLAN

Colac

The Colac subregion includes the District Town of Colac and the smaller sewered towns of Apollo Bay and Birregurra. Around 70 percent of planned growth is in Colac, consisting mainly of low density residential and significant commercial and industrial areas. The remaining growth is in Apollo Bay and Birregurra.

Colac is relatively well served by transport infrastructure although it has only three train services a day from Geelong and experiences significant heavy vehicle traffic through its town centre, which is identified for service and amenity upgrades. The town's urban drainage system is under capacity, resulting in occasional flooding and restricting further growth potential. Regionally, access roads and bridges serving the timber and dairy industries require upgrading, and tourism infrastructure is required in Apollo Bay.

Planned infrastructure in Colac includes projects aimed at regenerating the city centre (CBD & Entrances Project and community facilities (health, early years and emergency services, Beechy Precinct completion), as well as major drainage, gas, and water supply and sewer upgrades. NBN rollout is anticipated within three years. In Apollo Bay, a major harbour precinct redevelopment is envisaged; upgrades are planned for access roads and bridges for industry use and the Colac-Apollo Bay road link. A future highway bypass around Colac is also envisaged to improve CBD functionality and development.

Growth of Colac to a population of 20,000 residents is a strategic aim of the Growth Plan; in this scenario some augmentation of networked infrastructure and drainage may be required.

2.1.5 Explanation of infrastructure schedules and maps

The following sections identify regional and subregional infrastructure projects within the five infrastructure themes using project schedules and maps.

The schedules include:

- a **project reference** - this reference identifies projects on the infrastructure theme maps and in the more detailed project descriptions in the *Background Report*. The reference includes:
 - a letter identifying whether the project is regional (R) or subregional (G - Urban Geelong, L - Lara, P - Bellarine Peninsula, B - southern Golden Plains, T - Torquay, C - Colac, W - Winchelsea)
 - an infrastructure theme number following the region identifier 1 - Transport, 2 - Utilities, 3 - Community facilities, 4 - Business and tourism, 5 - Environment
 - a project number (sequential through each theme)

- **project title** - a summarised project description
- **current status** - the current status of the project: Concept - developed idea or preliminary assessment undertaken, Feasibility - business case or feasibility study phase, Planning - detailed design and planning phase, Pre-construct - planning complete or 'shovel-ready' and/or funds committed, Construction - under construction, Planned - in service authorities' planned programming
- **delivery timeframe** - envisaged timing for project development and delivery based on project prioritisation and sequencing of growth
- **indicative cost** - approximate cost, if applicable, based on a detailed cost analysis for well developed projects or estimate for early-stage projects derived from similar projects
- **funding source** - potential source of government or alternative funding: L - local, S - state, F - federal, O - other, including privately funded or paid for by provider through tariffs, D - development contributions levied on developers/new customers
- **further work required** - identified by ★ indicates potential 'game changer' or transformational projects which require as a short term priority more detailed investigation or business case development. These priorities are also identified in the theme commentary.

2.1.6 Funding

It is acknowledged that in identifying a range of major projects there are significant financial implications. While DCPs, public private partnerships or extended local government borrowings may assist provision for local infrastructure, many of the projects identified cannot proceed without major state and federal government funding because they relate to state or federal infrastructure, or because of the high capital costs involved. In a period of restrained spending it is important to identify a strong link with benefit delivery rather than just need.

While infrastructure projects have been identified and quantum of costs estimated in consultation with government departments where possible, this does not infer a funding commitment from either the state or federal governments.

The Implementation Plan identifies a timing sequence of projects based on when they would logically be required to support growth and because they enable subsequent project development to take place. This provides a basis for seeking critical project funding at a regional level. The Plan accepts that the required funding may not always be forthcoming, which will impact on project timing. G21 will work with government to support the timely funding of key infrastructure projects.

The region's transport network is critical not only to moving people and goods safely and efficiently, but also to supporting its future growth and prosperity.

2.2 TRANSPORT

2.2.1 Key challenges and opportunities

The region has an extensive transport network comprising:

- major roads, including the Princes Freeway, Geelong Ring Road, the Midland, Hamilton, Surf Coast, Bellarine and Princes Highways and the Great Ocean Road
- rail, including passenger rail services to Melbourne, Colac and Warrnambool, as well as standard, broad and dual gauge connections and freight linkages.
- public transport services, via bus/coach and train, in and between urban Geelong and District Towns.

This network provides important linkages with Melbourne, and adjoining regions and states, facilitates the movement of freight and agricultural products, supports the business and tourism sector and enables commuting. It also underpins the Growth Plan's support for strategic housing and jobs growth in Geelong and the District Towns and areas located on these networks. A strong regional transport network also supports the regional tertiary education sector and has community accessibility and health benefits. Transit stations and interchanges, where public transport offers high levels of accessibility, provide ideal opportunities for housing intensification, employment and community facilities.

The economic and social significance of the region's infrastructure is also linked to the role and importance of Geelong Port and Avalon Airport. These cross-theme infrastructure components are considered under the **Business and Tourism** chapter.

As the region grows, a number of deficiencies and gaps in the transport network are appearing that require upgrades to infrastructure, additional links and the provision or enhancement of public transport services.

At a subregional level, the key transport infrastructure needs include:

- Urban Geelong - road and rail freight links to the GREP and Geelong Port, Bacchus Marsh Road duplication, improvement of passenger rail services from Geelong to Grovedale and upgrade of station facilities, reorganisation of city bus services and provision of bicycle paths; in conjunction with Armstrong Creek build-out: duplication of Barwon Heads Road and Surf Coast Highway and feasibility study for the need for a high-speed southern link



- Lara - grade separation of level crossing at Station Lake Road and future McClelland Avenue bypass and a heavy rail passenger link to Avalon Airport
- Bellarine Peninsula - extension of the Geelong Ring Road to Portarlington Road, Drysdale bypass, Grubb Road duplication at Ocean Grove and improvement of public transport in and between District Towns and Geelong
- Southern Golden Plains - Midland Highway duplication, Hamilton Highway and Bannockburn-Skipton road upgrades, Bannockburn town road upgrades and heavy vehicle route, and reinstatement of passenger rail services
- Torquay - Anglesea Road duplication, bus improvements to Geelong and a future rail link from Armstrong Creek, and Great Ocean Road upgrades
- Winchelsea - Princes Highway duplication to Winchelsea (underway), station infrastructure and reinstatement of Moriac station for passenger rail. A bypass road may be considered in the long term in conjunction with town centre consolidation.
- Colac - Princes Highway duplication to Colac, future bypass and road improvements to the South Australian border, internal access road and bridge upgrades; an increase in rail passenger services to Colac from three to five trains per day in the short term, requiring the addition of passing loop/s, and longer term passenger rail service enhancements.

Schedule 1 identifies the key transport projects required to address these challenges and support growth consistent with the Growth Plan. They are also depicted geographically on Maps 4 and 5.

2.2.2 Road

The region's roads are experiencing an increase in traffic as a result of strong population growth. There are a number of roads across the region that exceed capacity and require either interim treatments/overtaking lanes or full duplication.

Road upgrades such as duplications need to be assessed with respect to predicted traffic volume and road safety considerations. Typical traffic volume triggers for duplication can range from 10,000 to 15,000 vehicles per day depending on the type of road i.e. urban or rural arterial road. *The G21 Regional Road Transport Plan* includes a strategy action plan that identifies projects and measures for an efficient, safe and integrated road transport system, while the refinement of the Victorian Integrated Transport Model to include identified growth areas in the City of Greater Geelong is an important tool for future network planning. Amenity impacts of heavy vehicles passing through regional town centres are prompting the review of alternative freight routes for Geelong, Drysdale, Bannockburn and Colac.

The region's iconic tourist road, the Great Ocean Road requires particular attention. It needs to be managed consistent with its heritage status. Geelong Ring Road capacity upgrades may also need to be considered in the longer term.

Current investments and projects

Major road projects and current studies underway include:

- Princes Highway duplication to Winchelsea/Colac
- Geelong Ring Road connection to Surf Coast Highway
- Route investigation for the long term realignment of the Princes Highway around Colac
- Drysdale Road Network Study.

Critical projects

Projects of highest significance are those which support major growth areas and build on the existing network by adding capacity or providing key commuter and business linkages:

- Freight road linkages from the Geelong Ring Road to Geelong Port and the GREP
- Connecting the Geelong Ring Road to the Bellarine Peninsula
- Upgrades to the Great Ocean Road and main internal connecting routes from the Princes Highway
- Upgrades to key links from Geelong to growth areas in Armstrong Creek and Torquay/Jan Juc
- Princes Highway duplication Winchelsea to Colac
- Duplication of Midland Highway to Bannockburn.

2.2.3 Rail

A key opportunity to reduce traffic pressures on roads is to facilitate commuting and movement of freight by rail. Rail patronage has grown at all of the region's stations from 2005 - 2011 with more than 250,000 patrons per month travelling from Geelong to Melbourne by train. The *Corio Norlane Structure Plan* and discussions with Northern Futures have highlighted the importance of upgrading passenger facilities at local stations as a catalyst for community regeneration and to encourage rail travel. Network upgrades are required to provide increased rail passenger services within Geelong, to Melbourne and to Colac-Warrnambool.

Freight connections to the Port, Avalon Airport and the GREP from key transport corridors are critical to support economic activity and jobs growth in the region. Passenger and freight rail connections to Avalon Airport will support the further development of this precinct and provide longer term port opportunities at Point Wilson. Future links to Werribee and Werribee East employment precincts and fast intercity services between Geelong and Melbourne will enhance regional economic activity and offer access to more employment opportunities.

New passenger rail links are identified to service growth areas in Armstrong Creek, Torquay, Bannockburn and the Bellarine Peninsula. Recognising demand may not justify service levels provided by rail in the short term, improved bus/coach services are likely in the interim.

Current investments and projects

Major rail projects and current studies underway include:

- Regional Rail Link, due for completion in 2016
- Grovedale Station construction, opening in 2014
- Construction of a rail crossing loop at Warncoort on the Warrnambool line for improved freight traffic
- Geelong Grain Loop enhancement project
- Avalon Airport Rail Link investigation
- Feasibility studies to investigate passenger rail to Ballarat (study complete), Drysdale and Torquay.

Critical projects

Projects of highest significance are those which build on and enhance the capacity of the existing system to offer more frequent services, rail freight opportunities and support development of major employment nodes:

- Rail freight connections to Geelong Port and GREP
- Partial duplication Geelong-Grovedale corridor and station upgrades
- Rail connection to Avalon Airport.

2.2.4 Public transport services

Public transport use has increased significantly in recent years since the Regional Fast Rail project and the opening of Marshall station, particularly between Geelong and Melbourne and also to and from Colac and Warrnambool. Long distance and city bus services have on the other hand been steady or in decline due to them being infrequent, indirect and not suited to commuting. Service level improvements and the provision of new transit corridors increases accessibility and transport choice for commuters and other users.

Public transport is planned based on the identification of transit corridors and required service level outcomes. The development of an integrated multi-modal network considers appropriate modes when attempting to match service requirements with travel demand. This typically implies the provision of bus or coach services in the short term and the eventual introduction of rail services in the medium-long term where they don't exist already.

Integrating public transport with land use helps broaden lifestyle choices and reduces car dependence. Locating residences, employment areas and community facilities along transit corridors or near stations and interchanges supports housing diversity/choice and offers improved access between centres of activity. It also builds demand and strengthens the case for service improvements and upgrades to higher capacity, faster modes such as rail.

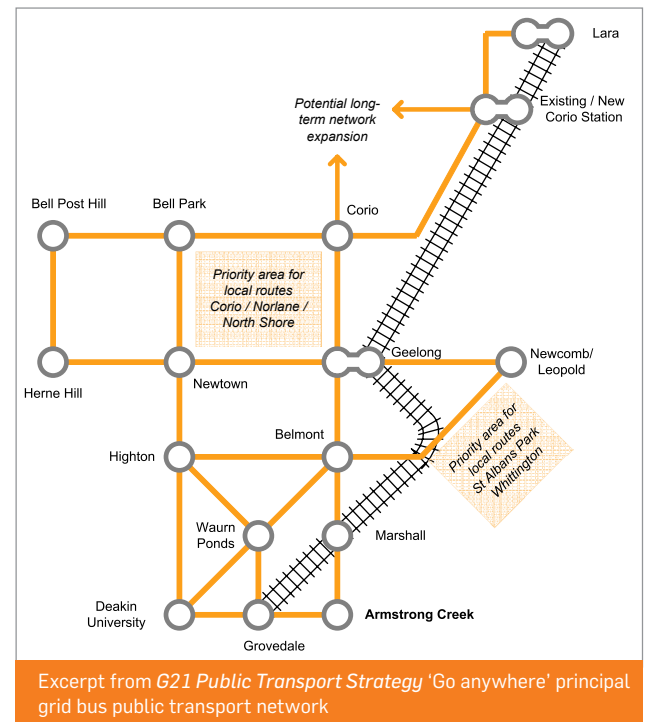
Current projects linked to service improvements

The Regional Rail Link will deliver a significant service level increase for passenger rail between Melbourne and Geelong. Peak frequencies will be around 10 minutes between Melbourne and Geelong and 20-30 minutes between Geelong and Grovedale, and counter peak and off-peak frequencies at around half this. Station upgrades with improved access and additional parking will be required to meet growing patronage. Further infrastructure investments along the Geelong-Grovedale corridor will permit higher service frequencies, a greater number of services running to Grovedale station and the future introduction of services to Torquay and Drysdale.

The *G21 Public Transport Strategy* identifies network and service level improvements aimed at increasing the utilisation of public transport. A four year action plan sets out initiatives under the following objectives:

- establishing a base level of service across the region and providing access for all potential users
- improving connectivity between regional centres
- supporting the development of an 'go-anywhere' urban public transport system in Geelong
- improving information, planning and partnerships.

Aligning with the third objective, the greater Geelong bus network is being reorganised into fewer, more direct trunk lines operating at higher frequencies and aligned with rail services at major stations. The service plan will be in place by 2016, coinciding with the opening of the Regional Rail Link, and its purpose is to cater better for commuters and increase the use of public transport.



Service improvement priorities

The most important service improvements are those that facilitate increased commuting and improve accessibility:

- Increase in rail passenger services between Geelong and Colac-Warrnambool from three to five trains per day in the short term with further increases in the longer term while maintaining freight capacity. This requires the addition of passing loop/s, ideally constructed at Colac station in conjunction with its redevelopment, and additional rolling stock
- Peak services Geelong - Bannockburn for commuting
- Direct/frequent bus routes within Urban Geelong and to Torquay and the Bellarine Peninsula through network reorganisation; this includes opportunities for bus prioritisation and real time information, and the trial of small bus solutions in District Towns.

2.2.5 Active transport

Active transport, including cycling and walking, is a healthy and environmentally friendly alternative to motorised transport. While cycling and pedestrian infrastructures are themselves not major drivers of growth, they offer, along with public transport, greater transport choice and are sustainable alternatives to road based transport. As well as reducing car use, cycling and walking provide a range of health and wellbeing benefits; they also encourage and support increased social engagement and safer environments through increased natural surveillance.

Current investments and projects

- G21 Regional Trails Strategy and Barwon River Parklands project
- City of Greater Geelong Bicycle Strategy
- Principal Pedestrian Network Demonstration project
- G21 Regional Road Transport Plan.

Developing a Principle Bicycle Network (PBN)

Creating an effective regional bicycle network is considered an important transport planning focus. This involves upgrading existing infrastructure and providing linking or new infrastructure in the form of on and off-road bike paths and lanes to address major safety issues. At a regional level, the idea of a Principal Bicycle Network (PBN) would include the following connections:

- Northern suburbs - connect Geelong to northern suburbs and Lara
- Western gateway - connecting Geelong to Ring Road, Bannockburn and Inverleigh
- Bellarine Peninsula - connect Geelong to Bellarine Peninsula towns and connect Peninsula communities
- Armstrong Creek - connecting Armstrong Creek to Geelong, Bellarine Peninsula and Torquay via the transit corridor and Barwon River Parklands project
- Surf Coast - connect Winchelsea and Lorne
- Colac Otway - connect Colac to Apollo Bay and Lorne
- Great Ocean Road - connect Geelong to Apollo Bay along the Great Ocean Road
- Deakin - connect Waurin Ponds and Waterfront campuses.

At a local level it will be important for councils in partnership with VicRoads as appropriate to implement commuter bicycle routes between key activity nodes.

Suggested response:

- It is recommended that a regional PBN Implementation Plan be developed
- That arterial road upgrade projects include provision for PBN.

Developing Principal Pedestrian Networks (PPN)

Principal Pedestrian Networks (PPN) aim to strategically plan and improve the pedestrian network around key destinations and activity areas to encourage more people to make more trips walking. The City of Greater Geelong is one of four local government partners in a PPN demonstration project which will see the design and implementation of pedestrian pause points and way finding. The ongoing development and mapping of PPNs will assist councils to provide for pedestrians and improve the pedestrian environment in a strategic way into the future.

GEELONG CENTRAL TRANSPORTATION LINKS STUDY

The Geelong Central Transportation Links Study, recently completed in partnership with DTPLI, VicRoads and City of Greater Geelong, investigates east west freight movements through central Geelong and provides an evidence base for considering the efficient movement of freight to complement the revitalisation of central Geelong.

2.2.6 Further work priorities

The following transport projects are considered to be priorities for further work:

- Rail freight connections to Geelong Port options study
- Major heavy vehicle road link Geelong Port - GREP - Princes Freeway options study
- Geelong stabling yards relocation options study
- Colac - Princes Highway bypass route designation in planning scheme
- Development of a Geelong Integrated Transport Plan
- Development of concept for future high speed rail link between Geelong and Melbourne.



FUTURE PROJECT – GEELONG INTEGRATED TRANSPORT PLAN

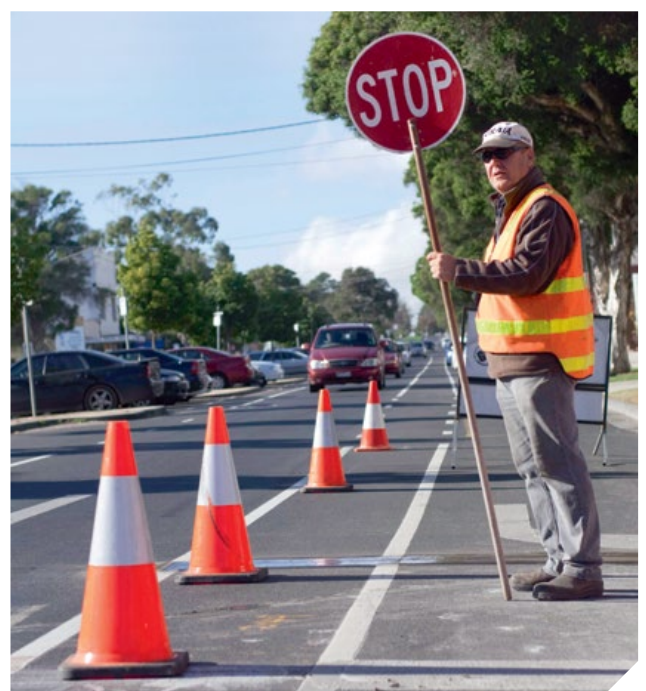
The further growth of Central and Urban Geelong as key employment and housing nodes will continue to place pressure on the transport network, particularly the road network and the limited capacity of existing north/south crossings of the Barwon River. While improvement of intra-Geelong public transport services will be a component in addressing this, there is also a need for a longer term, integrated transport strategy to address future capacity constraints within Geelong. This will need to be undertaken in the context of other strategies and studies under development including Vision II, G21 Public Transport Strategy and Geelong Central Transportation Links. The expansion of the Victorian Integrated Transport Model to Geelong and surrounding townships will enable modelling of the impacts of growth in Urban and Central Geelong on the transport network. Application of the SmartRoads process for Geelong will provide for equitable allocation of road space for competing transport modes. This could include a range of measures such as:

- bus priority at traffic signalised intersections and queue jump lanes
- provision of dedicated bicycle lanes and path linkages consistent with PBN/PPN and suitable for commuting and leisure travel
- diversion of heavy vehicles to dedicated routes.

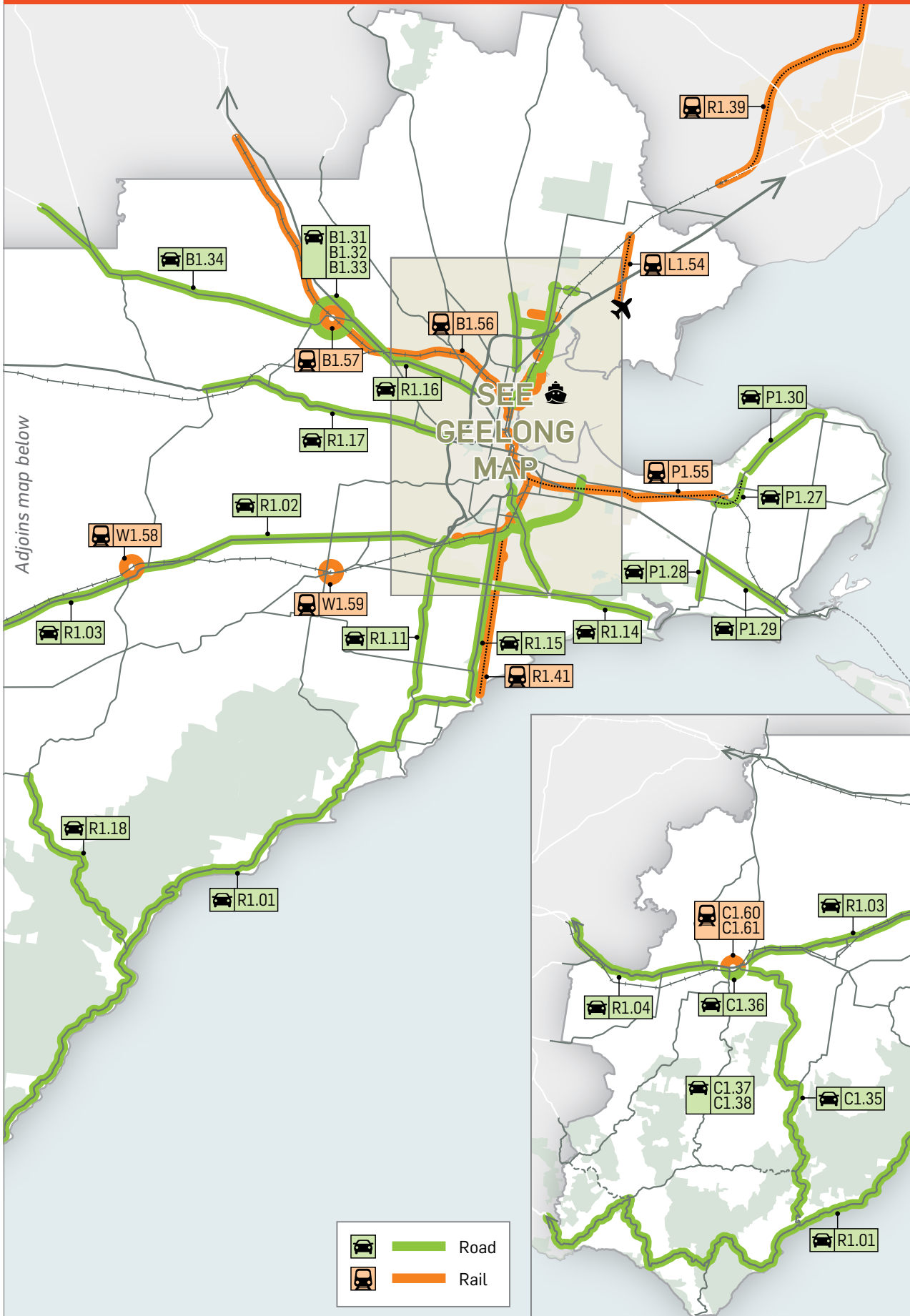
CRITICAL TRANSPORT PROJECTS EXTERNAL TO REGION

While not included in the project schedule, the following transport projects located outside the region are critical to the G21 region's capacity to grow:

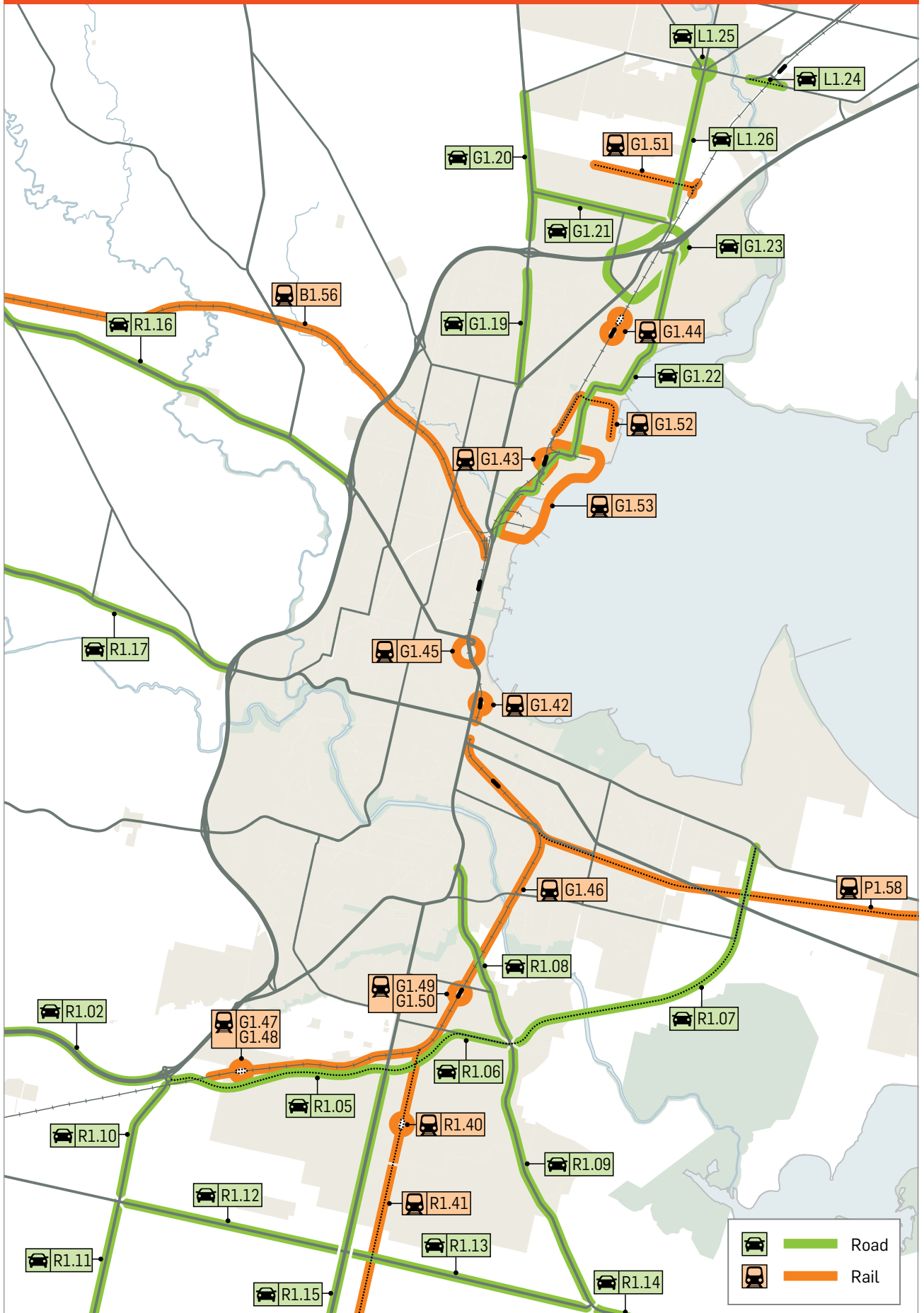
- transport links to Melbourne, a G21 Priority Project, including increased passenger rail services between Geelong and Melbourne, Regional Rail Link, reduction of traffic congestion on the West Gate Bridge through upgrades, the construction of East West Link and a second crossing of the Maribyrnong River to connect the Western Ring Road to the Port of Melbourne
- Outer Metropolitan Ring Transport Corridor linking Geelong and Melbourne's north and west and key transport hubs
- road upgrades to strengthen the linkages of the region to Warrnambool and the Great South Coast region
- increased passenger rail services and rail freight capacity from Geelong to Warrnambool and western Victorian regions
- restoration of passenger rail services from the region to Ballarat and ultimately to Bendigo.



MAP 4 / TRANSPORT PROJECTS – REGIONAL



MAP 5 / TRANSPORT PROJECTS – GEELONG
























TRANSPORT


Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 ROAD									
REGIONAL									
R1.01	Great Ocean Road upgrades	Planning						50	S,F
Princes Highway upgrades									
R1.02	Waurm Ponds to Winchelsea duplication	Construction						220	S,F
R1.03	Winchelsea to Colac duplication	Pre-construct						515	S,F
R1.04	Colac to SA border safety improvements	Planning						50–100	S
Geelong Ring Road Connection to Bellarine Peninsula									
R1.05	Anglesea Road to Surf Coast Highway (Section 4C)	Planning						110	S
R1.06	Surf Coast Highway to Barwon Heads Road	Planning						60	S
R1.07	Barwon Heads Road to Portarlington Road	Feasibility						200–300	S
Barwon Heads Road duplication									
R1.08	Stage 1: Corio-Waurm Ponds Road to Reserve Road	Concept						70–140	S
R1.09	Stage 2: Reserve Road to Lower Duneed Road	Concept						70–100	S
Anglesea Road duplication									
R1.10	Ring Road to Mount Duneed Road	Planning						17.4	S
R1.11	Mt Duneed Road to Great Ocean Road treatment	Feasibility						20	S
Southern link road									
R1.12	Anglesea Road to Surf Coast Highway	Feasibility						50–60	S
R1.13	Surf Coast Highway to Barwon Heads Road	Feasibility						50–60	S
R1.14	Barwon Heads Road to Barwon Heads	Concept						15–20	S
Other projects									
R1.15	Surf Coast Highway widening	Concept						50–80	S
R1.16	Midland Highway duplication to Bannockburn	Feasibility						130–160	S
R1.17	Hamilton Highway upgrade to Inverleigh	Feasibility						3–4	S
R1.18	Deans Marsh-Lorne Road upgrade	Feasibility						5–10	S

KEY

L Local government **S** State government **F** Federal government **O** Other (private, internal & tariffs) **D** Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 ROAD									
URBAN GEELONG									
Geelong Port-GREP-Ring freight connections									
G1.19	Bacchus Marsh Road duplication – South	Planning						18	S
G1.20	Bacchus Marsh Road duplication – North	Concept						30–40	S
G1.21	Rebuilding of Heales Road for heavy freight	Planning						10	L,S,F
G1.22	Port access and truck route improvements	Concept						50	S
G1.23	Geelong Port – GREP – Princes Freeway heavy vehicle link	Concept						80–150	S,F
LARA									
L1.24	McClelland Ave bypass and rail overpass	Feasibility						50	S
L1.25	6-way intersection Forest Road-Station Lake Road	Feasibility						3–5	S
L1.26	Forest Road South duplication	Concept						30–50	S
BELLARINE PENINSULA									
P1.27	Drysdale bypass	Feasibility						100	S
P1.28	Grubb Road duplication Ocean Grove	Feasibility						30	S
P1.29	Bellarine Hwy duplication Grubb Rd – Queenscliff	Concept						60–80	S
P1.30	Portarlinton Road upgrades Drysdale – Portarlinton	Concept						10–15	S
SOUTHERN GOLDEN PLAINS									
B1.31	Bannockburn town centre road upgrades	Concept						5	L,S
B1.32	Miltons Road bridge over Bruce's Creek	Concept						4–6	L,D
B1.33	Bannockburn heavy vehicle route	Feasibility						15–20	S
B1.34	Bannockburn-Skipton (C143) road upgrade	Concept						1–2	S
COLAC									
C1.35	Colac-Apollo Bay road link improvements	Planning						30	S
C1.36	Colac bypass	Concept						240	S,F
C1.37	Access roads for timber and other industries	Pre-construct						3	S
C1.38	Interior road and bridge upgrades	Pre-construct						13.5	L,S



* Further work required

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 RAIL									
REGIONAL									
R1.39	Regional Rail Link	Construction						5.3B	S,F
Torquay-Geelong Transit Link									
R1.40	Torquay rail link: Stage 1 to Armstrong Creek	Concept						70	S
R1.41	Torquay rail link: Stage 2 to Torquay	Concept						310	S
URBAN GEELONG									
G1.42	Geelong Railway Station redevelopment	Planning						8–10	S
G1.43	North Shore station redevelopment	Planning						3.5	S,F
G1.44	Corio station relocation and redevelopment	Concept						50	S
G1.45	Passenger train stabling yards relocation	Concept						200	S
G1.46	Partial duplication Grovedale to Geelong	Concept						200–300	S
Grovedale Station									
G1.47	Stage 1: Station construction	Construction						25	S
G1.48	Stage 2: South side development	Concept						75	S,O
Marshall Station development									
G1.49	Stage 1: Additional parking and access	Concept						3–5	S
G1.50	Stage 2: Area revitalisation and parking	Concept						15–20	S,O
Rail freight connections									
G1.51	Rail freight connection to GREP	Planning						15–20	S,F,O
G1.52	Rail freight connection to Lascelles wharf	Feasibility						11	S,F,O
G1.53	Rail siding and loop extensions Geelong Port	Concept						4	S,F,O
LARA									
L1.54	Rail link to Avalon Airport	Feasibility						400–1B	S,F

* Further work required

KEY

L Local government S State government F Federal government O Other (private, internal & tariffs) D Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 RAIL									
BELLARINE PENINSULA									
P1.55	Geelong – Drysdale rail line reinstatement	Concept						400–500	S
SOUTHERN GOLDEN PLAINS									
B1.56	Geelong-Ballarat passenger rail link	Feasibility						300–400	S
B1.57	Bannockburn railway station infrastructure	Concept						5	S
WINCHELSEA									
W1.58	Winchelsea railway station infrastructure	Concept						5	S
W1.59	Moriac railway station reinstatement	Concept						5–10	S
COLAC									
C1.60	Colac railway station redevelopment	Concept						5–7	L,S
C1.61	Colac rail-intermodal freight hub	Concept						20	S
 PUBLIC TRANSPORT SERVICES									
REGIONAL									
R1.62	Geelong-Torquay premium bus service	Feasibility							S
R1.63	Services increase to Ballarat and Apollo Bay	Feasibility							S
R1.64	Warrnambool rail line services increase	Feasibility							S
URBAN GEELONG									
G1.65	Reorganisation of bus network	Planning							S
G1.66	Smartbus routes Geelong	Concept						4 P.A.	S
BELLARINE PENINSULA									
P1.67	Improvements to main trunk bus services	Concept							S
P1.68	Local buses servicing district towns	Concept							S
 ACTIVE TRANSPORT									
REGIONAL									
R1.69	Principal cycling connections	Concept							S,F
R1.70	Principal pedestrian connections	Planning							L,S,F

SIGNIFICANT INVESTMENTS IN WATER AND RECYCLED WATER INFRASTRUCTURE HAVE RECENTLY BEEN COMPLETED

The timely, cost effective and efficient rollout of utility infrastructure underpins the region's capacity to support growth

2.3 UTILITIES

2.3.1 Key challenges and opportunities

The provision of utility infrastructure, or networked services including water, sewerage, drainage, gas, electricity and telecommunications, is critical for facilitating the development of new land for housing and industry and for supporting growth within existing urban areas and ensuring that District Towns are able to develop to their potential capacity and generate employment opportunities.

In some instances, existing infrastructure is aging or unable to meet current or future demands and requires upgrading or replacement. Most of the agencies responsible for providing these essential services are planning for new rollout or system upgrades consistent with the growth directions of the Growth Plan.

In new areas, the cost of incremental distribution infrastructure is paid for via development contributions, although there can be significant upfront costs for providers that are recovered through customer tariffs. This creates a need to ensure that new development leverages off existing networks or is provided efficiently through orderly sequencing so as to minimise land development costs or cost of living impacts through higher service prices.

In the medium to longer term, the effects of climate change will provide significant infrastructure challenges in terms of infrastructure loss, deterioration or capacity, and accommodating new technologies and energy sources.

At a subregional level, the utility infrastructure needs include, in addition to water supply and sewer upgrades in District Towns and urban areas:

- Urban Geelong - main outfall sewer duplication, major drainage works, augmentation of gas transmission pipeline to southern Geelong and Armstrong Creek reticulated gas rollout, a zone substation in Marshall and a terminal station in east Geelong. Further major infrastructure investment will be required to support the development of an FIA
- Lara - upgrade of gas distribution pipeline, and new zone substations at Lara and Avalon Airport
- Bellarine Peninsula - gas pipeline augmentation and upgrades to north and south Bellarine, and a new zone substation in Ocean Grove

- Southern Golden Plains - gas provision and a new zone substation at Bannockburn; water supply upgrades in Lethbridge and Inverleigh and a potable water trunk line for intensive agriculture near Lethbridge; water and gas provision for Gheringhap employment node
- Torquay - gas transmission pipe extension from southern Geelong to Torquay/Jan Juc, and new zone substations in Torquay and Lorne
- Winchelsea - gas provision via connection to South-West pipeline south of Winchelsea, and additional water supply and sewer upgrades in higher growth scenario
- Colac - water supply augmentation and water reclamation plant upgrade, drainage infrastructure, and gas supply to new growth areas in Colac; water supply and sewer upgrades in Apollo Bay.

Schedule 2 identifies the key utility infrastructure projects required to address these challenges and support growth consistent with the Growth Plan. They are also depicted geographically on **Map 6** and **7**.

2.3.2 Water supply

Significant investments in water and recycled water infrastructure have recently been completed or are planned to augment the region's water supply to meet the needs of a region of 500,000 people. Recently completed water infrastructure investments include:

- Melbourne to Geelong Pipeline
- Anglesea borefield
- Northern water plant supply of recycled water to the Geelong refinery
- Black Rock Water recycled water plant and associated dual pipe infrastructure to Armstrong Creek and north Torquay.

The existing Colac water supply is reaching capacity and investment in additional capacity will be required to cater for forecast growth. Similarly, upgrade of the Apollo Bay water supply is required to cater for forecast growth.

Planned investments

Water supply investments are planned to upgrade Colac's water supply to cater for forecast planned growth and also to upgrade supply to Apollo Bay

In addition, there are numerous local water supply upgrades and network extensions that are planned to be implemented in stages to progressively meet the water supply needs of ongoing development in the planned growth areas.

In the medium to longer term significant investment in upgrading water supply to support development of an FIA growth area including trunk sewer transfer mains and water storage tanks/basins. A timely decision on identification of a preferred FIA well ahead of potential development is required to enable forward infrastructure provision planning.

Critical projects

- Colac water supply upgrade
- Construction of a potable water trunk line to supply water for intensive agriculture near Lethbridge to facilitate economic activity and employment subject to government funding being secured.

2.3.3 Sewerage

Barwon Water has an extensive system of sewer pumping stations and reclamation plants managing waste from industry and domestic sources. Upgrades of the sewerage system capacity have been progressively implemented to meet the needs of development in planned growth areas across the region. The provision of sewer pump station odour control measures at the West Fyans Street Precinct in Geelong is identified as a factor required to facilitate development of this precinct (refer Section 3).

Planned investments

The following key sewerage investments are planned for the forecast growth in planned growth areas:

- Main outfall sewer duplication between south Geelong and the Black Rock water reclamation plant
- Colac water reclamation plant upgrade.

In the medium to longer term significant investment in upgrading sewerage infrastructure to a preferred FIA growth area will be required as adjacent infrastructure has limited capacity beyond that required for planned growth areas.

Critical projects

- Main outfall sewer duplication to Geelong
- Colac water reclamation plant upgrade.



2.3.4 Stormwater drainage and flooding

While technically not a utility, the provision of major drainage system upgrades and flood mitigation works in a number of urban areas is critical for providing the capacity needed to support the timely development of a number of identified growth areas. Climate change and variability will result in more frequent and significant storm and flooding events, which will present future system design challenges.

Current investments and projects

Ongoing works are being undertaken by G21 municipalities to enable the development of new growth areas and reduce the flood susceptibility of developed areas, particularly urban areas of Geelong and the Bellarine Peninsula. These projects link to other broader flood management plans and activities of the CCMA and Barwon Integrated Water Cycle Management Network.

Planned investments

Ongoing works to manage flooding or stormwater constraints to urban or commercial node development are planned for all District Towns and major urban areas to facilitate their timely development consistent with the Growth Plan.

Critical projects

High priority projects include:

- GREP northern catchment infrastructure to facilitate industrial/commercial growth
- Major drainage works in Colac and in key growth areas in Geelong and the Bellarine Peninsula.

2.3.5 Electricity

It will be necessary to augment and extend the existing power supply network to support further housing and industry growth. This includes new and upgraded zone substations. Electricity service providers have an ongoing 10 year plan to upgrade the existing network to expected load growth and support existing identified growth areas.

Current investments and projects

These include ongoing network upgrades and rollout of infrastructure to new communities.

Planned investments

Key projects providing additional system capacity to major urban areas and employment nodes include:

- East Geelong Terminal Station
- New Zone substations at Charlemont (Armstrong Creek), Lara, Avalon Airport, Ocean Grove, Bannockburn, Torquay and Lorne.

THE G21 REGION IS WELL PLACED IN THE NBN ROLLOUT STRATEGY WITH CONSTRUCTION COMMENCED IN SOME CENTRES OR PLANNED OVER THE NEXT THREE YEARS

Alternative energy opportunities

With potential onshore and offshore alternative energy opportunities in the region associated with wind, solar and geothermal resources, there will be a need to improve the capacity of the grid to permit energy to be distributed from source to homes and industry. Network upgrades should also consider linkages to the Great South Coast region given that region's alternative energy aspirations.

2.3.6 Gas

The gas network is generally keeping pace with growth and industrial activity. However, there are some current system capacity and access issues including:

- Winchelsea and Bannockburn do not have reticulated gas; gas to these towns will support housing growth and industrial opportunities
- Existing urban connection capacity challenges to Central Geelong, Torquay and Black Rock.

Current investments and projects

- *Energy for Regions Program* – delivery of gas identified for Winchelsea and Bannockburn
- Compressor station in Birregurra/Winchelsea area to increase capacity of high pressure transmission line (South-West pipeline)
- Transmission pipeline extension from southern Geelong to Torquay/Jan Juc.

Planned investments

Key gas projects to provide gas to District Towns and growth areas to support residential, industrial and employment development include:

- Capacity enhancement of South-West transmission pipeline via compressor station at Stonehaven and pipeline looping and extensions between Port Campbell to Rockbank (extended to Wollert)
- Augmentation of transmission pipeline to southern Geelong and south extension
- Upgrade of trunk distribution pipelines in Lara, Point Henry to Leopold-Drysdale, the northern Bellarine Peninsula, Ocean Grove and Point Lonsdale
- Gas provision to Bannockburn and Winchelsea via City Gate connection to the South-West pipeline, and reticulation to growth areas of Colac and Armstrong Creek.

Longer term, connection to smaller towns could be considered where larger commercial project opportunities make it feasible to do so.

2.3.7 Telecommunications

Improving telecommunications technology and infrastructure across the region is fundamentally important for doing business, connecting isolated communities and improving skills and access to education, health services and emergency services. The timely rollout of the NBN across the region is a key part of improving communications.

Current investments and projects

The G21 region is well placed in the NBN rollout strategy with construction commenced in some centres or planned over the next three years. Planned 3 year rollout includes parts of Urban Geelong and the majority of the region's District Towns. In most instances this includes fibre to the home for major centres (more than 1000 households) and fixed wireless or satellite service options for smaller centres.

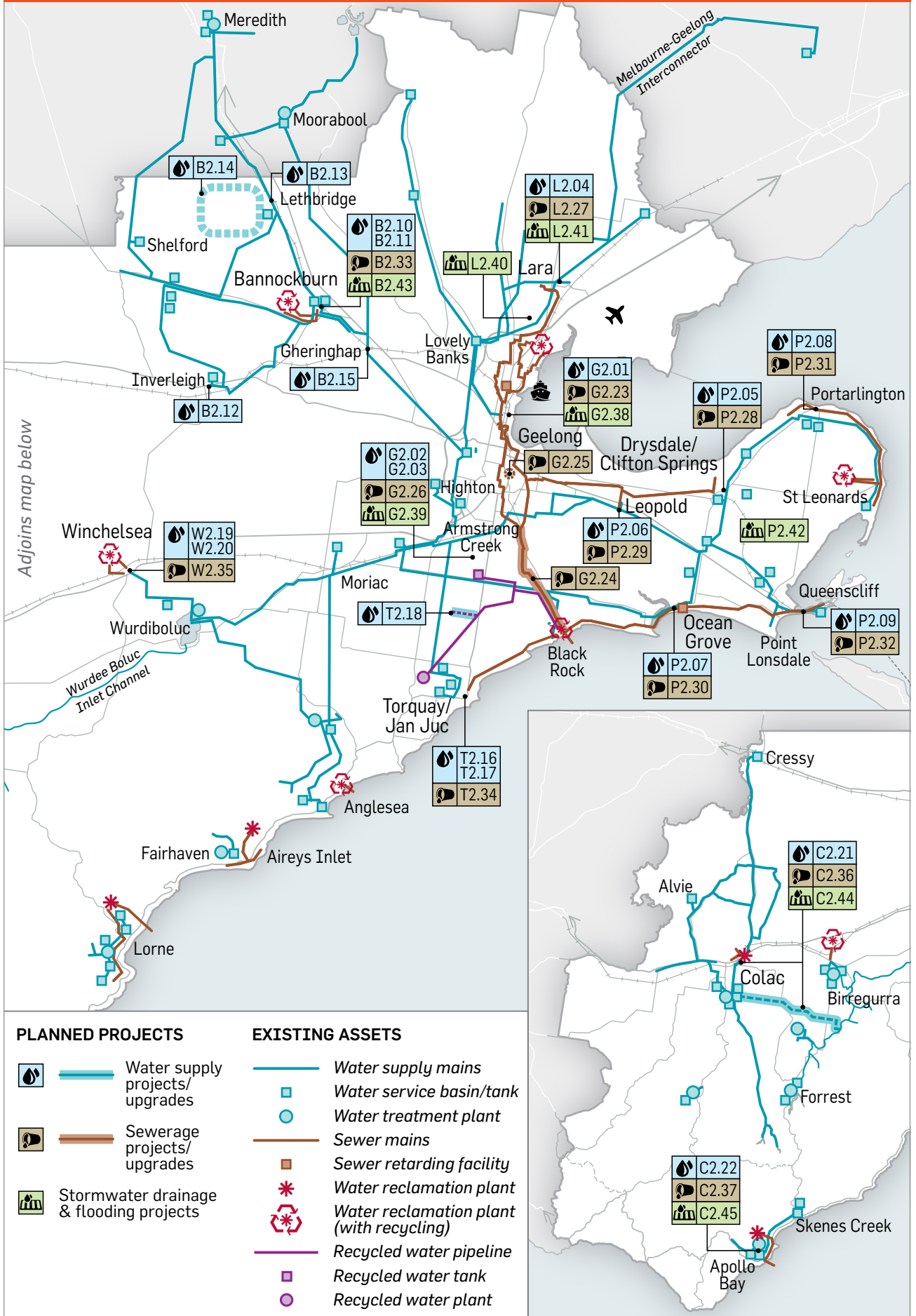
A clear timeframe for NBN rollout to Colac and some parts of the region has not yet been identified. Fibre to Colac in particular is considered to be a high priority within a three year timeframe, given its importance in providing improved access to health and education services, improved library services and support for business innovation, productivity and jobs growth. Desirably the whole G21 region should be NBN connected in this timeframe.

In some areas Telstra's exchanges may need to be upgraded to support timely NBN rollout. Mobile phone black spots in regional and rural areas restrict communications and require attention for emergency and general communications purposes.

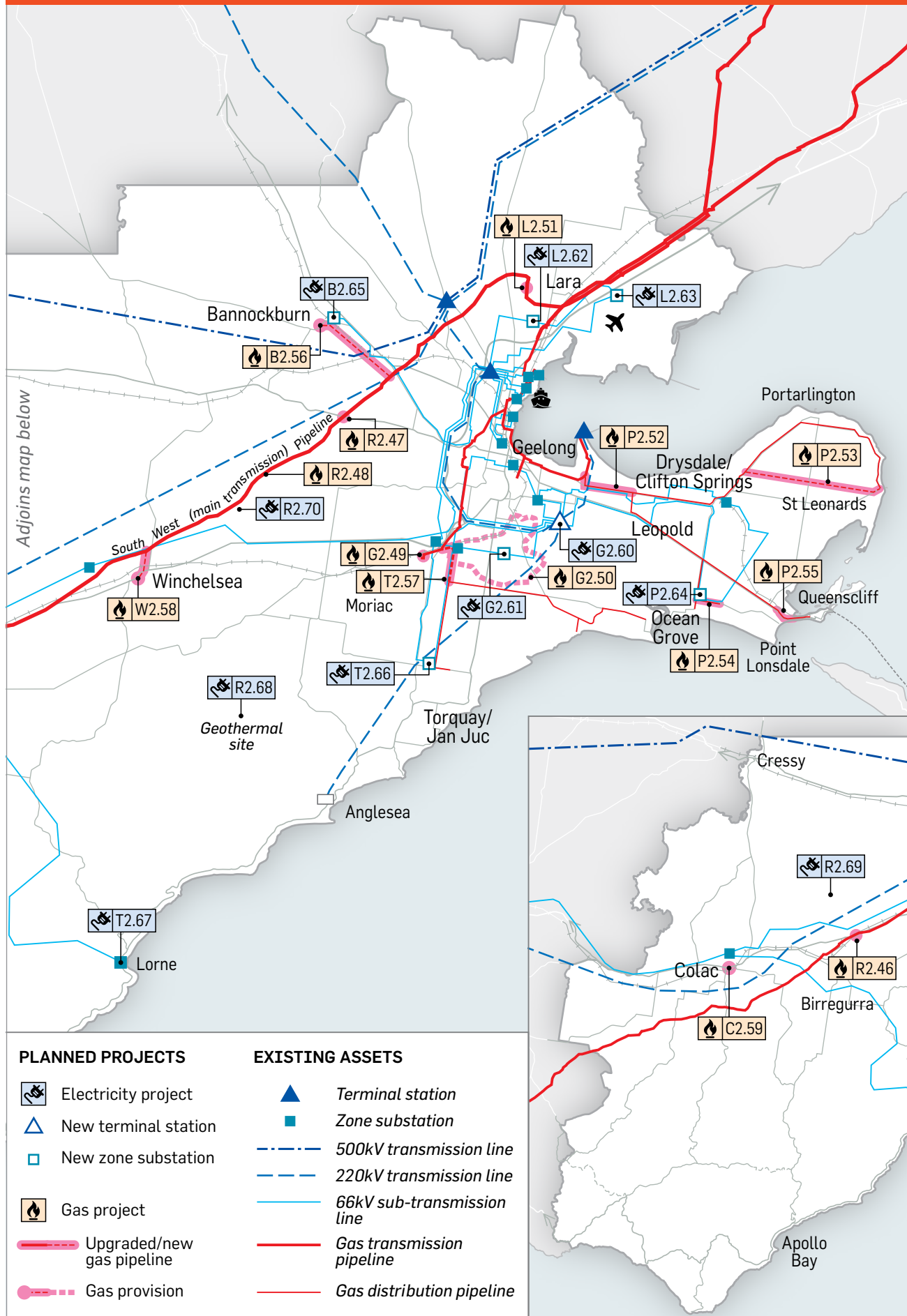
FUTURE PROJECT – GEELONG DIGITAL ROADMAP IMPLEMENTATION

The City of Greater Geelong is pursuing a number of strategic initiatives to improve the region's digital accessibility and capability. Priorities include development of a Digital Roadmap; optimising our fibre network and working collaboratively with key stake holders to better utilise the fast broad band opportunity presented through fibre connectivity; delivering Wi-Fi in Central Geelong and in the longer term other major commercial and tourist precincts; and establishing a "Geelong e-Business Centre" to assist the business sector to enhance engagement with the digital economy. Undertaking the next phase of project scoping, strategic planning or business case development is considered to be an important priority and will support a range of G21 Priority Projects and Vision 2.




















MAP 6 / WATER SUPPLY, SEWERAGE AND DRAINAGE PROJECTS



MAP 7 / ENERGY PROJECTS



UTILITIES

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 WATER SUPPLY									
URBAN GEELONG									
G2.01	Geelong water supply upgrades	Planned						93	O,D
G2.02	Armstrong Creek water supply system	Planned						31	O,D
G2.03	Armstrong Creek recycled water system	Planned						47	O,D
LARA									
L2.04	Lara water supply upgrades	Planned						13	O,D
BELLARINE PENINSULA									
P2.05	Clifton Springs water supply upgrades	Planned						7.2	O,D
P2.06	Leopold water supply upgrades	Planned						3.9	O,D
P2.07	Ocean Grove water supply upgrades	Planned						26	O,D
P2.08	Portarlington water supply upgrades	Planned						3.3	O,D
P2.09	Point Lonsdale-Queenscliff water supply upgrades	Planned						7.5	O,D
SOUTHERN GOLDEN PLAINS									
B2.10	Bannockburn water supply upgrades	Planned						19	O,D
B2.11	Bannockburn recycled water augmentation	Feasibility						15–20	O,D
B2.12	Inverleigh water supply upgrades	Planned						12	O,D
B2.13	Lethbridge water supply upgrades	Planned						18	O,D
B2.14	Potable water trunk line for intensive agriculture near Lethbridge	Planning						11.8	S,F,O
B2.15	Gheringhap infrastructure servicing	Concept						2–3	O,D
TORQUAY									
T2.16	Torquay water supply upgrades	Planned						61	O,D
T2.17	Torquay recycled water upgrades	Planned						20	F,O
T2.18	Thompson Valley water supply	Concept						5	L,O






















KEY

L Local government **S** State government **F** Federal government **O** Other (private, internal & tariffs) **D** Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
WATER SUPPLY									
WINCHELSEA									
W2.19	Winchelsea water supply upgrades	Planned	████████████████████				4.3	0,D	
W2.20	Winchelsea water supply upgrades for additional growth	Concept				██████████	20	0,D	
COLAC									
C2.21	Colac water supply upgrades	Planned	████████████████████				40	0,D	
C2.22	Apollo Bay water supply upgrades	Planned	████████████████				26	0,D	
SEWERAGE									
URBAN GEELONG									
G2.23	Geelong sewerage upgrades	Planned	████████████████████				88	0,D	
G2.24	Main Outfall Sewer duplication	Planned		████			82	0,D	
G2.25	West Fyans sewer odour control works	Planning		██			5.5	L,0	
G2.26	Armstrong Creek sewerage system	Planned	████████████████████				36	0,D	
LARA									
L2.27	Lara sewerage upgrades	Planned	████████████████				24	0,D	
BELLARINE PENINSULA									
P2.28	Clifton Springs sewerage upgrades	Planned	████████████████				34	0,D	
P2.29	Leopold sewer upgrades	Planned	████████████████				21	0,D	
P2.30	Ocean Grove sewer upgrades	Planned	████████████████				30	0,D	
P2.31	Portarlinton sewerage upgrades	Planned	████████████████				26	0,D	
P2.32	Point Lonsdale Queenscliff sewerage upgrades	Planned	████████████████				17	0,D	
SOUTHERN GOLDEN PLAINS									
B2.33	Bannockburn sewerage upgrades	Planned	████████████████				16	0,D	
TORQUAY									
T2.34	Torquay sewerage upgrades	Planned	████████████████				9.3	0,D	
WINCHELSEA									
W2.35	Winchelsea sewerage upgrades for additional growth	Concept				██████████	40	0,D	

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
SEWERAGE									
COLAC									
C2.36	Colac sewerage upgrades	Planned						16	O,D
C2.37	Apollo Bay sewerage upgrades	Planned						2.8	O,D
STORMWATER DRAINAGE AND FLOODING									
URBAN GEELONG									
G2.38	Geelong major drainage works	Planned						77	L,D
G2.39	Armstrong Creek major drainage works	Planned						170	D
G2.40	GREP northern catchment infrastructure	Planning						10.3	L,S,F,D
LARA									
L2.41	Lara major drainage works	Planned						70	L,D
BELLARINE PENINSULA									
P2.42	Bellarine major drainage works	Planned						112	L,D
SOUTHERN GOLDEN PLAINS									
B2.43	Bannockburn centre main drainage upgrades	Planning						1	L,D
COLAC									
C2.44	Colac major drainage infrastructure	Concept	*					4.5	L
C2.45	Apollo Bay drainage infrastructure	Planning						3.8	S,F
GAS									
South West (main transmission) Pipeline upgrades									
R2.46	Compressor station Birregurra-Winchelsea	Planning						40	0
R2.47	Compressor station Stonehaven	Planned						40	0
R2.48	Pipeline looping and extensions	Planned						250	0
URBAN GEELONG									
G2.49	Southern Geelong transmission pipeline augmentation	Planned							O,D
G2.50	Armstrong Creek reticulated gas rollout	Planned							O,D
LARA									
L2.51	Lara distribution pipeline upgrade	Planned							O,D

* Further work required

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 GAS									
BELLARINE PENINSULA									
P2.52	Point Henry to Leopold-Drysdale trunk distribution pipeline upgrade	Planned						0	
P2.53	Bellarine Peninsula trunk distribution pipeline upgrade	Planned						0,D	
P2.54	Ocean Grove distribution pipeline upgrade	Planned						0,D	
P2.55	Point Lonsdale distribution pipeline upgrade	Planned						0	
SOUTHERN GOLDEN PLAINS									
B2.56	Gas provision to Bannockburn	Planned						0,D	
TORQUAY									
T2.57	Transmission pipeline extension	Planned						0	
WINCHELSEA									
W2.58	Gas provision to Winchelsea	Planned						0,D	
COLAC									
C2.59	Colac growth area reticulated gas rollout	Planned						0,D	
 ELECTRICITY									
URBAN GEELONG									
G2.60	East Geelong Terminal Station	Planned						100–150	0
G2.61	Charlemont zone substation	Planned						20	0
LARA									
L2.62	Lara zone substation	Planned						20	0
L2.63	Avalon Airport zone substation	Planned						20	0
BELLARINE PENINSULA									
P2.64	Ocean Grove zone substation	Planned						20	0
SOUTHERN GOLDEN PLAINS									
B2.65	Bannockburn zone substation	Planned						20	0
TORQUAY									
T2.66	Torquay zone substation	Planned						20	0
T2.67	Lorne zone substation	Planned						20	0
ALTERNATIVE ENERGY PROJECTS									
R2.68	Geelong Geothermal Power Project	Feasibility						100	S,F,0
R2.69	Mount Gellibrand wind farm								
R2.70	Winchelsea wind farm								

The G21 region has a strong foundation of regional level community facilities. This infrastructure is critical for building necessary skills, supporting innovation, cultural diversity and community health and wellbeing and attracting a broader population mix and employment base.

2.4 COMMUNITY FACILITIES

2.4.1 Key challenges and opportunities

One of the region's competitive strengths is its extensive education, health and research facilities with high levels of collaboration between the health sector, Deakin University, the Gordon and CSIRO. The region also enjoys significant regional cultural and sporting facilities including Geelong Gallery, performing arts centres in Colac and Geelong and Simonds Stadium (Kardinia Park).

The G21 region however, has a number of challenges that are the focus of future service planning considerations:

- lower than state average health indicators, including chronic disease, obesity and life expectancy
- localised population dynamics - areas of limited population diversity, aged population concentrations and areas where tertiary aged youth are moving away for education or employment
- an increasingly aged population
- areas of disadvantage in terms of levels of income, access to transport and services, and housing stress
- workforce skill shortages and relatively low levels of education
- seasonal population variations, which also impacts on utility infrastructure capacity and presents payment challenges
- the ability of facilities and services to keep pace with population growth.

At a subregional level, the key community facility needs include:

- Urban Geelong - vocational training and expanded community health facilities (especially in the northern suburbs), expansion or redevelopment of arts/culture precincts and a range of sports/recreation facilities including aquatic, soccer, basketball, netball and parks. This includes a range of infrastructure projects identified as part of the revitalisation of Central Geelong.

- Lara - community and health centres, a permanent branch library and You Yangs mountain bike facility
- Bellarine Peninsula - early years and neighbourhood centres, community health facilities and library development in Drysdale/Clifton Springs, Leopold and Ocean Grove; Potato Shed expansion and sports facilities at the Drysdale subregional cultural and recreation precinct
- Southern Golden Plains - Bannockburn K - 12 school, community health facility and emergency services precinct
- Torquay - children's services hub, subregional library and an indoor sports stadium
- Winchelsea - community health hub and a branch library based on long term growth; a regional equestrian centre in Moriac
- Colac - medical precinct expansion, early years centre and a new emergency services and courts facility in Colac; aquatic centre and loop trails in Apollo Bay.

Schedule 3 identifies the key community infrastructure projects required to address these challenges and support growth consistent with the Growth Plan. They are also depicted geographically on **Map 8**. Where possible, new community facilities should be located within close proximity of public transport and preferably in areas of employment and housing intensification.

2.4.2 Education and training

The education sector is critical for developing the region's skills and facilitating innovation and research. It enjoys strong links between university and TAFE sectors and industry. The Infrastructure Plan focuses on tertiary and advanced education service provision rather than K - 12 facilities other than in the District Town of Bannockburn, which currently does not have these facilities that are important to support the town's growth. Future growth of Winchelsea will require a primary school and ideally a site should be identified as part of the Structure Plan process. Private school providers will continue to play an important part in meeting primary and secondary school options and needs. The Catholic Education Office for example is planning seven schools in the region to meet future growth. The region's growth will also create demand for special needs facilities.

Longer term further expansion of TAFE and tertiary education hubs at subregional locations is envisaged.

AS THE REGION GROWS, THE DEMAND FOR A BROADER RANGE OF RECREATIONAL OPPORTUNITIES AND SPORTING FACILITIES WILL ALSO GROW

Current investments and projects

- Deakin University - current investments of \$200 million at Waurm Ponds campus including: a new Centre for Advanced Design in Engineering Training (CADET); developing its collaborative research model at the Geelong Technology Precinct to help develop new materials industries; completion of the remaining stages of the Australian Future Fibres Research and Innovation Centre (AFFRIC) including the Carbon Nexus research facility in partnership with CSIRO and the Victorian Centre for Advanced Materials Manufacturing, the only facility of its type in a university worldwide. Deakin is also investing \$40 million at the Waterfront campus in office refurbishment, faculty relocations and facility upgrades.
- Centre for Advanced Design in Engineering Training (CADET)
- The Gordon - support for the Colac Trade Training Centre, providing construction and automotive with a view to expand presence in Colac; planning to establish physical presence in northern suburbs of Geelong to support local community needs; partner in 'Skilling the Bay' project responding to industry changes and training needs
- Trade Training Centres - in Corio (Northern Bay Trade Training Centre) and Colac (secondary school site - offering training in automotive, construction and hospitality)
- Surf Coast Secondary College under construction
- Planning for school provision at Bannockburn and Armstrong Creek.

Critical projects

Projects of highest significance are those which build skills in major urban centres and support the development of Deakin University and the Gordon:

- Regional Research and Information Centre (ADRI)
- Vocational training school northern Geelong



2.4.3 Health

Health is one of the main employment sectors in the region. Future growth and an aging population will also create demand for more aged care facilities. The Infrastructure Plan focuses on hospital and higher level community health centre services. These services are provided predominantly by Barwon Health, Geelong Hospital, St John of God Health Care, Colac Area Health, Bellarine Community Health, Otway Health and Hesse Rural Health.

Current investments and projects

- Barwon Health - expansion of Geelong Hospital (City campus) including additional beds and space for laboratories, a cancer wellness centre, investments in the Belmont Community Health centre and a day facility in conjunction with a new 32 bed community hospital at the Waurm Ponds precinct
- Private health sector - \$255 million Epworth teaching hospital development at Waurm Ponds in construction and to open in 2015/16; \$65 million St John of God Geelong Hospital redevelopment opening in April 2014
- Colac Area Health - student accommodation facilities in construction and due to be completed June 2013
- Bellarine Community Health - \$700,000 upgrade of Point Lonsdale medical suites, \$3.3 million main building upgrade proposed in 2013 - 2014
- G21 Health and Wellbeing Plan - Addressing Disadvantage using a place based impact approach.

Critical projects

Projects of highest significance are those which provide key health care services in major urban centres and District Towns to meet growth needs and further strengthen the region's health sector as a major employer and economic driver:

- Geelong Centre for Emerging Infectious Diseases
- Bellarine Community Health Centre - upgrade of Point Lonsdale Health Centre, Drysdale site for renal dialysis and early years and dental services, and development of a sub-acute primary health care facility in Ocean Grove
- New/expanded community health centres in the northern suburbs of Geelong, Bannockburn and Winchelsea
- Colac early years centre offering health services in early years, pregnancy/child birth, adolescent and adult needs.

2.4.4 Arts and culture

A strong arts and cultural sector is important not only to enrich the life of the existing community but also to enable the region to attract a range of specialist skills necessary to drive new enterprises and activity in a transitioning economy.

The following projects are central to these goals:

- Geelong Cultural Precinct Master Plan
- Subregional community and cultural precinct in Drysdale (Potato Shed Master Plan implementation)
- Leopold Community Hub, including a new library and multi-purpose community centre
- Library upgrades in Corio, Lara, Drysdale, Ocean Grove and Torquay.

Current investments and projects

Major arts and culture projects underway include:

- Geelong Library and Heritage Centre - \$45 million integrated facility development.

Critical projects

Projects of highest significance are those which build on key regional arts and culture infrastructure:

- Redevelopment of Geelong Performing Arts Centre
- Expansion of the Geelong Gallery.

2.4.5 Emergency services and justice

Public safety and emergency management is a key measure of health and wellbeing and an important ingredient in supporting a growing community and attracting new residents. In this context, the Implementation Plan looks at future Justice, police, SES, CFA and ambulance infrastructure needs as the region grows. These agencies monitor growth activity to determine when upgrades or new facilities are required and where best to locate them. Longer term there is a potential need for a regional recovery centre for fire and other emergencies to coordinate recovery operations.

Current investments and projects

- Waurin Ponds Police Station - \$15.6 million
- Barwon Prison high security unit - \$53 million.

Critical projects

The following future projects considered critical to support subregional needs:

- Bannockburn emergency services precinct
- New emergency services and courts facility in Colac
- Armstrong Creek Emergency Services Hub, including an Incident Control Centre.

2.4.6 Sports and recreation

As the region grows, the demand for a broader range of recreational opportunities and sporting facilities will also grow. These facilities are important for increasing the region's levels of health and wellbeing, reducing impacts on the health system and increasing economic activity and attraction to the region.

Current investments and projects

- *G21 Regional Soccer Strategy* addresses the challenges facing soccer in the G21 region, identifying opportunities for improved infrastructure and sports development programs.
- Further development of Geelong's Simonds Stadium as Victoria's third national event stadium
- Colac's Beechy Precinct development
- *Regional Trails Master Plan*, a G21 Priority Project, identifies seven trails and three mountain bike hubs, the development of which have liveability, health and wellbeing, environmental protection and nature-based tourism benefits. While not part of the Master Plan, integration with adjoining region trails such as the Port Phillip Bay Trail, will provide wider connectivity and recreation options.

The Master Plan projects include:

- Great Ocean and Surf Coast Walks
- Bellarine and Old Beechy Rail Trails
- Queenscliff to Barwon Heads Coastal Trail, Geelong Waterfront and Regional Trail connections and Barwon River Parklands and Trails
- You Yangs, Forrest and Anglesea Mountain Bike hubs.

Critical projects

Projects of highest significance are those which build on previous studies, generate increased visitation with an economic flow on effect and/or contribute to reducing disadvantage and increasing participation in sports:

- Regional Trails Network
- Simonds Stadium development completion.

The following projects are also important to support subregional needs:

- Stead Park master plan implementation and a synthetic hockey pitch
- Completion of Beechy Precinct, Colac - stadium redevelopment.
- Drysdale/Clifton Springs subregional sports precinct.

2.4.7 Waste management

The Barwon Region currently generates 300,000 tonnes of waste per year requiring 410,000 cubic metres of land fill space. Unless major reduction targets are achieved, this will increase to 325,000 tonnes per year by 2018. As the region grows, a next generation waste management system will be required along with increased recycling and reuse and waste to energy production facilities. Accessible facilities in the region that can manage a variety of waste stream elements will be necessary to support a growing population and manage service costs, and also to attract new industries and technologies. The Barwon Region Waste Management Group (BRWMG) is responsible for waste management planning across the region.

Current investments and projects

Major waste management projects underway include:

- Implementation of the Barwon Region Waste Management Group *Waste Management Plan*, including directions for waste transfer stations, land fill operations and waste reduction/recycling programs
- Review of transfer facilities and identification of the need for upgrades and replacements, with emphasis on resource recovery.

Critical projects

The regionally critical project is the development of a high-tech processing facility for residual waste.

Other important regional waste management projects include:

- Regional processing facility for garden organics
- Re-organisation of waste transfer facilities
- Geelong Cleantech Centre of Excellence, providing educational and commercial advice.

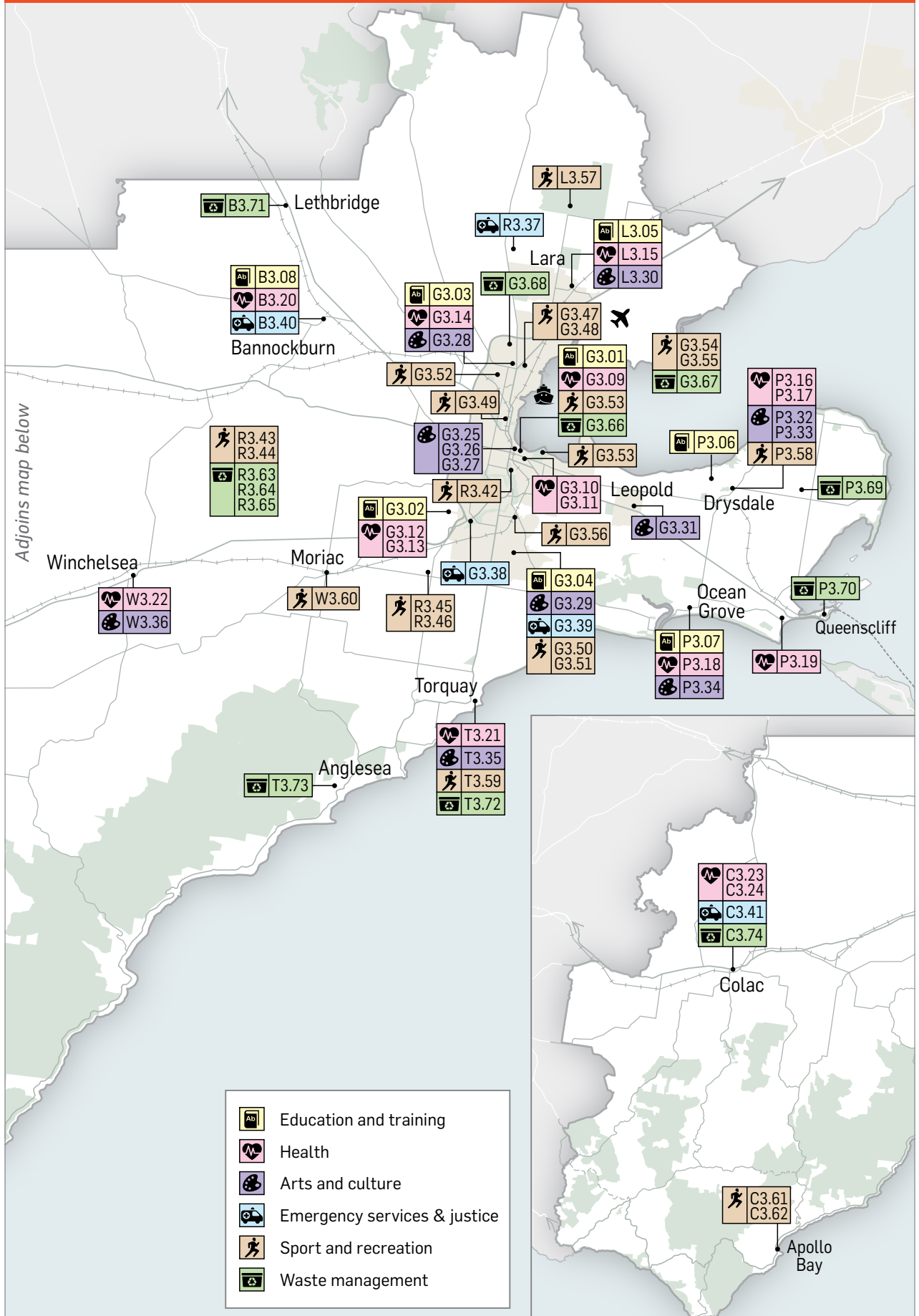
Further work priorities

The movement away from disposal by landfill towards resource recovery is linked to cost, land fill availability and commitments to sustainability. It brings about the need to develop and cost-assess advanced facilities to separate, recover and treat materials, the planning of which reflects an evolution of waste management processes over time based on economic viability or legislative requirements.

High-tech processing facilities for the treatment of residual waste, such as the mooted Cressy waste to energy facility, represent a new generation opportunity in waste management to sustainably serve the region's long-term waste needs and support self-sufficiency.



MAP 8 / COMMUNITY FACILITIES







COMMUNITY FACILITIES



Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
Ab EDUCATION AND TRAINING									
URBAN GEELONG									
G3.01	Regional Research and Information Centre	Planning	■					5	S,F,O
G3.02	Centre for Advanced Design in Engineering Training (CADET)	Construction	■					55	F,O
G3.03	Northern Geelong vocational training school	Feasibility	■					3–5	S
G3.04	Armstrong Creek trade training centre	Concept		■				10–15	F,O
LARA									
L3.05	Lara multipurpose community centre	Planning		■				10	D
BELLARINE PENINSULA									
P3.06	Jetty Road neighbourhood centre	Concept		■				1–2	L,S
P3.07	Ocean Grove early years hub and neighbourhood house redevelopment	Pre-construct	■					11	L,S
SOUTHERN GOLDEN PLAINS									
B3.08	Bannockburn K-12 school	Planning	■					35	S
TORQUAY									
Heart HEALTH									
URBAN GEELONG									
G3.09	Geelong Centre for Emerging Infectious Diseases	Pre-construct	■					12.1	F,O
G3.10	Geelong hospital expansion	Pre-construct	■					103	S
G3.11	Geelong hospital multi-storey extension	Planning				■		650	S
G3.12	Epworth teaching hospital development	Construction	■					255	O
G3.13	Waurin Ponds community hospital	Planning	■					85	S
G3.14	Geelong Northern Suburbs community hospital	Feasibility		■				35–45	S,O
LARA									
L3.15	Lara community health centre	Concept			■			5–10	S
BELLARINE PENINSULA									
P3.16	Drysdale community health centre upgrade	Pre-construct	■					3	S
P3.17	Drysdale early years hub	Planning		■				10	L,S

KEY

L Local government S State government F Federal government O Other (private, internal & tariffs) D Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 HEALTH									
BELLARINE PENINSULA									
P3.18	Ocean Grove sub-acute facility	Planning						7–10	S,F
P3.19	Point Lonsdale community health centre upgrade	Construction						3.2	F
SOUTHERN GOLDEN PLAINS									
B3.20	Bannockburn community health facility	Planning						5–10	S
TORQUAY									
T3.21	Torquay-Jan Juc childrens services hub	Feasibility						8	L,S,F,O
WINCHELSEA									
W3.22	Winchelsea community health hub	Feasibility						4–6	S
COLAC									
C3.23	Colac early years centre	Concept						7.5	S,F
C3.24	Colac hospital expansion	Concept						8–10	S
 ARTS AND CULTURE									
URBAN GEELONG									
G3.25	Integrated regional library and heritage centre	Construction						45	L,S,F
G3.26	GPAC redevelopment	Pre-construct						140	S,F
G3.27	Geelong Gallery expansion	Feasibility						20–30	S,F
G3.28	Corio-Norlane subregional library expansion	Concept						2	L,S
G3.29	Armstrong Creek subregional library	Planning						12	L,S,F,D
LARA									
L3.30	Lara permanent branch library	Concept						8	L,S
BELLARINE PENINSULA									
P3.31	Leopold community hub	Pre-construct						16	L,S,F
P3.32	Drysdale subregional library	Concept						7.2	L,S
P3.33	Drysdale community and cultural precinct	Planning						8	L,S,O
P3.34	Ocean Grove library expansion and upgrade	Concept						6	L,S
TORQUAY									
T3.35	Torquay subregional library	Planning						9	L,S,F
WINCHELSEA									
W3.36	Winchelsea branch library	Concept						8–10	L,S


Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 EMERGENCY SERVICES AND JUSTICE									
REGIONAL									
R3.37	Barwon Prison 40 bed high-security unit	Construction						53	S
URBAN GEELONG									
G3.38	Waurrn Ponds emergency services complex	Construction						15.6	S
G3.39	Armstrong Creek emergency services hub	Planning						20–25	S
SOUTHERN GOLDEN PLAINS									
B3.40	Bannockburn emergency services precinct	Planning						5	S
COLAC									
C3.41	Colac emergency services and courts facility	Concept						15–20	S
 SPORT AND RECREATION									
REGIONAL									
R3.42	Simonds Stadium development completion	Planning						140	L,S,F,O
R3.43	Regional trails network	Planning						35	S
R3.44	Regional motocross facility	Concept						4–5	L,S
R3.45	South-west Geelong basketball stadium	Planning						8	L,S
R3.46	Southern Geelong regional aquatic centre	Feasibility						20–25	L,S
URBAN GEELONG									
G3.47	Stead Park synthetic hockey pitch	Construction						2	L,S
G3.48	Stead Park master plan implementation	Concept						8	S
G3.49	Regional sports & entertainment centre	Concept						5	S,F
G3.50	Regional tennis hub	Feasibility						6	S,D
G3.51	Regional soccer & hockey facility	Planning						12	S,F
G3.52	Corio Leisuretime Centre redevelopment	Concept						10	L,S
G3.53	Eastern Park project	Planning						10	L,S
G3.54	Geelong regional play space	Planning						2	L,S
G3.55	Indoor bowls facility	Concept						30	S,F
G3.56	Indoor highball sports facility	Planning						30–40	L,S

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 SPORT AND RECREATION									
LARA									
L3.57	You Yangs regional mountain bike facility	Concept						5	S
BELLARINE PENINSULA									
P3.58	Drysdale-Clifton Springs subregional sports precinct	Planning						30	L,S,F
TORQUAY									
T3.59	Torquay indoor sports stadium	Feasibility						11	L,S,F,O
WINCHELSEA									
W3.60	Moriac regional equestrian centre	Concept						2	L,S
COLAC									
C3.61	Apollo Bay aquatic centre	Planning						10	S,F
C3.62	Apollo Bay loop trails	Feasibility						1	S,F
 WASTE MANAGEMENT									
REGIONAL									
R3.63	High-tech processing facility for residual waste	Feasibility						50	S
R3.64	Temporary garden organics waste facility	Planning						5	L,S
R3.65	Processing facility for garden organics	Concept						10–20	L,S
URBAN GEELONG									
G3.66	Geelong Cleantech Centre of Excellence	Planning						6–10	S,F
G3.67	Reorganisation of transfer facilities	Feasibility						5–10	L,S
G3.68	Timber recovery facilities	Planning							
BELLARINE PENINSULA									
P3.69	Drysdale landfill expansion	Feasibility						10	L,S
P3.70	Queenscliff food organics processing plant	Concept						1–2	L,S

* Further work required

KEY

L Local government S State government F Federal government O Other (private, internal & tariffs) D Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 WASTE MANAGEMENT									
SOUTHERN GOLDEN PLAINS									
B3.71	Lethbridge animal incinerator and landfill	Planning						50	0
TORQUAY									
T3.72	Torquay transfer station	Feasibility						5–10	L,S
T3.73	Anglesea transfer station	Feasibility						5	L,S
COLAC									
C3.74	Colac biogas facility	Planning						25	0

ARMSTRONG CREEK GROWTH AREA INTEGRATED INFRASTRUCTURE PLANNING

The City of Greater Geelong, in conjunction with the state government, has developed an integrated infrastructure delivery plan to ensure the Armstrong Creek Growth Area is provided with the timely delivery of infrastructure and services. A reference for all stakeholders in the growth area, it outlines indicative costs, development timeframes and infrastructure phasing based on planned and logical rollout and population triggers.

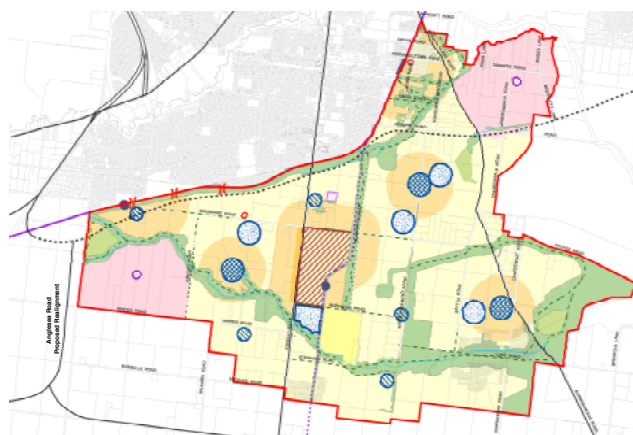
The plan addresses infrastructure at the local/precinct level across the themes of community facilities, integrated water cycle management, transport and energy. Such investments would typically not be included in a regional level infrastructure plan, the scope of which is limited to major transport links, trunk assets and subregional community facilities and open spaces. The G21 regional infrastructure plan includes the latter and captures key community facilities planned for Armstrong Creek of a subregional nature that are linked to growth of the wider region.

Planned community facilities at the local/precinct level include:

- Community: 8 community complexes, 8 health centres and 3 citizens halls

- Education: 14 primary, 5 secondary and a senior secondary government and non-government schools
- Emergency services: CFA, police and ambulance sites
- Sports and recreation: 113 hectares of active open space, 16 football/cricket ovals, 24 netball courts, 10 soccer pitches, 2 hockey pitches, 2 tennis complexes, 9 pavilions, 4 multi-purpose stadiums, 4 senior recreation reserves - lawn bowls, an athletics track & field complex and an aquatic centre

Other planned infrastructure partially covered in the G21 regional infrastructure plan includes the rollout of water and energy infrastructure, arterial and collector roads, recreation paths and public transport.



A diverse and vibrant regional economy will be based on building capacity with the region's key competitive strengths and growth sectors.

2.5 BUSINESS AND TOURISM

2.5.1 Key challenges and opportunities

The *G21 Economic Development Strategy* and Growth Plan identify the region's key future employment growth sectors as education, health and research, SMEs, freight and logistics, advanced manufacturing, tourism and agriculture.

This growth is founded on a number of competitive strengths including:

- a domestic and international airport
- a major port
- rail and road networks and connections
- a varied agricultural base
- world class tourist attractions
- first class education research and health infrastructure.

The *Victorian Freight and Logistics Plan* identifies the key gateway roles played by Geelong Port and Avalon Airport in the state's freight network. Building on the linkages of these assets to the Principal Freight Network through improvements in access and network capacity and an intermodal terminal network will support efficiencies, increased throughput, and supply chain jobs growth in the region.

Tourism is a significant component of the G21 region's economy. Much of this is nature-based tourism, where the most popular activities are going to the beach, bushwalking/rainforest walks, and visiting National/State Parks. In 2007, 37 per cent of domestic visitors and 77 per cent of international visitors undertook at least one nature-based tourist activity during their trip, accounting for a total of 15.5 million nature-based tourism visitors.

Strong growth for Victoria is expected from international markets, particularly China. By 2016, Victoria will receive 493,000 more nature-based international tourism visitors, while domestic nature-based tourism visitation is forecast to remain stable.

The *Great Ocean Road World Class Tourism Investment Study 2011* product gap analysis and *Great Ocean Road Destination Management Plan 2012* identify key projects to support tourism development including upgrading the Great Ocean Road and road linkages, upgrading of Avalon Airport to international status and development of the Geelong Convention and Exhibition Centre.

The region has a range of tourism accommodation options from camping and caravan parks to large resorts, with an additional 3,440 commercial guest rooms required across the Great Ocean Road Region by 2030 (Urban Enterprise 2012). A major challenge will be to secure the significant levels of investment required to upgrade facilities to meet the increased demand for caravan and camping park experiences on coastal crown land managed by Committees of Management. Recent changes to regional tourism structures will provide the opportunity for tourism promotion and program priorities to be better aligned with regional objectives.

Developing strong urban precincts in major urban areas and District Towns will also be important to foster new activity, vitality and investment and to support local jobs and the growth of key employment sectors.

Schedule 4 identifies the key business and tourism projects required to address these challenges and support growth consistent with the Growth Plan. They are also depicted geographically on **Map 9**.

2.5.2 Airports

Avalon is the region's pre-eminent aviation facility providing domestic and international passenger and freight services, and aeronautical industry opportunities.

The further development of Avalon Airport as an international airport and expansion of its aeronautical, manufacturing and training capabilities will provide for an important major employment node in Geelong's north. Linked with the GREP, Geelong Port and freight/passenger rail networks, it will be capable of major exporting of regional products and providing intermodal synergies.

Lethbridge Airpark, while outside the study area, will play an important part in the region's general aviation needs including pilot training, emergency services and providing local employment.

Current investments and projects

Major planning projects supporting the growth of Avalon Airport include:

- *Avalon Airport Master Plan* and terminal upgrades and aviation fuel pipeline connection
- Avalon Airport rail link investigation.

Critical projects

The key regional airport projects which will stimulate Avalon as a major tourism and employment node are:

- Avalon Airport precinct development including international terminal building, rail link and road connections
- Intermodal freight interchange at or near Avalon Airport
- Regional airport relocation to Avalon Airport (General Aviation Services).

AGRICULTURE IS ONE OF THE REGION'S KEY ASSETS AND RESOURCES AND A MAJOR SECTOR OF THE ECONOMY

2.5.3 Ports and harbours

Geelong is the largest regional port in Victoria and an important hub for the movement of cargo in to and out of the state. Geelong Port handles over 13.1 million tonnes of liquid, break and break bulk a year, with some 770 ship visits, and is a significant part of the regional and state economies. Access to the port is via a channel managed by the VRCA. The current width and depth of the channel and capacity of berth facilities constrains the ability for future port operations to respond to growth in the type and frequency of shipping activity.

Scope exists to expand berth capacity at Corio Quay and Lascelles wharf. On the land side, access to the port is primarily by road with some standard and broad gauge rail access. Future growth of the port is linked to improving rail access to berths and road connections to the Ring Road and GREP as identified in the *Geelong Port and Land Infrastructure Plan*.

The region also has a number of smaller harbours which provide for commercial fishing/aquaculture and tourist and recreational boats, including Queenscliff, Portarlington and Apollo Bay harbours.

The *Portarlington Safe Harbour Precinct Master Plan* provides for the expansion of the harbour to allow a larger mussel fishing fleet and future oyster industry as well as recreational boating. Capacity also exists for a future ferry service to Melbourne, which will add another transport option for Geelong.

The *Apollo Bay Harbour Precinct Master Plan* provides for potential development and improvement opportunities for the Apollo Bay Harbour precinct, including integrating the harbour and the town with new shared pathways and improved car access with increased parking.

The Queenscliff - Sorrento ferry operation also provides an important tourist, and increasingly commuter role. Development Plans for the staged expansion of the ferry terminal facilities are under development.

Current investments, strategies and projects

Major planning projects supporting the growth of regional ports and harbours include:

- *Victorian Freight and Logistics Plan*
- *VRCA Port of Geelong Development Strategy*
- *Geelong Port and Land Infrastructure Plan*
- *Portarlington Safe Harbour Master Plan*
- *Apollo Bay Harbour Precinct Master Plan.*

Critical projects

The key regional ports and harbour projects are:

- Geelong Port navigation channel enlargement
- Geelong Port berth expansions and improvements
- Portarlington Safe Harbour project implementation
- Queenscliff ferry terminal facilities upgrade
- Apollo Bay Harbour Precinct implementation.

2.5.4 Agriculture

Agriculture is one of the region's key assets and resources and a major sector of the economy. The region has a diversity of agricultural enterprises including beef and dairy cattle, cropping, viticulture, intensive livestock, forestry and fishing.

The availability of good transport networks, access to water, the Port and Avalon Airport, a comparatively favourable climate and resilience to the impacts of climate change and variability, encouraging prospects for food security and a thriving tourism sector all provide a good prognosis for the growth of the region's agricultural sector. With road and rail infrastructure upgrades linking the Port, Avalon and key industrial areas with major food and agricultural areas, there is potential to establish Geelong as a major food hub and portal for processing, value adding and distribution.



A number of potential agricultural nodes, including Lethbridge and the Thompson Valley, provide opportunities for economic growth and employment with access to potable or recycled water. Development of the Colac Livestock Selling Centre as a major regional facility will enhance the role of the region's west as a key agricultural hub. Aquaculture opportunities including those based at Portarlinton will support both value adding and further development of food and wine tourism.

Current investments and projects

Major agricultural projects underway include:

- Planning for the Lethbridge intensive agriculture expansion has been completed with funding for a potable water supply pipeline required to progress implementation
- Colac Livestock Selling Centre upgrades.

Critical projects

The key regional agricultural projects are:

- Colac Livestock Selling Centre redevelopment
- Potable water trunk line for intensive agriculture expansion near Lethbridge.

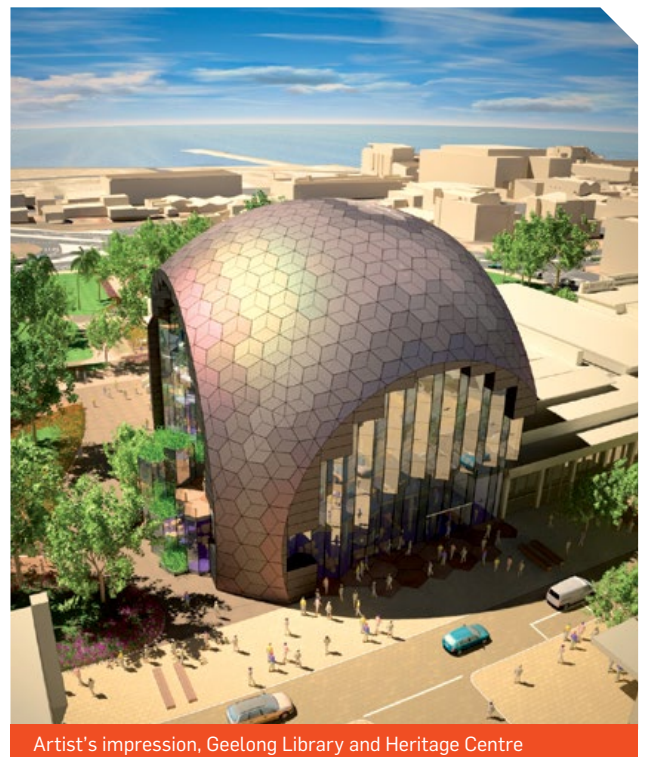
2.5.5 Urban precincts

Having a number of attractive, vibrant and functional commercial, employment and tourism precincts across the region is important to support increased regional services, visitation, investment and to grow jobs. The following precincts are key priorities.

- **Central Geelong:**
Major projects include G21 Priority Projects - Geelong Future Cities (refurbished GPAC, expanded art gallery and new library and heritage centre), Convention and Exhibition Centre and Yarra Street Pier reconstruction, and the concepts identified in Vision 2. The establishment of headquarters for the NDIA in Central Geelong along with these foundational projects will support the centre's role as Victoria's second city and as the region's major corporate and entertainment centre.
- **District Town centre revitalisation:**
Projects such as Colac CBD and Entrances (including the civic and cultural precinct) and Bannockburn town centre precinct development and infrastructure upgrades will stimulate further growth and attract supporting services. These outcomes would be enhanced for Colac through development of a Lake Colac Foreshore Master Plan to identify visitation enhancement opportunities.

G21 priority projects, including the Corio/Norlane regeneration project with Bacchus Marsh Road boulevard treatments and Waterworld precinct redevelopment and the completion of Colac's Beechy Precinct, provide growth attractors while supporting community growth and wellbeing.

- **Employment node development:**
Developing major employment precincts based around existing key assets including: the Deakin/Marcus Oldham College Waurin Ponds employment precinct; the Gheringhap industrial/commercial precinct and transport hub; and the Geelong Ring Road Employment Precinct (GREP) will support job diversity and provide sustainable local job opportunities into the future.
- **Tourism precincts:**
Supporting the development of major tourism assets around the region including the Point Grey Precinct in Lorne, Point Lonsdale Lighthouse Reserve development, Queenscliff Fort and Torquay's Surf City Precinct expansion based around surf culture will add to diversity of attraction, accommodation options and out of season visitation and employment opportunities.



Artist's impression, Geelong Library and Heritage Centre

Current investments and projects

- Northern Gateway Precinct Redevelopment Plan (community facilities and leisure centre in Corio)
- Beechy Precinct Colac - central reserve enhancement, trade training centre expansion and Bluewater Fitness Centre expansion and stadium redevelopment
- Colac CBD and Entrances project.
- Fort Queenscliff Tourism Development Plan

Critical projects

The key regional urban precinct projects are:

- Geelong Convention and Exhibition Centre
- Yarra Street Pier cruise ship berth and handling facilities
- Innovative employment hubs
- Corio/Norlane regeneration projects
- Colac CBD and Entrances project and a Lake Colac Foreshore Master Plan.
- Surf City Precinct, Torquay.

Further Work

Development of the Geelong CBD as a thriving, vibrant centre providing major retail services, health and education, entertainment and a significant resident population is a major objective of the Growth Plan. Implementation of the Geelong Future Cities and Vision 2 projects will require coordination and detailed planning, linked to the directions of an integrated transport plan.

The preparation of a Central Geelong Master Plan is considered to be a critical step in program implementation.

The FIA analysis identifies a significant recreation and tourist opportunity associated with the development of a lake within the Batesford Quarry linked to extensive river open space corridors (refer section 4.0 for more detailed considerations).

The Growth Plan identified the important role played by distinct settlement breaks. One of the key breaks identified is between Geelong and Werribee. This break is important not only to maintain a distinct visual identity and protect views and important habitats but also to buffer future development opportunities at Avalon Airport, Department of Defence and quarry sites. While not a regional infrastructure project, a clear strategy is required to manage this break.

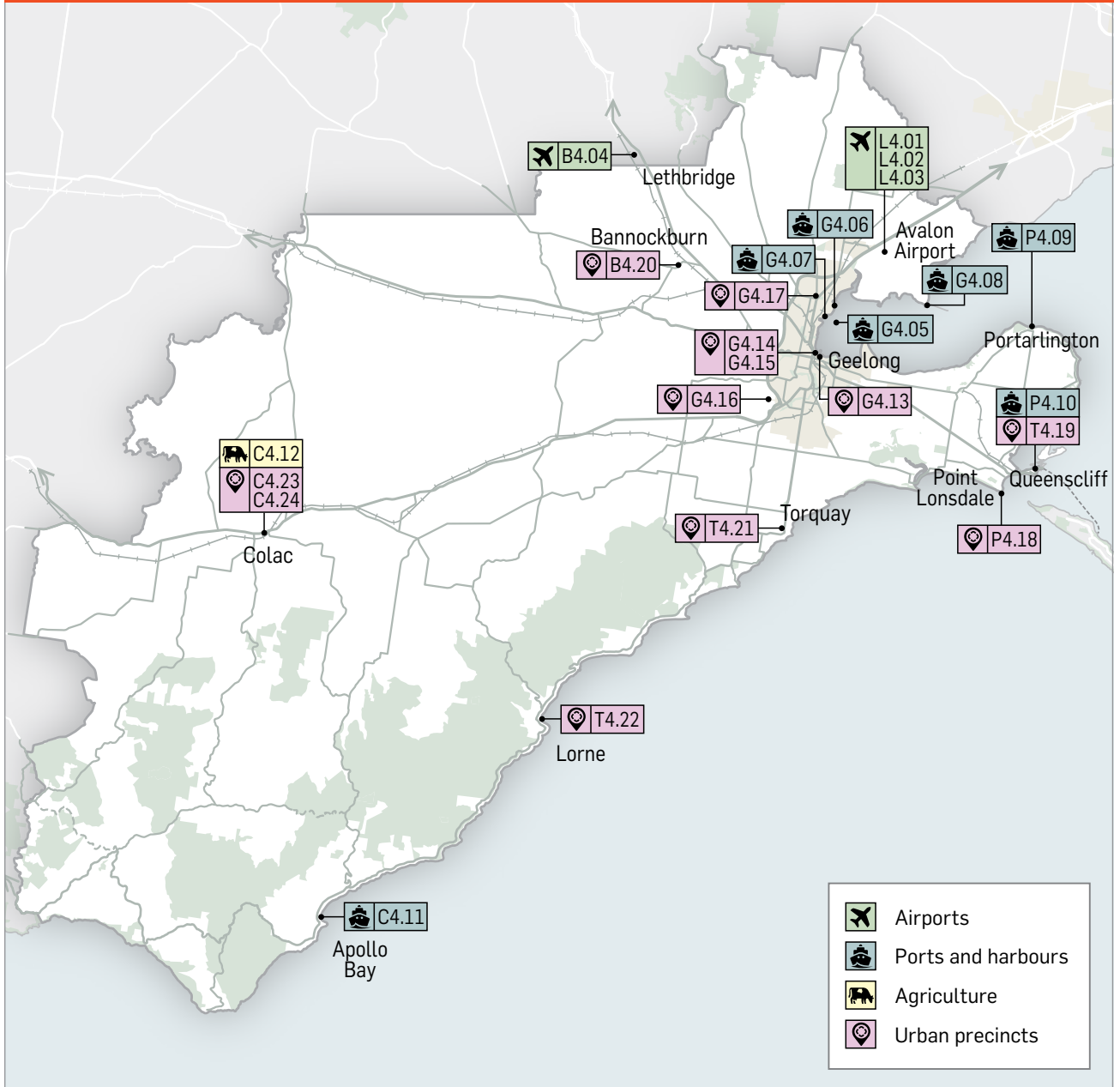
Suggested responses:

- That a Geelong - Werribee Settlement Break Strategy plan be developed as a priority to guide future planning.
- The development of a recreational lake and tourism precinct Master Plan for the Batesford Quarry incorporating a Moorabool River Corridor Strategy


















Artist's impression, Yarra Street Pier. Initial concept that is not necessarily reflective of the final design.

MAP 9 / BUSINESS AND TOURISM PROJECTS
















BUSINESS AND TOURISM

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 AIRPORTS									
LARA – AVALON AIRPORT									
L4.01	Avalon Airport facilities expansion	Concept						30	0
L4.02	Intermodal freight interchange	Concept							S,0
L4.03	Regional airport relocation	Planning						3	S,0
SOUTHERN GOLDEN PLAINS									
B4.04	Lethbridge Airpark development	Planning						1.8	S,0
 PORTS AND HARBOURS									
URBAN GEELONG									
G4.05	Navigation channel enlargement	Concept						320	S,F,0
G4.06	Lascelles berth expansion	Concept						50	S,0
G4.07	Corio Quay berth expansion	Concept						250–300	S,F,0
G4.08	Port facilities expansion to Point Wilson	Concept						N/A	S,0
BELLARINE PENINSULA									
P4.09	Portarlington Safe Harbour project	Planning						58	S,0
P4.10	Queenscliff ferry terminal upgrade	Planning						14	L,S,0
COLAC									
C4.11	Apollo Bay harbour precinct redevelopment	Planning						20	S,F
 AGRICULTURE									
COLAC									
C4.12	Colac Livestock Selling Centre redevelopment	Concept						6.5	L,S

KEY

L Local government S State government F Federal government O Other (private, internal & tariffs) D Development contributions

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 URBAN PRECINCTS									
URBAN GEELONG									
G4.13	Yarra Street Pier cruise ship berth	Planning						33	L,S,O
G4.14	Geelong Convention and Exhibition Centre	Planning						164	S,F,O
G4.15	NDIA headquarters establishment	Feasibility						25	S,F
G4.16	Innovative employment hubs	Concept						4	S,F,O
G4.17	Waterworld site redevelopment Norlane	Concept						5–20	L,S,O
BELLARINE PENINSULA									
P4.18	Point Lonsdale lighthouse reserve development	Planning							L,O
P4.19	Fort Queenscliff precinct	Planning						10	S,F,O
SOUTHERN GOLDEN PLAINS									
P4.20	Bannockburn central shopping precinct	Pre-construct						14	0
TORQUAY									
T4.21	Torquay Surf City precinct	Feasibility						45	L,S,F,O
T4.22	Lorne Point Grey precinct	Planning						5	L,S,F
COLAC									
C4.23	Colac CBD & Entrances project	Planning						50	L,S,F
C4.24	Colac Beechy Precinct facilities	Pre-construct						8	S,F

Our unique environment is critical to achieving the vision of the G21 region as a desirable destination for living and visiting. It is a driver for the region's economy and forms a highly valued element for residents and visitors alike.

2.6 ENVIRONMENT

2.6.1 Key challenges and opportunities

What type of environment do we want in 2050?

The Growth Plan and a range of other strategies identify a diverse portfolio of significant natural assets in the region including bays, coasts, rivers and wetlands, national, state and regional parks, conservation reserves and other areas of high biodiversity value. These areas provide a range of important values including marine and terrestrial ecosystem services, recreation and tourism, landscape, health and wellbeing, liveability and water quality.

The rapid growth of the region, adjoining regions and Melbourne, along with increased tourism and recreational visitation, will place additional pressure on the region's natural assets. These pressures include changing community expectations for access and new infrastructure, competition for resources, urban development pressures, which if not carefully managed, may result in habitat and biodiversity stress or loss, and a reduction in environmental values.

Adjustments to the effects of predicted climate change and variability will also provide a series of challenges to future management of the region's natural assets as it grows.

A more sustainable approach towards growth planning needs to have regard to the protection and enhancement of the region's core natural assets as central to its social and economic future.

The directions of the *G21 Region Plan* and principles of the Growth Plan recognise the need to protect, restore and enhance the quality of our land and marine areas, waterways and water resources, biodiversity and soils while responding to new challenges such as climate change.

The Growth Plan also identifies the need to build landscape resilience and to protect or enhance the environmental condition of the region's parks and reserves.

What is environmental infrastructure?

At a local level, local government, committees of management, Parks Victoria and other state government agencies undertake a range of infrastructure works to manage community access to, and levels of use of, public land and maintain asset condition and visitor safety such as paths, piers and ramps, fencing, amenities, club rooms, car parks and protection works. Managing the impacts of growth and visitation on the coast is a significant financial resource challenge for organisations such as coastal committees of management.

In cooperation with government, a similar approach is adopted by landholders and community groups throughout the region to protect high value environmental assets on private land, and maintain the sustainable productive capacity of the region.

This work is appropriately managed at the local level to respond to localised issues and challenges. It can be enhanced however, through broader strategic coordination and regional vision for the protection of the region's coast, waterways and major parks.

The *Corangamite Regional Catchment Strategy 2013-19*, its sub strategies including Waterway Strategy under development, Marine and Coastal Biodiversity Strategy, Native Vegetation Plan and Soil Health Strategy and the future regional Coastal Action Plans will provide a framework for this work, informed by strategies such as the Growth Plan and Implementation Plan priorities.

The other key approach to environmental infrastructure is to holistically embed environmental considerations into the design and planning of all infrastructure to minimise the environmental impacts of urban activity.

Strategies such as the *Geelong Low Carbon Growth Plan* or the OECD's *Financing Green Urban Infrastructure* paper identify environmental, social and economic benefit opportunities associated with renewable energy/cogeneration infrastructure, building refits, public and active transport, water storage and re-use, stormwater and waste management infrastructure and green space investment. Expansion of the *Geelong Low Carbon Growth Plan* across the region has the potential to contribute to a reduced regional carbon footprint and facilitate new industry opportunities.

Suggested response:

- Support the development of a regional Low Carbon Growth Plan.

In the context of climate change and variability and increasing energy costs, improved coordination and planning between land managers and infrastructure providers is required to achieve improved environmental outcomes.

Unlike the other infrastructure elements of the regional Infrastructure Plan, the plan for the environment focuses on identifying key strategies that will enhance and link the region's key natural values, and public land open spaces. This includes the region's national, state and regional parks and other public land resources including coastal reserves and major rivers and waterways. Some of the region's waterways such as the Moorabool River are highly stressed and degraded.

This approach provides the necessary strategic linkages with the *Corangamite Regional Catchment Strategy 2013-19* and its sub-strategies, future regional Coastal Action Plans and public land strategies and the state government's future *Healthy and Productive Public Lands Strategy*.

Regional natural open space assets

The Growth Plan identifies our key public land environmental assets as:

- The Corio, Swan and Port Phillip Bays and Surf Coast/Colac Otway coasts, coastal reserves and marine areas including Marine National Parks and sanctuaries
- National, State and Regional Parks including Brisbane Ranges and Great Otway National Parks, Otway Forest Park and the You Yangs Regional Park
- Wetlands and waterways - a range of high value waterways including the Barwon, Moorabool and Leigh Rivers and the internationally significant Ramsar listed Lake Connemara.

While this collective asset is important for the region's future, there is no clear vision for it to drive and coordinate key actions and projects to protect and enhance it. A regional level strategy would assist in the development of a vision, identification of risks and appropriate response actions that build resilience and enhance these assets.

2.6.2 Current projects and strategies

Climate and the coast:

- *Climate Resilient Communities of the Barwon South West* aims to increase capacity to manage risks and build preparedness for extreme climate events. The project aims to identify priority projects that may have infrastructure implications that could be considered in any review of the Implementation Plan

- *Corangamite Natural Resource Management Planning for Climate Change* will guide planning for climate change impacts on the region's natural resources and to maximise the environmental benefits of carbon farming projects. The plan will help to guide where biosequestration projects should be located in the landscape to both maximise the benefits for biodiversity, water and agricultural production, and to minimise any perverse outcomes
- The *Bellarine Corio Local Coastal Hazard Assessment* will assess the future vulnerability of the Bellarine and Corio Bay coastline to the predicted effects of climate change and future sea level rise. This project, funded through the state's Future Coasts program, also complements the City of Greater Geelong's *Climate Change Adaptation Strategy*. Similar assessment work should be undertaken for the remainder of the region's high risk coastal areas
- The various committees of management have detailed adopted Coastal Management Plans which identify infrastructure priorities, while the Central and Western Coastal Boards have Coastal Action Plans in place to address specific coastal issues linked to the *Victorian Coastal Strategy*.

Linking and resilience strategies:

- The *Corangamite Regional Catchment Strategy* identifies a series of objectives and actions to achieve the goal of increasing the protection, enhancement and restoration of valuable natural resources to improve health and sustainable productivity of the Corangamite catchment. A proposed NRM Plan for climate change will involve strategic remnant vegetation and wetland protection and revegetation.
- *Corangamite Waterway Strategy* will replace the Corangamite River Health Strategy and Wetland Strategy in mid 2014. It will guide investment and activity to protect and improve the health of high value rivers, estuaries and wetlands in the Corangamite CMA region.
- *G21 Regional Trails Master Plan* including the Barwon River Parklands Strategy and project.

Suggested response:

- Support organisations, community groups and landholders involved in the development and implementation of projects and strategies consistent with the aim of enhancing the natural values, linkages to and resilience of our key regional natural open spaces.
- Support projects which enable private land owners to undertake sustainable land practices critical for environment connectivity and landscape resilience adjacent to key regional natural assets and open spaces.

2.6.3 Critical projects

It is important to reinforce that the Infrastructure Plan focus is not on the development of an environmental strategy. It is specifically focused on building on existing public assets. A range of agencies and organisations continue to plan and invest in a range of actions aimed at improving the region's environment. This work is important and strongly supported.

Schedule 5 identifies the key projects required to address these challenges. They are also depicted geographically on **Map 10**. The following projects are considered to be short term priorities:

- Implementation of the Corangamite Regional Catchment Strategy and sub strategy key actions
- Continue Barwon River Parklands Strategy project implementation.

2.6.4 Further work priorities

The following projects are focused on the development of key strategies to enhance and link the region's key natural public land open spaces and respond to short to medium term challenges:

- Development of a coastal vulnerability assessment for high risk areas of the Surf Coast - Colac Otway coast between Point Impossible and Cape Otway
- Development of an infrastructure assets and coastal vegetation reestablishment management strategy for the region's coastline in response to completed coastal vulnerability assessments
- Development of a Regional Natural Assets and Open Space Strategy
- Development of a Moorabool River Health Strategy including extension of Barwon Parklands Strategic Plan up the lower Moorabool River
- Development of a Barwon Otway Strategic Bushfire Management Plan.

FUTURE PROJECT – REGIONAL NATURAL ASSETS AND OPEN SPACE STRATEGY

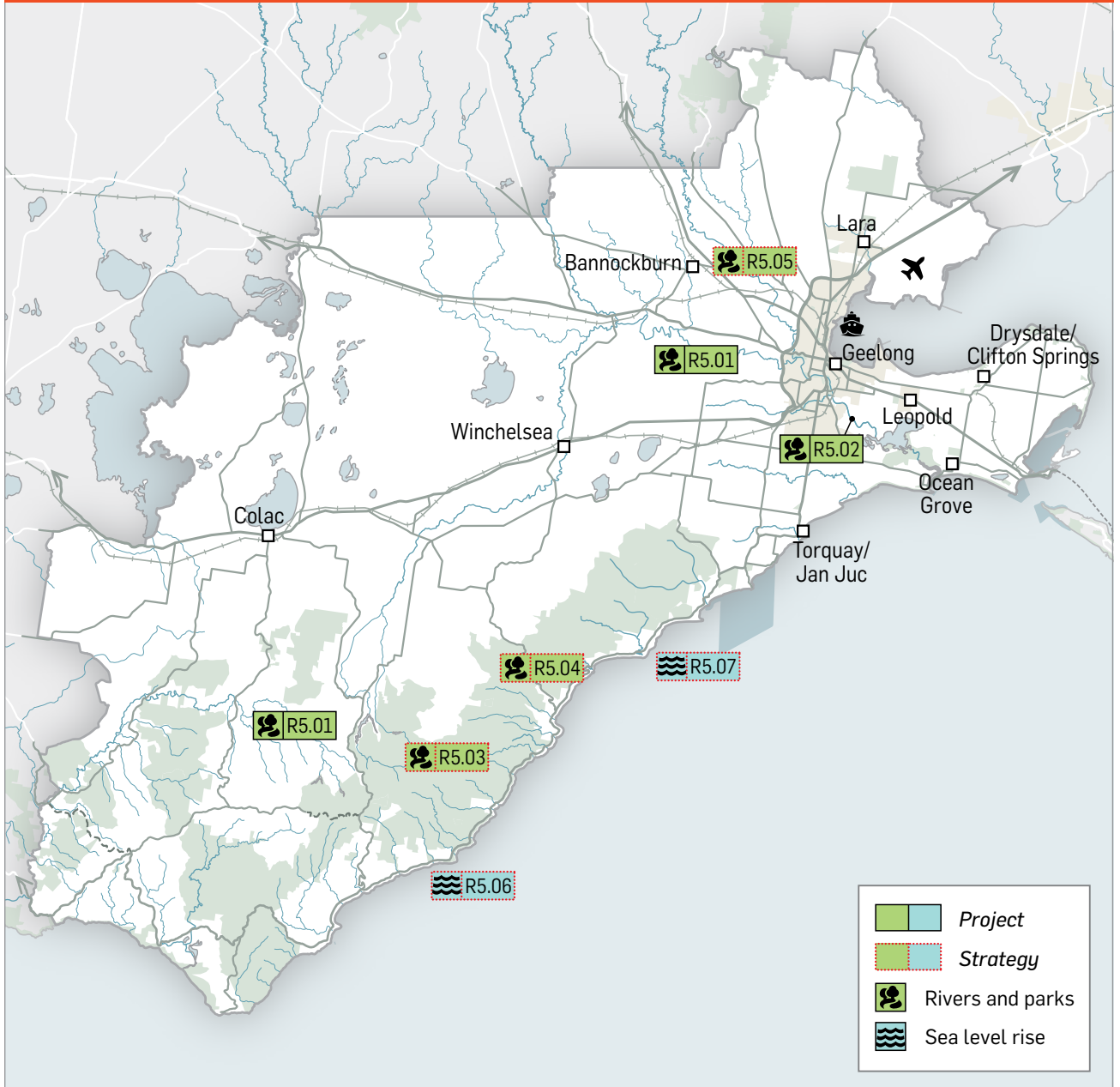
The development of a Regional Natural Assets and Open Space Strategy as an overall plan for the region's high value natural assets and major public land will provide for:

- establishment of a vision and values for combined natural assets
- identification of asset decline threats and identify appropriate management strategies and priority actions
- identification of migration-biolink corridors between key natural and public land assets to link, enhance, buffer and build resilience of assets
- key supporting infrastructure priorities including identification of major local level car parking and amenity priorities
- an asset augmentation strategy including a conservation land purchase program, application of vegetation offsets and investigation of funding strategies and models including Development Contribution Plans
- directions to ensure coordination of works to achieve improved environmental outcomes
- alignment to other national, state and local strategies such as the Corangamite Regional Catchment Strategy.










The strategy should ideally be developed as a high priority in partnership between G21, local and state government and other key land manager/ planning agencies including Parks Victoria, Corangamite CMA, coastal boards and committees of management.



MAP 10 / ENVIRONMENT PROJECTS



ENVIRONMENT

Ref.	Project title	Current Status	Delivery timeframe					Indicative cost \$M	Funding source
			2014 – 17	2017 – 20	2020 – 25	2025 – 35	2035 – 50		
 RIVERS AND PARKS									
PROJECTS									
R5.01	CCMA Regional Catchment Strategy major waterways enhancement and linkage projects	Pre-construct						15	L,S,F
R5.02	Implementation of Barwon River Parklands projects	Pre-construct						13.2	L,S,F
STRATEGIES									
R5.03	Regional Natural Assets and Open Space Strategy	Concept						◆	L,S
R5.04	Barwon-Otway Strategic Bushfire Management Plan	Concept						◆	L,S
R5.05	Moorabool River Health Strategy	Concept						◆	L,S
 SEA LEVEL RISE									
STRATEGIES									
R5.06	Coastal vulnerability assessment Surf Coast – Colac-Otway coast	Concept						◆	L,S
R5.07	Coastal vulnerability assets management strategy	Concept						◆	L,S

◆ Detailed project scoping required to identify costs for undertaking strategy projects

KEY

L Local government S State government F Federal government O Other (private, internal & tariffs) D Development contributions



The G21 Regional Growth Plan - Infrastructure Plan provides a consolidated view of the important projects required to capitalise on existing infrastructure to support growth, achieve the region's vision and potential to secure its future.

2.7 CRITICAL PROJECTS FOR A REGION OF 500,000

The Infrastructure Plan provides a holistic picture of the infrastructure required to support strategic growth of the region. While all these projects are important, there are a smaller number of catalytic projects that are region shapers and drivers. The core catalytic projects are:

- Connection of the Geelong Ring Road to the Bellarine Peninsula
- Geelong Ring Road and rail freight connections to Geelong Port and GREP
- Major upgrades of the Great Ocean Road and key connecting routes to the Princes Highway
- Geelong Port shipping channel access and berthing improvements
- Avalon Airport precinct development and rail link.

These are supported by a number of other key projects which stimulate employment and housing growth in District Towns or address regional issues and priorities:

Transport

- Upgrades to key transport links from Geelong to growth areas in Armstrong Creek and Torquay
- Princes Highway duplication to Colac
- Midland Highway duplication to Bannockburn
- Rail corridor upgrades Geelong - Grovedale and station upgrades
- Public transport service improvements in Geelong and to Colac, Bannockburn, Torquay and the Bellarine Peninsula.

Utilities

- Main outfall sewer duplication to Geelong
- Colac water supply and water reclamation plant upgrade
- Potable water trunk line connection to Lethbridge intensive agriculture node
- Gas provision to Bannockburn and Winchelsea
- Drainage infrastructure for GREP and Colac.

Community facilities

- Regional Research and Information centre
- Vocational training school in northern Geelong
- Centre for Advanced Design in Engineering Training (CADET)
- Geelong Centre for Emerging Infectious Diseases
- Bellarine Community Health Centre facility upgrades
- Colac Area Health centre expansion
- Expanded Community Health Centre services in northern Geelong, Bannockburn and Winchelsea
- Redevelopment of GPAC and Geelong Gallery
- Regional Trails Network implementation
- Completion of Simonds Stadium development
- Emergency services facilities in Armstrong Creek, Bannockburn and Colac

Business and tourism

- Portarlington Safe Harbour development
- Apollo Bay harbour precinct development
- Queenscliff ferry terminal facilities upgrade
- Colac Livestock Selling Centre redevelopment
- Geelong Convention and Exhibition Centre and Yarra Street Pier construction
- Colac CBD and Entrances project implementation
- Torquay Surf City precinct development.

The further work priorities include:

- Road and rail freight connections to Ring Road, Port and GREP options study
- Geelong stabling yards relocation options study
- Colac bypass land use planning and route designation
- Development of a Geelong Integrated Transport Plan
- Development of a next generation waste management and resource recovery plan
- Preparation of a Central Geelong Master Plan
- Coastal vulnerability assessments and asset management strategies
- Development of a Regional Natural Assets and Open Space Assets Strategy.

3.0

LAND SUPPLY AND STRATEGIC HOUSING INCENTIVES

Providing incentives for housing in strategic locations and the timely provision of land supply for housing and employment needs is vital to support the region's future growth



Having incentives to support key strategic housing outcomes, including sufficient residential and industrial land supply in the right locations, is important for providing future housing and employment needs and supporting housing diversity, choice and affordability.

3.1 INTRODUCTION

The Growth Plan identifies a number of key objectives and outcomes for future housing provision in the region:

- providing greater housing choice to meet the changing needs of households
- encouraging medium to high density living in identified precincts such as Central Geelong, Fyans - West Fyans Street Precinct and Waurin Ponds
- supporting urban regeneration objectives in centres such as Corio and Norlane
- supporting the timely development of short to medium term growth areas identified in District Towns and growth area structure plans and strategic policy
- supporting further longer term growth in Colac and Winchelsea
- ensuring adequate supply of residential and employment land in the right locations to meet future growth needs.

This section of the Implementation Plan identifies key barriers, considerations or challenges to the full achievement of these objectives and outcomes. It also sets out a range of policy and other actions necessary to facilitate orderly sequencing of planned growth to build on infrastructure investment and priorities; summarises the current residential and industrial land supply across the region and its key centres; and provides direction around supply adequacy and land release timing.

This information is critical to future land use and infrastructure planning activities and land release timing.

Consultants Urban Enterprise and Spatial Economics were engaged to assist in the identification of strategic housing incentives and development of land supply reports to inform the Implementation Plan directions. These reports have been prepared following a range of interviews with stakeholders in the land planning and property industry to test assumptions, data accuracy and methodology.

3.2 STRATEGIC HOUSING INCENTIVES

The *Background Report* and informing document *Strategic Housing Incentives Action Plan* identify a range of barriers to achieving the desired outcomes as well as a series of region wide and localised incentives.

3.2.1 Barriers to growth

Barriers or challenges to achieving strategic residential growth objectives in planned growth areas and urban renewal and regeneration areas have been identified based on consultation with key stakeholders and policy review and are summarised in **Figure 2**.

Barriers and challenges to residential growth represent a variety of issues which are often intrinsically interlinked or inter-dependent and represent different phases of the land release or development processes. They range from:

- **the initial identification of land or investigation areas for residential development within strategic planning policy** - barriers to this type of growth are often physical or environmental, relating to the need for detailed investigation work and robust strategic planning to understand the capacity, requirements and development potential of future growth areas
- **housing development and delivery** - barriers to delivery are often regulatory or financial and can be driven by factors such as wider economic conditions, costs associated with development and the restrictions imposed by the regulatory process.

Other barriers such as issues with amenity and locational characteristics, perceptions of different areas and community attitudes to development, can also impact on the viability of development and the efficiency of the approvals process.



FIGURE 2 / SUMMARY OF GROWTH, DEVELOPMENT AND INVESTMENT FACTORS

Planning for growth and land supply	Infrastructure
<ul style="list-style-type: none"> adequacy and supply of suitable residential zoned land to meet demand for future growth limited diversity of housing stock land ownership issues such as fragmented land ownership, difficulties in land assembly, land banking land contamination, particularly in urban renewal and regeneration areas potential capacity of some identified growth areas limited (or costly to develop) by inherent attributes, values and physical constraints 	<ul style="list-style-type: none"> timely delivery and adequacy of transport, community and social infrastructure (such as roads, public transport education, health, emergency services and community facilities) availability of servicing and utilities (drainage, sewerage, water, power, gas, telecommunications) access to employment opportunities and adequate services and facilities
Development viability	Development Approval and Planning Processes
<ul style="list-style-type: none"> cost and availability of finance for development lack of market demand and confidence (wider macro-economic conditions) and high land and construction costs (particularly for urban renewal areas) access to government funding and public resources to drive development (particularly in renewal areas) unrealistic land valuations and developer expectations additional unforeseen costs such as remediation, land assembly, holding costs developer and infrastructure contributions and costs affordable options in competing locations/developments level of amenity 	<ul style="list-style-type: none"> complexity of planning process can impact on project costs including expert studies, time delays, increased holding costs and level of certainty or risk currency of strategic policy and structure planning frameworks appropriate local government resources to adequately service strategic and statutory planning requirements

For planned growth areas issues impacting on growth and land release include:

- land ownership complexities limiting level of supply potential
- site constraints and impediments not clearly understood when identifying supply potential
- access to critical infrastructure and amenity
- need for supporting strategic planning and development approval processes to ensure a robust housing and land supply.

For urban renewal and regeneration areas issues impacting on activity include:

- Central Geelong – demand and developer confidence, competition from more affordable locations, level of infrastructure and amenity, high land values and construction costs, complexity of planning provisions
- Fyans – West Fyans Street Precinct – need to resolve ownership, flooding, odour and contamination constraints in addition to managing land use transition to unlock potential

- Corio Norlane – need for ongoing investments in amenity improvement to capitalise on affordability and encourage more people to move to the area.

3.2.2 Incentives Action Plan

The *Strategic Housing Incentives Action Plan* identifies the potential for a range of strategies and actions targeted at wider strategic initiatives applicable to the G21 region and location specific initiatives which address the identified issues:

- regional initiatives – targeted at the wider G21 region and ensuring that the common strategic housing growth challenges are addressed across planned growth and urban renewal areas
- urban renewal and regeneration initiatives – providing specific localised actions to stimulate development and targeted investment in identified areas
- growth area initiatives – specific targeted actions required to ensure that land release and housing growth is supported where and when it is required.

Regional Initiatives

Identified actions (refer **Figure 3** summary) focus on supporting housing growth, critical infrastructure and the management of timely planning processes as the key ingredients of land release at a strategic region-wide level:

- planning for housing growth and land supply - ensuring an adequate land supply and diversity in housing stock
- infrastructure - supporting delivery of the key regional and local infrastructure projects required to support growth
- development approvals and planning process - to support timely land release and minimise land costs.

Urban renewal and regeneration initiatives

Each urban renewal area is unique with different characteristics and issues influencing the potential for residential development and investment, owing to their differing locations and market profile. Identified actions (refer **Figure 4** summary) seek to assist existing development proposals and attract new development opportunities, improve perceptions and raise awareness, improve amenity and reduce development costs:

- provision of property information including up to date land supply and site identification
- direct assistance including technical, regulatory and planning advice
- investment and marketing campaigns and strong branding to convey the variety of development opportunities
- utilisation of government land assets where feasible
- fiscal incentives
- ensuring that supporting infrastructure is in place
- improvement of amenity and the public realm.

Key infrastructure projects, such as Vision 2 in Central Geelong, have the potential to improve perceptions, create enhanced liveability and accelerate investment and development.

Growth area initiatives

Key strategies (refer **Figure 5** summary) focus on understanding land supply capacity, issues affecting the release of land for housing and provision of housing diversity:

- ensuring land supply is monitored and updated
- investigating the physical constraints in key growth areas
- resolving land ownership and assembly issues

- supporting medium density development in appropriate locations
- delivering key local infrastructure projects required to facilitate growth or development
- providing adequate resources to support the planning process and ensure that sufficient land supply is identified, monitored and delivered when required
- Structure Planning in Colac and Winchelsea to identify areas for future growth.

Suggested response:

- That key strategies and actions identified be considered by G21 councils in the review of structure plans, planning controls and policy and Municipal Strategic Statements and preparation of DCPs, as well as rating strategies, surplus land identification and capital works programs
- That the City of Greater Geelong consider the possibility of using post code promotion campaigns and supporting planning advice arrangements for Central Geelong, Corio/Norlane and West Fyans Street Precinct including potential linkages to Enterprise Geelong and Central Geelong marketing activities
- That the City of Greater Geelong in partnership with DTPLI, Places Victoria, VicRoads and Barwon Water examine opportunities to establish a planning and delivery mechanism vehicle to drive further master planning, land assembly, infrastructure planning to progress activity in the West Fyans Street Precinct
- That key state government departments and agencies including, DTPLI, Places Victoria, DEECD and Office of Housing, Barwon Water be actively engaged and encouraged to partner in the implementation of identified actions particularly around utilisation and planning of government land and infrastructure coordination in key nodes and District Towns
- Land supply be regularly monitored across the region with a focus on District Towns and major urban areas
- Progress on the strategies and actions is monitored as part of the Implementation Plan review.

FIGURE 3 / REGIONAL INITIATIVES

Planning for growth and land supply

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Providing adequate lot supply	<ul style="list-style-type: none"> Review structure plans in line with Growth Plan including analysis of identified growth area suitability/capacity Monitor 15 year land supply and growth activity annually Support local government resourcing 	Local councils G21 advocacy	High (Ongoing)
Diversity and density of housing stock	<ul style="list-style-type: none"> Stimulate development in key urban regeneration and renewal areas by: <ul style="list-style-type: none"> direct development support such as a Postcode 3220 program, site data and market information, assistance and advice and investment attraction campaign using surplus state and local government land fiscal incentives such as rate relief, DCP payment deferrals Improve housing diversity and choice in growth area townships by: <ul style="list-style-type: none"> identifying key infill sites around activity centres supporting rezoning of identified urban consolidation or housing diversity areas using appropriate planning controls to encourage minimum and higher densities identified infill sites/areas 	Local councils State government DTPLI	High (short – medium term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key infrastructure in line with Implementation Plan Support key local infrastructure projects provision Ensure Structure Plans identify infrastructure and DCP requirements 	Local councils Federal and state government DTPLI G21 advocacy	High (Ongoing)
Development approval and planning processes			
Planning processes to support efficient land release	<ul style="list-style-type: none"> Deliver best practice and consistency in approvals process including approvals tracking, indicative timeframes, transparent dialogue and development assistance in complex urban renewal areas Ensure strategic planning frameworks are in place to facilitate development in identified areas Review controls in urban renewal areas to ensure they are effective Appropriate resourcing of local government to undertake planning activity 	Local councils DTPLI	High (short term – ongoing)

FIGURE 4 / URBAN RENEWAL AND REGENERATION INITIATIVES**CENTRAL GEELONG****Development facilitation**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Difficulty in delivering competitive priced high density housing	<ul style="list-style-type: none"> Rollout and expand Post Code 3220 project including: <ul style="list-style-type: none"> provision of data on development opportunities, data base of interested owners and investors and potential purchasers, property data developer assistance including expert technical advice, regulatory issues support, dedicated teas to support key projects promote 3220 project in Melbourne and regionally and develop investment prospectus, target national developers and convey 'Open for Business' Utilise state government and council land assets, identified through audit process, for demonstration or private development projects Provide fiscal incentives including development phase rate deferrals, construction phase infrastructure contribution deferrals, Support Central Geelong Urban Living Project including role of Housing Associations and establishment of a Property Assessment Feasibility Fund 	City of Greater Geelong Development industry	High – Medium (short term)

Infrastructure

CBD infrastructure and amenity	<ul style="list-style-type: none"> Improve landscape, streetscapes and public realm through support of Vision 2 initiatives including green spine, arrivals, city heart and laneways Support regionally significant development projects Provide necessary utility infrastructure to support critical mass 	City of Greater Geelong DTPLI	High (short term – ongoing)
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➤ IMPROVE LANDSCAPE, STREETSCAPES AND PUBLIC REALM THROUGH SUPPORT OF VISION 2 INITIATIVES INCLUDING GREEN SPINE, ARRIVALS, CITY HEART AND LANEWAYS

CORIO/ NORLANE

Development facilitation			
Issue	Strategy/Action	Responsibility	Importance (timeframe)
Difficulty in land assembly, perceptions, delivery of major sites and increased diversity	<ul style="list-style-type: none"> Consider Postcode 3214 project including: <ul style="list-style-type: none"> provision of data on development opportunities including public land assets, data base of interested owners and investors and potential purchasers, property data developer assistance including expert technical advice, regulatory issues support, dedicated teas to support key projects promote 3214 project in Melbourne, regionally and nationally, develop investment prospectus, target experienced developers, establish consistent branding Assist delivery of large scale sites including strategic investigation of sites identified in Corio Norlane Structure Plan including former school sites and consider applying new Residential Growth Zone at these sites. Increase housing diversity around activity centres by: <ul style="list-style-type: none"> identifying infill development opportunities within 400m walking catchment supporting development in 'Increased Housing Diversity Areas' applying Development Plan Overlay tool in targeted locations 	<p>City of Greater Geelong</p> <p>DTPLI</p> <p>Office of Housing</p>	High – Medium (short term – ongoing)
Infrastructure			
Level of infrastructure and amenity	<ul style="list-style-type: none"> Improve landscape, streetscapes and public realm through key projects including Bacchus Marsh Road boulevard treatment, Stead Park facilities investment, general streetscape improvements Support community infrastructure improvements including education, community health and recreation facilities and community hubs Deliver necessary utility services 	<p>City of Greater Geelong</p> <p>DTPLI</p>	High – Medium (short term – ongoing)
Development approval and planning process			
Planning processes support efficient land release	<ul style="list-style-type: none"> Funding to facilitate development of PSPs and DCPs 	<p>City of Greater Geelong</p> <p>State government</p> <p>DTPLI</p>	

FYANS/WEST FYANS STREET PRECINCT

Development facilitation			
Issue	Strategy/Action	Responsibility	Importance (timeframe)
Need for comprehensive approach to transform precinct	<ul style="list-style-type: none"> Establish a 'planning and development delivery vehicle' to drive master planning, land assembly, infrastructure investment, marketing, managing industry transition Further assess area constraints including flooding, contamination and heritage Facilitate land assembly including potential demonstration projects on public assets identified through an audit process, consider strategic land acquisition Stimulate demand by providing market information, direct assistance and technical advice, targeting key developers and market opportunities through rebranding and use of fiscal incentives including rate or DCP deferrals Dedicated team for approvals process support 	City of Greater Geelong DTPLI Places Victoria Developers	High (short – medium)
Infrastructure			
Level of infrastructure and amenity	<ul style="list-style-type: none"> Support infrastructure improvements including traffic management works on West Fyans Street and intersection with Latrobe Terrace and pumping station odour management 	VicRoads Barwon Water	

➤ **SUPPORT INFRASTRUCTURE IMPROVEMENTS INCLUDING TRAFFIC MANAGEMENT WORKS ON WEST FYANS STREET AND INTERSECTION WITH LATROBE TERRACE AND PUMPING STATION ODOUR MANAGEMENT**

FIGURE 5 / GROWTH AREA INITIATIVES

ARMSTRONG CREEK

Growth planning and land supply

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints to development	<ul style="list-style-type: none"> Assess constraints in context of developing PSPs and monitor lot supply data regularly 	City of Greater Geelong DTPLI Developers	High (short – medium term)
Fragmented land ownership	<ul style="list-style-type: none"> Facilitate land assembly or consortium approach in Marshall precinct by monitoring key site ownership, collaborative development of PSP dialogue and infrastructure coordination 	City of Greater Geelong State government DTPLI	High – Medium (short term – ongoing)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including public transport connections (Marshall station upgrade/new Grovedale station), premium bus services to Torquay, east-west link road, Surf Coast Highway upgrades Provision of key community infrastructure including schools, subregional library, regional sports centre, emergency services and health facilities Provision of utility services Prepare advance PSPs to identify critical infrastructure needs and identify delivery funding mechanisms 	DTPLI VicTrack PTV City of Greater Geelong DEECD CFA DHS/Barwon Health	High (short – medium term)



LARA**Growth planning and land supply**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints to development	<ul style="list-style-type: none"> Assess constraints in two growth areas identified in Lara Structure Plan and monitor lot supply data regularly 	City of Greater Geelong DTPLI Developers	High (short – medium term)
Fragmented land	<ul style="list-style-type: none"> Facilitate land assembly or consortium approach ownership in Lara West Growth Area by monitoring key site ownership, collaborative development of PSP 	City of Greater Geelong DTPLI Landowners/ developers	High – Medium (ongoing)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Support investigation and application of Residential Growth Zone to areas identified in Structure Plan for increased residential densities Support development in 'Increased Housing Diversity Areas' Targeted application of Development Plan Overlay Provide for housing diversity/medium density housing in PSPs 	City of Greater Geelong DTPLI Landowners/ developers	High – medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including 6 way intersection and rail overpass Provision of key community infrastructure including branch library and expanded town centre Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads City of Greater Geelong	Medium – High (short – medium term)

➤ **SUPPORT INVESTIGATION AND APPLICATION OF RESIDENTIAL GROWTH ZONE TO AREAS IDENTIFIED IN STRUCTURE PLAN FOR INCREASED RESIDENTIAL DENSITIES**

OCEAN GROVE

Growth planning and land supply

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints to development	<ul style="list-style-type: none"> Assess constraints in two growth areas identified in Ocean Grove Structure Plan and monitor lot supply data regularly 	City of Greater Geelong DTPLI Developers	Medium (short term)
Fragmented land ownership	<ul style="list-style-type: none"> Monitor key site ownership, coordinate and facilitate development and infrastructure provision in North Eastern Growth Area 	City of Greater Geelong DTPLI Landowners/ developers	High – Medium (short – term)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Support investigation and application of Residential Growth Zone to areas identified in Structure Plan for increased residential densities Support development in 'Increased Housing Diversity Areas' Targeted application of Development Plan Overlay 	City of Greater Geelong DTPLI Landowners/ developers	High – medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including Grubb Road and Bellarine Highway duplication Provision of key community infrastructure including library expansion and amenity improvements Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads City of Greater Geelong	Medium – High (short – medium term)

➤ PROVISION OF KEY COMMUNITY INFRASTRUCTURE INCLUDING LIBRARY EXPANSION AND AMENITY IMPROVEMENTS

DRYSDALE/CLIFTON SPRINGS**Growth planning and land supply**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Fragmented land ownership	<ul style="list-style-type: none"> Facilitate land assembly or consortium approach in Jetty Road Growth Area by monitoring key site ownership and supporting initial developments and coordination of infrastructure and open space 	City of Greater Geelong DTPLI Landowners/ developers	High – Medium (medium term)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Support investigation and application of Residential Growth Zone to areas identified in Structure Plan for increased residential densities Support development in 'Increased Housing Diversity Areas' Targeted application of Development Plan Overlay Provide for housing diversity/medium density housing in PSPs 	City of Greater Geelong DTPLI Landowners/ developers	High – medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including a town bypass Provision of key community infrastructure including facilities at the Grubb Road Sewerage capacity upgrades Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads City of Greater Geelong Barwon Water	Medium – High (medium term)

➤ IDENTIFY INFILL DEVELOPMENT OPPORTUNITIES WITHIN 400M OF ACTIVITY CENTRES

LEOPOLD

Growth planning and land supply

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints to development	<ul style="list-style-type: none"> Assess constraints of long term growth area identified in Leopold Structure Plan east of Ash Road and monitor lot supply data regularly 	City of Greater Geelong DTPLI Developers	Medium (short term)
Fragmented land ownership	<ul style="list-style-type: none"> Facilitate land assembly or consortium approach in Ash Road Area by monitoring key site ownership and supporting initial developments and coordination of infrastructure and open space at Ash road 	City of Greater Geelong DTPLI Landowners/ developers	High – Medium (short term)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Support investigation and application of Residential Growth Zone to areas identified in Structure Plan for urban consolidation opportunities Support development in 'Increased Housing Diversity Areas' Targeted application of Development Plan Overlay 	City of Greater Geelong DTPLI Landowners/ developers	High – medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Provision of key community infrastructure including library and community hub Sewerage capacity upgrades Ensure PSPs and DCPs prepared for growth areas 	DEECD DHS/Barwon Health City of Greater Geelong Barwon Water	High (short – medium term)

➤ SUPPORT INVESTIGATION AND APPLICATION OF RESIDENTIAL GROWTH ZONE TO AREAS IDENTIFIED IN STRUCTURE PLAN FOR URBAN CONSOLIDATION OPPORTUNITIES

BANNOCKBURN**Growth planning and land supply**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Support investigation and application of Residential Growth Zone to areas identified in Structure Plan for 'consolidated residential' Targeted application of Development Plan Overlay 	Golden Plains Shire	High – medium (short term)

Infrastructure

Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including Milton Street and Charles Road Bridges, 6 way intersection, Bannockburn Sheldford Road, Midland and Hamilton Highway duplications, upgrade station and crossing Provision of key community infrastructure including education precinct, and emergency services precinct, Water and sewerage capacity upgrades and natural gas connection Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads Golden Plains Shire Barwon Water DEECD CFA SP AusNet	Medium – High (short – medium term)
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TORQUAY/JAN JUC

Growth planning and land supply			
Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints	<ul style="list-style-type: none"> Assess constraints of identified growth areas to north east and north west of Torquay and monitor lot supply data regularly 	Surf Coast Shire DTPLI Developers	High –Medium (short – medium term)
Pattern of land ownership	<ul style="list-style-type: none"> Monitor land ownership patterns and facilitate land owner dialogue, a land assembly or consortium approach and provide support to coordinate development proposal considerations 	Surf Coast Shire DTPLI Landowners/ developers	High –Medium (medium – long term)
Lack of housing diversity	<ul style="list-style-type: none"> Identify infill development opportunities within 400m of activity centres Investigate the use of the use of the Residential Growth Zone or other mechanisms for areas identified for 'consolidation/ medium density housing' Targeted application of Development Plan Overlay 	Surf Coast Shire DTPLI	High – medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including Surf Coast Highway widening and transit link to Geelong and premium bus services Provision of key community infrastructure including secondary school, subregional library and aquatic centre Upgrades to gas network and NBN rollout Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads Surf Coast Shire PTV DEECD SP AusNet	Medium – High (short – medium term)
Development viability			
Current market demand and high land prices	<ul style="list-style-type: none"> Ensure adequate supply of land and promotion of Torquay as key holiday and investment destination 	DTPLI Surf Coast Shire	Medium (short term – ongoing)

UPGRADES TO GAS NETWORK AND NBN ROLLOUT

WINCHELSEA**Growth planning and land supply**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints	<ul style="list-style-type: none"> Assess constraints of future growth areas and monitor lot supply data regularly 	Surf Coast Shire DTPLI Developers	Medium (short – medium term)
Pattern of land ownership	<ul style="list-style-type: none"> Monitor land ownership patterns and facilitate land owner dialogue, a land assembly or consortium approach and provide support to coordinate development proposal considerations 	Surf Coast Shire DTPLI Landowners/ developers	High –Medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including Princes Highway Duplication Investigate community infrastructure needs for longer term growth through Structure Plan process Upgrades to gas network and NBN rollout Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicRoads Surf Coast Shire SP AusNet	Medium – High (short – medium term)

COLAC**Growth planning and land supply**

Issue	Strategy/Action	Responsibility	Importance (timeframe)
Physical and environmental constraints to development	<ul style="list-style-type: none"> Assess constraints of long term growth areas identified in Colac Structure Plan east of Ash Road, support implementation of Colac Flood Study and monitor lot supply data regularly 	Colac Otway Shire DTPLI Developers	Medium (short term – medium term)
Fragmented land ownership	<ul style="list-style-type: none"> Monitor land ownership patterns and facilitate land owner dialogue, a land assembly or consortium approach and provide support to coordinate development proposal considerations 	Colac Otway Shire DTPLI Landowners/ developers	High – Medium (short term)
Infrastructure			
Provision of critical infrastructure	<ul style="list-style-type: none"> Delivering key transport infrastructure including Princes Highway duplication and town bypass, rail services improvements including passing loops Provision of key community infrastructure including CBD entrances project and Beechy Precinct Water supply and sewerage capacity upgrades and drainage works and NBN rollout Ensure PSPs and DCPs prepared for growth areas 	DTPLI VicTrack PTV VicRoads Colac Otway Shire Barwon Water	Medium (short – medium term)

3.3 LAND SUPPLY

3.3.1 Supply

The Growth Plan identified that growth area planning across the region, along with infill housing capacity, was sufficient to meet the needs of a population of close to 500,000. It was acknowledged, however, that supply does not always match market demand in terms of location and choice and that a more detailed picture of land supply across the region is required.

Having a reliable, regularly updated picture of land supply is critical for future urban planning.

Since 2003 the state government's Urban Development Program (UDP) has provided municipal level industrial and residential land supply data for Melbourne and Geelong (including Torquay/Jan Juc). During 2009–2010, the UDP was expanded across key provincial areas in regional Victoria.

The UDP from 2004 to 2009 identified that the Geelong area during this period had sufficient residential broadhectare land stocks to meet between four to six years of projected demand. The estimated broadhectare lot capacity over this time period fluctuated from approximately 8,500 to 11,000 lots. In 2010, the latest published UDP reported that the Geelong region had a total residential broadhectare lot capacity of approximately 37,000 lots. This follows new growth areas such as Armstrong Creek, Ocean Grove North East Growth Area and Clifton Springs' Jetty Road Growth Area being rezoned or developed.

In terms of industrial land supply, the UDP has consistently reported there is sufficient land to meet over 25 years of future demand within the City of Greater Geelong. Adequacy of industrial land in Torquay/Jan Juc was not reported.

A series of *Land Supply Reports* have been developed for each municipality based on the methodology detailed in the *Background Report*.

Rather than identifying supply at a municipal level like the UDP, the Land Supply Reports provide residential and industrial land supply for each municipality which include the key growth centres and urban areas of:

- Geelong and Queenscliff (including separate data for Urban Geelong and Lara and the Bellarine Peninsula)
- Torquay/Jan Juc
- Winchelsea
- Colac
- Bannockburn.

Geelong's data has been split in two to reflect different housing markets, while retaining a sufficiently large area to maximise data quality and comparability and minimise small area data anomalies. Geelong's data also includes incremental or minor infill land supply given this infill housing activity accounts for a significant portion of new dwelling and lot construction.

For residential land supply, the reports identify broad hectare, major infill and rural residential supply levels to provide richer, 'real supply' data for different housing supply segments.

A summary of regional and major centre residential and industrial land supply is provided in **Figures 6 and 7**.



FIGURE 6 / LAND SUPPLY SUMMARY TABLES

Greater Geelong Residential Land Supply (including Borough of Queenscliffe*)							
SLA/Suburb/ LGA	Broad hectare (lots)	Major infill (lots)	Minor infill (lots under 5,000m ²)	Future residential (unzoned lots)	Total urban supply (lots)	Rural Living/Low Density Residential	
						Occupied (Ha)	Vacant (Ha)
Armstrong Creek	12,549		150	9,387	21,936	-	-
Geelong	4,531		1,236	400	4,931	24.6	4.8
Lara/Avalon	289		133	4,826	5,115	1,592.7	180.2
Urban Geelong total	17,398	1,832	1,533	14,613	32,011	2,326.4	373.1
Drysdale/Clifton Springs	2,770		467	2,205	5,065	385	45.9
Leopold	456		290	1,093	1,549	214.7	14.1
Ocean Grove	3,929		404	436	4,365	189.1	10.4
Bellarine Peninsula total*	8,740	54	2,113	9,387	21,936	1,748.5	189.9
Geelong LGA*	26,138	1,886	3,729	20,220	46,356	4,074.9	562.9

Regional Residential Land Supply (other than Greater Geelong LGA)							
SLA/Suburb/ LGA	Broad hectare/ Major infill (lots)	Minor infill (lots under 5,000m ²)	Future residential (unzoned)	Total urban supply (lots)	Rural Living/Low Density Residential		
					Occupied (Ha)	Vacant (Ha)	
Torquay/Jan Juc	3,682	832	2,464	6,146	443.6	66	
Winchelsea	129	46	135	313	208.4	32.9	
Surf Coast Shire LGA	3,852	1,311	2,607	6,459	1,570.8	129.5	
Bannockburn	844	96	2,276	3,120	627.5	111.4	
Southern Golden Plains Shire LGA	1,008	120	2,276	3,284	2,245.6	532.2	
Colac	1,136	139	-	1,136	490.4	94.7	
Apollo Bay	406	173	260	666	-	-	
Colac Otway Shire LGA	1,646	627	260	1,906	569.8	115.6	

FIGURE 7 / INDUSTRIAL LAND SUPPLY

Precinct/LGA	Zoned Industrial		Future industrial unzoned (Ha)	Recent average annual industrial land consumption (Ha)
	Unavailable (Ha)	Supply (Ha)		
Heales Road (GREP)	171.6	323.8		3.6
Geelong	681.1	28.13		2.28
South Geelong (inc Fyansford)	235	34.63		1.66
Armstrong Creek	-	158.5	157.83	-
Moolap	364	34.61		3.63
Ocean Grove	8.44	0.4		0.18
Point Wilson	659	0.0		-
Greater Geelong LGA total	2,133	592.9	157.83	11.63
Torquay/Jan Juc	10.1	21.2		0.42
Winchelsea	13.7	6.39		0.11
Surf Coast Shire LGA total	26.4	28.9		0.55
Colac	116.3	70.99	34.5	1.5
Colac Shire LGA total	125.8	86.98	34.5	1.76
Bannockburn	6.69	2.12		0.67
Southern Golden Plains Shire LGA total	6.69	2.12		0.67



Residential land supply summary

The land supply data indicates that the G21 region has a healthy level of land supply and development activity composition including:

- a diverse composition of development across established urban area, broad hectare and rural residential types
- multiple active development fronts with multiple developers
- a competitive land development environment ranging from local builders, owner/occupiers and state/national developers
- a relatively diverse housing and land product
- overall, ample capacity that is being realised.

As such the region compares favourably with Melbourne and comparable regional centres.

For municipalities and district towns the land supply data based on 2012 VIF population projections and current development activity indicates:

- Greater Geelong LGA - around 18 years of broad hectare zoned land supply and 14 years unzoned supply in planned growth areas. Even at a much higher population growth rate of 2.5% (equivalent to a 3% dwelling growth) zoned supply is around 12 years with a further 10 years planned growth supply identified.

Urban Geelong - a significant portion of urban Geelong's supply is located within Armstrong Creek, Lara and suburbs such as Waurrn Ponds, Highton and Fyansford. Significant unzoned planned growth supply is identified at Armstrong Creek and Lara.

Bellarine Peninsula - a significant portion of the Bellarine's broad hectare supply lies within Ocean Grove and Drysdale/Clifton Springs with significant unzoned planned growth supply identified in Drysdale/Clifton Springs, Leopold and St Leonards.

In addition to broad hectare supply there continues to be significant infill activity occurring within established urban areas, a trend which is likely to continue. Within Geelong however there has been limited construction of higher density dwelling products.

- Surf Coast - the majority of broad hectare supply is located within Torquay/Jan Juc and Winchelsea. Torquay has approximately 13 years of zoned supply across diverse and active development fronts resulting in a competitive land development market, with a further 9 years unzoned planned growth supply. Torquay also has significant minor infill activity. Winchelsea has zoned and unzoned supply stocks of 8 years respectively

- Southern Golden Plains - the majority of broad hectare supply is located within Bannockburn with around 13 years zoned supply and over 25 years unzoned planned growth. Bannockburn is experiencing very active uptake of broad hectare and rural residential stocks. The surrounding centres of Inverleigh, Lethbridge and Teesdale and Batesford provide adequate supply of rural residential land
- Colac Otway - the majority of broad hectare supply is located within Colac and Apollo Bay. Colac has a broad hectare supply sufficient to meet expected demand for 18 years. There are relatively significant levels of small scale infill activity occurring in Colac. Rural residential supply is provided at smaller centres such as Birregurra.

Industrial land supply summary

The industrial land supply information indicates that the majority of industrial land stocks are located in Geelong and in the larger district towns of Colac, Bannockburn and Torquay. Industrial land stocks are well distributed across the majority of urban centres servicing both 'export' and 'local' service economy requirements. There are a variety of existing vacant zoned industrial allotments by zone type and lot size. In addition, there are significant future (unzoned) industrial areas identified to meet future needs. Across the G21 region, approximately 15 hectares per annum of vacant industrial land is consumed (for example vacant industrial land converted to an occupied use):

- 11.6 hectares per annum across the municipal area of Geelong
- 1.5 hectares per annum in Colac
- 0.7 hectares per annum in Bannockburn
- 0.4 hectares per annum in Torquay.

Based on the levels of recent annual land consumption (subdivision and development data over periods of around six years) the following generalised comments can be made around supply:

- Demand and subsequent supply of industrial allotments is generally less than 0.5 hectares, with 94% of all recently (since July 2006) constructed industrial allotments of this size. This largely reflects the needs to meet local economy service requirements

A SIGNIFICANT PROPORTION OF GREATER GEELONG'S VACANT SUPPLY LIES IN FRINGE DEVELOPING INDUSTRIAL PRECINCTS INCLUDING HEALES ROAD AND ARMSTRONG CREEK

- Greater Geelong has significant levels of supply; however, inner urban areas such as 'south Geelong' and 'central Geelong' while having significant levels of supply, it is anticipated that these industrial precincts will slowly exhaust supply levels over time given limited capacity to expand. It is considered that the industrial stocks located in Moolap, Ocean Grove and Portarlington are sufficient to meet the local service industry requirements across the Bellarine Peninsula subregion in the medium to longer term.

A significant proportion of Greater Geelong's vacant supply lies in fringe developing industrial precincts including Heales Road and Armstrong Creek. This reinforces the strategic significance of these areas and the need for strategic road and rail connections and other supporting infrastructure investments

- The majority of the Surf Coast Shire's supply is located in Torquay and Winchelsea. Supply levels are considered ample given historic demand levels, the economic roles of these urban centres and the likely future demand profiles for industrial land
- The majority of the Colac Otway Shire's vacant industrial land stock is located in Colac. It is considered based on likely future demand there is sufficient industrial land stocks to meet the long-term needs in Colac and other significant urban centres such as Apollo Bay
- All of the southern Golden Plains Shire's industrial land supply is located in Bannockburn where there are limited available zoned land stocks. Golden Plains Shire Council is actively pursuing the rezoning of new supply areas. The Gheringhap employment node will also provide important future supply opportunities.



3.3.2 Adequacy

Ensuring adequacy of land supply is an important component of maintaining affordable housing price points, ensuring a broad range of housing choices and accommodating population growth. Similarly, overprovision of land supply can lead to higher servicing costs, infrastructure and service provision lags and isolated or disadvantaged communities. The costs and issues associated with the release of too much land supply are explored in more detail in the *Background Report* but they include:

- spreading of infrastructure demands
- the high cost of infrastructure provision and potential cost burden impacts on the broader community and creates higher housing costs
- impact on current infrastructure need and investment commitments and priorities.

The Growth Plan and lot supply reports identify the significant contribution infill housing activity makes to broader land supply levels and growth capacity of existing urban areas. The *State of Australian Cities 2013* report identifies the household and transport energy consumption costs, increased generation of waste, resource loss and greater vulnerability to climate variability as major implications of more dispersed low density car-dependent peripheral urban patterns. The report favours development of a more compact city with homes located near workplaces and/or along high capacity transport networks with high levels of accessibility and transport choice.

Key considerations for determining adequacy of supply and trigger points for new land to be rezoned/developed include:

- level of competition which can affect release rates and pricing
- extent of land that is not readily developable for example, is severely constrained by flooding, land owners are reluctant to develop the land or land is quarantined for other uses
- different housing markets, market behaviour and demand between areas
- infill housing activity
- lead times for land development

- pattern of development and the delivery of infrastructure
- strategic growth priorities – growth areas versus low or limited growth areas and extent of planned growth areas identified but not zoned
- Growth Plan directions and State Planning Policy Framework provisions including those associated with the Metropolitan Planning Strategy.

Typical municipal benchmarks include 15 years of zoned supply for residential and industrial land before further land rezoning is required. In practice this doesn't reflect some of the complexities identified above or different scales of activity across different towns and municipalities.

This trigger is considered appropriate for the majority of centres. Based on this trigger and land supply analysis the following observations are made:

- Torquay/Jan Juc - need to consider rezoning identified planned growth areas in the short - medium term
- Colac - no immediate need to rezone additional broad hectare stocks; however, current undeveloped broad hectare holdings are large, limiting demand led construction activity. Economies of scale are limiting market entry of larger infill developers
- Bannockburn - short term need to rezone additional identified planned broad hectare residential stocks and in the short term facilitate opportunities for further industrial zoned land identification and provision
- Urban Geelong - existing and planned supply levels are healthy for the medium to longer term. There is a need to avoid oversupply and too many active growth fronts so as not to impede competition or impact economies of scale. Land supply should be regularly monitored to respond to changes in population and housing growth
- Bellarine Peninsula - existing and planned supply levels are healthy for the medium to long term.

Suggested response:

- That the land supply data be considered by G21 Councils in the review of Structure Plans and timing of zoning of identified planned growth.

3.3.3 Land supply reporting

A web based land supply reporting tool to enable land supply monitoring within the G21 region has been developed which provides a visual representation and report capability of the residential and industrial land supply data.

The tool reports land supply data at any geographic scale ranging from municipal, town or project level and produces land supply maps and data. The tool has open level access and is compatible with the Urban Development Program and capable of being updated with subsequent supply assessments.

Regular updating of land supply information across the region's major urban areas will be important to ensure data is up to date and changes in lot supply can be tracked to inform future growth area planning timing.

For major centres and areas, where there are land supply issues, monitoring should be undertaken annually. For other centres, biennial assessment is more appropriate depending on the levels of development activity or level of strategic significance. Given growth activity in the G21 region, it is suggested that an annual land supply analysis be undertaken for major centres of Geelong and Torquay/Jan Juc with a biennial analysis of other low to modest supply District Towns. This is critical in the context for growth rates to change quickly particularly in Geelong in response to growth activity in Melbourne's west and as a result of key policy directions identified in the Metropolitan Planning Strategy. It is acknowledged that there are financial implications in undertaking regular analysis which may impact on timeframes. Potentially coordination with the UDP program may assist.

Suggested response:

- That the G21 councils use the land supply data to manage the timing of strategic growth area planning and land release to ensure adequate infill and broad hectare land supply for housing and industry.
- That the G21 Planning and Services Pillar coordinate the ongoing management of the online reporting tool and preparation of annual and biennial, as appropriate, land supply assessments for key centres in parallel with the UDP program subject to funding. Funding of this land supply monitoring should be proportionally funded by the G21 councils.

4.0

PLANNING FOR LONGER TERM GROWTH

Providing direction for future growth area planning will enable the region to respond to longer term growth activity, plan future infrastructure provision and create a benchmark for more sustainable communities



The Growth Plan identified two Further Investigation Areas as having the potential to provide for the medium to longer term growth needs of Geelong and the region.

4.1 INTRODUCTION

The Growth Plan identified two Further Investigation Areas (FIAs) or ‘strategic opportunity areas’ (refer Map 11), to be examined for their potential to provide capacity for the G21 region to grow to and beyond 500,000 people and respond to higher growth rates in the future:

- **Northern FIA** - generally located in Lovely Banks and generally bounded by Staceys Road to the north, Evans Road to the west and adjoining Rural Living zoned lots north of Plantation Road and west of Bacchus Marsh Road. Areas to the north of Staceys Road have been considered.
- **Western FIA** - located west of the Geelong Ring Road and extending through parts of Batesford from the Ballarat - Geelong rail line in Bell Post Hill to the north, to the Barwon River in Fyansford, and extending to Dog Rocks/Friend in Hand Roads in the west.

More detailed contextual information about the Further Investigation Areas is contained in the *Background Report*.

The Growth Plan indicated that these areas were not required in the short term, given existing land supply and infill opportunities.

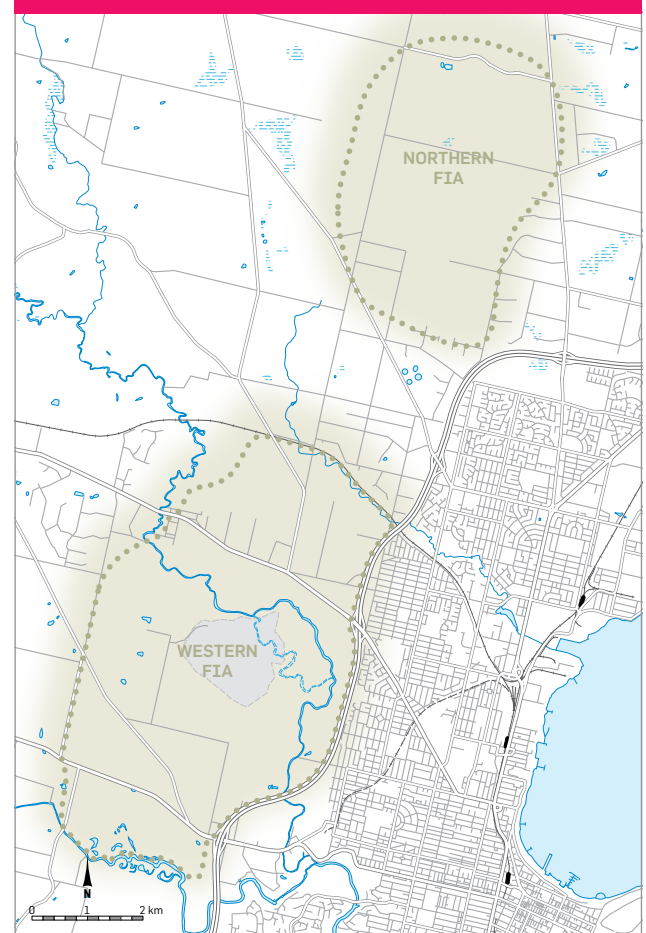
While the Growth Plan identifies that one or part of these areas is a medium to longer term prospect for urban growth there are a number of reasons why the Implementation Plan looks at these areas now:

- the G21 region has the potential to grow beyond the current growth rate of 1.5%, particularly as a result of a major strategic investment decision or infrastructure project
- there is a need to investigate opportunities to deliver greater housing choice and affordability
- there are long lead times in progressing from land identification to land release
- identifying them now helps to protect their potential role while more detailed investigation is undertaken as to their suitability, ultimate size and land use mix.

The Implementation Plan seeks to provide information about the two areas to assist the next steps of planning by identifying:

- the relative constraints and opportunities of each area to identify appropriate planning responses (Section 4.2)
- key community and urban planning outcomes to be considered in future growth area planning (Section 4.3)
- a range of possible next planning steps including detailed area planning, policy development and zoning, infrastructure planning, land release timing triggers and staging directions (Section 4.4).

MAP 11 / FURTHER INVESTIGATION AREAS



4.2 FURTHER INVESTIGATION AREA ANALYSIS OVERVIEW

As identified in the Background Report a detailed analysis has been undertaken on the two FIAs. Given the FIAs are notional areas only with no fixed boundaries, logical adjacent areas were considered in the analysis.

The relative merits and suitability of each of the FIAs as a future growth area has been determined through an analysis of:

- **land capability** - consideration of site assets, values and constraints including topography, hydrography, drainage and flooding, biodiversity, fire risk, geotechnical and land stability and land contamination
- **planning** - consideration of cultural heritage, land use and buffer interfaces, zoning and overlays, views and landscape
- **accessibility** - integration with existing transport and open space networks
- **capacity to deliver** an integrated community including analysis of land fragmentation and potential lot yields, infrastructure capacity and ability to connect efficiently to networked services.

Analysis of the two FIAs has been based on information sourced from:

- existing site data available from the City of Greater Geelong, state government departments and agencies including CCMA, DEPI, DTPLI, VicRoads, Barwon Water and service authorities. This data includes information on hydrology, biodiversity, topography, land capability, infrastructure, cultural heritage, fire, soils, climate and land use
- concept proposals and background studies independently prepared for Lovely Banks Management Pty Ltd, Ramsay Property Group and Batesford South consortia of land owners at their own initiative for parts of the identified FIAs. While this work has been received by the Project Team, it has no formal status
- conversations and interviews with key stakeholders and project partners and agencies.

A situational analysis of each FIA has been undertaken to identify relative strengths and opportunities associated with land attributes, and weaknesses and threats associated with each site including external environmental factors.

The FIA and situational analyses have also been considered against the capacity or potential to deliver a **liveable, vibrant and cohesive community**. Six goals have been identified to measure the extent of delivery of this outcome. The outcome and goals have been derived from the Growth Plan vision and principles as well as criteria used by the Growth Area Authority (GAA) for growth area planning.

The six goals are:

- ability to **create a diverse and unique community**
- ability to **deliver significant community benefit** to Geelong
- ability to **provide accessible and integrated transport choices**
- ability to **provide efficient infrastructure and services**
- ability to ensure **efficient and sustainable use of land and resources**
- ability to **provide exceptional physical environments**.

A summary of the situational analysis is shown in **Figures 8 and 9**. These considerations as well as other factors are also summarised in **Maps 12 and 13**.

Each area has a number of strengths or opportunities. In terms of future planning for one of these sites initially, those strengths and opportunities should be maximised and realised to derive maximum community benefit.

Each area also brings a range of significant challenges. These challenges are not insurmountable and do not preclude any of these areas being a suitable growth area candidate. They will, however, require careful, detailed consideration to identify appropriate solutions to ensure they achieve the broader principles of the Growth Plan before they proceed to development.

FIGURE 8 / SUMMARY SITUATIONAL ANALYSIS – NORTHERN FIA

Goals	Strength/ Opportunity	Weakness/Threat
Ability to create a diverse and unique community	<ul style="list-style-type: none"> Area is large enough to create a critical mass to build and sustain a sense of community Coordinated land owner-development consortium in place 	<ul style="list-style-type: none"> Physical separation from Geelong's established urban areas means there is a risk residents will feel socially isolated to the wider Geelong community and identify more with Lara and/or Melbourne Community will potentially be self-contained with little social cohesion or interaction with the wider Geelong community Fragmented land parcels
Ability to deliver a significant community benefit to Geelong	<ul style="list-style-type: none"> Increased activity in northern Geelong may stimulate future public and private investment into provision of retail, community services and infrastructure in northern Geelong, particularly Corio, Norlane and Lara Area is well located in relation to employment opportunities in the industrial and transport hubs of northern Geelong and the emerging health, education and technology hubs of southern Geelong via the Geelong Ring Road Good road connections into the Geelong CBD via Bacchus Marsh Road and Princes Highway will provide reasonable vehicular access to employment opportunities in Geelong Provides critical mass to underpin demand for provision of a subregional vocational training and larger community health centre in northern Geelong Opportunity to integrate adjoining rural living areas or provide opportunities for an expanded GREP 	<ul style="list-style-type: none"> Location on Geelong northern outskirts and the physical separation from Geelong's established urban areas means there is potential for the community to evolve into a 'commuter community' that predominantly works in, and associates with Melbourne and adds minimal economic and cultural value to the Geelong community or the region With the exception of employment opportunities related to construction and development and the provision of community services, it is not likely to create major long-term employment opportunities but will be leveraging off existing employment nodes in the area Due to proximity to the Lara West Growth Area west of Bacchus Marsh Road, there is a high likelihood that development would impact the present rural setting and character of Lara as a distinct community with a continual urban environment from Lara to Lovely Banks
Ability to provide accessible and integrated transport choices	<ul style="list-style-type: none"> Good arterial road network with capacity for widening and able to accommodate bus, bicycle and pedestrian networks linking to Urban Geelong. Identified upgrade of North Shore Station and relocation of Corio Station to School Road would contribute to more transport choices with appropriate connections 	<ul style="list-style-type: none"> Site does not include an existing railway line and is not within a walkable catchment from a station Closest railway stations (Lara, Corio and North Shore) are not ideally located relative to the site and would require upgrades and/or relocation to cope with added patronage. Lara, being the closest station, would require significant car parking upgrades. Future station near GREP unlikely Physical separation and distance from Geelong's established urban areas means that the early provision of public transport services such as regular bus services may be difficult to justify, meaning that private car use is entrenched as the exclusive mode of transport No established bus, bicycle and pedestrian networks that link the site to Geelong

Goals	Strength/ Opportunity	Weakness/Threat
Ability to provide efficient infrastructure and services	<ul style="list-style-type: none"> No major works required to deliver energy and telecommunications infrastructure Provision of recycled water into sewerage infrastructure design is technically feasible and advisable to achieve IWCM Terrain is relatively flat, with the exception of the eastern slopes associated with the Lovely Banks Monocline, minimising infrastructure construction costs New community services and infrastructure delivered as part of any development may also be utilised by residents of surrounding suburbs which are reportedly under-serviced Opportunity for early private school provision 	<ul style="list-style-type: none"> Major south west gas pipeline dissects the subject land requiring significant separation distances for sensitive and high density land uses identified through a Safety Management Plan which could limit development potential or optimum urban planning outcomes Lag times in the provision of community services and infrastructure until population thresholds within the community are reached will place pressure on infrastructure and services within surrounding suburbs which are significantly under-serviced Development of this area will require significant investment in water infrastructure (provision of potable water, sewer and recycled water) Physical separation and distance from Geelong's established urban areas may increase costs of provision of infrastructure Potential downstream drainage catchment impacts
Ability to ensure efficient and sustainable use of land and resources	<ul style="list-style-type: none"> Land is relatively flat and stable with the exception of potential geotechnical instability along the Lovely Banks Monocline Potential to utilise alternative energy sources generated at GREP. Other potential linkages with GREP include storm and waste water utilisation solutions 	<ul style="list-style-type: none"> Rural amenity of the surrounding land use will cause interface challenges and rural amenity impacts Residential activity may create pressure for Rural Living zoned land to the east and south to be re-zoned to a more intensive land use without due strategic justification Impact on rural views of the Lovely Banks hills from Geelong Risks associated with the South West Gas Pipeline and the Lara Energetic materials manufacturing Plant will constrain development potential Potential impacts on GREP and Industrial 2 resource with reverse amenity impacts affecting development opportunity in this employment node
Ability to provide exceptional physical environments	<ul style="list-style-type: none"> Preliminary studies indicate minimal environmental constraints on site Aboriginal and European cultural heritage not likely to constrain development potential Natural drainage lines running down the eastern slope of the FIA may be a potential opportunity for some natural open space 	<ul style="list-style-type: none"> Environmental Significance Overlay Schedule 4 (ESO4) covers the site indicating that threatened grasslands may be present, which native vegetation surveys will ascertain Possible presence of suitable habitat Striped Legless Lizard and Golden Sun Moth which fauna surveys will ascertain No known existing natural values or biodiversity assets or values on site that can be enhanced or integrated into natural open space networks

➤ AREA IS WELL LOCATED IN RELATION TO EMPLOYMENT OPPORTUNITIES IN THE INDUSTRIAL AND TRANSPORT HUBS OF NORTHERN GEELONG AND THE EMERGING HEALTH, EDUCATION AND TECHNOLOGY HUBS OF SOUTHERN GEELONG VIA THE GEELONG RING ROAD

MAP 12 / NORTHERN FIA ISSUES FOR CONSIDERATION

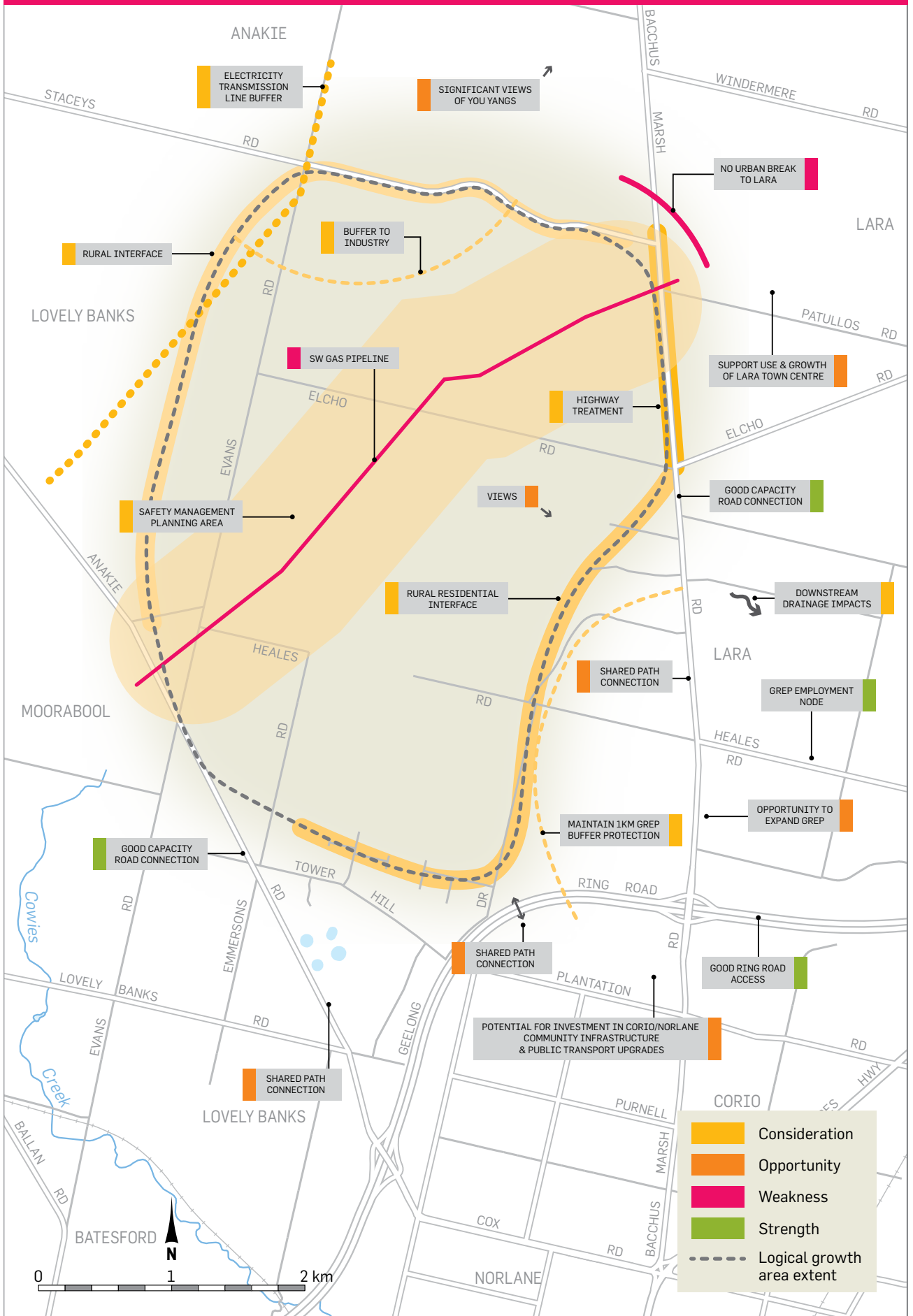


FIGURE 9 SUMMARY SITUATIONAL ANALYSIS – WESTERN FIA

Goals	Strength/ Opportunity	Weakness/Threat
Ability to create a diverse and unique community	<ul style="list-style-type: none"> Diversity of natural assets including a proposed recreational lake (current quarry) and potential to link to urban Geelong with natural open space and shared trail networks along corridors associated with the Moorabool River, Barwon River and Cowies Creek will contribute to uniqueness and branding of the growth area and attract regional and local visitors facilitating social integration and connectivity within Geelong and the region Core areas in two ownerships 	<ul style="list-style-type: none"> Geelong Ring Road may act as a barrier to social integration with wider Geelong Land ownership fragmentation in northern Bell Post Hill area
Ability to deliver a significant community benefit to Geelong	<ul style="list-style-type: none"> Potential to significantly contribute to the social, environmental and economic wellbeing of Geelong and G21 region through: <ul style="list-style-type: none"> provision of regionally significant open space and shared trail networks along the Moorabool and Barwon Rivers and Cowies Creek corridors leveraging of investment into a potential community asset by re-using and converting the Batesford Quarry into a lake for public recreation, tourism activity and possible environmental benefit rehabilitation and enhancement of degraded aquatic and riparian ecosystems, establishment of biodiversity corridors along the rivers and the protection of nationally threatened grassland habitats In addition to construction and development employment there is potentially for employment opportunities in tourism Centrally located in relation to employment nodes in northern Geelong and emerging health, education and technology hubs of southern Geelong via the Geelong Ring Road. Close to Central Geelong and identified Gheringhap employment node 	<ul style="list-style-type: none"> While there is an opportunity to upgrade the existing road network including Hyland Street, Autumn Street and Church Street, this may constrain traffic movements and increase congestion Approval processes and infrastructure planning will require coordination across multiple agencies as a consequence of the multifaceted nature of this growth area and extent of land capability and environmental issues. Site complexity and an integrated planning approach will increase risk of delays and higher costs which may impact house prices. This impact is highest in former quarry areas and where environmental values are present, and least, north of the Midland Highway or adjacent to the Hamilton Highway Open space areas including biodiversity and lake assets will have ongoing maintenance costs, requiring development of management and funding arrangements While modelling indicates water quality in the lake is likely to be suitable for public use, in practice the water quality may at times be unsuitable and require further technical analysis

➤ LINKING OF TRAILS ALONG THE MOORABOOL RIVER AND COWIES CREEK CORRIDORS WITH EXISTING URBAN SHARED TRAILS WILL PROVIDE BICYCLE AND PEDESTRIAN LINKAGES TO GEELONG

Goals	Strength/ Opportunity	Weakness/Threat
Ability to provide accessible and integrated transport choices	<ul style="list-style-type: none"> • Potential reinstatement of passenger rail services into Geelong on the Ballarat-Geelong rail line and construction of a railway commuter station near Bell Post Hill will provide more transport choices and present an opportunity for the development of an activity centre around a transport node • Utilisation of the disused rail reserve located between Fyansford and the Geelong Stabling Yards as a transit corridor if economically and technically feasible • Linking of trails along the Moorabool River and Cowies Creek corridors with existing urban shared trails will provide bicycle and pedestrian linkages to Geelong • Creamery Road over-bridge provides a good local road connection with the Geelong suburbs east of the Geelong Ring Road (and north of the Midland Highway) • Potential to upgrade existing road network including Hyland Street, Autumn Street and Church Street and provide an over-bridge at Hamlyn Heights, although costly to construct • Proximity to the Geelong Ring Road provides reasonable vehicle access to most of Geelong's (and the region's) key employment nodes 	<ul style="list-style-type: none"> • Significant challenges in increasing carrying capacity of east – west roads into Urban Geelong creates a major traffic constraint to potential growth particularly the southern portion of the area around Hamilton Highway • Traffic management strategies to encourage traffic moving between the growth area and Geelong CBD onto the Midland Highway/Ballarat Road will significantly increase peak traffic congestion on this route, however upgrading the Midland Highway west of the Geelong Ring Road will partly mitigate this impact • Construction of north-south linkages within the growth area to facilitate traffic movement onto the Midland Highway will be technically difficult and costly due to complex terrain and the Moorabool River valley • Increased traffic on the Midland and Hamilton Highways may impact established freight corridors between western Victoria and Geelong • Major road and rail corridors may create acoustic issues for future residents requiring appropriate design responses • Passenger rail services may not be reintroduced in the short – medium term
Ability to provide efficient infrastructure and services	<ul style="list-style-type: none"> • Suburbs abutting the site to the east are well established and reasonably well serviced by community services and infrastructure and generally have capacity to absorb initial demands until population thresholds for onsite provision are reached • Established K-12 private school and council managed sporting reserves north of the Midland Highway provide a foundation for an activity node • Provision of recycled water into sewerage infrastructure design is technically feasible and advisable in order to achieve to IWCM objectives • No major works required to deliver energy and telecommunications infrastructure 	<ul style="list-style-type: none"> • Physical separation caused by the Geelong Ring Road may hinder access to some community services within the abutting suburbs to the east (with the exception of the land north of the Midland Highway which is reasonably well connected by Creamery Road and shared trails) • Complex terrain mainly around the Moorabool River Valley and past Batesford Quarry operations and considerable open space may escalate the infrastructure construction costs which may impact housing affordability • Development of this growth area will require significant investment in water infrastructure (provision of potable water, sewer and recycled water) • Electricity transmission line which intersects the area on the south-eastern corner will need to be considered through precinct planning exercises

Goals	Strength/ Opportunity	Weakness/Threat
Ability to ensure efficient and sustainable use of land and resources	<ul style="list-style-type: none"> • Opportunity to re-use and convert a soon to be exhausted quarry and enhance a number of stressed ecosystems into regionally significant community and biodiversity assets • Potential for peak flows on the Moorabool River could be directed into the proposed lake to improve ecological outcomes and reduce the risk of flooding down stream • Three water courses within the growth area and a proposed recreational lake represent open space opportunities and potential to achieve Integrated Water Cycle Management outcomes • Area provides a diversity of landscapes, view sheds, terrains and living experiences which may in turn provide opportunity for a range of housing types 	<ul style="list-style-type: none"> • Natural features and topography will increase financial costs of delivery of physical infrastructure such as reticulated services • Rural nature of surrounding land to west of the growth area may cause interface issues and risk of amenity impacts • Rural view sheds will be impacted for residents of Hamlyn Heights and to a lesser extent Highton and from Barrabool Hills
Ability to provide exceptional physical environments	<ul style="list-style-type: none"> • Ability to identify, protect and enhance nationally and state listed threatened habitats, flora and fauna and link with other habitats through establishment of biodiversity corridors • Ability to improve conservation values with presently degraded a stressed aquatic habitats and riparian habitats • Ability to create opportunities for community to access and experience the ecological values through passive nature based activities 	<ul style="list-style-type: none"> • Highly significant environmental values including threatened flora and fauna and grassland habitats are present (particularly near the three water courses and Batesford) within the site

➤ **OPPORTUNITY TO RE-USE AND CONVERT A SOON TO BE EXHAUSTED QUARRY AND ENHANCE A NUMBER OF STRESSED ECOSYSTEMS INTO REGIONALLY SIGNIFICANT COMMUNITY AND BIODIVERSITY ASSETS**

To summarise:

- The Northern FIA has minimal land capability constraints and is relatively straight forward to develop and service; however the public transport options and the potential for isolation from the rest of Geelong would need to be addressed.
- The Western FIA presents an opportunity to create major regional community assets and biodiversity enhancements integrated with a diversity of housing options; however complex site, road connection and capacity challenges would need to be addressed.

The identified challenges call for a range of responses to be considered in the detailed planning phase and which are identified in the next **section 4.3.5 Site specific considerations**. These responses are further supported by more detailed analysis, explanation and commentary included in the *Background Report*.

Specific outcomes for each site are explored in the next section.

The development of either FIA will also entail significant investments in physical and community infrastructure including major water and waste treatment facilities, schools and kindergartens, open space and arterial road upgrades. Sufficient lead time will be required from identification of a preferred FIA to development to allow detailed infrastructure planning, costing and programming. This is further considered in Section 4.4.



4.3 FUTURE GROWTH AREA OUTCOMES

4.3.1 Taking 'the next step' in planning for new communities

The way in which we build our new urban developments will have a lasting effect on the sustainability of our cities.

While it is difficult to identify the planning controls, guidelines and standards that will need to be applied when one of these FIAs is ready to progress to a developing growth area, it is clear that a 'next step' in planning will need to be taken to create a more viable, liveable and connected urban environment.

What we can be confident about is that our climate, energy needs, travel patterns, housing needs, working and recreation arrangements will change in the 2050 planning horizon. Taking the 'next step' in developing more sustainable communities, particularly when extending urban areas outward is critical in this context.

Developing a more strategic approach to embed sustainability into new urban areas is one way to achieve this.

Projects such as the *Geelong Low Carbon Growth Plan* identify substantial greenhouse gas reductions associated with effective building design and construction practices and use of alternative energy sources. Other concepts such as *One Planet Living* demonstrate that a sustainable low carbon future can be achievable, attractive and affordable. Current planning for the *Armstrong Creek Town Centre Sustainable Urban Development Framework* has explored a range of opportunities to embed a more holistic approach to implementing sustainability measures into urban settings.

Some of the following sustainability outcomes are important to incorporate into growth area planning, policy and control development and approval processes:

- zero carbon
- zero waste
- sustainable water
- sustainable transport
- improved environmental outcomes
- community infrastructure provision.

These outcomes can be achieved in the planning process through:

- Precinct Structure Planning (PSP) requirements and design
- design guidelines
- planning tools including policy, overlays or other controls.

REGIONAL GROWTH AREA PLANNING

While focused on future planning of the FIAs the following principles around sustainability and infrastructure planning and community design are equally applicable to future growth area planning around the region including Bannockburn, Winchelsea and Colac.

Zero carbon

Opportunities to provide for a carbon neutral urban environment include:

- energy efficiency through building design techniques including thermal performance, green roofs or walls, building management systems, use of solar electricity
- use of rating tools such as Green Star to ensure all buildings achieve best practice, or set percentage 'beyond compliance' to enable targets to change over time
- design to avoid the urban heat island effect through landscaping
- providing energy efficient street lighting
- sourcing energy onsite or from nearby renewable or low carbon sources and providing generation and distribution networks. Options include photovoltaic panels, wind power, waste to energy (creating energy from waste), co and tri-generation involving the recovery and use of heat
- offsite zero carbon options include off-site energy generation, purchase of green power and carbon offsets
- encourage on-site food production including community gardens. The Heart Foundation's *Food-sensitive planning and urban design guideline* provides ideas for creating local production and recycling of food.

Zero waste

Opportunities to provide for a zero waste urban environment include:

- using innovative solutions for waste avoidance, waste management plans and on site recovery
- setting targets for waste recovery, reduction of waste to landfill, reducing waste generated in construction and using recycled construction waste or sustainably sourced materials with low embodied energy.

Sustainable water

Opportunities to provide for sustainable water usage include:

- water efficient landscaping
- stormwater management including stormwater harvesting and reuse for open space irrigation, bio-retention systems, porous surfaces and construction of wetlands
- water re-use including on site capture of rainwater, green roofs and use of greywater and recycled water reticulation for toilet, garden and other outdoor uses. The later involves using recycled water from offsite waste water treatment facilities via a separate pipe. The third, or 'purple' pipe recycled water system, is being rolled out across Armstrong Creek
- applying an Integrated Water Cycle Management approach to an entire area.

The broad goal of Integrated Water Cycle Management (IWCM) is to enhance the resilience of urban environments, from a water cycle perspective. Urban IWCM requires a systems approach to all aspects of water cycle management in an urban setting, including natural waterways, drinking water networks, stormwater and floodplains and sewerage networks. This approach allows water managers to identify system risks and develop holistic solutions that build resilience of the urban water cycle through four broad strategies:

- diversity - multiple forms of water sources will be available for multiple types of use
- efficiency - people and businesses will be efficient in their consumption of water resources
- adaptability - system infrastructure will be flexible to change in response to new pressures
- cohesion - water will be a unifying link between community, the natural environment and the economy.

Agencies involved in urban water cycle planning and management need to collaborate to strengthen these characteristics.

Sustainable transport

Opportunities to provide sustainable transport include:

- designing suburbs to reduce the need to travel to key destinations and provision of an integrated transport hub
- ensuring a range of transport options including public transport and low carbon modes of transport such as walking and cycling to reduce emissions and the need to travel, provide designated Principal Pedestrian and Bicycle Networks

- planning for efficient bus networks and associated road priorities
- bicycle infrastructure including storage and connections to major destinations
- provision of electric vehicle shared infrastructure.

BARWON REGIONAL IWCM NETWORK

In 2012, key water cycle related agencies across the region agreed to collectively progress IWCM as the way of the future. The Barwon Regional IWCM network aims to enhance collaboration between stakeholders involved in planning and managing the urban water cycle. It provides a regional interpretation of the state government's reform priorities for integrated water cycle management as outlined in the *Living Melbourne, Living Victoria* policy.

The Network has the following vision and objectives:

A smart and resilient water cycle system for a liveable, sustainable and productive region

Urban water cycle systems across our region that are:

more sustainable

- efficient use of water resources
- enhancing natural water based assets
- reducing environmental impacts of urban water cycle management

more liveable

- water resilient urban landscapes
- water resilient communities
- security of all water resources

more productive

- enhancing community water literacy
- recognising and realising the true value of water resources
- water cycle innovation for sustainable economic growth

The Network is proposing a Master Plan for Northern Geelong in order to develop a template for wider IWCM application and which should be applied to future growth areas.

The Office of Living Victoria is also planning to develop a Living Geelong water cycle plan.

Improved environmental outcomes

Protecting and restoring biodiversity and natural habitats through appropriate land use and integration into the built environment is critical. New urban areas should significantly enhance existing natural assets and create new resilient environments and landscapes. This may include ongoing weed, pest and plant management and fencing some areas off from public access.

4.3.2 Community infrastructure provision

Providing well planned community infrastructure including places to meet and gather, functional open spaces and places for recreation, linked footpath and cycle networks, good public transport and accessible community services and facilities is critical to supporting vibrant, safe and healthy communities.

Ensuring infrastructure delivery keeps pace with development and need is also important to building communities and to minimise long travel distances to important services.

Having an effective *Integrated Infrastructure Delivery Plan* (IIDP) in place at an early stage of area planning is critical to provide a basis for budget planning and resource allocation processes, delivery, phasing and triggers for provision of key infrastructure. Infrastructure considered includes community facilities, social housing, open space, transport and movement networks and stormwater management. These plans are developed in consultation with key service and infrastructure providers to identify whole of community infrastructure needs and coordinate planning and delivery.

Infrastructure should be provided based on triggers, for example population based triggers, drawn from current best practice provision rates. Documents such as the *Armstrong Creek Integrated Infrastructure Delivery Plan* and City of Greater Geelong's *Sustainable Communities - Infrastructure Development Guidelines* provide a basis for identifying community infrastructure requirements and design standards.

Funding of infrastructure provision in new urban areas is shared between developers via Development Contribution Plans (DCPs) and local and state government. Developing these areas ahead of logical sequencing (that is ahead of other existing growth areas identified in Structure Plans) is undesirable and would result in inefficient growth outcomes.

4.3.3 Community design

As discussed in Section 4.2, the Implementation Plan identifies six goals for the development of an FIA as a growth area to achieve a resilient as well as liveable, vibrant and cohesive community:

- ability to create a diverse and unique community
- ability to deliver significant community benefit to Geelong
- ability to provide accessible and integrated transport choices
- ability to provide efficient infrastructure and services
- ability to ensure efficient and sustainable use of land and resources
- ability to provide exceptional physical environments.

As identified above, well designed communities can deliver high levels of liveability, vibrancy, social connectedness, health and wellbeing and reduced travel costs and community resilience.

The development of Precinct Structure Plans (master plans for whole communities) supported by key detailed studies, is the current planning approach to developing well planned communities.

The GAA has a number of frameworks, guidelines and checklists for preparing Precinct Structure Plans (PSPs) and achieving community liveability which should be used allowing for localised considerations.

PSPs should also include provision for specific *design guidelines* for housing, town centres and employment areas. The design guidelines should be supported by a mechanism which ensures compliance as part of the approvals and construction process.

4.3.4 Housing diversity

Measures to encourage diverse and lower cost housing outcomes are critical for creating sustainable communities. These could include:

- providing a diversity of living experiences and choice from affordable to higher-value residential areas
- identifying areas for medium and higher density living
- providing a range of lot sizes including creative small lot arrangements
- provision of social housing and low cost/low rent housing and options for Housing Association or Housing Trust arrangements
- sites for independent living and aged care/nursing accommodation to encourage 'aging in place'

A *Housing Diversity Plan* should be provided as part of any PSP development and include practical measures for delivery.

4.3.5 Site specific considerations

In the context of growth area goals identified in section 4.2 and the FIA analyses there are a number of site specific considerations to be factored into future FIA planning. The *Background Report* includes additional supporting information which informs and expands the following considerations.

Growth Area extent

While more detailed studies will refine the boundaries of a future growth area, each FIA has a logical extent based on buffer, landscape, environmental and infrastructure considerations as well as longer term logical extensions.

For the Northern FIA the logical extent is:

- to the north – Staceys Road so as to maintain a separation between Lara, preserve views to the You Yangs and ensure appropriate buffers to the Lara Energetics Plant (Chemring), Barwon Prison and minimise impacts on agricultural land and farming activities.
- to the west – the 500 kV transmission line to avoid growth area fragmentation
- to the south – Plantation Road and adjoining rural living lots
- to the east Bacchus Marsh Road, refer also to comments below about interfaces.

For the Western FIA the logical extent is:

- to the north – the Ballarat – Geelong rail line. West of Ballan Road the northern boundary is suggested as the 200 kV transmission line easement
- to the west – north of Midland Highway, urban development should not extend beyond Ballan Road unless to provide support infrastructure including stormwater, waste water treatment, energy generation and open space. Support infrastructure should be limited to the Cowies Creek drainage catchment extent. This provides clear spatial separation from the Batesford township and minimises visual or other impacts on the Moorabool River catchment
- to the west – south of Midland Highway, urban development should not extend beyond Dog Rocks, Friend in Hand and Merrawarp Roads. While remaining in the FIA area the area between Fyansford-Gheringhap Road and Hamilton Highway is highly constrained by drainage issues and is likely to have a limited urban development role. Refer also to comments below about interfaces
- to the south – the Barwon River, allowing for substantial open space corridors along the river and providing buffers to existing industrial zoned land.
- to the east – the Geelong Ring Road.

The identified extent of these areas, as identified above and in **Maps 14** and **15**, does not infer that these areas will be fully developed, with further detailed planning to determine land use and interface arrangements and extent of development.

Interfaces

Both FIAs have interfaces with rural and rural living zones and activities. Appropriate interfaces between urban land and more sensitive uses are required to minimise impacts on sensitive uses and to provide distinct edges and settlement character.

For the Northern FIA, key interface considerations in any future PSP development should include:

- maintaining a distinct urban break or a similar appropriate treatment between the Lara township and the north-east of the FIA to avoid a continual urban area from Lovely Banks to Lara
- edge treatments with rural land uses to the north and west – this could include transitioning lot sizes, providing for internal road access from edge lots, rural road treatments and landscaping
- buffers for external land uses with potential amenity impacts including intensive animal agriculture operations and the Lara Energetic Materials Manufacturing Plant
- providing an appropriate landscape, entry treatment and edge to Bacchus Marsh Road
- interface between existing rural residential lots and Bacchus Marsh Road and the GREP. Opportunities include transitioning of lot sizes beyond the GREP buffer or converting land to an appropriate industrial zone to expand the capacity of the GREP as a major employment node. Any PSP process should ideally cover this interface area.

For the Western FIA, key interface considerations in any future PSP development should include:

- edge treatments to the Moorabool and Barwon Rivers and Cowies Creek and associated flood plains
- acoustic issues and edge treatments to the Ballarat – Geelong rail line and Geelong Ring Road
- edge treatments to sensitive environmental areas such as the Dog Rocks Reserve and the Dog Rocks Flora and Fauna Sanctuary, Moorabool River Reserve, Red Gum Reserve and adjoining properties of high biodiversity value
- appropriate response to areas subject to flood, inundation, heritage and environmental overlays

- treatments along Midland Highway to integrate existing recreation and commercial uses
- edge treatments with rural land uses to the west – this could include transitioning lot sizes, providing for internal road access from edge lots, rural road treatments and landscaping. It will be important to maintain the rural character of Batesford and the Dog Rocks Road area and preserve a distinct visual break between urban development and the Batesford/Dog Rocks rural residential areas.
- protection of the South-West gas pipe line. This may preclude sensitive or high density land uses (such as schools and activity centres) within 350 – 570 metres of the pipeline easement. A Safety Management Plan will need to be developed to assess risk and land use buffers
- opportunities to provide for a regional level open space area
- the opportunity to enhance community infrastructure within Corio and Norlane

Integration

The location of the FIAs beyond the Ring Road and away from any existing established urban areas means it is difficult to fully integrate them into existing communities. It is important that any future growth area is not remote and isolated from other communities, services and facilities. However, each FIA has opportunities to address.

Key integration considerations in any future PSP development should include:

- providing physical links between communities – pedestrian, cycle and roads
- linking new and existing open space networks
- locating new community infrastructure near neighbouring activity nodes
- ability to utilise spare capacity within existing adjacent community infrastructure or upgrade it to accommodate for short to medium term needs until new infrastructure is provided
- locating and providing community infrastructure and open spaces in locations that can be accessed by external communities and of a capacity that can support nearby community needs
- ensuring growth areas do not negatively impact on adjoining communities.

Infrastructure

Provision of timely and adequate infrastructure is important to create viable and connected communities. The preparation of an IIDP should be developed early in the planning of any growth area. As identified previously, this should also consider infrastructure upgrades in adjoining areas where this can provide significant community benefit rather than within the growth area.

For the Northern FIA key infrastructure considerations in any future PSP development should include:

- opportunities to utilise proximity to GREP for alternative energy, storm and waste water opportunities

- provision of infrastructure to support sustainable outcomes as identified in section 4.3.1

For the Western FIA, key infrastructure considerations in any future PSP development should include:

- provision at an early stage of an open space corridor along the Moorabool River linking Fyansford and Batesford
- building on existing open space and community infrastructure within the Bell Post Hill portion of the FIA
- enhancing community infrastructure within Fyansford
- provision of infrastructure to support sustainable outcomes as identified in section 4.3.1

Employment opportunities and economic impacts

Both FIAs have the capacity to provide onsite employment opportunities, primarily through activity centre and commercial nodes to achieve a one job per household benchmark.

The Northern FIA is located close to the GREP and within 15 minutes of the Avalon Airport node. This area also has the opportunity to provide a larger catchment for the Corio subregional shopping centre. As identified above there is also opportunity to expand the GREP employment node.

A key consideration for the Northern FIA will be ensuring that activity centres are of an appropriate size (that is, large neighbourhood) to ensure the primacy of the Corio subregional shopping centre and Lara town centre activity. An Economic Impact Assessment supported by a Social Impact Assessment will be a critical requirement.

The Western FIA is within five kilometres of Central Geelong and well positioned within ten minutes' drive to the GREP and Deakin employment nodes. Again the provision of activity centres and employment nodes will need to be timed and of a scale to ensure the retail centres of Bannockburn and Fyansford and the employment node at Gheringhap are not prejudiced. An Economic Impact Assessment supported by a Social Impact Assessment will be a critical requirement.

Transport choices

While both FIAs have access to major roads they are challenged by the lack of ready access to public transport options, particularly trains. Detailed transport plans should be provided to support the development of PSPs which examine existing network capacity and upgrade requirements, impacts on existing freight networks and sustainable transport considerations as identified section 4.3.1. Transport network modelling should utilise material from the Victorian Integrated Transport Model (VITM) developed for Geelong.

For the Northern FIA, key transport infrastructure considerations in any future PSP development should include:

- identification of public transport corridors to the GREP, Corio Village and to Corio and North Shore railway stations
- bus networks, including linkages to key destinations and internal priority networks and treatments
- internal pedestrian and cycle networks and linkages to Corio and Lara, including on and off road bicycle paths.

For the Western FIA, key transport infrastructure considerations in any future PSP development should include:

- identification of a future station and associated precinct on the Ballarat - Geelong rail line
- major river crossing road linkages to the Midland Highway. These are likely to involve substantial structures which will require design to consider impacts on the river corridors and landscape
- a long term strategy for traffic management and upgrades on the Hamilton and Midland Highways and investigation of an additional Ring Road over-bridge connection to Urban Geelong and potential utilisation of the former rail reserve as a transit corridor so as to provide additional capacity to support growth to the south of the FIA
- bus networks including linkages to key destinations and internal priority networks and treatments
- internal pedestrian and cycle networks including the creation of a shared path within a 'green corridor' to provide connection from Cowies Creek to the Barwon River and linkages to Fyansford and Batesford.

Environment

The Northern FIA has minimal opportunities to build on existing environmental assets. It is likely there are some remnant grasses however the FIA has been highly modified and grazed. There is opportunity to provide for an open space network linked to major drainage lines. A consideration in any future PSP should include the opportunity to set aside a large area to create an urban forest and associated grassland reserve to improve biodiversity outcomes in the area.

Within the Northern FIA further considerations in any future PSP development should include:

- development of a Native Vegetation Precinct Plan to inform future application of ESO4
- native vegetation ground truthing assessment including habitat assessments for Golden Sun Moth and Striped Legless Lizard and presence and distribution of those species
- native vegetation quality assessment including net gain assessment.

The Western FIA has a range of environmental features of significant value including three waterways, areas of remnant vegetation and habitat. Key environment considerations in any future PSP development should include:

- the opportunity to create a 'green corridor' connecting the three water courses west of Geelong (Barwon River, Moorabool River and Cowies Creek)
- development of a Native Vegetation Precinct Plan
- protecting, enhancing and linking key habitat and remnant native vegetation areas including adjacent areas such as the Dog Rocks Flora and Fauna Sanctuary and Moorabool River Reserve and potential biolinks
- comprehensive ecological assessment including seasonal flora and fauna surveys
- providing greenways
- designing waterways to provide security of supply to enable restoration of the Moorabool River
- restoring waterways through the removal of channels, revegetating edges, connecting the original Moorabool river alignment remnants and providing integration with the former quarry
- providing for the adaptive reuse of the former quarry to provide a recreational lake with appropriate access, slope battering and landscape treatments
- financial mechanisms to manage the lake on an ongoing basis such as a special rate.

Other site specific considerations

For the Northern FIA, considerations in any future PSP development should include:

- geotechnical investigation of the north eastern slope (Lovely Banks monocline)
- view shed analysis and response for ridgeline

For the Western FIA, considerations in any future PSP development should include:

- geotechnical investigation of the overburden dumps and environmental audit for potential contamination associated with extractive industry operations. This may identify the need for an Environmental Audit Overlay
- quarry Rehabilitation Plan review to ensure the rehabilitation can progress according to the ultimate land use arrangement
- groundwater recovery investigation to identify land stability impacts of groundwater rebounding associated with refilling of quarry
- basalt quarry rehabilitation
- Open Space Master Plan and a Lake Management Plan supported by detailed water quality investigations
- geotechnical investigation of potential landslip areas adjacent to Cowies Creek; between Geelong Ring Road and Moorabool River; between Midland Highway, Moorabool river and Deviation Channel; and Barwon River banks
- view shed analysis and character design response for escarpment and other exposed landscape features or areas - this may inform application of Significant Landscape or Design and Development Overlays.

The complexities associated with the environmental elements of the Western FIA including quarry and river rehabilitation, lake management, water regime monitoring and potential contamination would benefit from a coordinated agency response to assist in the approvals process.

The Background Report provides more detailed explanation of issue context and suggested management approaches.

Suggested response:

That the development of one of the Further Investigation Area as a future growth area:

- demonstrate significant 'beyond compliance', best practice urban design and community outcomes
- include development of a Sustainability Plan including a Sustainable Transport Plan based on considerations identified in the Implementation Plan
- be supported by an Integrated Infrastructure Delivery Plan development process
- be supported by a Housing Diversity Plan as identified in the Implementation Plan
- consider the community design and site specific issues identified in the Implementation Plan, including growth area extent and design guidelines and establishment of a design approvals mechanism.



4.4 NEXT PLANNING STEPS

The following considerations are identified to guide and support the next planning steps to preserve future growth options and advance one of the FIAs to future growth area status.

4.4.1 Timing

As identified in the *Background Report* it is important to ensure the appropriate amount of residential land is supplied to the market at the right time and in the right place with appropriate servicing. A key challenge is to provide for the release of sufficient well-serviced and strategically located land while avoiding the creation of too many dispersed development fronts or an over-supply of zoned residential land stocks, as this will result in increased infrastructure servicing costs and contribute to the increased cost of housing. Spreading infrastructure demand across many dispersed development fronts will mean that economies of scale in the delivery of infrastructure will not be achieved (Spatial Economics 2013).

Other critical considerations in bringing on major new growth fronts include:

- the level of existing capital investment in current growth areas by councils and other agencies requiring a rate of return
- service cost increases for consumers
- infrastructure needs and priorities of existing communities
- diversion of infrastructure investment projects from existing planned growth areas and weakening the functionality of existing and newly developing employment nodes.

The Growth Plan's directions for the sequencing of growth identify that the FIAs provide a medium to long term housing growth role. This direction is confirmed and reinforced by current land supply levels identified in the City of Greater Geelong Land Supply Report. This report indicates that at present levels of lot supply consumption, existing zoned land and identified future growth area supply is sufficient to meet the growth needs of Geelong for around 20 years before one of the FIA areas might be required. Increased infill housing activity will also extend growth capacity within existing urban and identified growth areas. A range of factors will continue to influence annual population growth and future housing activity rates.

In order to ensure that Geelong is able to accommodate additional growth opportunities in the medium to long term and respond to any major changes in growth activity in a timely manner, the timing of planning and release of land in the FIAs needs to be linked to a rigorous, evidence-based approach involving:

- a regular review of land supply in urban Geelong to monitor existing zoned land and identified future growth area supply levels and adequacy
- the impacts of major land use policy directions including the Metropolitan Planning Strategy
- an understanding of impacts on infrastructure capacity, priorities and service delivery cost impacts.

4.4.2 Out of sequence considerations

A significant magnitude of investment in infrastructure is required to enable initial development of an FIA or support its subsequent growth. This includes major water and sewerage infrastructure, roads and extensive community infrastructure. Rezoning land too early or rezoning both FIAs at the same time could result in inefficient growth outcomes.

The Implementation Plan strongly advocates for an FIA not to be developed out of sequence to the growth priorities identified in the Growth Plan. While not advocated, should the City of Greater Geelong, state government and other key infrastructure delivery agencies agree that a sound case be made for an FIA to progress to detailed planning and be developed 'out of sequence' then the following considerations are critical:

- demonstrable significant net community, economic and environmental benefits for Geelong and the region
- the development of an Integrated Infrastructure Delivery Plan. This should include a plan for advanced infrastructure provision and cost recovery including council infrastructure with deferral of council and agency costs for infrastructure contributions for a set period. This set period should align with anticipated timing for land development identified at 4.4.1
- the development of a Sustainability Plan, including a Sustainable Transport Plan covering elements identified at sections 4.3.1 and 4.3.4
- the establishment of a suitable mechanism for the development of a Framework Plan/Precinct Structure Plans, Transport and Infrastructure Plans. Ideally, the City of Greater Geelong would be the lead and engaging with key proponents and landowners, and costs would be covered by a development contribution under a DCP.

4.4.3 One growth area or two?

As identified in the *Background Report*, there is a high risk associated with allowing the FIAs to develop as growth areas at the same time. Developing both areas would require substantial upfront infrastructure, including separate sewerage treatment plants, which is not financially sustainable and would exacerbate the impacts identified above.

Together, the two FIAs provide capacity for over 25,000 homes and 60,000 people which substantially exceeds growth forecasts and demands to well beyond 2050 given existing planned growth and infill capacity.

It is recommended that only one FIA be developed in its entirety including consideration of any logical inclusions to build on existing investment before the other is considered for development consistent with the timing identified above. This means the second FIA is unlikely to be needed as a growth area in the foreseeable long term future.

However, in order to consider the longer term growth of Geelong well beyond 2050 it is considered appropriate that the FIA designation remain, requiring some policy direction will be required to enable some broader land use activity and limited subdivision.

The Implementation Plan does not identify a priority area. Each area has its relative merits and challenges. It is suggested that the City of Greater Geelong consider the analysis and directions provided in the Implementation Plan to determine which area delivers the greatest benefit to Geelong and the wider region in terms of employment, ability to achieve sustainable outcomes and utilisation of infrastructure, and provision of wider community benefits and environmental outcomes.

Choosing one area rather than two creates an issue regarding what to do with the FIA that does not have a growth area role in the foreseeable future. Options include:

- retaining the FIA or similar designation on the land through the planning scheme and progressing the second FIA as a growth area once warranted by land supply triggers
- deleting the FIA status once the other preferred growth area is rezoned.

In determining an approach the following aspects should be considered:

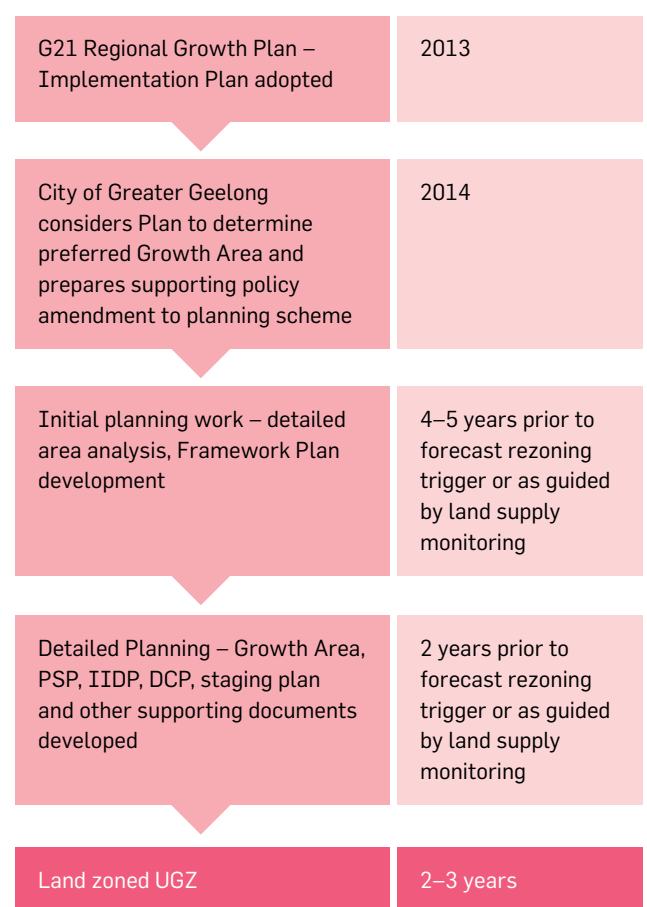
- the likely future use of the land if it were not a growth area
- the potential for long term land speculation or land being tightly held and creating high land development costs
- providing land owner and community certainty
- blighting or preventing land from being developed for any use which might prejudice long term urban use.

The Northern FIA comprises smaller rural holdings and adjoins a rural living area. It is anticipated that, without a growth role, this area would undergo some conversion to smaller rural living or low density residential lots particularly at the southern and eastern edges and to the north be used for agriculture.

The larger portion of the Western FIA south of Midland Highway includes a quarry operation with less than 20 years resource life. The site's rehabilitation plan will provide some limited agricultural opportunities. Obtaining a public link along the Moorabool River and enhancement of the corridor is a significant community and environmental benefit opportunity which may require other land use opportunities to be explored. The northern portion of the FIA in Bell Post Hill has some logical urban or low density living role given its levels of access and existing facilities.

A suggested series of steps for progressing to identification of a preferred FIA and growth area planning is identified in **Figure 10**.

FIGURE 10 / FIA TO GROWTH AREA POSSIBLE STEPS



4.4.4 Phasing

Each of the FIAs have a logical sequencing, or phasing, based on infrastructure availability or major land use issues as notionally shown in **Map 14** and **15**. Specific decisions on phasing should account for interface treatments with Heritage, Floodway, Inundation and Environmental Overlays, efficient infrastructure rollout, and be responsive to market considerations and be managed through the PSP process. Phasing of employment nodes should balance impacts on other employment nodes with the need to establish employment opportunities early on. Again, economic impact assessments will be important to support this along with employment attraction strategies.

While phasing plans need to be developed as part of the PSP process which will provide a greater basis for phasing, the following indicative FIA phasing suggestions are made.

Northern FIA:

- **Phase 1** - progressing north and west of existing Rural Living nodes. Neighbourhood centre to be staged to minimise impacts on other centres until appropriate population thresholds are reached
- **Phase 2** - northern and western fringes and any other employment nodes and rural living area transition response.

There is potential for future expansion of the FIA to include land to the west of Evans Road, maintaining appropriate buffers to industry as well as to transmission lines and rural interfaces.

Western FIA:

- **Phase 1** - Bell Post Hill node, building on existing school and open space infrastructure and connections to Creamery Road and south of Midland Highway above the Moorabool River escarpment. Phase 1 should be linked to the duplication of the Midland Highway to the Geelong Ring Road. Potential exists for inclusion of some areas between the Geelong Ring Road and Moorabool River following resolution of location of Water Reclamation Plant and further targeted land capability analysis including geotechnical, odour, noise and access issues.
- **Phase 2** - area north of Fyansford-Gheringhap Road subject to appropriate quarry rehabilitation and provision of road connections to Midland Highway and duplication of Hamilton Highway to the Ring Road. Completion of entire open space network.

- **Phase 3** - off Hamilton Highway, subject to traffic capacity issues being addressed into Urban Geelong and consideration of economic impacts of the major employment precincts on other key growth area employment precincts including Fyansford, Bannockburn and Armstrong Creek. Drainage issues may also significantly reduce development opportunities within the Fyansford-Gheringhap Road and Hamilton Highway corridor area.

Development of and access to the Moorabool River open space corridor has not been tied to a residential development phase. The phasing of the open space component should be independently negotiated to provide for enhancement works to commence in the near future. The timing and phasing of development of the open space corridor should take into account:

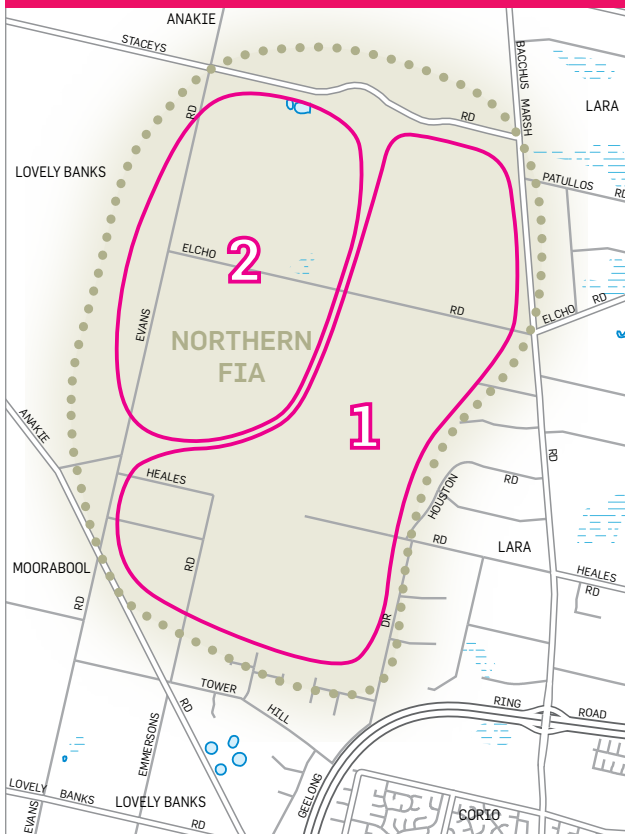
- the potential community benefit to be derived from the opportunity
- the rehabilitation plan for Batesford Quarry
- the need for safe public access and separation from quarry operations
- the integration and connection with Fyansford Green open space components
- timing of an environmental improvement and works program
- the as yet unconfirmed location for a Water Reclamation Plant site
- funding and ongoing management model for open spaces and waterways.

Suggested response:

That the development of a Further Investigation Area as a future growth area:

- not occur before the timing considerations identified in the Implementation Plan
- be supported by a mechanism to coordinate all planning actions as identified in the Implementation Plan
- consider the land staging directions identified in the Implementation Plan to ensure effective community and environmental outcomes and efficient infrastructure provision
- a second FIA is not developed before triggers identified in the Implementation Plan have been reached and logical growth area extensions and sequencing issues considered
- the FIA designation remain in place for the non-preferred growth area to protect long term growth options, supported by planning policy direction.

MAP 14 / NORTHERN FIA POTENTIAL PHASING



MAP 15 / WESTERN FIA POTENTIAL PHASING



EACH OF THE FIAs HAVE A LOGICAL SEQUENCING, OR PHASING, BASED ON INFRASTRUCTURE AVAILABILITY OR MAJOR LAND USE ISSUES

4.4.5 Detailed planning

Once a preferred FIA has been identified as a future growth area, the following planning approaches are recommended (note: this is based on the assumption that, in the future the following planning tools remain available and largely unchanged):

Zoning

The recommended land zoning approach is the application of the Urban Growth Zone supported by an overall Framework Plan and planning policy. More detailed zones and overlays would be developed as part of the PSP process.

Precinct Structure Plan(s)

The development of PSP(s) will provide a mechanism to undertake more detailed growth area and neighbourhood level planning.

This planning step would be informed by a range of detailed site analyses, specific plans and information including:

- geotechnical
- hydrological
- flooding/drainage including stormwater management plans
- Cultural Heritage Management Plan
- Post-contact Heritage Assessment
- biodiversity
- utility services
- traffic
- Bushfire Hazard Assessment
- other reports detailing site specific considerations identified in the Implementation Plan
- Integrated Infrastructure Delivery Plan (IIDP) and associated DCP
- Sustainability Plan
- Housing Diversity Plan
- design guidelines
- 'out of sequence' considerations (as required).

PSP development process

Options for PSP delivery include:

- preparation managed by the planning authority (City of Greater Geelong). This is the preferred option, but may have staff and financial resource implications including those associated with auspicings specialist reports. Reasonable costs for developing PSPs can be defrayed through DCPs. This option should involve mechanisms to ensure appropriate land owner/developer and infrastructure provider agency involvement
- preparation managed by the developer consortium with or on behalf of all land owners. This option can sometimes result in less than optimum outcomes, is not as transparent and may not involve the same level of agency integration as the first option, and can disenfranchise smaller land holders
- preparation by a third party such as the GAA. This option is not recommended as it introduces another level of planning responsibility, although it is noted that the GAA can play a valuable peer review or other support role given its extensive growth area planning experience.

Determination of the preferred option should also consider processes for developing the IIDP and associated DCPs, Sustainability Plan, Housing Diversity Strategy and design guidelines and their ongoing implementation/application.

Planning policy

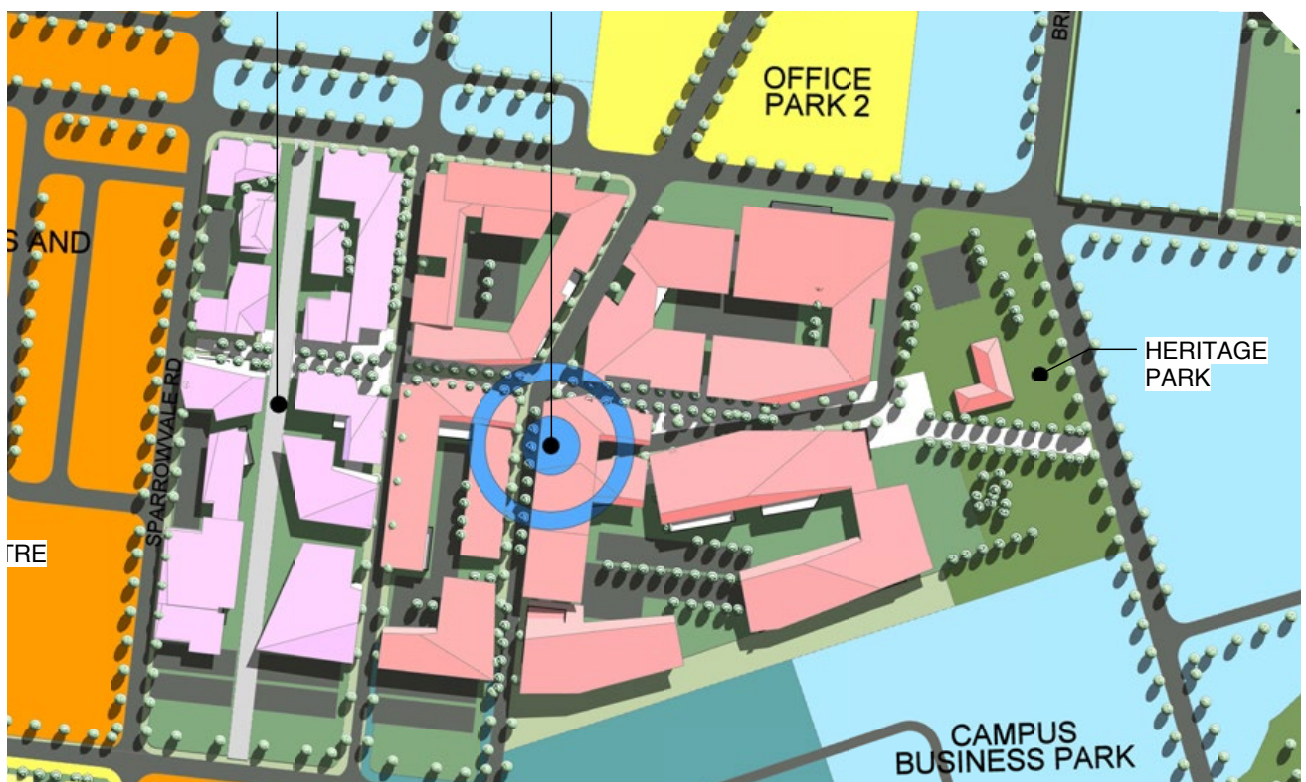
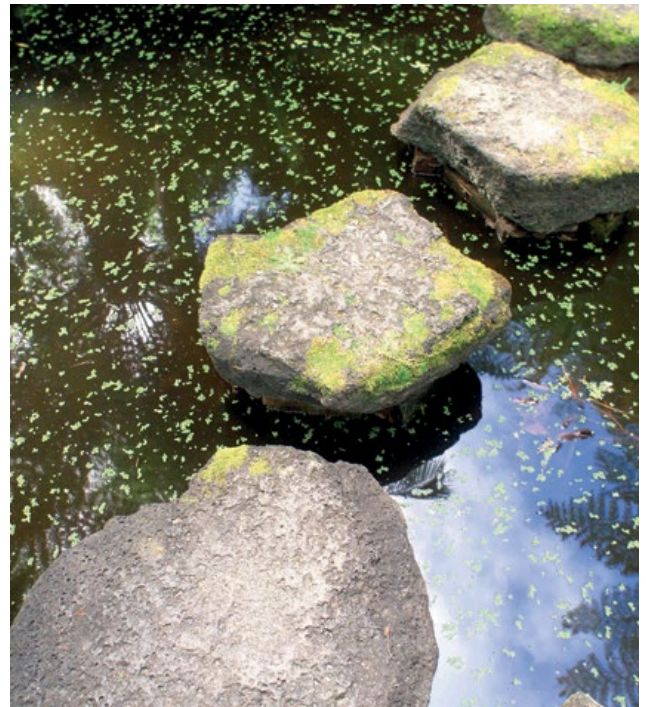
Supporting Planning Municipal Strategic Statement or Local Planning Policy and other scheme changes are likely to be required, including:

- changes to the Municipal Framework Plan identifying the growth area and remaining FIA
- policy around interim land use and development activity before the application of an Urban Growth Zone to a preferred FIA
- inclusion of a Growth Area Framework Plan and supporting policy at the appropriate time
- directions for the FIA not selected as a growth area
- inclusion of PSP and DCP provisions.

Suggested response:

That the following planning approach be considered for progressing a Further Investigation Area to the growth area planning and zoning phase at the appropriate time:

- application of an Urban Growth Zone supported by a Framework Plan and policy
- development of a PSP and supporting documents as identified in the Implementation Plan
- a PSP process led by the City of Greater Geelong with costs covered by a DCP as identified in the Implementation Plan
- establishment of mechanism to implement and monitor the PSP, Sustainability Plan, Housing Diversity Strategy and design guidelines
- review existing Greater Geelong Planning Scheme policy provisions as appropriate.



For illustrative purposes – Keystone Business Park

A landscape photograph showing a field of tall grasses in the foreground, a large tree trunk on the right side, and a range of mountains in the distance under a cloudy sky. The image is overlaid with a yellow vertical bar on the left side containing text.

5.0

REVIEW

The Implementation Plan requires regular review to monitor actions and to adapt and respond to changing priorities and conditions

The Implementation Plan needs to be flexible enough to respond to future changes in society, the economy and environment so that it remains valid and relevant.

5.1 IMPLEMENTATION PLAN REVIEW

To ensure the Implementation Plan remains current and adaptable as new information becomes available, future strategies are completed and new priorities are identified, it is important that the Plan is reviewed regularly.

The key focus of any future review should be:

- the Infrastructure Plan – identifying implementation progress, new and completed projects, examining timelines and priorities
- land supply information – including monitoring land supply across the regions key centres and undertaking new assessments
- monitoring progress on Housing Strategy Incentive Action Plan implementation.

Suggested response:

- That the Implementation Plan be reviewed every three years supported by an annual review of the Infrastructure Plan project schedules. The review should be coordinated by the G21 Planning and Services Pillar
- That the G21 councils use the land supply data to manage the timing of strategic growth area planning and land release to ensure adequate infill and broadhectare land supply for housing and industry
- That the G21 Planning and Services Pillar coordinate the ongoing management of the online reporting tool and preparation of annual or biennial land supply assessments as appropriate for key centres in parallel with the UDP program. Funding of this land supply monitoring should be proportionally funded by the G21 councils.



REFERENCES

- AEC Group and G21 Geelong Region Alliance, *G21 Economic Development Strategy* (2013)
- AECOM Australia Pty Ltd for G21 Region, *G21 Public Transport Strategy* (2013)
- Armstrong Creek Project Team, *Armstrong Creek Geelong's Growth Area, Integrated Infrastructure Delivery Plan* (2009)
- Australian Government Investment and Regulatory reform working group, *Great Ocean Road World Class Investment Study* (2011)
- Avalon Airport Australia Pty Ltd, *Preliminary Draft Avalon Airport Master Plan* (2013)
- BioRegional and World Wildlife Fund, *One Planet Living*
- Biiru for Department of Planning and Community Development, *Central Geelong Urban Living Project* (CGUL), (2010)
- City of Greater Geelong and Tract and Moreland Energy Foundation Ltd *Armstrong Creek Town Centre Sustainable Urban Development Framework* (2012)
- City of Greater Geelong, *Corio Norlane Structure Plan* (2012)
- City of Greater Geelong, *Fyans - West Fyans Precinct Structure Plan* (2009)
- City of Greater Geelong, *Sustainable Communities - Infrastructure Development Guidelines* (2010)
- Climate Works Australia, *Low Carbon Growth Plan for Greater Geelong* (2011)
- Corangamite Catchment Management Authority, *Corangamite Regional Catchment Strategy 2013-2019* (2012)
- David Lock Associates, University of Melbourne and Heart Foundation, *Food-sensitive planning and urban design guideline* (2011)
- Department of Infrastructure and Transport, *State of Australian Cities* (2013)
- Meinhardt for Colac Otway Shire, *Apollo Bay Harbour Precinct Master Plan* (2009)
- G21 Geelong Region Alliance, *G21 Regional Football (Soccer) Strategy* (2012)
- G21 Geelong Region Alliance, *The Geelong Region Plan* (2007)
- G21 Geelong Region Alliance in partnership with state government, *G21 Regional Growth Plan* (2013)
- G21 Geelong Region Alliance in partnership with state government, *G21 Regional Growth Plan - Background Report* (2012) and *Issue Papers* (2012)
- G21 Geelong Region Alliance in partnership with state government, *G21 Regional Growth Plan - Implementation Plan Background Report* (2013)
- G21 Partnership Project, *G21 Regional Road Transport Plan* (2009)
- GHD and Juturna Consulting for Geelong Port et al, *Geelong Port-City 2050 Final report of the Geelong Port and Land Infrastructure Plan*
- Inspiring Place and Robin Crocker and Associates, *Barwon South West Regional Trails Master Plan* (September 2009)
- Meinhardt Infrastructure & Environment Pty Ltd for Barwon Regional Waste Management Group, *Barwon Regional Waste Management Plan* (2006)
- OECD, *Financing Green Urban Infrastructure*
- Parks Victoria, *Portarlington Safe Harbour Master Plan* (2009)
- Skilling the Bay, *Creating a jobs vision for Geelong - a discussion paper* (2013)
- State Government of Victoria, *Victoria The Freight State, The Victorian Freight and Logistics Plan* (2013)
- Spatial Economics, *G21 Residential & Industrial Land Supply Reports and Background Paper* (2013)
- Urban Enterprise, *Great Ocean Road Destination Management Plan* (2012)
- Urban Enterprise for Australian Government Investment and Regulatory Reform Working Group, *Great Ocean Road World Class Tourism Investment Strategy A Product Gap Analysis* (2011)
- Urban Enterprise, *Strategic Housing Incentives Action Plan* (2013)
- Victorian Coastal Council, *Victorian Coastal Strategy* (2008)
- Victorian Regional Channels Authority, *Port of Geelong - Development Strategy* (2013)
- Vision 2 partnership, *Central Geelong Vision 2* (2013)

Photographs sourced from Barwon Water, Deakin University, Keystone Business Park, Tract Consultants, City of Greater Geelong, Shires of Colac Otway and Golden Plains and G21 Region Alliance.

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NOTES



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