

## Yelarbon to Gowrie Review

The section of Inland Rail between Yelarbon and Gowrie represents one of the most challenging aspects of the Inland Rail programme with regard to:

- Engineering design (e.g. construction on black soil plains and limiting changes to known flooding conditions);
- Potential community impacts (e.g. property severance, flooding and noise pollution); and
- Existing rail alignments not being to the standard of Inland Rail. Where they are operational, they have very limited rail services relative to other brownfield sections of Inland Rail.

A route for the Yelarbon to Gowrie section was initially identified by the Australian Rail Track Corporation (ARTC), through the Inland Rail Alignment Study undertaken on behalf of the Australian Government and completed in 2010. This was subsequently refined through concept design work as part of a \$300 million Australian Government Inland Rail preconstruction program, undertaken by ARTC.

In 2016 the Hon Darren Chester MP, Minister for Infrastructure and Transport, commissioned an independent review of four alignment options between Yelarbon and Gowrie in response to community concerns, particularly from stakeholders along the Base Case Modified alignment. A range of factors led to these concerns:

- Insufficient stakeholder engagement in the 2010 Inland Rail Alignment Study and more recent planning activities undertaken by ARTC;
- Release of a study commissioned by the Queensland Department of Transport and Main Roads and undertaken by SMEC proposing alternative alignments (and favouring the Karara-Leyburn alignment);
- The development of the Brisbane West (Wellcamp) Airport subsequent to the 2010 Inland Rail Alignment Study; and
- The desire of Southern Downs Regional Council and other stakeholders to pursue a route closer to Warwick to serve the Southern Downs region.

An independent team of technical experts from AECOM/Aurecon was engaged by ARTC to complete a like-for-like analysis of the four alignments, including a Multi Criteria Analysis (MCA). The results of this analysis were reported to ARTC and informed the recommendations contained in ARTC's Yelarbon to Gowrie Corridor Options Report.

The MCA process applied to the Yelarbon to Gowrie alignment review was agreed to by the Melbourne to Brisbane Inland Rail Steering Committee for use across the whole Inland Rail alignment, in situations where alternative alignments are being considered against the 2015 base case.

The Minister formed a Project Reference Group (PRG) to provide local input to the review and verify the impartiality and transparency of the alignment review process. In forming the PRG, peak bodies such as farming organisations, chambers of commerce, progress associations and other community organisations were invited to nominate representatives as Members. Local councils, State Government Departments, and relevant Federal and State MPs were also invited to attend PRG meetings as Observers. The PRG was chaired by Mr Bruce Wilson AM.

The PRG meet seven times between 14 December 2016 and 10 April 2017. At these meetings, the technical experts provided an update on data being collected for the like-for-like analysis and answered questions asked by PRG Members.

The MCA workshop and scoring day was held on 17 March 2017. The results did not reveal significant differences between the Yelarbon to Gowrie alignment options, although the Warwick alignment performed worse than other options across a variety of criteria (Table 1). The MCA workshop and scoring day was observed by four PRG representatives as well as Mr Wilson and staff of the Department of Infrastructure and Regional Development (the Department). The cost estimates were developed separately by an independent expert using data from the MCA. The MCA results and the results of the cost estimates were discussed at PRG meetings on 22 March and 10 April 2017.

**Table 1: Summary of the outcomes of the Multi-Criteria Analysis**

Assessment Criteria	Wellcamp-Charlton	Karara-Leyburn	Warwick
<b>TOTAL<sup>1</sup></b>	<b>-0.28</b>	<b>0.49</b>	<b>-3.03</b>
Technical viability	-0.04	0.60	-0.30
Safety assessment of the proposed alignment	0.04	-0.29	-0.78
Operational approach	0.00	-0.82	-0.55
Constructability and schedule	-0.13	0.09	-0.19
<b>Technical Sub-total<sup>2</sup></b>	<b>-0.13</b>	<b>-0.42</b>	<b>-1.82</b>
Environmental and heritage impacts	0.09	0.28	-0.84
Community and property impacts	-0.25	0.63	-0.38
Approvals and stakeholder risk	0.00	0.00	0.00
<b>Non-Technical Sub-Total<sup>3</sup></b>	<b>-0.16</b>	<b>0.91</b>	<b>-1.22</b>

Notes:

1. A score of positive 5 suggests the option is measurably better than the Base Case Modified. A score of negative 5 suggests the option is measurably worse than the Base Case Modified.
2. A score of positive 3.125 suggests the option is measurably better than the Base Case Modified. A score of negative 3.125 suggests the option is measurably worse than the Base Case Modified.
3. A score of positive 1.875 suggests the option is measurably better than the Base Case Modified. A score of negative 1.85 suggests the option is measurably worse than the Base Case Modified.

The Minister was provided with the Report from the Chair on the Yelarbon to Gowrie Project Reference Group on 27 April 2017.

Throughout the review process, the Minister made concerted efforts to inform himself of key issues, including:

- Meeting with Mr Wilson to receive updates on the PRG process; and with local MPs Dr John McVeigh (Member for Groom) and Mr David Littleproud (Member for Maranoa) to discuss concerns raised by their constituents during the review process;
- Attending a PRG meeting on 15 March 2017 to listen to issues and answer queries raised by PRG Members; and
- Conducting a tour of the Darling Downs on 7 June 2017, to see alignment issues first-hand and to meet with residents and business owners to discuss the impacts that Inland Rail may have on communities along each alignment.

### Box 1: Description of Alignment Options

The **Base Case Modified** corridor bypasses Inglewood to the north and follows Millmerran-Inglewood Road until Millmerran. The corridor then follows the existing Millmerran Line before cutting north at Yarranlea towards Mt Tyson where it joins the disused Cecil Plains Branch Line. The corridor deviates from the Cecil Plains Branch Line north of Aubigny to cut north-west to join the West Moreton Railway west of Kingshorpe.

The **Wellcamp-Charlton** corridor follows the Base Case Modified corridor to the north of Brookstead, then traverses along the Gore Highway via Pittsworth and Southbrook before heading towards the Wellcamp-Charlton industrial precinct (including Wellcamp Airport), and joining the existing West Moreton Railway east of Kingshorpe.

The **Karara-Leyburn** corridor follows the existing South Western Railway corridor until Karara. It then heads north towards Leyburn following Toowoomba-Karara Road, before crossing the Condamine River near Felton. The corridor then heads towards the Wellcamp-Charlton industrial precinct (including Wellcamp Airport), and follows the same route as the Wellcamp-Charlton route.

The **Warwick** corridor generally follows the Karara-Leyburn route and the existing South Western Railway corridor from Yelarbon towards Warwick via Karara. The proposed route bypasses Warwick by approximately 20 km to the west before generally following the existing Southern Railway to Wyreema before turning north-west towards Wellcamp-Charlton Industrial Precinct (including Wellcamp Airport). The corridor then follows the same route as the Wellcamp-Charlton and Karara-Leyburn routes.

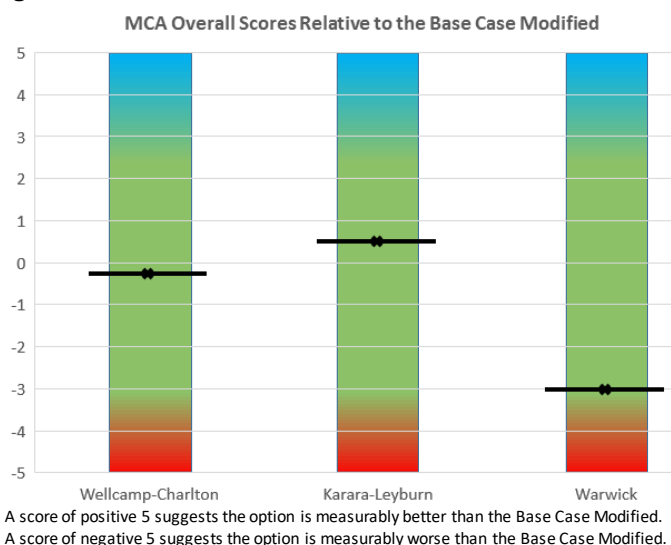
The four routes differ in terms of the amount of existing rail and road corridor they use, as well as the number of properties they traverse. Development has traditionally occurred around established road and rail corridors, and any substantive change to these corridors is likely to affect communities and stakeholders.

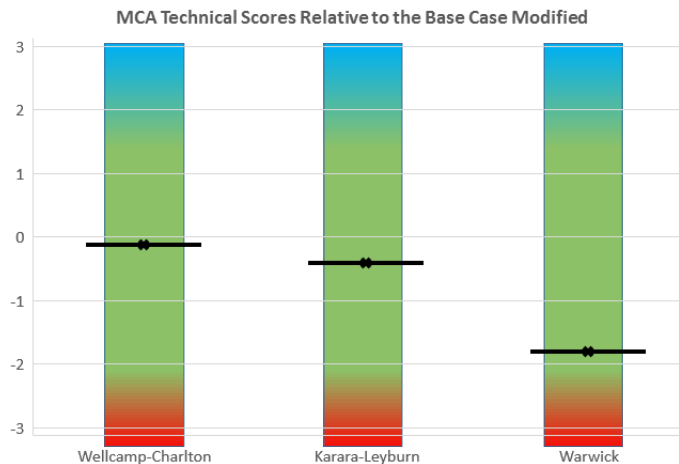
The Department notes that existing rail corridors to Millmerran, Cecil Plains and Pittsworth are currently not in operation, while the Thallon line via Warwick, Karara and Goondiwindi has a much lower level of utilisation than proposed by Inland Rail.

### Comparison of the alignment options

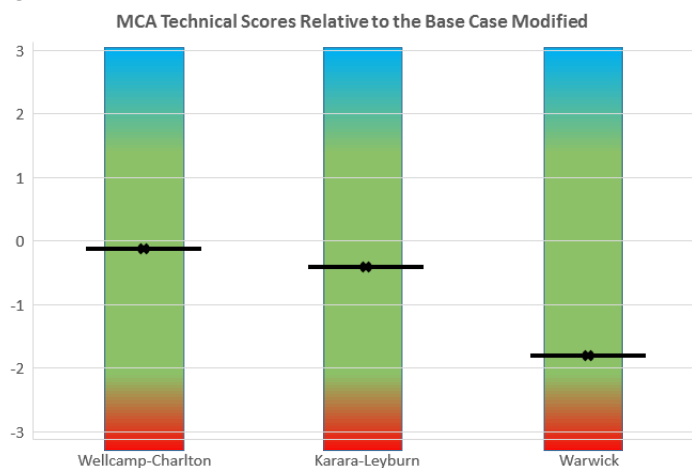
No alignment scored significantly better or worse than the Base Case Modified in the MCA, although the Warwick option scored less favourable across multiple criteria. Figures 1 to 3 demonstrate the relative differences in the MCA scores for each alignment.

**Figure 1**



**Figure 2**

A score of positive 3.125 suggests the option is measurably better than the Base Case Modified.  
 A score of negative 3.125 suggests the option is measurably worse than the Base Case Modified.

**Figure 3**

A score of positive 3.125 suggests the option is measurably better than the Base Case Modified.  
 A score of negative 3.125 suggests the option is measurably worse than the Base Case Modified.

### *The Base Case Modified option*

The Base Case Modified alignment is slightly longer than the Wellcamp-Charlton and Karara-Leyburn options (see table 2), however the differences between the three alignments are not considered significant in relation delivering the Inland Rail service offering.

The Base Case Modified alignment is the lowest cost of the four alignments (see table 3). However this cost differential is considered to be of less significance when compared to the strategic potential offered by the three other alignment options, which support the potential future freight infrastructure requirements of the west Toowoomba industrial precinct and potentially future proof passenger services to the Toowoomba West (Wellcamp) Airport from Brisbane (see discussion at page 7).

Further, it is anticipated that the Base Case Modified alignment would require amendment to avoid a constrained corridor through the community of Kingsthorpe (see discussion at page 10), increasing its cost by an amount not yet estimated; reducing its cost advantage against the three alternative routes.

**Table 2: Summary of the outcomes of the like-for-like review of the Inland Rail Service Offering**

Element	Base Case Modified	Wellcamp-Charlton	Karara-Leyburn	Warwick
Corridor Length (km)	181.3 -	168.1 -13.2	171.9 -9.4	208.3 27.0
Length of grade impacting speed (km and % of total)	26 14%	39 23%	35 20%	45 22%
<b>Transit Time (northbound)</b>	<b>2:09:23</b>	<b>2:05:20</b>	<b>2:14:44</b>	<b>2:33:48</b>
Minutes	129.38	125.33	134.73	153.80
Time difference	-	-4.05	5.35	24.42
Average speed (km/h)	84	80	77	81
<b>Transit Time (southbound)</b>	<b>1:56:02</b>	<b>1:48:51</b>	<b>1:53:34</b>	<b>2:18:04</b>
Minutes	116.03	108.85	113.57	138.07
Time difference	-	-7.18	-2.46	22.04
Average speed (km/h)	94	93	91	91

Note: the key differentiating element of the Inland Rail Service Offering is the northbound transit time. Assuming the same Melbourne to Brisbane Inland Rail reference train for each alignment option, differences in the northbound transit times are a function of the corridor length and the length of grade (slope) reducing the speed of a train.

**Table 3: Summary of the outcomes of the relative construction cost estimates**

Element	Base Case Modified <sup>1</sup>	Wellcamp-Charlton	Karara-Leyburn	Warwick
Construction Cost	\$1,232,743,893	\$1,334,949,841	\$1,518,129,385	\$1,647,486,972
<b>Cost differential against the Base Case Modified</b>	-	<b>\$102,205,948</b> <b>(+8%)</b>	<b>\$285,385,493</b> <b>(+23%)</b>	<b>\$414,742,079</b> <b>(+34%)</b>
<b>Incremental cost differential<sup>2</sup></b>	-	<b>\$102,205,948</b>	<b>\$183,179,544</b>	<b>\$129,357,587</b>

Note:

4. The Base Case Modified construction cost estimate does not include the potential additional cost of modifying the alignment to resolve the issues relating to avoiding community and business impacts at Kingsthorpe.
5. Construction cost difference between the two next expensive alignment options.

### *The Wellcamp-Charlton option*

The Wellcamp-Charlton and Karara-Leyburn options have a reduced community and property impact when compared with the Base Case Modified and Warwick options (see tables 4-6). Regardless of the alignment selected, affected communities may be vocal in their opposition to the decision.

The Wellcamp-Charlton alignment is the second least expensive alignment option, behind the Base Case Modified alignment (see table 3). Its additional cost compared with the Base Case Modified alignment is expected to be offset by the strategic benefits that it provides through its proximity to the west Toowoomba industrial precinct.

### *The Karara-Leyburn option*

While the Karara-Leyburn alignment was determined to have the fewest sensitive receptors and least number of properties affected by greenfield corridor (see tables 4-6), there is strong community opposition along the alignment, and communities such as Felton are demonstrably well-organised to fight against Inland Rail.

The Karara-Leyburn alignment is more expensive than the Base Case Modified and Wellcamp-Charlton alignments (see table 3). This additional cost is not outweighed by any benefits that may be generated or impacts avoided by selecting this alignment.

### *The Warwick option*

Significantly more sensitive receptors and greenfield property impacts were identified along the Warwick option than other corridors (see tables 4-6). Although Southern Downs Regional Council is advocating for the Warwick option, some stakeholders along this alignment oppose it, particularly given noise and other operational impacts in communities such as Nobby, Clifton and Wyreema.

The Warwick alignment has a significant additional estimated construction cost (see table 3) and an increased transit time compared with other alignment options.

**Table 4: Receptors (identified habitable structures) within 200m of the construction corridor<sup>1</sup>**

Element	Base Case Modified	Wellcamp-Charlton	Karara-Leyburn	Warwick
Total residential and commercial	225	148	69	576
<i>Total Residential<sup>2</sup></i>	203	126	67	508
<i>Residential – Greenfield</i>	24	61	38	46
<i>Residential – Brownfield</i>	179	65	29	462
<i>Total Commercial / Industrial<sup>3</sup></i>	22	22	2	68
<i>Other sensitive receptors<sup>3</sup></i>	2	2	0	6

Notes:

1. A receptor is defined as an identified habitable structure.
2. Number of residential receptors within 200m of the notional construction corridor used in the MCA to inform an otherwise qualitative assessment of the potential visual impact, the potential noise and vibration impact and potential air quality impact of each route option.
3. Number of receptors within 200m of the notional construction corridor used in the MCA to inform the potential noise and vibration impact and potential air quality impact of each route option.

**Table 5: Potential flood receptors within 500m upstream and 200m downstream of notional alignment within floodplain<sup>1</sup>**

Element	Base Case Modified	Wellcamp-Charlton	Karara-Leyburn	Warwick
Residential <sup>2</sup>	49	49	24	67
Other <sup>2</sup>	67	66	103	161

Notes:

1. A receptor is defined as an identified habitable structure. Receptors within 500m upstream and 200m downstream of the notional alignment, within the 1% AEP floodplain (i.e. the likelihood of occurrence of a flood of given size or larger occurring in any one year), based on published QLD Globe floodplain overlays.
2. Data used to compare potential property impacts.

**Table 6: Types of greenfield properties within each alignment corridor (by number of land parcels)<sup>1</sup>**

Element	Base Case Modified	Wellcamp-Charlton	Karara-Leyburn	Warwick
<b>By tenure<sup>2</sup></b>				
Freehold	297	260	191	330
Leasehold	22	12	8	24
<b>By land use type<sup>3</sup></b>				
Total cropping	153	113	58	88
Cropping – grain	129	101	50	79
Total pastoral / animal	89	90	98	131
Pastoral – cattle	62	66	55	83
Industrial	4	2	0	10
Residential	35	42	69	170
Urban	16	8	1	11
Resources	8	6	2	7
Vacant land	115	78	17	33
Other	28	5	6	27

**Notes:**

1. Property impacts were assessed by determining the number of properties (land parcel or lots on a plan) that would be traversed or severed by each route option. The numbers are greater than those contained in Table 3 as not all properties will have habitable structures (i.e. the measure of a potential receptor).
2. Land tenure provides a high-level indicator of the potential complexity of the land acquisition process. It is expected that acquiring freehold properties will be more complex than acquiring leasehold properties.
3. Land use provides a high-level indicator of the type of land-use impacts. The actual impact will depend on the nature of the property severance on the function of the property.

**Comment on Table 6:** Table 6 provides the number of properties, by type, that could be impacted from new track (greenfield) construction and new train operations. It does not provide an indication of the impact of the additional Inland Rail services that would affect communities along brownfield sections of the alignment (see Table 4 for the number of residential receptors along brownfield sections).

**Other items to note**

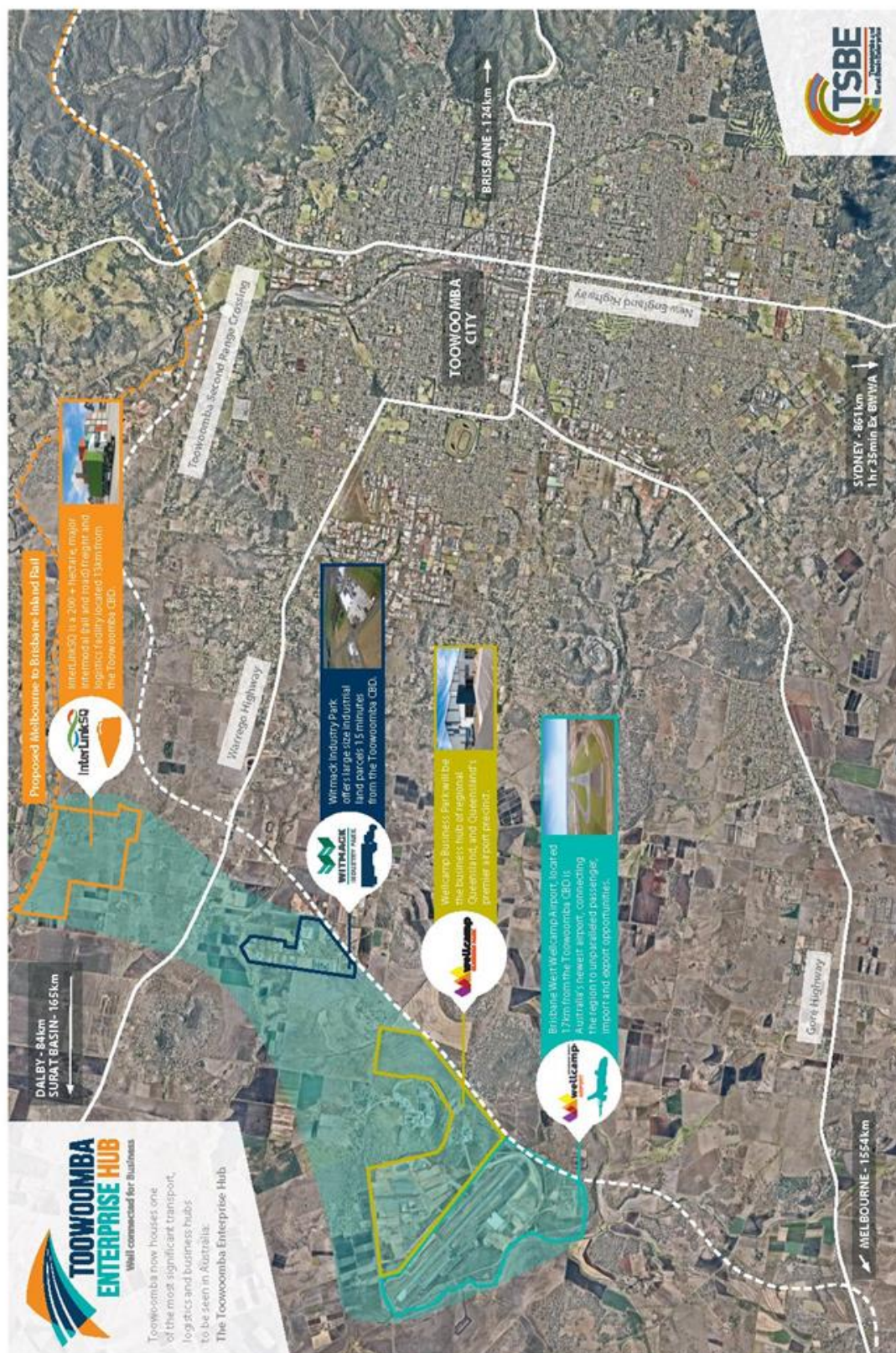
The Yelarbon to Gowrie Corridor Options Report developed by ARTC and endorsed by the Inland Rail Steering Committee provides a clear and objective analysis of the four alignments based on technical and non-technical criteria. However, the Department notes that a range of other factors are worth consideration.

*Strategic advantages offered by the west Toowoomba industrial precinct*

The Department's recommendation to progress an option via the Wellcamp area is based partly on an assessment of the current and future industrial development conditions with respect to the west Toowoomba industrial precinct (see Figure 4).



**Figure 4: Toowoomba Enterprise Hub**





All alignment options provide access to the InterLink SQ intermodal terminal at Charlton. The Wellcamp-Charlton, Karara-Leyburn and Warwick alignments have the added benefit of being located to the east of the Toowoomba Enterprise Hub; providing additional potential to stimulate and capitalise on the growth of the industrial precinct. This is a benefit not provided by the Base Case Modified option.

While the Department considers there to be potential strategic benefit with respect to the current and future industrial development conditions of the Toowoomba Enterprise Hub, the Department notes that:

- a. The 2010 Inland Rail alignment assessment (which preferred the Base Case alignment) pre-dated the substantial development of the west Toowoomba industrial precinct, while the *2015 Inland Rail Implementation Group Report* and Inland Rail Programme Business Case did not quantify specific benefits of Inland Rail to the Toowoomba region;
- b. Since 2015, the Wellcamp Airport has been built and associated development of the surrounding Wellcamp Business Park is progressing;
- c. The current west Toowoomba land management plan and associated Toowoomba Enterprise Hub proposal were developed to maximise the benefits of the Toowoomba Second Range Crossing, and assumed that Inland Rail would be to the north of the precinct along the West Moreton Line;
- d. There is sufficient land available to the south and southwest of the west Toowoomba industrial precinct to support a future intermodal terminal capable of handling 3,600 m Inland Rail trains, and support the development of adjacent industry suitable to generating and attracting rail-based supply chains; and

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*The Township of Kingsthorpe*

The Base Case Modified corridor proposes that Inland Rail joins the West Moreton Line west of Kingsthorpe, whereas all three alternate corridors connect to the West Moreton Line east of Kingsthorpe. The latter presents a more favourable option as, since the like-for-like review, ARTC has advised of previously unidentified construction complexity at Kingsthorpe which would add significant cost to the Base Case Modified option.

Transiting Kingsthorpe will potentially require claiming an additional 7-10 m wide strip of land through the township in order to maintain existing coal train operations while constructing the Inland Rail track. In addition, there is a sizeable molasses storage facility and ancillary infrastructure adjacent to the existing rail corridor that would be problematic to relocate or work around.

Also, based on advice from the Toowoomba Regional Council, Kingsthorpe and its surrounds are forecast to experience significant population growth over the next 10-20 years.

Developments are being planned on either side of the existing railway. Grade separated crossings may be necessary to maintain connectivity of the town on both sides of the railway.

The Base Case Modified corridor could be optimised through a deviation built south of the existing West Moreton Line. Should a bypass south of the existing line be adopted based on a recommendation from the Department of Transport and Main Roads, approximately 7.2 km of new track would be required with an addition of three new level crossings. This is a greenfield environment and additional land acquisition would be required, further impacting landowners. In addition, there would be the potential isolation of land trapped between the existing rail corridor and the greenfield development.

As a result, ARTC and the Department are of the view that the Wellcamp-Charlton corridor is a more favourable option.

*Lobbying for the Warwick alignment*

Southern Downs Regional Council is advocating for the Warwick alignment option to support the economic development of the Southern Darling Downs and Granite Belt Regions, and has advised that they will lobby the Queensland Government to support the Warwick alignment.

Departmental representatives met with Southern Downs Regional Council Mayor, Cr Tracy Dobie, and other local stakeholders on 6 June 2017. At this meeting, and subsequently, representatives outlined a range of forthcoming investments in the region as a demonstration of the economic development of the region.

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Furthermore, if Inland Rail does not use the existing Toowoomba to Thallon via Warwick corridor of the South-Western rail system, the Queensland Government will need to continue

to subsidise the maintenance of the loss-making corridor. It is possible the Queensland Government will attempt to circumvent this by insisting Inland Rail goes via Warwick, or that ARTC takes over the management of that line. Should the Queensland Government do so, a financial contribution towards construction of Inland Rail via Warwick should be sought.

*The State Forest (Cecil Plains) Proposal*

A variation to the Base Case Modified corridor was raised by some PRG Members during the PRG process. This proposed corridor departs the Base Case Modified corridor to go via the Whetstone, Bulli, Western Creek and Dunmore State Forests, connecting to the non-operational Cecil Plains branch line where it re-joins the Base Case Modified corridor at Mount Tyson.

A high-level assessment of this alternative corridor by the consultants shows an increased length of 19 km, including an additional 6.5 kms that traverses endangered remnant vegetation communities, and an estimated cost increase of \$130 million over the Base Case Modified corridor. It is estimated there will also be an increase of about 15 minutes to the overall transit time as a result of the increased corridor length. These estimates have been based on a very preliminary corridor (without a concept or feasibility design); and adopt the average per kilometre construction cost used to produce the Base Case Modified estimate.

This estimate also does not include any allowance for greenfield/brownfield differences plus any potential environmental impacts and possible offset requirements.

It is ARTC's view that the additional cost coupled with the additional transit time is unlikely to be offset by sufficient benefits in adopting this option.