VicRoads

Western Highway Project – Section 3: Ararat to Stawell

Economic Impact Assessment Report

November 2012

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Contents

Table Index

Figure Index

Executive Summary

VicRoads is progressively upgrading the Western Highway as a four-lane divided highway between Ballarat and Stawell (Western Highway Project). The Western Highway Project consists of three sections, to be constructed in stages. Section 3 (Ararat to Stawell) of the Western Highway Project (the Project) is the subject of this report.

On 27 October 2010, the Victorian Minister for Planning advised that an Environment Effects Statement (EES) would be required to identify the anticipated environmental effects of the Project. GHD has been commissioned by VicRoads to undertake an economic impact assessment for the Project as part of the EES.

Following a multi-criteria assessment of numerous potential alignment options, VicRoads selected an alignment for the Project which was subjected to the risk and impact assessment presented in this report. The proposed alignment is outlined in Section 6.1 of this report.

The EES scoping requirements for the economic impacts assessment of the Project are detailed in section 2 of this report. In summary, they require:

- Identification of the potential economic effects of the proposed works and relevant alternatives during construction and operation at the local and regional level in relation to employment, income distribution and existing land uses in the area, (especially key infrastructure or services, agriculture, business and tourism); and
- An overall analysis of the costs and benefits of the proposed works and relevant alternatives, including the “no project” scenario.

The impact assessment undertaken by GHD involved identification of existing conditions pertinent to the study and then considered the impacts arising from execution of the Project on a number of industry sectors, including the agricultural sector, local non-agricultural businesses, employment and tourism. The Project was also considered from an economic benefit cost assessment standpoint.

The impact assessment indicated potential for a moderate impact in the agricultural sector through the loss of agricultural facilities and infrastructure (estimated at a loss of revenues in the region of $1.3 million), plus the loss of agricultural land and severance of properties. The risk assessment also identified potential impacts to businesses through the loss of passing trade and for access disruptions during construction.

The findings indicate that, subject to the implementation of management controls, these impacts could be mitigated substantially through appropriate interventions. The mitigation of some business impacts would also positively impact the local tourism industry.

There would be an additional impact to employment as a result of the Project, with the creation of up to 1,536 direct full time equivalent (FTE) jobs over the construction profile of the Project, plus up to 2,856 indirect FTE jobs, depending on the alignment option.

The study found that the likely costs and benefits associated with the Project resulted in a Benefit Cost Ratio (BCR) of 0.60. Such BCRs are common for rural highway upgrades because of the high cost involved for long corridors.

1. Introduction

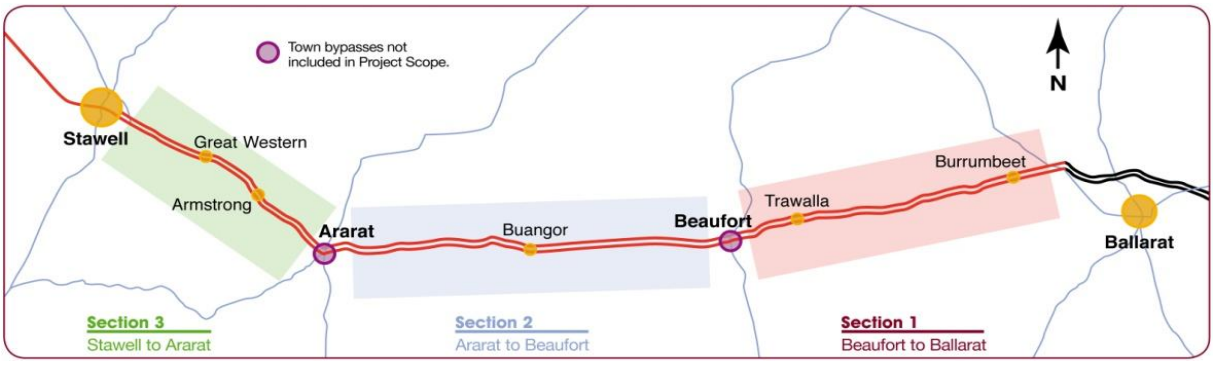
1.1 Background & Project Description

The Western Highway (A8) is being progressively upgraded as a four-lane divided highway for approximately 110 kilometres (km) between Ballarat and Stawell. As the principal road link between Melbourne and Adelaide, the Western Highway serves interstate trade between Victoria and South Australia and is the key corridor through Victoria's west, supporting farming, grain production, tourism and a range of manufacturing and service activities. Currently, more than 5500 vehicles travel on the highway west of Ballarat each day, including 1500 trucks.

The Western Highway Project (here within referred to as 'the Project') consists of three stages:

- Section 1: Ballarat to Beaufort
- Section 2: Beaufort to Ararat
- Section 3: Ararat to Stawell.

Figure 1 Map showing the Western Highway alignment



Works on an initial 8 km section between Ballarat and Burrumbeet (Section 1A) commenced in April 2010 and will be completed in 2012. Construction for Section 1B (Burrumbeet to Beaufort-Carngham Road) commenced in early 2012 and is expected to be completed by June 2014. The last 3 km section from Beaufort-Carngham Road to Smiths Lane in Beaufort (Section 1C) commenced in late 2011 and will finish in 2012. Separate Environment Effects Statements (EESs) and Planning Scheme Amendments (PSAs) must be prepared for both Sections 2 and 3. It is expected that Sections 2 and 3 will be completed and opened in stages through to 2016, subject to future funding.

Section 2 of the Project commences immediately west of the railway crossing (near Old Shirley Road) west of the Beaufort township and extends for a distance of approximately 38 km to Heath Street, Ararat.

Section 3 of the Project commences at Pollard Lane, Ararat and extends for approximately 24 km to Gilchrist Road, Stawell.

The EES will focus on assessment of the proposed ultimate upgrade of the Western Highway between Beaufort and Stawell to a duplicated highway standard complying with the road category 1 (freeway) of VicRoads Access Management Policy (AMP1). The project includes a duplicated road to allow for two lanes in each direction separated by a central median.

The EES has also considered a proposed interim upgrade of the Western Highway to a highway standard complying with the VicRoads Access Management Policy AMP3. When required, the final stage of the project is proposed to be an upgrade to freeway standard complying with AMP1.

The proposed interim stage of the Project (AMP3) would provide upgraded dual carriageways with wide median treatments at key intersections. Ultimately the Western Highway is proposed to be a freeway (AMP1) where key intersections would be grade separated, service roads constructed and there would be no direct access to the highway. The economic assessment considers AMP3 upgrade only due to the 30 year timeframe applied to the analysis.

To date $505 million (M) has been committed for the Western Highway Project by the Victorian Government and the Australian Government as part of the Nation Building Program.

Highway improvements for the three sections between Ballarat and Stawell would involve:

- Constructing two new traffic lanes adjacent to the existing highway, separated by a central median.
- Converting the existing highway carriageway to carry two traffic lanes in each direction.
- Constructing sections of new four-lane divided highway on a new alignment.

In addition to separating the traffic lanes, highway safety would be improved with sealed road shoulders, safety barriers, protected turning lanes, intersection improvements, and service lanes for local access at some locations.

Town bypasses of Beaufort and Ararat are not included in the current proposals. Beyond Stawell to the Victorian border, ongoing Western Highway improvements would continue with shoulder sealing works, new passing lanes and road surface improvements.

The aims/objectives of this Project are to:

- Provide safer conditions for all road users by:
    - Reducing the incidence of head-on and run-off road crashes;
    - Improving safety at intersections; and
    - Improving safety of access to adjoining properties.
- Improve efficiency of freight by designing for High Productivity Freight Vehicles
- Provide adequate and improved rest areas.
- Locate alignment to allow for possible future bypasses of Beaufort and Ararat.

1.2 Project and Study Area

1.2.1 Project Area - Section 3 (Ararat to Stawell)

The project area was defined for the purposes of characterising the existing conditions for the Project, and to consider alignment alternatives. The project area encompasses a corridor extending generally up to 1500 metres (m) either side (east and west) of the edge of the road reserve, except around Great Western where the project area extends up to 1800 m.

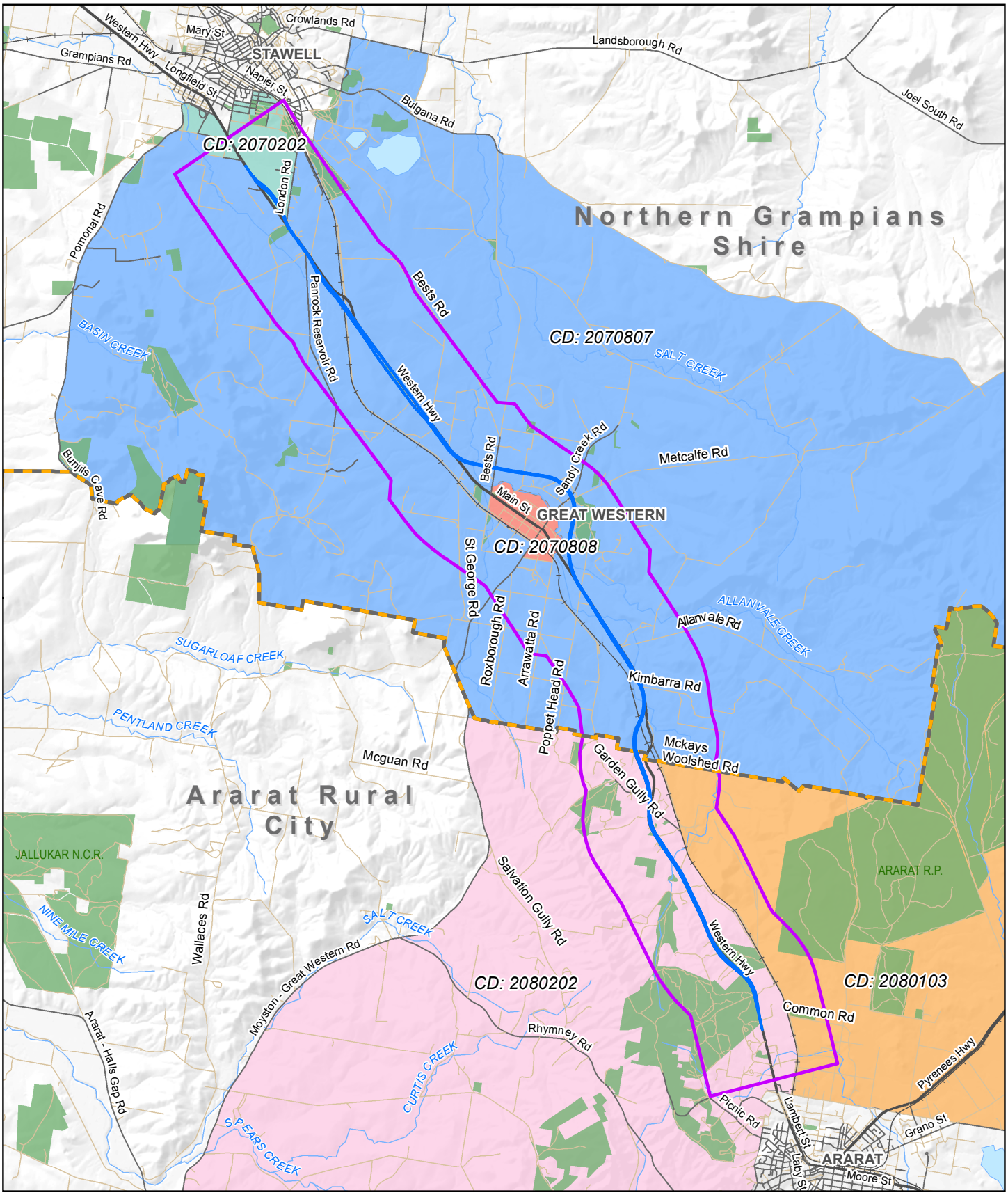
1.2.2 Study Area

The study area for this economic assessment is the same as the project area described above. However, a wider regional area has been described in the existing conditions assessment (outlined in Section 5 of this report) to provide a suitable base for assessment of the potential impacts. The regional area includes the Local Government Areas of Northern Grampians, Ararat, Pyrenees and Ballarat. Ballarat is included due to its significant role as major regional activity centre servicing the area in which the Project is located. The immediate study area is outlined in Figure 2, and Figure 3 provides the regional context.

1.2.3 Proposed Alignment

Existing condition assessments of the project area informed a multi-criteria assessment of various alignment options (the economic impact existing condition assessment is documented in Section 5 of this report).

The proposed alignment and associated construction corridor is the subject of the risk and impact assessment presented in this report and described in more detail in Section 6.



LEGEND

Study Area
Proposed Alignment
Municipal boundary

ABS CCD Boundary
2070202
2070807
2070808
2080103
2080202

Parks
Highway
Sealed road (arterial & local)
Unsealed road

Paper Size A4
0 0.5 1 2 3 4
Kilometers
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

N

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VicRoads
Western Highway Project

Ararat to Stawell
Study Area

Job Number 31-27558
Revision B
Date 02 Nov 2012

Figure 2

180 Lonsdale Street Melbourne VIC 3000 Australia T 61 3 8687 8000 F 61 3 8687 8111 E melmail@ghd.com W www.ghd.com

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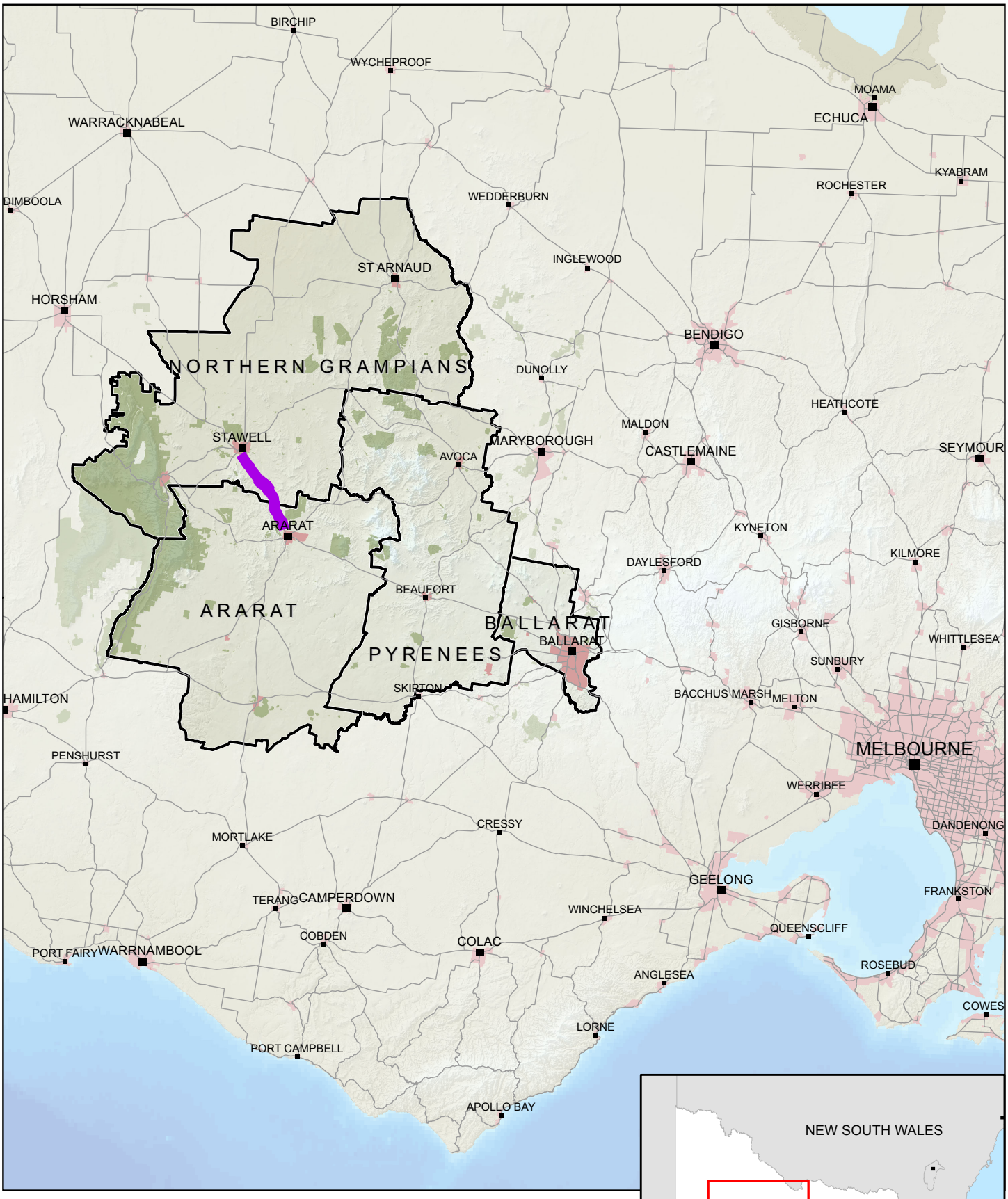
Data source: DSE, VicMap, 2012; VicRoads, 2011; GHD, Design, 2012; ABS, 2012. Created by:splaird



LEGEND

- Study Area
- Major road
- Municipal boundary
- Township area

Paper Size A4

0 5 10 20 30 40 50

Kilometers

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

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Revision C
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Regional Context

Figure 3

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Data source: DSE, VicMap, 2012; VicRoads, 2011; GHD, Design, 2012. Created by:splaird

2. EES Scoping Requirements

2.1 EES Objectives

For the Economic Impact Assessment of the Western Highway Project, the relevant draft evaluation objective outlined in the EES Scoping Requirements is:

- *To provide net economic benefits for the State, having regard to road user benefits, direct costs, and indirect costs with respect to other land uses and economic activities.*

2.2 EES Scoping Requirements

The EES Scoping Requirements for the Economic Impact Assessment are as follows:

- *Identify the potential economic effects of the proposed works and relevant alternatives during construction and operation at the local and regional level in relation to employment, income distribution and existing land uses in the area, (especially key infrastructure or services, agriculture, business and tourism) including effects.*
- *Provide an overall analysis of the costs and benefits of the proposed works and relevant alternatives, including the "no project" scenario.*

3. Legislation, Policy and Guidelines

This section details the legislation, guidelines and policies relevant to the economic conditions in the local and regional study areas or to the economics of the project.

3.1 Commonwealth

Nation Building Program

To date, $505 M has been committed for the Project by the Victorian Government and Australian Government as part of the Nation Building Program.

National Land Freight Strategy – Discussion Paper 2011

The Western Highway is part of the indicative national land freight network.

The goals on page 55 of the strategy include:

- High productivity/performance based standard network for 'national' highways – Goulburn Valley – Newell, Hume – Pacific – Bruce etc. (identification of operating impediments to high productivity vehicle access, including local housing/traffic and traffic lights etc.).
- Town bypasses and grade easing on national highways.
- Improved safety outcomes embedded in each of the initiatives.

3.2 State and Regional

Transport Integration Act 2010

Part 2, Division 2 of the *Transport Integration Act 2010* outlines the objectives of the Act; many of which are relevant to this economic assessment. The relevant objectives are listed in Table 1.

Table 1 Transport Integration Act Transport System Objectives of Relevance to the Socio-Economic Impact Study

Social and economic inclusion
The transport system should provide a means by which persons can access social and economic opportunities to support individual and community wellbeing including by— (a) minimising barriers to access so that so far as is possible the transport system is available to as many persons as wish to use it; (b) providing tailored infrastructure, services and support for persons who find it difficult to use the transport system.

Economic prosperity

The transport system should facilitate economic prosperity by—

(a) enabling efficient and effective access for persons and goods to places of employment, markets and services;

(b) increasing efficiency through reducing costs and improving timeliness;

(c) fostering competition by providing access to markets;

(d) facilitating investment in Victoria;

(e) supporting financial sustainability.

Efficiency, coordination and reliability

(1) The transport system should facilitate network-wide efficient, coordinated and reliable movements of persons and goods at all times.

(2) Without limiting the generality of subsection (1), the transport system should—

(a) balance efficiency across the network so as to optimise the network capacity of all modes of transport and reduce journey times;

(b) maximise the efficient use of resources including infrastructure, land, services and energy;

(c) facilitate integrated and seamless travel within and between different modes of transport;

(d) provide predictable and reliable services and journey times and minimise any inconvenience caused by disruptions to the transport system.

Planning and Environment Act 1987

The *Planning and Environment Act 1987* (P&E Act) establishes a framework for planning the use, development and protection of land in Victoria in the present and long-term interest of all Victorians. The Act sets out the legislative basis to ensure that planning provisions are prepared and approved throughout Victoria.

The P&E Act provides for a single instrument of planning control, the planning scheme, which sets out the way land may be used or developed. A planning scheme is a statutory document which sets out objectives, policies and provisions relating to the use, development, protection and conservation of land in the area to which it applies, usually a municipality. A planning scheme regulates the use and development of land through planning provisions designed to achieve those objectives and policies.

State Planning Policy Framework

Every Victorian planning scheme includes the State Planning Policy Framework (SPPF). The SPPF consists of general principles for land use and development in Victoria as well as specific objectives and strategies applying to the whole State or to areas of State significance.

The following clauses from the SPPF are of particular relevance to this study:

Clause 11.05 relates to regional development and sub-clause 11.05-1, which relates to regional settlement networks, contains the following relevant strategies:

"Direct urban growth into the major regional cities of Geelong, Ballarat, Bendigo and the Moe, Morwell and Traralgon cluster.

Support sustainable development of the regional cities and centres of Ararat … Horsham …

Promote transport and communications and economic linkages between the various settlements through the identification of servicing priorities in regional land use plans."

Sub-clause 11.05-4, which relates to regional planning strategies and principles, contains a strategy to support a network of integrated and prosperous regional settlements by, amongst other things:

- "Strengthening networks of settlements by maintaining and improving transport links, spatial patterns of service delivery, and promoting commercial relationships and community activities."

Clause 18 relates to transport and has the overall objective that "Planning should ensure an integrated and sustainable transport system that provides access to social and economic opportunities, facilitates economic prosperity, contributes to environmental sustainability, coordinates reliable movements of people and goods, and is safe."

Sub-clause 18.02-4 relates to management of the road system and contains the following relevant strategies:

- "Selectively expand and upgrade the road network to provide for:
    - High-quality connections between Metropolitan Melbourne and regional cities, and between regional cities.
    - Upgrading of key freight routes. …"
- Improve the management of key freight routes to make freight operations more efficient while reducing their external impacts."

10 Year Tourism and Events Strategy

The guiding strategy for tourism and events development in Victoria is the 10 Year Tourism and Events Strategy which was released in 2006, followed by a progress report in 2010.

Four key focus areas are set out in this Strategy. These focus areas are:

1. Build upon existing strengths
2. Develop new strengths
    - Assist with investment attraction and facilitation to leverage new major tourism investment in Victoria

3. Focus on long term growth opportunities
   - Focus on business events acquisition with the finalisation of a business case for developing business events in regional Victoria and the implementation of a new strategy to attract and leverage these
   - Focus on regional destination development and marketing programs, particularly the regions beyond Melbourne Surrounds that have the greatest growth potential in the next 5 – 10 years. Focus on attracting entrepreneurs to invest in iconic tourism product in regional Victoria.
4. Strengthen the partnership between government and industry

Since then, a number of strategies have been developed that specify the implementation of the framework in the 10 Year Strategy. These are:

- *Three Year Business Plan 2008-2011*
- *Regional Tourism Action Plan 2009 – 2012*; and
- Specific Market Segment Plans, of which the following are relevant for the Western Highway Project due to the tourism product located in the wider region –
  - Victoria's China Tourism Strategy 2012
  - Victoria's Cycle Tourism Action Plan 2011-2015
  - Backpacker Tourism Action Plan 2009-13
  - Victoria's Aboriginal Tourism Development Plan 2006-2009
  - Victoria's Nature-Based Tourism Strategy 2008-2012, and
- *Victorian Trails Strategy 2005-2010 Regional Marketing and Development Plan 2011-2012 – Grampians,* which covers the Grampians Tourism Region[1] and implements the State level strategies at a regional level.

Relevant objectives and actions of these plans are shown in Table 2 below. The Project is relevant for these tourism development efforts because access to the destination is an important aspect of the experience and reduced travel time would ease access.

Table 2 Relevant Regional Tourism Strategies and Actions

Strategy/Plan	Objective/Action	Relevance
Backpacker	Increase backpacker visitation to regional Victoria	Grampians identified as a high-opportunity destination for leisure backpackers.
Aboriginal Plan/ Nature-Based	Actively support market-ready Aboriginal attractions to ensure they develop and maintain a high profile in appropriate markets.	Visitation to Brambuk National Park and Cultural Centre in Grampians

[1] Grampians Tourism Region incorporates the municipalities of Ararat, Northern Grampians, Southern Grampians, Horsham, West Wimmera, Hindmarsh, Yarriambiack, Buloke and Mildura. Note that Pyrenees shire is part of the Goldfields Tourism Region.

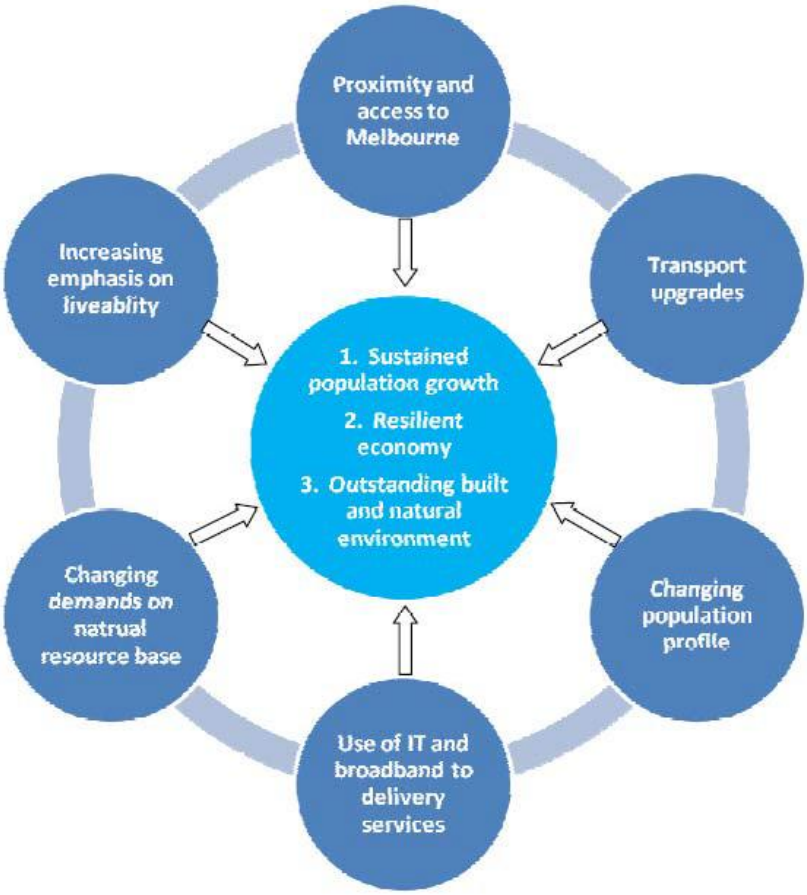
Strategy/Plan	Objective/Action	Relevance
Trails Strategy/Nature-Based	Investigate development of a 3-4 day long distance trail using existing trails in Grampians NP. Facilitate investment in cabins for overnight accommodation on the trail.	As a flagship trail, this would target interstate and international visitors.
Nature-Based/Food and Wine/Aboriginal	Improving the supply and quality of tourism experiences/ Assist with investment in quality accommodation and infrastructure.	Grampians is included in Phase 1
China Tourism	Increase tourism visitation and yield from China to 2020; facilitate increased visitation to regional Victoria	Ararat has Chinese heritage and sister city arrangements; potential to increase visitation building on the existing links.
Regional Tourism Action Plan/Grampians Region	Increasing consumer demand for regional tourism experiences:	Marketing of Halls Gap under the Villages of Victoria program to the interstate and intrastate markets.
Grampians Region	Priority events: ◗ Marketing of Grampians Grape Escape Priority Product: ◗ One priority product is to promote development of accommodation associated with food and wine product.	Targeting the Melbourne market – reduced travel time to destinations in the Grampians Region has the potential to increase demand by tourists from the Melbourne area as it would also be a daytrip option for these visitors.

Central Highlands Regional Strategic Plan, 2010

Eight local government areas form the Central Highlands Region, namely Ararat Rural City, City of Ballarat, Central Goldfields, Golden Plains, Hepburn, Moorabool, Northern Grampians and Pyrenees. In 2010, the Central Highlands Regional Strategic Plan was endorsed by these municipalities and provides a clearly articulated framework designed to best position the region to 2030 and beyond.

Figure 4 illustrates the key comparative advantages and drivers, issues and challenges facing the region

Figure 4 Comparative advantages of and drivers, issues and challenges facing the Central Highlands Region



Source: Central Highlands Regional Strategic Plan Overview, 2010

The Project is identified as a project that would add to the competitive advantages of the region. The Central Highlands Regional Strategic Plan builds on these competitive advantages and encourages more investment in transport infrastructure and services as evidenced in the below listed strategic directions and actions included in the plan.

The existing villages with heritage structures are also listed as a strength for the region; there would be focus on such villages to support population growth and settlement in existing urban areas. Bypassing of smaller towns along the existing highway would increase urban amenity in the bypassed towns and should support this objective.

The strategic directions and actions included in the plan are the following:

- Central Highlands regional settlement network and hierarchy
- Settlement Development and Managed Land Use in the Melbourne Urban Areas – A Regional Land Use and Development Plan
- Managed Land Use and Regional Scale Assets, Horticulture, Securing Water and Energy and providing for Planned Rural Living
- Investment in Transport Infrastructure and Services
- Positioning the Region's Heritage at the National level
- Expanded and Better Health Services, IT Development, Broadband Provision and Access
- Housing Options, Ballarat CBD Revitalisation and, Education and Training Facilities
- Leadership, Capacity Building and Regional Planning – Implementation and Governance.

As large parts of the region and its population are closely linked to the economy of Melbourne, the Central Highlands Regional Strategic Plan highlights the importance of the transport connections between Melbourne and the region. However, there is also a realisation that many people are too dependant on Melbourne for work, goods and other services. Growth in metropolitan Melbourne may have a detrimental effect on the Central Highland's high level of liveability and the region plan therefore seeks to influence growth and development in those peri-urban areas that may affect the Central Highlands Region. These actions are covered under the strategic direction that relates to Settlement Development in the Melbourne Urban Areas.

3.3 Municipal

The Local Legislative and Policy Context that affects the route most directly are the Municipal Strategic Statement (MSS) and Local Planning Policy Framework (LPPF). Although two municipalities are involved, namely Ararat and Northern Grampians, a commonality exists in the legislative framework required.

Municipal Strategic Statement

The MSS outlines the key strategic planning, land use and development objectives specific to the municipality and provides strategies and actions for achieving those objectives.

The Northern Grampians Planning Scheme Clause 21.06 pertains to agriculture and states that:

"Agriculture is the largest industry in the Shire. In general terms, broad scale cropping occurs in the north of the Shire and grazing and viticulture in the south."

A key strategic issue that is listed in Clause 21.06 and is relevant to this project is *"Protect high quality agricultural land for agricultural use"*.

This strategy implies giving special consideration to high quality agricultural land that could be affected by any of the route options.

Local Planning Policy Framework

The Local Planning Policy Framework identifies long term directions for land use and development within each municipality and provides rationale for zone and overlay requirements and particular provisions of the relevant Planning Scheme.

The zone provision that underpins the relevant agricultural strategies appropriate to the LPPF are found in Clause 35.07 Farming Zone (FZ) and include:

- "To ensure that non-agricultural uses, particularly dwellings, do not adversely affect the use of land for agriculture";
- "To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision";
- "To protect and enhance natural resources and the biodiversity of the area".

The major agricultural impacts that Highway or Freeway development tends to have are the direct loss of land, infrastructure loss and severance of land holdings. It is with the knowledge of these impacts that the strategies above need to be considered.

Council strategies

In Northern Grampians Shire, the town of Stawell is identified as having a strategic location on the Western Highway. Stawell also benefits from the existence of a manufacturing base, which comprises the largest contributor to the Shire's economy.

In the Economic Development Strategy of Ararat Rural City, there are a number of action areas which might be impacted by the duplication of the Western Highway. These include the industry sector, which covers manufacturing and larger service industry businesses employing 5 or more people. It is an action in the Economic Development Strategy to "Promote industrial land usage – actively and strategically approach potential industries that will complement our industry mix; and to Work with Council departments and potential industries to promote and facilitate industry activity at the Ararat Renewable Energy Park". Industrial development and therefore the availability of industrial land is therefore an important economic development factor for Ararat Rural City.

In terms of tourism, both Northern Grampians Shire Council and Ararat Rural City Council recognise the importance of this industry to their economic prosperity. While individual Council strategies recognise the importance of tourism to the region, Tourism Victoria's Regional Marketing and Development Plan 2011-2012 - Grampians is the strategic document that articulates the priorities for the region. Within the Study Area, there are specific tourism development and marketing plans for Great Western, and in the wider region, the town of Halls Gap is identified by Tourism Victoria as the main tourist hub of the region and a priority 'Nature Based Tourism Destination'. How access to these towns and their amenity is affected is therefore important criterion for the evaluation of the Western Highway Project.

The Great Western Community Plan 2009-13, identifies the bypass of the township of Great Western as the highest priority regional issues impacting on the Great Western community. The Plan highlights the recognition by the community that this bypass will go ahead and notes their desire to be involved with ongoing liaison through the project development in order to maximise the potential for the town to prosper as a result.

4. Methods

4.1 Estimating Impacts

In order to understand the economic effects of the Project on the Study Area, the method described below has been used:

- The existing conditions of the Project and Study Area were described, in terms of regional context and immediate Study Area. This is the base case against which potential effects are measured.
- The potential economic effects were assessed and where possible, these effects were quantified, otherwise they are described qualitatively.

4.2 Existing Conditions

In order to provide a base case for the assessment and to understand the local and regional existing economic conditions, the regional economic context of the Project has been detailed in Section 5.

To augment the assessment, the study process establishes the following agricultural conditions:

- The characteristics of the farming environment including climate, soils, landform, vegetation patterns and land capability;
- The type of farming activity being conducted and its significance to the regional economy; and
- The pattern of land ownership and the type and degree of land management impacts being anticipated through constructing the Project.

This task has involved desktop analysis (including internet searches), field work and consultation with land owners and those who would be adversely impacted.

Major information sources are referenced within the report.

4.3 Impact and Risk Assessment

The following impact assessment methodology was used to determine the Economic impact pathways and risk ratings for the Project:

1. Determine the impact pathway (how the Project impacts on a given economic value or issue).
2. Describe the consequences of the impact pathway.
3. Determine the maximum credible ‘consequence level’ associated with the impact. Table 3 provides guidance criteria for assigning the level of consequence. The method used for defining these criteria is described in Section 4.3.1.
4. Determine the likelihood of the consequence occurring to the level assigned in step 3. Likelihood descriptors are provided in Table 4.
5. Using the Consequence Level and Likelihood in the Risk Matrix in Table 5 to determine the risk rating.

Table 3 Impacts Consequence Table

Insignificant	Minor	Moderate	Major	Catastrophic
Minimal impact at locality. Recovery time potential within range of natural variability.	Impact at local level Isolated exceedance of standard Recovery time detectable.	Severe impact at locality, or of significance at regional level.	Severe disbenefit to the region.	Very high magnitude event, affecting a State-wide area. Requiring over a decade to reach functional recovery Examples: major disruption to activities, total loss of operating capability, damage exceeding $5 M.

See Table 6 for economic specific impact consequence table.

Table 4 Likelihood Guide

Descriptor	Explanation
Almost Certain	The event is expected to occur in most circumstances
Likely	The event will probably occur in most circumstances
Possible	The event could occur
Unlikely	The event could occur but not expected
Rare	The event may occur only in exceptional circumstances

Table 5 Risk Matrix

Likelihood	Consequence Level				
	Insignificant	Minor	Moderate	Major	Catastrophic
Almost Certain	Low	Medium	High	Extreme	Extreme
Likely	Low	Medium	High	High	Extreme
Possible	Negligible	Low	Medium	High	High
Unlikely	Negligible	Low	Medium	Medium	High
Rare	Negligible	Negligible	Low	Medium	Medium

4.3.1 Consequence Criteria

Consequence criteria (Table 3) range on a scale of magnitude from “insignificant” to “catastrophic”. Magnitude was considered a function of the size of the impact, the spatial area affected and expected recovery time of the economic system. Consequence criteria descriptions indicating a minimal size impact over a local area, and with a recovery time potential within the range of normal variability were considered to be at the insignificant end of the scale. Conversely, catastrophic consequence criteria describe scenarios involving a very high magnitude event, affecting a State-wide area, or requiring over a decade to reach functional recovery.

The consequence criteria used for describing the economic impact assessment was the economic impact on businesses and the associated loss of annual revenue. These consequence criteria are based on the Impacts Consequence Table set out in Table 3, where an ‘Insignificant’ consequence has ‘Minimal impact on a local area’ and ‘Catastrophic’ consequence is a ‘Very high magnitude event, affecting a State-wide area.’ The consequence level thresholds are identical to thresholds that have been used for other road project impact evaluation, including for the Peninsula Link project near Frankston. The impact is measured over the whole length of Section 3 of the Western Highway Project and distinguishes between short term impacts during construction and ongoing impacts at completion of the project. Levels of impact were assigned as per Table 6 below.

Table 6 Economic Impacts Consequence Table

	Consequence Level				
	Insignificant	Minor	Moderate	Major	Catastrophic
Economic impacts on businesses	Loss of annual revenue less than $100,000	Loss of annual revenue less than $1 M but greater than $100,000	Loss of revenues less than $10 M but greater than $1 M	Loss of revenues less than $100 M but greater than $10 M	Loss of revenues less than $1B but greater than $100 M

The economic effects that have been quantified are outlined in Table 7 below:

Table 7 Quantified Economic Effects

Effect	Measure
Change in travel time and travel costs for business travel, personal travel and freight transport	Savings in travel times and savings in vehicle operating costs
Costs in terms of construction and maintenance of the Project	Employment generated as a result of construction activity and ongoing operation expenditure
Displacement (wholly or partially) of businesses and farm operations that operate on land which would be required for the project	Impacts on revenue and resulting employment impacts. Change in productivity of land due to severance, change in allotment size
Infrastructure loss (e.g. farm sheds, barns, dams, fencing) of some landholdings along the project route	Impact estimated through required investment in new infrastructure

4.3.2 Benefit Cost Assessment

Benefit Cost Assessment (BCA) is the tool adopted for assessing the direct benefits and costs of the Project. It involves identification and analysis of the benefits and costs associated with the Project with investigation of the direct economic, social and environmental impacts. It aims to express, in monetary terms, all the direct gains and losses (benefits and costs) created by the Project to all members of society, and to combine the gains and losses into a single measure.

The benefits that are covered in the BCA for this Project are:

- Travel time savings – increases in average speeds as a result of the Project improve overall travel time resulting in a positive economic benefit;
- Vehicle operating costs savings – increases in average speed typically lead to a decrease in vehicle operating costs per kilometer leading to an overall reduction in transport costs and a positive benefit;
- Road crash cost savings – improvements in safety would reduce the expected level of crashes overall and therefore reduce the cost incurred as a result of crash costs; and
- Externality savings – improvements to greenhouse gases, air and noise pollution arising from the Project (compared to the no-project scenario).

The costs covered in the BCA are:

- Capital costs involved in construction of the Project including construction costs of the road; and
- Maintenance costs required for the Project's upkeep.

Table 8 Overarching benefit cost assumptions and estimates

Description		Source
Rate that future benefits and costs are discounted to determine present values	4.4% real	VicRoads
Project life for economics assessment	30 years	VicRoads
Construction cost estimate in current dollars	$240,000,000	GHD estimate
Construction period	3 years elapsed time	GHD estimate
Construction begins	last quarter of 2014	GHD estimate
Construction ends	First quarter of 2017	GHD estimate

4.3.3 Construction Impacts

The Project would require inputs from a number of industries and result in flow-on effects to other economic activity and generate significant short term employment during the construction phase in the construction industry and in the wider economy. Economic impacts of the construction of the Project would be estimated based on the number of jobs the expenditure in the construction industry generates. These values are obtained from input-output tables for

2007-08 (latest available) produced by the Australian Bureau of Statistics and a detailed analysis of the construction industry's linkages as provided in the ABS Year Book Australia 2002, Cat № 1301.0.

4.3.4 Economic impact on agricultural business

The construction of the Project would have an effect on agricultural businesses currently operating on land which would be required for construction of the highway duplication.

The farming activity within the study area comprises a mixed farming system of livestock grazing, viticulture and dryland cropping.

In order to estimate the effect on economic activity from the potential loss of land, production values have been assigned to different types of economic activities. These production values were developed with reference to other agricultural impact assessments in Victoria, ABS statistics and regional survey data. Table 9 provides a measure of economic activity based on gross margin analysis (gross income level less variable costs) drawn from the Livestock Farm Monitor Project, (DPI 2007-08 to 2010-11).

Table 9 Gross Margin values per hectare

Economic Activity	$/ha	Source
Wool	$375	DPI
Prime lamb	$465	DPI
Crop	$350	DPI

Olives and grapes are grown in the district but are only mildly impacted by the Project. Their gross margins are significantly higher than wool, prime lamb and crop. Olive gross margins are expected to fall in the range of $1500-$2500/ha and grapes $7000-$15000/ha.

Where allotments were predicted to lose land as a result of the Project it was possible to estimate the size in hectares of land loss (relative to the size of the allotment) as well as whether there would be any impacts on infrastructure (sheds, stock yards, storage facilities etc) associated with the production on the allotment.

The effect of severance of landholdings was also estimated. Severance is incurred where the highway passes through an allotment isolating one section from the other. The sorts of impacts that can be imposed include the severance of links with buildings and facilities and a reduction in farming efficiency due to increases in time, costs and management to manage the isolated block.

The economic impact from direct land loss and severance was estimated in the following way:

- The direct area lost was multiplied by the expected gross margin to provide an annual production loss;

- Severed areas were identified and measured from aerial photos. An annual production value was then estimated using the same technique as for direct land loss but discounted by 30% to account for reduced efficiencies. The 30% value was the assumed productivity loss;
- Both direct land loss and severance were summed to reach a total productivity loss from the Project Area;
- A present value of the productivity losses was determined using a 4.4% (real) discount rate over the project life of 30 years. For each parcel of land affected by loss of infrastructure, a one-off replacement cost was estimated for the replacement or relocation of affected infrastructure; and
- A total loss of productivity over the life of the Project, to include infrastructure replacement, was calculated.

4.4 Business Impacts

Business impacts are estimated based on loss of trade as a result of the Project and the impact this may have on employment. Consultation with businesses in the township of Great Western was undertaken to ascertain employment in each business (permanent, part time and casual), and reliance on passing trade. Employment is used as an indicator of business revenue, and percentage of passing trade as an estimate of the upper limit of potential loss due to the Project.

5. Existing Conditions

This section provides an overview of the economic context of the Study Area and region in order to understand the local and regional existing economic conditions. The section quantifies the regional geography and economy in terms of the following factors:

- Existing employment and major industries of employment by local government area;
- Land transport infrastructure other than the existing highway;
- Agricultural conditions and farming systems;
- Manufacturing and industrial land supply; and
- Tourism and other industries.

5.1 Existing Employment

Table 10 provides a breakdown of the latest 2006 census information on fields of employment for the population of the regional area by LGA. In this region, Ballarat is the regional centre providing a range of higher order services, including extensive retail, health care and hospitals, secondary and tertiary education, and entertainment, arts and cultural experiences. Stawell and Ararat are major district towns and local government centres.

Agriculture is an important sector throughout the region. As shown in Table 10, agriculture employs 11.3% of the workforce in Northern Grampians LGA and 16.2% of the Ararat LGA workforce. Tourism and manufacturing sectors are also of importance to the regional area and discussed further in this section.

Table 10 Regional area top industries of employment 2006

LGA	Industry	Number of People Employed	Proportion of Total LGA Employment
Northern Grampians	Sheep, Beef Cattle and Grain Farming	580	11.3%
	School Education	259	5.0%
	Hospitals	255	5.0%
	Total LGA Employment	**5,149**	
Ararat	Sheep, Beef Cattle and Grain Farming	763	16.2%
	School Education	252	5.4%
	Hospitals	244	5.2%
	Total LGA Employment	**4,706**	

LGA	Industry	Number of People Employed	Proportion of Total LGA Employment
Ballarat	Hospitals	2,372	6.3%
	School Education	2,221	5.9%
	Cafes, Restaurants and Takeaway Food Services	1,587	4.2%
	Total LGA Employment	**37,537**	
Pyrenees	Sheep, Beef Cattle and Grain Farming	509	19%
	Hospitals	117	13%
	School Education	101	10%
	Total LGA Employment	**2,540**	

Source: Census Quickstats, 2006

5.2 Land transport Infrastructure

Other than the Western Highway, there is a rail line between Ararat and Stawell which impacts with the local study area. This rail line is part of the Melbourne to Adelaide interstate rail corridor, which is managed by the Australian Rail Track Corporation (ARTC). There are constraints on the Ararat and Stawell line as Oddfellows Bridge (adjacent to Harvey Lane Stawell) is only single stack. Two crossing loops have been identified between Ararat and Stawell.

In terms of number of services, most of the current rail traffic on the rail line between Ararat and Stawell is interstate freight travelling to and from Adelaide and Perth and originating at or destined for Melbourne. The key commodities that are moved include grain and timber. 80% of Melbourne to Perth surface-based freight travel is along this rail link (Department of Transport and Regional Services, 2007). There are many locations within the overall rail corridor which restrict the movement of double-stacked containers, however there are no constraints on the route between Ararat and Stawell.

The only passenger service using the rail line between Ararat and Stawell, the Overlander, is predominately a tourist route. The service operates three times per week between Melbourne and Adelaide and three times per week between Adelaide and Melbourne and includes station calls at both Ararat and Stawell. (Great Southern Rail, 2011). Intrastate journeys within Victoria are not permitted on this service. Hence, there is no carriage of intrastate passengers within the section by rail. Passengers wishing to travel by public transport within and between Ararat and Stawell can use local / regional bus services.

5.3 Agricultural Conditions

Land use characteristics for the regional study area were derived from Australian Bureau of Statistics (ABS) data. Table 11 indicates the broad land use patterns on an individual municipality and total basis recorded in 2006. There are a number of observations:

- Grazing is the most dominant land use in both area and value
- Cropping represents about 30% of land use overall with a greater orientation in the Ararat and the Northern Grampians municipalities;;
- Forestry is a minor enterprise over all municipalities; and
- Establishment number is similar between municipalities.

Table 11 Regional Study Agriculture: Land Use

		Ballarat	Pyrenees	Ararat	Northern Grampians	Total
Area of holding	ha	38023	235951	320228	357576	951778
All crops	ha	6648	55768	97392	117507	277315
Grazing	ha	29132	161509	201203	210887	602731
Forestry	ha	198	3176	3152	156	6682
Other	ha	2045	15498	18481	29026	65050
Establishment number	No.	224	503	525	496	1748

ABS Small Area data 2005-06

The major crop types are cereals (wheat, barley, oats, triticale) and oilseeds (canola) grown on a rotation basis. The other lesser but significant crop type is grapes, particularly in the Great Western locality. Table 12 illustrates the proportions of the two broad acre crops.

Table 12 Regional Study Area Agriculture: Crop Type

		Ballarat	Pyrenees	Ararat	Northern Grampians	Total
All crops	ha	6648	55768	97392	117507	277315
Cereals	ha	4243	38130	62118	90064	194555
Oilseeds	ha	888	8429	20608	8519	38444
Other including fallow	ha	1517	9209	14666	18924	44316

ABS Small Area data 2005-06

Table 13 shows the livestock numbers across the municipalities. Sheep are dominant and represent over 80% of dry sheep equivalents (dse)[2] followed by beef (<20%).

Table 13 Regional Study Area Livestock type and numbers

		Ballarat	Pyrenees	Ararat	Northern Grampians	Totals
Sheep & lambs	No.	113476	911788	1185722	733551	2944537
Milk cattle	No.	429	3	163	8	603
Meat cattle	No.	11773	25425	34679	10222	82099
Stocking rate	dse/ha	9.1	8.9	9.4	5	7.7

ABS Small Area data 2005-06

The sheep enterprises are principally wool production but with prime lamb production a significant and growing proportion. Merinos remain the dominant breed for wool production while first cross ewes are favored for prime lamb production.

Table 14 shows commodity value across the municipalities with livestock being dominant. Cropping generally has a higher earning rate potential to livestock on a per ha basis but is more demanding in terms of soil suitability and seasonal conditions.

Table 14 Regional Study Area Commodity values

		Ballarat	Pyrenees	Ararat	Northern Grampians	Totals
Crop value	$m	13.9	38.4	59.2	59.1	170.6
Livestock	$m	24.9	63.1	80.4	84.1	252.5
All	$m	38.8	101.5	139.6	143.2	423.1

ABS Small Area data 2005-06

[2] Livestock equivalents are usually measured as dry sheep equivalents. A dry sheep equivalent is that amount of dry matter required by one mature wether per annum.

5.3.1 The Farming Environment

The farming environment within the area is cropping and grazing based due to the combination of landform, climate and soil type characteristics. There is considerable physiographic change along the route through the interaction of these natural features.

From Ararat to Stawell there is a change in climate, geology and soil type. The annual average rainfall lessens approaching Stawell, with the climate becoming a little drier and more orientated to annual cropping. However, with the change in geology, and to some extent landform, soils are lighter, of lower inherent fertility and more susceptible to erosion. As indicated in Table 15, soil quality progressively deteriorates and becomes more suited to pasture rather than crop. Soils and landform data extracted from various DPI publications summarizes these features in Table 15.

Table 15 Ararat to Stawell Land Units

Feature	*Ararat*	*Great Western*	*Stawell*
Annual rainfall	530-575 mm	530-550 mm	500-520 mm
Landform	Rolling plain	Undulating plain	Undulating plain
Geology	Ordovician	Ordovician	Pliocene clays & sands
Soil	Gritty fine sandy loams over clay with gravel	Brown loam to fine sandy loam overlying mottled medium to heavy clay	Sandy loam to loamy sand over medium to heavy clay
Vegetation	Yellow gum, red stringybark, yellow box	Yellow box, yellow gum, grey box, red gum	Yellow box, yellow gum, grey box, red gum
Hazard	Sheet erosion, gullying, streambank	Low erosion Some stone fragments in surface soils	Low erosion Stone fragments in surface soils

Construction by Phillips Agribusiness from different sources

5.3.2 Farming Systems

The farming systems practiced include both crop and stock. Crop rotations are usually based on some combination of oilseeds (canola) and cereals (wheat, barley, oats) with a rotation length of three years after which the land returns to pasture. Expected crop yields are in the range of 1.2-2.0 t/ha for canola and 2.5-4.0 t/ha for cereals.

Gross margins for wheat, canola and oats are shown in Table 16. They are estimates derived from South West Farm Monitor Project data which is an annual livestock and crop survey conducted across the Western District. The values used are averages for the last three years (2008-2011).

Table 16 Gross margins by crop

	Measure	Wheat	Canola	Oats
Yield	t/ha	3.0	1.6	2.9
Price	$/t	210	500	170
Variable costs	$/ha	300	440	243
Gross margin	$/ha	330	360	250

South West Farm Monitor Project 2008-2011

The pasture phase supports livestock enterprises including merino wool production, prime lamb and beef cattle. The relative proportion of sheep to beef is 85:15. The regional stocking rate is estimated at 7.6 dry sheep equivalents per ha (dse/ha) but with the range 7-15 dse/ha depending on land quality and management capability.

Gross margins from the South West Farm Monitor Project, 2010/11 are shown in Table 17. Stocking rates are significantly higher than the immediate region and the gross margins would not reflect local performance. A weighted gross margin between crop and stock of around $350/ha is considered more appropriate to the locality. The high value crops such as grapes and olives are only marginally affected by the alignment.

Table 17 Gross margins stock

	Measure	Wool	Lamb	Beef
Stocking rate	dse/ha	15.0	15.5	15.5
Wool cut (greasy)	kg/head	3.5		
Wool price (clean)	$/kg	12		
Lamb price-carcass weight	$/kg		5	
Beef Price-liveweight	$/kg			1.75
Gross margin	$/dse	25	30	23
Gross margin	$/ha	375	465	350

5.3.3 Agricultural Land Ownership

Small lot development occurs immediately north of Ararat, essentially rural living in nature.

Small tenements continue along the route, aggravated by the limited distance between the highway and railway line which places a constraint to effective land management.

The same pattern of small tenements continues to Great Western, particularly to the west. Some eastern tenements are larger. Beyond Great Western the situation is similar, especially where the railway line, is closely located to the highway. Beyond that constraint, to both east and west, holding size becomes larger.

Along this route tenement patterns appear small, well below that required for sustainable, economic commercial farms. It may be that part time farming is a significant use or that land holdings are run in association with other land.

5.4 Tourism and other industries

An important 'driver' for the upgrade of the Western Highway is to maintain the important tourism industry in the region. This section of the Project is located in the Grampians Tourism Region, which is a large tourism region that includes the Central Highlands, Western Grampians and Wimmera sub-regions. Northern Grampians and Ararat comprise the Central Highlands sub-region. Visitation to the Grampians region has declined over the 12 year period from 2000, and analysis of the visitation data shows that the Grampians Region is losing its share of visitation to and within Victoria, down from 3.6% of total visitors in 2000 to 2.4% in 2012. Table 18 and Table 19 provide tourism visitation data for the region and totals for Victoria.

Table 18 Number of visitors to Grampians Region ('000)

	Year Ending March						
	Region	**2000**	**2008**	**2009**	**2010**	**2011**	**2012**
Day trip visitors	Grampians	1252	819	647	758	689	858
	Victoria	42895	36529	35491	39720	40084	43712
Domestic overnight	Grampians	871	632	607	592	609	641
	Victoria	16928	17928	16329	16379	16749	17828
Inter-national overnight	Grampians	43.6	38.8	37.1	35.0	33.2	28.1
	Victoria	1071	1485	1472	1544	1674	1767
Total visitors	Grampians	2166.6	1489.8	1291.1	1385.0	1331.2	1527.1
	Victoria	60894	55942	53292	57643	58507	63307

Source: International Visitor Survey, National Visitor Survey, Year ending March 2000, 2007-2012

Table 19 Visitor nights to Grampians Region, 2000 and 2007-2012 ('000)

	Year ending March					
	2000	**2008**	**2009**	**2010**	**2011**	**2012**
Domestic visitor nights	2081	1454	1503	1447	1761	1555
Av. length of stay – nights	2.4	2.3	2.5	2.4	3.0	2.6

Source: National Visitor Survey, Year ending March 2000, 2007-2012

As detailed in the Grampians Market Profile, prepared by Tourism Victoria, domestic (as distinct from international) visitation accounts for 98% of visitation to the Grampians region, and is clearly the key market for the region. From Table 19 and Table 20, it can be seen that in 2012 the average length of stay for domestic overnight visitors was 2.6 nights. This is the same as the average for the last five years of 2.6 nights. Data for international visitor nights is not available due to the small number of international visitors, but some survey results provide an indication of their travel pattern. The majority of international visitors (79%) come to the Grampians Region for a short visit of 1 – 3 nights.

Domestic overnight visitors to the Central Highlands sub-region are estimated to spend $306 per visitor (2010) and approximately $74 per day trip visitor according to Tourism Research Australia, Travel expenditure by domestic and international visitors in Australia's region, 1999-2010. International visitor expenditure is not available by tourist region, but for regional Victoria it is estimated at $58 per visitor per night. Total expenditure in the Central Highlands sub-region (Ararat and Northern Grampians LGAs) by domestic overnight visitors was estimated at $63 M in 2010

In 2005, tourism employment in the Grampians region was estimated at 1,840 or 4.4% of total employment (Tourism and Transport Forum Australia Victoria Tourism Employment Atlas 2005). This employment is measured using the tourism satellite account, as tourism is not an industry listed in the Australian and New Zealand Standard Industrial Classification (ANZSIC) system. The tourism satellite account models 14 tourism-related sectors, the most important of these being:

- Travel agency and tour operator services where tourism accounts for 97.1% of the industry employment,
- Accommodation where tourism accounts for 90.1% of the employment,
- Air and Water Transport (67.1%),
- Cafés and restaurants (26.6%), and
- Clubs, Pubs, Bars and Taverns (19.1%).

It is also worth noting that tourism contributes 8.1% to employment in retail trade, and that in tourist destinations such as Great Western, this percentage would be significantly higher.

The value of tourism to the region can also be measured by its contribution to Gross Value Added of other industries. Estimates by Tourism Victoria of the ratio of the tourism region's total tourism output to the region's total economic output, indicates that tourism represents 2.7% of the economy of the Grampians region in 2007/08 (refer Grampians Market Profile, Year Ending December 2010).

Tourism and retail operations in Section 3 include the following:

- Around Great Western
  - Grampians Estate – cellar door, on the eastern outskirts of Great Western on the existing Highway
  - Seppelts Great Western - winery and cellar door
  - Bests Winery – winery and cellar door and contract harvesting

- Allanvale Homestead and Shearer's Quarters accommodation and function centre (approximately 2 km east of town centre).

- In Great Western
  - Great Western Motel
  - B&B, Jenrick House, including home-based picture framing business
  - B&B, Rymney Reef Cottage
  - Great Western General Store and Post Office
  - Salingers Café
  - Toll Gate Studio Gallery- gallery and workshop
  - United petrol station and garage with associated mower and trailer sales
- On the eastern outskirts of Stawell
  - Sisters Rocks – indigenous heritage site
  - Grange Golf Club – 18 hole golf course
  - Stawell Park Caravan Park – short term and long term accommodation.

Table 20 Tourist and Retail Operations in Section 3

Tourist and Retail Operations	Name and Location	Details
 	Grampians Estate Cellar vineyard and cellar door, 1477 Western Highway, Great Western	Café, deli and cellar door.
	Seppelts Great Western Winery and Cellar door, 39 Cemetery Road Great Western	Key tourist attraction in Great Western. Cellar door open daily 12 – 5pm. Heritage listed Underground Drives, a 3 km labyrinth of tunnels hidden beneath the Winery. Accommodation in Homestead and 2 cottages. Weddings and conference venue.

Tourist and Retail Operations	Name and Location	Details
	Bests Winery Cellar door, 111 Bests Road, Great Western	Cellar door open daily. Mon – Saturday 10 – 5pm, Sunday 11 – 4pm. Winery reliant on cellar door sales. Contract grape harvesting business works from this site (reliant on heavy machinery access).
	Great Western Hotel Motel, Main Street, Great Western.	Hotel Motel offering bistro meals & coffee. 8 rooms in motel section. Accommodation section reliant on passing trade.
	Toll Gate Studio Gallery, 105 Main Street, Great Western	Art gallery and workshop. Highly reliant on passing trade (50%) and highway visibility.
	B&B Jenrick House 87 Main Street, Great Western	Traditional B& B with 3 bedrooms, and cooked breakfast. Home-based picture framing operates from this site.
	B&B, Rymney Reef Cottage 90 Stephenson Street, Great Western	Self-contained cottage, which can accommodate two couples.
	Great Western General Store & Post Office, 93-95 Main Street, Great Western	Located in the centre of Great Western, high visibility provides fast food and coffee for passing highway traffic. Local post office.

Tourist and Retail Operations	Name and Location	Details
 	United petrol station and garage 116 Main Street, Great Western	Located in the centre of Great Western, this business has a high degree of visibility to passing highway traffic in a slower moving urban setting. Affiliated mower sales and repairs and trailer sales on adjacent site.
	Salingers Café, 98 Main Street, Great Western	Located in the centre of Great Western, this business has a high degree of visibility to passing highway traffic in a slower moving urban setting
	Sisters Rocks, off Western Highway	An indigenous heritage site, and an informal recreation and meeting place of local importance.
 	Grange Golf Club 2 Monaghan Road, accessed directly off Western Highway	18 hole golf course with sandgreens. One of two courses in Stawell and one of 31 clubs in the Wimmera District Golf Association. Approx. 65 members, and caters for tourists. Membership numbers appear to be stable. (Victorian Golf Association) Located adjacent to caravan park, hosted the Victorian Sandgreens Championship 2011 (ladies).Sept 2011.

Tourist and Retail Operations	Name and Location	Details
 	Stawell Park Caravan Park Monaghan Road, accessed directly from Western Highway	One of two caravan parks in the Stawell area. Contains 100 powered sites, and 20 unpowered sites, 10 cabins and 8 onsite vans, and adding relocatable housing to service the Stawell rental market. Weekly rates available for longer stays.

The majority of the tourism and retail businesses along Section 3 are located within and around Great Western. Great Western is a village in Northern Grampians Shire with a population of approximately 570 people. It is a small community that relies on tourism and passing trade to support the retail and service offering – cafes, petrol station, hotel motel, post office and general store/fast food outlet – as it is well serviced, taking its small population base and the proximity of Stawell and Ararat into account. It has experienced population decline since 2006, when it had a population of 644 residents.

Employment in wineries, retail and service businesses along or near the highway is estimated at 55 to 60 permanent positions augmented by part time employment in the vineyards during pruning, thinning and harvest. The wineries and vineyards are the major employers in Great Western. Total employment based on place of work data is not available at suburb level; however in the Statistical Local Area (SLA) in which Great Western is located there were 3490 jobs in 2006. This SLA includes the town of Stawell as a regional centre of employment.

Owners of several businesses in the township are looking for buyers for their businesses. However, no change of ownership of these businesses has occurred and the uncertainty in terms of location of the bypass that the township has faced since planning for the Project started in 2010 has not facilitated any sale of businesses.

GWM Water is currently undertaking a sewerage scheme in Great Western with construction planned to commence in 2013. The sewerage scheme means that it will be possible to increase residential development in the township. Council is currently investigating the opportunities and demand for residential development in Great Western and also the potential for planning for development of the township as a 'drawcard' wine village. Heavy traffic through the township on the Western Highway is detrimental to its development as a tourist village, and the bypass provides the township with new potential.

6. Impact Assessment

The detailed impact assessment documented in this report addresses the potential impacts of the construction and operation of the proposed alignment of the Project. The alignment assessed is a culmination of progressive refinement of the design and consideration of potential impacts. The process for assessment and relational for selection of the proposed alignment assessed in the EES is described in the 'Western Highway Project Section 3 Options Assessment Report' (February 2012) (Technical Appendix B of the EES)

The Existing Conditions section of this report (Section 5) covered an area encompassing the long list of alignment options considered for the Project. Potential impacts of each option in the long list of alignments were considered in Phase 1 of the options assessment process, and were used to reduce the initial long list to a short list of alignment options.

The potential impacts of each option in the short list of alignment options were considered in more detail in Phase 2 of the option assessment process. A single proposed alignment was selected for further detailed assessment in the EES. The impacts of the proposed alignment, together with potential mitigation measures, were considered in detail through the environmental risk assessment process. The outcomes of the risk assessment process were used to finalise the proposed alignment assessed in the EES. The environmental risk assessment methodology and complete risk register for all specialist disciplines is presented in 'Western Highway Project Section 3 EES Environmental Risk Assessment' (November 2012) report.

The proposed alignment assessed in this report is the outcome of progressive refinement through each phase of the options assessment process. The proposed alignment was also refined following the initial consideration of the environmental risk assessment.

Extracts form the environmental risk register prepared for the EES are provided in this report and the identified impacts of the proposed alignment are considered in detail in the following sections.

6.1 Project Description

The Project provides two lanes in each direction, and associated new interchanges and intersection upgrades to improve road safety and facilitate the efficient movement of traffic. It commences at Pollard Lane, Ararat, and extends northwest for approximately 24 km to Gilchrist Road, Stawell. The upgrade assessed in this impact assessment is a combination of freeway standard (AMP1) and duplicated highway standard (AMP3). The first length is proposed to be upgraded highway standard (AMP3) from Pollard Lane to the Majors Road. Then the upgrade is proposed to be freeway standard (AMP1) from Pollard Lane to Gilchrist Road on the outskirts of Stawell.

From Ararat the existing carriageway is duplicated to the east, crossing the railway via a new bridge adjacent to the existing Armstrong Deviation bridge. A new dual carriageway highway provides for a north-eastern bypass of Great Western, commencing north-west of Delahoy Road and passing through part of the former Great Western landfill and a quarry, meeting the existing highway alignment again near Briggs Lane. The existing carriageway is duplicated to

the east until Harvey Lane. Oddfellows Bridge at Harvey Lane would be upgraded to accommodate one carriageway crossing of the railway, and a second bridge would be constructed for the other carriageway further west.

Overall, the proposed alignment involves two crossings of the Melbourne to Adelaide railway, eight crossings of major waterways and 26 minor waterways (tributaries, drainage lines and irrigation channels), and a bypass Great Western townships.

The topography is undulating, and the surrounding land use predominately agricultural (grazing, cropping, viticulture), apart from the forested Ararat Regional Park and other smaller remnants.

Apart from the Melbourne to Adelaide railway line which carries both freight and passenger services, no State significant infrastructure, such as major pipelines or powerlines, is located within the study area.

6.2 Key Issues

The key impacts of the Project relate to impacts on agriculture and impacts on retail and other businesses that rely on highway traffic.

6.2.1 Agricultural Impacts

The AustRoads Guide to Project Evaluation methodology and parameters do not include agricultural impacts, however these have been reported and are considered to be a valid economic impact.

An economic assessment of the cost to regional agriculture is measured through direct land loss and severance. No attempt has been made to measure other forms of amelioration (access, infrastructure, residential) as these are best determined at an individual property level through the compensation process.

For direct land loss, a gross margin of $350/ha is used which is a considered average between crop and livestock performance throughout the region. Direct land loss area has been measured on an individual property basis by Vic Roads. The values are on an annual basis.

Severance is considered to be the parcel of landholding that has been severed from the main landholding through the passage of the alignment. While not lost directly, it suffers management inefficiencies in its separation including increased labour and machinery costs, duplication of facilities and increased travel time. To take account of these inefficiencies, the gross margin is discounted by 30% from what reasonably could be earned. The area affected was estimated through studying aerial photography.

The annual productivity loss from land and severance was then capitalised over a 30 year time period using Net Present Value techniques and a discount rate of 4.4%. Table 21 summaries these estimates.

Table 21 Regional Economic Loss

Item	Unit	Proposed Alignment
Direct loss	ha	195.5
Gross margin	$/ha	350
Annual loss	$	68425
Severance	ha	50
Gross margin loss	%	0.3
Annual loss	$	12250
Total Regional loss	$m	1.33

A Consultation Program was undertaken with affected landholders during January 2012. Seven landholders were interviewed and their landholdings inspected for alignment impact. Properties were selected on the basis of route representation, range in size and severity of impact.

The major issues that arose out of the interview process were as follows:

Direct land loss

Direct land loss for the total alignment is estimated at 195 ha. However, most landholders appeared reconciled to this loss as it occurred as road widening affecting only boundaries and not representing a large proportion of total property.

The exceptions are the land holdings impacted by intersection constructions or bypass commencement and exit locations (the proposed Great Western bypass).

Severance of landholding

The effect of severance along the route is low and mostly incorporated in direct land loss. However, a few properties are significantly impacted, more particularly within the Armstrong Deviation and the commencement and end of the Great Western Bypass. The affects are identified below, some of which are permanent through not being responsive to amelioration

- A reduction in allotment sizes that contribute to a farm management holding;
- The severance of links with buildings and facilities;
- Severed landholdings would be used less and at lowered stocking rates due to their inconvenience in management;
- A reduction in farming efficiency due to increases in time, costs and management flexibility to transport stock and undertake necessary animal husbandry activities.
- The lack of certainty in alignment route has compromised long term strategic thinking in rural business development.

Most of these concerns can be addressed through the compensation process.

Impacts on infrastructure

Infrastructure impacts on dams, buildings, yards, drains, and vegetation removal were some of the affects anticipated. Most, if not all can be replaced or relocated.

Interruption to access

Most of the route is only subject to road widening. In this case, difficulties with access are generally associated with the construction period and short term in nature. The exception might be the Armstrong Deviation where existing constraints are likely to be aggravated by the upgrade.

Significant changes to access arrangements occur along the route through the extensive use of service roads in the freeway standard (AMP1), the bypass of Great Western and a major intersection upgrade at London Road. A number of concerns were cited:

- Road closures, provision of service roads and location of overpasses, together with the time scale of implementation would have major implications for the affected farming operations;
- Cropping machinery would not be able to travel on the freeway and movement of farm equipment would be hampered;
- Restricted access for B-Double stock transports from service roads;
- The need to transport rather than drove stock across the highway; and
- An increase in travel distance to service affected properties.

Most of these concerns are responsive to amelioration or can be addressed through the compensation process.

Other impacts

Other impacts mentioned included:

- An increase in noise level through moving the highway closer to some farm residences;
- Removal of vegetation, modification to water catchments, lowered aesthetic values, potential damage to wetlands and trees; and
- A lack of certainty in future planning.

6.2.2 Business Impacts

The impact on businesses includes access disruptions and/or change in access arrangements both during and after construction. This aspect is predicted to create an economic impact of approximately $100,000 loss during the construction period.

There is also the prospect of the loss of passing trade; this is pertinent for Great Western which is planned to be bypassed. This loss is predicted to be in the region of $100,000 - $1 M over the 30 year period.

Traffic and transport modeling undertaken to inform this assessment (GHD, 2012) indicated that the travel time would be improved marginally.

As outlined in Section 5, the Study Area's economic activity is reliant largely on the agricultural and tourism sectors. These industries rely to a certain degree on the movement of people (staff or customers) and the movement of freight in terms of inputs and outputs. Improvements to the speed and reliability of this major interstate corridor would have benefits.

Effects on businesses in Great Western and near Stawell

Consultation with businesses in Great Western and on the east side of Stawell provided the basis for estimating potential impacts of the Project.

Table 22 Potential economic impact on business activities in Great Western and near Stawell[3]

Business	Employment – Full Time Equivalent	% of Passing Trade	Potential Impact
Wineries & Vineyards (excluding casual work in vineyards). Seppelts and Bests are destinations (located off the current highway); Grampians Estate rely on highway visibility	33-35 FTE	Up to 25%	3 – 4 FTE
Retail and Accommodation in Main Street of Great Western. Mainly small businesses with mix of local and tourist trade.	13 – 15 FTE	Up to 50% for Gallery	7 – 9 FTE
Non-winery/non-Main Street Great Western businesses i.e. Rymney Reef Cottage and Allanvale (accommodation and function venue)	2 – 5 FTE	Negligible	No impact
Caravan Park and Golf Club near Stawell	2 – 3 FTE	Up to 25%	0 – 1 FTE
Total	50 – 58 FTE	-	10 – 14 FTE

Potential impacts on businesses in the main street of Great Western are the most significant. Several of these businesses have been listed for sale; if their turnover decrease significantly it may be sufficient for business owners to sell the business for land and building value i.e. not as an on-going viable business. There is a risk of a cumulative effect if several businesses in the town become unviable due to loss of passing trade to the milk bar, hotel/motel, petrol station etc, causing the town to become less liveable, and resulting in loss of population and potentially reduction in numbers in schools and sporting clubs. The potential cumulative impact could result in the 'death of the town' as we know it.

The completion of the sewerage project in Great Western, and subsequent residential development along with its development as a draw card wine village would mitigate effects of lost passing trade and has the potential to attract new businesses to the township. However,

[3] Loss of employment in absence of ameliorative measures such as signage.

detailed planning for the town is necessary and of very high importance as the construction of the bypass is the beginning of a vulnerable phase for Great Western as a town.

The Stawell Park Caravan Park near Stawell is in the process of redeveloping parts of the caravan park site as a residential village catering for the Stawell rental market. According to the property owners, there is a shortage of rental accommodation in Stawell.

The Grange Golf Club is not reliant on passing trade for business, but receives some green fee revenue from patrons of the adjacent caravan park. It is likely to lose some of its existing car parking to the Project, but an adjacent area has been identified to provide the club with replacement car parking.

6.3 Impact Pathways

This section identifies and describes economic cause and effect pathways associated with the construction and operation of the Project.

VicRoads has a standard set of environmental protection measures which are typically incorporated into its construction contracts for road works and bridge works (VicRoads, April 2012, Contract Shell DC1: Design & Construct, Section 1200 Environmental Protection) hereafter referred to as the 'VicRoads standard environmental protection measures.' These measures have been used as the starting point for the risk assessment. Those which are relevant to the economics assessment are included in the 'planned controls' column of the risk assessment table.

As a result of the initial risk assessment, additional Project specific controls have been proposed to reduce risks in some cases. These are outlined in the 'additional controls' column of the risk assessment table.

Both VicRoads standard environmental protection measures and the additional Project specific controls have been included in the Environmental Management Framework for the Project.

The most significant risk in the economics assessment is the loss of productive agricultural land and severance to allotments.

6.3.1 Agriculture

Alignment performance is considered in three parts:

- From its commencement 300 m west of Pollard Lane to Delahoy Road, east of Great Western;
- Bypass of Great Western from Delahoy Road to Briggs Lane to the west; and
- From Briggs Lane to highway completion near Gilchrist Road, Stawell.

A description of these sections and how they impact on agriculture is provided below:

Pollard Lane to Delahoy Road

The agricultural quality of this section of land is only moderate due to the characteristics of landform, soil type and climate. Land use is mostly grazing on semi improved pastures and tree cover is moderate to high, depending on terrain and soil quality.

Allotment sizes are generally small, aggravated by the narrow land strip that exists between road and rail. As a result, the tenement pattern that has developed is a mixture of rural living, part-time farming and commercial farms. The latter comprises multiple ownership of small allotments.

The major agricultural impact is direct land loss through road widening, off takes and service roads. The level of severance is minor. However, there are a number of other impacts that the alignment is likely to impose:

- The loss of infrastructure including dams, farm structures and facilities;
- Housing impacts including direct housing loss; and
- Aggravating land fragmentation and its effect on lowering productivity, reduced access and increased management difficulties.

One of the most sensitive areas is the Armstrong Deviation. One rural holding which comprises multiple small allotments within its total farm management area, was significantly affected through the deviation's initial construction. The impact was to reduce each allotment's size and create severance difficulties between landholdings, buildings and facilities. The current proposed alignment would aggravate most of these impacts, possibly to the extent where some allotments may not be agriculturally viable.

Bypass of Great Western

The bypass of Great Western commences in the east at Delahoy Road, arcs to the north and rejoins the Western Highway at Briggs Lane. There are a number of agricultural affects:

- At the bypass's eastern commencement, the impacted landholding is significantly affected through direct land loss, severance and facilities loss. Its area is reduced by half including the better quality creek flats land;
- At the same location but on the southern side of the highway, minor land loss is imposed on a vineyard. However, the greatest loss is likely through a reduction in access to the associated café and wine retail outlet;
- The next section of route to Hurleys Lane is either well aligned to property boundaries or passes through agriculturally unproductive land. However, the quarries that are affected are considered economically significant;
- From Hurleys Lane to rejoining the Western Highway at Briggs Lane, Bests Wines is the major landholder affected. The impacts are direct land loss, severance and changes in access. No vineyards are affected but the company shareholders consider that an underpass is required to provide livestock access to the severed grazing land.

Briggs Lane to highway completion

The route to Panrock Reservoir Road principally affects one grazing property with the impacts being direct land loss and facilities loss (dams). The alignment returns to the existing Western Highway through forested land, extending north into grazing land to accommodate the London Road intersection. At Monaghan Road, the Grange Golf Club is affected through direct loss of its carpark, and the Stawell Park Caravan Park through direct land loss of a strip of land adjacent to the Highway within the maximum construction footprint. Two tenements at the

London Road intersection are affected through direct land loss, one comprehensively, the other significantly.

6.3.2 Businesses

- The Project would disrupt access to businesses during construction across the alignment;
- The Project would change or complicate access arrangements to business;
- The Project would result in reduced exposure to passing trade for businesses in Great Western; and
- The Project would impact on the Stawell Park Caravan Park.

The Project provides potential for Great Western to develop as a 'drawcard' wine village when traffic has been removed from the main street.

6.4 Manufacturing

While not generating the highest employment within the local study area, when measured in terms of output, manufacturing is an important industry in the region. The contribution of manufacturing to LGA output is shown in Table 23 below.

Table 23 Manufacturing Output

LGA	Output
Ararat Rural City	$438 M
Northern Grampians Shire	$473 M

Source: Ararat Rural City Economic Development Strategy, based on Dec 2008 REMPLAN data, Grampians for Growth Manufacturing fact sheet, based on 2009 SEP Consulting research

The close link between agricultural output and manufacturing employment is demonstrated in the Pyrenees Shire, where wine and spirit manufacturing accounts for $83 M or 73% of output from the manufacturing industry. As a large proportion of this industry's output is exported, transport links to capital cities and major ports are important to the future competitiveness of the region's manufacturing industry, and in turn to the agricultural industry in the region.

The region's manufacturing industry benefits from the strategic location of towns such as Stawell and Ararat on the Western Highway, the main transport route between Melbourne and Adelaide and the provision of affordable industrial land.

Council development strategies continue to focus on providing suitable industrial land with good access to the highway, and any impacts on highway access to/from these identified industrial areas is therefore an important consideration.

There is an existing industrial estate to the east of Stawell which has frontage to the Western Highway. This estate is not directly impacted by the proposal.

6.5 Risk Assessment

The risk assessment is presented in Table 24 below.

Table 24 Economic Risk Assessment

Risk No.	Impact Pathway Description	Description of consequences	Planned Controls to Manage Risk	Initial Risk			Additional Controls Recommended to Reduce Risk	Residual Risk		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
E1	Operation of the Western Highway would reduce passing trade for some businesses (Great Western).	Some businesses along the alignment rely for a portion of their turnover on passing traffic. This traffic would be reduced with a consequent reduction in turnover Potential for cumulative effects with one business closure leading to other business closures.		Minor	Almost Certain	Medium	Install gateway signage for Great Western and maintain existing tourist signage in accordance with VicRoads Tourist Signage guidelines Fund and undertake detailed planning for the town in conjunction with sewage works that enable additional residential development, and a marketing strategy to ensure Great Western's planned role as a wine village is realised and new residents are attracted to settle there.	Insignificant	Almost Certain	Low
E2	Construction of the Western Highway would result in the loss of agricultural facilities and improvements plus the loss of agricultural land and severance of properties across the alignment.	Stock yards, sheds, access lanes and other improvements may require replacement or relocation. Some agricultural land would be lost as a result of the construction and there would be severance and access issues to some properties.		Minor	Almost Certain	Medium	Compensation measures for loss of infrastructure, land, severance and access issues. Optimise intersections and access opportunities for affected properties.	Insignificant	Almost Certain	Low

Risk No.	Impact Pathway Description	Description of consequences	Planned Controls to Manage Risk	Initial Risk			Additional Controls Recommended to Reduce Risk	Residual Risk		
				Consequence	Likelihood	Risk Rating		Consequence	Likelihood	Risk Rating
E3	The Western Highway would disrupt access to businesses during construction.	Some businesses along the route would have access disrupted during the construction process.	Continuous access would be maintained to commercial property, consistent with business operating hours. Any alteration would be with written agreement of proprietor. Traffic Management Plans (TMPs) would be prepared to identify, assess and appropriately eliminate, reduce or mitigate road safety hazards and to be reviewed by VicRoads prior to implementation. TMPs would comply with standard VicRoads practices, the Traffic Management Code of Practice and the *Road Management Act 2004*. Examples include: speed reduction where appropriate, worksite safety barriers, advance warning signage, hazard visibility, etc.	Minor	Almost Certain	Medium	Work with businesses to optimise construction schedules.	Insignificant	Almost Certain	Low
E4	The duplicated Western Highway would complicate access to businesses post construction.	Closure of roads into the duplicated Western Highway would permanently complicate access for some businesses to and from Western Highway.		Minor	Almost Certain	Medium	Maintain existing signage for business destinations which are of tourist interest (including wineries). Otherwise, update signage to areas of business or local amenities in accordance with VicRoads Tourist Signage guidelines.	Insignificant	Almost Certain	Low

Agricultural land and property would be lost or severed as a result of the new alignment. The likely aggregated value of these lost assets was scored as a 'minor' consequence that is 'almost certain' in terms of its likelihood of occurrence. Therefore, the overall initial risk rating for the impact to agriculture is scored as 'medium'. The appropriate intervention factor designed to mitigate and reduce the risk was identified as the offer of a suitable level of compensation, reducing the consequence to 'insignificant' and therefore the residual risk to 'low'.

Business impact during and post construction was scored as a 'medium' risk rating, which reduced to a 'low' risk rating in the residual risk assessment, following an intervention to sign existing business areas and maintain existing tourist-related business activities, notably the regional wineries.

The impact of the alignment on passing trade was scored as a 'medium' risk rating in the base case, which reduced to a 'low' risk rating in the residual risk case with appropriate signage to business areas, facilities or amenities, which should mitigate the impact somewhat.

6.6 Impact Assessment

The Economic Impact Assessment has been undertaken using a conventional Benefit Cost Assessment approach and an assessment of the wider economic impacts, which have been reported in the areas of agriculture, business and employment impacts.

6.6.1 Benefit Cost Assessment

Table 25 outlines the key timing, discount rate and capital cost assumptions used in the benefit cost assessment.

Table 25 Overall benefit cost assumptions and estimates

Description	Assumption	Source
Rate that future benefits and costs are discounted to determine present values	4.4% real	VicRoads
Project life for economics assessment	30 years	VicRoads
Construction cost estimate in current dollars	$240 M	GHD estimate
Construction period	3 years elapsed time	GHD estimate
Construction begins	Last quarter of 2014	GHD estimate
Construction ends	First quarter of 2017	GHD estimate

Travel Time Savings

The parameter values that are applied to the travel times to assess the extent of the time savings benefits are calculated using the methodology outlined in the Austroads publication *Guide to Project Evaluation, Part 4: Project Evaluation Data* (2008), and based on seasonally adjusted full time weekly earnings for Australia. The crew costs for freight vehicles were also sourced from Austroads (2008) and have been updated to 2012 values using the average annual increase in average wages. Freight travel time values have also been sourced from Austroads (2008) and adjusted to 2012 values. (Refer Table 26).

Table 26 Value of travel times by vehicle type

Vehicle type	$ value per hour
Articulated trucks	48.38
Rigid trucks	34.00
Light commercial vehicle	35.04
Cars undertaking business travel	55.99
Cars undertaking private travel	22.89

Source: Austroads (2008) (adjusted to 2012 values)

Since the project options induce higher average travel speeds there is a reduction in total vehicle hours travelled over the base case. Table 27 displays vehicle hours travelled (per day) in the base and project case options and the resultant reduction in vehicle hours travelled. These are shown for the forecast year of 2026.

Table 27 Vehicle hours travelled per day by vehicle type, 2026

Vehicle type	Base case	Proposed Project
Light vehicles	1,368	1,194
Heavy vehicles	663	579
	Reduction in vehicle hours travelled over base case	
Light vehicles	NA	174
Heavy vehicles	NA	84

Source: GHD traffic engineering estimates

The daily reduction in vehicle hours travelled due to the project (from Table 27) is applied to the hourly value of travel time (from Table 26) to generate estimates of daily travel time savings. These estimates are subsequently annualised to give annual travel time savings for the project case options (in undiscounted dollar terms).

After discounting the annual stream of travel time savings, a total (or cumulative) travel time benefit of $40.8 M was estimated over the 30-year evaluation period.

Vehicle Operating Cost Savings

The calculation of vehicle operating costs was based on standard NIMPAC algorithms for rural roads (Harmonisation of Non-Urban Road User Cost Models, Austroads 2005). Using these algorithms, the process for calculating vehicle operating costs (VOC) in the base case and project case options involved a number of steps. These are as follows:

- Identified longitudinal grades by road section;
- Identified NAASRA roughness meter (NRM) counts by road section (assumed NRM=100 for base case and NRM=49 for project options);
- Identified model road state (MRS) by road section (assumed MRS=13 for majority of base case and MRS=22 for project options);
- Calculated passenger car equivalents (PCE) by road section using longitudinal grades;
- Calculated volume-capacity ratios by road section using PCE;
- Calculated adjusted free speeds for light vehicles (LV) and heavy vehicles (HV) using longitudinal grades and MRS; and
- Calculated VOC (for both LV and HV) using adjusted free speeds, volume-capacity ratios, and pavement roughness.

The final step in the above process utilises a distance-weighted average to calculate VOC in dollars per vehicle kilometre travelled ($/VKT). The resultant vehicle operating cost parameters in the base and project case options are displayed in Table 28.

Table 28 Vehicle operating cost parameters, $ per VKT

Vehicle type	Base case	Proposed Project
Light vehicles	0.30	0.27
Heavy vehicles	1.20	0.98

Source: Austroads (2005) and GHD estimates

Table 29 displays vehicle kilometres travelled (per day) in the base and project case option. These are shown for the forecast year of 2026. (The reason why the VKT in the base case and proposed project case are very similar is because the length travelled for both options is only 200 m more for the proposed project case.)

Table 29 Vehicle kilometres travelled per day, 2026

Vehicle type	Base case	Proposed Project
Light vehicles	130,272	131,358
Heavy vehicles	63,144	63,670

Source: GHD traffic engineering estimates

The vehicle kilometres travelled (in Table 29) is applied to the vehicle operating cost rates (in Table 28) to generate estimates of daily vehicle operating costs in the base and project case options. Project option VOC costs are subtracted from base case VOC costs to obtain VOC savings on a daily basis. These estimates are subsequently annualised to give annual vehicle operating savings for the project case options (in undiscounted dollar terms).

After discounting the annual stream of vehicle operating cost savings, a total (or cumulative) travel time benefit of $75.9 M was estimated over the 30-year evaluation period.

Crash costs savings

Crash cost savings were derived from estimates based on the previous crash history on the route and the known improvements to the standard of the infrastructure that would occur as a result of this Project. Overarching average casualty costs (originally sourced from the Austroads Guide to Project Evaluation) were then applied to the expected reduction of persons involved in 'fatal', 'serious' or 'minor injury' incidents due to the project. These average casualty costs ($ per person) are described in Table 30 below.

Table 30 Average Casualty Costs

Type of Crash	Cost per crash
Fatal	$2,494,995
Serious injury	$574,236
Minor injury	$24,141

Source: Austroads (2008) (adjusted to 2012 values)

Section 3, between Ararat and Stawell, has a crash history of 4.2 crashes per 100 million vehicle kilometres travelled. These statistics include a total of three serious injury crashes and no fatalities within the past five years (Source: VicRoads Crash Statistics, 2005-2010).

Victoria's Road Safety Strategy has an objective of reducing the incidence and severity of road crashes by 30% by 2017. The Project is expected to offer crash reductions (over the 30 year life of the Project) in accordance with this Government objective.

Total crash cost savings (over the base case) were estimated at $2.8 M over the 30-year evaluation period.

Externalities Savings

The parameter values used to calculate externality savings are displayed in Table 31 and Table 32. Future traffic split were assigned to these parameter values in order to estimate externality savings.

The savings in greenhouse gases, air and noise pollution as a result of the Project were estimated at zero over a 30 year Project lifespan.

Table 31 Externality parameter values

Vehicle Type	Values
Heavy Vehicles	$0.03 (per 1,000 ntkm[4])
Light Commercial	$0.25 (per 1,000 ntkm)
Passenger Vehicles	$0.07 (per 1,000 vkm[5])

Source: Austroads (2008) (adjusted to 2012 values)

Table 32 Heavy and light commercial payload parameter values

Vehicle Type	Values
Heavy Vehicles (Articulated trucks)	25.1 (tonnes per trip)
Heavy Vehicles (Rigid trucks)	7.3 (tonnes per trip)
Light Commercial	0.3 (tonnes per trip)

Source: Australian Bureau of Statistics, Survey of Motor Vehicle Use, 9208.0

Residual Value

The Australian Transport Council National Guidelines (Volume 4) for cost benefit analysis of road transport projects specify a 50 year lifespan for road pavements. Since the project evaluation period is for 30 years this gives rise to a residual value benefits item. With 20 years' worth of remaining asset value at the end of the evaluation period a proportion of 40% (i.e. 20 years divided by 50 years) is applied to undiscounted capital cost value. This gives a residual value estimate of $21.3 M.

Capital Costs

Capital costs (the sum of money required to oversee the construction of the road alignment) have been estimated to reflect a P90 confidence level[6] as consistent with VicRoads risk based estimating requirements.

The capital costs due to the Project were estimated as being $240 M. Table 33 provides the estimate detail.

The capital costs have been staged over a three year period and have been subject to an escalation factor of 4.6% - the escalation factor would account for the costs required in future dollar terms when considering the impact of inflation. The capital spend over the timeframe has then been subject to a discount rate of 4.4% to produce values which have been used in the modeling, which have informed the Benefit Cost Ratios observed.

[4] ntkm – net tonne kilometres, a unit representing a load across distance

[5] vkm – vehicle kilometres, a unit

[6] A Percentile is an increment of the values in a data set. The 90th Percentile (P90), for example, is the value in the data set for which 90% of the values are below it and 10% are above. This is generally used to give confidence the risk contingency is not exceeded.

Table 33 Capital Expenditure Profile

Year	cf base	Assumed Expenditure		Escalation Factor	Required Budget
		Expenditure %	Expenditure $		
12/13	1	5%	$10,809,350	1.000	$10,809,350
13/14	2	20%	$45,226,321	1.046	$47,306,732
14/15	3	30%	$70,952,574	1.094	$77,622,116
15/16	4	30%	$74,195,379	1.144	$84,879,514
16/17	5	15%	$38,816,376	1.197	$46,463,202
		100%	$240,000,000		$267,080,913

Source: GHD cost estimates

Maintenance Costs

Maintenance costs for the Project have been estimated at $410,000 per year over the project's 30 year life. The assumptions that have been used to inform this estimate are:

- Maintenance costs are equal for both highway and freeway design standards;
- All items (as per Table 34) would be necessary as part of the maintenance requirement; and
- Quantities of each item have been drawn from a comparable rural highway i.e. the Princes Highway East Traralgon – Sale Business Case, and scaled to the length of Section 3 of the Western Highway Project to inform the quantity estimates.

Table 34 includes all aspects that comprise the maintenance requirements:

Table 34 Annual Maintenance Costs

Item	Unit Cost
Pavement and Roadside (Rural)	$9,000 per lane km
Structures	$2,800 per structure
Street lighting	$400 per lantern
Linemarking and pavement markers	$300 per lane km
Median wire rope safety barrier	$15,000 per km
Off-carriageway safety barriers	$10,000 per km

Source: VicRoads cost estimates

Benefit Cost Ratio

Table 35 the contribution of the above benefits and costs to the Project's benefit cost ratio of 0.60. Such BCRs, suggesting that project can not be justified on the economic performance only, are common for rural highway upgrades because of the high cost involved for long corridors

The BCRs have been calculated on the basis of a duplicated highway upgrade (AMP3 standard), however an upgrade to freeway standard (AMP1) is expected at some future date above and beyond the 30 year lifetime of the Project.

Table 35 Results of the Project's Benefit Cost Assessment

	Present Value (4.4% discount rate over 30 years)
Vehicle operating cost savings	$75.9 M
Travel Time savings	$40.8 M
Crash Cost savings	$2.8 M
Externality savings	$0 M
Residual value	$21.3 M
TOTAL BENEFITS	**$140.7 M**
Capital Costs	$230.9 M
Maintenance Costs	$ 5.4 M
TOTAL COSTS	**$236.3 M**
Benefit Cost Ratio (BCR)	**0.60**
Net Present Value	**$(-95.6) M**

6.6.2 Other Economic Impacts

There are other economic impacts that are in addition to those identified and reported as part of the Benefit Cost Assessment (which utilises the Austroads guide (2008)).

Construction Employment and Flow-on Effects

Construction of the Project would require inputs from a number of industries and result in flow-on effects to other economic activity and generate significant short term employment during the construction phase, both in the construction industry and in the wider economy.

The ABS Year Book Australia 2002 provides a clear analysis of the construction industry's linkages. The analysis is based on the Australian National Accounts which provide a detailed analysis of the construction industry's input and outputs and linkages with other industries.

The Year Book analysis of the construction industry also provides employment multipliers that indicate the level of flow on effects of activity in the construction industry. Apart from the initial effects, there are production induced effects and consumption induced effects as a result of wages of construction workers being spent. Based on the this analysis, and updating the industry expenditure per job generated with the Consumer Price Index for the construction industry, it is estimated that $1 M of extra output by the construction industry generates approximately 6.4 direct Full Time Equivalent (FTE) jobs (additional jobs beyond direct project construction jobs), or one job per $156,000 in construction costs.

The construction costs for the Section 3 are estimated to be $240 M.

With an indicative construction period of three years, the Project is therefore estimated to generate the following employment on an average annual basis (rounded):

- 1,536 FTE or 512 FTE jobs per annum during the three year construction period.

Flow-on effects in the wider economy are estimated using the employment multiplier of 1.86 for the construction industry (the employment multiplier has been adopted using a conservative multiplier of 65 per cent of the ABS stated maximum multiplier from the ABS *Feature Article: The Construction Industry's Linkages with the Economy, 2002*). Estimated flow-on effects are 2,856 FTE.

The flow-on effects would be distributed over a longer period than the three year construction period, as the consumption effect is diluted by superannuation contributions and other savings.

Effects on business and industries downstream from the Project

Traffic and transport modelling undertaken to inform this assessment (GHD, 2012) indicated that the congestion benefits from the Project would improve travel times (from the current mean speed of 96 km/h for Section 3 to 110 km/h).

As outlined in section 5, the region's economic activity is reliant largely on the tourism and agricultural sectors. These industries rely to a certain degree on the movement of people (staff or customers) and the movement of freight in terms of inputs and outputs. Improvements to the speed and reliability of this major interstate corridor would have benefits in terms of improved connectivity. Speed and reliability benefits would also have a positive impact on freight, which would be particularly beneficial for High Productivity Freight Vehicles.

Values of Freight and Connectivity

There are benefits in assessing the value of freight that is supported by the Western Highway and the improved connectivity that would be provided by the Project, particularly for import and export freight that involves a movement to or from the Port of Melbourne.

Conclusion

All of the above other economic benefits are significant and are in addition to the benefits factored into the benefit cost assessment using the Austroads guidelines.

7. Management and Mitigation Measures

7.1 Construction

VicRoads would require the construction contractor to develop and implement a Construction Environmental Management Plan (CEMP) for the Project. VicRoads standard environmental protection measures and some additional Project specific controls identified below have been incorporated into the Environmental Management Framework for the Project which is documented in the Project Environment Protection Strategy (PEPS). The PEPS is a VicRoads Document that details the environmental management arrangements for the design, construction and operation of the Project. VicRoads would require the construction contractor to incorporate all of these measures into the CEMP. Refer to Chapter 21 of the EES for further explanation of the environmental management framework and documentation proposed for the project.

VicRoads standard environmental protection measures for Economic Impact that would be adopted for this Project include:

- Consultation with existing land owners who would be affected by the alignment options.
- Continuous access would need to be maintained to commercial property, consistent with business operating hours.
- Traffic Management Plans (TMPs) would need to be prepared to identify, assess and appropriately eliminate, reduce or mitigate road safety hazards and would be reviewed by VicRoads prior to implementation.

Additional, Project specific controls are also proposed to reduce negative Economic Impacts include:

- Giving effect to compensation measures for loss of infrastructure, land, severance and access issues.
- Optimise intersections and access opportunities for affected properties.
- Work with businesses to optimise construction schedules.
- Provide improved signage for business destinations which are of tourism interest and to areas of business activity or local amenities in accordance with VicRoads Tourist Signage guidelines.

7.2 Operation

VicRoads may need to both install and maintain signage for business-related areas and for tourism. VicRoads would need to consider the potential access issues to agricultural businesses caused by the construction.

VicRoads would also need to provide compensation measures for existing landowners impacted by loss of infrastructure, land, severance and access issues. A second mitigation measure could be through the optimisation of intersections and access opportunities for affected properties.

7.3 Summary

Table 36 presents a summary of the mitigation measures that have been identified to avoid, reduce or minimise negative impact. The measures comprise both relevant requirements of the VicRoads standard environmental protection measures as well as the additional measures identified by this impact assessment. The aim is to achieve the relevant EES Objectives described in Section 2.

Table 36 Environmental Management Measures

Risk No.	Risk Description	Management Measures	Responsibility
E1	The Project has the potential to reduce passing trade levels for some businesses (Great Western)	Install new signage for any business areas affected by the reduction in passing trade and for creating an awareness of tourism opportunities (if new signage meets the VicRoads guidelines). Fund and undertake detailed planning for the town in conjunction with sewage works that enable additional residential development, and a marketing strategy to ensure Great Western's planned role as a wine village is realised and new residents are attracted to settle there.	VicRoads
E2	The Project would result in the loss of agricultural facilities and infrastructure, plus loss of agricultural land and severance of properties across the alignment	Compensation measures would be provided for loss of infrastructure, land, severance and access issues.	VicRoads
E3	The Project would disrupt access to agricultural businesses during its construction	Communicating with businesses would occur to optimise construction schedules	VicRoads
E4	The duplicated Western Highway would complicate access to businesses post construction	Maintain existing signage for business destinations which are of tourist interest (including wineries). Otherwise, update signage to areas of business or local amenities in accordance with VicRoads Tourist Signage guidelines	VicRoads

8. Conclusion

The Project in Section 3 between Ararat and Stawell seeks to improve safety and improve the efficiency of freight by designing for High Productivity Freight Vehicles.

The Economic Impact Assessment is one study which informs a broader and comprehensive EES for the Project.

The findings indicate that, subject to the implementation of management controls, the economic impacts of the Project could be mitigated substantially through appropriate interventions. The mitigation of some business impacts would also positively impact the local tourism industry.

The value of direct loss of productive agricultural land and severance of properties across the proposed alignment is estimated to be $1.3 M. The value of loss for agricultural facilities has been estimated in excess of $1 M, which could be mitigated to a large degree by a suitable level of compensation to existing landowners.

The impact to non-agricultural businesses in terms of access impediments pre and post construction has been estimated at up to $100,000. The loss of passing trade for businesses has also been estimated to be in the region of $100,000 - $1 M.

There would be an additional impact to employment as a result of the Project, with the creation of up to 1,536 FTE jobs over the construction profile of the Project, plus up to 2,856 indirect FTE jobs.

The economic impact assessment study outlined in this report found that the likely costs and benefits associated with the Project resulted in a BCR of 0.60. Such BCRs are common for rural highway upgrades because of the high cost involved for long corridors.

9. References

This report draws on information from a range of documents and sources, including but not limited to:

- Ararat Rural City (2009), *Economic Development Strategy 2009-2012,* available at http://www.ararat.vic.gov.au/
- Ararat Rural City, *Ararat Renewable Energy Park* (information sheet), available at http://www.ararat.vic.gov.au/
- Australian Bureau of Statistics (2009). *Average weekly earnings*, June 2009, cat. no. 6302.0, ABS, Canberra;
- Australian Bureau of Statistics, *2006 Census Data*
- Australian Bureau of Statistics, *National Regional Profile 2005-2009*, available at http://abs.gov.au
- Australian Transport Council (2006). *National Guidelines for Transport System Management in Australia*, Canberra;
- Austroads (2004). *Road Safety Engineering Risk Assessment – Stage 1;*
- Austroads (2008). *Guide to Project Evaluation, Part 4: Project Evaluation Data*, AGPE04/08, Sydney;
- Department of Transport, Victoria (2008) *The Victorian Transport Plan* available at http::/transport.vic.gov.au;
- Department of Transport and Regional Services (2007) 2007 Melbourne – Perth Corridor Strategy – Building our National Transport Future, available at http://www.infrastructure.gov.au/transport/publications/files/Melbourne_Perth_Corridor_Strategy.pdf
- Great Southern Rail (2011), timetable and service information, available at http://www.gsr.com.au last accessed 15 July 2011
- Infrastructure Australia (2008). *Outline of Infrastructure Australia's Prioritisation Methodology*, Sydney;
- Network Planning Consultants Pty Ltd and Essential Economics Pty Ltd (2002), *Beaufort and Avoca Industrial Land Strategy*
- Network Planning Consultants Pty Ltd and Essential Economics Pty Ltd for Pyrenees Shire (2005), *Beaufort and Avoca Industrial Land Strategy, Supplementary Review,* available at http://www.pyrenees.vic.gov.au/Your_Council/Publications/Strategic_Plans
- Northern Grampians Shire, *Industry Snapshots – Manufacturing, Tourism (2008),* available at www.grampiansforgrowth.com.au
- Pyrenees Shire, *Pyrenees Shire Growth and Development Strategy 2010-14,* available at http://www.pyrenees.vic.gov.au/Your_Council/Publications/Strategic_Plans
- Tourism Research Australia, Department of Resources, Energy and Tourism, *Regional Expenditure,* available at http://www.ret.gov.au

- Tourism Victoria (2005), *Concept Proposals for Tourism Development in Victoria,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2006), *Victoria's Aboriginal Tourism Development Plan 2006-2009,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2008), *Victoria's Nature-Based Tourism Strategy 2008-2012,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2008), *Regional Tourism Action Plan 2008-2011,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2006), *10 Year Tourism and Events Industry Strategy* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2010), *10 Year Tourism and Events Industry Strategy: Progress report,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2011), *Tourism Victoria's Regional Marketing and Development Plan 2011-2012,* available at http://www.tourism.vic.gov.au/
- Tourism Victoria (2011), Visitation Statistics – Domestic and International, and Economic Value of Tourism, available at http://www.tourism.vic.gov.au/
- *Transport Integration Act 2010,* available at http:://transport.vic.gov.au;
- TTF Australia (2005), Victorian Tourism Employment Atlas, available at http://www.ttf.org.au/
- Victorian Department of Planning and Community Development (2008). *Victoria in Future 2008 - One Page Profiles – Regional*;
- Victorian Department of Transport (2008). *Guidelines for Cost-Benefit Analysis*, Victoria;
- Victorian Department of Transport (2009). *Transport Demand Information Atlas for Victoria 2009 - Volume 2: Regional Victoria*.
- Victorian Golf Association Annual Report 2001, 2003, 2004, 2005, 2007, 2009, 2010,

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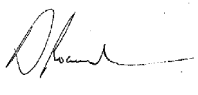
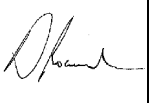
Final	Tomas Nohel Mende Gorgievski Marianne Stoettrup Ray Phillips	David Rolland		David Rolland		5/11/12