CHAPTER 02

Project Rationale

INLAND RAIL—BORDER TO GOWRIE ENVIRONMENTAL IMPACT STATEMENT

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

Contents

Figures

Tables

2. Project Rationale

2.1 Introduction

This chapter describes the rationale for the Inland Rail—Border to Gowrie Project (the Project) and the broader Inland Rail Program and provides discussion on:

- The existing rail network constraints between Melbourne and Brisbane
- Future demands that are forecast to be placed on this network
- Comparison of freight movement alternatives as a solution to the projected freight network capacity constraints
- The benefits of proceeding with Inland Rail and the Project
- The consequences of not proceeding with Inland Rail and the Project
- The strategic options considered in determining the route for Inland Rail
- The alignment options assessed through the reference design process
- Relationship to other projects.

This chapter has been prepared to address Section 6.7 and Section 10.1(e) of the Terms of Reference (ToR).

Specifically, Section 6.7 of the ToR requires that the draft Environmental Impact Statement (EIS) include assessment of alternative route options identified in submissions on the draft ToR. Two alternative route options were identified in submissions on the draft ToR and are introduced in Table 2.1, with cross-reference to where each option is considered in this chapter.

TABLE 2.1 ALTERNATIVE PROJECT ROUTE OPTIONS IDENTIFIED IN SUBMISSIONS ON THE DRAFT TERMS OF REFERENCE AND ADDRESSED IN THE ENVIRONMENTAL IMPACT STATEMENT

Alternative Project route option identified in submissions on the draft ToR	Description	Where the route option is discussed
Forestry route, via Cecil Plains	A route option presented to ARTC on 10 April 2017 by a representative of the Yelarbon to Gowrie Project Reference Group that extended north from Whetstone through Bringalily State Forest to Cecil Plains, then follows an existing rail corridor (the Cecil Plains Branch line) to Mount Tyson and then to near Oakey where it joins with the Western Rail Line to Gowrie.	Section 'Forestry route, via Cecil Plains'
Inglewood area, including Yarranbrook	Alternative alignment options that would avoid or minimise impacts and severance to properties along the banks of Macintyre Brook and Canning Creek, including the Yarranbrook feedlot.	Section 2.9.1.1

2.2 Existing rail network constraints

At present, there is no continuous inland rail link between Melbourne and Brisbane. Interstate rail freight travels between Melbourne and Sydney via Albury, and then between Sydney and Brisbane, generally along the coast. Transit times are long and the existing network cannot accommodate highly efficient, long, double-stacked trains. In addition, the existing route relies on rail that is also used by passenger trains in metropolitan areas, which are typically given right-of-way during daily peak travel times.

The demand for urban transport infrastructure is projected to increase significantly. The *Australian Infrastructure Plan* (Infrastructure Australia, 2016a) identifies that, without action, the cost to the wider community of congestion on urban roads could rise to more than $50b each year by 2031. Demand for many key urban road and rail corridors is projected to significantly exceed current capacity by 2031. This projection is supported by findings published in the 2019 edition of *The Household, Income and Labour Dynamics in Australia Survey* (Wilkins, et al., 2019), which found that the mean daily commute times of employed persons in mainland capital cities increased by 19.5 per cent between 2002 and 2017. This trend would continue, and potentially worsen, with increased trucking movements on metropolitan roads.

The *National Land Freight Strategy* (Standing Council on Transport and Infrastructure, 2013) identifies a number of existing challenges facing road and rail freight in general, including:

- Congestion from increasing numbers of passenger vehicles and the priority given to passenger vehicles over freight vehicles in urban transport can adversely impact on the efficiency of freight vehicle movement. This is particularly the case on routes such as the Pacific and Ipswich Motorways, and the Hume, Newell and Warrego highways
- Urban development in metropolitan areas is encroaching on freight routes and precincts as cities grow in size.

The *Melbourne–Brisbane Inland Rail Alignment Study* (ARTC, 2010) indicates that:

- There are likely to be capacity constraints on the existing coastal railway unless significant capital works are undertaken
- The coastal railway between Sydney and Brisbane, a route shared by freight and passenger trains, would reach capacity around 2052.

Much of the infrastructure on the existing regional rail systems is old and has maintenance and renewal issues and, as such, has restrictions on axle loads and tonnages that can be transported. Poor maintenance of rail lines leads to network availability issues and speed constraints. When combined, these existing rail network constraints are resulting in an increasing reliance on freight transportation by road, thereby imposing additional maintenance and safety burdens on the affected road asset managers (Infrastructure Australia, 2015).

A summary of key characteristics of the Melbourne to Brisbane road and rail network, including constraints, is shown in Figure 2.1.

2.3 Future freight demand

In 2011–12 the Bureau of Infrastructure, Transport and Regional Economics estimated that the Australian domestic freight task totalled almost 600 billion tonne kilometres—equivalent to about 26,000 tonne kilometres of freight moved for every person in Australia (ACIL Allen Consulting, 2014). Of this volume, the domestic rail freight task totalled 261.4 billion tonne-kilometres, accounting for approximately 46 per cent of total domestic freight. This represents an increase of 91 per cent since 2000–2001 (Infrastructure Australia, 2015).

The *Australian Infrastructure Audit* (Infrastructure Australia, 2015) noted that:

- The national land freight task is expected to grow by 80 per cent between 2011 and 2031
- Demand for freight rail infrastructure is expected to grow, particularly for resource bulk commodity haulage in Western Australia, Queensland and NSW
- There is an opportunity for freight rail will need to play a growing role in the movement of goods between ports and inland rail freight terminals, and in the movement of containerised and general freight over longer distances.

The Melbourne to Brisbane corridor is one of the most important general freight routes in Australia, supporting key population and employment precincts along the east coast and inland NSW. The current volume of non-bulk and complementary freight moving within the corridor is approximately 21 million tonnes per annum. This is expected to increase to 40 million tonnes of freight per annum by 2050, consisting of manufactured (non-bulk) products, bulk steel, paper, agricultural and mining products (Infrastructure Australia, 2016a). Rail has been losing mode share to road freight since 2003 on shorter hauls, such as Melbourne to Sydney and Sydney to Brisbane (ACIL Allen Consulting, 2014).

Inland Rail would help to ease the burden placed on roads by this additional volume of freight by providing an alternative means for transporting the equivalent of more than 200,000 truck movements annually from 2049–50 (ARTC, 2015a).

The eastern states of Australia comprise 18 million residents (79 per cent of Australia's population), nine million jobs (78 per cent of Australia's national employment) and contributes $1.1 trillion in gross state product (75 per cent of gross domestic product). Interstate freight transport is projected to increase by 70 per cent between 2015 and 2030, to 140 billion tonne-kilometres. The Melbourne to Brisbane corridor already supports 17 per cent of these interstate movements (ARTC, 2015a).

With the population of the eastern states forecast to increase by 60 per cent over the next 40 years, the need for efficient and effective freight transport will continue to increase. Strong forecast population growth, accompanied by comparable employment growth, is likely to place significant pressure on existing infrastructure and services (ARTC, 2015a). Without the increased use of rail, the growth in freight demand is likely to increase pressure on the road network, resulting in:

- Increased freight costs
- Lost economic opportunities
- Increased frequency of safety incidents
- Increased road maintenance
- Increased pressure to expand the road network.

Inland Rail will intersect the east–west rail corridor at Parkes, better connecting all state mainland capitals and will serve a variety of freight markets, not just Melbourne to Brisbane, with significant demand from regional commodities and interstate freight. Inland Rail will also be a catalyst for other complementary investments in the supply chain, including new multimodal terminals, processing facilities and distribution centres along the supply chain (ARTC, 2018e).

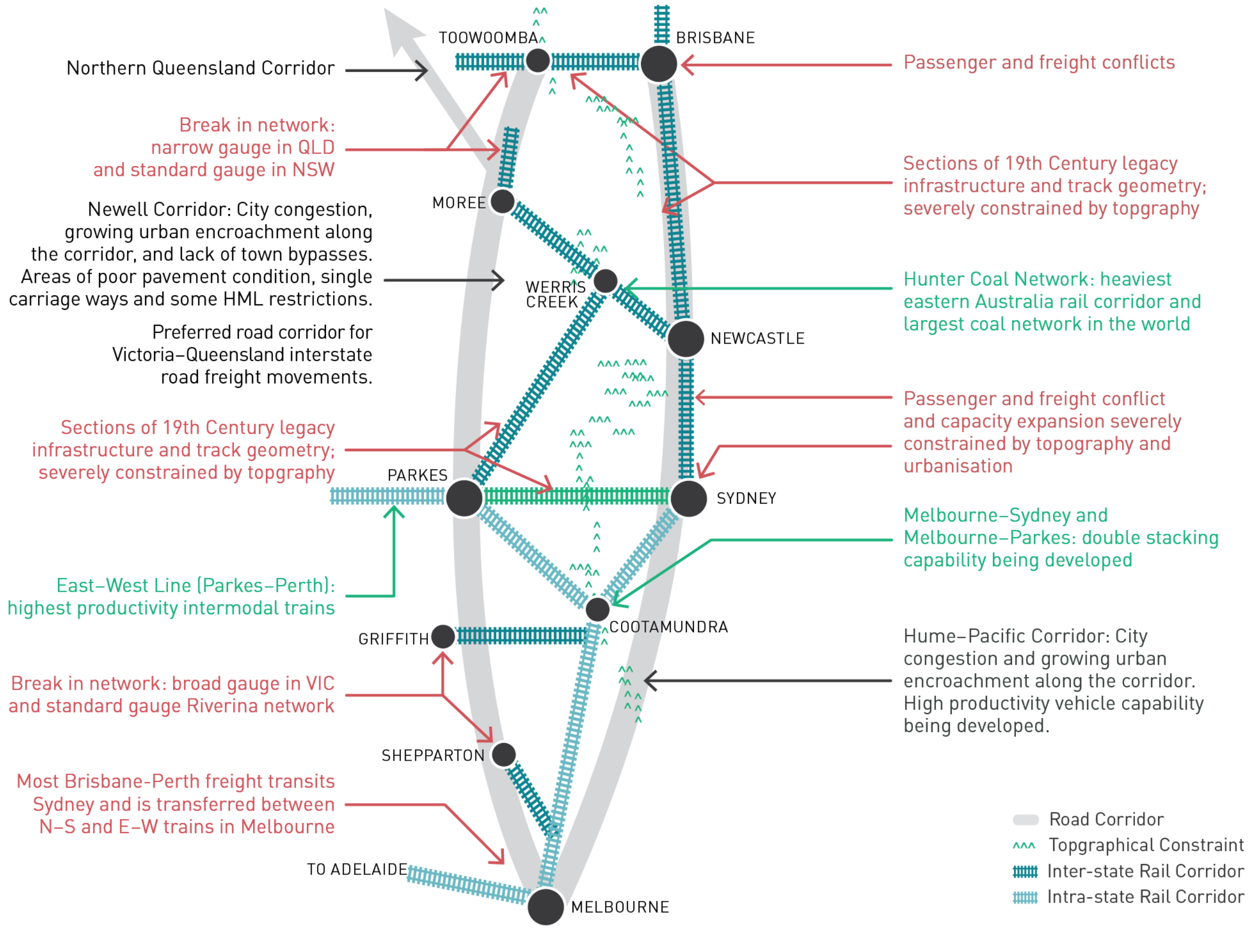


FIGURE 2.1 SUMMARY OF KEY CHARACTERISTICS OF THE MELBOURNE TO BRISBANE ROAD AND RAIL NETWORK

Source: *Inland Rail Implementation Group Report* (Inland Rail Implementation Group, 2015)

In 2008, the then Australian Government Minister for Infrastructure, Transport, Regional Development and Local Government announced a second study, the *Melbourne–Brisbane Inland Rail Alignment Study* (ARTC, 2010). The purpose of this study was to analyse the likely economic and commercial benefits of an inland rail route between Melbourne and Brisbane, such as reducing the supply chain costs by a reported $10/tonne. The outcome was a determination of a preferred alignment, based on consideration of the economic benefits and key commercial considerations. This study is discussed further in Section 2.8.2.

In November 2013, the then Australian Government Minister for Infrastructure and Regional Development announced $300 million in funding for Inland Rail, to be used for pre-construction activities such as detailed corridor planning, environmental assessments and community consultation. The Minister also announced that a high-level Implementation Group would be formed to drive Inland Rail.

In 2014, ARTC developed a Concept Business Case (ARTC, 2014) as a precursor to a more detailed Program Business Case. The Concept Business Case outlined key scope and scheduling assumptions, identified key risks and environmental and planning considerations, and preliminary updates to demand, economic and financial analysis.

The Concept Business Case identified key areas for further consideration or analysis. These areas included demand, costs, risks, technical and operational requirements, and refined financial and economic analysis, which were subsequently addressed within the *Inland Rail Programme Business Case* (ARTC, 2015a).

The *Inland Rail Programme Business Case* was developed in 2015 to provide a detailed assessment of why Inland Rail is needed and how it could be delivered. The viability, benefits, costs and risks associated with the Program were all assessed (ARTC, 2015a). This study is discussed further in Section 2.8.4.

2.4 Comparison of alternatives to rail freight

Alternative solutions with the potential to address Australia's current and future freight challenges were assessed by the *Inland Rail Implementation Group Report* (Inland Rail Implementation Group, 2015) and the *Inland Rail Programme Business Case* (ARTC, 2015a).

Three capital investment options were assessed by the *Inland Rail Programme Business Case* (ARTC, 2015a):

- Progressive road upgrades
- Upgrading the existing east coast railway
- An inland railway.

These capital investment options were subjected to a rigorous assessment against seven equally weighted criteria:

- Capacity to serve future inter-capital and regional/bulk freight market needs on the east coast
- Foster economic growth through improved freight productivity and service quality, including improved reliability and resilience
- Optimise environmental outcomes
- Alleviate urban constraints
- Enable regional development
- Ease of implementation
- Cost-effectiveness.

Overall, constructing an inland railway was found to be the preferred option, with an average 'high likelihood' of improving outcomes across all criteria. Progressive road upgrades and upgrading the existing east coast railway both had an average 'medium likelihood' of improving outcomes across all criteria.

In relation to individual criteria, progressive road upgrades outranked an inland railway only in relation to ease of implementation and ranked equally with an inland railway in relation to enabling regional development outcomes. An inland railway was found to be the best option across all other criteria.

The following alternatives were reviewed by the Inland Rail Implementation Group:

- Maritime shipping
- Air freight
- Road freight
- Rail solutions.

The results of the review of alternatives undertaken by the Inland Rail Implementation Group are summarised below.

2.4.1.1 Maritime shipping

Maritime freight was examined as a potential alternative to Inland Rail based on two types of services, including:

- A dedicated service between Melbourne and Brisbane (coastal shipping)
- Using spare capacity on vessels calling at Melbourne and Brisbane as part of an international voyage.

The *Inland Rail Implementation Group Report* (Inland Rail Implementation Group, 2015) concluded that:

- Shipping is unlikely to be a strong alternative to Inland Rail because it does not provide the level of service (transit time and service availability) required by much of the Melbourne to Brisbane interstate market
- Shipping still has a role to play, especially due to its strengths in transporting high-volume and long-distance cargo around the coast. Shipping can be used in conjunction with other modes such as an inland railway to meet Australia's future transport needs.

Additionally, a maritime freight solution would not provide the same potential economic benefits and opportunities to inland communities that can be provided by Inland Rail.

2.4.1.2 Air freight

Domestic air freight accounts for less than 0.01 per cent of total domestic freight movements in Australia by weight (Inland Rail Implementation Group, 2015). Most of these movements are comprised of newspapers and parcels between major cities, on either dedicated freight flights or on existing passenger flights. Air freight is highly specialised due to the inherent constraints on aircraft size and the nature of the goods that can be carried. The report concluded that:

- Air freight has a limited role to play in the transport of bulky or heavy goods on the Melbourne to Brisbane corridor, but will continue to play a crucial role for small, high-value and time-dependent goods
- Air freight is not a viable alternative for addressing Australia's freight requirements on the Melbourne to Brisbane corridor into the future.

2.4.1.3 Road freight

The role of road transport was considered as a potential alternative to Inland Rail. Road transport is the main mode of transport for most commodities produced or consumed in Australia. Along the north–south corridor, the main routes for road freight are on the Hume Highway (between Sydney and Melbourne), the Pacific Highway (for coastal transport between Sydney and Brisbane) and the Newell Highway (between Melbourne and Brisbane) (Inland Rail Implementation Group, 2015).

The identified issues and considerations relevant to road freight on these corridors include:

- The north–south road corridor will face significant local and regional capacity constraints for road freight in the medium to longer term
- The mix of local traffic, private vehicles, and freight vehicles on road transport corridors reduces reliability due to the different average travel speeds between cars and heavy vehicles, and increased accident rates
- Increased frequency of safety incidents between local traffic, private vehicles and freight vehicles on these corridors in line with significant forecast growth in population, employment and demands for freight transport
- Compared with rail, road freight results in additional environmental costs, including from air pollution, greenhouse gas (GHG) emissions and water pollution. Improved sustainability is likely with an expected production of 750,000 fewer tonnes of carbon and one-third of the fuel when compared to road transport (ARTC, 2015a). Approximately 1,100 km, or 70 per cent, of Inland Rail will use existing rail lines and corridors, making the best possible use of previous investments and minimising the impact on the environment and community (ARTC, 2019a).
- The cost to freight operators of congestion in urban areas due to reduced travel speeds and reliability for freight transport is estimated to be around $60 million per year for Melbourne to Brisbane inter-capital freight alone
- The Australian Government and state governments are investing in road infrastructure along the north–south corridor. However, this investment will be insufficient to alleviate all constraints on the road network. The productivity of road freight will continue to be vulnerable to road network constraints despite this investment.

The Melbourne–Brisbane Inland Rail Report (Inland Rail Implementation Group, 2015) concluded that:

- While road transport will continue to contribute to Australia's freight task, unless substantial additional investment is made in road infrastructure, it will be unlikely, by itself, to meet the longer-term needs for Australia's freight task due to significant local and regional capacity constraints
- Should the Australian Government decide not to proceed with a rail solution, further investigation of road transport is required to determine its capacity to manage the future north–south freight task.

2.4.1.4 Rail solutions

The two main rail solutions considered by the Inland Rail Implementation Group were enhancement of the existing east coast railway and construction of a new inland railway.

The *Melbourne–Brisbane Inland Rail Report* (Inland Rail Implementation Group, 2015) noted that there are capacity, reliability and performance issues associated with the existing east coast railway. As shown in Section 2.2, the performance issues mainly relate to constraints associated with moving freight trains through the Sydney metropolitan rail network. The service offering constraints of the existing coastal rail route compared to Inland Rail are summarised in Table 2.2.

TABLE 2.2 COMPARISON OF EXISTING MELBOURNE TO BRISBANE COASTAL RAIL ROUTE TO INLAND RAIL SERVICE OFFERING

Service offering	Coastal rail (2014–15)	Inland Rail	Improvement with Inland Rail
Transit time	32–34 hours	Up to 24 hours	10 hours
Reliability[1]	83%	98%	15%
Availability[2]	61%	95%	34%
Relative price (to road)[3]	85%	57-65%	20-28%

Source: *Inland Rail Programme Business Case* (ARTC, 2015a)

Table notes:

1. Reliability is defined as the percentage of goods delivered on time by road freight, or available to be picked up at the rail terminal or port, when promised.
2. Availability refers to the percentage of available departure and arrival services that are convenient for customers, which depends on cut-off and transit times.
3. Relative price is presented for non-bulk inter-capital freight (door-to-door) indicating the range over the period 2024–25 to 2049–50.

As a sub-option of enhancing the existing east coast railway, the report noted that the proposed new Outer Sydney Orbital corridor would provide opportunities for a rail route that could ease freight congestion on Sydney freight networks; however, the main role of this corridor would be to address freight capacity constraints on other routes, such as those for intrastate and export freight. In addition, this option would not provide significant transit time savings for Melbourne to Brisbane freight, as the missing link between north-west NSW and southern Queensland would still be required, or the existing coastal line would need to be upgraded (Inland Rail Implementation Group, 2015).

The report concluded that:

- For Melbourne to Brisbane freight, the existing east coast railway would not be competitive with road in terms of cost or time, even with significant further investment. It is not a viable alternative to Inland Rail.
- Inland Rail would meet Australia's future freight challenge and bring significant and positive national benefits by boosting national productivity and economic growth, while promoting better safety and environmental outcomes.

2.4.1.5 Summary of findings

Overall, in relation to the various alternatives to Inland Rail, the Inland Rail Implementation Group concluded that:

- While shipping and air will continue to play a role in the interstate freight market, they are not viable alternatives to rail
- Without Inland Rail, road is the only mode capable of addressing most of the future freight task.

2.5 Benefits of proceeding with Inland Rail and the Project

Inland Rail presents a unique opportunity to establish a competitive freight system by providing trunk rail infrastructure that supports a network of intermodal terminals and local sidings for the distribution of commodities at the national, regional and local level.

As a component of the larger Inland Rail Program, the potential benefits of the Project cannot be separated from those that are attributed to the full Melbourne to Brisbane alignment. Therefore, the potential benefits of Inland Rail and of this Project, as documented in the business case (ARTC, 2015a) are presented in this section.

2.5.1 Direct benefits

Foreseeable direct benefits of Inland Rail and this Project are provided below.

2.5.1.1 Improved access to and from regional markets

- Improved linkages to regional areas for intercapital freight, such as via the direct connectivity that would be provided between the existing QR South Western Line, Millmerran Branch Line and West Moreton Line. Inland Rail is expected to attract 2 million tonnes of agricultural freight from road to rail, with a total of 8.9 million tonnes of agricultural freight expected to be carried in 2050.
- Agricultural areas and regions, such as the Darling Downs, have improved access to key local and international markets and ability to move greater volumes of grain via rail.

2.5.1.2 Reduced costs for the market

- Reduced intercapital freight transport costs for the market are likely to result in lower prices for consumers (predominantly manufactured goods). This also presents an opportunity for flow-through of cost savings to reduce the cost of living for consumer households.
- Inland Rail is likely to reduce lifecycle costs for infrastructure owners and operators on traditional road freight routes due to lower freight volumes on these assets. This would reduce maintenance costs and enable investments in capacity to be avoided or deferred.
- Reduced transport costs may improve competitiveness of key markets and economic activity, particularly in the agricultural sector
- Intercapital and agricultural freight currently travelling by road should benefit from reduced operating costs due to economies of scale in rail relative to road transport.

2.5.1.3 Improved reliability and certainty of transit time

- Improved reliability and certainty of transit time would result in productivity and economic efficiency due to operating cost savings, shorter transit times, improved availability and avoided road incidents on the coastal route
- Benefits associated with higher axle loads, longer trains, lower gradients, longer curves, resulting in shorter transit times
- Inland Rail would provide linkages between existing rail networks, such as the existing QR South Western Line, Millmerran Branch Line and West Moreton Line. Additionally, railway infrastructure within existing corridors used by Inland Rail would be subject to replacement and upgrade. New linkages and upgraded infrastructure would combine to enable faster transit time on existing journeys.

2.5.1.4 Increased capacity of the transport network

- Increased capacity would enable the opportunity to return unused freight routes to passengers in Sydney and Brisbane during off-peak periods (noting that passengers are already given absolute priority during peak periods on metropolitan networks).
- Improved customer outcomes for rail passengers between Sydney and Brisbane with unused freight schedule timeslots on the coastal route would be able to be returned to passenger services. The benefit of increased frequency of passenger services would reduce average wait time and provide greater reliability and certainty for passengers.
- Increased freight capacity would enable greater volumes of intercapital freight to be moved via rail with a reduced reliance on existing State-controlled and local road networks.
- By providing new linkages between existing rail networks, such as those operated by QR, Inland Rail would provide an option for alleviating future short- or long-term capacity constraints on these railways.

2.5.1.5 Reduced distances travelled

- Inland Rail will provide a shorter option for the transportation of freight, resulting in a reduced time between the point of source and the market for goods and produce
- By providing new linkages between existing rail networks, such as those operated by QR, Inland Rail will provide a shorter route option for undertaking existing journeys.

2.5.1.6 Improved safety

- Inland Rail has the potential to remove 200,000 long-haul truck movements from roads each year from 2049–50. It is expected that road transport will still be required for distribution from intermodal terminals.
- Reduced congestion and created capacity on existing road and rail networks in metropolitan Sydney
- Reduced burden on roads and improved safety
- Reduced truck volumes in over 20 regional towns
- Relocated mainline freight traffic from existing railways out of some town centres such as Inglewood, Pittsworth and Southbrook, providing for a safer environment with enhanced liveability
- Modern global positioning system (GPS) controlled train movements through the Advanced Train Management System (ATMS). Each train 'knows' where it is on the network and can be automatically braked if it exceeds speed or does not have permission to be on a section of track.

2.5.1.7 Improved sustainability

- Inland Rail will provide a long-haul freight solution that is time- and cost-competitive when compared to road freight. Consequently, Inland Rail will replace some of the long-haul road freight task, resulting in reduced road congestion and fewer vehicular carbon emissions.
- It is estimated that transportation of freight on Inland Rail is expected to use one-third of the fuel when compared to transporting the same volume of freight via the existing road route (ARTC, 2015a).

2.5.2 Indirect benefits

Foreseeable indirect benefits of Inland Rail and the Project are:

2.5.2.1 Create a step-change in the Australian freight network

Inland Rail offers significant performance advantages over the existing coastal rail route, including:

- Faster and more reliable transit times
- Shorter alignments
- More optimal grades
- The potential for double stacking and longer and heavier axle load trains.

Inland Rail will improve the reliability and resilience of the freight network and improve access to export ports and urban freight destinations. These operational efficiencies will increase the role rail plays in the broader freight network and will allow rail to compete in the market as a viable alternative to road, increasing the overall network capacity and freight mode options available to the market. It will provide direct linkage to other ports, such as Sydney, through the East-West Line at Parkes as well as across to Perth, and Newcastle via Moree.

2.5.2.2 Act as a catalyst for growth

Inland Rail will future proof Australia's freight task against road congestion associated with population growth and the projected increase in freight demand, allowing for increased productivity in major capital cities.

Inland Rail is expected to deliver 16,000 new jobs at the peak of construction, and an average of 700 additional jobs per year over the entire period. It is expected to increase Australia's gross domestic product (GDP) by $16 b during its construction and first 50 years of operation.

It will improve the safety of the network with separation of freight and passenger modes in urban and regional environments. This separation will result in improved network efficiency by shorter journeys, lower fuel and maintenance costs, leading to supply chain efficiencies and reduced costs, which will ultimately benefit consumers.

At a regional level, the Project has the potential to catalyse development through:

- Opportunities to encourage, develop and grow Indigenous, local, and regional businesses through the supply of resources and materials for the construction and operation of the Project (e.g. borrow and ballast materials, fencing, electrical installation (excluding rail systems) and instrumentation, rehabilitation and landscaping, cleaning and maintenance of construction and accommodation facilities).
- Opportunities in secondary service and supply industries (such as retail, hospitality and other support services) for businesses in proximity to the construction footprint (including opportunities to supply the three proposed accommodation facilities near to Millmerran, Inglewood and Yelarbon. The expansion in construction activity is also likely to support additional temporary flow-on demand and additional spending by the construction workforce in the local community.

- As part of Inland Rail, the Project has the potential to stimulate business and industry development at the Toowoomba Enterprise Hub in Wellcamp. By providing efficient transport access to intrastate and interstate markets, the Project may act as a catalyst for further private sector investment in this area, particularly for freight and logistics operations. The further development of the Toowoomba Enterprise Hub has the potential to unlock greater economic activity in the region, such as through promoting greater international export opportunities via Wellcamp Airport.
- As a greenfield/brownfield development, the Project comprises upgrades and new dual-gauge track to create a more direct rail freight corridor for freight operators. As a critical link of the broader Inland Rail, the Project offers opportunities to support the local agricultural industry, by driving savings in freight costs, improving market access, and reducing the volume of freight vehicles on the region's road network.

2.5.2.3 Facilitate training and skills development

ARTC has a strong commitment to training local and Indigenous people. Training pathways and the creation of opportunities for the development of skilled local and Indigenous workers through the Project's construction and operation will be achieved by:

- Providing information about the nature of skills required with sufficient lead-time to enable local training programs to be customised
- Cooperating with high schools in the region and training providers to provide appropriate training and skill development, and identify available employment pathways
- Indigenous community networks, to encourage applications and increase the number of Indigenous people applying for jobs
- Key partners, to link training and development programs with other projects and local industries to provide the greatest regional benefit
- Queensland State Government and Australian Government to provide long-term outcomes through training, mentoring and other support programs.

ARTC is also establishing the Inland Rail Skills Academy, which is a collection of projects and partnerships with the aim to:

- Facilitate local employment and procurement opportunities regionally by 'priming the market' in each region in which Inland Rail would be constructed
- Make it easy for Inland Rail contractors to employ and procure trained and competent people locally
- Use the opportunity created by the Project to provide medium- to long-term local and regional community benefits.

The Inland Rail Skills Academy comprises four pillars, including:

- Education: science, technology, engineering and maths (STEM) and trades education in schools and university scholarships into Inland Rail related professions (e.g. engineering, project management)
- Skills and training: apprenticeships and traineeships, and gaining industry accreditation to support employment into Inland Rail projects as well as other major regional industries
- Business capacity building: for small-to-medium enterprises to understand and meet major projects' supply chain requirements and enhance the value proposition of local business chambers and business groups
- Inland Rail staff training and inductions: opportunities for individuals to increase skills in a range of areas, including safety and sustainability.

The partnerships and projects that make up the Academy are in progress, with a comprehensive program to be delivered from 2020.

ARTC's workforce development project, training partnerships and the Inland Rail Skills Academy will help to ensure that young people and Indigenous people in the region have the opportunity for skills training that will equip them for the construction industry and will be transferrable to future projects. It will also result in an increase in the skilled labour force in the proposal region.

2.5.2.4 Enable complementary market-driven investments

The ultimate benefits of Inland Rail require interdependent and complementary investment in several other development opportunities and initiatives, and these will be coordinated across Inland Rail, including:

- Intermodal terminals, loading facilities and sidings for regional and agricultural freight
- Rollingstock investment in longer, heavier trains along with supporting train operations to take advantage of the improved rail offering (e.g. determination of arrival, departure and transit times) by train operators
- Double stack terminal capacity in Melbourne and Brisbane and ability to accommodate 1,800 m trains initially and up to 3,600 m trains in the future
- Investment in connecting existing rail lines and rail sidings in south-west Queensland to the Port of Brisbane, for example the South Western Line, the Millmerran Branch Line, the West Moreton Line and metropolitan Brisbane lines.

2.6 Consequences of not proceeding with Inland Rail and the Project

Not progressing with Inland Rail would potentially constrain the future growth potential of the national economy. Without the increased rail efficiency and performance provided by Inland Rail, pressure on the road networks will continue to increase, freight costs will continue to rise, consumers would pay more for products, and productivity in important industrial sectors could decline.

Without Inland Rail, road will increasingly become the dominant freight transport mode, with rail becoming less relevant. A continued over-reliance on road transport to meet the future east coast freight task will increase the vulnerabilities to projected population growth that is, even today, driving shortages of long-distance truck drivers and increasing costs. Providing customer choice between competitive transportation modes will build resilience into the national freight network.

More specifically, if investment in the east coast/Inland Rail freight corridor is not undertaken to increase capacity and minimise supply chain costs, the following risks are highly likely to eventuate:

- National productivity and economic growth will be constrained
- Freight companies and the consumers of products transported along the corridor are expected to experience excessive freight costs
- There will be an increase in congestion on both rail and road networks, given the reliance on shared freight/passenger corridors
- There will be an increase in the number of trucks on urban and regional roads required to move the rising freight volumes
- Governments will be required to make significant investments in major arterial and regional roads to ensure they can support the increase in the number and size of heavy vehicles
- There will be a deterioration of safety on the road network with existing infrastructure not supportive of changes in vehicle mix
- Fuel used and emissions discharged from an increased number and size of heavy road vehicles will have greater environmental impacts when compared to rail
- An increase in freight road traffic will have major impacts on urban and regional communities on the freight route, such as congestion, amenity and noise, resulting in safety and environmental issues.

2.7 Strategic planning context

This section identifies the national and State freight strategies and plans and discusses how the Project meets and supports their planning intent. Planning frameworks of relevance to the conceptual development of Inland Rail and the Project, addressed in this section include:

- *National Land Freight Strategy—A place for Freight* (Standing Council on Transport and Infrastructure, 2013)
- *Toowoomba Region Sustainable Transport Strategy 2014* (Toowoomba Regional Council (TRC), 2014a)
- *Australian Infrastructure Plan* (Infrastructure Australia, 2016a)
- *South East Queensland Regional Plan 2017* (*ShapingSEQ*) (Department of Infrastructure, Local Government and Planning (DILGP), 2017a)
- *Toowoomba Region Economic Development Strategy—Bold Ambitions 2038* (TRC, 2018)
- *National Freight and Supply Chain Strategy* (Transport Infrastructure Council, 2019)
- *Queensland Freight Strategy—Advancing Freight in Queensland* (Department of Transport and Main Roads (DTMR), 2019b)
- *Darling Downs Regional Transport Plan 2019* (DTMR, 2019c)

For each of these strategies and plans, an overview is provided below, in addition to discussion on the relevance to the Project.

2.7.1 National Land Freight Strategy—A place for Freight

Overview

The *National Land Freight Strategy* (Standing Council on Transport and Infrastructure, 2013) was developed as a partnership between the Australian, state, territory and local governments and industry to deliver a streamlined, integrated and multimodal transport and logistics system, capable of efficiently moving freight throughout Australia.

The objective of the strategy is to improve the efficiency of freight movements across infrastructure networks, minimise the negative impacts associated with freight movements and influence policy making relevant to the movement of freight. The strategy's long-term outcomes are to ensure:

- An efficient, productive and competitive national land freight system
- A sustainable land freight system that responds to growth and change
- Policies affecting land freight are aligned and coherent across governments.

The strategy seeks to direct the efforts of all governments and industry towards the long-term vision, objectives and outcomes for freight in Australia. It identifies six major challenges facing freight that require coordinated policy action and effort by governments and industry:

- Ensure long-term and integrated plans are in place for freight
- Invest in the right infrastructure at the right time
- Improve access, investment and charging arrangements for heavy vehicles
- Create better and more consistent regulation
- Enhance understanding of the freight task and its associated challenges
- Build community understanding and support for the role of freight.

Relevance to the Project

Once delivered, Inland Rail (and the Project) will help to realise the core objectives of the strategy: an increase in the efficiency of freight movements across infrastructure networks by providing modal alternatives and relieving the capacity constraints experienced by the existing freight supply chain. Inland Rail will achieve this by acting as a catalyst for moving freight from road to rail by delivering a greater supply of faster, more reliable rail freight paths offering significantly lower operating costs than either road transport or existing rail via the coastal route (ARTC, 2020b). Inland Rail will also encourage and facilitate the shift of more freight from road to rail. This modal shift will help to significantly reduce the economic cost to Australia from road congestion, forecast to be as much as $37 billion a year by 2030 (ARTC, 2020b).

2.7.2 Toowoomba Region Sustainable Transport Strategy 2014

Overview

The *Toowoomba Region Sustainable Transport Strategy 2014* (TRC, 2014a) is a plan for the future integrity and sustainability of the transport system in Toowoomba. The strategy provides the planning framework to improve the connectivity of the region, and has been developed to complement forthcoming infrastructure developments, including Inland Rail. Inland Rail is identified as a project that will significantly change how freight moves through the region.

Relevance to the Project

Freight transport is identified as a major component of the strategy, with a clear focus on supporting greater rail freight mode share, including mode shift from road freight. By supporting improved rail freight efficiency, the Project will encourage this mode shift, subsequently improving road safety and local traffic operations.

2.7.3 Australian Infrastructure Plan

Overview

The *Australian Infrastructure Plan* (the Plan) (Infrastructure Australia, 2016a) was developed by Infrastructure Australia as a long-term plan for infrastructure reform and investment in Australia. The plan is guided by four aspirations:

- Productive cities, productive regions
- Efficient infrastructure markets
- Sustainable and equitable infrastructure
- Better decisions and better delivery.

Within the 'productive cities, productive regions' aspiration, the plan recognises that at a national level the efficient movement of freight into, out of and across Australia is critical to the nation's ongoing productivity growth and competitiveness. The plan identifies a number of challenges facing the freight network and supply chains, including constraints such as missing links, pinch points, operational restrictions, and first and last mile access challenges.

Relevance to the Project

The plan highlights the importance of the Melbourne to Brisbane freight corridor in supporting population, production and employment precincts. Inland Rail will improve the efficiency, effectiveness and safety of freight movements travelling along this corridor. As both a greenfield and enhancement (brownfield) development, the Project will contribute to the realisation of these benefits, including improvements to the productivity and competitiveness of Australia's freight sector.

2.7.4 *South East Queensland Regional Plan 2017* (*ShapingSEQ*)

Overview

ShapingSEQ is the Queensland Government's plan to guide the future development of the SEQ region. *ShapingSEQ* aims to '*set the direction for sustainability, global competitiveness and high-quality living*'. The planning framework for the next 25 years is based off five strategic goals: grow, prosper, connect, sustain and live.

Relevance to the Project

In particular, *ShapingSEQ* addresses 'prosper' through a focus on regional economic clusters such as the Western Gateway, which will be further enabled by the development of Inland Rail, including the Project, which develops critical greenfield infrastructure within the Program. *ShapingSEQ* recognises the role of Inland Rail in unlocking opportunities for the greater intensification and consolidation of industrial activities and rail-dependent industries within the western subregion of Queensland.

Additionally, *ShapingSEQ* recognises the role of Inland Rail in improving national freight network connections, including links to the port of Brisbane. These improved connections will support efficient freight movements, align with *ShapingSEQ*'s goal of 'connection' and contribute to economic development throughout SEQ.

2.7.5 Toowoomba Region Economic Development Strategy—Bold Ambitions 2038

Overview

The *Toowoomba Region Economic Development Strategy* (TRC, 2018) describes an ambition for the future economic position of the region. The vision states that by 2038 '*…the Toowoomba region has an internationally competitive, vibrant, diverse and inclusive economy that provides opportunities for employment, entrepreneurship and investment that enhance the region's lifestyle and environment*'.

The development of Inland Rail is included in the strategy as an opportunity to enhance the region's agricultural industry supply chain and increase the competitiveness of Toowoomba's agriculture in domestic and international markets. This is especially important in maintaining the region's role as an agricultural hub and pivotal freight and logistics centre. Industries such as food-product manufacturing, machine manufacturing, and freight and logistics will be able to capitalise on the freight link provided by the Project and the broader Inland Rail Program.

The strategy also mentions the opportunity for transport and logistics, and freight and warehousing business development as a result of major road, rail and infrastructure investment in the region.

Relevance to the Project

The Project alignment is adjacent to the Toowoomba Enterprise Hub, which includes the InterLinkSQ intermodal facility and Toowoomba Wellcamp Airport. Connecting the Project to this hub will enable the region to further capitalise on its export potential to Asia and other global markets out of the Toowoomba Wellcamp Airport. In addition, the Economic Development Strategy highlights the opportunity for further growth and development of these facilities as a result of Inland Rail. The Project has the potential to assist in facilitating greater intermodal opportunities and freight movements, in addition to supporting investment into these adjacent freight and logistics businesses.

2.7.6 National Freight and Supply Chain Strategy

Overview

The *National Freight and Supply Chain Strategy* (Transport Infrastructure Council, 2019) was established in response to the following concerns:

- Australia's freight volumes are projected to grow by over 35 per cent between 2018 and 2040. Freight volumes are also changing, with urban freight forecast to increase by nearly 60 per cent over 20 years to 2040, in conjunction with growing population density pressures.
- Australia's freight productivity and costs have plateaued, with little change in real freight costs since the 1990s. These trends impact the competitiveness of our exports, including minerals and agriculture travelling from our regions to international markets.
- Changes in the way goods are made, purchased and distributed and technological advances, especially digitalisation, automation and electrification, have the potential to dramatically improve freight productivity and costs.
- Australia's freight and supply chains need to build resilience to meet emerging issues associated with natural disasters and climate risk, security and cyber threats and increasing community demands to improve safety and environmental outcomes.

In response to these concerns, the strategy sets an agenda for coordinated and well-planned government and industry action across all freight modes over the next 20 years and beyond. It sets a national vision for freight systems and supply chains to contribute to a strong and prosperous Australia through achieving the following goals:

- Improved efficiency and international competitiveness
- Safe, secure and sustainable operations
- A fit-for-purpose regulatory environment
- Innovative solutions to meet freight demand
- A skilled and adaptable workforce
- An informed understanding and acceptance of freight operations.

These goals guide governments and industry in considering strategic priorities for freight policy, programs and investment. The strategy determines that the goals will be achieved by taking national action across four critical areas:

- Smarter and targeted infrastructure investment
- Enable improved supply chain efficiency
- Better planning, coordination and regulation
- Better freight location and performance data.

Relevance to the Project

Once delivered, Inland Rail, and the Project, will provide a fast, safe and reliable inland freight rail connection between Melbourne and Brisbane. In doing so, it will address driving concerns of the strategy by providing an efficient supply chain backbone, which will enable connections with regional and national rail lines. These connections will reduce costs and provide greater flexibility in the way producers are able to transport goods and freight to markets throughout Australia, including to ports in Queensland, New South Wales, Victoria, South Australia and Western Australia (ARTC, 2020b).

2.7.7 Queensland Freight Strategy—Advancing Freight in Queensland

Overview

The *Queensland Freight Strategy—Advancing Freight in Queensland* (DTMR, 2019b) sets a shared vision for the State's freight system through a series of commitments that have the aim of guiding policy, planning and investment decision making over the next ten years. The vision for Queensland is *'an integrated, resilient and safe freight system that supports the economy and community*'.

The strategy makes a commitment to optimise existing freight infrastructure and target investment towards creating economic opportunities. The strategy also acknowledges the importance of smarter connectivity and access, identifying the role of competitive rail freight services in promoting the mode shift for freight from road to rail.

Relevance to the Project

The development of Inland Rail, and the Project, supports the strategic intent and direction of the strategy, by ensuring connectivity to existing operating lines, such as the South Western Line and the Millmerran Branch Line, to improve the efficiency of rail freight. The Project is projected to improve the productivity of regional and state supply chains and industry.

The direct and indirect benefits presented in Section 2.5.1 and Section 2.5.2 demonstrate that the Project is consistent with the intent of the *Queensland Freight Strategy*.

2.7.8 Darling Downs Regional Transport Plan 2019

Overview

The *Darling Downs Regional Transport Plan* (Darling Downs RTP) (DTMR, 2019c) outlines a shared direction for shaping the region's transport system over the next 15 years. The Darling Downs RTP sets out regional transport priorities and actions for developing the transport system in a way that supports regional communities, growth and productivity. The Darling Downs RTP details the economic importance of the relationship between infrastructure, transport and land use.

The Darling Downs RTP recognises the vital role of the freight network, particularly rail freight, across the Darling Downs in supporting future trade development and growth of the region's export-orientated industries. The RTP highlights the potential for Inland Rail to enable improvements in supply chains and freight productivity. Specifically, Inland Rail has been identified as an opportunity to improve access to export gateways and affords the region the opportunity to be the gateway for southern Queensland and north-western NSW to local, national and international markets.

Relevance to the Project

Overall, the Project, as part of the broader Inland Rail Program, will increase the attractiveness and competitiveness of rail freight, consistent with the planning intent of the Darling Downs RTP.

The direct and indirect benefits presented in Section 2.5.1 and Section 2.5.2 further demonstrate that the Project is consistent with the intent of the Darling Downs RTP.

2.8 Strategic options assessment

This section provides a discussion of the strategic option assessments for Inland Rail, from 2006 to 2015, and for the Project, from 2016 to early 2017.

Alternative routes for Inland Rail, between Melbourne and Brisbane, were initially considered through the following studies:

- *North–South Rail Corridor Study* (Ernst & Young, ACIL Tasman & Hyder Consulting, 2006)
- *Melbourne–Brisbane Inland Rail Alignment Study* (ARTC, 2010)
- *Melbourne—Brisbane Inland Rail Report* (Inland Rail Implementation Group, 2015)
- *ARTC 2015 Inland Rail Programme Business Case* (ARTC, 2015a)

Section 2.8.1 to Section 2.8.4 summarises these studies, including a discussion of the route options assessed and the outcomes of the options analysis. The *Melbourne—Brisbane Inland Rail Report* (Inland Rail Implementation Group, 2015) and the *ARTC 2015 Inland Rail Programme Business Case* (ARTC, 2015a) culminated in the finalisation of the Inland Rail service offering and approval from the Australian Government to proceed to the concept planning phase for the Program. The Inland Rail service offering is introduced in Section 2.8.5. A discussion of the main corridor and alignment option assessments completed from early 2016 to late 2017 during the concept assessment phase of the Project is provided in Section 2.8.6.

2.8.1 North—South Rail Corridor Study (2006)

The purpose of the *North–South Rail Corridor Study* (Ernst & Young, ACIL Tasman & Hyder Consulting, 2006) was to identify a route from Melbourne to Brisbane that would deliver the best overall outcome with consideration for:

- Market demand
- Operating efficiency
- Infrastructure requirements
- Environmental constraints.

The report considered:

- Route options (refer Section 2.8.1.1)
- Market assessment
- Projected demand
- Environmental issues
- Other transport infrastructure requirements
- Financial and economic impacts.

2.8.1.1 Options identified

Potential route options were identified within a 'north–south rail corridor', which was an elliptically shaped area defined by the standard gauge rail line along the NSW coast, and a broad arc west of Shepparton, Jerilderie, Coonamble, Burren Junction, Goondiwindi and Toowoomba. This area covered all sections of the existing rail network in Victoria, NSW and Queensland that currently form, or could potentially form, part of an Inland Rail freight route between Melbourne and Brisbane. The study area for the *North–South Rail Corridor Study* is shown in Figure 2.2.

FIGURE 2.2 STUDY AREA FOR THE NORTH–SOUTH RAIL CORRIDOR STUDY, AS PUBLISHED IN THE **NORTH–SOUTH** RAIL CORRIDOR STUDY—DETAILED STUDY REPORT

Source: Ernst & Young, ACIL Tasman & Hyder Consulting, 2006

Within this corridor, four sub-corridors were identified, each of which could be combined with alternative routes between Melbourne and Junee, via Shepparton or via Albury. The four sub-corridors comprised:

- Far Western Sub-Corridor—linking Junee to Brisbane via Parkes, Dubbo and/or Narromine, Coonamble, Burren Junction, Narrabri and/or Moree, North Star, Goondiwindi, Warwick and/or Toowoomba
- Central Inland Sub-Corridor—linking Junee to Brisbane via any inland route that includes the Werris Creek to Armidale to Tenterfield rail links
- Coastal Sub-Corridor—following the existing coastal route between Junee and Brisbane (via Goulburn), through Sydney
- Hybrid Sub-Corridor—combining elements of an inland and coastal route, linking Junee to Brisbane via Muswellbrook and Maitland.

Within each of these sub-corridors, the feasibility of 136 possible route options was investigated. These options involved different combinations of new tracks and upgrades to existing tracks.

2.8.1.2 Analysis of options

The route options were compared using an optimisation model specifically developed for the study, based on the following criteria:

- Operating efficiency
- Infrastructure requirements
- Market demand
- Environmental constraints
- Financial and economic viability.

The study identified potential demand, financial issues, environmental issues and infrastructure costs relevant to the four sub-corridors. The analysis undertaken for the study concluded that the Far Western Sub-Corridor (via Albury and Parkes) was the best performing sub-corridor option, based on the following:

- Shortest and fastest transit journey from north to south, while avoiding the impact of Sydney rail traffic congestion
- This option was projected to require the lowest level of capital expenditure of the four sub-corridors
- In addition to carrying Melbourne–Brisbane freight, the far western sub-corridor had the potential to derive additional revenue from southern Queensland freight travelling to the western states and from Perth to the east coast. This additional revenue opportunity is specific to this sub-corridor
- A rail freight line through the far western sub-corridor is expected to divert some of the freight that moves between regional areas and ports.

2.8.2 Melbourne–Brisbane Inland Rail Alignment Study (2010)

In 2008, Inland Rail was announced by the Australian Government to be led by ARTC. The *Melbourne–Brisbane Inland Rail Alignment Study* (ARTC, 2010) was commissioned following this announcement. This Study established the 'base case' alignment.

The purpose of the *Melbourne–Brisbane Inland Rail Alignment Study* was to determine the optimum alignment within the Far Western Sub-Corridor identified in the North–South Rail Corridor Study (Ernst & Young, ACIL Tasman & Hyder Consulting, 2006). The report considered:

- Market take-up
- Route development and high-level costings
- Capital cost vs transit time
- Financial and economic appraisal.

2.8.2.1 Options identified

The *Melbourne–Brisbane Inland Rail Alignment Study* short-listed and analysed viable route options, through:

- Identification of the route—evaluation of the route options and preliminary analysis for the three main areas: Melbourne to Parkes, Parkes to Moree, and Moree to Brisbane
- Analysis of the route—the route was analysed in terms of capital cost, potential environmental impacts, journey time, as well as its preliminary economic and financial viability
- Development of the preferred alignment—the preferred alignment was developed considering environmental, social and engineering factors.

The study noted that, with the combination of numerous route options and sections, there were over 50,000 possible options for the route between Melbourne and Brisbane. As it was not feasible to analyse each option, two key criteria (i.e. capital cost and journey time) were used to establish a shortlist of route options in each of the three main areas. The shortlist included:

- Southern Section (Melbourne to Parkes)—two main options:
  - Via Albury
  - Via Shepparton.
- Central Section (Parks to Moree)—four main options:
  - Parkes to Moree via Werris Creek
  - Parkes to Moree via Binnaway and Narrabri
  - Parkes to Moree via Curban, Gwabegar and Narrabri
  - Parkes to Moree via Burren Junction.
- Northern Section (Moree to Brisbane)—two main options:
  - The Warwick route
  - The Toowoomba route.

Each of these sections, and the options within them, are shown on Figure 2.3.

FIGURE 2.3 STUDY AREA FOR THE INLAND RAIL ALIGNMENT STUDY 2010

2.8.2.2 Analysis of options

A number of route options were evaluated in the southern, central and northern sections of the Far Western Sub-Corridor. The evaluation considered:

- Capital cost vs transit time
- Impacts on demand
- Financial and economic performance.

Optimal economic performance was a key decision criteria in the choice of the overall route and, in the key central sector, led to the recommendation of a shorter, faster Narromine to Narrabri direct greenfield route, rather than using existing corridors via Werris Creek.

The above routes were assessed on the basis of their ability to attract contestable freight. Freight firms and customers were surveyed to understand how modal choices on contestable freight were made. For express and other just-in-time freight, minimum transit time and high reliability were identified as essential.

The report found that the:

- Southern Section offered the greatest opportunity to save money, as Shepparton route was estimated to cost $900 million more than Albury route (2010 dollars, not updated)
- Central Section offered greatest opportunity to save time, saving more than 5 hours 30 minutes by not going via Dubbo and Werris Creek
- Northern Section offered the greatest opportunity to use existing protected rail corridors in greenfield sections.

On this basis, the final preferred alignment consisted of:

- Southern Section:
  - Tottenham–Albury–Illabo (existing corridor)
  - Illabo–Stockinbingal (greenfield)
  - Stockinbingal–Parkes–Narromine (existing corridor).
- Central Section:
  - Narromine–Narrabri (greenfield)
  - Narrabri–North Star (existing corridor.
- Northern Section:
  - North Star–Yelarbon (greenfield)
  - Yelarbon–Gowrie–Kagaru (greenfield plus existing corridors)
  - Kagaru–Acacia Ridge (existing corridor).

Some sections of the existing corridor were identified as requiring enhancement works, principally clearance improvements to accommodate double-stacked trains, while others were secondary lines requiring upgrading to full main line standards.

This work was later reaffirmed in the work undertaken in 2015 by the Inland Rail Implementation Group (refer Section 2.8.3) and formalised in the Inland Rail Service Offering (refer Section 2.8.4).

2.8.3 Inland Rail Implementation Group (2015)

To progress Inland Rail, in late 2013, the then Deputy Prime Minister, the Hon Warren Truss MP, established the Inland Rail Implementation Group (IRIG) to lead the development of a 10-year delivery program for Inland Rail by ARTC and prepare the business case. Responsibilities included settling the alignment, determining construction priorities, commencing pre-construction and monitoring the development of the program. The IRIG was chaired by former Deputy Prime Minister, the Hon John Anderson AO, with senior representatives from the Australian, NSW, Queensland and VIC governments, and ARTC.

In 2015, the Inland Rail Implementation Group prepared a report to the Australian Government, which set out a strategic analysis of the need for Inland Rail as one potential solution to the future freight task along the Melbourne–Brisbane corridor and included the main features of a business case for Inland Rail developed during 2014 and 2015 by ARTC. The report, *Melbourne–Brisbane Inland Rail Report* (Inland Rail Implementation Group, 2015), also provided government with recommendations on the delivery of Inland Rail. The report was written to be read in conjunction with *Inland Rail Programme Business Case* (ARTC, 2015a) (refer Section 2.8.4).

In relation to the route for Inland Rail, the IRIG broadly agreed with the alignment identified in the *2010 Inland Rail Alignment Study* (refer Section 2.8.2.2), but considered three sections in more detail:

- Albury vs Shepparton: The IRIG endorsed the route via Albury (as per the *2010 Inland Rail Alignment Study*) rather than Shepparton because freight values coming from Shepparton did not justify the added cost of between $1 billion and $2 billion (2015 dollars, not updated).
- North Star to Toowoomba: The IRIG noted that further hydrological and geotechnical assessments were needed between North Star and Toowoomba, which may result in a final alignment to the east or west of the 2010 Inland Rail Alignment Study alignment.
- Toowoomba Range: The IRIG endorsed adoption of Queensland Transport's 2003 alignment between Gowrie and Grandchester.

The Inland Rail route endorsed by the IRIG is shown on Figure 2.4.

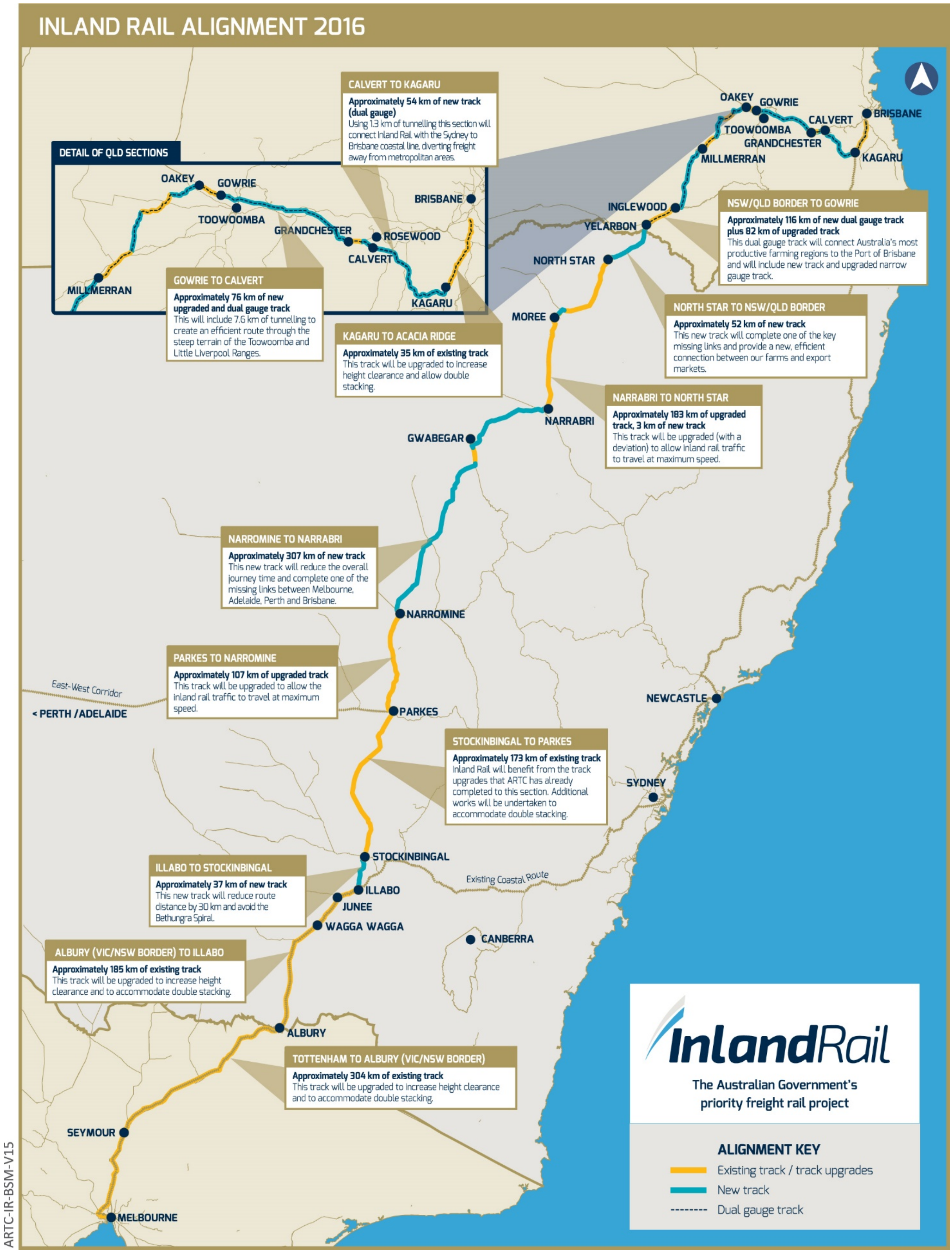


FIGURE 2.4 INLAND RAIL IMPLEMENTATION GROUP 2015 ROUTE

Source: ARTC, 2020b

2.8.4 Inland Rail Programme Business Case (2015)

The *Inland Rail Programme Business Case* (ARTC, 2015a) was prepared to accompany the IRIG's report to the Australian Government (refer Section 2.8.3).

The Business Case provided a detailed assessment of why Inland Rail is needed and how it could be delivered. The viability, benefits, costs and risks associated with the Inland Rail Program were also assessed, although the Business Case acknowledged that further development of designs, costs and other technical and economic data was required as the Program progressed. The Business Case was developed to be submitted to the Australian Government for endorsement and approval in order to proceed with the delivery of the Inland Rail Program.

Extensive consultation with key market participants and other industry stakeholders was undertaken to develop the service offering and scope of the Inland Rail Program to ensure the infrastructure meets market needs in terms of service specification and performance. This consultation concluded that the proposed alignment endorsed by the IRIG (refer Figure 2.4) and scope of Inland Rail:

- Optimises the use of existing rail infrastructure
- Is compatible and interoperable with high-productivity train operations in the east–west corridor (to Adelaide and Perth)
- Bypasses bottlenecks on the congested metropolitan Sydney rail network
- Optimises connections with regional and local rail and road networks
- Maximises value for money in meeting the needs of the market.

2.8.5 Service offering

The Inland Rail service offering was established in parallel to development of the *Inland Rail Programme Business Case*, in consultation with key market participants and other industry stakeholders. The service offering is central to the delivery and competitiveness of Inland Rail and reflects the priorities of freight customers. It was developed in consultation with key market participants and stakeholders and represents the key elements to be addressed by Inland Rail to enable a competitive and complementary service offering compared to other modes, including road transport.

The key characteristics of the Inland Rail service offering are:

- **Reliability:** 98 per cent, defined as the percentage of goods delivered on time by road freight, or available to be picked up at the rail terminal or port when promised
- **Price:** cheaper relative to road transportation, as a combined cost of access to the rail network, rail haulage and pick-up and delivery
- **Transit time:** 24 hours or less from Melbourne to Brisbane
- **Availability:** services available with departure and arrival times that are convenient for customers, which depends on cut-off and transit times.

These service offerings are underpinned by the key technical characteristics that are particularly relevant to rail operators as these directly influence operating-cost structures and their own service offerings to the market. The key technical characteristics of Inland Rail and the Project are discussed in Chapter 5: Project Description.

While the service offering is specific to the rail network, terminals are a critical element and ARTC will work with terminal operators and proponents as Inland Rail progresses to enable connection opportunities.

2.8.6 Concept planning (2016–2017)

Following from the IRIG Report (refer Section 2.8.3), ARTC's task as the delivery agent for Inland Rail was to examine whether there were cost-effective opportunities to improve upon the 2015 IRIG alignment in order to improve outcomes beyond the Inland Rail Service Offering (refer Section 2.8.5). An option was assessed to the point where it was determined that it was either too expensive or degraded the Service Offering.

ARTC classified the Inland Rail route into 13 sections (projects) that could be described broadly as either brownfield (using existing rail track or corridors) or greenfield (sections requiring completely new corridors or track). The greenfield sections required assessment of options to determine alignment study areas within which the final rail corridor will be located. As a result, the alignment included in the IRIG Report has undergone further refinement in a number of sections since 2015.

There are three key considerations in selecting any route:

- Ability to enhance the Inland Rail Service Offering
- Construction and operating costs
- Multi-Criteria Analysis (MCA).

The MCA framework, shown in Figure 2.5, seeks to ensure recommendations consider a wide range of criteria including:

- Engineering and technical factors
- Social and community impacts
- Number of properties directly impacted
- Environmental impacts
- Geotechnical and constructability related issues.

Within a particular MCA workshop, the agreed weightings for each criteria are applied uniformly across all options considered in that workshop. The outcome of any MCA workshop is just one factor in choosing between competing route options and not a determining factor in its own right.

An MCA indicates whether a route option warrants further consideration which is then assessed for its ability to enhance the Service Offering and whether its estimated construction and operating costs are appropriate for any perceived benefits. This route evaluation process is represented in Figure 2.6.

The sections below provide a summary of the main corridor and alignment option assessments that were completed during the concept assessment phase of the Project, from early 2016 to late 2017. During the concept assessment phase, the NSW/QLD border to Yelarbon section of the Project was assessed separately to the Yelarbon to Gowrie section. Therefore, these sections are discussed separately below.

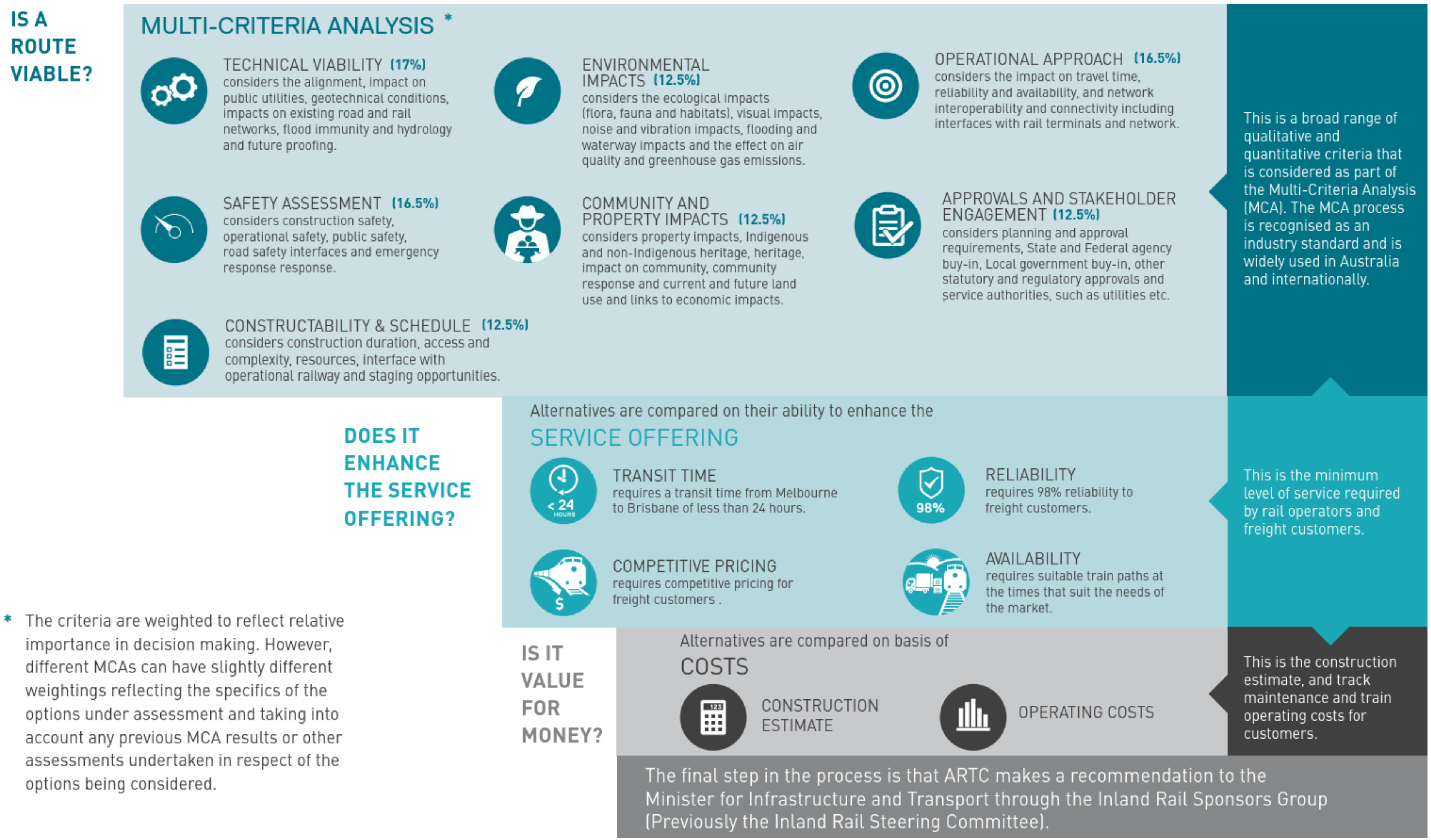
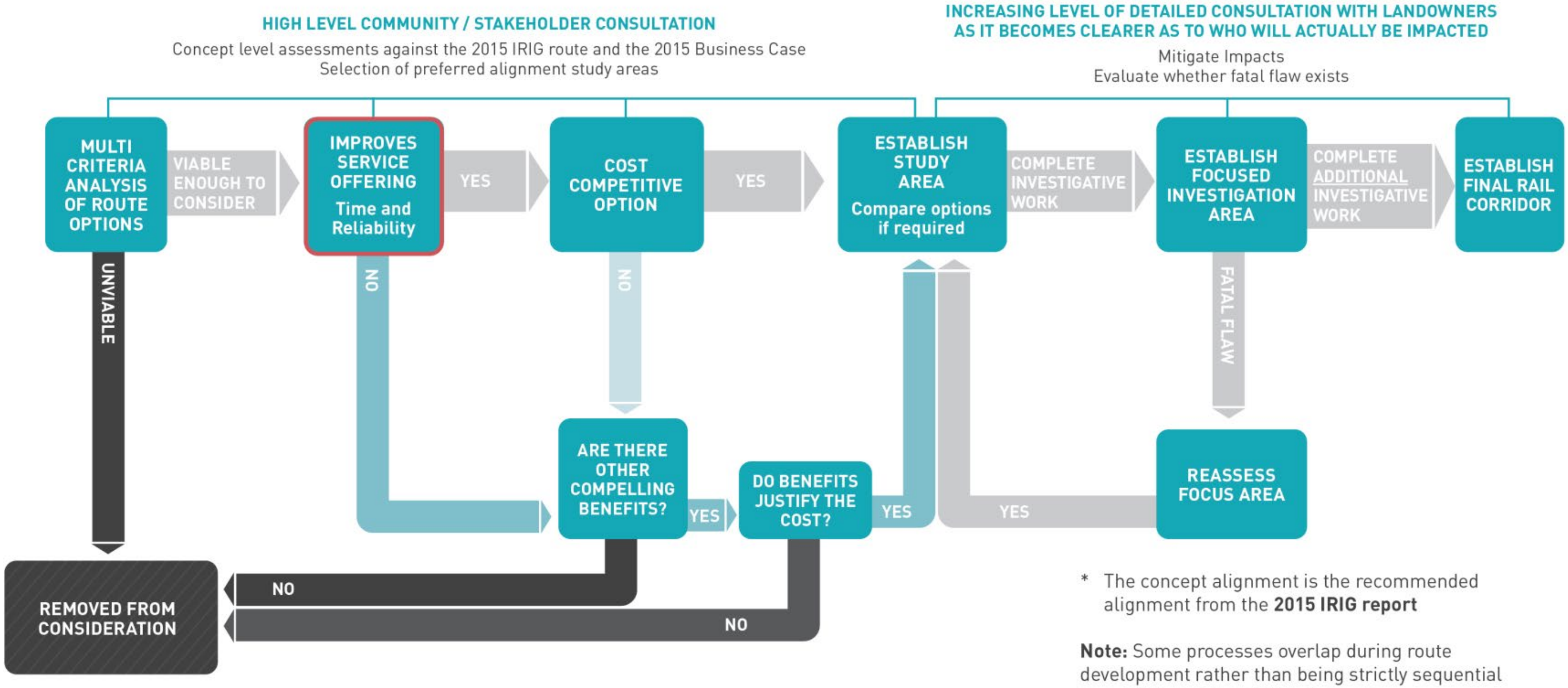


FIGURE 2.5 FACTORS AFFECTING ROUTE SELECTION SINCE 2016

Source: ARTC, 2020b



* The concept alignment is the recommended alignment from the **2015 IRIG report**

Note: Some processes overlap during route development rather than being strictly sequential as per this representative diagram.

FIGURE 2.6 PROCESS FOR ASSESSING ROUTE OPTIONS LEADING TO A FINAL RAIL CORRIDOR

Source: ARTC, 2020b

2.8.6.1 New South Wales/Queensland border to Yelarbon

This section discusses the corridor and alignment options considered for the section of the Project that is located from the NSW/QLD border, on the Macintyre River, to Yelarbon.

Corridor selection

The IRIG alignment for Inland Rail was proposed to cross the NSW/QLD border to the south of Yelarbon; however, subsequent concept studies and discussions with local stakeholders led to the identification of four alternative route options, with different border crossing locations. These route options are shown on Figure 2.7 and described as follows:

- Base case alignment (IRIG alignment)
- Option 1—73 km (38 km of new track constructed in abandoned rail corridor or greenfield construction)
- Option 2—90 km (46 km of new track constructed in abandoned rail corridor or greenfield construction)
- Option 3—65 km greenfield alignment
- Option 4—65 km greenfield alignment.

FIGURE 2.7 EASTERN AND WESTERN ALIGNMENT OPTIONS FROM THE CONCEPT ASSESSMENT

These options were comparatively assessed using an MCA, which considered:

- Technical viability
- Safety
- Operational constraints
- Constructability and schedule
- Environmental constraints
- Community and property issues
- Approvals and stakeholder concerns.

The MCA was documented in the *2016 Verified Alignment Development Assessment Report* (WSP & Parsons Brinckerhoff, 2016) and concluded that:

- The base case alignment performed comparatively worse than the other route options due to hydrological challenges and interaction with the environmentally sensitive Yelarbon desert
- The projected journey time for Option 2 was not compatible with the objective total journey time for Inland Rail
- Option 3 resulted in greater land impacts than Option 4
- Option 1 and Option 4 could not be separated by the MCA and required more detailed comparative assessment.

Further comparative assessment of Option 1 and Option 4, and variants of each, was undertaken by implementing an MCA based on the outcomes of additional stakeholder and community engagement, geotechnical site investigation, flood modelling and more detailed quantity estimation and costing. This assessment identified a 6 km corridor around the western route option, Option 1, to be the preferred investigation corridor for the next phase of the Project as it scored favourably in relation to community and property issues, environmental constraints and approvals, and stakeholder concerns (WSP & Parsons Brinckerhoff, 2017).

The comparative assessment process for the east versus the west route options is shown in Figure 2.8 and the conclusions of the MCA process are summarised in Figure 2.9.

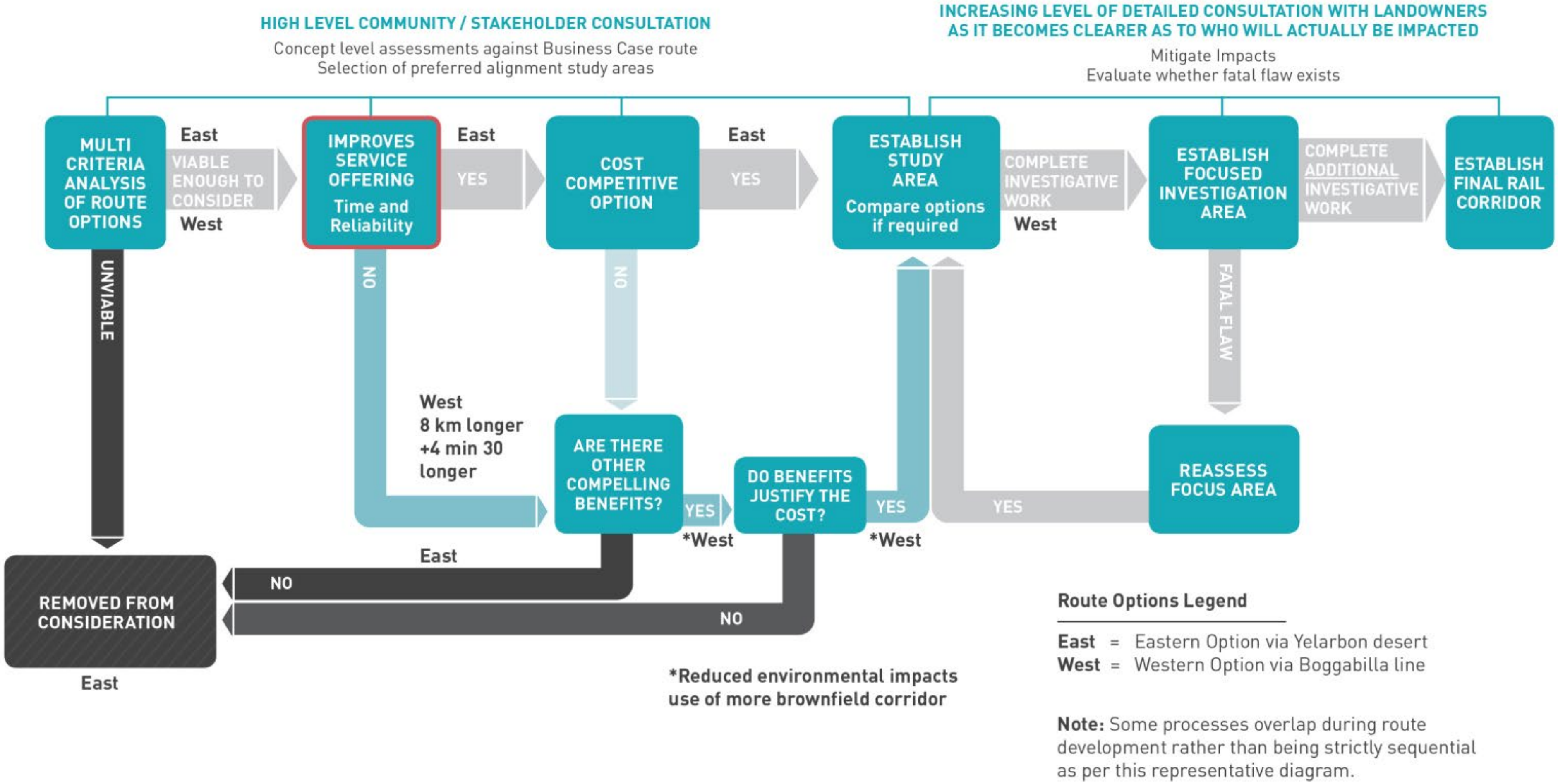


FIGURE 2.8 COMPARATIVE ASSESSMENT PROCESS FOR EAST VERSUS WEST ROUTE OPTIONS

Source: ARTC, 2020b

	East (Base Case)		West	
Distance	65km	Neutral	73km 8km longer	Unfavourable
Service Offering / Transit time	-	Neutral	4m 26s longer	Neutral
MCA:				
Stakeholder/ community impact	Greater impact on greenfield stakeholders including compromising viability of organic certified business employing 40 people	Highly unfavourable	Wide support for Western alignment	Favourable
Flooding	Similar for both options	Neutral	Similar for both options	Neutral
Environmental	Multiple environmental impacts including crossing of Yelarbon desert	Highly unfavourable	Reduced impacts on EPBC* and remnant vegetation, (104ha vs 133ha on eastern route) lower property impacts, reduced visual impact	Favourable
MCA Score	0	Neutral	+1.2	Favourable
Construction Cost	$0m (for relativity)	Neutral	+$29m/+6.5%	Unfavourable
Recommended				✓

- Favourable
- Neutral
- Unfavourable
- Highly unfavourable

*EPBC – Environmental Protection and Biodiversity Conservation Act 1999

FIGURE 2.9 SUMMARY OF MULTI CRITERIA ASSESSMENT OF EAST VERSUS WEST ROUTE OPTIONS

Source: ARTC, 2020b

Alignment selection

The preferred study area for this section of the Project was announced in February 2017 by the then Australian Government Minister for Infrastructure and Transport. After the preferred study area was announced, additional work was undertaken to refine the 6 km corridor around the proposed Macintyre River crossing to a 2 km wide corridor. This refinement work included:

- Additional flood studies
- Consultation with key stakeholders, including potentially affected landowners, elected representatives, industry groups and government agencies.

Consequently, six greenfield alignment options for crossing the Macintyre River and tying into the South Western Line were developed and assessed through an MCA. These options are shown on Figure 2.10. The MCA considered:

- Technical viability
- Safety
- Operational constraints
- Constructability and schedule
- Environmental constraints
- Community and property issues
- Approvals and stakeholder concerns.

The MCA identified 'Option D st 1D' to be the preferred alignment due to:

- Reduced impacts on environment, utilities, land use and property
- Improved hydrological and flooding outcomes in the vicinity of Whalan Creek and the Macintyre River
- Improved safety outcomes for road users due to a reduction in the number of road–rail interfaces
- Opportunities to connect with regional transport and freight hubs in northern NSW.

As a result, alignment option 'Option D st 1D' has formed the basis for the reference design for this Project between the NSW/QLD border and the existing QR South Western Line.

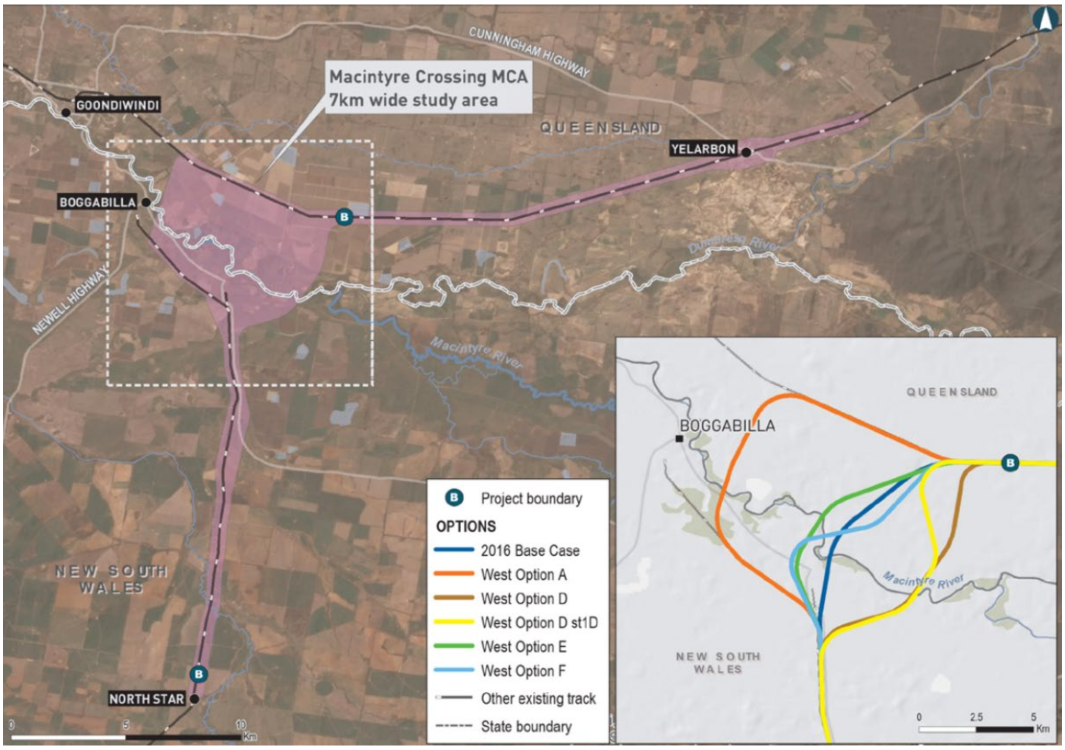


FIGURE 2.10 GREENFIELD ALIGNMENT OPTIONS FOR THE NORTH STAR TO YELARBON SECTION OF INLAND RAIL

Source: ARTC, 2020b

2.8.6.2 Yelarbon to Gowrie

This section discusses the corridor and alignment options considered for the section of the Project that is located from Yelarbon to Gowrie.

Review of the base case alignment

In 2016, ARTC revisited the base case alignment previously established in the *Melbourne–Brisbane Inland Rail Alignment Study* (ARTC, 2010) (refer Section 2.8.2) to confirm the technical viability of the alignment and to undertake localised route optioneering. This review resulted in localised modifications to the alignment to achieve a route that was optimal in relation to engineering, environmental, social and economic constraints. The revised alignment was named the 'Base Case Modified' alignment.

As a component of this review, route options were considered that extended north from Whetstone, through the Whetstone State Forest, thereby bypassing to the west of Inglewood. In total, six State forest route options were identified and assessed against the base case. These six options are shown in Figure 2.11 and were as follows:

- **Option 3124**: North through Whetstone State Forest along the transmission line easement, across the Gore Highway and passing to the north of Millmerran, via Captains Mountain
- **Option 3125**: North through Whetstone State Forest along the transmission line easement, across the Gore Highway and extending to Commodore Mine, via Captains Mountain
- **Option 3126**: North through Whetstone State Forest along the transmission line easement, then extending east in parallel to the Gore Highway to Commodore Mine
- **Option 3127**: North through Whetstone State Forest along the transmission line easement, then extending east in parallel to the Gore Highway to the north of Millmerran
- **Option 3128**: North through Whetstone State Forest along the transmission line easement, then northeast to the western side of Millmerran Downs and parallel to the Gore Highway to Commodore Mine
- **Option 3129**: North through Whetstone State Forest along the transmission line easement, then northeast to the eastern side of Millmerran Downs and parallel to the Gore Highway to Commodore Mine.

The options were considered in a like-for-like manner against the Base Case Modified option, with consideration for the following factors:

- Alignment length
- Journey time
- Property impacts
- Environmental constraints
- Impacts with existing infrastructure
- Hydrological constraints
- Earthwork volumes
- Maximum vertical gradients.

This comparative assessment concluded that the Base Case Modified alignment performed better than the six alternative alignment options as it:

- Was between 10 km and 28 km shorter than the alternative alignment options
- Had a journey time between 3 and 18 minutes faster than the alternative alignment options
- Required substantially less earthworks than the alternative alignment options
- Avoided the steep vertical grades that were otherwise encountered by the State Forest options
- Required between 19 and 37 fewer private access severances than the alternative alignment options
- Had fewer watercourse crossings than the alternative alignment options.

The *Concept Assessment Report—Yelarbon to Gowrie* (AECOM, 2017a) was developed as an output of this review and defined departures from the 2010 base case route.

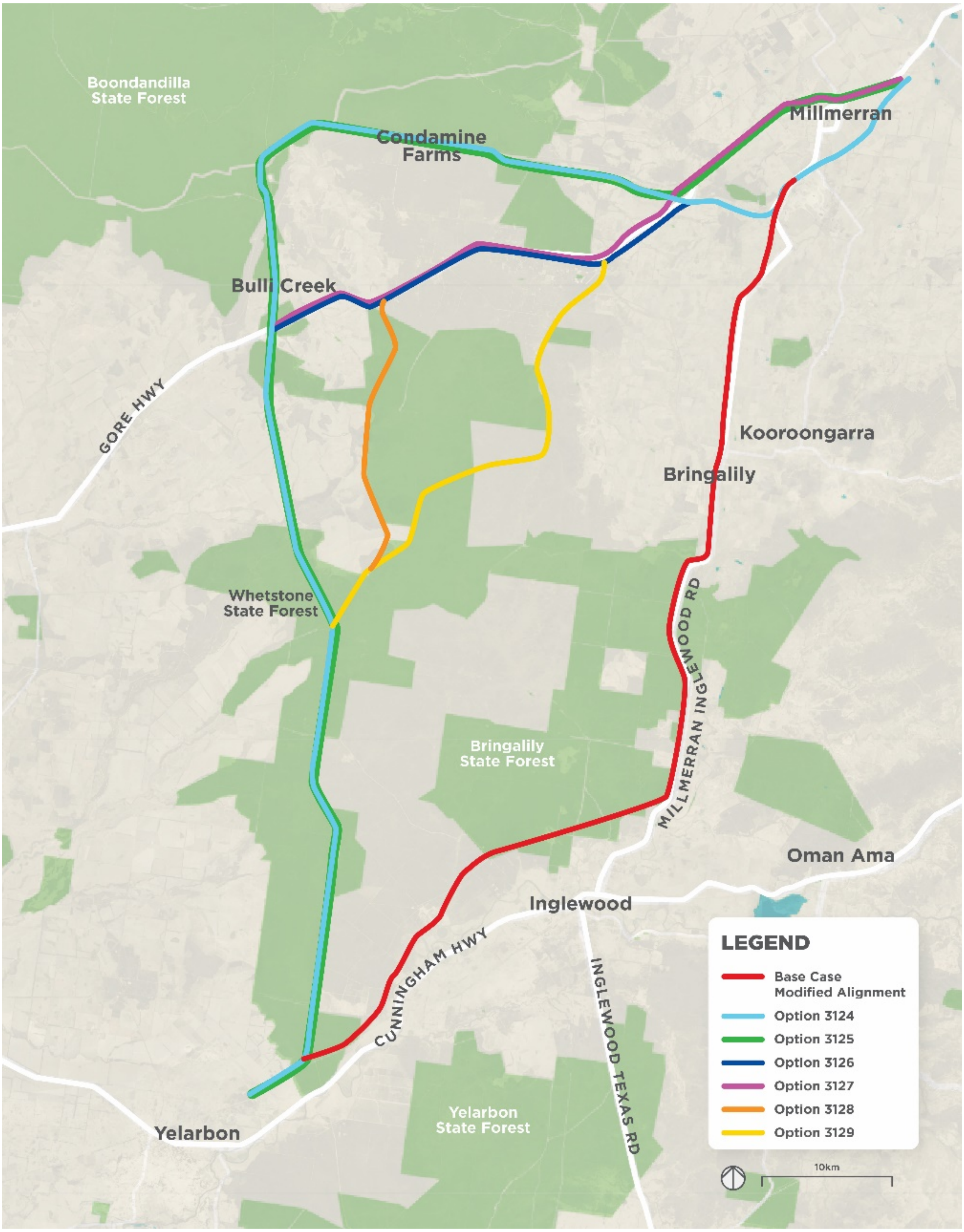


FIGURE 2.11 STATE FOREST ROUTE OPTIONS CONSIDERED DURING THE CONCEPT ASSESSMENT

Corridor options assessment

In late 2016, the Australian Government directed ARTC to investigate and comparatively assess three additional corridor options, between Inglewood and Gowrie, against the Base Case Modified alignment option. The opening of the Toowoomba Wellcamp Airport in November 2014 was one of the key drivers for this request, due to the economic growth opportunities that the airport introduced for the region.

The four options that were assessed were:

- **Corridor 1: Base Case Modified option.** This option followed Millmerran–Inglewood Road to Millmerran, and then extended through or close to Brookstead, Mount Tyson, Aubigny and Kingsthorpe. The corridor had a length of 181.3 km.
- **Corridor 2: Wellcamp–Charlton option.** This option followed Millmerran–Inglewood Road to Millmerran, and then extended through or close to Brookstead, Pittsworth, Southbrook and Wellcamp. The corridor had a length of 168.1 km.
- **Corridor 3: Karara/Leyburn option.** This option followed the existing South Western Line until Karara. It then extended through or close to Leyburn, Southbrook and Wellcamp. The corridor had a length of 171.9 km.
- **Corridor 4: Warwick option.** This option followed the existing South Western Line to approximately 20 km west of Warwick. The option then extended north through or close to Ellinthorp, Clifton, Nobby, Wyreema and Wellcamp. The corridor had a length of 208.3 km.

Each of these corridor options are shown on Figure 2.12.

The alternative corridor assessment process was conducted by independent consultants and overseen by the Yelarbon to Gowrie Project Reference Group, a group of stakeholder representatives specifically formed for the task.

The corridor assessment process involved comparing the three alternative corridors against the Base Case Modified alignment on a like-for-like basis, involving the following steps:

1. MCA of the four routes, considering:
   i) Technical criteria
      - Technical viability
      - Safety
      - Operational constraints
      - Constructability and schedule.

   ii) Non-technical criteria
      - Environmental constraints
      - Community and property issues
      - Approvals and stakeholder concerns.
2. Comparative construction cost estimates
3. Community consultation and validation of the transparency of the assessment process.

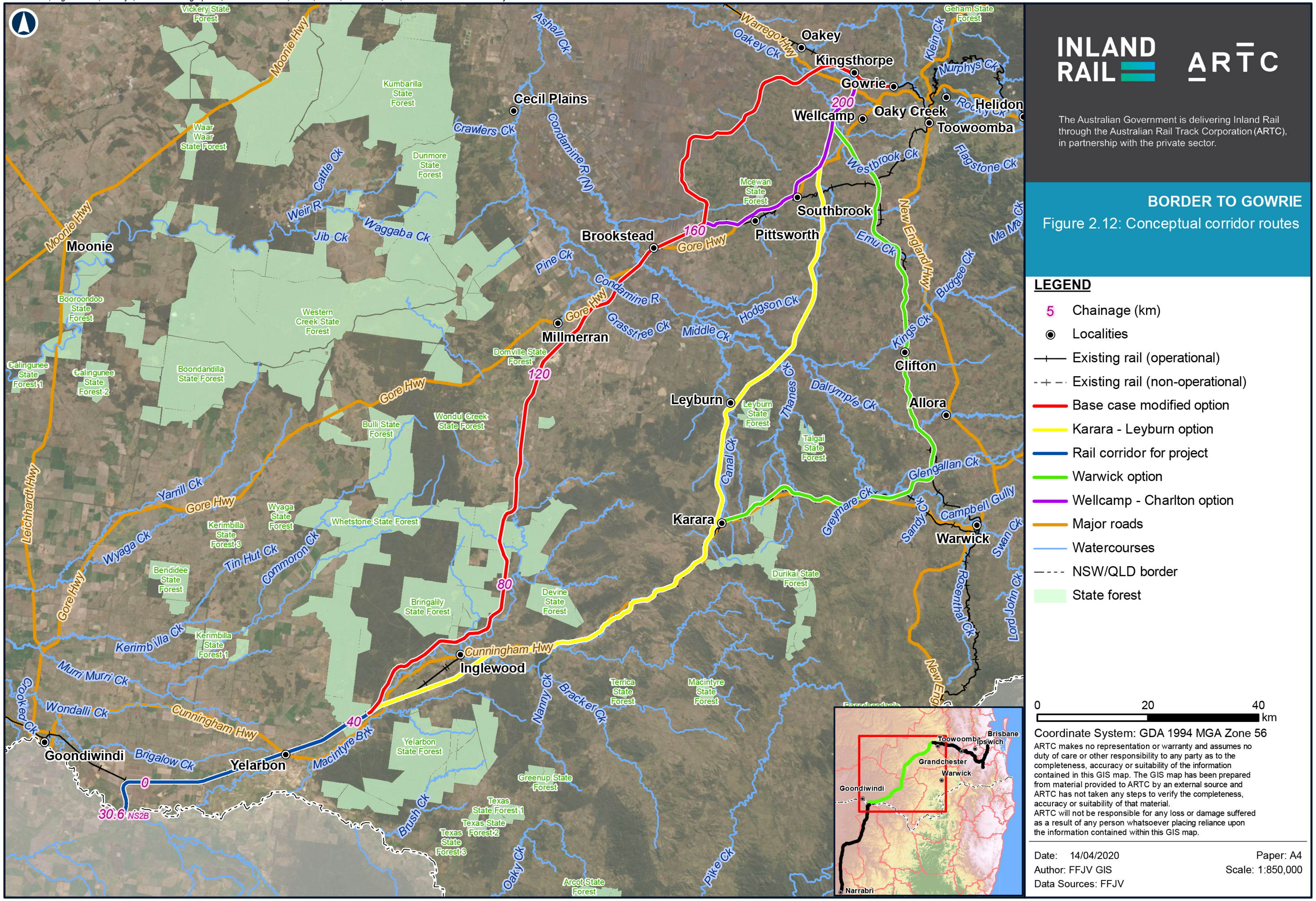
Once each alignment had been developed and refined to comply with ARTC's design standards, each was assessed by a multi-disciplinary team to determine key metrics and values that would provide differentiators for the MCA and cost estimate.

A key component in the route option assessment was crossing the Condamine River floodplain and associated waterways. As with all sections of Inland Rail, the priority is to design a rail line that is safe. In this section, it also means a line that will not cause unacceptable flooding impacts to landowners. For this purpose, the assessment looked at the length of each route that traversed land that would be flooded in 1% annual exceedance probability (AEP) events and flooded in 10% AEP events (refer Figure 2.13). Corridor 2 and Corridor 3 were rated more favourably than the Base Case Modified route (Corridor 1) and Corridor 4.

The results of the MCA indicated that two of the alternative options scored closely to the Base Case Modified alignment option, these being the Wellcamp–Charlton route (Corridor 2) and the Karara–Leyburn route (Corridor 3). The third alternative option, the Warwick route (Corridor 4), did not score as closely and scored negatively when compared to the Base Case Modified alignment route. This negative score was a function of the extra length of the alignment, the interfaces with more local communities and sensitive receptors, and the requirement to modify the existing alignment to meet the ARTC design standards.

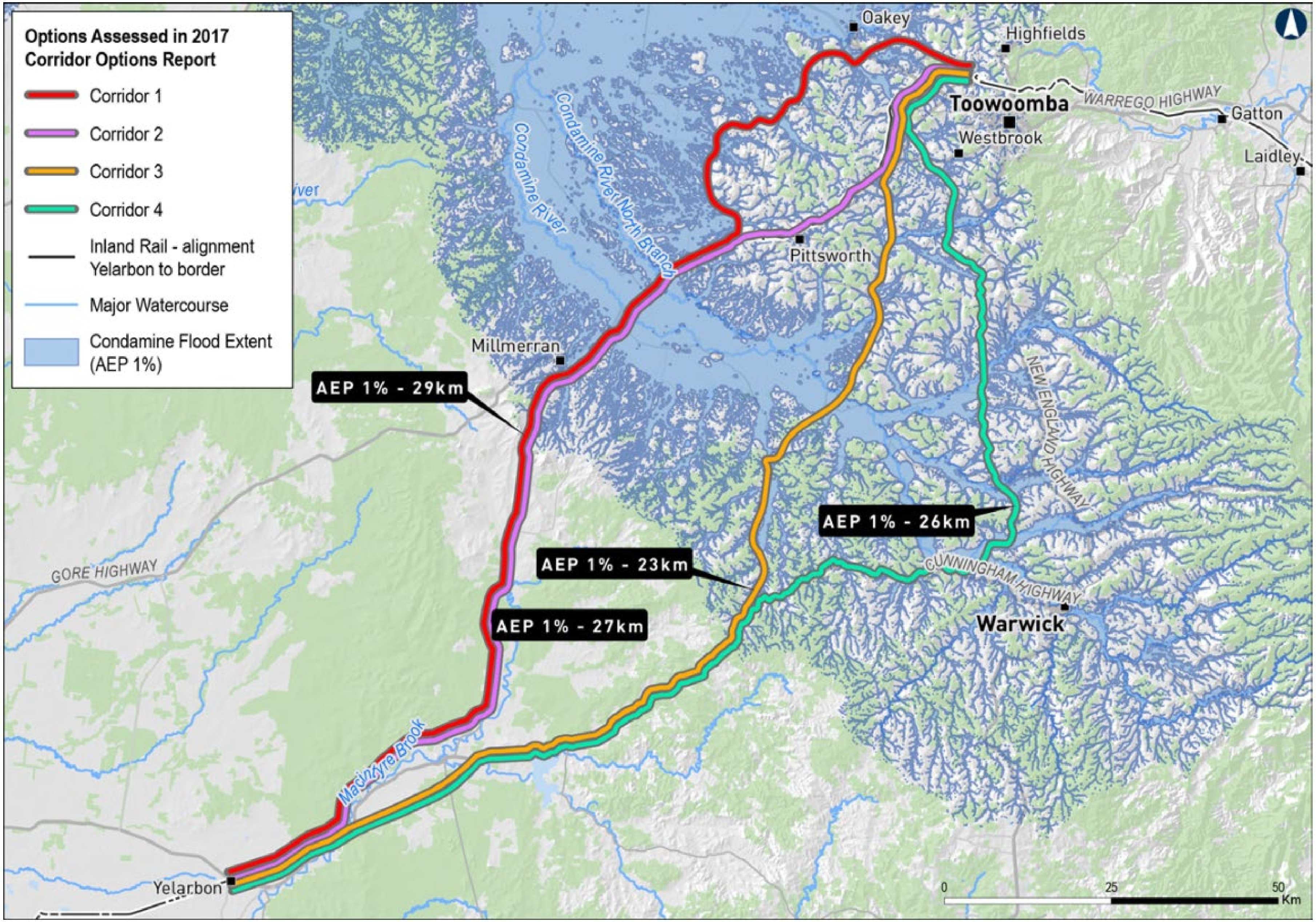
The process for comparative assessment of the four route options is shown in Figure 2.14. The outcomes of the MCA were documented in the *Corridor Options Report* (AECOM, 2017b) and are summarised in Figure 2.15. The report, in combination with the cost estimate for each option, was provided by ARTC to the Minister for Infrastructure and Transport for consideration.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

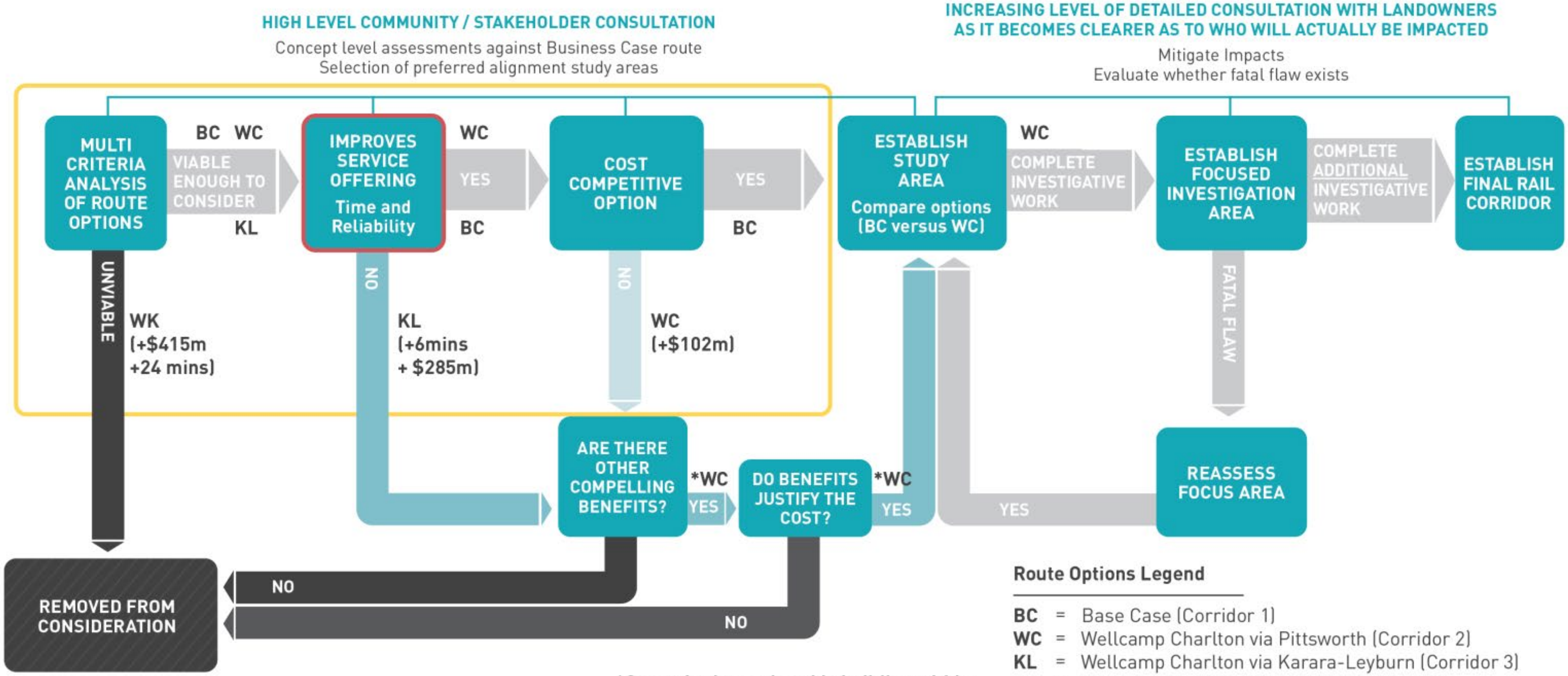


BORDER TO GOWRIE
Figure 2.12: Conceptual corridor routes

Map by: LCT/IW Z:\GIS\GIS_310_B2G\Tasks\310-EAP-201812111441_EIS_Chapter_1_Figures\310-EAP-201812111441_ARTC_Chapter2_Fig2.6_rev5.mxd Date: 14/04/2020 13:05



Options Assessed in 2017 Corridor Options Report
Corridor 1
Corridor 2
Corridor 3
Corridor 4
Inland Rail - alignment Yelarbon to border
Major Watercourse
Condamine Flood Extent (AEP 1%)
Oakey
Highfields
Toowoomba
WARREGO HIGHWAY
Gatton
Westbrook
Laidley
Condamine River
Condamine River North Branch
Pittsworth
Millmerran
AEP 1% - 29km
NEW ENGLAND HIGHWAY
AEP 1% - 26km
AEP 1% - 23km
CUNNINGHAM HIGHWAY
GORE HIGHWAY
AEP 1% - 27km
Warwick
Macintyre Brook
Yelarbon
0
25
50
Km



***Saves 4 mins and avoids building within the narrow and constrained operational rail corridor at Kingsthorpe and provides access to new intermodal facilities in the Toowoomba areas.**

Route Options Legend

BC = Base Case (Corridor 1)
WC = Wellcamp Charlton via Pittsworth (Corridor 2)
KL = Wellcamp Charlton via Karara-Leyburn (Corridor 3)
WK = Wellcamp Charlton via Warwick (Corridor 4)

Note: This analysis work was undertaken independently of ARTC by AECOM and Aurecon as part of the April 2017 Corridor Options Report

Note: Some processes overlap during route development rather than being strictly sequential as per this representative diagram.

FIGURE 2.14 PROCESS FOR COMPARATIVE ASSESSMENT OF FOUR ROUTE OPTIONS

	Corridor 1 Base Case Modified		Corridor 2 Wellcamp-Charlton		Corridor 3 Karara, Leyburn & Felton		Corridor 4 Warwick	
Distance	181km	Neutral	168km 13km shorter	Favourable	172km 9km shorter	Favourable	208km 27km longer	Highly unfavourable
Service Offering / Transit time (northbound)	129min	Neutral	125 min 4 min saving	Favourable	135 min 6 min longer	Unfavourable	154 min 24 min longer	Highly unfavourable
No. of agricultural properties on alignment	242	Highly unfavourable	203	Unfavourable	156	Favourable	219	Unfavourable
No. of residences on alignment	35	Neutral	42	Neutral	69	Unfavourable	170	Highly unfavourable
MCA Technical Score	0	Neutral	−0.126	Neutral	−0.417	Neutral	−1.815	Highly unfavourable
MCA Non-technical Score	0	Neutral	−0.156	Neutral	+0.906	Favourable	−1.22	Highly unfavourable
Overall MCA Score	0	Neutral	-0.283	Neutral	+0.490	Neutral	−3.03	Highly unfavourable
Construction Cost	$0m (for relativity)		+$102m	Highly unfavourable	+$285m	Highly unfavourable	+$415m	Highly unfavourable
Strategic factors:								
Avoidance of constructing in an operational rail line and congested area at Kingsthorpe		Highly unfavourable		Favourable		Favourable		Favourable
Tap into strategic potential of Wellcamp-Charlton		Highly unfavourable		Favourable		Favourable		Favourable
Recommended				✓				

Favourable
Neutral
Unfavourable
Highly unfavourable

FIGURE 2.15 SUMMARY OF MULTI CRITERIA ASSESSMENT OF THE CORRIDOR OPTIONS ASSESSMENT

Source: ARTC, 2020b

Forestry route, via Cecil Plains

In April 2017, an alternative route option was presented to ARTC by a representative of the Yelarbon to Gowrie Project Reference Group, which was referred to as the 'Forestry route, via Cecil Plains'. This alternative route extended north from Whetstone through Bringalily State Forest to Cecil Plains, then followed an existing rail corridor (the Cecil Plains Branch Line) to Mount Tyson and then to near Oakey where it joined with QR's West Moreton Line to Gowrie. This route option is shown in Figure 2.16 with the Base Case Modified alignment option for comparison.

Following receipt of the alternative route option, ARTC undertook a key criteria comparative assessment between the Forestry route, via Cecil Plains, and the Base Case Modified alignment option (refer Figure 2.16). This comparative assessment concluded the Forestry route, via Cecil Plains to be 15 km longer than the Base Case Modified alignment option, resulting in an additional journey time of approximately 12 minutes (at an average speed of 84.08 km/hr). The Forestry route, via Cecil Plains was also reliant on using an alignment through the State forest that traversed unfavourable topography, resulting in substantially greater earthworks (refer Figure 2.11 and associated discussion) and non-optimal operating gradients.

Based on these findings, it was concluded that the Forestry route, via Cecil Plains performed less favourably than the Base Case Modified alignment option in achieving the Inland Rail service offering and that the corridor assessment process documented in the *Corridor Options Report* (AECOM, 2017b) did not need to be revisited.

On 21 September 2017, the Australian Government announced the Wellcamp–Charlton corridor via Brookstead, Pittsworth and Wellcamp (Corridor 2, Figure 2.12) to be the preferred corridor to take forward into the formal planning and approvals process.

By letter dated 29 June 2020, the Deputy Prime Minister confirmed to the Chair of the Millmerran Rail Group that the Deputy Prime Minister had:

> *...asked for an immediate review of the "forestry route" via Cecil Plains in the Border to Gowrie section of Inland Rail against the selected [Inland Rail] route to assess its ability to meet the business case requirements including transit time, reliability, cost competitiveness and availability.*

The letter stated that the Department of Infrastructure, Transport, Regional Development & Communications (DITRDC) would:

> *...engage an independent consultant to review the assessment process. The independent consultant will ensure that ARTC has used like-for-like methodologies when assessing the service offering attributes of the routes. Following this, the assessment will be presented to the Australian Government for consideration.*

For this review, potential route options via Cecil Plains were assessed against the reference design for the Project. Three routes via Cecil Plains were considered as possible alternatives to the reference design:

a) Via Cecil Plains, to join the existing QR West Moreton Line near to Oakey

b) Via Cecil Plains, to join the existing QR West Moreton Line near to Kingsthorpe

c) Via Cecil Plains then direct via a greenfield route to join the Reference Design route near Wellcamp.

These route options are shown in Figure 2.16.

From Cecil Plains, the route proposed to follow the current disused rail line and join the QR West Moreton system closer to Oakey would require construction within the constrained corridor at Kingsthorpe, which was identified as a significant issue in 2017. The route has a track length in the order of 7 km longer than the route that goes direct from Cecil Plains to Wellcamp and 5 km longer than that which joins the existing QR system closer to Kingsthorpe. It is also approximately 33 km longer than the reference design alignment. The route also impacted more private landowners than either of the other two routes via Cecil Plains, as a result of its proximity to the township of Oakey.

As a result of the above combined factors, the route via Cecil Plains to near Oakey was discounted from further assessment on the basis that the route offered no advantages compared with either of the other routes via Cecil Plains and was the least likely to meet the Inland Rail service offering.

The two remaining viable routes via Cecil Plains were assessed against the reference design in a like-for-like comparison. A summary of key comparative data for route options via Cecil Plains against the reference design is presented in Table 2.3.

TABLE 2.3 SUMMARY OF KEY COMPARATIVE DATA FOR ROUTE OPTIONS VIA CECIL PLAINS AGAINST THE REFERENCE DESIGN

Inland Rail Service Offering Metric	Reference Design	Via Cecil Plains & Wellcamp	Via Cecil Plains & Kingsthorpe
Distance	206.9 km	232.8 km	234.7 km
Distance difference	Baseline	+25.9 km	+27.8 km
Number of crossing loops	5	6	6
Transit time north (Hrs:Mins:Sec)[1]	02:49:37	03:08:49	03:06:49
Added transit time (north)	Baseline	+00:19:12	+00:17:12
Transit time south (Hrs:Mins:Sec)[1]	02:40:32	03:00:11	02:59:19
Added transit time (south)	Baseline	+00:19:39	+00:18:47
Length of all floodplains crossed	14.2 km	36.7 km	38.6 km
Length of Condamine River floodplain crossed	12.5 km	33.0 km	33.0 km
Length of Condamine River floodplain bridges	6.1 km	6.3 km	6.3 km
Length of Condamine River floodplain embankment (with culverts)	6.4 km	10.0 km	10.0 km
Construction cost[2]	Baseline	+$281.9 m	+$303.5 m
Operations cost[3]	Baseline	+$93.7 m	+$98.1 m
Number of residences within 200 m	104	134	234
Area of cropping land impacted (ha)—assumes 60 m wide rail corridor along length of route	407.7	222.6	197.5
Area of irrigated cropping land impacted (ha)—assumes 60 m wide rail corridor along length of route	32.8	89.4	83.2

Table note:

1. Modelled from RailSys on basis of Inland Rail Reference Train operating in 2040 when the network is at capacity
2. Includes 7.5 km spur line required on the route via Kingsthorpe to connect the existing QR line to Wellcamp at cost of $12.7 m per km—added cost of $95.3 m
3. Net Present Cost calculated for period to 30 June 2075. Economic cost of longer transit time is the freight value of time impacts to end customers over the period.

In addition to the above comparison, ARTC considered whether there may be opportunities to 'improve' the route via Cecil Plains at the southern end in the vicinity of Inglewood or at the northern end in the vicinity of Cecil Plains.

It was considered that there is no practical way to improve the proposed route to Cecil Plains at the southern end, as moving west would take the route into more undulating terrain while taking the route to the east would take it away from the state forest and effectively replicate the Reference Design route in this section.

At the northern end of the route to Cecil Plains, two different options for potentially improving the route were considered as shown in Figure 2.16:

a) A route that deviated from the 'forestry route' approximately 19.6km south of Cecil Plains; and

b) A route that deviated from the 'forestry route' approximately 24.8km south of Cecil Plains.

The alternative routes did reduce overall distance in comparison with the Forestry route, via Cecil Plains, by a distance of 7.6 km (route Option A as described in Table 2.4) and 10.9 km (route Option B as described in Table 2.4). Each route resulted in a slightly improved transit time relative to the Forestry route, via Cecil Plains as shown in Table 2.4 but the transit times on each route option remained slower than for the reference design route.

TABLE 2.4 RELATIVE TRANSIT TIME OF ROUTE OPTIONS CONSIDERED AGAINST THE ROUTE VIA CECIL PLAINS

Measure	Forestry Route via Cecil Plains	Option A Deviation (19.6 km south of Cecil Plains)	Option B Deviation (24.8 km south of Cecil Plains)
Distance	53.2 km	45.6 km	42.3 km
Transit time differential (north) versus route via Cecil Plains[1]	Baseline	-00:06:02	-00:08:40
Transit time differential versus reference design	+00:19:12	+00:13:10	+00:10:32

Table note:

1. Based on application of an average speed of 75.4 kph which is the average speed for the route via Cecil Plains and Kingsthorpe

The direct comparison of key data indicates that the viable routes via Cecil Plains are longer than the reference design, have a greater journey time, require a longer section of track across floodplains and would result in greater construction and operational costs.

On 2 November 2020 the independent assessment of the proposed alternative routes via Cecil Plains for the Border to Gowrie project was published. A copy of the Inland Rail B2G Alternative Route Comparison Review is available at: **inlandrail.gov.au/people-and-community/Border-to-Gowrie-route-assessment**.

The Inland Rail B2G Alternative Route Comparison Review showed that an alternative route via Cecil Plains is more than 25 km longer, would add at least 17 minutes to the travel time, increase costs by more than $472 million and would reduce the reliability of the Inland Rail service.

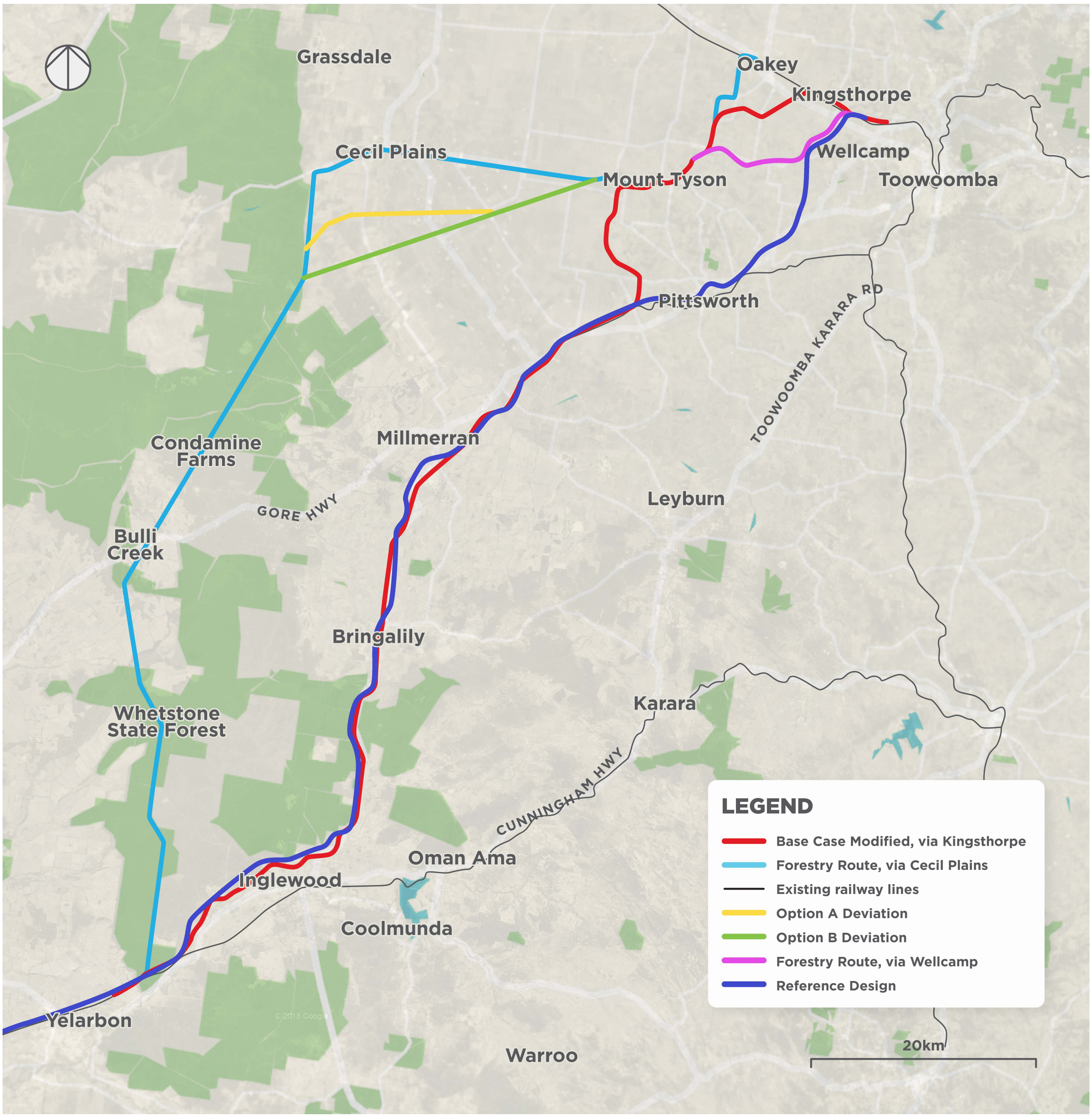


FIGURE 2.16 FORESTRY ROUTE, VIA CECIL PLAINS, WITH THE 'BASE CASE MODIFIED' ALIGNMENT OPTION AND REFERENCE DESIGN ALIGNMENT

2.9 Reference design options assessment (2018-present)

This section provides a summary of the main alignment option assessments that were undertaken during the reference design and EIS development phase of the Project, from early 2018 to the present. Specifically, alignment option assessments were conducted during development of the reference design for the following extents of the Project:

- Whetstone to Millmerran
- Inglewood area
- Millwood area (Millmerran–Inglewood Road)
- Commodore Mine area
- Yarranlea to Southbrook
- Southbrook to Athol
- Athol to Gowrie Mountain
- Warrego Highway to Gowrie Junction

The extent of each of these areas is shown on

Figure 2.17. The alignment options considered and the outcomes of assessment are discussed for each of these areas in Section 2.9.1.1 to 2.9.1.8.

The main overarching principles that were applied in positioning the alignment for the reference design were:

- Maximise the use of existing rail corridors
- Outside of existing rail corridors, seek to maximise co-location with existing linear transport infrastructure.

Through considering and applying these principles, additional considerations needed to be optimised through the design process. These included, but were not limited to:

- Minimising severance to properties in greenfield areas
- Lessening impact to landowners, businesses and existing infrastructure
- Minimising the extent of alignment located within floodplain areas, due to cross-drainage and constructability issues
- Avoiding challenging topography to lessen earthworks and footprint impacts to stakeholders and surrounding infrastructure.

In all instances, the guiding principles of ecologically sustainable development (ESD) have been factored into the assessment and selection of corridor and alignment options for the Project. These guiding principles, as established in the *National Strategy for Ecologically Sustainable Development* (Ecologically Sustainable Development Steering Committee, 1992), are as follows:

- Decision-making processes should effectively integrate both long- and short-term economic, environmental, social and equity considerations
- Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation
- The global dimension of environmental impacts of actions and policies should be recognised and considered
- The need to develop a strong, growing and diversified economy that can enhance the capacity for environmental protection should be recognised
- The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised
- Cost-effective and flexible policy instruments should be adopted, such as improved valuation, pricing and incentive mechanisms.

Decisions and actions should provide for broad community involvement on issues that affect them.

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

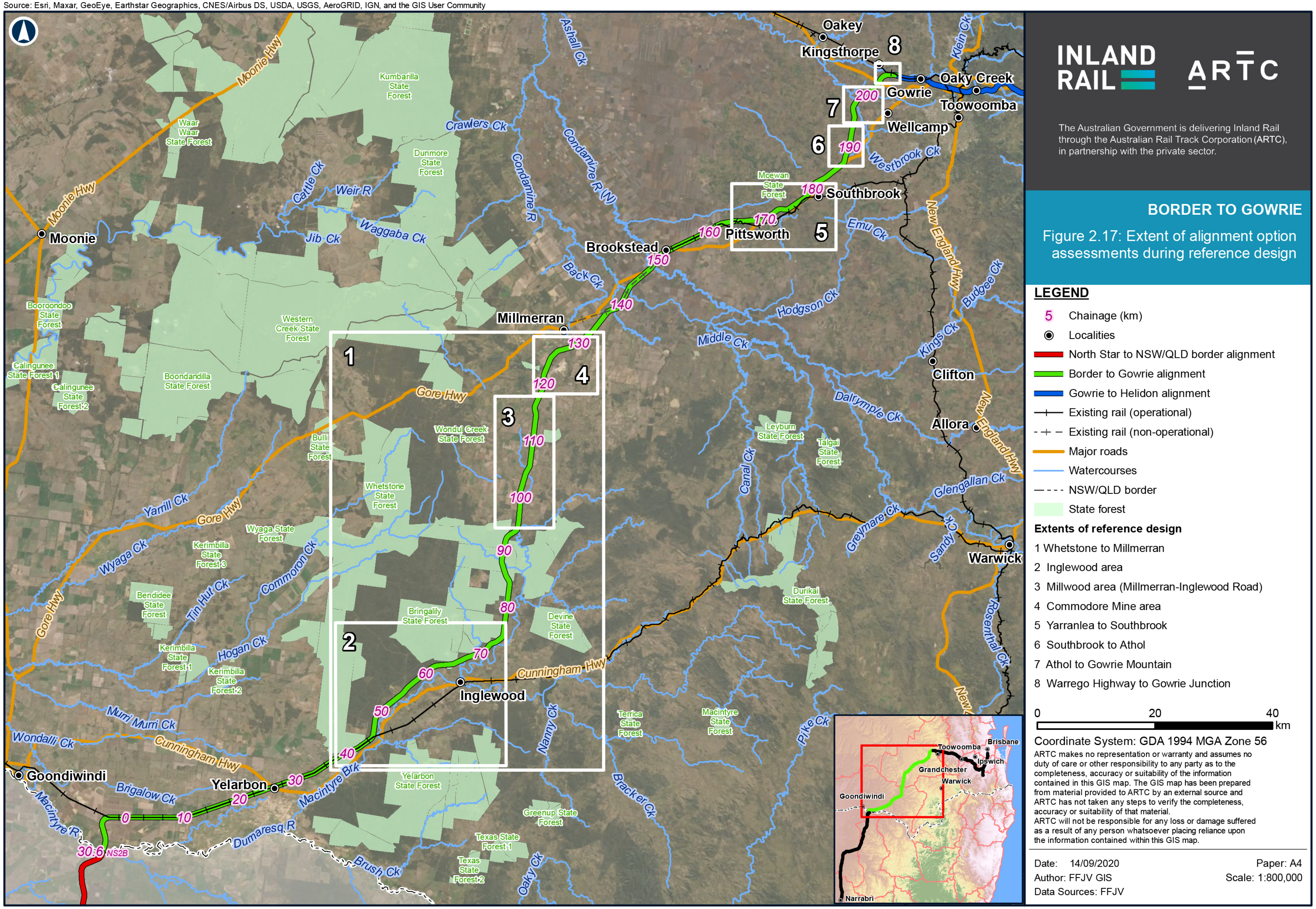


Figure 2.17: Extent of alignment option assessments during reference design

Map by: LCT/DTH Z:\GIS\GIS_310_B2G\Tasks\310-EAP-202004301056_Project_Rationale_Figure\310_EAP_202004301056_ARTC_Figure_Extent_of_aligment_v3.mxd Date: 14/09/2020 13:39

2.9.1.1 Whetstone to Millmerran

In July 2018, ARTC received a request from GRC for an alternative alignment option to be assessed—referred to as the GRC State forest alignment option. This alignment option differed from the State forest route options considered during the concept planning phase (refer Section 2.8.6.2). It deviated from the Base Case Modified alignment option at Whetstone (Yarranbrook Feedlot) and extended northwards towards Millmerran through Bringalily State Forest, approximately 8–10 km west of Millmerran–Inglewood Road. This alignment option is shown in Figure 2.18 as 'GRC Option 1'.

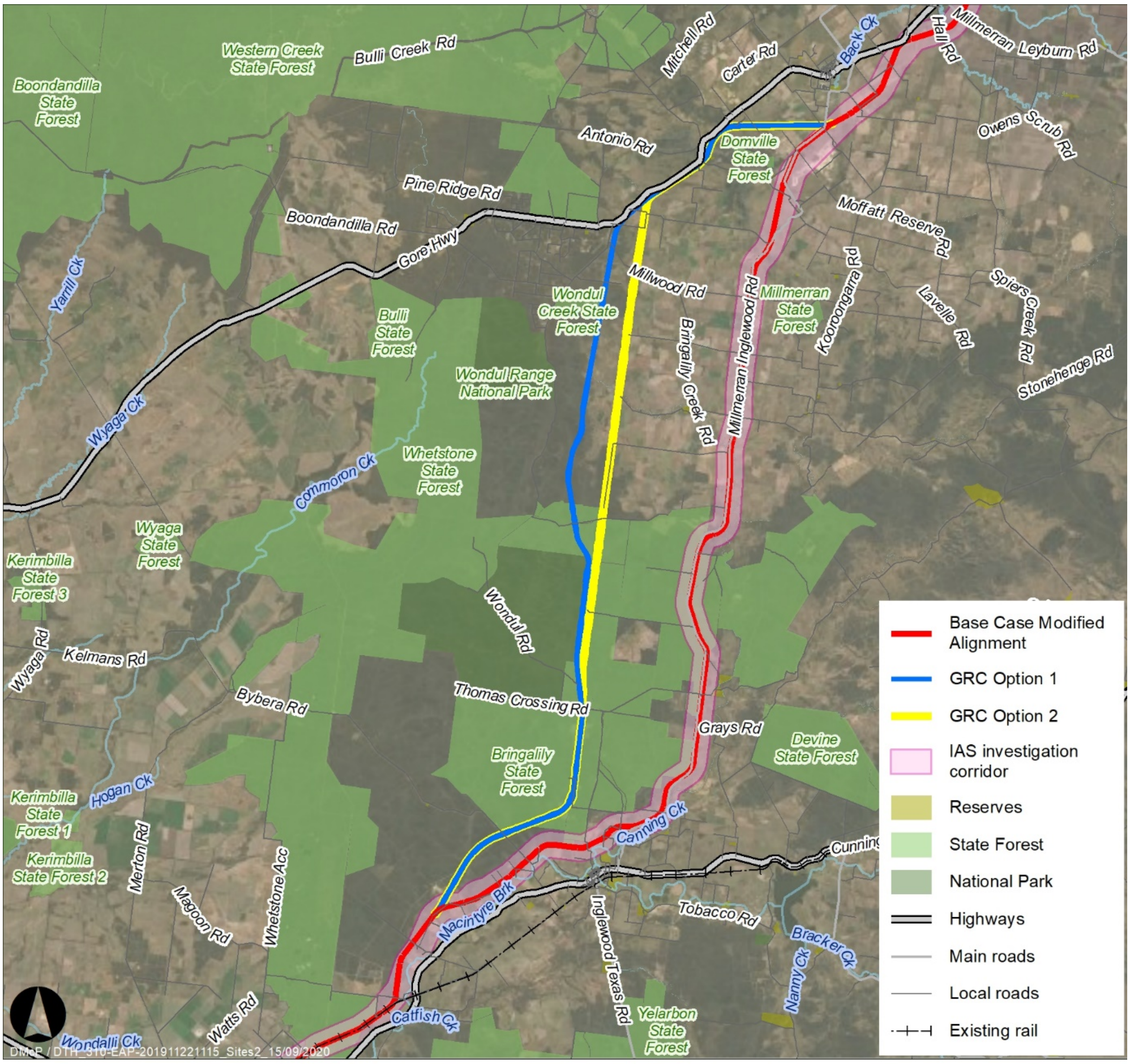
Following receipt of the alternative alignment option, ARTC undertook an initial feasibility assessment of the GRC State forest alignment option. As part of this initial assessment, ARTC identified a shorter, modified version of GRC's nominated alignment for inclusion in a comparative options assessment. This alignment option is shown in Figure 2.18 as 'GRC Option 2'.

A key criteria comparative assessment between 'GRC Option 1', 'GRC Option 2' and the Base Case Modified alignment option was undertaken. This comparative assessment concluded that, while all three options were of comparable length, the alternative GRC options were reliant on using an alignment through the State forest that traversed unfavourable topography, resulting in substantially greater earthworks (refer Table 2.5) and non-optimal operating gradients.

Based on these findings, it was concluded that the alternative GRC options performed less favourably than the Base Case Modified alignment option in achieving the Inland Rail service offering. The conclusions of this comparative assessment were presented to GRC on 22 August 2018. As an outcome, the Base Case Modified alignment was adopted for further progression through the reference design development process.

TABLE 2.5 SUMMARY OF COMPARATIVE ASSESSMENT OF ALIGNMENT OPTIONS BETWEEN WHETSTONE AND MILLMERRAN

Alignment option:	Base Case Modified	GRC Option 1	GRC Option 2
Length	75.34 km	76.73 km	75.28 km
Earthworks: Total cut	2,740,000 m^3	12,750,000 m^3	10,760,000 m^3
Earthworks balance	- 220,000 m^3	+ 3,470,000 m^3	+ 2,810,000 m^3
Cost differential	0%	119%	94%



Alignment options between Whetstone and Millmerran

FIGURE 2.18 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS BETWEEN WHETSTONE AND MILLMERRAN

2.9.1.2 Inglewood area

Four alignment options were investigated through this section of the Project, with the purpose being to minimise impacts and severance to properties along the banks of Macintyre Brook and Canning Creek. The four alignment options that were assessed are shown in Figure 2.19.

Three of the alignment options encroached, to varying degrees, on Bringalily State Forest. The need for revocation of State Forest for these options and the process that this would trigger (Ministerial in-principle approval, Queensland Legislative Assembly consideration and assent by the Governor in Council) was considered in the option comparison process.

Comparative assessment of the alignment options in this section concluded that OPT5, as shown in Figure 2.19, was the best performing option as it:

- Minimised the number of properties impacted
- Minimised the extent of severance impact to properties
- Minimised the area of impact to productive agricultural land
- Minimised the length of alignment within the 1 % AEP associated with Macintyre Brook
- Was consistent with feedback received through stakeholder consultation, which highlighted a desire to have impacts to property and agricultural land minimised through this area.

The OPT5 alignment has been adopted for the Project's reference design and assessed for this draft EIS.

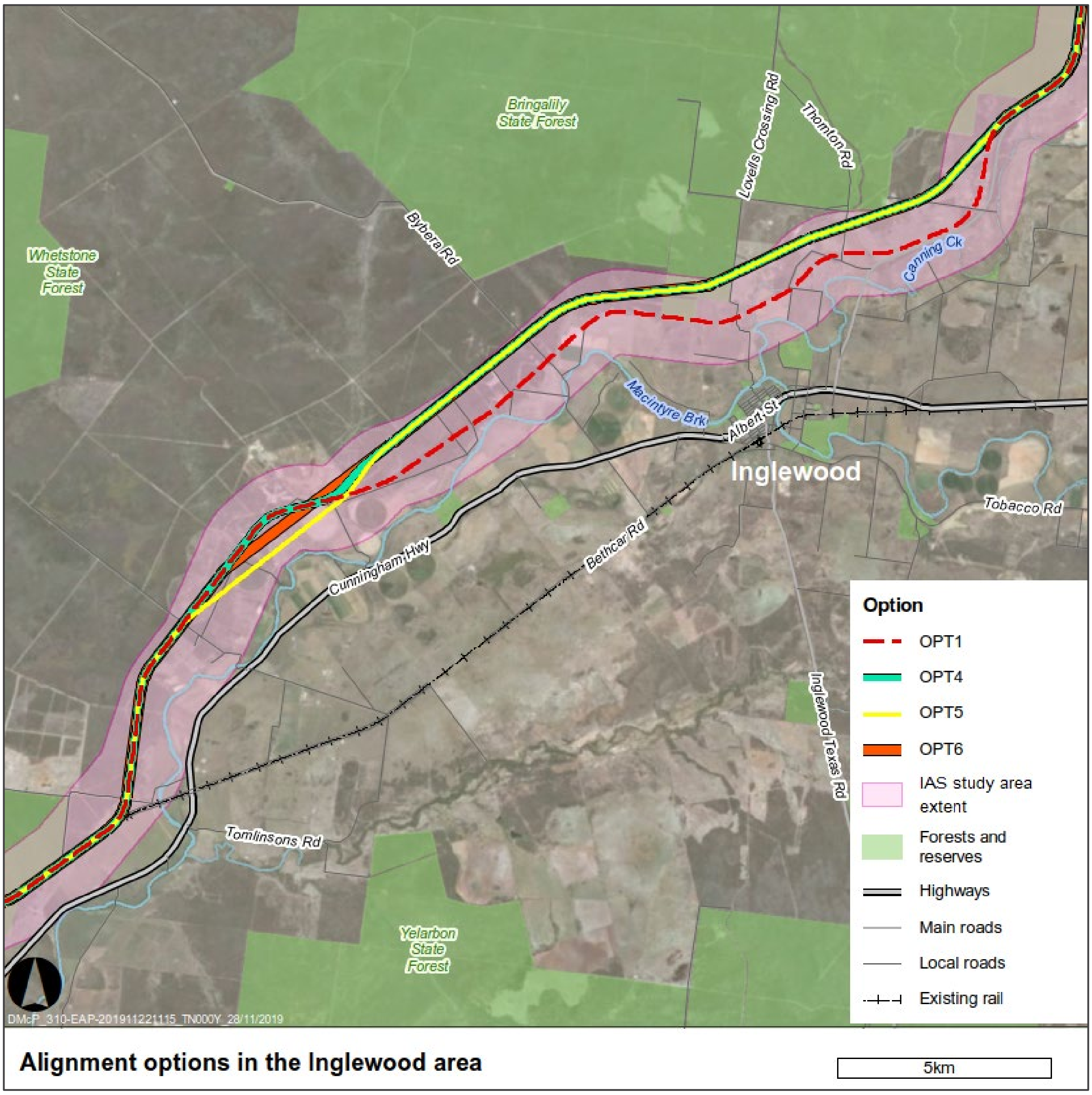


FIGURE 2.19 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE INGLEWOOD AREA

2.9.1.3 Millwood area (Millmerran–Inglewood Road)

The Millmerran–Inglewood Road section of the Project, in the vicinity of Millwood, contains challenging topographical constraints, complex road intersections, as well as numerous property and creek interfaces. Eight alignment options were investigated through this section of the Project, to minimise impacts to properties and private accesses, as well as reduce the number of road intersections. The seven alignment options that were assessed are shown in Figure 2.20.

Comparative assessment of the alignment options in this section concluded that Option A (OPTA), as shown in Figure 2.20, was the best performing option as it results in:

- The fewest number of agricultural properties affected mid-block, meaning the property is impacted through division, altering the current operational management of the property
- The fewest number of agricultural operations within 200 m of alignment
- No direct impacts to existing feedlots in the area
- The fewest number of residences within 200 m.

Additionally, the OPTA alignment was considered to be consistent with feedback received through stakeholder consultation, which highlighted a desire to have the alignment along the back of property boundaries to reduce the number of access severances, and to bypass homesteads and key feedlot infrastructure.

The OPTA alignment has been adopted for the Project's reference design and assessed for this draft EIS.

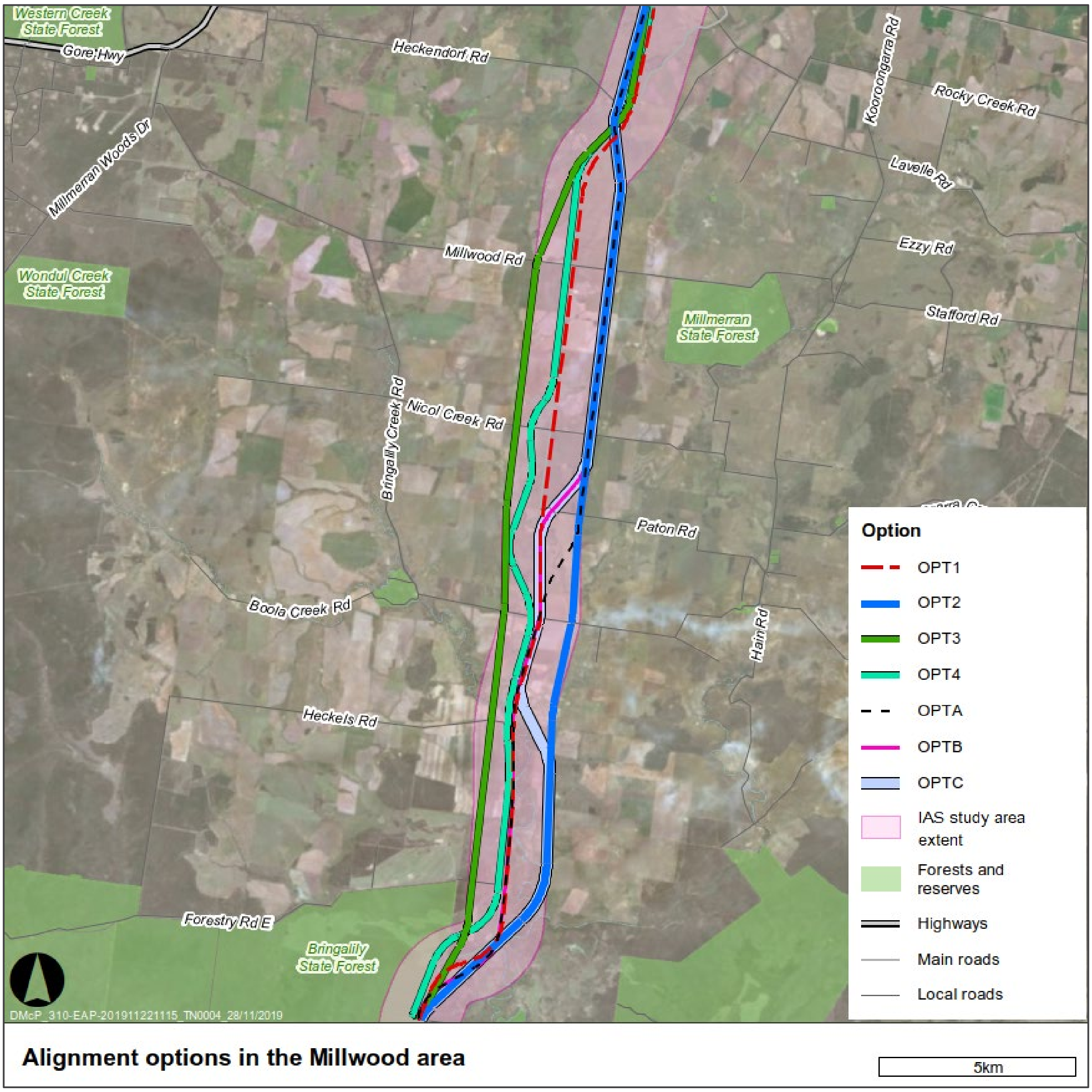


FIGURE 2.20 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE MILLWOOD AREA (MILLMERRAN–INGLEWOOD ROAD)

2.9.1.4 Commodore Mine area

The Base Case modified option (refer Figure 2.12) crossed Millmerran–Inglewood Road near the south-western end of the Commodore Mine then ran parallel to the eastern side of Millmerran–Inglewood Road and along the edge of the current Commodore Mine open cut pit. InterGen, the operators of Commodore Mine and Millmerran Power Station, during early consultation, expressed a desire to have alternative alignment options investigated in proximity to the mine to avoid or minimise impacts to current and future operations.

In response to this request, ARTC developed four alternative alignments located to the west of the Base Case Modified alignment. These four alignments are shown in Figure 2.21 in addition to the Base Case Modified alignment. These alternative alignments were developed to be located on land owned by InterGen or its subsidiaries, ensuring no direct impacts to new landowners. The alternative alignments were also developed with an appreciation of the following design constraints:

- The existing Powerlink 330 kilovolt (kV) transmission line extending west from Millmerran Power Station to Bulli Creek Substation
- The flow path of Back Creek
- Millmerran–Inglewood Road
- The Millmerran Power Recycled Water Pipeline
- The future operational plans for Commodore Mine.

A key criteria comparative assessment between the alternative alignment options the Base Case Modified alignment option was undertaken. This assessment considered:

- Technical viability
- Road network impacts
- Bridge and structural requirements for each option
- Interactions with utilities, such as the Powerlink 330 kV transmission line
- Environmental and social sensitivities
- Property impacts
- Rail operational factors
- Current and future Commodore Mine operations.

As a result of the technical assessment, community consultation and stakeholder engagement the OPT4 (refer Figure 2.21) was identified as the preferred alignment through the Commodore Mine area for the following reasons:

- Impacts to current mining operations are avoided
- Impacts to the current active mining lease, ML 50151, are avoided
- Impacts to future mine expansion into the adjoining mineral development license area, MDL 299, are minimised compared to other alternative options
- One less level crossing than the Base Case Modified alignment.

Consequently, the OPT4 alignment was adopted. This alignment option was subject to further refinement during design development to optimise the crossings of Schwartens Road and Millmerran–Inglewood Road. This refined OPT4 alignment has been adopted for the Project's reference design and assessed for this draft EIS.

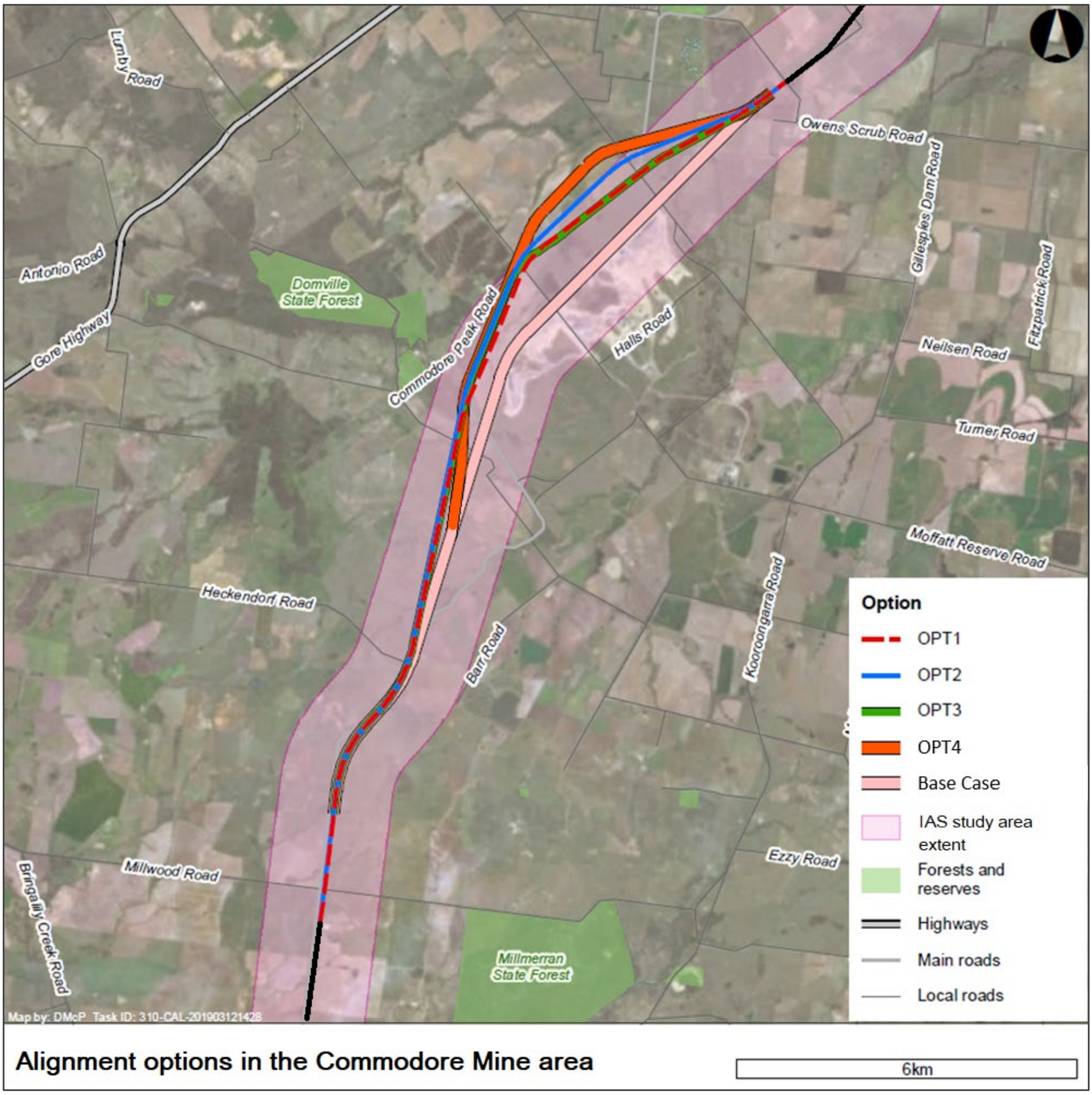


FIGURE 2.21 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE COMMODORE MINE AREA

2.9.1.5 Yarranlea to Southbrook

The Yarranlea to Southbrook section of the Project contains:

- Challenging topography and geotechnical conditions
- Major linear infrastructure, such as with the Gore Highway and Millmerran Branch Line
- Major utilities, such as the Toowoomba Regional Council (TRC) water reservoirs, Millmerran Recycled Water Pipeline and Santos Oil Transmission Pipeline
- Approved future developments, such as solar farms and the Pittsworth Industrial Precinct Enabling Project
- Social sensitivities associated with the townships of Pittsworth and Southbrook.

Two alignment options were investigated through this section of the Project, with the purpose being to minimise interactions with the above-mentioned constraints. The two alignment options assessed are shown in Figure 2.22. These were subject to detailed technical and non-technical comparative assessment. This assessment concluded that OPT1 (base case) was preferred due to better technical viability and construction feasibility, and fewer impacts to community, stakeholder and properties. Additionally, the OPT1 (base case) alignment was considered consistent with feedback received through stakeholder consultation, which highlighted a desire to:

- Maintain access for emergency services
- Maintain access to private properties
- Avoid or minimise impacts to water infrastructure and flow paths
- Minimise noise and vibration impacts to sensitive receptors, including schools.

The OPT1 (base case) alignment was adopted and subjected to further refinement during design development between Ch 178.0 km and Ch 182.0 km to reduce the number of properties impacted. This refined OPT1 (base case) alignment has been adopted for the Project's reference design and assessed for this draft EIS.

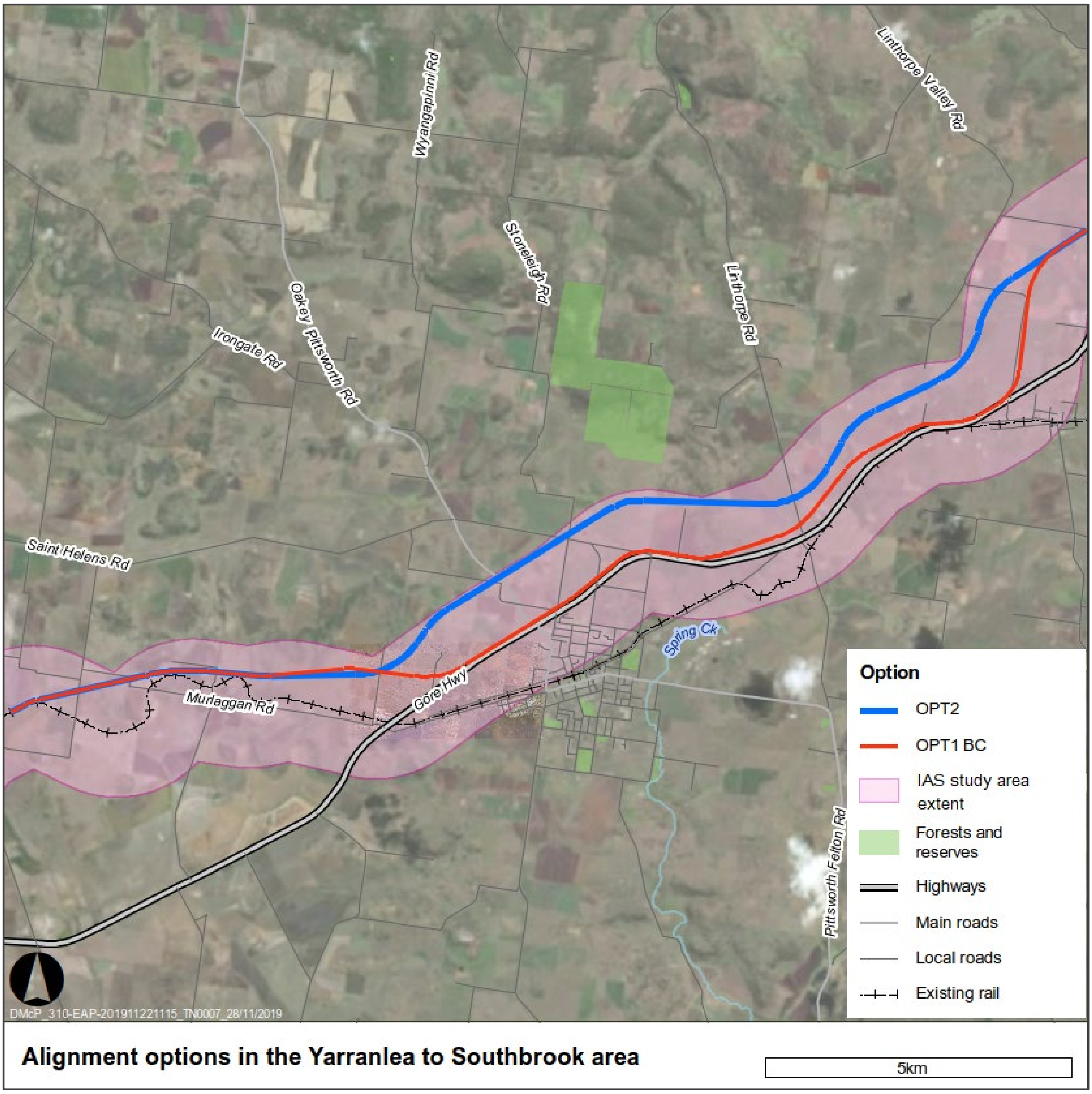


FIGURE 2.22 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE YARRANLEA TO SOUTHBROOK AREA

2.9.1.6 Southbrook to Athol

The Southbrook to Athol section of the Project contains:

- Challenging topography and geotechnical conditions
- Major linear infrastructure, such as with the Gore Highway and Millmerran Branch Line
- Multiple freehold properties of non-uniform shape.

The overarching design principle for this section of the alignment was to parallel the Gore Highway as much as possible, thereby forming a multi-modal transport corridor. The primary reason for this approach was to minimise the extent of severance impact to freehold properties. Based on this principle, the Option 1 alignment through this section was established (refer Figure 2.23).

Consultation with potentially affected landowners, DTMR and TRC regarding the Option 1 alignment identified the following key themes:

- Interest in seeing the Project Initial Advice Statement (IAS) study area moved
- Interest in the property valuation and compensation process for the Project
- Concerns regarding impacts to existing utility infrastructure
- Concerns regarding alterations to the existing road network
- Concerns regarding maintenance of access for emergency services
- Concerns regarding impacts to water infrastructure and flow paths
- Concerns regarding the height of the alignment relative to the surrounding ground level
- Concerns regarding operational rail noise and vibration.

In response to this feedback, further alignment option assessment was conducted for this section of the Project.

An alternative alignment to the east of the Gore Highway would require two grade separations of the Gore Highway. This would come at considerable cost and would involve substantial disruption to the public road network and impact to a critical State-controlled road asset. An alternative alignment to the east of the focused area of investigation was therefore considered not to be technically viable.

An alternative alignment located further to the west would involve significantly greater severance impacts to freehold properties. As the topography rises relatively steeply to the west, an alternative alignment would also involve substantially increased earthworks volumes, impacting program, cost, constructability and sustainability objectives. An alternative alignment to the west of the IAS study area was therefore considered not to be technically viable.

As neither an eastern nor western alternative alignment was considered technically feasible, a modification to Option 1 was considered to reflect stakeholder feedback. The modifications resulted in the establishment of Option 2, which sought to:

- Decrease the offset distance from the Gore Highway, near to Purcell Road
- Straighten the alignment to run north–south coming up from the Gore Highway to reduce property impacts to three properties between Purcell Road and Athol School Road.

Option 1 and Option 2 are shown in Figure 2.23. Option 2 has been adopted for the Project’s reference design and assessed for this draft EIS.

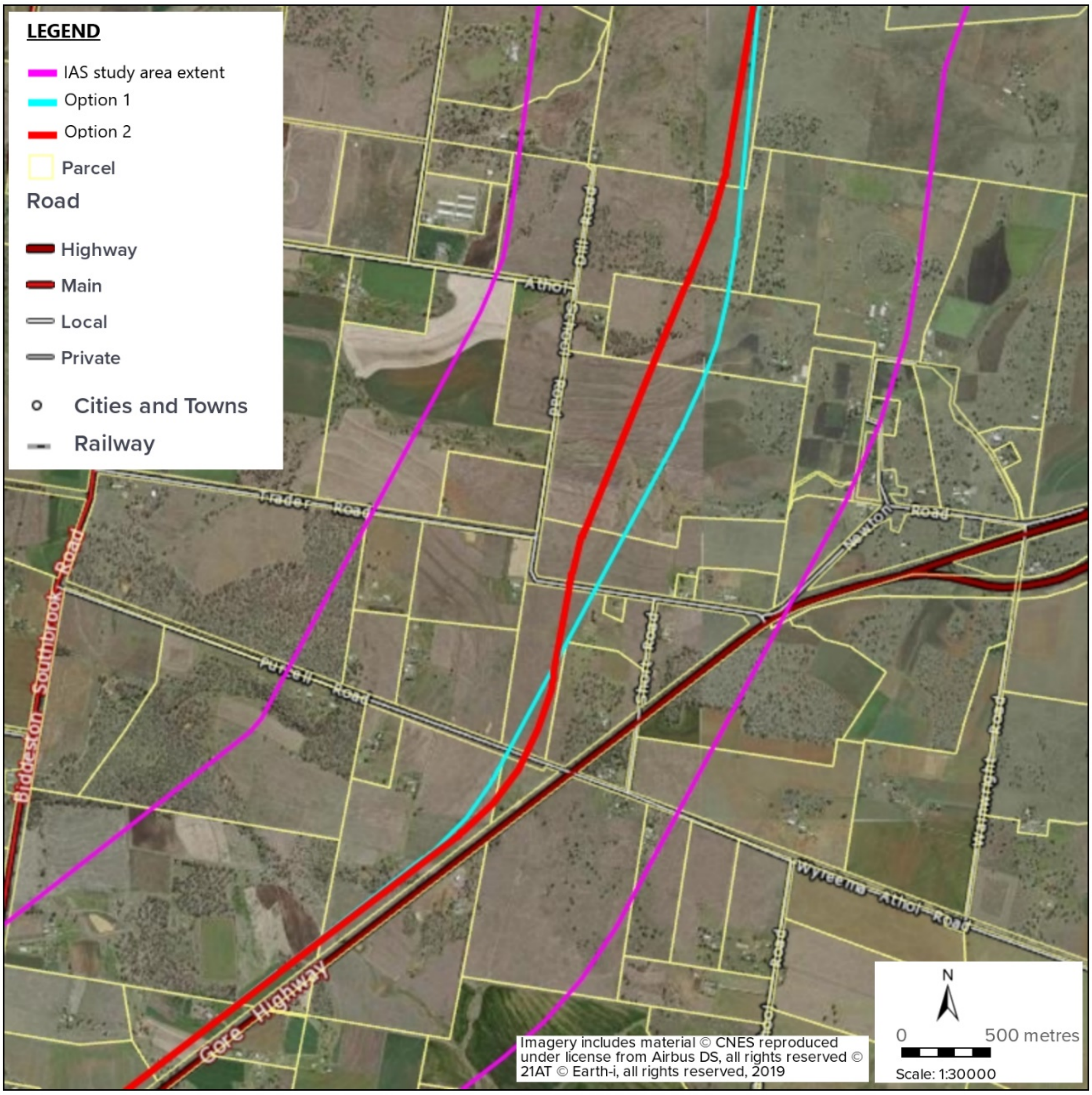


FIGURE 2.23 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE SOUTHBROOK TO ATHOL AREA

2.9.1.7 Athol to Gowrie Mountain

The Athol to Gowrie Mountain section of the Project contains:

- Toowoomba Cecil Plains Road
- Warrego Highway
- Existing utilities (Powerlink, gas and water mains)
- Westbrook Creek and Dry Creek floodplains
- Brimblecombe Road
- Toowoomba Wellcamp Airport infrastructure and obstacle limitation surface (OLS) restrictions
- Challenging topography and geotechnical conditions.

The positioning of the alignment through this section sought to minimise the number of interface points between the Project and Dry Creek. In doing so, alignment options on either the western or eastern side of the creek were considered (refer Figure 2.24). Identification of these options were defined by the following considerations:

- Minimising impacts associated with the Westbrook Creek floodplain
- Adhering to OLS requirements of the Toowoomba Wellcamp Airport
- Optimising rail–road interface solutions at Toowoomba Cecil Plains Road and Brimblecombe Road
- Feedback from consultation with potentially affected landowners, DTMR, TRC, Toowoomba Wellcamp Airport, which identified the following key themes:
  - Interest in seeing the IAS study area moved
  - Interest in the property valuation and compensation process for the Project
  - Concerns regarding impacts to the community of Gowrie Mountain
  - Concerns regarding impacts to existing utility infrastructure
  - Concerns regarding alterations to the existing road network
  - Concerns regarding maintenance of access for emergency services
  - Concerns regarding impacts to water infrastructure and flow paths
  - Concerns regarding the height of the alignment relative to the surrounding ground level
  - Concerns regarding operational rail noise and vibration
  - Concerns regarding the separation distances between double-stacked trains and aircraft.

The Option 1 alignment, on the eastern side of Dry Creek, was found to have a longer crossing of the Westbrook Creek floodplain. Option 1 crossed 1,670 m of this floodplain and would require approximately 640 m of bridging across three defined channels. In addition, Option 1 crossed 340 m of floodplain attributed to Dry Creek, with a main channel crossing width of 20 m (refer Figure 2.25).

Rollingstock on Option 1 may also encroach on the OLS of Toowoomba Wellcamp Airport.

In comparison, Option 2 crosses Westbrook Creek to the east of its confluence with Dry Creek and thereafter is located on the western side of Dry Creek. This alignment traverses approximately 1,100 m of floodplain, with a main channel crossing of 40 m requiring a 180 m long bridge (refer Figure 2.26).

Following comparative assessment of the two alignment options, Option 2 was identified as being better performing due to:

- Being more cost effective due to a reduction of earthworks and drainage structures
- Requiring fewer level crossings
- Impacting fewer private properties
- Avoiding conflict with Toowoomba Wellcamp Airport OLS
- A shorter length within with Westbrook Creek and Dry Creek floodplains.

Based on the above, Option 2 has been adopted for the Project's reference design and assessed for this draft EIS.

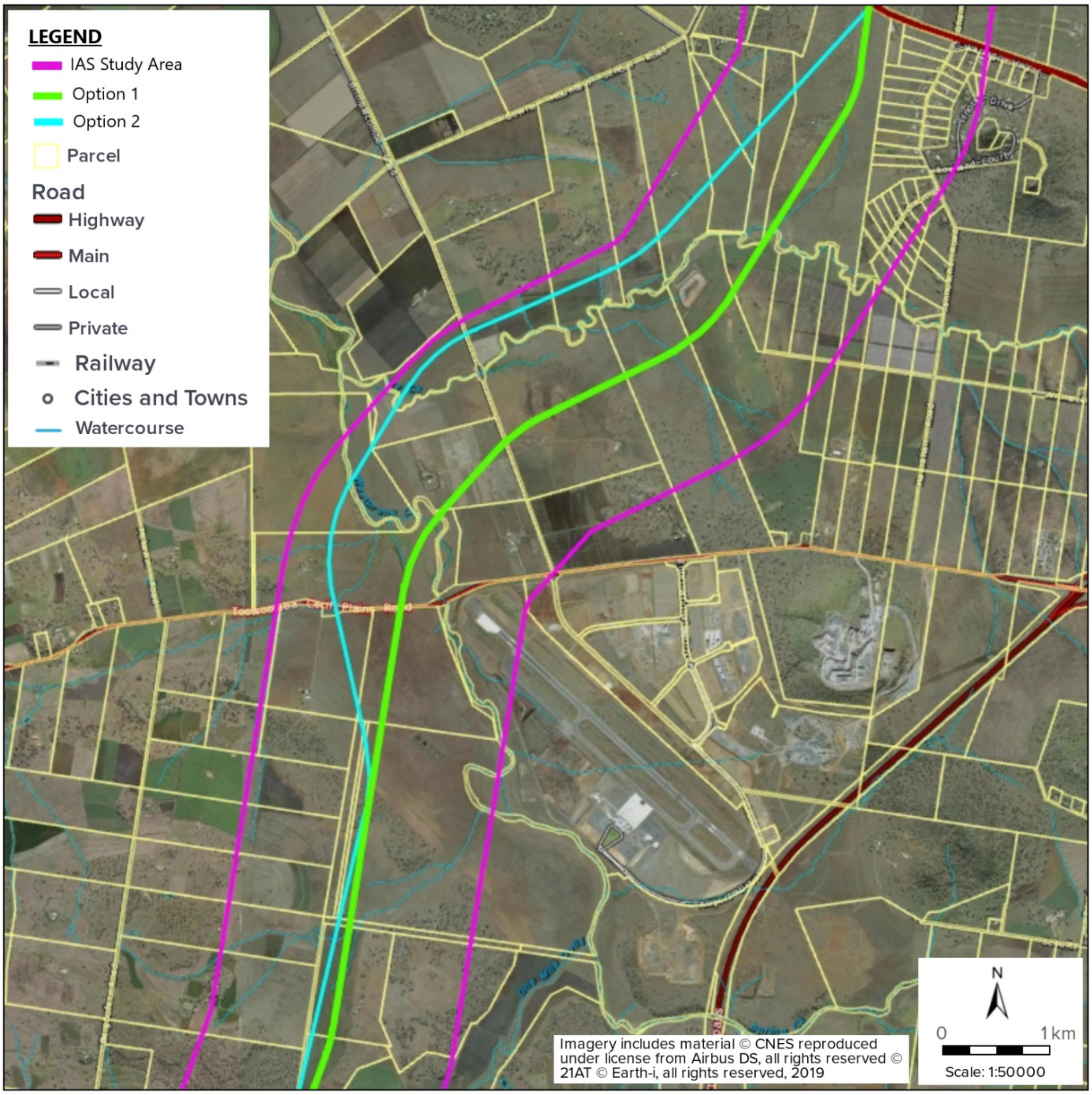


FIGURE 2.24 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE ATHOL TO GOWRIE MOUNTAIN AREA

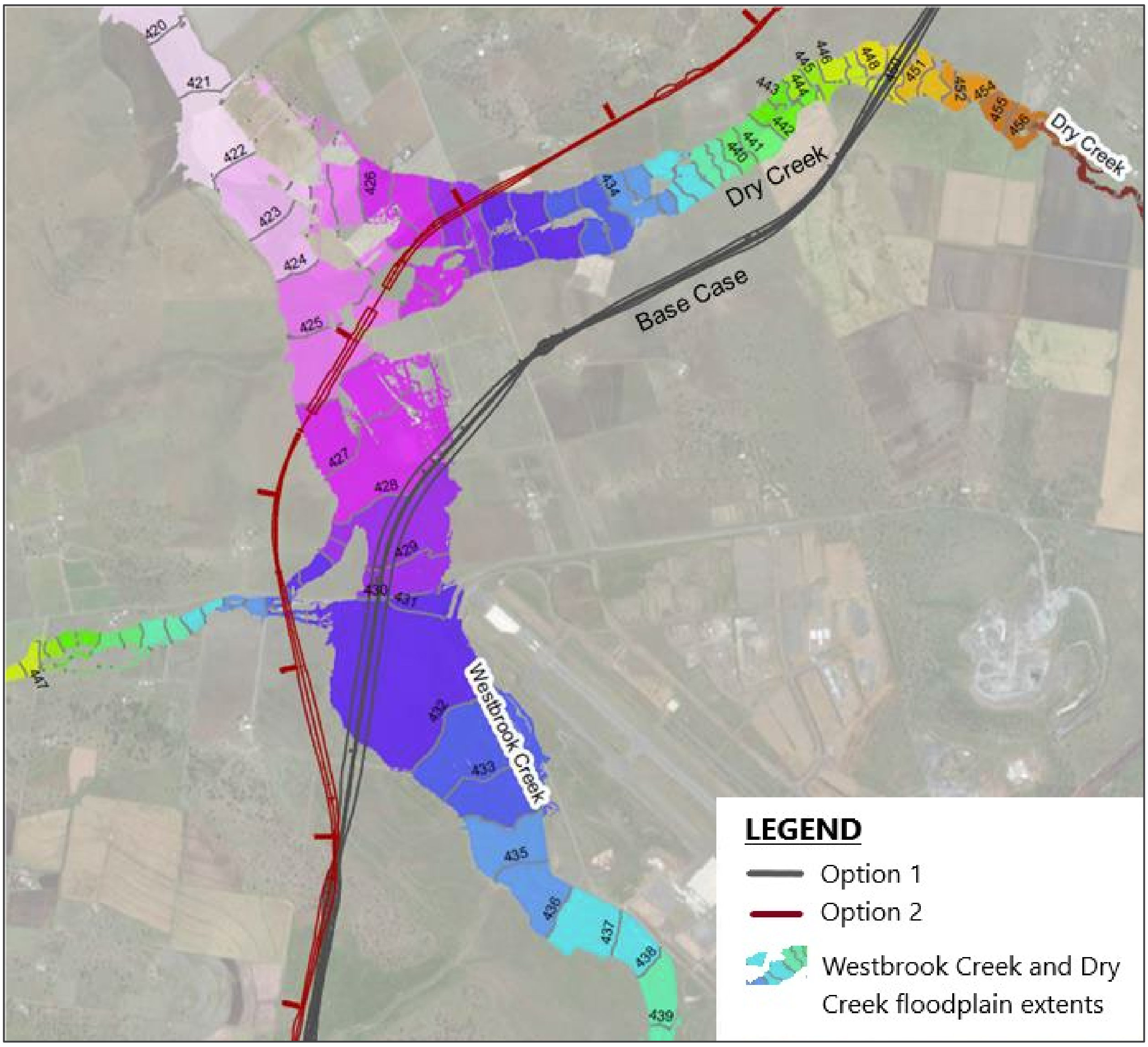


FIGURE 2.25 FLOODPLAIN EXTENTS FOR ALIGNMENT OPTIONS IN THE ATHOL TO GOWRIE MOUNTAIN AREA

2.9.1.8 Warrego Highway to Gowrie Junction

The final 4.5 km of the Project contains the following:

- Grade separation of the Warrego Highway, with associated topographical challenges
- Elevation change of 29 m along 1,300 m of alignment, from the Warrego Highway to Gowrie Creek
- Interfaces with critical utilities, including:
  - Roma to Brisbane APA Group high-pressure gas main
  - TRC potable water main
- Gowrie Creek and associated floodplain
- QR West Moreton Line
- Tie-in with the Gowrie to Helidon Inland Rail project
- Interface with the InterLinkSQ development.

Four alignments were investigated through this section, as shown on Figure 2.26, which included:

- Option A—the Base Case alignment
- Option B—modified to cross north of Gowrie Creek to connect to the existing QR rail corridor for the West Moreton line
- Option C—a hybrid of Options A and D
- Option D—runs parallel to Robsons Road before connecting to the existing QR rail corridor.

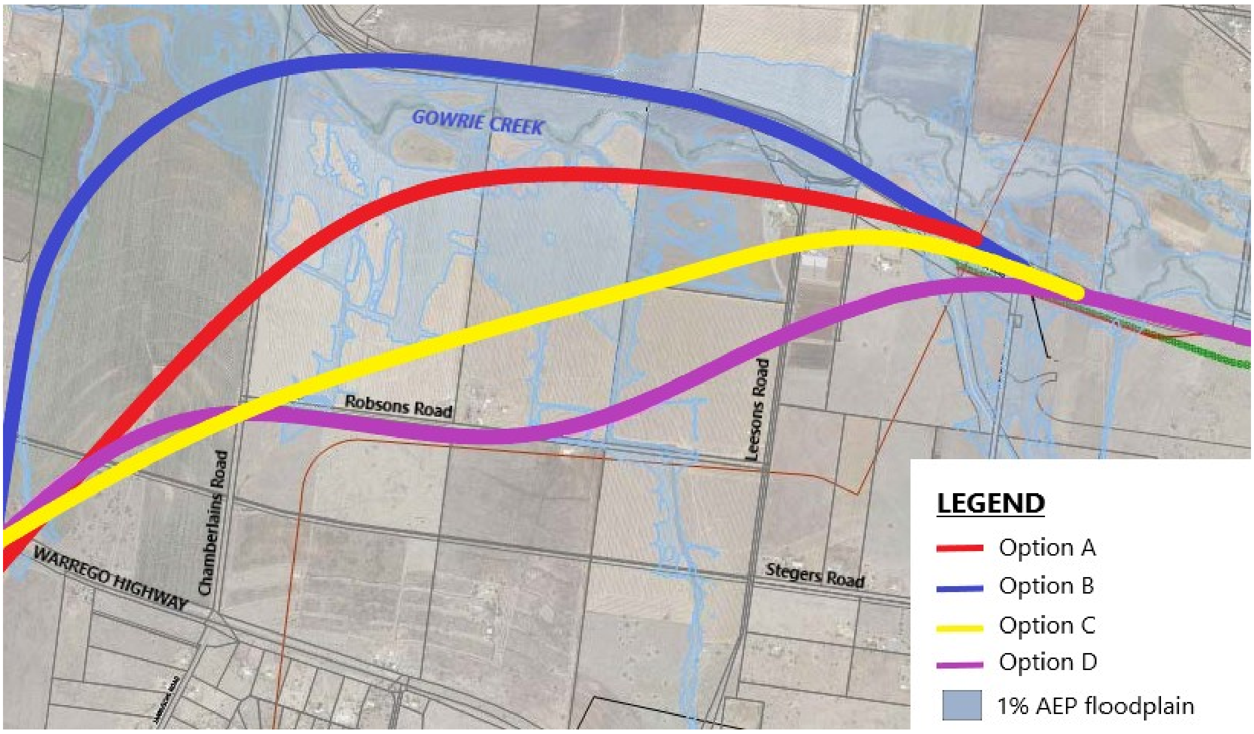


FIGURE 2.26 REFERENCE DESIGN PHASE ALIGNMENT OPTIONS IN THE WARREGO HIGHWAY TO GOWRIE JUNCTION AREA

Following comparative assessment of the four options, Option A was selected as the optimal alignment solution through this area based on:

- Shorter in length (8.0 km) than Option B (8.8 km)
- Less of a hydrological impact than Option B
- Traverses fewer properties (six) than Option C (nine) and Option D (eight)
- Enables connection into the InterLinkSQ development, unlike Option C and Option D
- Requires fewer road interface design treatments that Option C and Option D.

As a result of these findings, Option A and was progressed for further design development. Following further consultation with the potentially affected landowners in this area, it was apparent that additional optimisation of Option A was required to reduce the impact to agricultural operations while also balancing earthworks. The objective of this further alignment optimisation was to lessen the extent of diagonal impact across properties, thereby achieving more favourable outcomes for current land use. In doing so, a modified alignment, Option E, was developed. Option A and Option E are both shown in Figure 2.27.

Option E was considered to achieve better outcomes for continuity of existing land use within the area, as requested through landowner consultation. Consequently, Option E was adopted for the Project's reference design and assessed for this draft EIS.

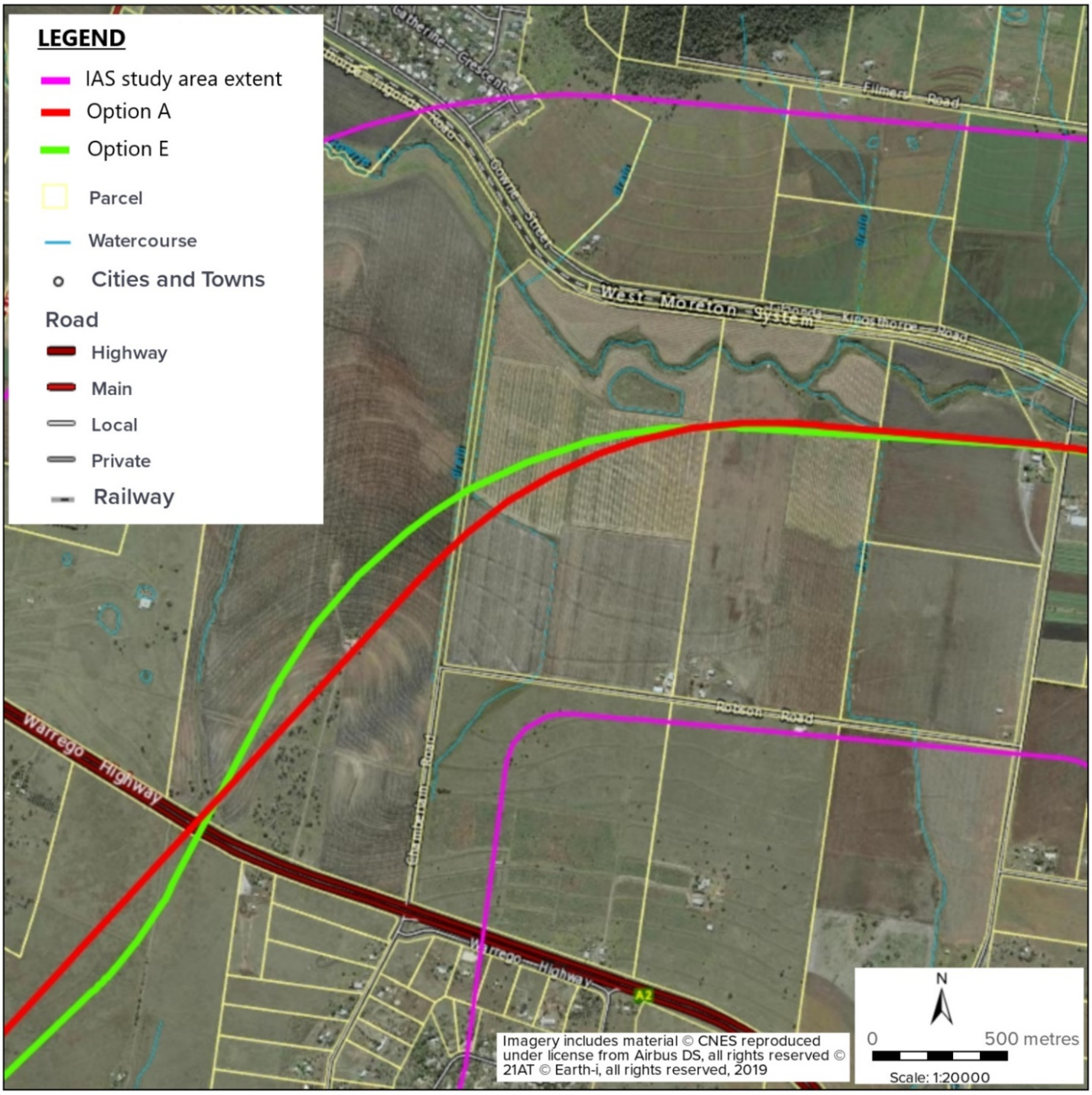


FIGURE 2.27 REFINEMENT OF ALIGNMENT OPTION BETWEEN THE WARREGO HIGHWAY AND GOWRIE JUNCTION

2.10 Relationship to other projects

The Inland Rail has been divided into 13 projects. Inland Rail will be operational when all 13 sections are complete, which is estimated to be in 2026; however, each of the sections of Inland Rail can be delivered independently with tie-in points to the existing national rail network.

This Project forms part of the overall Inland Rail and is one of the 'missing links' across the program. At the southern limit, on the NSW/QLD border, the Project will connect into North Star to NSW/QLD Border project. The North Star to NSW/QLD Border project has been declared as State Significant Infrastructure (application number SSI-9371) by the NSW Department of Planning and Environment. An environmental impact assessment is currently being prepared for the project in accordance with Part 3 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (NSW).

At its northern limit, the Project will connect into the Gowrie to Helidon project. The Gowrie to Helidon project has been declared a coordinated project for which an EIS is required under the SDPWO Act. An EIS is currently being prepared for this project.

Two other Inland Rail projects, the Helidon to Calvert (H2C) project and the Calvert to Kagaru (C2K) project have been declared as coordinated projects for which an EIS is required under the SDPWO Act. An EIS is currently being prepared for each of these projects.

The Project does not have a direct relationship with any other coordinated projects, major projects and/or developments. However, the Project will provide more direct connectivity opportunities between the existing QR South Western Line, Millmerran Branch Line and the Charlton–Wellcamp Enterprise Area, including Toowoomba Wellcamp Airport.

The full suite of potential benefits associated with the Inland Rail Program, as discussed in Section 2.5, can only be realised once this Project is complete and operational, in addition to the other 12 Inland Rail sections.

The potential for cumulative impacts due to the Project in combination with other coordinated projects, major projects and/or developments has been assessed as part of this draft EIS and is presented in Chapter 21: Cumulative Impacts.