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WESTERN VICTORIA TRANSMISSION NETWORK

LOCAL ECONOMIC IMPACT ASSESSMENT

MOORABOOL SHIRE COUNCIL | FEBRUARY 2021

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VERSION

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ACRONYMS

AOI	Area of Interest	NTNDP	National Transmissions Network Development Plan
ABS	Australian Bureau of Statistics	MSS	Municipal Strategic Statement
AEMO	Australian Energy Market Operator	MW	Megawatt
ANZSIC	Australia New Zealand Standard Industry Classification	PACR	Project Assessment Conclusions Report
BMID	Bacchus Marsh Irrigation District	PADR	Project Assessment Draft Report
CHMP	Cultural Heritage Management Plan	PSCR	Project Specification Consultation Report
CBA	Cost Benefit Analysis	REZ	Renewable Energy Zone
DELWP	Department of Environment, Land, Water and Planning	RIT-T	Regulatory Investment Test for Transmission
DER	Distributed Energy Resources	TNSP	Transmission Network Service Provider
DTF	Department of Treasury and Finance	TRA	Tourism Research Australia
EES	Environmental Effects Statement	VAPR	Victorian Annual Planning Report
EIA	Economic Impact Assessment	VRET	Victoria Renewable Energy Targets
NER	National Electricity Rule	WIN	Western Irrigation Network

GLOSSARY OF TERMS

Direct Impacts	Direct output or value of development or construction activity.
Employment	Represents the number of people employed by businesses / organisations in each of the industry sectors in a defined region. Employment data presented in this report is destination of work data. That is, no inference is made as to where people in a defined region reside. This employment represents total numbers of employees without any conversions to full-time equivalence. Retail jobs for instance represent typical employment profiles for that sector, i.e. some full time, some part time and some casual.
Indirect Impacts	As output increases, so too does employment and wages and salaries paid to local employees. Part of this additional income to households is used for consumption in the local economy which leads to further increases in demand and output region. The increased output generated by servicing industry sectors in response to the direct change in output and demand.
Output	Represents the gross revenue generated by businesses / organisations in each of the industry sectors in a defined region. Gross revenue is also referred to as total sales or total income.

EXECUTIVE SUMMARY

The Western Victoria region has been identified as a preferred location to accommodate an upgraded transmission network to address a constrained renewable energy transmission system. Although a specific alignment has not been nominated, the Area of Interest shows that the project will broadly connect transmission infrastructure from near Stawell and Ararat in Western Victoria to metropolitan Melbourne and will traverse through Moorabool Shire.

Th purpose of this assessment is to identify and assess a range of local economic benefits and disbenefits that could accrue in Moorabool Shire that have not been previously been considered as part of the project's Regulatory Investment Test for Transmission (RIT-T) process.

RIT-T PROCESS

A review of the RIT-T and associated documents has led to the following findings:

- The RIT-T does not appear to consider costs or benefits outside the electricity market.
- The RIT-T process selects a preferred option on the basis of net direct electricity market benefit and does not take into account any local, indirect or non-market impacts (positive or negative).
- The capital costs considered include construction, operation, maintenance, regulatory costs and easements. It is apparent that no other costs are considered such as non-market economic, social and environmental impacts.
- The benefits assessed include price benefits to electricity consumers and the profitability of energy production and subsequent flow to business. It is apparent that no other benefits are considered, including non-market economic impacts.

Given the significant scale of the project and the prospect of a wide range of local, indirect and non-market impacts, consideration should also be given to local economic, environmental and social effects such as those assessed in a typical business case and cost benefits analysis.

When comparing the key elements and scope of the RIT-T process with the Victorian Department of Treasury and Finance's (DTF) Cost Benefit Analysis (CBA) guidelines, the key differences between the two approaches are:

- The RIT-T considers electricity market stakeholders only. A CBA requires identification of all stakeholders who will be affected.
- The RIT-T only considers economic effects. A CBA considers economic, social and environmental effects.
- A CBA considers a much broader range of costs and benefits.

STRATEGIC & ECONOMIC CONTEXT

Economic and strategic findings that are relevant to this impact assessment are as follows:

- Moorabool's economy is driven by agriculture, population service industries, tourism and state significant natural resources. These industries make up more than 80% of local employment and generate approximately two-thirds of the Shire's annual output.
- These industries are fundamental to the function and productivity of the local economy – any short term disruptions or ongoing impacts to these industries would have a material effect on the broader Moorabool economy.
- State and regional planning and economic strategies point to Moorabool playing an increasingly important role in accommodating population growth, especially around Bacchus Marsh. Major urban growth is proposed in several precincts.
- Various strategies and policies identify the importance of lifestyle and the natural environment to population attraction and visitation, including the importance of the region's environmental assets and landscapes to the economy.

ECONOMIC IMPACT FRAMEWORK

Table S1 summarises the benefits and disbenefits assessed in this report, along with the likely stakeholders and industries that would be impacted:

- Positive impacts and benefits are shown in **green;**
- potential negative impacts and disbenefits shown in **red**; and
- Impacts which are neutral or expected to be negligible in scale are shown in **grey**.

The project will directly impact several elements of the Moorabool economy which are both existing areas of specialisation and sectors targeted for investment and growth for the benefit of the municipality, region and state.

In the absence of a proposed alignment, it is not possible to seek to specifically quantify or explain the expected impacts in detail at this point, however it is clear from this analysis that significant economic value is at risk of being impacted by the project at the local level.

It is important that the energy market benefits of the project are considered alongside the many economic disbenefits that will take place locally, given that these were not addressed in the RIT-T process.

TABLE S1 ECONOMIC IMPACT FRAMEWORK, WESTERN VICTORIA TRANSMISSION NETWORK

No.	Benefit / Disbenefit	Impacted industries	Impact area, timeframe and indicative scale	Values impacted or at risk ($)
PROJECT IMPACTS				
1	Energy sector benefits to consumers and producers, including long term benefits associated with greater renewable energy production.	Energy consumers and producers.	National Ongoing High	RIT-T estimates a net market benefit of $80m.
2	Direct construction benefit of project construction	Specialised construction and engineering and associated supply chain elements.	State-wide Short term High	$364 m construction cost across project.
3	Ongoing employment and activity generated by project, such as opportunities for local technicians, trades and suppliers (mainly maintenance).	Engineering, construction	Local Ongoing Low	Not available in RIT-T
AGRICULTURE				
4	Direct loss of land for farming purposes due to construction, acquisition and easements.	Agriculture Property	Local Ongoing Moderate	Agriculture is a sector of local specialisation and further investment potential. Sector generates $295m output, $206m export value (33% of the Shire's exports) and 800 jobs. Up to 330ha will be needed within easements, impacting up to 100 farms.
5	Reduced efficiency, productivity and competitiveness of affected agricultural properties due to new physical and property barrier.	Agriculture	Local Ongoing Moderate-high	
6	Short term disruptions to business trade during the construction period (e.g. construction on farmland/agricultural businesses)	Agriculture Others (depending on alignment)	Local Short term Moderate	

TOURISM AND NATURAL RESOURCES

7	High potential for negative impact on natural amenity and views (depending on alignment) which would directly conflict with the tourism brand and reasons for visit which are based on scenic values and nature-based assets.	Tourism, hospitality, events, accommodation, retail.	Local Ongoing High	Tourism is a sector of local specialisation and investment potential at the state and local levels. 442,000 visitors per annum generate $141 million in output p.a. and supports 891 jobs.
8	Indirect benefits of project construction, including demand for accommodation and hospitality.	Accommodation, property (mainly rentals), retail and hospitality	Local Short term Moderate	Not available in RIT-T
9	Neutral impact on local energy production and earth resources.	Earth resources Energy production	N/A	Earth resources is an industry of specialisation and high export value. Energy production is a growth sector for the state.

URBAN ENVIRONMENT AND PROPERTY

10	High potential for a decrease in the attractiveness of towns to future residents relative to current conditions, at least in areas proximate to or in view of the transmission lines. Implications for population attraction and retention, property values and businesses relying on population-led demand.	Population-service industries Property	Local Ongoing Moderate	Population service industries account for 57% of local jobs (4,484) and 43% of annual output ($976m). Population growth is a state objective for Bacchus Marsh and will support labour force growth in the area.
11	Urban growth area land may be impacted depending on the ultimate alignment, including developable area, efficient development and investment value. A material reduction in land supply available for new housing will have implications for housing availability, choice and affordability across eastern Moorabool and potentially also western Melbourne.	Property Construction Housing consumers	Local and regional Ongoing Moderate	Urban growth areas have potential to accommodate in the order of $5bn in construction activity and contribute to the region's supply of housing, supporting state-wide planning objectives, needs and affordability.

Source: Urban Enterprise 2020.

1. INTRODUCTION

1.1. BACKGROUND

The Western Victoria region has been identified as a preferred location to accommodate an upgraded transmission network to address a constrained renewable energy transmission system. Western Victoria is an attractive location for new renewable generation, due to the quality of renewable energy resources (namely wind and solar), however the transmission infrastructure in the region is insufficient to allow unconstrained access to all the new generation seeking to connect to it.

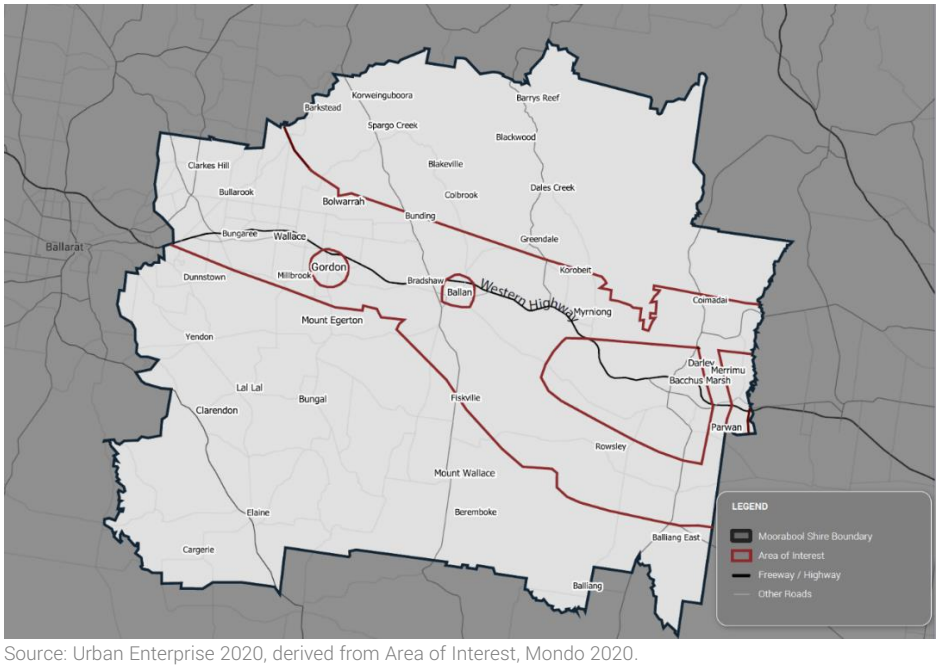
The Western Victoria Renewable Integration Project was initiated in April 2017 by the Australian Energy Market Operator (AEMO) to address the transmission network limitations in Western Victoria. In December 2019, Mondo was awarded the project by AEMO to design, procure, construct, own and operate. The project will consist of:

- 75 km of 500 kV double circuit transmission lines;
- 115 km of 220 kV double circuit transmission lines;
- A new terminal station at north of Ballarat with 2 transformers;
- Reconfiguration of existing network with new 220 kV transmission lines at Waubra and Elaine Terminal Stations; and
- The installation of reactive compensation at Sydenham and the new Terminal Station.

Although a specific alignment has not been nominated, an Area of Interest shows that the project will broadly connect transmission infrastructure from near Stawell and Ararat in Western Victoria to metropolitan Melbourne and will traverse through Moorabool Shire. The AOI is a broad geographical investigation area used to understand existing constraints and opportunities to determine a preferred alignment.

The Moorabool Shire Area of Interest (AOI) is shown in Figure 1. The design, route and location of the new infrastructure, including transmission lines will be determined once community engagement and detailed environmental, heritage and social investigations have been completed. The AOI for Moorabool Shire excludes the townships of Gordon, Ballan and Bacchus Marsh, as shown in Figure 1.

F1. TRANSMISSION NETWORK AREA OF INTEREST, MOORABOOL SHIRE



Source: Urban Enterprise 2020, derived from Area of Interest, Mondo 2020.

1.2. ENGAGEMENT, PURPOSE & SCOPE OF WORK

Moorabool Shire Council engaged Urban Enterprise to complete an independent local economic impact assessment of the above-ground Transmission Network that is proposed to travel east-west through Moorabool Shire. The purpose of the assessment is to identify and assess a range of economic benefits and disbenefits that have not been previously been considered as part of the process which could arise from the project.

The scope of this assessment includes the following:

- Review the Regulatory Investment Test for Transmission (RIT-T) - Review the AEMO's Project Assessment Draft Report (PADR) to understand the approach, methodology and assumptions that were adopted for the RIT-T. Critically review the economic and cost benefit assessment to identify impacts (benefits/disbenefits) that were excluded/overlooked in the methodology.
- Literature review & case study assessment - Undertake a literature review to identify examples of Transmission and other major infrastructure economic impact assessments that could be applied to the case example in Western Victoria. Summarise the methodologies that have been adopted in the past, and types of benefits/disbenefits that are commonly assessed.
- Economic profile of Moorabool Shire & the Area of Interest - Complete an economic profile of Moorabool Shire and the area of interest (i.e. the impact area) to understand the economic specialisations and the scale of economic activity (e.g. output, export value & jobs) that is at-risk of being impacted.
- Economic impact and benefit framework - prepare a framework that outlines at a high-level the suite of benefits and disbenefits that could be expected in the impact area and Moorabool Shire.

1.3. INFORMATION SOURCES

The following technical reports, assessments and data sets have been reviewed and referenced in this report:

- Project Specification Consultation Report (PSCR), April 2017
- Projects Assessment Draft Report (PADR), December 2018.
- Project Assessment Conclusion Report (PACR), July 2019
- RIT-T and RIT-D Application Guidelines, Australian Energy Regulator, 2017
- National Electricity Rules, Australian Energy Market Commission (AEMC)
- Long Form Business Case Guidance, Victorian Department of Treasury and Finance, 2017
- Moorabool Economic Development Strategy, Geografia, 2015
- Grow West Land Suitability Analysis of the Shire of Moorabool, Victorian Government Department of Primary Industries Landscape Systems, 2006
- Moorabool Industrial Areas Strategy, SGS Economics and Planning, 2015
- Moorabool Small Towns and Settlement Strategy, 2016
- ANZSIC industry and economic indicators for Moorabool Shire, Remplan Economy, 2019
- Census of Population, Housing and Employment, Australian Bureau of Statistics (ABS), 2016.

2. REGULATORY INVESTMENT TEST

2.1. OVERVIEW

The National Electricity Rules (NER) state that the Australian Energy Market Operator (AEMO) is required to provide information about network limitations and identify potential options to address these limitations. The process used to assess the market benefits of potential options is the Regulatory Investment Test for Transmission (RIT-T). The RIT-T is an economic cost-benefit analysis used to assess and rank different electricity transmission investment options. Its purpose is to identify the investment option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market.

Urban Enterprise reviewed the Regulatory Investment Test for Transmission (RIT-T) prepared by the Australian Energy Market Operator (AEMO) for the Western Victoria Renewable Integration project. The purpose of the review is to understand and summarise the approach and methodology that was used for the RIT-T and to identify market and non-market impacts (both positive and negative) that may have been excluded.

The exercise undertaken by Urban Enterprise does not constitute a detailed peer review of the RIT-T, but rather a summary of the overall approach and information across key stages of the process and an assessment of the other impacts, benefits and disbenefits that are not within the scope of the RIT-T.

2.2. WESTERN VICTORIAN TRANSMISSION NETWORK APPROVALS PROCESS

Table 1 provides an overview of the approvals process that is required for the Western Victoria Transmission Network. The RIT-T has been completed and an Environmental Effects Statement (EES) is underway. The Victorian Department of Environment, Land, Water and Planning is coordinating the EES process.

Whilst the primary focus of the EES is to identify and consider the key impacts on the environment, the process also presents the opportunity to identify and assess environmental issues that have a relationship and flow-on impact to the economy. This includes the following issues which are identified in the scope of the EES for this project:

- "impacts on visual and landscape values"; and
- "other effects on land uses and the community".

The EES is an important opportunity for Moorabool Shire Council to provide input into the approvals process regarding the local impacts of the proposal.

T1. OVERVIEW OF THE APPROVALS PROCESS

STEP	Regulatory Investment Test for Transmission *(completed)*	Environmental Effects Statement (EES) *(underway)*	Statutory Approvals
OVERVIEW	Identify network limitations and potential options to address these limitations. Assess the market benefits of potential options through the Regulatory Investment Test for Transmission (RIT-T). The RIT-T is an economic cost-benefit analysis used to assess and rank different electricity transmission investment options. Its purpose is to identify the investment option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market.	Conduct technical studies and undertake stakeholder consultation. An EES describes a project and its potential environmental effects. It should enable stakeholders and decision-makers to understand how the project is proposed to be implemented and the likely environmental effects of doing so. The minister identified the following key matters and environmental risks that the EES should investigate and document: • alternative corridors, alignments, site locations, designs or other options for the planning, construction or operation of the project; • potential effects on biodiversity, including loss, degradation or fragmentation of habitat; • effects on Aboriginal and historic cultural heritage values; • impacts on visual and landscape values; and • other effects on land uses and the community.	The project will require a range of approvals under Victorian legislation. DELWP coordinates the EES process including approvals procedures, consultation and public notice requirements, and the planning approval process. The key approvals known to be required under Victorian legislation are: • approved cultural heritage management plans (CHMPs) under the Aboriginal Heritage Act 2006; and • planning approvals under the Planning and Environment Act 1987 for use and development of land and associated matters across six planning schemes (Northern Grampians, Pyrenees, Hepburn, Ballarat, Moorabool and Melton).

Source: Regulatory investment test for transmission application guidelines, Australian Energy Regulator, 2017 / Environmental Effects Statement, Department of Environment, Land, Water and Planning, 2020

2.3. OPERATION & APPLICATION OF THE RIT-T

The process used to assess the market benefits of potential options is the Regulatory Investment Test for Transmission (RIT-T). The RIT-T is an economic cost-benefit analysis used to assess and rank different electricity transmission investment options. Its purpose is to "identify the investment option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market".

According to the RIT-T application guidelines (2017), A RIT-T should include the following key steps:

1. Identify a need for the investment (known as the identified need)
2. Identify the base case and a set of credible options to address the identified need. A credible option is an option (or group of options) that:
    - addresses the identified need
    - is (or are) commercially and technically feasible, and
    - can be implemented in sufficient time to meet the identified need
3. Identify a set of reasonable scenarios that are appropriate to the credible options under consideration
4. Quantify the expected costs of each credible option
5. Quantify the expected market benefits of each credible option—calculated over a probability weighted range of reasonable scenarios
6. Quantify the expected net economic benefit of each credible option and identify the preferred option as the credible option with the highest expected net economic benefit.

Some of the critical elements of the RIT-T are discussed below.

2.3.1. CREDIBLE OPTIONS

The RIT-T guidelines state that a credible option may include a decision rule or policy specifying not just an action or decision that will be taken at the present time, but also an action or decision that will be taken in the future, if the appropriate market conditions arise.

Under clause 5.15.2(b) of the National Electricity Rules, in applying the RIT-T, a Transmission Network Service Provider (TNSP) must consider all options that could reasonably be classified as credible options, taking into account:

- Energy source;
- Technology;
- Ownership;
- The extent to which the credible option enables intra-regional or inter-regional trading of electricity;
- Whether it is a network or non-network option;
- Whether the credible option is intended to be regulated;
- Whether the credible option has a proponent; and
- Any other factor which the TNSP reasonably considers should be taken into account.

The Australian Energy Regulator (AER) is of the view that a TNSP has considered a sufficient number and range of credible options where the number of credible options being assessed regarding a particular identified need is proportionate to the magnitude of the likely costs of any credible option.

Therefore, if the TNSP reasonably estimates that the costs arising from any one of several credible options orientated towards meeting is $50 million, the TNSP should consider a larger number and range of credible options than if the estimated cost was $10 million.

2.3.2. COSTS

Costs are defined in the RIT-T as the present value of the direct costs of a credible option. The determination of costs include:

- Costs incurred in constructing or providing the credible option;
- The operating and maintenance costs over the operating life of the credible option; and
- The costs of complying with any mandatory requirements in relevant laws, regulations and administrative requirements.

2.3.3. MARKET BENEFITS

The total benefit of a credible option includes the change in:

- Consumer surplus, which is the difference between what consumers are willing to pay for electricity and the price they are required to pay; and
- Producer surplus, which is the difference between what electricity producers and transporters are paid for their services and the cost of providing those services (excluding the costs of the credible option).

The RIT-T needs to be based on a cost benefit analysis which includes "an assessment of reasonable scenarios of future supply and demand if each credible option were implemented compared to the situation where no option is implemented". The two scenarios assessed, include:

- A state of the world with the credible option in place, and
- A state of the world in the base case.

In essence, a RIT-T assesses and compares the expected market benefits of electricity production and consumption of each credible option relative to each other and the existing situation.

2.4. THE RIT-T PROCESS FOR THE WESTERN VICTORIA RENEWABLE INTEGRATION

As outlined in clause 5.16.4 of the NER, the RIT-T process involves the publication of three reports:

- The first report (the PSCR) seeks feedback on the identified need and credible options to address the need.
- The second report (the PADR) identifies and seeks feedback on the preferred option which delivers the highest net market benefit and the other issues addressed in the report.
- The third and final report (the PACR) concludes the preferred option.

For the Western Victoria Renewable Integration project, the AEMO completed the RIT-T process following these steps:

- Project Specification Consultation Report (PSCR), April 2017 - Provides information about potential network limitations in Western Victoria and potential options to address these limitations.
- Projects Assessment Draft Report (PADR), December 2018 – Assesses a number of options based on expected market benefits, as well as capital and operational expenditure.
- Project Assessment Conclusion Report (PACR), July 2019 - confirms the initial investment plans proposed in the preceding report, to improve transmission capacity.

Urban Enterprise has undertaken a preliminary review of the PSCR and the PADR to understand and summarise the key findings and the approach and methodologies that were used to underpin the recommendation for the preferred credible option.

2.4.1. PROJECT SPECIFICATION CONSULTATION REPORT, APRIL 2017

AEMO prepared the Project Specification Consultation Report (PSCR) to identify potential network limitations in Western Victoria and potential options to address these limitations.

AEMO's 2016 Victorian Annual Planning Report (VAPR) and 2016 National Transmission Network Development Plan (NTNDP) identified that there is a high level of interest in renewable generation connection in the Western Victoria area, further emphasised by the proposed Victorian Renewable Energy Target (VRET). The target proposes that 25% of energy generation in Victoria will come from renewable sources by 2020, and 40% by 2025. This is expected to deliver up to 1,500 megawatts (MW) of additional large-scale renewable generation by 2020, and 5,400 MW by 2025.

2.4.2. PSCR FINDINGS

The following key findings are provided in the PSCR in respect of the need for the Western Victoria Transmission Network:

- The current transmission network in Western Victoria is constrained by thermal limitations, which may result in inefficiencies that could result in higher prices for electricity for consumers.
- System strength in Western Victoria is low due to the electrical distance (i.e. network impedance) between local terminal stations in Western Victoria and connected synchronous plant.
- Without network investments to improve system strength, the 3,000 megawatt (MW) of new renewable generation may still be constrained or disconnected, even after investments to improve network thermal capacity have been carried out.
- More than 3,000 megawatt (MW) of new renewable generation may be constructed in Western Victoria as a result of the Victorian Government's VRET target.
- There is a need to increase the capability of the Western Victoria power system in order to reduce constraints on projected renewable energy generation in that region.

2.4.3. POTENTIAL OPTIONS

The PSCR identified five potential broad-based network and non-network options that could address the transmission constraints. They are as follows:

1. Minor network augmentations – refers to minor line upgrades to remove rating limiting station equipment, and to enable wind monitoring. This option would not fully remove constraints on the worst affected lines but could be deployed quickly.
2. New 220 kV transmission capacity – 220 kV transmission capacity gradually added to the worst congested parts of the network, as new generation becomes committed.
3. New 275 kV or 330 kV transmission capacity – 275 kV or 330 kV transmission capacity added from Buronga Terminal Station to Red Cliffs Terminal Station, if the New South Wales transmission network between Buronga to Darlington Point is upgraded, and if a new South Australia to New South Wales interconnector is built.
4. New 500 kV transmission capacity – 500 kV transmission capacity may be required to increase new generation connection capacity, and to align with long-term transmission development plans identified in the ISP.
5. Non-network options – non-network options to increase transmission network capacity will need to increase local demand (for example by battery charging or demand shifting) during periods when thermal constraints are binding due to high generation.

Derived from the above, the subsequent Projects Assessment Draft Report (PADR) provides a number of credible options for the Western Victorian Renewable Integration. The credible options that could be pursued can be a

combination of network and non-network options. The PADR provides a cost-benefit analysis for each credible option in order to recommend a preferred option that provides maximum net benefits.

2.5. PROJECTS ASSESSMENT DRAFT REPORT, DECEMBER 2018

The Project Assessment Draft Report (PADR) marks step two of the consultation process for the RIT-T. The report recommends the preferred option which delivers the highest net economic benefit to all those who produce, consume or transport electricity in the market.

2.5.1. METHODOLOGY

The modelling undertaken for the RIT-T is based on least-cost development of the Victorian electricity network to meet the identified need. The methodologies in the RIT-T are based on relevant regulatory requirements and the assumptions are consistent with the 2018 Integrated System Plan (ISP), which are required in the NER "to maintain and improve power system security."

AEMO used "market dispatch modelling" to estimate the market benefits associated with the credible options where the 'base case' (state of the world) is assessed against each 'credible option case'. The 'state of the world' is essentially a description of the National Energy Market outcomes expected in each case, and includes the type, quantity, and timing of future generation, storage, and transmission investment, as well as the market dispatch outcomes over the modelling period.

The PADR primarily uses two market models to deliver its key outputs:

- Capacity outlook model – determines the most cost-efficient long-term trajectory of generator and transmission investments and retirements to maintain power system reliability. Two variants exist and were used in the analysis
- Time-sequential model – carries out an hourly simulation of generation dispatch and regional demand while considering various power system limitations, generator forced outages, variable generation availability, and bidding models. This model validates insights on power system reliability, available generation reserves, emerging network limitations, and other operational concerns.

The PADR states that modelling was undertaken via Siemens PSS®E software, which is used to examine the engineering parameters of the identified need and the credible options. According to Siemens, the SS®E software is used for a variety of analysis functions, including high-performance transmission planning.

We note that information about the modelling software and associated inputs and assumptions are not available in the documents reviewed.

2.5.2. ASSUMPTIONS

An overview of the assumptions adopted for the Western Victorian Renewable Integration RIT-T as detailed in the PADR are outlined below.

Analysis Period

The RIT-T analysis has been undertaken over the period from 2020-21 to 2031-32.

Discount Rate

A base discount rate of 6% has been used in the NPV analysis, for all credible options. Sensitivity testing was conducted on a lower rate of 3.5% and an upper rate of 8.5%.

Reasonable Scenarios

The NER requires the RIT-T to be based on a cost-benefit analysis that includes an assessment of reasonable scenarios of future supply and demand of each credible option. A reasonable scenario represents a set of variables or parameters that are not expected to change across each of the credible options or the base case.

The four reasonable scenarios include:

1. Neutral – central projections of economic growth, future demand growth, fuel costs, technology cost reductions, and distributed energy resources (DER) aggregation growth.
2. Neutral with storage initiatives – all the scenario settings of the Neutral scenario, combined with the proposed Snowy 2.0 and Battery of the Nation pumped hydro storage projects, and associated augmentations of the transmission network.
3. Slow change – compared with the Neutral scenario, assumed weaker economic and demand consumption growth, lower levels of investments in energy efficiency, slower uptake of electric vehicles, slower cost reductions in renewable generation technologies, and greater aggregation of DER.
4. Fast change – compared with the Neutral scenario, assumed stronger economic and demand growth, higher levels of investments in energy efficiency, faster uptake of electric vehicles, faster cost reductions in renewable generation technologies, and less aggregation of DER.

All scenarios assumed existing market and policy settings including:

- Emissions trajectories: reduce emissions to 28% on 2005 levels by 2030.
- VRET: 25% renewables by 2020 and 40% by 2025.
- Queensland Renewable Energy Target (QRET): 50% renewables by 2030.

Demand

The RIT-T applies the same regional electricity demand projections as the 2018 ISP.

A review of the ISP found that planning for future energy supply has regard to forecast changes in average demand, the timely retirements of existing supply resources, and the economic profile and other attributes of new supply resources, including storage resources. Demand projections have regard to the following:

- Demand forecasts – underlying demand for power (at consumers' power points) is projected to increase, due to population and economic growth.
- Schedule of generation retirements – a schedule outlining when existing generation plant reaches expected end of technical life and retires is a key input to the ISP. The assumed retirement timing of a significant proportion of the coal-fired generation fleet is a dominant driver for future planning of the power system.
- Cost projections for supply – the cost components of conventional generation and the cost and performance of renewable generation and energy storage are key inputs to the ISP. Changes in these input costs are also forecast over the plan period, projecting trends observed over recent years and expected cost reductions over time based on the maturity and potential of the technology.
- Transmission development options – a wide range of potential upgrades to the national transmission grid were designed and costed by AEMO and the TNSPs.
- Policy assumptions –modelled under policy directives current at time of modelling. The approach was to model the lowest-cost approach in the context of current federal and state government policies.

We note that the PADR outlines the demand factors that are considered as part of the projections modelling, but does not provide specific inputs, assumptions and/or calculations.

2.5.3. CREDIBLE OPTIONS ASSESSED

There are four broad categories of credible network options that were assessed:

- Category A: Minor network augmentations.
- Category B: 220 kV network augmentation only.
- Category C: 500 kV and 220 kV network augmentation.
- Category D: Red Cliffs to Buronga network augmentation

The preferred option is a combination of Option A1 and Option C2. A high-level summary of the potential options to pursue is provided in Table 2.

Each credible options includes an estimated cost. Estimated costs include the following:

- Construction cost to build the transmission lines (includes project management, administration and overheads);
- Cost of easements;
- Operating costs;
- Maintenance costs; and
- Regulatory costs.

T2. COST & NET MARKET BENEFITS (NPV) OF CREDIBLE OPTIONS

Option	Description	Cost $M (2018-19, PV)	Weighted net market benefit ($M)
A1	Minor augmentations for the Red Cliffs to Wemen to Kerang to Bendigo; and Moorabool to Terang to Ballarat 220 kV transmission lines.	$5.2	$1
B2	• Construction of a new 220 kV double circuit line from Moorabool to Elaine to Ballarat to Bulgana to Horsham. • Retire Ballarat to Moorabool 220 kV circuit No. 1 and cut in Ballarat to Moorabool 220 kV circuit No. 2 at Elaine.	$314	$14
B3	• Construction of a new 220 kV double circuit line from Moorabool to Elaine to Ballarat to Bulgana. • Retire Ballarat to Moorabool 220 kV circuit No. 1 and cut in Ballarat to Moorabool 220 kV circuit No. 2 at Elaine.	$263	$67
B4	• Rebuild existing Moorabool to Elaine to Ballarat to Bulgana single circuit 220 kV transmission line as a 220 kV double circuit transmission line. • Cut in Ballarat to Moorabool 220 kV circuit No. 2 at Elaine.	$275	$57
C1	• Construction of a new 500 kV double circuit line from Sydenham to Ararat. • Cut in Ballarat to Moorabool 220 kV circuit No. 2 at Elaine.	$323	$64
C2 (preferred)	• Construction of a new 500 kV double circuit line from Sydenham to Ballarat. • Construction of a new 220 kV double circuit line from Ballarat to Bulgana. • Cut in Ballarat to Moorabool 220 kV circuit No. 2 at Elaine.	$364	$79
D1	• Construction of a new 220 kV double circuit line from Red Cliffs to Buronga (operated as a single circuit initially), and a 400 MVA 330/220 kV transformer at Buronga	Refer to SAET RIT-T	Refer to SAET RIT-T
E1	Battery at Ararat Terminal Station	$117	-$76

Source: Western Victoria Renewable Integration, Project Assessment Draft Report, December 2018

It should be noted that the cost estimates for the different types of credible options were estimated in the following ways:

1. Minor network augmentations – costs were obtained from AusNet Services.
2. Network options – the cost of each option was estimated by requesting quotes from three different vendors, and AusNet Services, for transmission line works, which are the main cost component.
3. Non-network options – the cost estimates were derived from the ISP's modelling assumptions.

The construction costs above have an accuracy of ±30% and the cost of easements was estimated on the basis of estimated land values. We note that the approach to calculating land values and the cost of easements was not provided in the PADR.

2.5.4. OTHER OPTIONS CONSIDERED

Beyond the credible options assessed, the AEMO identified a number of alternative options. These were not regarded as credible options and therefore did not form part of the RIT-T. The PADR concluded that these options would not address the identified need or would not be technically or commercially feasible. These other options consisted of:

- Re-stringing the existing single circuit transmission lines;
- Building a double circuit line and stringing one circuit initially;
- Building a new transmission cable entirely underground;
- Build a 275 kV transmission line from Horsham;
- Augmentation to Haunted Gully Terminal Station;
- Transmission augmentation from Horsham Terminal Station to Red Cliffs Terminal Station; or
- High voltage direct current (HVDC) option.

The alternative options section in the PADR does not provide a link to the conclusions for capital costs and anticipated market benefits. For example, the only statement that accompanies the potential option of building a new transmission cable underground is as follows:

> *"this option is expected to cost up to 10 times more per kilometre than overhead lines, and is not expected to deliver net market benefits." (p. 30)*

2.6. URBAN ENTERPRISE FINDINGS

A review of the RIT-T and associated documents has led to the following findings that should assist Moorabool Shire Council in understanding, communicating and responding to the economic considerations forming part of the assessment of this project:

1. The RIT-T for the project follows the guidelines set by the National Electricity Rules. These rules only require a RIT-T to "identify the investment option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market."
2. The capital costs considered include construction, operation, maintenance, regulatory costs and easements. It is apparent that no other costs are considered such as economic, social and environmental (discussed on the following page).
3. The benefits assessed include price benefits to electricity consumers and the profitability of energy production and transportation to business. It is apparent that no other benefits are considered such as economic benefits associated with the construction phase (these are discussed later in the report).
4. Many details of the economic analysis underpinning the RIT-T findings – particularly details of the cost benefit analysis of credible options –are not disclosed in the reports. This prevents a thorough review and verification of the content of the analysis.
5. Of what can be ascertained from the information, wide variations in capital costs are considered possible, given that a cost variance of ±30% is adopted. Such variations would clearly influence the ultimate cost-benefit relationship established in the RIT-T.
6. It is unclear how land values were derived to estimate the cost of easements required under each option, especially given that a specific alignment has not been determined. It is also apparent that no costs are included relating to indirect land value impacts as a result of the project.
7. The RIT-T does not appear to consider costs or benefits outside the electricity market. In this sense, the RIT-T process selects a preferred option purely on the basis of net direct electricity market benefit and does not take into account any local, indirect or non-market impacts (positive or negative).

Given the significant scale of the project and the prospect of a wide range of local, indirect and non-market impacts, it is our view that any subsequent approvals process – such as the EES process – should have close regard to these impacts that are yet to be considered.

In the following section, we provide a comparison of the RIT-T scope and process against the standard approach to Cost Benefit Analysis required for public infrastructure projects in Victoria.

COMPARISON OF RIT-T AND CBA APPROACHES

Table 3 provides a comparison of the key elements and scope of the RIT-T and The Victorian Department of Treasury and Finance's (**DTF**) Cost Benefit Analysis (**CBA**) guidelines.

The Guidelines state that for Business Cases, a CBA should *"identify welfare impacts on society, both costs and benefits, for each project option – these impacts include both market and non-market specific impacts in the areas previously described as social, environmental and economic"* (p.10)[1].

The key differences between the two approaches are:

- The RIT-T considers electricity market stakeholders only. CBA requires identification of all stakeholders who will be affected.
- The RIT-T only considers economic effects – CBA considers economic, social and environmental effects.
- CBA considers a much broader range of costs and benefits.

The differences are summarised in Table 3.

T3. KEY DIFFERENCES BETWEEN THE RIT-T & BUSINESS CASE/COST BENEFITS ANALYSIS

Item	Regulatory Investment Test for Transmission	Business Case & Cost Benefit Analysis
Purpose	An economic cost-benefit analysis that is used to assess and rank different electricity transmission investment options. Its purpose is to identify the investment option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the market.	Its purpose is to define the problem and identify/assess a number of solutions to address the problem. Outline and evaluate economic, social and environmental benefits and disbenefits that would be delivered. Identity and assess the range of stakeholders who will be affected and how.
Market and/or non-market benefits/disbenefits	Considers market benefits and disbenefits only.	Considers market and non-market benefits and disbenefits. Examples of economic impacts include value-add, productivity, workforce participation, unemployment and investment. Outline the social and economic impacts and opportunities of the proposal and identify any significant social issues specifically relevant to particular project options.
Stakeholders / beneficiaries considered	Producers, transporters and consumers of energy.	Business, consumers/individuals and government. These groups may be broken down into sub-groups where there are likely to be differential effects from a proposed measure.
Types of costs and benefits	**Costs** include capital, operational and ongoing maintenance costs associated with the physical infrastructure. **Benefits** include cost benefits to consumers as it relates to the cost of production, stability of energy supply and potential cost of outages.	**Costs** include capital costs, operational costs, impacts on production, transportation or marketing procedures, license fees or other government charges, higher input costs, cost of delays, time costs, cost of legal/consultancy fees, cost of compliance and other measures. **Benefits** include increased efficiency and productivity, lower prices for goods and services, improved safety, ability to take advantage of economies of scale, reduction in workplace accidents and injuries, greater access to information, as well as higher output, employment, export value and value-add.

Source: Cost Benefit Analysis (CBA) guidelines and Business Case Template, The Victorian Department of Treasury and Finance, 2014 & 2017

[1] Long Form Business Case Guidance, Victorian Department of Treasury and Finance, 2017

2.7. CASE STUDY ASSESSMENT

To assist with identifying the types of non-market benefits and disbenefits that could be caused by the project, an assessment of case examples of transmission networks and other major infrastructure projects was undertaken.

The literature review found that there are very few transmission network projects with publicly available information relevant to this project, such as economic impact assessments, business case reports, journal articles or press releases. As a result, the scope of the search was broadened to include other major infrastructure projects with similar characteristics, such as major roads (e.g. freeways, highways) and large-scale renewable energy projects (e.g. solar and wind farms).

The following case examples were identified as the most comparable and relevant to the Western Victorian Transmission Network:

- Eastern Link Transmission Line, New South Wales and Queensland, Australia;
- Western Highway Road Project, Victoria, Australia; and
- Newlands Transmission Lines, Wellington, New Zealand.

These examples are recognised as the most comparable in terms of project size and scale, the types of impacts and scale of impact area. A summary of case examples is provided in Appendix A.

2.7.1. EASTERN LINK TRANSMISSION LINE, ARMIDALE (NSW) TO SPRINGDALE (QLD)

Project: Installation of a high voltage dual transmission line from Springfield to Armidale (not constructed)
Location: Springfield to Armidale, Queensland and northern New South Wales.
Year: 1993 to 1995
Lead agency: Australian Federal Government
Relevant documentation: Parliamentary inquiry and Senate Committee established to investigate the benefits/disbenefits of the project raised through community consultation.

The Eastern Link Transmission Line project proposed to establish high voltage transmission lines between Armidale, New South Wales and Springdale, Queensland in 1993-95. The project proposed to connect the Queensland electricity grid with the south eastern states via a high voltage dual transmission line.

The Commonwealth strongly supported the extension of electricity transmission links between the states on the basis of increasing the level of competitiveness among power authorities. However, there was widespread opposition to the project by local communities along the proposed route. In 1995, the Australian Senate referred the following matters to the Senate Economics References Committee for inquiry:

1. The possible impact of the powerline and the accompanying land resumptions on:
    - The health of people and animals in surrounding areas with particular reference to the likely effects of electromagnetic field radiation;
    - The vegetation and overall environment; and
    - The social fabric and local economic viability of surrounding communities, including the likely loss of agricultural land.
2. The overall economic impact of the powerline.

The key findings of the Senate Committee that are relevant to the proposal for Western Victorian Transmission Line are summarised on the following page.

Health and Electromagnetic Fields

The potential health effects of electromagnetic fields was of the most concern to the community. In response, the committee noted that:

- There is research that is both in support of and against the notion that high voltage power lines may cause health effects in people living near them.
- The Committee was unable to totally dismiss the possibility that there may be adverse effects. Similarly, the Committee was unable to conclude that a definite link between high voltage power lines and adverse effects on human health exists.
- The Committee agreed that the concept of 'prudent avoidance' should continue to be practiced by government and power authorities.
- The Committee acknowledged that there are some difficulties with it as a policy with practical application. Firstly, people who own land through which high voltage power lines traverse may have difficulty in 'prudently avoiding' those lines while carrying out the normal activities that their farming enterprise requires. Secondly, there are currently no guidelines for what 'prudent avoidance' means.

The Committee concluded that, in the case of Eastlink, 'prudent avoidance' should mean siting the line as far as possible from houses, outbuildings and other farm facilities.

Social and Local Economic Impact

Agricultural and farming property owners were concerned that the position of the line would have a detrimental impact on the efficient operation of their businesses through interference with facilities and with aerial agriculture. **The Committee recommended that any detrimental impact on farm operations should be the subject of compensation.**

The report noted that Eastlink had prepared an initial assessment of impact on the real estate market for properties along the Western corridor. In addition, it was noted that property values along the corridor could be reduced by the advent of the powerline.

Regional economies may feel a flow-on effect from the stagnation of the rural real estate market and the unwillingness of property owners in general to make any further capital investment in the properties. The visual impact of the power line may also affect regional tourism.

The power authorities noted that real estate devaluations sometimes occur when a power line is first proposed, but suggested that the market typically regains its previous level at some stage after the power line has been completed. The Committee noted that this information does not help property owners who want to sell now or who are planning to sell in the near future.

The Committee concluded that if the power authorities are confident that the property market will return to normal once the Eastlink proposal was complete, they should purchase at pre-Eastlink valuation; for any property that was on the market and did not achieve a sale due to speculation about Eastlink.

2.7.2. WESTERN HIGHWAY DUPLICATION, WESTERN VICTORIA

Project description: Establish an additional lane to create a dual carriageway in each direction for 33km stretch of Highway between Beaufort and Ararat.
Location: Ballarat City, Pyrenees Shire, Ararat Rural City and Northern Grampians Shire
Year: 2012
Lead agency: Major Road Projects Victoria
Supporting documentation: Economic Impact Assessment (EIA), Benefit Cost Assessment (BCA) prepared by GHD

This project proposed to duplicate the Western Highway by adding an additional lane to create a dual carriageway in each direction between Beaufort and Ararat. The Economic Impact Assessment (EIA) provides analysis of existing conditions in relation to employment, land transport infrastructure, agricultural conditions, industrial land supply and tourism.

The assessment identified some of the likely benefits, including direct and indirect employment, construction employment and flow-on effects for businesses and industries serving the construction industry and labour force.

Some of the issues and disbenefits that were raised included:

- Reduced agricultural activity;
- Impacts on infrastructure;
- Direct land loss;
- Lowered aesthetic values; and
- Potential damage to natural assets (e.g. wetlands and trees).

2.7.3. NEWLANDS TRANSMISSION LINES, WELLINGTON, NEW ZEALAND

Project description: Transmission lines in Newlands, Wellington, New Zealand
Location: Newlands, Wellington, NZ
Year: 2000
Supporting documentation: The Impact of Transmission Lines on Property Values: Coming to Terms with Stigma Massey University NZ, Property Management Journal, 2002

This project proposed to establish two transmission lines in Newlands in Wellington, New Zealand. A research paper was completed to investigate the impact of the two transmission lines on residential property values for affected landowners. The study specifically assessed the impacts of transmission pylons on residential properties, as it was too difficult to ascertain the distance between transmission lines and residential properties. The paper also summarised results of a questionnaire that was sent out to residents in the study area, to understand resident perceptions of transmission pylons.

The research paper found that having a pylon close to a residential property could negatively impact house prices by 20% (if a residential property were within a 10 to 15 metre distance from the pylon) and decreasing to 5% when within 50 metres. The questionnaire results indicated that the main areas of concern for residents in relation to decreasing property values related to visual and noise amenity impacts, and health and safety concerns.

2.8. KEY FINDINGS

A range of local, non-market or indirect benefits and disbenefits have been identified through assessments of relevant case study projects. The most common impacts assessed are summarised in Table 4.

The table shows that the local, non-market or indirect benefits associated with major infrastructure projects such as transmission networks mostly relate to short term impacts during the construction period. This includes the potential use of local technicians and trade workers to assist with the construction and maintenance of the physical infrastructure. Similarly, the flow-on impacts of the transient workforce required to build the infrastructure, often provides a strong yet temporary surge in demand for local accommodation, hospitality and retail businesses. It is important to note that these benefits are largely limited to the construction period, and generally do not endure beyond the construction period.

The local, non-market and indirect disbenefits identified in the case study projects comprise a mix of short term disruptions and longer term or ongoing impacts to landowners, residents and specific businesses/industries.

T4. EXAMPLES OF NON-MARKET BENEFITS & DISBENEFITS

Benefits	Disbenefits
Construction industry sector impacts stimulated by capital investment (e.g. short term increase in construction and jobs).	Reduction in land values caused by easements (direct land loss), visual amenity impacts and negative health perceptions.
Flow on-impact for rental properties, commercial accommodation and retail, food services sector as transient workers support higher occupancy rates, rents and revenue for service businesses over the construction period.	Negative impacts on certain business and industry specialisations caused by infrastructure dissecting landholdings (e.g. productive agricultural land, nature-based tourism assets)
Opportunities for local technicians, trades and suppliers - large construction projects typically make use of local labour for smaller project components and maintenance tasks, as well as other supply chain impacts during construction.	Impacts to the attraction and retention of population due to amenity and perception changes, resulting in the subsequent loss of future economic benefits (e.g. household spending). Population loss can be caused by an erosion of scenic values through visual amenity impacts and negative health perceptions associated with transmission lines (e.g. radiation from electromagnetic fields)
	Short term disruptions to business trade during the construction period (e.g. construction on farmland/agricultural businesses)

Source: Case Study Assessment (see Appendix A), Urban Enterprise.

3. STRATEGIC AND ECONOMIC CONTEXT

3.1. OVERVIEW

Economic impact and benefit assessments must have close regard to the 'base case' prior to any project being delivered. For the purposes of this engagement, the base case relates to the strategic and economic context for the Moorabool Shire economy and community, both now and into the foreseeable future.

This section provides an overview of the strategic planning and economic priorities for the Shire, including the identified opportunities for growth. This section also profiles Moorabool Shire's economy to identify the economic and industry specialisations, as well as the strategic assets and unique attributes of the Shire that are considered critical to its current economic role.

3.2. CURRENT ECONOMIC PROFILE

Moorabool Shire has an estimated population of 32,000 people and accommodates close to 8,000 local jobs. In 2019, the Shire's economy's Gross Regional Product was $1.3 billion and generated $2.3 billion in economic output and exported goods and services with a total value of $620 million.

T5. MOORABOOL SHIRE'S ECONOMY – HEADLINE INDICATORS, 2019

Population	Gross Regional Product	Annual Output	Local Jobs	Export Value
31,820	$1.30 billion	$2.31 billion	7,882	$620 million

Source: Remplan Economy, 2019.

The Moorabool Planning Scheme identifies that the Shire's economy is primarily based on natural resources and agricultural activities. The Shire's key economic drivers and industry specialisations include:

- Agriculture (agribusiness and primary production), which is mostly concentrated to productive and versatile areas outside of the townships, as well as designated agribusiness and irrigation precincts. Agricultural activities include broad acre cropping, grazing and intensive horticulture in the Bacchus Marsh Irrigation District.
- State significant natural resources - Moorabool Shire is rich in earth resources such as coal and sand. The Darley / Coimadai sand quarries and the coal mine at the Maddingley Waste and Resource Recovery Hub are key drivers of the sector in Moorabool.
- Tourism industry driven by domestic visitation to nature-based attractions and activities, food and wine, arts, heritage and cultural attractions and town centres.
- Population service industries such as construction, professional services, retail, food services, health services and education. These are mostly confined to the Shire's urban areas.

INDUSTRY SPECIALISATIONS

Table 6 summarises the annual output, employment and export value by industry sector in Moorabool. The results provide further evidence of the key drivers and specialisations across the Shire's economy. Key observations include the following:

- In aggregate, population service industries account for 57% of local jobs (4,484) and 43% of annual output ($976m);
- Agriculture, resources and extractive industries account for 46% of the Shire's exports ($284m), 13% of jobs (993) and 18% of annual output ($412m); and
- The tourism, accommodation and food services industry includes 891 local jobs and generates $141 million in annual output (6%).

Together, these industries make up more than 80% of local employment and generate approximately two-thirds of the Shire's annual output. Agriculture and extractive industries make up almost half of the Shire's annual export value. These industries are fundamental to the function and productivity of the local economy – any initial disruptions or ongoing impacts to these industries would have a material impact on the broader Moorabool economy.

T6. JOBS, OUTPUT & EXPORT VALUE ($M), ANZSIC INDUSTRIES, MOORABOOL SHIRE, 2019

Industry Sector	Jobs		Output ($m)		Regional Exports ($m)	
Construction	1,003	12.7%	$431.20	19%	$104.11	17%
Education & Training	964	12.2%	$122.90	5%	$29.28	5%
Health Care & Social Assistance	964	12.2%	$127.30	6%	$2.32	0%
Agriculture, Forestry & Fishing	796	10.1%	$295.50	13%	$206.67	33%
Retail Trade	683	8.7%	$80.30	3%	$4.51	1%
Accommodation & Food Services	458	5.8%	$60.70	3%	$13.47	2%
Tourism	433	5.5%	$80.60	3%		
Transport, Postal & Warehousing	405	5.1%	$100.70	4%	$57.06	9%
Professional, Scientific & Technical Services	388	4.9%	$106.20	5%	$4.32	1%
Public Administration & Safety	384	4.9%	$74.00	3%	$1.81	0%
Manufacturing	331	4.2%	$204.90	9%	$88.71	14%
Other Services	308	3.9%	$43.50	2%	$1.02	0%
Administrative & Support Services	176	2.2%	$40.40	2%	$4.04	1%
Mining	130	1.6%	$75.20	3%	$67.45	11%
Arts & Recreation Services	113	1.4%	$19.90	1%	$3.32	1%
Rental, Hiring & Real Estate Services	96	1.2%	$58.00	3%	$9.83	2%
Wholesale Trade	93	1.2%	$37.70	2%	$6.14	1%
Electricity, Gas, Water & Waste Services	67	0.9%	$40.80	2%	$9.64	2%
Financial & Insurance Services	61	0.8%	$45.10	2%	$5.28	1%
Information Media & Telecommunications	24	0.3%	$13.10	1%	$1.35	0%
Ownership of Dwellings	5	0.1%	$255.80	11%		
Total	**7,882**	**100%**	**$2,313.70**	**100%**	**$620.33**	**100%**

Source: Remplan Economy, 2019
Key: Blue is population service industries, red is agriculture, resources & extractive industries, purple is tourism industries

3.3. STRATEGIES AND GROWTH

STATE GOVERNMENT PLANNING STRATEGIES

Plan Melbourne (2017) is the State Government's strategic plan to guide Victoria's growth to 2050, providing guidance for the future development of metropolitan and peri-urban areas, and also providing direction for Regional Victoria.

Outcome 7 of the Plan relates to Regional Victoria and includes strategic directions and policy that is relevant to Moorabool Shire. The Plan states that growth in peri-urban areas will attract about 32% of Regional Victoria's population to 2031. The Plan identifies that as traditional economic delineations change, economic linkages between Regional Victoria and Melbourne will become increasingly important. The priority industries for Regional Victoria's future are identified as agriculture, energy and resources, tourism, health and education.

Plan Melbourne also states the following in respect of economic and employment growth in the State's peri-urban areas: *"Maintain a strong, dynamic economy and employment base by building on the comparative advantages in agriculture, timber, transport, tourism, education, manufacturing, the service industry and commerce."*

Outcome 7 of the Plan relates to regional Victoria and includes the following direction and policy relevant to urban Moorabool Shire:

- Direction 7.1: Invest in regional Victoria to support housing and economic growth
  - Policy 7.1.2 Support planning for growing towns in peri-urban areas.

Plan Melbourne states that:

> *"A number of towns in peri-urban areas have capacity for more housing and employment-generating development without impacting on the economic and environmental roles that surrounding non-urban areas serve. Those towns include …Bacchus Marsh… Other towns identified by Regional Growth Plans as having potential growth include …. Ballan." (p.131)*
>
> *"Peri-urban towns can provide an affordable and attractive alternative to metropolitan living." (p.131)*

Plan Melbourne (2017) recognises that Bacchus Marsh and Ballan are peri-urban towns with potential to accommodate additional residential and housing growth in the future. Importantly, the Shire provides a gateway and economic link to regional areas further west, including the Regional City of Ballarat.

The Victorian Planning Authority is working with Moorabool Shire to plan for several new urban growth areas around Bacchus Marsh, including Parwan Station and Merrimu precincts. Council is also planning for other growth areas in the municipality, including Hopetoun Park North and Ballan South.

The official state government population forecasts project strong population growth in excess of 2% per annum, resulting in approximately 14,000 new residents over the period 2021 to 2036. An alternative population scenario prepared by Id Consulting in November 2019 shows a much higher rate of growth. The alternative scenario indicates a population growth rate in the order of 3.7% per annum (AAGR) to 2036. In any case, Moorabool Shire is expected to experience strong population and housing growth over the next 15 years.

T7. POPULATION PROJECTIONS, MOORABOOL SHIRE, 2020 - 2036

Year	2021 (ERP)	2026	2031	2036	Change (2021-36)	Change (2021-36)	AAGR %
Moorabool Shire Estimate Resident Population - VIF	36,114	41,228	45,484	49,939	13,825	38%	2.2%
Moorabool Shire Estimate Resident Population - Id	35,946	40,996	50,865	61,545	25,599	71%	3.7%

Source: Victoria in Future 2019 / Id Consulting 2019

CENTRAL HIGHLANDS GROWTH PLAN, 2014

The Central Highlands Growth Plan provides a regional approach to land use planning in the Central Highlands and identifies opportunities to encourage and accommodation growth and manage change over the next 30 years. Importantly the plan identifies:

- Where future development will be supported and assessed at a regional scale;
- Environmental economic, community, and cultural assets and resources of regional significance that should be preserved, maintained or developed;
- How the region can respond to opportunities, challenges and long term drivers of changes; and
- Key regional priorities for future infrastructure planning and investment to support growth.

The vision (identified initially in the Central Highlands Regional Strategic Plan) for the Central Highlands region towards 2030 and beyond is to provide a productive, sustainable and liveable region for its people.

Key principles of relevance for this project include:

- The region's economy should be strengthened so that it is more diversified and resilient;
- The development of sustainable and vibrant communities should be supported by enhancing the level of access to key services;
- Encourage services, facilities and housing that meet the diverse needs of the community;
- Planning for growth should be integrated with the provision of infrastructure
- Encourage infrastructure that has a range of positive benefits or can support directions in the plan;
- The region's land, soil, water, and biodiversity should be managed, protected and enhanced;
- Capitalise on the region's environmental assets to improve environmental outcomes and support economic development;
- The importance of cultural heritage and landscapes as economic and community assets should be recognised;
- Recognise the economic development and liveability benefits associated with the region's cultural heritage and landscapes.

The plan highlighted that the majority of the population growth across the Central Highlands Region over the next 30 years was likely to occur in the Ballarat West Growth Area and Bacchus Marsh.

MOORABOOL SHIRE ECONOMIC DEVELOPMENT STRATEGY, 2015

The Moorabool Shire Economic Development Strategy, 2015 outlines the vision, objectives and targets for its local economy into the future. The Strategy also identifies the main characteristics of the Shire's economy, potential growth opportunities, the role of Council and how the Strategy will be monitored.

Three core economic objectives are recognised by the Strategy and are outlined below:

1. "New jobs, for local people;
2. A diverse and entrepreneurial local industry base; and
3. Facilitate the capacity and diversity of the workforce".

The EDS identifies the following 'target industries' for growth to capitalise on specialisations and competitive advantages in the municipality:

- Agri-business processing / value adding;
- Agricultural primary production;
- Professional and business services;
- Health services;
- Retail;

- Tourism (aligned with agriculture); and
- Education.

3.4. KEY FINDINGS

The following key findings are relevant to the assessment of the potential economic impact of the project:

- Moorabool's economy is driven by agriculture, state significant natural resources, tourism and population service industries. These industries make up more than 80% of local employment and generate approximately two-thirds of the Shire's annual output.
- Agriculture and extractive industries make up almost half of the Shire's annual export value. Agriculture (both primary production and processing / value-adding) is identified as a key industry for growth, alongside tourism and population services.
- State and regional planning and economic strategies point to Moorabool playing an increasingly important role in accommodating population growth, especially around Bacchus Marsh. Major urban growth is proposed in several precincts, including the Parwan Employment Precinct which is planned to accommodate substantial investment in agriculture, industry and other employment uses.
- Various strategies and policies identify the importance of lifestyle and the natural environment to population attraction and visitation, including the importance of the region's environmental assets and landscapes to the economy.

4. POTENTIAL IMPACTS IN THE AREA OF INTEREST

4.1. INTRODUCTION

This section provides an assessment of the economic activity and proposed growth and investment in the Moorabool Area of Interest which enables a preliminary assessment of the potential impacts of the Transmission project. Given that the alignment of the project is yet to be announced, this broad 'corridor' focus has been used in order to highlight the general economic values that should be considered as part of the approvals processes.

The analysis is presented spatially for three sections of the corridor:

- East Moorabool: Bacchus Marsh, Parwan, Maddingley, Darley, Merrimu and surrounds;
- Central Moorabool: Ballan, Myrniong and surrounds; and
- West Moorabool: Gordon, Wallace, Bungaree and surrounds.

MAIN AREAS OF FOCUS FOR ECONOMIC IMPACTS AND BENEFITS

The previous sections of this report identify that there are three main sectors which underpin the economy and which could be impacted by the proposal as shown in Table 8. The remaining content in this report refers to the value and potential impacts on these three main groups.

T8. MAIN AREAS OF FOCUS FOR ECONOMC IMPACTS AND BENEFITS

Economic land uses / activities	Details
Agriculture	Agricultural production is an existing strength of the economy and is identified as a growth opportunity. Importantly, there are linkages between agriculture and tourism, industry and employment growth in the Shire.
Natural assets: tourism and resource extraction	The natural assets and resources of the Shire underpin both tourism visitation (primarily through nature-based tourism) and economic activity through resource extraction. These assets provide strengths and advantages which strategies seek to capitalise on.
Urban / built environment	The urban areas of Moorabool provide a wide range of services and employment to residents, driving a significant proportion of economic activity. Population is attracted in large part due to the natural amenity of the towns. Importantly, significant population growth is projected.

Source: Urban Enterprise.

The following sub-sections provide a closer analysis of the type of economic activity, specialisation and planned growth within the Area of Interest.

4.2. AGRICULTURE

CURRENT ROLE, VALUE AND STRENGTHS

Figure 2, 3 and 4 on the following pages show the key agricultural areas and strategic assets in East, Central and West Moorabool relative to the Area of Interest. Much of Moorabool Shire consists of highly suitable and 'moderate' to 'highly productive' agricultural land.

The following comments are made regarding the existing role, value and strengths of the area:

- In West Moorabool, there are expansive areas of highly suitable agricultural land within the AOI. This area accommodates a high level of farming activity, with a mix of livestock grazing and vegetable growing.
- Outside the township of Ballan in Central Moorabool, the surrounding agricultural areas largely consist of livestock farming (sheep and cattle);
- In East Moorabool, the AOI:
  - Overlaps with the Bacchus Marsh Irrigation District (BMID), a state significant irrigation and agricultural district with fertile alluvial soils. The BMID supports most of Bacchus Marsh's agricultural production which is transported throughout Australia and internationally.
  - Overlaps with the proposed Western Irrigation Network (WIN), a major project to establish newly irrigated farming land in the Balliang area.
  - Includes land designated as the Parwan Employment Precinct, an area identified as a future economic and employment area that seeks to attract major agribusiness and industrial investment.

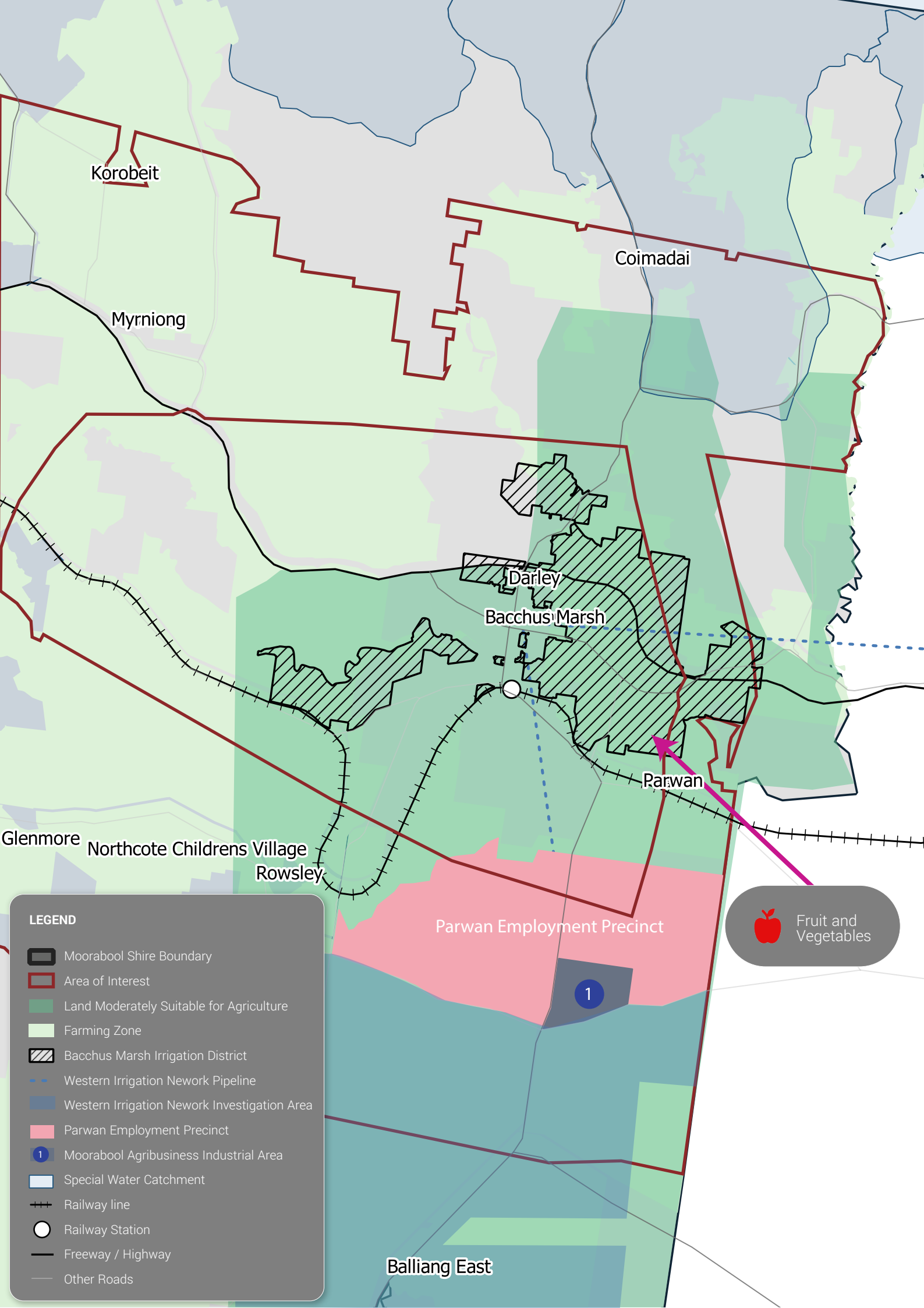
POTENTIAL IMPACTS

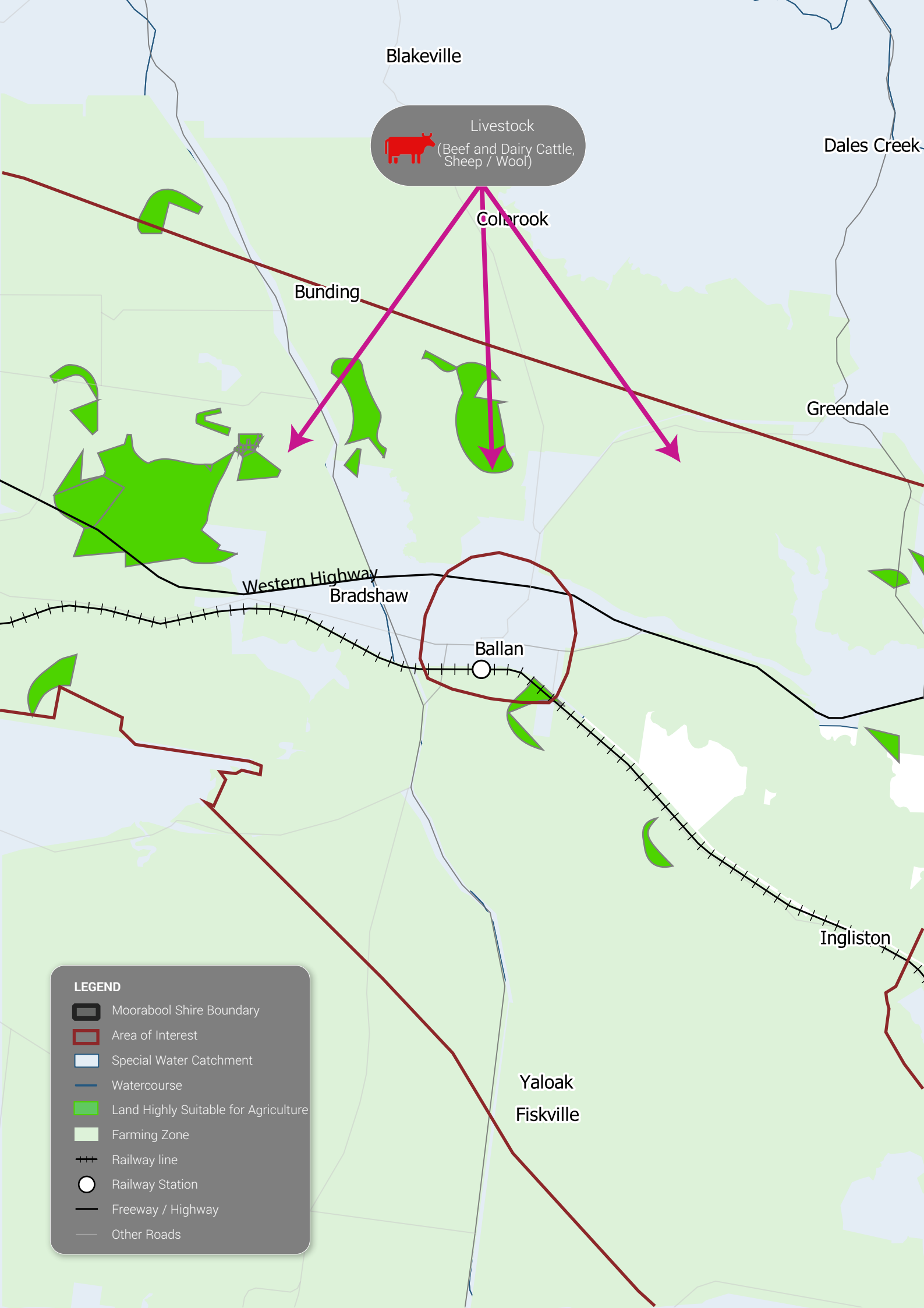
The potential impacts of a major transmission line for agricultural producers include the following:

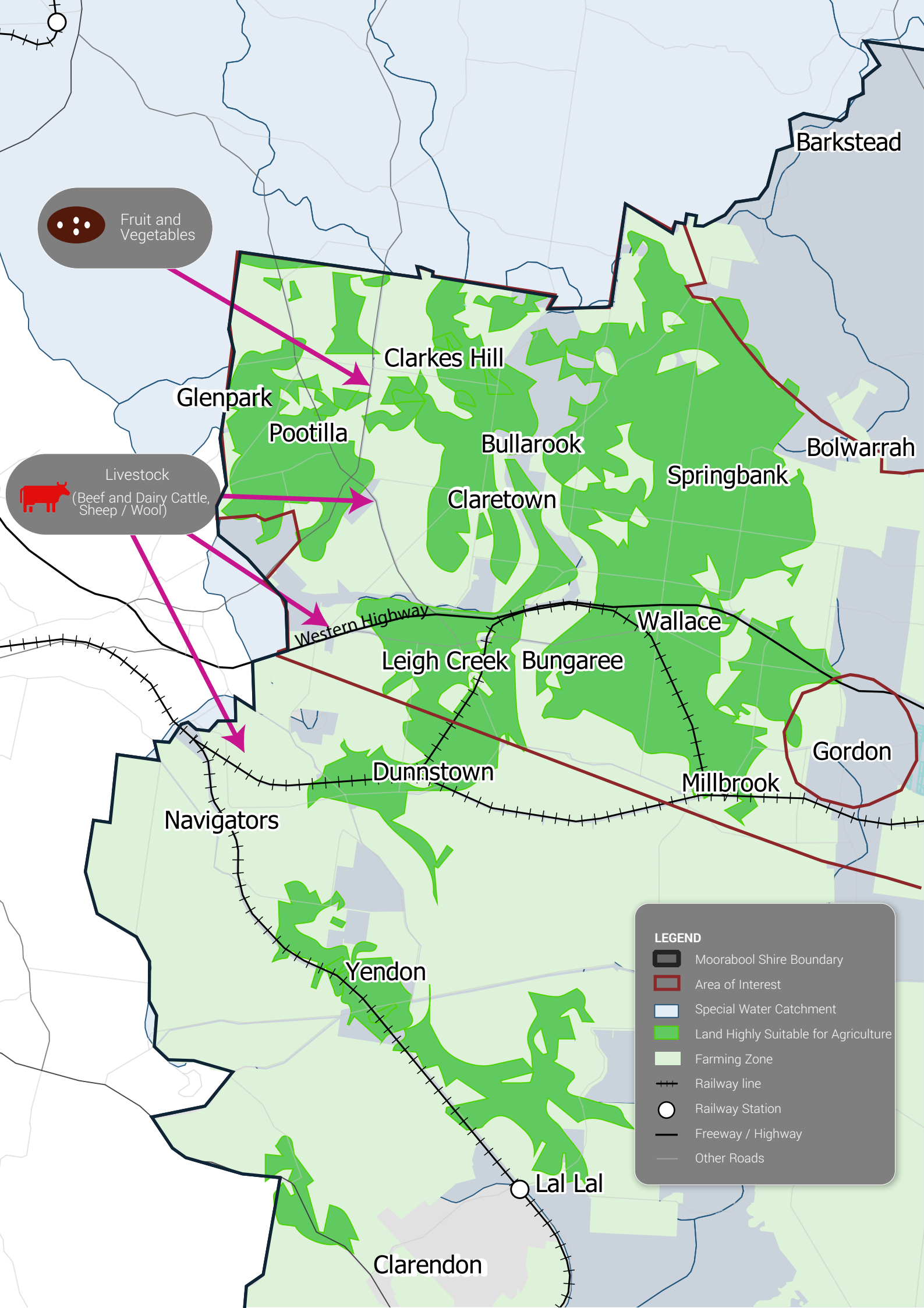
- Productive agricultural land and any associated buildings and infrastructure directly required for the transmission line (i.e. subject to acquisition or easements), resulting in lost farming income and profit. A typical easement width for a transmission line of the proposed size would be 60-70m[2], meaning that the total area of easement (and therefore direct impact) would be in the order of 330 hectares (approximate 51km width within the Shire x 65m easement width).
- Changes to the layout of existing farms and therefore changes to farm practices, resulting in potential inefficiencies and reduced competitiveness; and
- Potential limitations to the use of large scale equipment and technology, such as irrigators, in locations proximate to the transmission lines, with resulting impacts on productivity and competitiveness.
- In terms of positive impacts, no immediate benefits to the agricultural sector have been identified.

The location, scale and impact of these factors should be tested further once a proposed alignment is known.

[2] Comparison of 500 kV Overhead Lines with 500 kV Underground Cables, Moorabool Shire Council, September 2020.


Korobeit
Coimadai
Myrniong
Darley
Bacchus Marsh
Parwan
Glenmore
Northcote Childrens Village
Rowsley
Parwan Employment Precinct
Fruit and Vegetables
1
Balliang East
LEGEND
Moorabool Shire Boundary
Area of Interest
Land Moderately Suitable for Agriculture
Farming Zone
Bacchus Marsh Irrigation District
Western Irrigation Nework Pipeline
Western Irrigation Nework Investigation Area
Parwan Employment Precinct
Moorabool Agribusiness Industrial Area
Special Water Catchment
Railway line
Railway Station
Freeway / Highway
Other Roads


Blakeville
Livestock
(Beef and Dairy Cattle, Sheep / Wool)
Dales Creek
Colebrook
Bunding
Greendale
Western Highway
Bradshaw
Ballan
Ingliston
Yaloak
Fiskville
LEGEND
Moorabool Shire Boundary
Area of Interest
Special Water Catchment
Watercourse
Land Highly Suitable for Agriculture
Farming Zone
Railway line
Railway Station
Freeway / Highway
Other Roads


Barkstead
Fruit and Vegetables
Clarkes Hill
Glenpark
Pootilla
Bullarook
Bolwarrah
Springbank
Livestock
(Beef and Dairy Cattle, Sheep / Wool)
Claretown
Western Highway
Wallace
Leigh Creek
Bungaree
Gordon
Dunnstown
Millbrook
Navigators
Yendon
Lal Lal
Clarendon
LEGEND
Moorabool Shire Boundary
Area of Interest
Special Water Catchment
Land Highly Suitable for Agriculture
Farming Zone
Railway line
Railway Station
Freeway / Highway
Other Roads

4.3. TOURISM, NATURE-BASED ASSETS & NATURAL RESOURCES

Figure 5, 6 and 7 on the following pages show the tourism, nature-based assets and natural resources in East, Central and West Moorabool.

TOURISM

The tourism, accommodation and food services industry delivers significant economic benefits to the Shire, generating $141 million in annual output and supporting 891 local jobs.

On average, Moorabool attracts approximately 442,000 visitors per annum, including 364,000 (82%) domestic daytrip visitors and 78,000 (18%) domestic overnight visitors per annum. Visitation to Moorabool is increasing, with domestic day trip visitors increasing by 6% and domestic overnight visitors increasing by 27% per annum between 2015 and 2019.

The tourism and hospitality sectors have been heavily impacted by the COVID-19 pandemic due to travel restrictions, business restrictions, international and domestic border closures and general economic uncertainty. The area has an opportunity to capitalise on ongoing international travel restrictions and risks by attracting further domestic travel in the coming years.

Moorabool Shire is characterised by a diverse range of rural landscapes, which include ranges, plains, gorges, parks and forests. More than 74% of the Shire comprises of water catchments, State Forests, State Parks and a National Park. The collection of natural assets and peri-urban environment is a key attraction for lifestyle and 'tree-change' residents and visitors, particularly from metropolitan Melbourne. According to Tourism Research Australia (TRA) 27% of domestic daytrip visitors and 40% of domestic overnight visitors engage in nature-based activities such as bushwalking and hiking.

The visitor guide prepared by Daylesford Macedon Ranges Tourism begins with the following in respect of the Bacchus Marsh and Blackwood areas: "visitors are instinctively drawn to the scenic parks and cool, relatively undisturbed forests of this part of the Region." (p.121). There is a strong correlation between the natural assets of Moorabool, particularly the gorges, parks and forests, and the visitation to the area, particularly day-trip visitation from Melbourne residents.

In terms of the potential impacts of the project on this sector, the following points are relevant:

- Although the AOI does not include the major forests and parks such as Lerderderg State Park, Brisbane Ranges National Park and Werribee Gorge State Park, depending on the alignment the transmission lines are likely to be visible in several areas near these natural assets across the municipality. This would directly conflict with the tourism brand of the area and one of the key motivations to visit.
- Some hospitality tourism businesses could experience an increase in trade during the construction period, however this benefit would be temporary.

EARTH RESOURCES AND ENERGY

Moorabool Shire has an abundance of earth resources such as coal and sand. As a result, quarrying is a key economic activity in the Shire, with seven quarries operating. Main quarries include the Darley and Coimadai sand quarries and Maddingley Brown Coal. The AOI includes quarries in Coimadai and Rowsley.

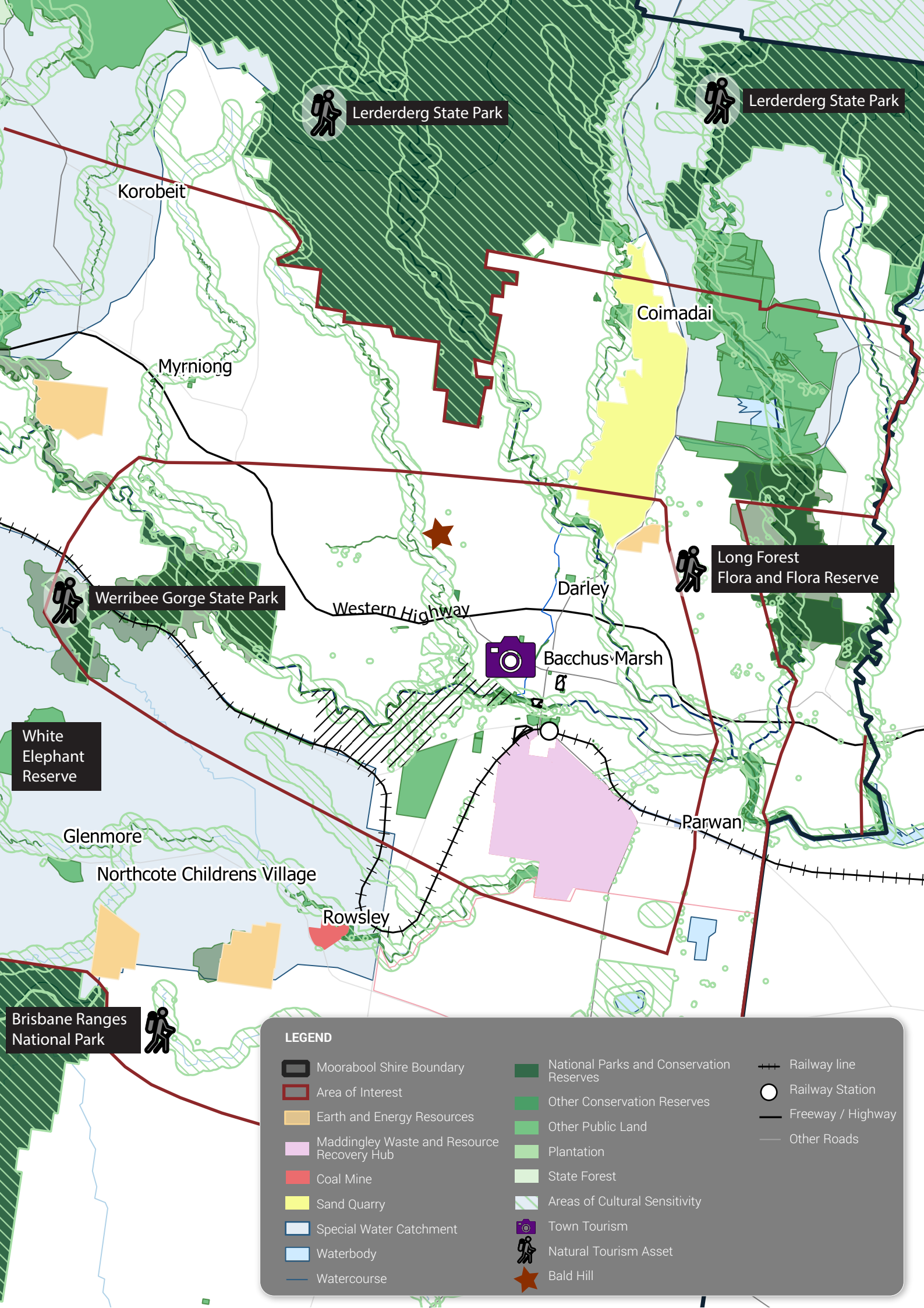
Three wind farms are operating or under construction in Moorabool Shire south of Ballan. These facilities will ultimately comprise 178 turbines. Each facility is approved, meaning that there is no direct benefit of the proposed Western Transmission Line project. The project will increase the overall capacity of the transmission network, meaning that there will be additional capacity for new renewable projects to be established over time.

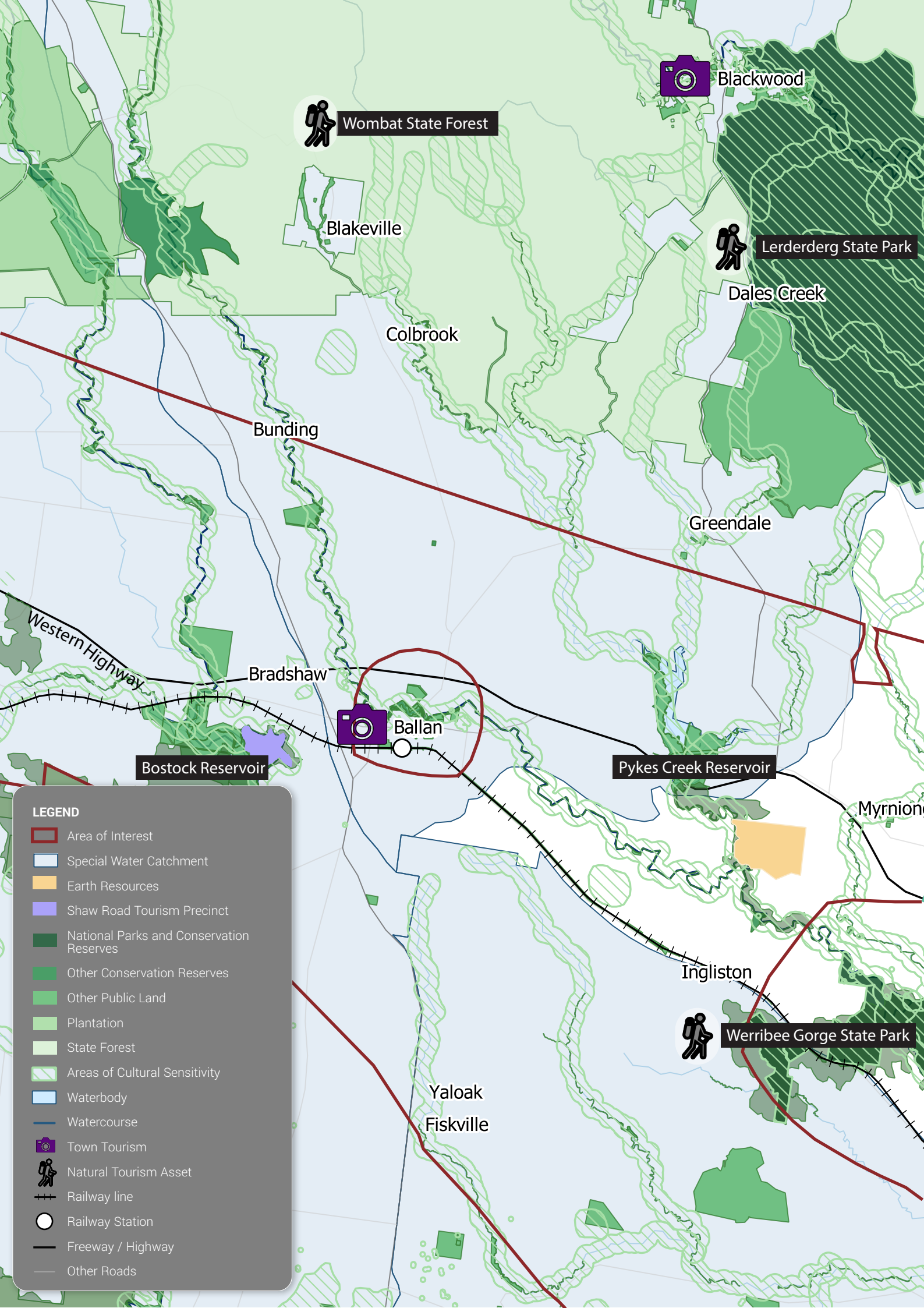
This is a potential opportunity for further energy investment in the region, including in Moorabool Shire, however the economic impacts of the wind farms to local economies are generally negligible because of the minimal labour required to operate the turbines once completed. For example, an assessment of two wind farms in south-west

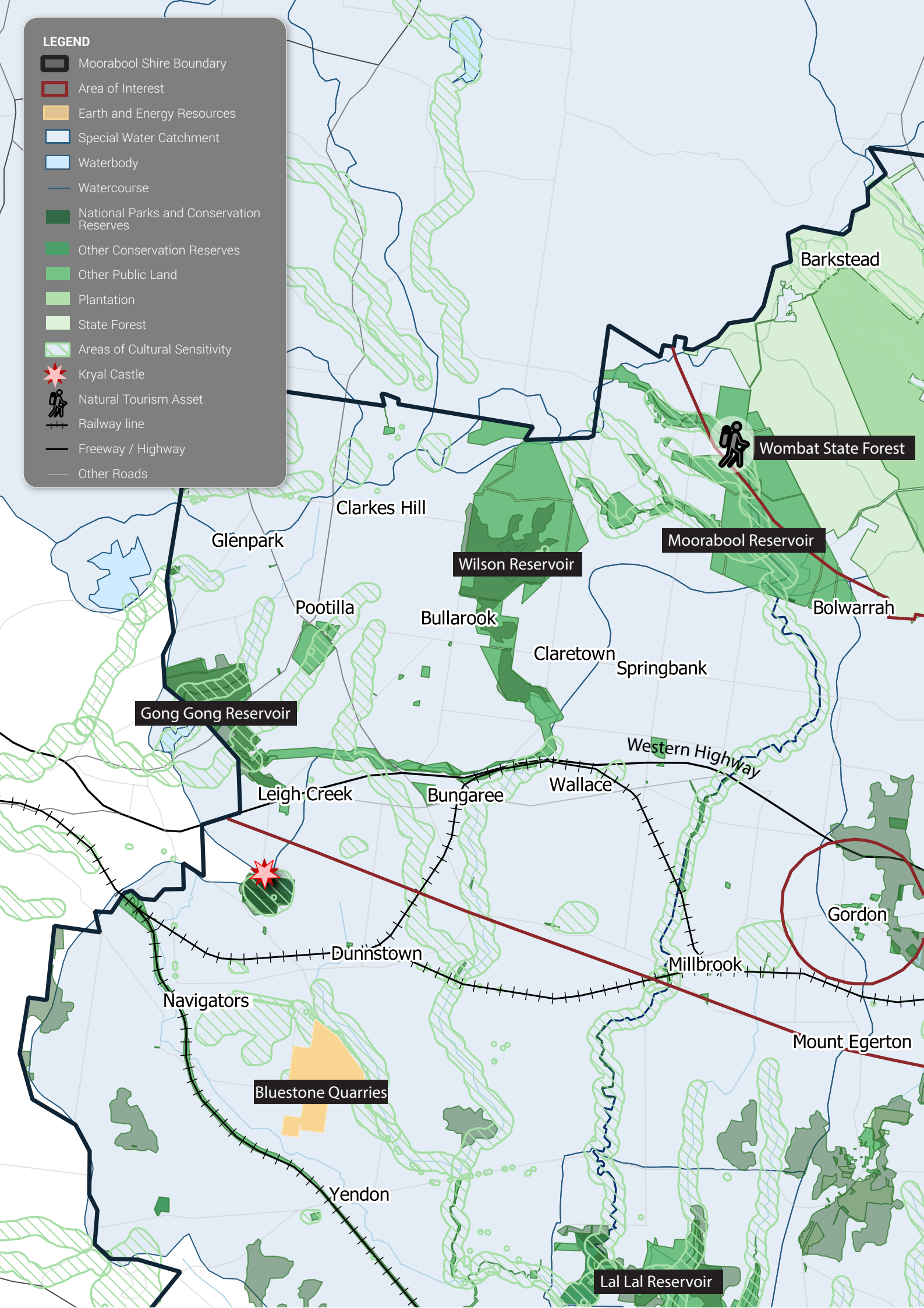
Victoria[3] found that the ongoing impact of a 32-turbine wind farm would require 4 full-time staff in the operational phase, compared with 95 direct full time jobs in the construction phase. Similarly, for a 140 turbine proposal, 17 staff would be required ongoing, compared with 478 during the construction period.

Overall, it is expected that the transmission project would not have a material impact on the earth resources and energy production sectors in the municipality, however it will be important to ensure that there would be no disruption to the ongoing resource extraction operations near Bacchus Marsh which generate substantial employment and export value.

[3] Economic impact assessment of Oaklands Hill and Macarthur wind farms, SKM, 2012.


Lerderderg State Park
Lerderderg State Park
Korobeit
Coimadai
Myrniong
Long Forest
Flora and Flora Reserve
Werribee Gorge State Park
Darley
Western Highway
Bacchus Marsh
White
Elephant
Reserve
Parwan
Glenmore
Northcote Childrens Village
Rowsley
Brisbane Ranges
National Park
LEGEND
Moorabool Shire Boundary
Area of Interest
Earth and Energy Resources
Maddingley Waste and Resource Recovery Hub
Coal Mine
Sand Quarry
Special Water Catchment
Waterbody
Watercourse
National Parks and Conservation Reserves
Other Conservation Reserves
Other Public Land
Plantation
State Forest
Areas of Cultural Sensitivity
Town Tourism
Natural Tourism Asset
Bald Hill
Railway line
Railway Station
Freeway / Highway
Other Roads


Blackwood
Wombat State Forest
Blakeville
Lerderderg State Park
Dales Creek
Colbrook
Bunding
Greendale
Western Highway
Bradshaw
Ballan
Bostock Reservoir
Pykes Creek Reservoir
Myrnion
Ingliston
Werribee Gorge State Park
Yaloak
Fiskville
LEGEND
Area of Interest
Special Water Catchment
Earth Resources
Shaw Road Tourism Precinct
National Parks and Conservation Reserves
Other Conservation Reserves
Other Public Land
Plantation
State Forest
Areas of Cultural Sensitivity
Waterbody
Watercourse
Town Tourism
Natural Tourism Asset
Railway line
Railway Station
Freeway / Highway
Other Roads


LEGEND
Moorabool Shire Boundary
Area of Interest
Earth and Energy Resources
Special Water Catchment
Waterbody
Watercourse
National Parks and Conservation Reserves
Other Conservation Reserves
Other Public Land
Plantation
State Forest
Areas of Cultural Sensitivity
Kryal Castle
Natural Tourism Asset
Railway line
Freeway / Highway
Other Roads
Barkstead
Wombat State Forest
Clarkes Hill
Glenpark
Moorabool Reservoir
Wilson Reservoir
Pootilla
Bullarook
Bolwarrah
Claretown
Springbank
Gong Gong Reservoir
Western Highway
Leigh Creek
Bungaree
Wallace
Gordon
Dunnstown
Millbrook
Navigators
Mount Egerton
Bluestone Quarries
Yendon
Lal Lal Reservoir

4.4. URBAN AREAS AND LIVEABILITY

CURRENT ROLE, VALUE AND STRENGTHS

Figure 9, 10 and 11 on the following pages show the main urban area across the municipality and the location of proposed urban growth areas (including residential and employment).

Bacchus Marsh and surrounding suburbs accommodate more than 20,000 residents and Ballan approximately 3,000 residents. These residents generate both demand and labour for a range of retail, hospitality, professional, health and education services.

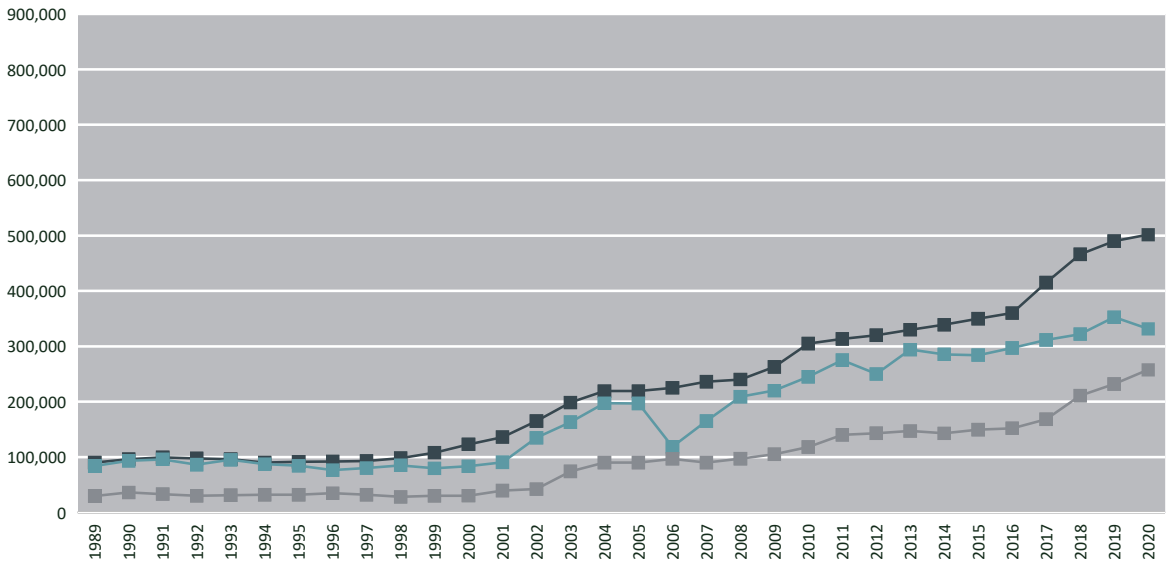
The urban centres of Bacchus Marsh and Ballan are experiencing strong growth and Council has recently completed long term strategic planning projects to identify and designate strategic areas to cater for ongoing housing and employment growth over the next 15 to 20 years. The town of Ballan is projected to more than double in population by 2036.

Beyond Bacchus Marsh and Ballan, some of the smaller towns that are located in West and Central Moorabool along the Western Highway play an important township, rural and low density living and tourism role in the Shire (e.g. Gordon, Bungaree, Wallace and Myrniong). These towns are experiencing development pressure and Council is advocating for improvements to infrastructure (particularly sewer) to enable further residential growth.

Population services represent 57% of employment in the Shire and 44% of output. It is important that the Shire's towns continue to attract and retain population to underpin demand for services and to provide labour for local businesses across a range of sectors.

Population attraction and retention also underpins stable property values and growth, an important asset base for individuals and tax base for state and local governments. The median house price across Moorabool Shire now exceeds $500,000 as shown in Figure 8.

F8. MEDIAN HOUSE, UNIT AND VACANT HOUSE BLOCK PRICES, MOORABOOL SHIRE



Source: A Guide to Property Values 2019.

The Moorabool Planning Scheme recognises the role of the natural environment in attracting residents to the Shire through the following policy notes:

- "Future population growth needs to be balanced with protection and sustainable use of the Shire's environmental assets which contribute significantly to the lifestyle and attraction of Moorabool Shire as a place to live, invest and visit." (21.01)

- "The environmental assets… as well significant waterways, historic buildings, rural townscapes, and landscapes contribute to the Shire's numerous places of natural and cultural heritage significance. These features inter-twine to form the character and lifestyle opportunities that attract people to Moorabool Shire." (21.01)
- "The communities and towns of Moorabool Shire have a very strong rural setting and character that is defined by the local agricultural base, spectacular scenic landscapes and diverse vegetation. There is a need to ensure that these values, which draw people to the area, are protected." (21.03)
- "The Shire's agricultural base and attractive rural setting are important drivers in attracting people to live in Moorabool." (21.04).

POTENTIAL IMPACTS

Although the AOI excludes the majority of existing urban land, it overlaps with all of the Shire's proposed major residential growth areas, including:

- Parwan Station;
- Merrimu;
- Hopetoun Park North;
- Parwan Employment Precinct; and
- Ballan South.

The residential precincts alone could accommodate in the order of 15,800 new lots[4]. At full development (a long term proposition), these residential precincts could generate in the order of $5bn in construction activity.[5] A significant proportion of the economic impact during the construction phase would flow to local businesses, including construction companies, trades, retail and other supply chain elements, demonstrating the economic importance of these growth areas. Further benefits of the growth areas are generated post-construction, including retail spending, labour force availability and so on.

The following potential economic impacts are relevant:

- The AOI indicates that the transmission lines could potentially be located in close proximity to several towns and urban areas throughout the Shire. If clearly visible from key towns, this would be likely to change views to rural landscapes and influence the perception of certain areas and towns to existing and new residents and visitors. Given that one of the major drivers of population attraction in Moorabool as frequently referenced in the Planning Scheme is the scenic rural setting, there is a clear risk of a decrease in the attractiveness of Moorabool's towns to future residents relative to current conditions, at least in areas proximate to or in view of the transmission lines.
- Developability and attractiveness of proposed growth areas: the various growth areas around Bacchus Marsh are designed to accommodate significant population growth and to contribute to the supply of urban land across the metropolitan and peri-urban areas of Melbourne. Any reduction in the rate at which this land can be developed due to the location or alignment of the transmission network, the efficiency with which the land can be developed, or the value of the resulting lots would result in a cost to the local economy. There would also be implications for the availability and price of housing in Melbourne's western growth corridor due to less supply being available than required to meet demand.
- Property values are primarily influenced by the balance of demand and supply for a particular product. The introduction of a transmission line in or near a residential area is likely to reduce the number of potential buyers and therefore influence property values. The extent to which this factor manifests in property prices will depend on a wide range of factors and circumstances. Some researchers have sought to quantify this

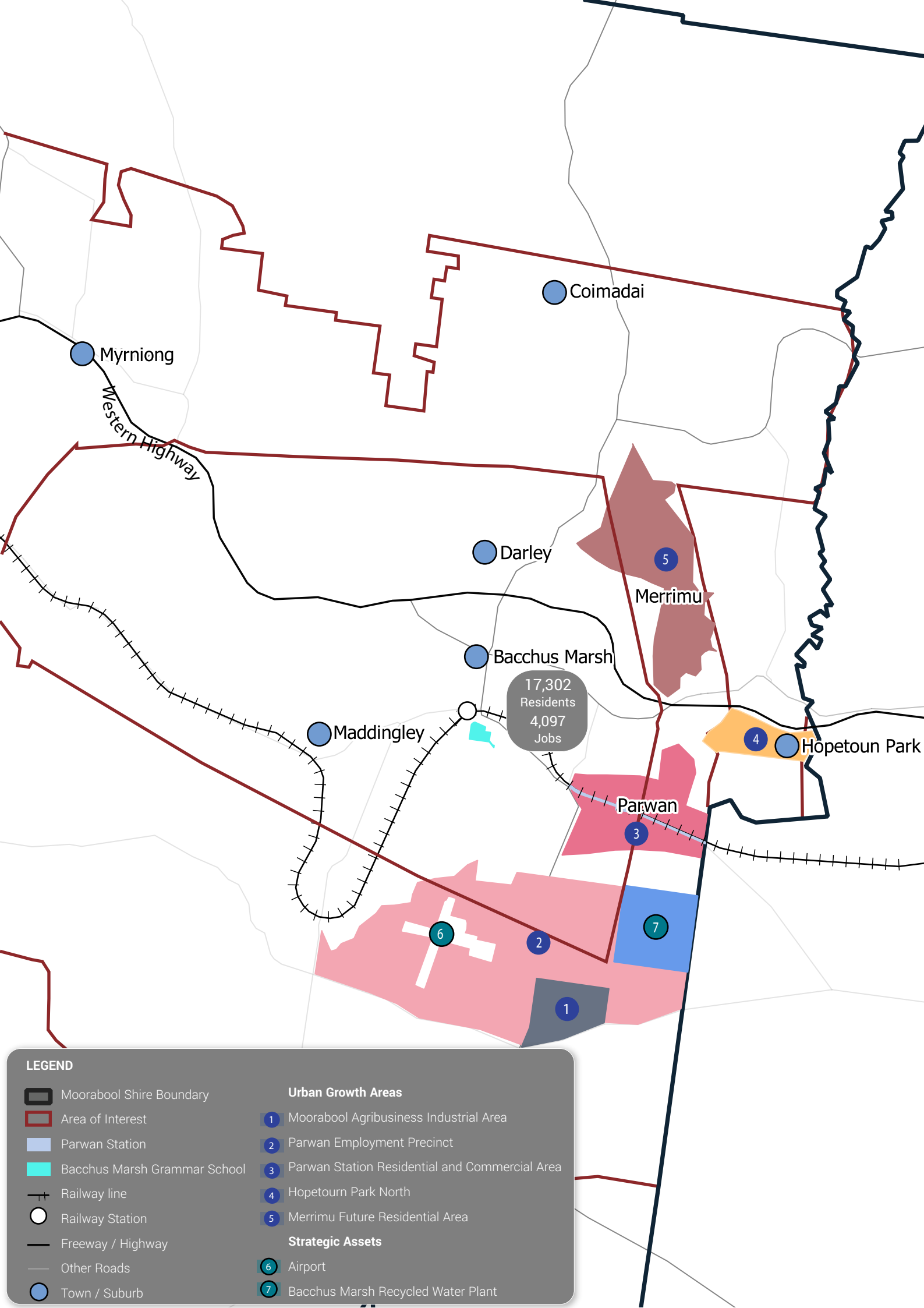
[4] Based on the Bacchus Marsh Urban Growth Framework and Ballan Strategic Directions Plan.

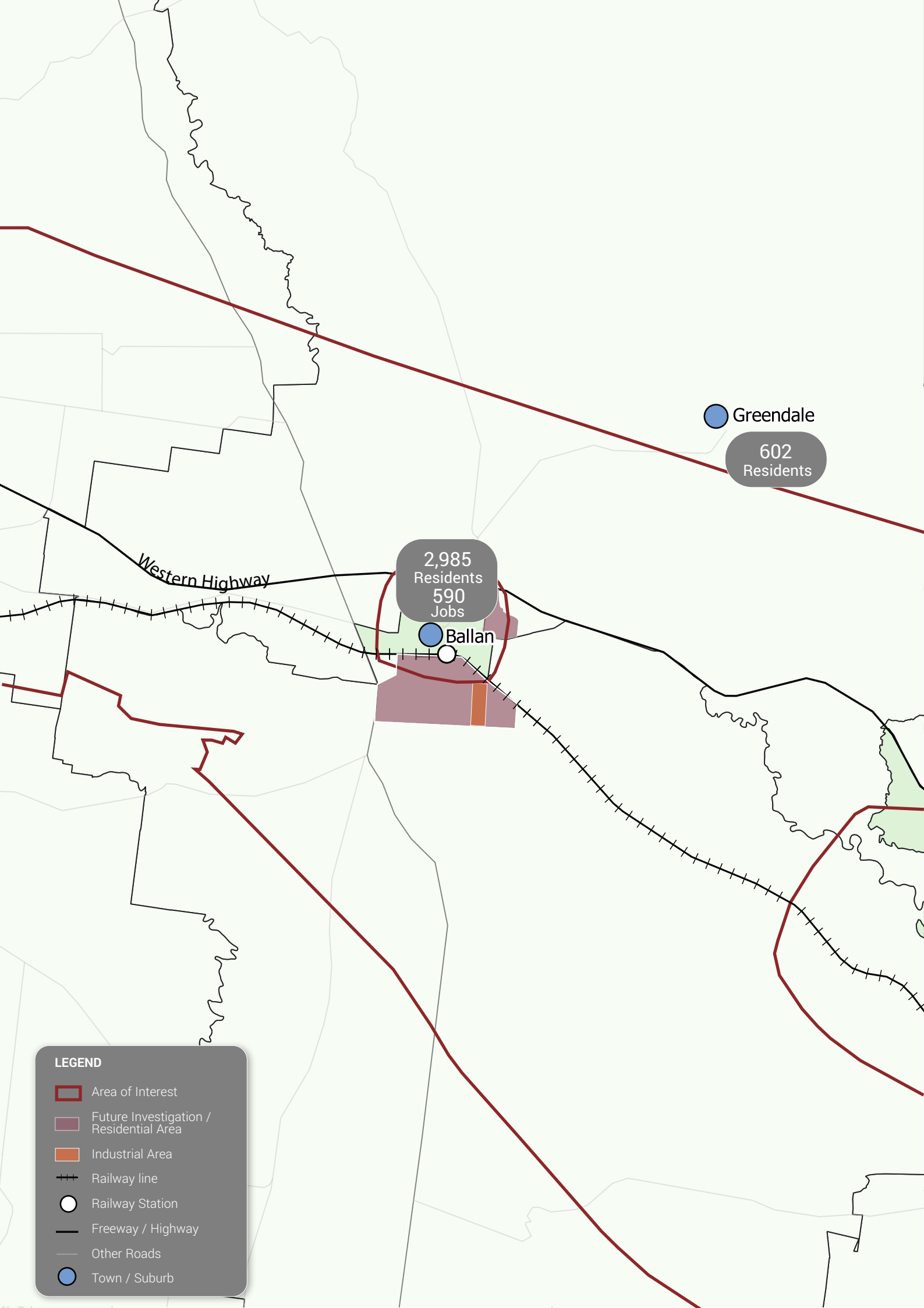
[5] Urban Enterprise estimate, assuming $100,000 per lot development costs and $250,000 per dwelling construction costs.

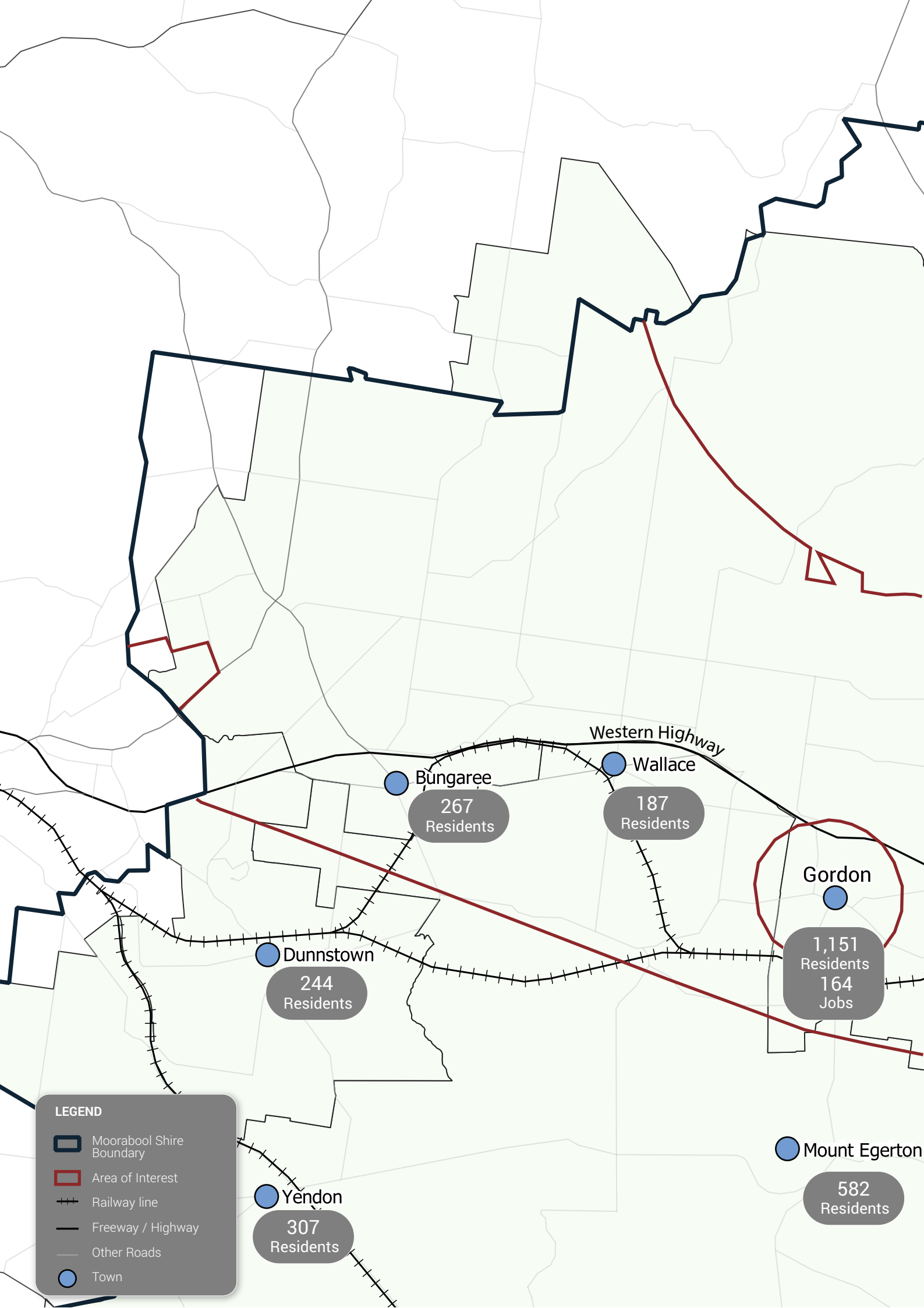
type of impact through the use of regression analysis for case studies in North America, with findings indicating that urban property values have been impacted in areas close to transmission lines in the order of -1% to -9%.[6]

The potential economic impacts identified in this section are difficult to quantify, however further consultation with real estate agents and additional research into the potential impacts on property values in the local context could be undertaken once an alignment is known.

[6] The Impact of Transmission Lines on Property Values: Coming to Terms with Stigma, Elliott and Wadley, Property Management (2002) 20 (2): 137-152.


Coimadai
Myrniong
Western Highway
Darley
Merrimu
5
Bacchus Marsh
17,302
Residents
4,097
Jobs
Maddingley
4
Hopetoun Park
Parwan
3
6
2
7
1
LEGEND
Moorabool Shire Boundary
Area of Interest
Parwan Station
Bacchus Marsh Grammar School
Railway line
Railway Station
Freeway / Highway
Other Roads
Town / Suburb
Urban Growth Areas
1 Moorabool Agribusiness Industrial Area
2 Parwan Employment Precinct
3 Parwan Station Residential and Commercial Area
4 Hopetourn Park North
5 Merrimu Future Residential Area
Strategic Assets
6 Airport
7 Bacchus Marsh Recycled Water Plant


Greendale
602
Residents
Western Highway
2,985
Residents
590
Jobs
Ballan
LEGEND
Area of Interest
Future Investigation / Residential Area
Industrial Area
Railway line
Railway Station
Freeway / Highway
Other Roads
Town / Suburb


Western Highway
Bungaree
267
Residents
Wallace
187
Residents
Gordon
1,151
Residents
164
Jobs
Dunnstown
244
Residents
Yendon
307
Residents
Mount Egerton
582
Residents
LEGEND
Moorabool Shire Boundary
Area of Interest
Railway line
Freeway / Highway
Other Roads
Town

4.5. ECONOMIC IMPACT FRAMEWORK

Table 9 provides a framework which summarises the benefits and disbenefits identified in this report, along with the likely stakeholders and industries that would be impacted. Positive impacts and benefits are shown in green and expected and potential negative impacts and disbenefits shown in red. Impacts which are neutral or expected to be negligible in scale are shown in grey.

The indicative scale of impacts are categorised as follows:

- Low - where the scale of benefit or disbenefit is unlikely to have a material and enduring impact on the productivity and output of the sector/specialisation.
- Moderate – where the scale of benefit or disbenefit is expected to have a marginal impact on the productivity and output of the sector/specialisation.
- High – where the scale of benefit or disbenefit is expected to have a notably disruptive or positive, and enduring impact on the productivity and output of the sector/specialisation.

T9. ECONOMIC IMPACT FRAMEWORK, WESTERN VICTORIA TRANSMISSION NETWORK

No.	Benefit / Disbenefit	Impacted industries	Impact area, timeframe and indicative scale	Values impacted or at risk ($)
Project impacts				
1	Energy sector benefits to consumers and producers, including long term benefits associated with greater renewable energy production.	Energy consumers and producers.	National Ongoing High	RIT-T estimates a net market benefit of $80m.
2	Direct construction benefit of project construction	Specialised construction and engineering and associated supply chain elements.	State-wide Short term High	$364 m construction cost across project.
3	Ongoing employment and activity generated by project, such as opportunities for local technicians, trades and suppliers (mainly maintenance).	Engineering, construction	Local Ongoing Low	Not available in RIT-T
Agriculture				
4	Direct loss of land for farming purposes due to construction, acquisition and easements.	Agriculture Property	Local Ongoing Moderate	Agriculture is a sector of local specialisation and further investment potential. Sector generates $295m output, $206m export value (33% of the Shire's exports) and 800 jobs. Up to 330ha will be needed within easements, impacting up to 100 farms.
5	Reduced efficiency, productivity and competitiveness of affected agricultural properties due to new physical and property barrier.	Agriculture	Local Ongoing Moderate-high	
6	Short term disruptions to business trade during the construction period (e.g. construction on farmland/agricultural businesses)	Agriculture Others (depending on alignment)	Local Short term Moderate	
Tourism and natural resources				
7	High potential for negative impact on natural amenity and views (depending on alignment) which would directly conflict with the tourism brand and reasons for visit which are based on scenic values and nature-based assets.	Tourism, hospitality, events, accommodation, retail.	Local Ongoing High	Tourism is a sector of local specialisation and investment potential at the state and local levels. 442,000 visitors per annum generate $141 million in output p.a. and supports 891 jobs.

8	Indirect benefits of project construction, including demand for accommodation and hospitality.	Accommodation, property (mainly rentals), retail and hospitality	Local Short term Moderate	Not available in RIT-T
9	Neutral impact on local energy production and earth resources.	Earth resources Energy production	N/A	Earth resources is an industry of specialisation and high export value. Energy production is a growth sector for the state.
Urban environment and property				
10	High potential for a decrease in the attractiveness of towns to future residents relative to current conditions, at least in areas proximate to or in view of the transmission lines. Implications for population attraction and retention, property values and businesses relying on population-led demand.	Population-service industries Property	Local Ongoing Moderate	Population service industries account for 57% of local jobs (4,484) and 43% of annual output ($976m). Population growth is a state objective for Bacchus Marsh and will support labour force growth in the area.
11	Urban growth area land may be impacted depending on the ultimate alignment, including developable area, efficient development and investment value. A material reduction in land supply available for new housing will have implications for housing availability, choice and affordability across eastern Moorabool and potentially also western Melbourne.	Property Construction Housing consumers	Local and regional Ongoing Moderate	Urban growth areas have potential to accommodate in the order of $5bn in construction activity and contribute to the region's supply of housing, supporting state-wide planning objectives, needs and affordability.

Source: Urban Enterprise 2020.

4.6. CONCLUSIONS

The expected economic benefits and disbenefits identified in this report show that the Western Transmission Network project will directly impact several elements of the Moorabool economy which are both existing areas of specialisation and sectors targeted for investment and growth for the benefit of the municipality, region and state.

In the absence of a proposed alignment, it is not possible to seek to specifically quantify or explain the expected impacts in detail at this point, however it is clear from this analysis that significant economic value is at risk of being impacted ongoing by the project at the local level.

It is important that the energy market benefits of the project are considered alongside the many economic disbenefits that will take place locally, given that these were not addressed in the RIT-T process. When the RIT-T process is viewed alongside a typical business case and cost benefit approach, there is consideration of a much broader range of costs and benefits, including economic and social effects that have the potential to impact on local economies and communities.

Given this finding, it is our recommendation that close consideration of the suite of impacts identified in Table 9 should form part of all subsequent approvals processes and should also directly inform the selection of a preferred option and alignment.

APPENDICES

APPENDIX A CASE STUDY SUMMARY

EASTLINK TRANSMISSION LINE, SOUTHERN QUEENSLAND AND NORTHERN NSW

Project	Eastlink Transmission Line
Description	A high voltage dual transmission line from Springdale near Gatton in Queensland, to Armidale in northern NSW. The line would be a 330kV double circuit steel tower transmission line having a length of about 380-400km and capable of carrying 500rnw in either direction.
Project Type	Transmission line
Location	State Government of Queensland and New South Wales
Impact Area	Distance from Transmission Line / Number of Houses 0 – 250m/ 3 houses 250 – 500m/ 23 houses 500 – 1000m/ 58 houses
Organisation	n/a
EIA Year of Completion	A parliamentary inquiry was undertaken by the Australian Government to investigate the benefits and disbenefits of the project in 1995.
Project Status	The project was culled in 1997 due to widespread opposition.
Methodology/ Approach	The report is not supported by an EIA. The **Parliamentary inquiry** captures the **depth of community concern** towards the project. Submissions were sent from areas directly affected, surrounding urban areas, and from wider community groups such as Greenpeace and Australian Conservation Foundation.
Identified Benefits	**Operational efficiencies:** The project will allow lower cost power generation in one system to replace higher cost generation in others; The deferral of new power station construction through **increased reserve sharing** across four states; and **Greater efficiencies** by increasing competition between power generators through trading in electricity between states (power interchange).
Identified Disbenefits	Local economic disbenefits of the project, as identified through community consultation include: **Devaluation of Affected Land:** Land values may be affected by the impact of the power line on visual appearance and by constraints imposed by the physical presence of the line and associated easement. **Land Values:** People in the area affected by Eastlink submitted that land values would be lowered by the visual impact of the line, the perceived risks to health, the disturbance caused by construction, the need to relocate farm infrastructure away from the route, and the continuing inconvenience of the easement and towers. **Impact on the Economy of Individual Farms:** Through concern about exposure to Electromagnetic Fields (EMFs), both to operators and to farm animals, landholders are reluctant to work under power lines, to put breeding stock in paddocks with lines running across them, and to carry out any improvements along easements. This they believe will result in reduced productivity and will therefore contribute to economic losses. **Concern for Organic & Bio-Dynamic Farming Practices:** Several submissions expressed concern that properties which had Organic or Bio-Dynamic certification status, and located along the proposed Eastlink route would lose that status. It takes many years of chemical-free farming practices to achieve certification and once it is achieved the grower must undergo regular testing to retain a chemical-free rating. **Impact on the Local Economy:** The economic impact of Eastlink is already being felt in the communities along the line. Some properties which were for sale have lost buyers, others have dropped considerably in value. **Impact on Regional Tourism:** Concern that the visual impact of the Eastlink power line would have an adverse impact on tourism and, in particular nature-based tourism.
Quantified	Evidence is anecdotal, but included: The **value of residential properties** along the corridor may well be reduced by the advent of the power line. This has been estimated by community members to be anywhere from 25% to 100%. **Regional economies** May feel a flow-on effect from the stagnation of the rural real estate market and the unwillingness of property owners in general to make any further capital investment in the properties. The **visual impact** of the power line may affect regional tourism and farm stay holiday' income.

WESTERN HIGHWAY DUPLICATION, WESTERN VICTORIA

Project	Western Highway Upgrades
Description	Extra lane in each direction for 33km of the Western Highway between Beaufort and Ararat.
Project Type	Road
Location	Western Victoria
Impact Area	Ballarat City Pyrenees Shire Ararat Rural City Northern Grampians Shire
Organisation	GHD
EIA Year of Completion	2012
Project Status	Constructed in 2016
Methodology/ Approach	The existing conditions of the project, study area and region were described. This is the base case against which potential effects are measured. The report includes an assessment of the wider economics impacts, in the areas of agriculture, non-agricultural business and employment impacts. The potential economic effects were assessed and where possible, these effects were quantified, otherwise they are described qualitatively. The following **economic effects** were quantified: - Changes in travel time and travel costs for business travel, personal travel and freight transport; - Costings in terms of construction and maintenance; - Displacement of businesses and farm operations; and - Infrastructure loss.
Identified Benefits	**Additional impact to employment:** Creation of up to 2,200 direct full time equivalent (FTE) jobs over the construction profile of the project, plus up to 4,090 indirect FTE jobs. **Travel time savings**: Increases in average travel speeds. **Vehicle operating costs savings:** Increases in average speed, typically lead to a decrease in vehicle operating costs per kilometre leading to an overall reduction in transport costs. **Road crash cost savings:** Improvements in safety would reduce the expected level of crashes overall, therefore reduced the cost incurred as a result of crash costs. **Externality savings**: Improvements to greenhouse gases, air and noise pollution (compared to the No Project scenario). **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. **Effects on business and industries downstream from the Project:** Improvements to the speed and reliability of this major interstate corridor would have benefits in terms of improved connectivity e.g. tourism, freight. **Impact of the Grain Harvest:** Higher quantity of grain would be moved between grain production silos in Victoria either interstate or to the Port of Melbourne for export.
Identified Disbenefits	Key issues identified are: **Agricultural Impacts:** The impact on agriculture is divided between agricultural land and agricultural facilities. **Severance of landholding:** Severance is being imposed on some properties either directly through the alignment's passage or by upgrading the highway to dual carriageway. **Impacts on infrastructure:** Infrastructure impacts on dams, buildings, yards, drains, power pole relocation and plantation removal. **Direct land loss:** Direct land loss for the total alignment is substantial (over 350 ha). **Impact on access:** The impact of upgrading the existing highway to dual carriageway could prevent direct access to adjoining properties and require the greater use of service roads and, other existing roads and overpasses.

	Other Impacts Noise levels; removal of vegetation, modification to water catchments, lowered aesthetic values, potential damage to wetlands and trees.
Quantified	**Effect:** Change in travel time and travel costs for business travel, personal travel and freight transport. **Measure:** Savings in travel times and savings in vehicle operating costs. **Effect:** Costings in terms of construction and maintenance. **Measure:** Construction and operation costs. **Effect:** Displacement (wholly or partially) of businesses and farm operations that operate on land which would be required for the project. **Measure:** Loss of annual revenue as an indicator for loss of employment due to changes in productivity of agricultural land and business conditions for other businesses. **Effect:** Infrastructure loss (e.g. farm sheds, stock yards, dams) of some landholdings along the project route. **Measure:** Estimated through required investment in new infrastructure.

OAKLANDS HILL AND MACARTHUR WIND FARM PROJECTS, SOUTH-WESTERN VICTORIA

Project	Oaklands Hill and Macarthur Wind Farm Projects
Description	Installation of Oaklands Hill wind farms (32 turbines) and Macarthur Wind Farm (140 turbines). The purpose of the EIA is to assess the impact the wind farms have on the regional economy and, to a lesser extent, on the State and Australian economies.
Project Type	Wind farm
Location	South-Western Victoria
Impact Area	Southern Grampians Shire Moyne Shire Glenelg Shire Warrnambool City
Organisation	Sinclair Knight Merz (SKM)
EIA Year of Completion	2012
Project Status	Oaklands Hill (constructed 2012) Macarthur Wind (constructed 2013)
Methodology/ Approach	The primary input of the assessment is the total **expenditure and employment data** collected from key contractors through a questionnaire. The following information was requested: - Total expenditure by phase and indicative proportions by locations in which it was spent; - Regional expenditure e.g. Accommodation, meals, incidental spending etc. - Type of accommodation used; and - Peak and average employment figures by phase. Based on the expenditure and employment data, SKM estimated the economic impact on Gross Regional Product (GRP) and first and second order jobs generation.
Identified Benefits	Interviews with local businesses, representatives from Councils and representatives from contractors involved in this project identified the following benefits: Oakland Wind Project **Job Creation:** 156 total jobs in the region, 517 total jobs in Victoria and 599 total jobs in Australia (direct, indirect and induced). **Employment**: 72 full time equivalent employees worked at the wind farm during construction. Approximately four full time staff, 1 part time staff and some contractors will be employed during on-going operations. **Local benefits**: Industries that will benefit from the project are Domestic scale electricians; Transport operators; Competent machine operators; General labourers; and Quarries. **Flow-on benefits to other sectors:** Accommodation, food services, general retail and trade, transport, tourism and community benefit. Macarthur Wind Project Job Creation: 719 total jobs in the region, 1,973 total jobs in Victoria and 2,183 total jobs in Australia

	(direct, indirect and induced) **Employment:** 416 full time equivalent employees worked at the wind farm during construction, 17 full time staff, 1 part time staff and 10 contractors will be employed during on-going operations. **Local benefits:** Domestic scale electricians; Transport operators; Competent machine operators; General labourers; Quarries, and concrete businesses that appear to have done particularly well and put on employees. **Flow-on benefits to other sectors:** Accommodation, food services, general retail, trade, manufacturing, transport/roads, tourism and community benefits.
Identified Disbenefits	The scope of the paper did not include disbenefits of the project.
Quantified	The report quantifies the following sets of information for each project: - Direct expenditure in the Region - Employment - Gross Regional Product (GRP)

MURRA WIND FARM, WESTERN VICTORIA

Project	Murra Wind Farm
Description	116 wind turbines each with an installed capacity of 3.7 MW); with the total installed capacity estimated at 430 MW.
Project Type	Wind farm
Location	Western Victoria
Impact Area	22 properties within Horsham Rural City Council and Yarriambiack Shire
Organisation	Essential Economics
EIA Year of Completion	2017
Project Status	Under construction
Methodology/ Approach	A qualitative study that assessed **the economic impacts** of the proposed development including investment, employment, business participation, local wage stimulus, impact on accommodation, impact on agricultural activities, financial returns to landowners, Council and community, environmental benefits and potential tourism-related opportunities. The analysis is underpinned by consultation with Horsham and Yarriambiack Shires and with the Wimmera Development Association. In addition, **case study analysis** summarises the benefits and lessons learnt for the construction and operation of the Challicum Hills Wind Farm (commissioned in 2003) and the ongoing development of the Ararat Wind Farm.
Identified Benefits	**Project Employment:** 235 direct and 375 indirect FTE positions over the construction period. Once operational, 15 direct and 45 indirect FTE jobs will be supported by the facility. **Industry and Business Participation Opportunities**: In terms of cost efficiencies (lower transport, labour costs etc), as many large construction projects are serviced from within the same region. **Housing and Commercial Accommodation:** Sector impacts as the influx of these workers support higher occupancy rates and revenues for local accommodation operators over the construction period. **Local Wage Spending Stimulus:** Increased spending in the following areas: Housing expenditure, retail expenditure, recreation spending and personal, medical and other services. **Ongoing Economic Stimulus**: The turbines are likely to be spread across 18 land owning families, providing income returns to these landowners. **Returns to Council and the Community:** Increases in council rates revenue that can be re-invested in infrastructure and services, which will benefit the communities in the two municipalities. **National Grid Supply Benefits:** Capacity to provide sufficient renewable energy to support the annual electricity needs of approximately 420,000 households. **Reduced Greenhouse Gas Emissions Benefits:** Reduction of an estimated 1.7 million tonnes in carbon dioxide emissions on an annual basis compared to the same level of electricity generation using fossil fuels.

	Tourism Opportunities: Tourism opportunities associated with the facility would be expected to be minimal. However, this does not preclude the possibility of providing an interpretation area which would allow people to visit the facility.
Identified Disbenefits	The scope of the paper did not include disbenefits of the project.
Quantified	See above benefits

NEWLANDS TRANSMISSION LINES, WELLINGTON, NEW ZEALAND

Project	Wellington Transmission Lines
Description	Impacts of two transmission lines in Newlands, Wellington. Both lines were constructed in the early twentieth century and have 26 metre high pylon towers, with lines carrying 110 KV.
Project Type	Two transmission lines
Location	Suburb of Wellington, New Zealand
Impact Area	330 properties recorded for sale, within 300m of the transmission lines.
Organisation	n/a
EIA Year of Completion	An assessment of the project on residential property values was undertaken in 2000 by researchers from Massey University in New Zealand.
Project Status	Khandallah - Takapau line erected in 1924 and upgraded in 1983. Khandallah - Haywards line erected in 1931 and upgraded in 1981.
Methodology/ Approach	The report is not supported by an EIA. The Valuation New Zealand study used an **indexing system** to **compare changes in property values along the transmission line corridor, with those outside it.** The study specifically assessed the impacts of transmission pylons and residential properties based on physical distance. The second part of the study summarises **results of questionnaire** that was sent out to residents in the study area to understand resident perceptions of transmission lines.
Identified Benefits	The scope of the study did not include benefits of the transmission lines.
Identified Disbenefits	**The study** revealed that pylons have a diminishing effect on property value that reduces to a minimal amount at around 100m. **The questionnaire** was sent to residents living within close proximity of the transmission line, and revealed the main areas of concern as: - Noise - Health and safety - Aesthetics - Resale value Residents who notice the transmission lines and pylons the most and who evaluate them most negatively are those who live within 50 metres of either the transmission lines or the pylons.
Quantified	**Quantified property values** according to distance away from the transmission pylon. The results of the study show that the effect of having a 'pylon' close to a particular property is significant and has a negative effect of twenty percent at ten to fifteen metres from the pylon, decreasing to five percent at fifty metres.

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