APPENDIX B: B1-ALTERNATIVE CORRIDOR OPTIONS OMR

This Appendix describes and evaluates alternative corridor options for the Outer Metropolitan Ring Transport Corridor. It includes assessments made of all or specific sections of the route at various times in response to particular issues.

B1.1 ALTERNATIVE CORRIDOR OPTIONS OMR

This section summarises the process of developing and refining corridor and alignment options for the Outer Metropolitan Ring (OMR) Transport Corridor.

In broad scale, the first major question to be answered was whether the corridor to be planned was to be:

- Geelong-Craigieburn via Bacchus Marsh; or
- Werribee – Craigieburn

It was concluded that the Werribee-Craigieburn Corridor should be further investigated as a Geelong-Craigieburn Corridor via Bacchus Marsh would be unlikely to be well used. Also sections of the Geelong-Craigieburn corridor, particularly a crossing of Deep Creek, would have been very expensive to construct, given the need for very long, high bridging across this valley.

It became necessary at an early stage to undertake more detailed assessments on the Werribee-Craigieburn Corridor at two locations, namely, in the vicinity of:

- Mickleham/Kalkallo;
- Toolern, east of Melton.

These investigations were required, as planning was proceeding for the rezoning of land in those localities within the existing Urban Growth Boundary. For VicRoads to be able to respond adequately to those planning proposals, it was necessary to determine whether the Outer Metropolitan Ring (OMR) Transport Corridor would impact on land that was the subject of those planning processes. It was concluded in both of those cases that the OMR Transport Corridor should avoid the land that was the subject of these rezoning proposals.

A range of preliminary options to the west of Werribee between Wyndham Vale and Little River, together with varying corridors between Melton and Caroline Springs were also investigated.

North of the Calder Freeway, Diggers Rest through to Donnybrook Road, Mickleham there was one broad corridor, as corridor options were limited due to the geographic constraints of Deep Creek, and other features such as hills. Further, small variations of several of the preliminary options were investigated in this section.

Planning for the OMR became integrated with planning for *Melbourne @ 5 million* during 2008. Key principles in this integrated approach were consideration of:

> areas of potential future urban development;

> areas of rare and endangered grassland to be permanently protected.

Land with rare and endangered grassland to be permanently protected would need to be separate to land required for the OMR Transport Corridor.

As the OMR Transport Corridor would provide for a freight railway, and urban planning is based on providing for a 21st century residential environment, it was considered that the OMR Transport corridor should, where possible, be placed in locations that would not have abutting residential development on both sides of the corridor. It was also desired that the area for permanent protection of grasslands be separated from areas for urban development by the OMR Transport Corridor, and that the area for permanent protection of grasslands be maximised.

This resulted in the OMR Transport Corridor proposal being located:

> as close as possible to the western side of Werribee;

> closer to Rockbank, west of Caroline Springs.

Further options for the OMR Transport Corridor were examined in the vicinity of:

> Kalkallo/Beveridge;

> Rockbank; and

> west of Werribee

before this proposed corridor was finalised for public display purposes.

The interchange locations were developed to be complementary with the existing and proposed arterial road network.

B1.2 BROAD CORRIDOR OPTIONS

This section describes potential very broad corridors for linking Geelong and Werribee to Craigieburn. It also includes evaluation of northern linkages to the Hume Freeway.

B1.2.1 DESCRIPTION OF OPTIONS

B1.2.1.1 GEELONG – CRAIGIEBURN CORRIDOR (OPTION GC)

The strategic basis for this corridor investigation was set out in "*Meeting Our Transport Challenges*" 2006, which stated that:
"possible future road corridors include:

> Possible long-term route from Geelong to the north through Bacchus Marsh"

This component of the study investigated the possible duplication of existing roads as far as possible to improve inter-regional linkages between Geelong, Bacchus Marsh, Gisborne, Sunbury and Hume in the Craigieburn area. The investigation was discontinued as preliminary traffic modelling indicated that a corridor linking Geelong to Bacchus Marsh was unlikely to require duplication in the foreseeable future. Additionally, very substantial infrastructure, in terms of major bridges, would have been required to cross significant deep valleys, west of Mickleham.

The broad corridor shown in Figure B1 -1 Broad Corridor Options (Yellow) would start in Geelong, north from the Geelong Bypass, following the line of the Geelong - Bacchus Marsh Rd proceeding through the east side of Bacchus Marsh and across the Bacchus Marsh Bypass of the Western Freeway. An alternative further to the east (Blue dashed), would deviate south of Bacchus Marsh and rejoin the main corridor at the Diggers Rest – Coimadai Road. The main corridor would continue to Toolern Vale. The corridor would then go north along Gisborne-Melton Rd, east along Couangault Rd to cross the Calder Freeway in the vicinity of Mundy Road From there it would link to Konagaderra Road, through Oaklands Park, cross Deep Creek and link to Donnybrook Rd. An alternative (blue dashed) from Toolern Vale to just east of Mt Riddell Road would cross the Calder Freeway further south at Gap Road.

B1.2.1.2 WERRIBEE-CRAIGIEBURN CORRIDOR (OPTIONS GWN AND GWS)

Figure B1 -1 Broad Corridor Options shows initial options (Red) for this corridor. Options were considered from Geelong to Werribee as the Western Plains Grasslands form a considerable environmental constraint. The first alternative, Option GWN, would swing east from the Geelong-Bacchus Marsh Road at Little River-Ripley Road, across the Werribee River south of Eynesbury, and run along Boundary Road and across to join the Deer Park Bypass.

The second alternative, Option GWS, would swing east at Peak School Road, run east parallel to the Geelong – Melbourne Railway line, then north west of Newtons Road crossing the Werribee River just north of Cobbledicks Ford. The main corridor would then run north approximately following Leakes Road, crossing the Calder Freeway between the Bulla-Diggers Rest interchange and the Calder Raceway, across Sunbury Road north west of Bulla, Craigieburn Road east of Oaklands Road and Mickleham Road in the vicinity of Mt Ridley Road before splitting into Options A,B,C and D to the Hume Freeway and beyond (see later).

B1.2.1.3 WERRIBEE-CRAIGIEBURN CORRIDOR OPTIONS: WEST OF MELTON; NORTH OF SUNBURY (OPTION NS)

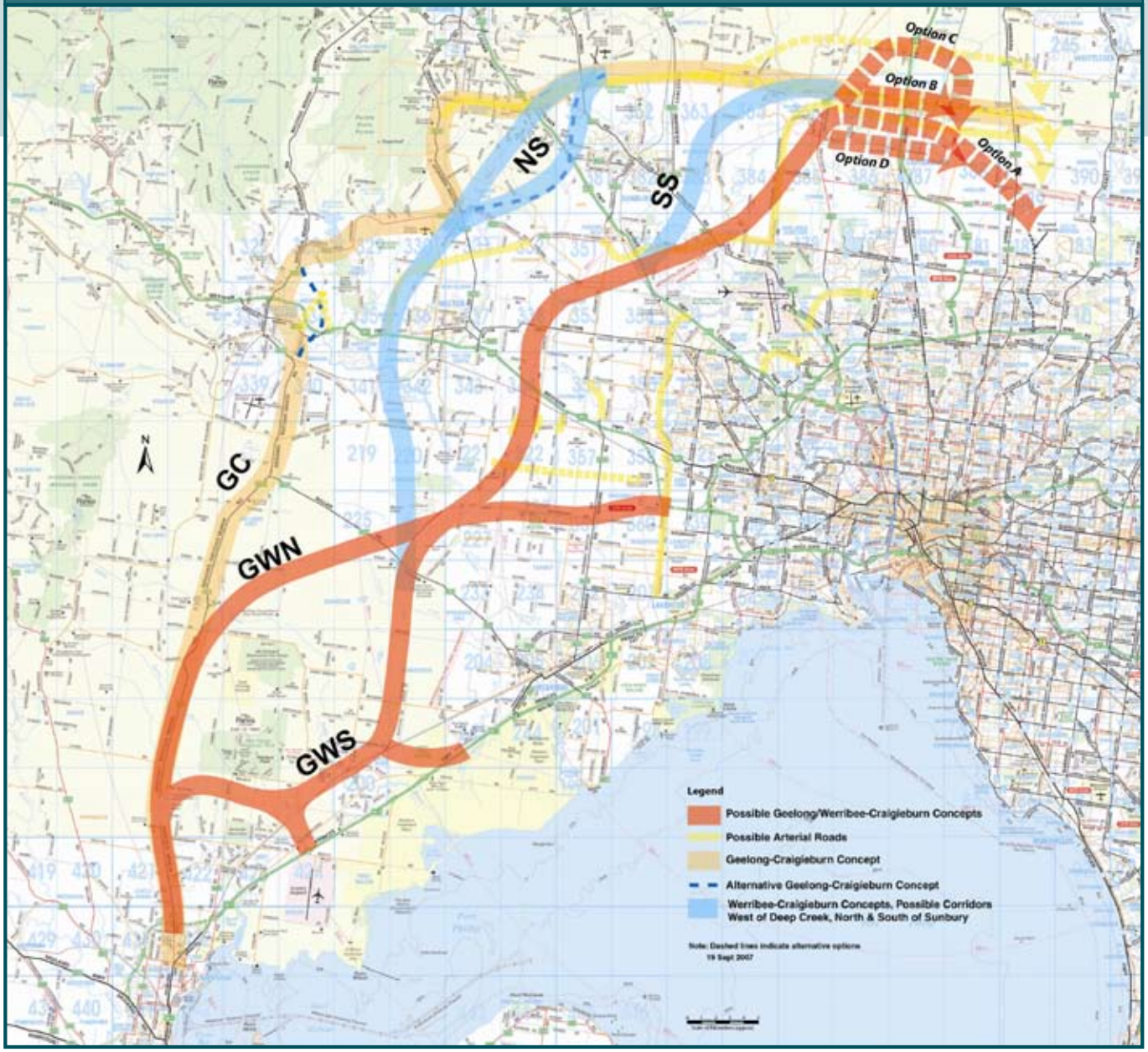
In developing the broad corridor options described above, consideration was given to the possible development of routes utilising part of the Geelong – Craigieburn route in the north and swinging round to the west of Melton. This would involve a crossing of Deep Creek in the Donnybrook Road / Konagaderra Road area.

Options to the west of Melton were not further pursued because they would not adequately satisfy one of the important objectives for the corridor, namely to improve linkages between residential and employment growth areas.

B1.2.1.4 WERRIBEE-CRAIGIEBURN CORRIDOR OPTIONS: EAST OF MELTON; SOUTH OF SUNBURY; WEST OF DEEP CREEK (OPTION SS)

Options passing east of Melton, but further to the west of Craigieburn were not further pursued, because they would not adequately meet key transport objectives. Such options would not readily serve the growth area around Craigieburn unless two major crossings of Deep Creek were provided. This was not considered worthwhile to further pursue.

FIGURE B1-1: BROAD CORRIDOR OPTIONS



B1.2.1.5 OPTIONS A,B,C,D HUME CORRIDOR

More detailed options for the potential northern corridor link to the Hume Freeway needed to be resolved early in the study process, due to the then need to respond to amendments to the Hume Planning Scheme in this area. These amendments were:

> C92 Merrifield Industrial Development (north of Donnybrook Road), proponent MAB;
> C98 Folkestone Development (south of Donnybrook Road and north of transmission line), proponent Folkestone .

OPTION A - TRANSMISSION LINE

The transmission line route was considered for the following reasons:

> The transmission line is relatively clear of vegetation;
> The location is on the southern edge of the proposed development thus reducing impact on the proposed development;
> The facility can interchange with the Hume Highway (subject to traffic investigation);
> A facility on this route should limit commercial traffic demand south on E14; and
> Would allow construction of the Donnybrook Road interchange (subject to modifications of ramps).

OPTION B - DONNYBROOK ROAD

A Donnybrook Road route was considered for the following reasons:

> The outline development plan shows it as an arterial road, but it is proposed to be six lanes with a planned Donnybrook Road/Hume Highway interchange;
> It is in the centre of the development of MAB and Folkestone;
> Minimal environmental impacts;
> Established road carrying existing freight via Mickleham Road.

OPTION C – GUNNS GULLY ROAD

A route in the general area of Gunns Gully Road was considered for the following reasons:

> Minimal environmental impacts; and
> Limited impact on the proposed development i.e., is in broad compliance with the outline development plan, i.e. does not affect Donnybrook Road interchange or southern interchange.

This strategy option had two sub-options:

C1 – would include an east west arterial along or adjacent to the high voltage transmission lines to link the Folkestone and other developments to the OMR

C2 – would include an east west arterial near the southern edge of the Folkestone Development, east of the E14; then use E14 and Mt Ridley or Craigieburn Roads to connect to the OMR.

OPTION D – MT RIDLEY ROAD

A possible corridor along Mt Ridley Road was proposed for the following reasons:

> It is an existing arterial road; and
> It would provide an east west freeway closer to Craigieburn Road and Craigieburn Town Centre.

Of the strategic options – Option A and Option C were designed in further detail with several interchanges as these were considered likely to provide the best outcomes. These options are shown in Figure B1-1 Broad Corridor Options and Figure B1-2 Hume Corridor Options.

B1.2.2 EVALUATION OF OPTIONS

Options were evaluated according to the overall project objectives outlined in Chapter 2, Methodology, 2.1.5 Assessment Methodology.

B1.2.2.1 EVALUATION OF BROAD CORRIDOR OPTIONS

At this stage, the evaluation of options against objectives was based on judgement, informed by constraints mapping. The assessment of traffic impacts was based on judgement, informed by a preliminary assessment of trip generation and attraction. Table B1 -1 Broad Corridor Options Analysis provides a summary of the assessment against each of the objectives.

Table B1 - 1 Broad Corridor Options Analysis

Objective Sub objective	**Geelong- Craigieburn Corridor (GC)**		**Geelong - Werribee - Craigieburn Corridor (north) (GWN)**		**Geelong - Werribee - Craigieburn Corridor (south) (GWS)**		**Geelong- Werribee Corridor West of Deep Creek & North of Sunbury (NS)**		**Geelong- Weribee Corridor West of Deep Creek & South of Sunbury (SS)**	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	Geelong - Bacchus Marsh - Toolern Vale - Couangult Rd - Mundy Rd - Oaklands Park - Donnybrook Rd. Alternative routes east of Bacchus Marsh and south of Gap Rd		Geelong - Ballan Rd - Western Fwy - Melton Rd - Calder Fwy - Mickleham Rd - Donnybrook Rd		Geelong - Mill Rd - Edgars Rd - Ballan Rd - Western Fwy - Melton Rd - Calder Fwy - Mickleham Rd - Donnybrook Rd		Ballan Rd - Exford Rd - Western Fwy - Toolern Vale - Mundy Rd - Oaklands Park - Donnybrook Rd. Alternative south of Gap Rd		Calder Fwy south of Diggers Rest - Sunbury rd - west of Deep Creek - Oaklands Park - Doonybrrok Rd	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airoports, Port of Geelong, other Intermodal freight hubs and freight service economy areas										
	Of limited benefit as intended to link regional towns rather than provide a high speed transport link	Very poorly	Would serve Port of Geelong well but less so Avalon Airport as not so direct	Poor	Would serve Port of Geelong and Avalon Airport well. Would also link to Werribee	Well	Would not serve Melbourne Airport	Poor	Could be advantagous as route would be between Sunbury and the Airport (when considered in conjunction with rest of Werribee - Craigieburn Corridor (south)). Would require Bulla Bypass.	Well
Objective 2: Serves key interstate and major regional destinations										
Enhancing competitiveness and regional development by providing a second high speed circumferential transport link between nationally important highways (Princes West, Western, Calder, Hume that serve interstate and major regional destinations for freight and persons	Not a high speed route but would link outer Melbourne regional centres	Poor	Would meet this objective and could provide for additional link to Deer Park Bypass	Satisfactory	Would meet this objective well as closer to Werribee and potential future Freight area development and could provide for additional link to Deer Park Bypass	Very well	Would not support current and potential future industrial development areas well	Poor	Would meet this objective but would not service arterial roads leading to Craigieburn	Satisfactory
Providing a second transport corridor for rail travel between Geelong and Melbourne	Not suitable for rail	Very poorly	Likely to meet objective, but at greater cost.	Well	Likely to meet objective	Well	May encounter difficulties north of Calder Freeway and Sunbury	Poor	Likely to meet objective but would require very large bridge across Deep Creek	Satisfactory
Providing a second high speed road transport link between Melbourne and Geelong	Not a high speed route	Very poorly	Likely to meet objective	Well	Likely to meet objective	Well	May encounter difficulties north of Calder Freeway and Sunbury	Poor	Likely to meet objective	Well
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham										
	Would link Bacchus Marsh, Gisborne and possibly Sunbury to Geelong and Donnybrook industrial employment areas but not connect Melton or Werribee growth areas	Very poorly	Would link Melton, Sunbury and Tullamarine to employment hubs to north and west and to Geelong. Would not link Werribee well	Poor	Would link Weribee, Melton, Sunbury and Tullamarine to employment hubs to north and west of Melbourne	Well	Would link Werribee to Melton, but may not capture Melton traffic to north as west of City and would not serve Sunbury Tullamarine area	Poor	Would link Weribee, Melton, Sunbury to employment hubs to north and west of Melbourne	Satisfactory
Objective 4: The Project is capable of performing its function										
Provides outer ring road function	No would not be required for many years	Very poorly	Yes but distant from Werribee	Satisfactory	Yes	Satisfactory	Would not be as effective as other options	Poor	Likely to meet objective	Well
Provides high speed rail for freight and passengers and/or metropolitan rail function	Not suitable for rail	Very poorly	Likely to meet objective, but at greater cost	Well	Likely to meet objective	Well	May encounter difficulties north of Calder Freeway and Sunbury	Poor	Yes	Satisfactory
Objective 5: The project is technically feasible										
To ensure road design standards are met	Envisaged as an arterial road . Corridor would have to be substanitally modified to meet freeway standards and would encounter major difficulties between Bacchus Marsh, around Merrimu Reservoir and north of the Calder Freeway. Feasible-Subject to concept design.	Poor	Feasible - Subject to concept design	Well	Feasible - Subject to concept design	Well	Feasible - Subject to concept design.	Satisfactory	Feasible - Subject to concept design	Satisfactory
To ensure rail design standards are met	Not determined at this point		Not determined at this point		Not determined at this point		Not determined at this point		Not determined at this point	

To have minimal impact on existing/proposed road infrastructure	Issues with Western Freeway at Bacchus Marsh. Potential impacts on Calder Freeway interchange	Very poorly	Dependent on option selected at Hume Freeway	Well	Dependent on option selected at Hume Freeway	Well	Issues with Western Freeway at Bacchus Marsh. Potential impacts on Calder Freeway interchange	Poor	Dependent on option selected at Hume Freeway	Well
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment	Conflicts with large areas of Environmental Signifcance Overlay	Very poorly	Conflicts with Environmental Signifcance Overlay	Satisfactory	Conflicts with Environmental Signifcance Overlay	Satisfactory	Conflicts with large areas of Environmental Signifcance Overlay	Very poorly	Conflicts with large areas of Environmental Signifcance Overlay	Very poorly
To protect species and ecological communities listed under the Flora and Fauna Guarantee Act 1988 (Vic) and Environment Protection and Biodiversity Conservation Act 1999 (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Would avoid Western Plains Grasslands but would cross more creeks and could affect a small part of the FFG listed threatened Long Forest ecosystem, a wetland south of Bacchus Marsh, catchment areas and waterways	Poor	Would skirt Western Plains Grasslands, and fewer river crossings	Satisfactory	Would impact significant areas of Western Plains Grasslands, but fewer river crossings	Poor	Would impact significant areas of Western Plains Grasslands, cross more creeks and could affect a small part of the FFG listed threatened Long Forest ecosystem	Very poorly	Would impact significant areas of Western Plains Grasslands, but extra and wider river crossings	Very poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Partly in water catchment areas to North West of Melbourne, numberous major creek crossings	Poor	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance. 7 more creek crossings than options to east	Satisfactory	Mitigation measures would enable acceptable performance. 1 more major creek crossing (Emu Creek)	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale	
Impact on Aboriginal cultural heritage sites	Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale		Not relevant to this assessment - too broad scale	
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and indistrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Least impact as envisaged as widening of existing roads with sections of new road	Well	Would impact agricultural enterprises and 3 quarries	Poorly	Would impact agricultural enterprises and 5 quarries	Poorly	Would impact agricultural enterprises and 3 quarries	Poorly	Would impact agricultural enterprises and 2 quarries	Poorly
Industrial development, other uses, utilities, service centres	Limited support for metropolitan industrial development	Very poorly	Would support metropolitan industrial development	Satisfactory	Would support metropolitan industrial development and closer to planned developments	Well	Limited support for metropolitan industrial development	Very poorly	Would support metropolitan industrial development	Satisfactory
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Potential impacts on north Geelong, east and north Bacchus Marsh, Toolern Vale, Gisborne South, south of Riddells Creek and Clarkefield)	Very poorly	Potential impacts on north Geelong and Kongadera Springs (Mickleham Rd). Chartwell if extension to Deer Park Bypass included	Poorly	Potential impacts on either/ or north Geelong and Little River and Kongadera Springs (Mickleham Rd). Chartwell if extension to Deer Park Bypass included	Poorly	Potential impacts on Brookfield (Melton), Toolern Vale, Gisborne South, south of Riddells Creek and Clarkefield)	Very poorly	Potential impacts on either/or north Geelong and Little River. Chartwell if extension to Deer Park Bypass included	Poorly
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	May impact Significant Landscape Overlay (SLO) north and south of Bacchus Marsh	Poorly		Satisfactory		Satisfactory		Satisfactory		Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**Would not meet most objectives or deliver the project's transport function**	**Very poorly**	**Has potential in longer term for Geelong but would not serve Avalon or Werribee well**	**Satisfactory**	**Links from Avalon and south of Werribee have potential to meet main transport objectives. This outweighed potential social and environmental impacts at this stage**	**Well**	**Would not meet the first 3 objectives and would have increased biodivesity impacts over Deep Creek**	**Poorly**	**Increased biodiversity impacts considered to outwiegh any advantages. Not as good as Option GWS**	**Poorly**

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

GEELONG – CRAIGIEBURN CORRIDOR (OPTION GC)

The Geelong - Craigieburn Corridor would perform a different function to that of the Werribee – Craigieburn Corridor i.e. linking regional towns and developing areas on the periphery of Melbourne. This study did not proceed further as preliminary traffic analysis concluded that such a project would not be required for a very long time, possibly mid century. Based upon a simple gravity model, it was concluded that the population of Geelong multiplied by the population of Bacchus Marsh, would have to rise by a factor of eight for there to be merit in duplicating the Geelong – Bacchus – Marsh Road. The conclusion was that a link between Werribee and Craigieburn would be required sooner. It should be noted that localised proposals to change north-south traffic flow patterns around Bacchus Marsh, to remove some truck traffic from the inner area of Bacchus Marsh, do not necessarily depend on this larger option.

GEELONG – WERRIBEE – CRAIGIEBURN NORTH CORRIDOR (OPTION GWN)

This corridor would not serve Avalon Airport or Werribee well. It should not be ruled out of consideration in the longer term if the population of Geelong were to increase several fold.

This broad corridor option from Geelong was not supported at this time.

GEELONG – WERRIBEE – CRAIGIEBURN SOUTH CORRIDOR (OPTION GWS)

The main corridor for Option GWS would be relatively close to the existing Princes Freeway, while providing a less direct route to Geelong than the existing route. The links from Avalon Airport and south of Werribee were considered to have potential to meet the objectives of linking key international transport hubs and serving key interstate and major regional destinations.

It was clear that environmental considerations would be a major challenge for any potential corridor, especially any closer to Werribee as the Western Plains Grasslands cover a wide area.

This broad corridor option from Geelong was not supported.

WERRIBEE-CRAIGIEBURN CORRIDOR OPTIONS WEST OF DEEP CREEK NORTH AND SOUTH OF SUNBURY (OPTIONS NS AND SS)

In the north, Options north and south of Sunbury were not supported due to the increased impact on biodiversity across the additional creek crossing and the extended area covered by an Environmental Significance Overlay of Deep Creek in particular. In addition the northern option would impact on the settlements of north Sunbury and south Gisborne. The northern option was not considered to meet the first three objectives.

B1.2.2.2 OPTIONS A,B,C,D HUME CORRIDOR

Assessment of these options is shown on Table B1 -2 Hume Corridor Options Analysis.

Option A (Transmission Line) was not supported due to the high biodiversity impacts, impacts on future business/industrial development and lesser network functionality.

Option B (Donnybrook Road) was not supported due to potential operational/ safety issues and loss of network functionality, impacts on future business/industrial development and existing development including the town of Kalkallo and technical difficulties with the interchange location and future requirements.

Option C was supported as it would provide a freeway corridor to support potential future urban growth and provide a bypass of the proposed industrial area for regional traffic, thus avoiding significant impact upon it. Option C would not have unduly significant environmental impacts on its own. No decision was made regarding the C1 and C2 supporting network options (Options 1 and 3, Figure B1-2) pending further investigation.

Option C with all potential network options as shown in Figure B1-2 Hume Corridor Options was published on the OMR Project website in November 2007 with a generic route option west of Melbourne pending further investigation of preliminary options.

Option D (Mt Ridley Road) was not supported due to impacts on Mt Ridley (scenic area, route would be on the skyline) and the Mt Ridley Conservation Area, impacts on future business/industrial development and existing residential development, technical difficulties with the interchange location with Hume Freeway and requirement for extensive earthworks/additional very long bridge.

Table B1-2 Hume Corridor Options Analysis

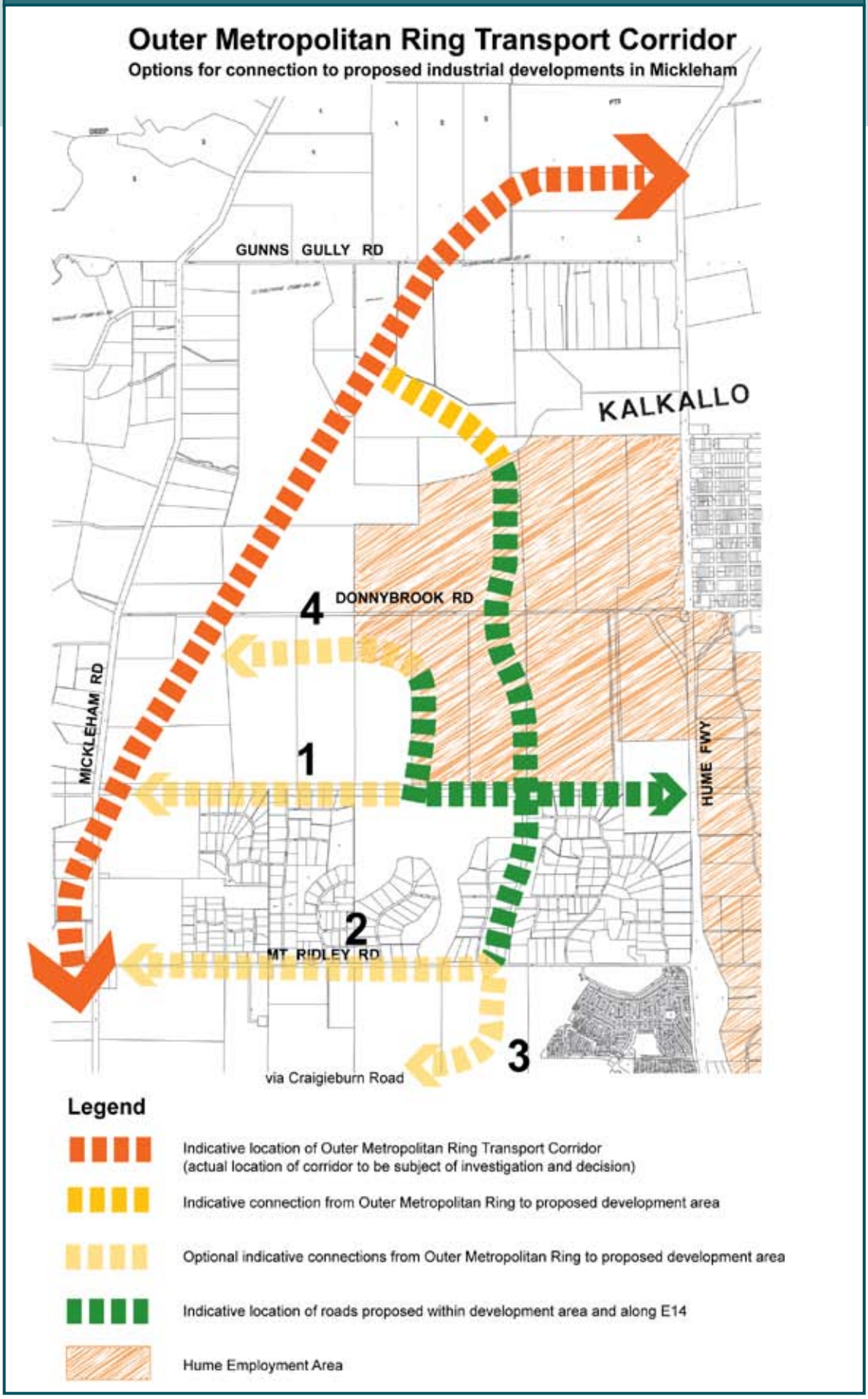
Objective Sub objective	Option A		Option B		Option C1		Option C2		Option D	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	Follows transmission line midway between Mt Ridley Rd and Donnybrook Rd		Follows Donnybrook Rd		Follows Gunns Gully Rd with east-west arterial along transmission line		Follows Gunns Gully Rd with east-west arterial from Hume Fwy to proposed E14, connect to OMR at Mt Ridley or Craigieburn Rds to south		Follows Mt Ridley Rd	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airoports, Port of Geelong, other Intermodal freight hubs and freight service economy areas										
Serves Key international transport hubs, eg Melbourne and Avalon Airoports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Location serves Mickleham Industrial Development. Possible congestion point in vicinity of Hume Freeway/Ring Road Interchange	Satisfactory	Location would serve the Mickleham Industrial Development. Possible congestion point in vicinity of Hume Freeway/Ring Road Interchange	Satisfactory	If an arterial road is located on/adjacent to transmission line easement, then this option would serve the Mickleham Industrial Development	Well	Option would serve the Mickleham Industrial Development access via Mt Ridley Road/E14	Satisfactory	Location suits Mickleham Industrial Development. Possible congestion point in vicinity of Hume Freeway/Ring Road Interchange	Poor
Objective 2: Serves key interstate and major regional destinations										
Enhancing competitiveness and regional development by providing a second high speed circumferential transport link between nationally important highways (Princes West, Western, Calder, Hume that serve interstate and major regional destinations for freight and persons	Links regional highways, but directs regional traffic past industrial area	Well	Links regional highways, but directs regional traffic past industrial area	Satisfactory	Provides a bypass of industrial areas for regional traffic	Very well	Provides a bypass of industrial areas for regional traffic	Very well	Links regional highways, but directs regional traffic past industrial area	Well
Providing a second transport corridor for rail travel between Geelong and Melbourne		Not assessed								
Providing a second high speed road transport link between Melbourne and Geelong		Not assessed								
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham										
Enhance employment opportunities by providing a high speed circumferential transport link between metropolitan growth areas and employment hubs in the north and west of Melbourne	Links Melton, Tullamarine and Mickleham. Some potential congestion problems. However mixes some regional and local traffic near edge of industrial development	Well	Links Melton, Tullamarine and Mickleham. However, mixes regional and local traffic near Donnybrook Road interchange (centre of industrial area) and may not perform well	Satisfactory	Links Melton, Tullamarine and Mickleham	Very well	Links Melton, Tullamarine and Mickleham	Well	Links Melton, Tullamarine and Mickleham (via Mt Ridley). Leads to additional traffic on Hume Freeway south of Kalkallo	Well
Assisting Metropolitan growth by providing a network of arterial links in the medium to longer term	Provides a network of arterial links		Provides a network of arterial links		Provides a network of arterial links		Provides a network of arterial links		Provides a network of arterial links	Well
Objective 4: The Project is capable of performing its function										
Provides outer ring road function	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Provides high speed rail for freight and passengers and/or metropolitan rail function	Would need to be confirmed in concept design	Satisfactory	Would need to be confirmed in concept design	Satisfactory	Likely to link to exisiting rail satisfactorily	Well	Likely to link to exisitng rail satisfactorily	Well	Mt Ridley would be an issue	Poorly
Objective 5: The project is technically feasible										
To ensure road design standards are met	Difficult to provide freeway to freeway interchange. Size of development potentially requires three interchanges to the Hume Freeway which impacts on the freeway to freeway interchange	Poorly	Requires high standard access roads on each side of the freeway. Issues associated with providing interchanges to freeway and adjoining access roads. Size of development requires three interchanges to the Hume Freeway and providing interchanges is difficult	Poorly	Limited impact on MAB, no impact on MAB and Shell. Allows provision of the three interchanges required to service the development	Well	Limited impact on MAB, no impact on MAB and Shell. Allows provision of the three interchanges required to service the development	Well	Extremely difficult terrain to construct a freeway to freeway interchange. Impacts on the Hume Highway, Hume Freeway interchange. Too close to Amaroo Road interchange. Would impact on the proposed southern interchange to the development	Very poorly
To have minimal impact on existing/ proposed road infrastructure	Potential impact on Donnybrook Road interchange	Poorly	Potential impact on Donnybrook Road interchange	Poorly	Potential impact on Donnybrook Road interchange	Poorly	Potential impact on Donnybrook Road interchange	Poorly	Potential impact on interchanges	Very poorly

Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment	Conflicts with Environment Signifcance Overlay	Very poorly		Satisfactory	Conflicts with Environment Signifcance Overlay	Very poorly		Satisfactory		Satisfactory
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Arterial connection would impact on Nationally Significant vegetation. (DSE rate as unacceptable). Options to construct road in transmission easement and underground the high voltage power lines would involve minimal direct impact on vegetation although may sever the conservation area	Very poorly	Limited flora and fauna impacts	Satisfactory	Arterial connection would impact on Nationally Significant vegetation. (DSE rate as unacceptable). Options to construct road in transmission easement and underground the high voltage power lines would involve minimal direct impact on vegetation although may sever the conservation area	Very poorly	Limited known flora and fauna impact	Satisfactory	Would impact on area of significant flora	Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Would impact 3 Heritage Overlay sites	Satisfactory	Would impact 8 Heritage Inventory sites and 9 Heritage overlay sites all local significance	Poorly	Would impact 3 Heritage Inventory sites and 2 Heritage Overlay sites	Satisfactory	Would impact 4 Heritage Inventory sites and 2 Heritage Overlay sites	Satisfactory	Would impact 3 Heritage Inventory sites and 5 Heritage Overlay sites	Satisfactory
Impact on Aboriginal cultural heritage sites	No sites recorded	Well	Would impact on earth feature and 4 artefact scatters	Poorly	Would impact 2 artefact scatters	Satisfactory	Would impact 3 artefact scatters	Satisfactory	No recorded sites	Well
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and indistrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Significant impact on Folkestone and Shell land. Likely impacts on Shell Service Centre	Poorly	Removes the Shell Service Centre. Large impact on MAB, Folkestone and Shell with adverse impact on proposed layouts	Very poorly	Impacts on the Caltex Service Centre. Likely impacts on Shell Service Centre	Satisfactory	Impacts on the Caltex Service Centre. Likely impacts on Shell Service Centre	Satisfactory	Minimal impact on employment centres	Well
Industrial development, other uses, utilities, service centres	Supports industrial development, transmission line could be accomodated	Poorly	Adverse impact on Mickleham industrial development	Poorly	Supports industrial development, transmission line could be accomodated	Satisfactory	Supports industrial development	Satisfactory	Proposed industrial development further to north	Poorly
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Adjoins residential living area. Enables industrial traffic to bypass residential area	Satisfactory	Separates residential and commercial traffic. Avoids residential areas	Very well	Subject to provision of suitable arterial, commercial traffic would avoid residential areas. Arterial would adjoin residential living area	Well	Traffic from industrial area would traverse residential areas	Poorly	Traverses a newly built up area of high quality housing with major impacts. Would cause commercial traffic to traverse residential living areas	Very poorly
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Would impact on Mt Ridley Woodlands and Grasslands	Very poorly	No significant values	Satisfactory	Would impact on Mt Ridley Woodlands and Grasslands	Very poorly	No significant values	Satisfactory	Would have a major impact on Mt Ridley – a high landscape feature and conservation reserve	Very poorly
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Avoids most residences in Kalkallo and Mt Ridley	Well	Avoids most residences in Kalkallo and Mt Ridley	Well	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**Environmental and engineering impacts outweigh other advantages**	**Poorly**	**Impacts on employment, proposed development, heritage and engineering outweigh other advantages**	**Poorly**	**Would perform well / satisfactory on most objectives if environmental issues can be overcome**	**Satisfactory**	**Would perform well / satisfactory on most objectives**	**Satisfactory**	**Rated very poorly due to difficulty of construction and major impacts on Mt Ridley**	**Very poorly**

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

DSE: Department of Sustainability and Environment

FIGURE B1-2: HUME CORRIDOR OPTIONS



B1.3 PRELIMINARY OPTIONS

B1.3.1 INTRODUCTION

This section describes and evaluates the early options in Corridors 1, 2 and 3 including an evaluation of options through and to the east of Melton known as M1-M5. Corridors 1,2 and 3 are shown on Figure B1-3 Preliminary Corridor Options and Corridors M1-M5 in Figure B1-4 Melton Corridor Options.

This discussion considers these options in three separate sections, Southern, Central and Northern, as there is the potential to 'mix and match' some options between the different sections. The Southern Section would comprise the portion of the OMR between the Princes Freeway and the Werribee River, the Central Section, the portion of the OMR between the Werribee River and the Calder Freeway and the Northern Section, the portion of the OMR between the Calder Freeway and the vicinity of the Melbourne Sydney Railway.

B1.3.2 SOUTHERN SECTION OPTIONS (OPTIONS 1,1A, 2,3)

B1.3.2.1 DESCRIPTION OF OPTIONS

The southern part of Option 1 would start at the Princes Freeway West opposite Avalon airport interchange. It would essentially follow Farrars Road, east of the You Yangs up to Gilkins Road, then swing to the north east through the southern section of the Western Plains Grasslands to cross Lollipop Creek and the Werribee River at Cobbledicks Ford.

Option 1a would continue north from Gilkins Road, to cross Ballan Road then swinging round to cross the Werribee River and Toolern Creek, just above their confluence.

Option 2 would start west of the Point Wilson interchange with the Princes Freeway West crossing Little River south of Gleesons Road, keeping to the east of the main town ship, crossing the Geelong-Melbourne Railway line where the OMR railway line would link in, and progressing north parallel approx 200 east with Edgars Road. This option would then cross Lollipop Creek and Ballan Road to join up with Option 1 in the vicinity of a tributary to the Werribee River west of Cobbledicks Ford.

Option 3 would start at the Little River interchange with the Princes Freeway West, crossing the Geelong-Melbourne Railway line where the OMR rail line would link in, and would run north across Lollipop Creek and Ballan Road , skirting the edge of the area covered by a heritage overlay at Cobbledicks Ford.

B1.3.2.2 EVALUATION OF OPTIONS

The initial assessment was made in the central section on Options M1-M5 to enable the development or otherwise of the Toolern Precinct Structure Plan to proceed. This analysis is covered in Table B1-4 Melton Corridor Options Analysis. This influenced the subsequent analysis of the preliminary options in the southern section.

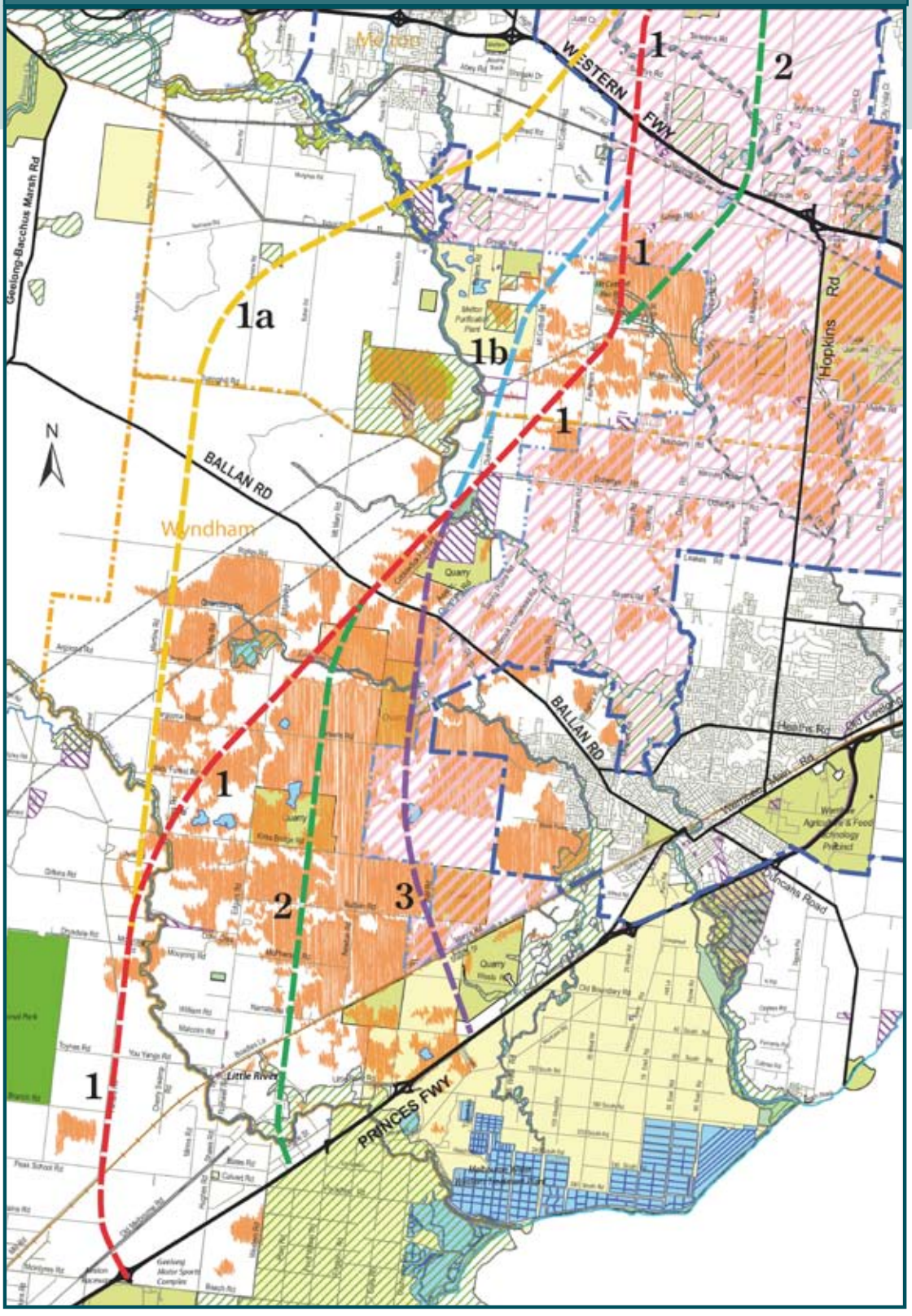
Analysis of the southern section of the Preliminary Corridor Options is shown in Table B1-3 Preliminary Corridor Options Analysis, Southern and Northern Sections.

Option M1 was rejected (refer discussion on Central Section). Hence, the remainder of Option 1a in the southern section became redundant, and was rejected.

Options 1, 2 and 3 would all have significant impacts on the Western Plains Grasslands in the southern sections. Option 2 was not supported as is would split the southern section of the grasslands and a quarry and would pass through a significant area of the northern section of the grasslands. Option 1 in this location was not continued as it would still pass through significant areas of grassland and split a potential intermodal freight terminal site at Lara.

Option 3 in this location was taken forward and further variations developed to try to find a potential route though the grasslands and two working quarries. A further attempt to skirt the grasslands to the west was also made. Option 3 could link to any of Options 1, 1b or 2 in the central section.

FIGURE B1-3: PRELIMINARY CORRIDOR OPTIONS SOUTHERN SECTION



Legend

- Urban Growth Boundary
- Public Acquisition - Roads
- Heritage Overlay
- GAA Investigation Area
- Environmental Significance Overlay
- Vegetation Protection Overlay
- Commonwealth Land
- Municipal Boundary
- Public Conservation & Resource
- Public Park & Recreation
- Rural Conservation
- Special Use
- Public Use
- Highest Native Vegetation Importance (DSE)

Note: Planning Scheme Overlays Data June 08. Simplified overlay descriptions for clarity purposes.

0 1.5 3 6 12
Scale of Kilometers

Table B1-3 Preliminary Corridor Options Anaysis

Objective Sub objective	**Option 1 + 1c** Northern Section Assessment		**Option 1+1d** Northern Section Assessment		**Option 1** Southern Section Assessment		**Option 2** Southern Section Assessment		**Option 3** Southern Section Assessment	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	From Calder Fwy, crosses Jackson & Deep Creeks west of Bulla, Mickleham Rd south of Mt Ridley Rd, joins Hume Fwy north of Gunns Gully Rd		From Calder Fwy, crosses Jackson & Deep Creeks west of Bulla, Mickleham Rd south of Mt Ridley Rd, parallel and east of Old Sydney Rd crosses Northern Hwy and links to Hume Fwy near Wallan		From Princes Fwy at Avalon, follows Farrars Rd, crosses Little River and Lollypop Creek to Cobbledicks Ford on Werribee River		From Princes Fwy east of Little River town, east of and generally parallel to Edgars Rd, crosses Lollypop Creek to Cobbledicks Ford on Werribee River		From Princes Fwy west of quarries (Wests Rd, Balls Rd), crosses Lollypop Creek and Ballan Rd to Cobbledicks Ford on Werribee River	
Objective 1: Serves key international transport hubs eg Melbourne and Avalon Airports, Port of Geelong, other intermodal freight hubs and freight and service economy areas										
Serves key international transport hubs eg Melbourne and Avalon Airports, Port of Geelong, other intermodal freight hubs and freight and service economy areas	Would provide good link between airports	Satisfactory	Link between airports good, poor for northern freight hub	Very poorly	Would provide good link between airports, would not link Werribee area. Would impact potential intermodal site at Lara.	Poorly	Link between airports good with Princes Fwy, would not link Werribee area	Satisfactory	Link between airports good with Princes Fwy, good link Werribee area	Well
Objective 2: Serves key interstate and major regional destinations										
Serves key interstate and major regional destinations	Would meet this objective	Satisfactory	Would not meet this objective, poor connection to Hume Fwy	Very poorly	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham										
Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham	Would not link Werribee residential area with Melton and north	Poorly	Would not link Werribee residential area with Melton and not optimal for northern industrial area	Very poorly	Would not link Werribee residential area with Melton and north	Poorly	Would not link Werribee residential area with Melton and north	Poorly	Would provide good link to all areas	Well
Objective 4: The Project is capable of performing its function										
Provides Outer Ring Road function	Yes	Satisfactory	No -extends ring route journey. Traffic is likely to choose Donnybrook Rd as alternative east-west link.	Very poorly	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Provides High Speed Rail freight and interregional passenger function	Yes	Satisfactory	Could not link to Melbourne - Sydney Railway line from the north	Poorly	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Objective 5: The project is technically feasible										
To ensure road design standards are met	Rail design standards adopted for road corridor.	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange not feasible with Hume Freeway	Very poorly	Rail design standards adopted for road corridor.	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory
To ensure rail design standards are met	Option designed for high speed (160 km/ hr) interstate/ inter regional passenger rail with 2500m curves and 1% grade.	Well	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves and/ or metropolitan passenger rail service.	Very poorly	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves and/or metropolitan passenger rail service.	Poorly	Preliminary design allows for high speed (160km/ hr) freight line with 1500 m curves and/or metropolitan passenger rail service.	Poorly	Option designed for high speed (160 km/hr) interstate/ inter regional passenger rail with 2500m curves and 1% grade.	Well

Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment - assessment based on modelling prior to field surveys	Potential impacts on Mt Ridley Plains Grassy Woodland	Poorly	Potential impacts on Mt Ridley Plains Grassy Woodland	Poorly	Would minimise impact on Western Plains Grasslands southern section	Satisfactory	Major impact on Western Plains Grasslands in southern section	Very poorly	Would minimise impact on Western Plains Grasslands southern section	Satisfactory
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Limited impact on locally and regionally significant vegetation sites	Satisfactory	Minimal impact on locally and regionally significant vegetation sites	Satisfactory	Native grasslands would be impacted. Potential to impact 17 EPBC listed fauna species	Very Poorly	Potential impact on 2 EPBC listed flora species and 2 FFG listed flora species. Potential impact on 21 EPBC listed fauna species. Impact on significant sections of native grasslands. Impact on ESO	Very poorly	Potential impact on 1 EPBC listed flora species. Potential impact on 8 EPBC listed fauna species and 2 FFG listed species. Impact on significant areas of native grassland	Very poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Could potentially impact 8 Heritage Overlays, one on Heritage Inventory (school at Mt Ridley Rd)	Poorly	Could potentiallyimpact 8 Heritage Overlays, two sites on Heritage Inventory	Poorly	Could potentially impact 2 Heritage Overlay sites	Satisfactory	Could potentially impact 2 Heritage Overlay sites	Satisfactory	Could potentially impact 2 Heritage Overlay sites	Satisfactory
Impact on Aboriginal cultural heritage sites	Could potentially impact 2 aboriginal sites	Satisfactory	Could potentially impact 3 aboriginal sites	Satisfactory	Could potentially impact 1 aboriginal site	Satisfactory	Could potentially impact 1 aboriginal site	Satisfactory	Could potentially impact 4 aboriginal sites	Satisfactory
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and indistrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would impact agricultural enterprises	Satisfactory	Would impact agricultural enterprises	Satisfactory	Would impact agricultural enterprises	Satisfactory	Would impact agricultural enterprises and 1 existing quarry	Poorly	Would impact agricultural enterprises and 2 existing quarries	Very poorly
Industrial development, other uses, utilities, service centres	Closer to industrial development within existing UGB. Could realign to avoid Melbourne Water retarding basin.	Well	More distant to industrial development within existing UGB but workable. Difficult to avoid Western Water reclamation land.	Satisfactory	Would not support metropolitan industrial/ residential development as well as other options as closer to Geelong	Poorly	Supports industrial development within UGB marginally better than Option 1	Poorly	Would support industrial development within UGB better as closer to Werribee	Well
Future land use *in Melbourne @ 5 million* potential developments	Likely to support future residential development in north with realignment	Well	Unlikely to support future residential development in north	Poorly	Would not support future metropolitan industrial/ residential development as well as other options as closer to Geelong.	Poorly	Would support future industrial/residential development marginally better than Option 1	Poorly	Would support future industrial/residential development better as closer to Werribee	Well
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Would avoid current residential development	Well	Would avoid current residential development	Well	Commercial traffic will avoid residential areas.	Well	Commercial traffic will avoid residential areas.	Well	Commercial traffic will avoid residential areas.	Well
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	No major issues known	Satisfactory	May impact on Mt Frazer	Poorly	No major issues known	Satisfactory	No major issues known	Satisfactory	No major issues known	Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**Could provide a good route with some realignment**	**Well**	**Option not technically feasible**	**Very poorly**	**Rated very poorly due to impacts on grasslands, quarry, and potential intermodal freight centre**	**Very poorly**	**Environmental impacts outweigh anyother benefits**	**Poorly**	**Could provide good route if environmnetal issues can be overcome**	**Well**

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

UGB: Urban Growth Boundary
EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)
FFG: Flora and Fauna Guarantee Act 1988 (Victorian Government)
ESO: Environmental Significance Overlay

B1.3.3 CENTRAL SECTION OPTIONS (OPTIONS 1,1A,1B, 2, M1-M5)

B1.3.3.1 DESCRIPTION OF OPTIONS

These options are shown in Figure B1-4 Melton Corriodr Options Central Section.

Option 1/Option M4 would pass through the northern section of the Western Plans Grasslands crossing a tributary to Dry Creek, skirt the east side of Mt Cottrell cross the Ballarat – Melbourne Railway line, then linking to the Western Freeway with a freeway to freeway interchange between Leakes Road and Paynes Road, Rockbank.

Option M4 is basically Option 1 in the Melton area deviated to the east to provide a better grade around Mt Cottrell for the OMR railway line. It would be outside the Melton UGB and have only a minor impact at the Western Highway boundary. Preliminary design indicated that it is likely that a freeway to freeway interchange could be provided with the Western Freeway with only minor impact on the existing Leakes Road interchange currently being constructed.

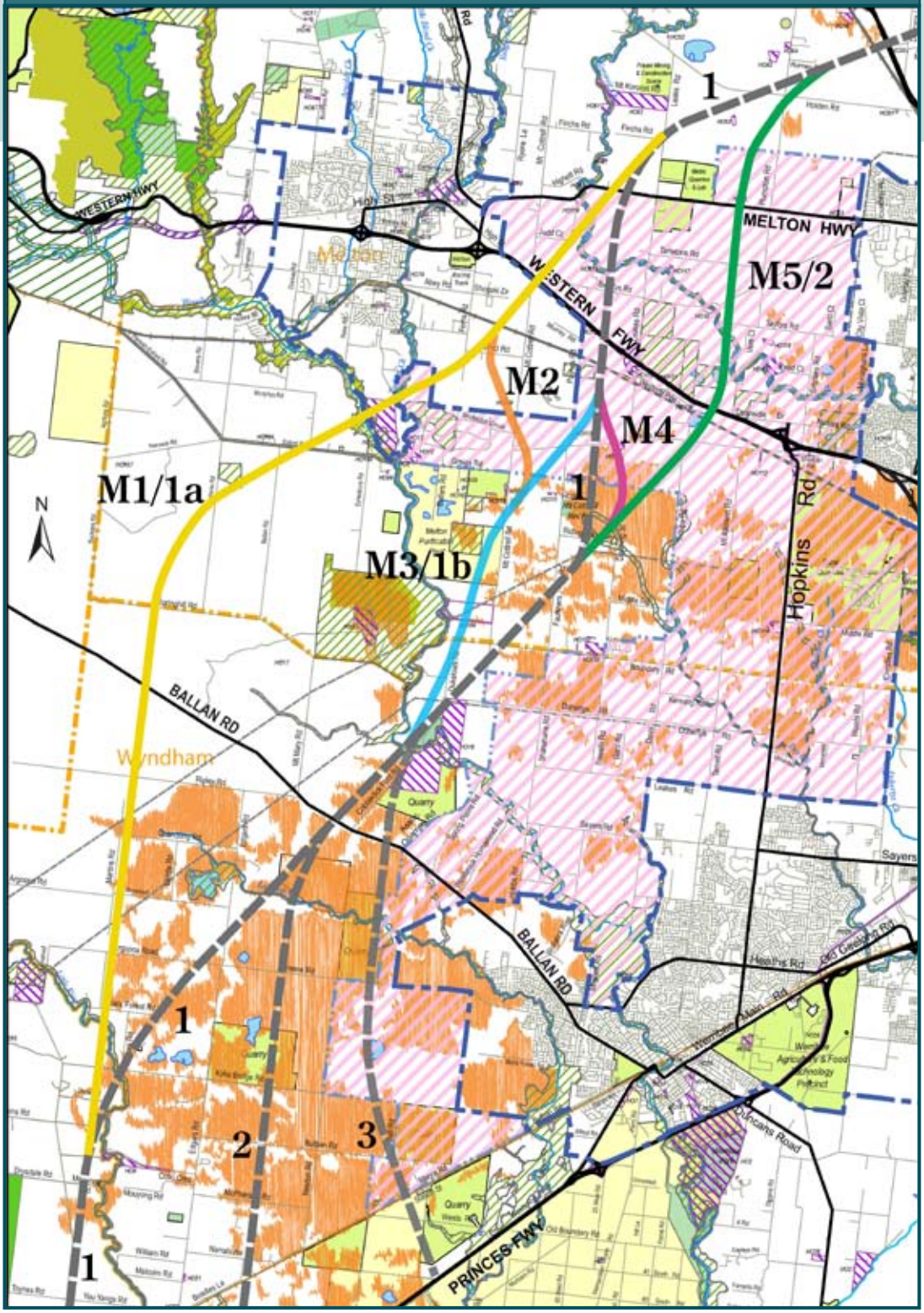
North of the Western Freeway Option 1 would cross Kororoit Creek to the north of Beattys Road and the Melton Highway (Keilor –Melton Road), then swing round, crossing the Bendigo-Melbourne Railway line, to a freeway to freeway interchange with the Calder Freeway between the Bulla –Diggers Rest interchange and the Calder Park Raceway.

Option 1a/Option M1 is the most western option considered. It would continue on from Option 1a north to cross Ballan Road then swing round to cross the Werribee River and Toolern Creek, just above their confluence. It would pass through the middle of the Toolern Precinct to cross the Ballarat – Melbourne Railway line, then link to the Western Freeway with a freeway to freeway interchange in the vicinity of Mt Cottrell Road, to join up with Option 1 just north of the Melton Highway. It would cross over large areas of low – moderate biodiversity value in the northern section of the Western Plains Grasslands and would provide a link to Avalon in the event that the environmental conditions east of Toolern were insurmountable.

The intent of both 1 and 1a/M1 was to skirt as far as possible the Western Plains Grasslands and provide a more direct link to Geelong and Avalon airport.

Option M2 would be a short link between Option M1 and Option M3 between Alfred Road in the proposed Toolern Precinct avoiding as far as possible Melton south, crossing Greigs Road to hook back into Option M3. It would also cross over large areas of low – moderate biodiversity in the northern section of the Western Plains Grasslands, provide a link to Avalon in the event that the environmental conditions east of Toolern were insurmountable and would allow for a metropolitan passenger rail facility with a station in the proposed Activity Centre.

FIGURE B1-4: MELTON CORRIDOR OPTIONS CENTRAL SECTION



Legend

- Urban Growth Boundary
- Public Acquisition - Roads
- Heritage Overlay
- GAA Investigation Area
- Environmental Significance Overlay
- Vegetation Protection Overlay
- Commonwealth Land
- Municipal Boundary
- Public Conservation & Resource
- Public Park & Recreation
- Rural Conservation
- Special Use
- Public Use
- Highest Native Vegetation Importance (DSE)

Note: Planning Scheme Overlays Data June 08. Simplified overlay descriptions for clarity purposes.

0 1.5 3 6 12
Scale of Kilometers

Option 1b/Option M3 would provide an option to the west of Mt Cottrell and provide a link to an option outside the existing Melton Urban Growth Boundary. It may be able to be developed to avoid areas of state/ nationally significant vegetation sites and would provide an option that could link up to any potential option developed in Wyndham from Avalon to just west of Werribee.

Option 2/Option M5 would briefly follow the line of Option 1b before continuing to cross the Ballarat- Melbourne Railway line, linking to the Western Freeway with a freeway to freeway interchange east of Rockbank. It would then cross the Kororoit Creek, continue west of and parallel to Plumpton Road to link into Option 1 north of Holden Road and south of Romeo Court. Option 2 would pass through the northern section of the Western Plains Grasslands.

B1.3.3.2 EVALUATION OF OPTIONS

This assessment is shown in Table B1-4 Melton Corridor Options Analysis.

Option 1a/Option M1 would perform well against environmental considerations as it would largely avoid the grasslands but its very poor performance in relation to the development of the Melton growth area at Toolern, potential industrial development sites and impacts on future residential development were considered to outweigh any advantages.

Option M2 was not supported for similar reasons.

In both cases it was considered that previous Government decisions regarding the Melton Urban Growth Boundary (UGB) were binding and that alternative corridors needed to be found outside the existing UGB.

Option M3/1b was not supported as it would impact the Melton purification plant and is not as good as Option M4 for the railway line.

The small section of Option 1 that would impact on Mt. Cottrell was rejected in favour of the Option M4 deviation, which would be better for rail grades. Option 1/Option M4 was considered worthy of further investigation notwithstanding its poor performance against environmental objectives as it would provide a route close to Melton that would enhance access to employment to the south and north, would preserve the existing arterial network to assist in the future development of Toolern.

Option2/M5 would provide better access to the north from Caroline Springs and would provide a potential route through perceived areas of potentially lesser environmental significance (local and regional significance site).

Options 1a/M1, M2 and 1b/M3 were discarded. Option 1/M4 was developed into Option 1e and Option 2/M5 was continued and developed into Option 3a.

B1.3.4 NORTHERN SECTION

B1.3.4.1 DESCRIPTION OF OPTIONS

These options are shown in Figure B1-5 Preliminary Corridor Options Northern Section.

Option 1 would then proceed across Jacksons and Deep Creeks north to cross Oaklands Road immediately south of Craigieburn Road, pass to the north-west of Crowe Hill to cross Mickleham Road, just south of the Mickleham School at Mt Ridley Road.

Option 1 would then split in to Option 1c through Melbourne Water's retarding basin, across Gunns Gully Road to join the Hume Freeway at a freeway to freeway interchange on the bend near Donovans Lane and Option 1d a more northerly option that would join the Hume Freeway north of the Northern Highway/Hume Freeway interchange.

Option 1c would pass through several smaller areas of grasslands/woodlands as well as plains grassy woodlands in the north, the Mickleham Road Avenue of Honour, various heritage sites and environmental significance overlays associated with the creeks. Option 1d would pass through Western Water Irrigation land north of Camerons Lane.

B1.3.4.2 EVALUATION OF OPTIONS

Option 1d was not considered technically feasible owing to the difficulties in relation to linking to the Hume Freeway without impeding the functioning of Northern Highway/ Hume Freeway and the Wallan-Whittlesea Road / Hume Freeway interchanges. In addition it would not meet the objective of forming a feasible ring road as it would add a further 14km to the trip between interchanges at Donnybrook Road. Donnybrook Road, a six lane arterial in the long term, would most likely become the de facto OMR and would be expected very rapidly to become congested given all the conflicts of adjacent industrial activity.

Option 1c was retained for further study. This assessment is shown in Table B1-4 Preliminary Corridor Options Analysis, Southern and Northern Sections.

TableB1- 4 Melton Corridor Options Anaysis (Central Section Options 1& 2 Werribee River to Calder Freeway)

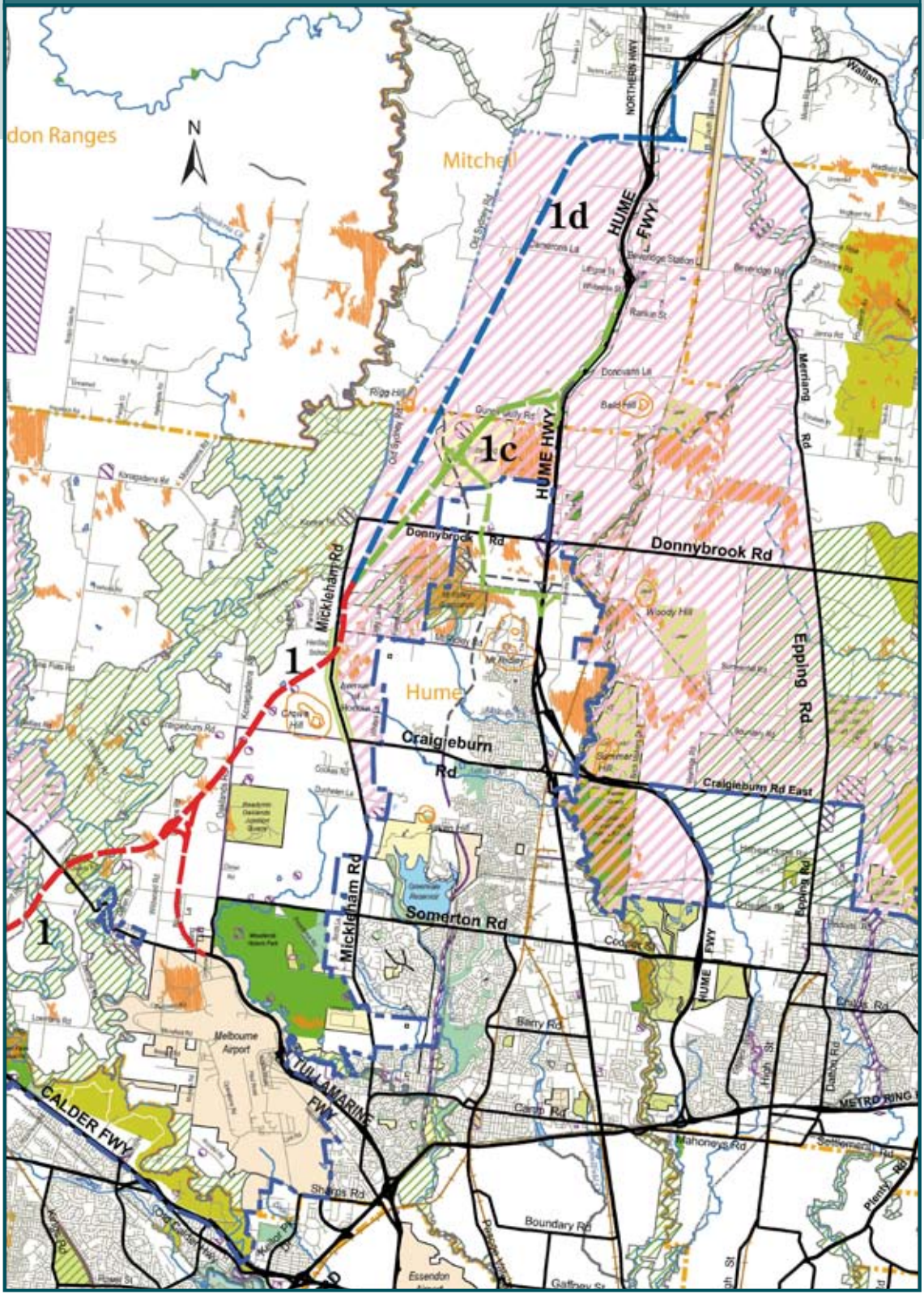
Objective Sub objective	**Option M1** **(Option 1a)**		**Option M2**		**Option 1 + M3** **(Option 1b)**		**Option 1 + M4**		**Option 1+ M5**	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	Is Option 1a in central section. Most westerly from Option 1, crossing Werribee River/ Toolern Creek, through Toolern Precinct, crossing Western Fwy near Mt Cottrell Rd , rejoins Option 1 north of Melton Hwy		Links M1 from Alfred Rd through Toolern Precinct via Greigs Rd to M3		Is Option 1b in central section. From Option 1 at Cobbledicks Ford crosses Mt Cottrell Rd at purification plant and rejoins Option 1 at Greigs Rd		Option 1 in central section. From Option 1 at Cobbledicks Ford with M4 deviation to east of Mt Cottrell along contour, crossing Western Fwy west of Leakes Rd, deviating north of Melton Hwy to cross Calder Fwy south of Diggers Rest interchange		Option 2 in central section. Leaves Option 1 near Dry Creek crosses Western Fwy east of Rockbank, parallel to Plumpton Rd, rejoins Option 1 south of Calder Fwy	
Objective 1: Serves key international transport hubs eg Melbourne and Avalon Airports, Port of Geelong, other intermodal freight hubs and freight and service economy areas										
Serves key international transport hubs eg Melbourne and Avalon Airports, Port of Geelong, other intermodal freight hubs and freight and service economy areas	Specific freight and transport hub linkages outside Toolern study area.	Satisfactory	Specific freight and transport hub linkages outside Toolern study area.	Satisfactory	Specific freight and transport hub linkages outside Toolern study area.	Satisfactory	Specific freight and transport hub linkages outside Toolern study area.	Satisfactory	Specific freight and transport hub linkages outside Toolern study area.	Satisfactory
Objective 2: Serves key interstate and major regional destinations										
Serves key interstate and major regional destinations	Links regional highways and railways, but directs regional traffic through Toolern Growth Area residential zone.	Poorly	Links regional highways and railways, but directs regional traffic through Toolern Growth Area activity centre.	Very poorly	Links regional highways and railways	Satisfactory	Links regional highways and railways	Satisfactory	Links regional highways and railways	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham										
Provides better links to residential and employment growth areas to the north and west of Melbourne eg Werribee, Melton and Mickleham	Freeway and high speed rail corridor would divide development and severly degrade residential component of Toolern Growth Area. Location would link Melton/Toolern with proposed and potential industrial areas in Hume.	Very poorly	Freeway and high speed rail corridor would divide development and severly degrade residential component of Toolern Growth Area. Location would link Melton/Toolern with proposed and potential industrial areas in Hume.	Very poorly	Location would link Melton/ Toolern with proposed and potential industrial areas in Hume. Opportunity to provide rail linkages outside Toolern Growth Area	Satisfactory	Location would link Melton/ Toolern with proposed and potential industrial areas in Hume. Opportunity to provide rail linkages outside Toolern Growth Area	Satisfactory	Location would link Melton/ Toolern with proposed and potential industrial areas in Hume. Opportunity to provide rail linkages outside Toolern Growth Area	Satisfactory
Objective 4: The Project is capable of performing its function										
Provides Outer Ring Road function	Yes but would not be as effective as options to the east of Melton	Satisfactory	Yes but not optimal through Melton	Satisfactory	Reasonably good western route	Well	Deviation of route to accomodate rail requirements an acceptable trade off	Well	Reasonably good eastern route	Well
Provides High Speed Rail freight and interregional passenger function	Could link to Melbourne Ballarat regional rail at station in activity centre. Could be adapted to provide for high speed interstate rail. However best use would be metropolitan rail only.	Poorly	Specifically located through activity centre for metropolitan passenger rail. Could link to Melbourne Ballarat regional rail at station in activity centre. Would not be viable for freight and interregional passengers as well	Very poorly	Could provide for rail requirements apart from grade.	Poorly	Could accommodate freight and interregional passengers. Rail lines could be situated on east side of freeway allowing possible station location at Rockbank if metropolitan rail to be considered.	Well	Could provide for rail requirements if grade issues resolved	Satisfactory
Objective 5: The project is technically feasible										
To ensure road design standards are met	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory	Rail design standards adopted for road corridor. Freeway to freeway interchange feasible with Western Highway	Satisfactory
To ensure rail design standards are met	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves and/or metropolitan passenger rail service.	Poorly	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves, however back to back curves make option not viable	Very poorly	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves and/ or metropolitan passenger rail service. Potential issues with grade on west side of Mt Cottrell	Poorly	Option designed for high speed (130) interstate/ inter regional passenger rail with 2500m curves and 1% grade.	Well	Preliminary design allows for high speed (160km/hr) freight line with 1500 m curves and/ or metropolitan passenger rail service. Potential issues with grade north of Western Freeway	Poorly
To have minimal impact on existing/ proposed road infrastructure		Satisfactory		Satisfactory	Potential impact on Leakes Road interchange	Satisfactory		Satisfactory		Satisfactory

Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment - assessment based on modelling prior to field surveys	Avoids most high value biodiversity area through to Werribee River and potentially to Ballan Road	Well	Minimal environmental issues through link	Well	Avoids most high value biodiversity area through to Werribee River	Satisfactory	Would impact on high value biodiversity area	Very poorly	Avoids most high value biodiversity area through to Werribee river	Satisfactory
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Limited impact on locally and regionally significant vegetation sites	Satisfactory	Minimal impact on locally and regionally significant vegetation sites	Satisfactory	Minimal impact on locally and regionally significant vegetation sites	Satisfactory	Would impact on small area of State /nationally significant vegetation site for EPBC listed Plains Rice Flower (may be translocatable)	Very poorly	Some impact on locally and regionally significant vegetation sites and ephemeral lakes	Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Could potentially impact 6 Heritage Overlay sites and 1 Heritage Inventory site	Poorly	No known sites on this link	Well	Could potentially impact 2 Heritage Overlay sites and 2 Heritage Inventory site	Satisfactory	Could potentially impact 1 Heritage Overlay sites and 2 Heritage Inventory site	Satisfactory	Could potentially impact 2 Heritage Overlay sites and 3 Heritage Inventory sites	Satisfactory
Impact on Aboriginal cultural heritage sites	Could potentially impact 1 aboriginal heritage site	Satisfactory	No known sites on this link	Well	Could potentially impact 2 aboriginal heritage sites	Satisfactory	Could potentially impact 2 aboriginal heritage sites	Satisfactory	Could potentially impact 5 aboriginal heritage sites	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and indistrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would impact agricultural enterprises	Poorly	Would impact fewer agricultural enterprises	Satisfactory	Would impact agricultural enterprises	Poorly	Would impact agricultural enterprises	Poorly	Would impact agricultural enterprises	Poorly
Industrial development, other uses, utilities, service centres	Adverse impact on Melton industrial development, minimal impact transmission lines	Very poorly	Adverse impact on Melton industrial development, minimal impact transmission lines on adjoining M1 and M3	Very poorly	Supports industrial development. Would impact Melton Water Purification Plant, minimal impact transmission lines	Very poorly	Supports industrial development,minimal impact transmission lines	Satisfactory	Adverse impact on adjacent residential areas and on landscape, minimal impact transmission lines	Poorly
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Commercial traffic would cut through proposed residential areas in Toolern.	Very poorly	Commercial traffic would cut through proposed residential areas in Toolern.	Very poorly	Commercial traffic will avoid residential areas in Toolern.	Satisfactory	Commercial traffic will avoid residential areas in Toolern.	Satisfactory	Commercial traffic will avoid residential areas in Toolern.	Satisfactory
Future land use in *Melbourne @ 5 million* potential developments	Would not serve future development in investigation areas	Very poorly	Would not serve future development in investigation areas	Very poorly	Would not serve future development in investigation areas	Very poorly	Would not serve future development in investigation areas	Very poorly	Would divide investigation area - now considered acceptable	Satisfactory
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Would cut across proposed linear park reserve along Werribee River and cross Melton reservoir	Very poorly		Satisfactory	Would have a major impact on Mt Cottrell – a high landscape feature	Very poorly		Satisfactory	Would have a major impact on Mt Cottrell – a high landscape feature	Very poorly
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation) but not desirable	Very poorly	Acceptable (with suitable mitigation) but not desirable	Very poorly	Acceptable (with suitable mitigation)	Satisfactory	Away form residential areas	Well	Away form residential areas	Well
OVERALL OPTION ASSESSMENT	**Undesirable impacts on Melton Growth area outweigh any advantages**	**Very poorly**	**Undesirable impacts on Melton Growth area outweigh any advantages**	**Very poorly**	**Not as good as Option M4 for rail and impacts major utility**	**Poorly**	**Could provide good route if environmental issues can be overcome**	**Satisfactory**	**Could provide good route if environmental and social issues can be overcome**	**Satisfactory**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

FIGURE B1-5: PRELIMINARY CORRIDOR OPTIONS NORTHERN SECTION



B1.4 FURTHER VARIATIONS ON PRELIMINARY OPTIONS

B1.4.1 INTRODUCTION

Further variations (Options 1e, 3a, 3b and 3c) were developed to try to find acceptable routes through the northern and southern sections of the Western Plains Grasslands. Potential options within the current Urban Growth Boundary were also examined (Options 4 , 4W, 4E1, 4E2 and 4E3).

B1.4.2 SOUTHERN SECTION OPTIONS (OPTIONS 1E, 3A,3B,3C,4)

B1.4.2.1 DESCRIPTION OF OPTIONS

These Options are shown in Figure B1-6 Further Variations to Preliminary Corridor Options, Southern Section. Some variations incorporated parts of the previous Options 1-3 shown in Figure B1-3 Preliminary Corridor Options.

Option 1e would start in the vicinity of Hughes Road, crossing the Geelong-Melbourne Railway line, where the OMR railway line would link in, swinging round to the intersection of Black Forest Road with Little River Road before swinging back to cross the Werribee River just north of Cobbledicks Ford to avoid the heritage precinct.

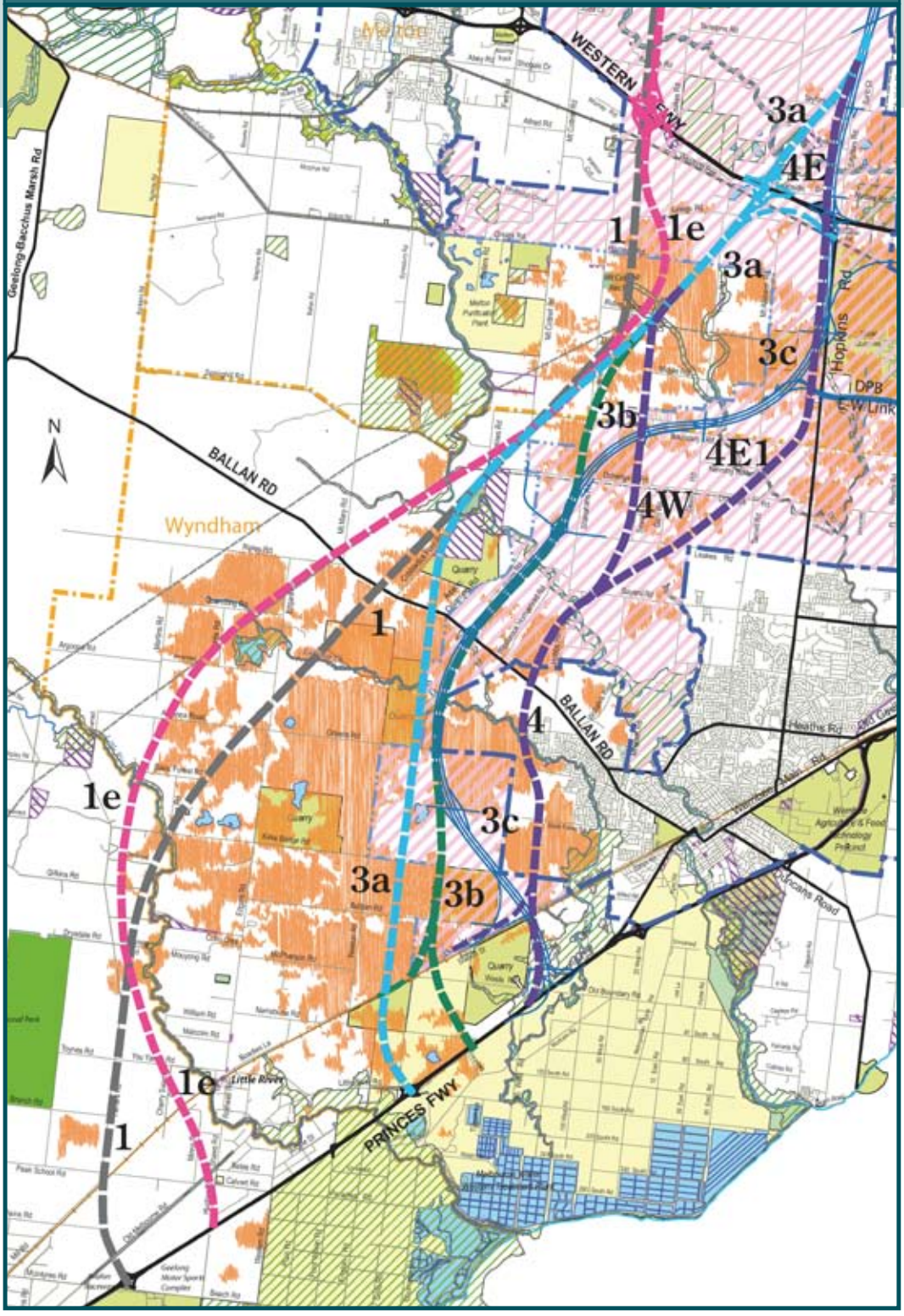
Option 1e would cross some more isolated sections of the Western Plains Grasslands but would leave a large area to the east intact.

Option 3a would start at the Little River interchange with the Princes Freeway West, crossing the Geelong-Melbourne Railway line where the OMR rail line would link in, and would run north across Lollipop Creek linking into the former Option 3 south of Greens Road.

Option 3a would pass through significant areas of the southern section of the western plains grasslands and would cross two quarries and land set aside for public use at the southern end owned by City West Water.

Option 3b was developed as a refinement on the previous Option 3 to take advantage of a gap between the Urban Growth Boundary (UGB) around Werribee and an adjacent quarry to the west. It was moved east at the southern end to accommodate the OMR railway line linking into the middle of the OMR freeway and to minimise impacts on the southern grasslands. North of the UGB gap, the corridor was moved further east to get a good engineering crossing point for the Werribee River.

FIGURE B1-6: FURTHER VARIATIONS TO PRELIMINARY CORRIDOR OPTIONS SOUTHERN SECTION



Legend

- Urban Growth Boundary
- Public Acquisition - Roads
- Heritage Overlay
- GAA Investigation Area
- Environmental Significance Overlay
- Vegetation Protection Overlay
- Commonwealth Land
- Municipal Boundary
- Public Conservation & Resource
- Public Park & Recreation
- Rural Conservation
- Special Use
- Public Use
- Highest Native Vegetation Importance (DSE)

Note: Planning Scheme Overlays Data June 08. Simplified overlay descriptions for clarity purposes.

0 1.5 3 6 12
Scale of Kilometers

Option 3b would pass through land set aside for public use owned by City West Water west of the quarries in the vicinity of Wests and Balls Roads. It would cross significant areas of the grasslands and leave large areas to the east separated from the main southern section of the grasslands.

Option 3c was developed in order to minimise impact on the Western Plains Grasslands by maximising the area to the west of the OMR transport corridor.

Option 3c would start south of the Maltby Bypass / Princes Highway interchange, immediately west of Lollypop Creek. It would then cross Wests Rd, Lollipop Creek and its floodplain before crossing the Geelong – Melbourne Railway line and Bulban Road which runs parallel with the railway at this point. The route would curve to the west, just clipping the north eastern corners of the two quarries in the vicinity of Balls and Wests Roads. It would then follow approximately the same route as Option 3b east of the current Urban Growth Boundary and across the Werribee River.

The OMR railway line would start west of the OMR freeway from the north side of the Geelong – Melbourne Railway line to link into the centre of the OMR transport corridor in the vicinity of Bulban Road and continue north in the centre of the corridor.

Option 4 was briefly considered to see whether it would be advantageous to locate the OMR within the Urban Growth Boundary using a corridor set aside for transport links now taken up by the Regional Rail Link.

Option 4 would start in approximately the same location as Option 3c for the freeway but further east for the railway, would then follow a route north leading to the reservation for the railway line and Andersons Creek Road, swing west through the development area of Manor Lakes, cross the Werribee River near Hobbs Road.

B1.4.2.2 EVALUATION OF OPTIONS

Although Option 1e would perform well in minimising impacts on existing settlements, this was not considered to outweigh the disbenefits of splitting potential future development in the *Melbourne @ 5 million* Investigation Area north of the Western Highway and the still considerable impacts on the Western Plains Grasslands. While this is outside the southern section, this discussion is relevant to Option 1e in the southern section area. The separation of the grasslands from the You Yangs National Park by a transport corridor was not considered desirable. Although intended to minimise impacts on the potential intermodal freight centre at Lara this option would still impact the eastern end of the site and would impact 2 existing service stations on the Princes Highway, making it less attractive. This option was therefore discontinued.

While Option 3a would provide an ideal engineering solution, the impacts on the grasslands, quarries and the heritage sites at Cobbledicks Ford along with the distance from Werribee led to the discarding of this option.

Option 3b was initially rejected in favour of Option 3c as it appeared to have a greater impact on the grasslands and Option 3c would provide the maximum area for consideration for environmental protection. This decision was reassessed once environmental field work was completed and more was known about potential development of the *Melbourne @ 5 million* Investigation Area (refer Southern Options Analysis). At this stage, however, Option 3c was taken forward for further development.

In respect of Option 4, the OMR transport corridor, being a nominal 200 metres wide would not fit within the 80 metre reservation available in the rail corridor through the growth area west of Werribee and would severely impact on development at Manor Lakes. All options would adversely affect any residential development proposed in the northern part of the *Melbourne @ 5 million* Investigation Area west of Werribee. This analysis is shown in Table B1-5 Further Variations to Preliminary Corridor Options Analysis Southern Section.

B1.4.3 CENTRAL SECTION OPTIONS

B1.4.3.1 DESCRIPTION OF OPTIONS (OPTIONS 1E, 3A, 3B, 3C, 4W, 4E1, 4E2 AND 4E3)

These options are shown in Figure B1-7 Further Variations to Preliminary Corridor Options Central Section.

In the central section Option 1e would follow the route of Option M4 (refer Figure B1-4 Melton Corridor Options) and Option 1 (refer Figure B1-3 Preliminary Corridor Options) from Mt Cottrell Road to the Calder Freeway. It would pass through a significant part of the northern section of the grasslands.

Option 3a would be essentially the same as the previous Options 1 and 2 but slightly further east of Rockbank at the freeway to freeway interchange with the Western Freeway where it would divert to join the more easterly Option 3c. This option also considered a rail link from the south to the Ballarat – Melbourne Railway line linking on the north side of the rail line.

It would pass through rural residential settlements at Greigs Road west of Rockbank, and would pass between two heritage sites just north of Kororoit Creek.

Option 3b would make a more easterly crossing of the Werribee River close to the gas pipeline. North of the Werribee River Option 3b would link back to Option 3a in the vicinity of Dowling Street/Riding Boundary Road.

Option 3b would pass through significant areas of the northern section of the grasslands on the western side.

Option 3c was located as far north of Werribee and as close to Caroline Springs as possible to serve the potential future growth areas to be identified in the *Melbourne @ 5 million* study.

North of the Werribee River Option 3c would diverge to the east just south of Dohertys Road. It would then cross Boundary Road east of Sewells Road, through the eastern part of the rural residential area of Chartwell, before swinging northwards across Dry Creek to run approximately 300m west of and parallel to Hopkins Road.

Option 3c would require the reconstruction of the Hopkins Road interchange in the longer term. The proposed freeway to freeway interchange with the Western Freeway would also pass though existing residential and business development centred on the existing Hopkins Road interchange. The route would then cross Kororoit Creek and continue in a fairly direct line, compared with Option 1e, to the Calder Freeway to freeway interchange.

The OMR railway line would continue north through the interchange in the centre of the corridor. In addition, the railway line would diverge from the OMR transport corridor north of Riding Boundary Road, crossing under Hopkins Road to link with the Ballarat – Melbourne Railway line in the vicinity of Christies Road. At this stage it was understood that the railway lines would have to link on the northern side of the Ballarat – Melbourne Railway line.

Option 3c would pass through parts of the northern section of the grasslands including north and south of the existing railway line but would leave a larger area intact to the west. The OMR railway link would also cross Boral quarry identified as one of two quarries of regional significance to Melbourne by the Department of Primary Industries (personal communication).

Option 4, after crossing the Werribee River would split into Options 4W and 4E1, 4E2 and 4E3 at Sayers Road. Option 4W would continue north, just west of Sewells and Downing Roads, to link into Option 3a in the vicinity of Riding Boundary Rd.

Option 4E1 would swing eastwards crossing Leakes, Dohertys and Boundary Roads, then north parallel to Hopkins Rd on the west side to link into Option 3c.

Option 4E2 would swing further east and bisect the Boral Quarry.

Option 4E3 would utilise Christies Road to the east.

Options 4 and 4W would cross significant areas of Western Plains Grasslands within the Urban Growth Boundary (UGB), *Melbourne @ 5 million*, Investigation Area north of Werribee and outside both.

Table B1-5 Further Variations to Preliminary Corridor Options Analysis Southern Section (Assessment Princes Freeway West to Werribee River)

Objective Sub objective	**Option 1e** New route south of Western Fwy		**Option 3a** Option 3 extended south from Greens Rd and north from Boundary Rd, east of Rockbank		**Option 3b** East of Option 3a from Princes Fwy to north of Boundary Rd		**Option 3c** Close to Werribee, next to Hopkins Rd to Calder Fwy east of 3a/3b, north of 1e over Creeks, west of 1e at Mickleham Rd		**Option 4** In rail corridor within UGB through Manor Lakes	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	From Princes Fwy near Hughes Rd crosses Option 1 near Armstongs Rd and Little River near Black Forest Rd then swings round to just north of Cobbledicks Ford		From Princes Fwy/Little River intersection runs north to Cobbledicks Ford		From Princes Fwy runs north and west of quarries (Wests Rd and Balls Rd), between UGB and third quarry, east of fouth quarry to cross Werribee River closer to Werribee		From Princes Fwy in Lollypop Creek floodplain, runs north and east of quarries (Wests Rd and Balls Rd), between UGB and third quarry, east of fouth quarry to cross Werribee River closer to Werribee		From Princes Fwy in Lollypop Creek Floodplain, runs north in line with, but deviating west just before Armstrongs Rd, crossing proposed extension of Manor Lakes, then Werribee River north east of Hobbs Rd	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas										
Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	1. Good route between airports and to pick up Geelong airport traffic. 2. Better than Option 1 for potential intermodal freght terminal at Lara. 3. Not good for Werribee freight service economy areas	Poorly	1. Slightly shorter route between airports. 2. Closer to Werribee but not as optimal as Option 3c	Satisfactory	Would provide good link between airports, would not link Werribee area. Would impact potential intermodal site at Lara	Satisfactory	1. Slightly longer route between airports and not as good as other options for Geelong airport traffic. 2. Most optimal for Werribee	Well	1. Longer route between airports and not as good as other options for Geelong airport traffic, 2. Within Werribee UGB	Satisfactory
Objective 2: Serves key interstate and major regional destinations										
Serves key interstate and major regional destinations	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg. Werribee, Melton and Mickleham										
Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham	Would not link Werribee future residential and employment areas with Melton and north	Poorly	Not optimal link between Werribee future residential and industrial development area with Melton and north	Satisfactory	Not optimal link between Werribee future residential and industrial development area with Melton and north	Satisfactory	Optimal link between Werribee future residential and industrial development areas to west and north with Melton and north	Well	A good link between Werribee future residential and industrial development areas to to west and north with Melton and Hume	Well
Objective 4: The Project is capable of performing its function										
	Yes but changes purpose of road as would not pick up Werribee traffic.	Poorly	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Objective 5: The project is technically feasible										
Technically feasible	Yes. Final design standards for high speed rail passenger and freight of 2600m curves and 1% grade adopted for road.	Very Well	Provide a line of best fit taking into account all known current constraints. In a technical engineering sense this would be the best option.	Very Well	Yes. Final design standards for high speed rail passenger and freight of 2600m curves and 1% grade adopted for road.	Very Well	Yes. Final design standards for high speed rail passenger and freight of 2600m curves and 1% grade adopted for road. Road grades adopted where practicable.	Very Well	Yes. Could not use Armstrong Road corridor as would need to expand beyond current 80m reservation, hence deviation	Satisfactory
Technically feasible interchanges	Yes	Very Well	Yes	Very Well	Yes	Very Well	Yes	Very Well	Yes	Very Well
Technically feasible rail connections	Would conflict with proposed Lara intermodal site (eastern end) on Geelong- Melbourne Railway Line, may be difficult to connect to standard gauge.	Poorly	Feasible connections to all existing railway lines likely but not examined in detail	Satisfactory	Feasible connections to all existing railway lines likely but not examined in detail	Satisfactory	Feasible connections to all existing railway lines. Would require adjustments to exisitng railway lines.	Satisfactory	Difficult - 1. Would need to consider short term use of OMR for freight at least and use of Standard Gauge tracks at side rather than in median, extra complexity to Geelong - Melbourne Railway link 2. Combined wider Werribee River crossing	Poorly
Terrain constraints	Limited options for Werribee River crossing.	Very Well	Limited options for Werribee River crossing.	Very Well	Limited options for Werribee River crossing.	Very Well	Limited options for Werribee River crossing.	Very Well	Probably OK, but wider Werribee River crossing	Very Well
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment - assessment based on modelling prior to field surveys	Severs western end of grasslands and would be a barrier between grasslands and You Yangs Regional Park	Poorly	Would sever major area in southern block of Western Plains Grasslands	Very poorly	Would sever significant area of Western Plains Grasslands to east in southern block.	Very poorly	Would significantly reduce severance on southern block of Western Plains Grasslands	Satisfactory	1. Severs southern block high value biodiversity area but lesser overall effect.	Poorly

To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Would impact more scattered western areas of Western Plains Grasslands	Poorly	Would impact significant area of Plains Grassland and crosses into Ramsar Wetland, but would not have a significant impact on its ecological character	Very poorly	Could potentially impact 1 EPBC threatened fauna species, and crosses into Ramsar Wetland, but would not have a significant impact on its ecological character	Very poorly	1. Would sever southern block high value biodiversity area but lesser overall effect. 2. Princes Freeway interchange located in Lollypop Creek flood plain ESO. 3. Crosses into Ramsar Wetland, but would not have a significant impact on its ecological character	Satisfactory	1. Significant areas of Plains Grassland within UGB. 2. Princes Freeway interchange located in Lollypop Creek flood plain ESO. 3. Crosses into Ramsar Wetland, but would not have a significant impact on its ecological character	Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Could potentially affect 1 Heritage Inventory site	Satisfactory	Could potentially affect 1 Heritage Inventory site	Satisfactory	No sites currently registered	Well	Would impact 3 Heritage Overlay sites and 1 Heritage Inventory site of local significance.	Satisfactory	Would potentially impact 1 Heritage Inventory site	Satisfactory
Impact on Aboriginal cultural heritage sites	No Aboriginal heritage sites recorded	Satisfactory	Could potentially affect 7 Aboriginal heritage sites	Poorly	Would affect 2 earth feature and 6 artefact scatter sites. Potential sites at river crossings likely especially Werribee River	Poorly	Would affect 1 artefact scatter site and 1 earth feature site. Potential sites at river crossings likely especially Werribee River	Poorly	Could potentially impact 4 Aboriginal heritage sites. Potential sites at river crossings likely especially Werribee River	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would impact agricultural enterprises and no quarry sites	Satisfactory	Would impact agricultural enterprises and 2 quarry sites	Satisfactory	Would affect 31 properties many of which would be agricultural enterprises and no quarry sites	Satisfactory	Would affect yy properties many of which would be agricultural enterprises and minor impacts on 2 quarry sites.	Poorly	Would impact agricultural enterprises and commercial employment around Western Freeway	Satisfactory
Industrial development. Other uses, utilities, service centres, intermodal sites	Would impact 2 service centres on Princes Freeway. Transmission lines could be accomodated.	Poorly	Would encroach into Western Treatment Plant land	Satisfactory	Would impact City West Water and encroach into Western Treatment Plant land. Would cross sections of high pressure gas pipeline	Poorly	Would impact City West Water and encroach into Western Treatment Plant land. Would cross sections of high pressure gas pipeline	Poorly	May impact on service centre	Poorly
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Would not affect residential areas	Well	Would not affect residential areas	Well	Would not affect residential areas.	Well	Would not affect residential areas.	Well	If deviated at Manor Lakes would sever development to west within UGB from rest of Manor Lakes. Could incur high compensation claim from developer	Very poorly
Impact on *Melbourne @ 5 Million* Investigation areas	Would not support future development in Investigation Areas	Very poorly	Would not support future development in Investigation Areas	Very poorly	Would support future development in Investigation areas	Well	Would support future development in Investigation areas and closer to Werribee	Very Well	Would sever any future development to west and north of Werribee.	Very poorly
To protect the character of significant landscapes, open space and recreation values, to the extent practicable		Satisfactory		Satisfactory		Satisfactory		Satisfactory		Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**The poor performance on an number of objectives and very poor performance with regard to future development led to this option being discarded.**	**Poorly**	**The very poor performance with regard to the environment and future development outweighed all other advantages.**	**Poorly**	**This option was not considered appropriate to take forward initially, due to the perceived very poor environmental impacts based on early modelling prior to field work. Refer Table B1-12 for later analysis**	**Poorly**	**This option was initially considered th best option to take forward for development due to its perceived superior performance with regard to future development and the environment. Refer Table B1-12 for later analysis**	**Well**	**The potential impacts on the Werribee Growth Area at Manor Lakes and difficulties in providing for rail were considered to outweigh any advantages of this option.**	**Very Poorly**

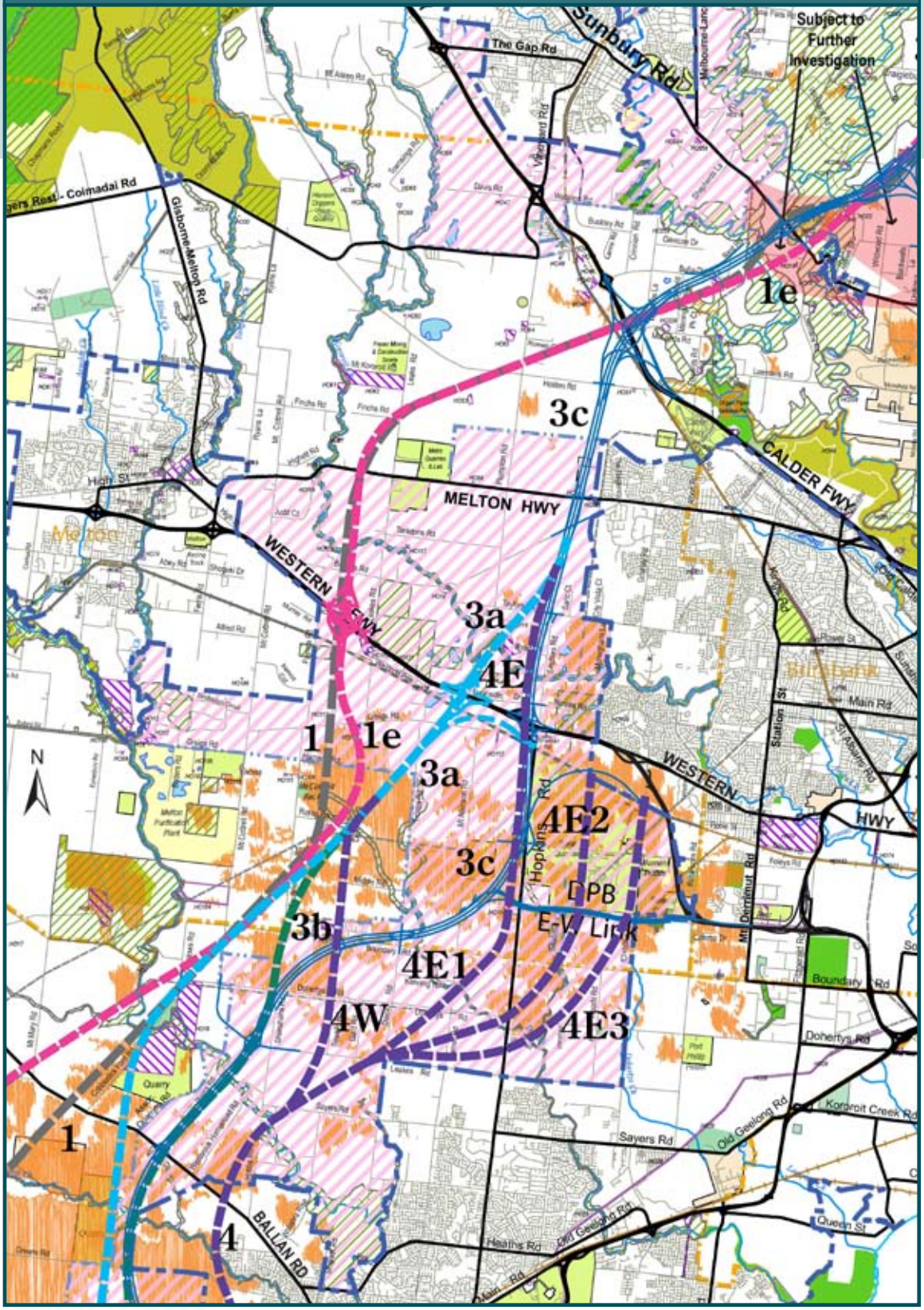
Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

UGB: Urban Growth Boundary ESO: Environmental Significance Overlay

EPBC: *Environment Protection and Biodiversity Conservation Act 1999* (Australian Government)

FIGURE B1-7: FURTHER VARIATIONS TO PRELIMINARY CORRIDOR OPTIONS CENTRAL SECTION



Option 4E1 would cross a smaller area of grassland to the west of Hopkins Road, while option 4E2 would cross grasslands to the north of the current Boral quarry operational area. All options would bisect potential residential areas in the northern part of the *Melbourne @ 5 million* Investigation Area north of Werribee.

B1.4.3.2 EVALUATION OF OPTIONS

Although Option 1e would perform well in minimising impacts on existing settlements, this was not considered to outweigh the disbenefits of splitting potential future development in the *Melbourne @ 5 million* Investigation Area north and south of the Western Highway and the still considerable impacts on the Western Plains Grasslands. This option was therefore discontinued.

Options 3a, 3b and 3c were developed as variations to Option 3 to find a viable eastern route to compare with Option 1e. Option 3a and Option 3b would offer a more direct link to the Calder Freeway than Option 2 (refer Figure B1-3 Preliminary Corridor Options), while not being as optimal with regard to the interchange crossing. However, compared with Option 3c south of the Calder Freeway, Option 3a and Option 3b with the 3a Western Highway interchange are considered to be the most technically optimal corridor options.

However impacts on the Western Plains Grasslands and potential impacts on the *Melbourne @ 5 million* Investigation Area were considered to outweigh any other benefits.

Option 3c would not perform well against impacts on existing rural residential development as it would impact on Chartwell and Hopkins Road communities. It would also require the replacement of the Hopkins Road interchange. However this option would perform very well in regard to maximising opportunities for the *Melbourne @ 5 million* Investigation Area and the protection of the Western Plains Grasslands by leaving the largest possible area in both northern and southern sections of the grasslands. The assessment is shown in Figure B1-6 Further Variations to Preliminary Corridor Options Analysis Central Section.

This option was therefore considered for further development and all other options discontinued.

Options 4,4W,4E1, 4E2 and 4E3 were assessed against Option 3b as shown in Table B1 – 7 Preliminary Corridor Options Variations in UGB Analysis.

All of the options 4, 4W, 4E1, 4E2 and 4E3 would still impact grasslands, although it is understood that these impacts may be able to be mitigated within the UGB and *Melbourne @ 5 million* Investigation Area.

Table B1-6 Further Variations to Preliminary Corridor Options Analysis Central Section (Assessment from Werribee River to Calder Freeway)

Objective Sub objective	**Option 1e** New route south of Western Fwy		**Option 3a** Option 3 extended south from Greens Rd and north from Boundary Rd, east of Rockbank		**Option 3b** East of Option 3a from Princes Fwy to north of Boundary Rd		**Option 3c** Close to Werribee, next to Hopkins Rd to Calder Fwy east of 3a/3b, north of 1e over Creeks, west of 1e at Mickleham Rd	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	Option 1 plus M4 in central section. From Cobbledicks Ford at Werribee River to east of Mt Cottrell along contour, crossing Western Fwy west of Leakes Rd, deviating north of Melton Hwy to cross Calder Fwy south of Diggers Rest interchange		From Cobbledicks Ford at Werribee River to east of Mt Cottrell across to Western Fwy west of Rockbank, joining 3c north of Taylors Road then north to cross Calder Fwy south of Diggers Rest interchange		From Werribee River to Shanahans/Falkners Rd to join 3a in vicinity of Dry Creek near Riding Boundary Rd.		From Werribee River to Boundary Rd just east of Shanahans Rd, across to Hopkins Rd, through Hopkins Rd interchange north to cross Calder Fwy south of Diggers Rest interchange	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas								
Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Good route between airports and to pick up Ballarat airport traffic. Close to Melton.	Satisfactory	Slightly shorter route between airports but not as good as Option 1e for Ballarat airport traffic.	Satisfactory	Slightly shorter route between airports but not as good as Option 1e for Ballarat airport traffic.	Satisfactory	Slightly longer route between airports and not as good as other options for Ballarat airport traffic.	Satisfactory
Objective 2: Serves key interstate and major regional destinations								
Serves key interstate and major regional destinations	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham								
Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham	Would not link Melton well to Werribee future residential and employment areas, satisfactory to north, however not as good for Caroline Springs	Poorly	Not optimal link between Melton and Werribee future residential and industrial development area , satisfactory to north and better for Caroline Springs	Satisfactory	Not optimal link between Melton and Werribee future residential and industrial development area , satisfactory to north and better for Caroline Springs	Satisfactory	Optimal link between Melton and Werribee future residential and industrial development area , satisfactory to north and better for Caroline Springs	Well
Objective 4: The Project is capable of performing its function								
The Project is capable of performing its function	Yes but changes purpose of road as would not pick up Werribee traffic.	Poorly	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Objective 5: The project is technically feasible								
Technically feasible	Yes	Satisfactory	Provide a line of best fit taking into account all known current constraints. In a technical engineering sense this would be the best option.	Very Well	Not as optimal as Option 3a but better than Option 3c.	Very Well	Yes - feasible but not optimal south of Melton Highway, particularly across Western Freeway. Closeness to Hopkins Rd an issue.	Satisfactory
Technically feasible interchanges	1. Difficult to provide for E-W link from Deer Park Bypass in vicinity of OMR interchange at Boundary Rd. 2. Likely to affect western ramps at Western Freeway/Leakes Rd interchange.	Poorly	1. Difficult to provide for E-W link from Deer Park Bypass in vicinity of OMR interchange at Boundary Rd. 2. May marginally affect Hopkins Rd interchange western ramps	Satisfactory	1 .Difficult to provide for E-W link from Deer Park Bypass in vicinity of OMR interchange at Boundary Rd. 2. May marginally affect Hopkins Rd interchange western ramps	Satisfactory	1. Western Freeway interchange would replace Hopkins Road interchange. 2. Overpass at downgraded Hopkins Rd for local access across Western Freeway. 3. Access across Western Freeway complex and from Western Freeway to Hopkins Rd indirect. 4. E-W OMR interchange much closer to Deer Park Bypass and separated from Boundary Rd interchange.	Poorly
Technically feasible rail connections	Would need to avoid Rockbank Station on Ballarat - Melbourne Railway Line.	Poorly	Feasible connections to all existing railway lines likely but not examined in detail	Satisfactory	Feasible connections to all existing railway lines likely but not examined in detail	Satisfactory	Feasible but would require lowering of Ballarat - Melbourne and Bendigo - Melbourne Railway Lines (outcome of more detailed design).	Satisfactory
Terrain constraints	Mt Cottrell a constraint	Satisfactory	Need to avoid Mt Atkinson.	Satisfactory	Need to avoid Mt Atkinson.	Satisfactory	Need to avoid Mt Atkinson.	Satisfactory
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain								
Environment - assessment based on modelling prior to field surveys	Would sever western end of Western Plains Grasslands	Poorly	Would sever significant area in northern block of Western Plains Grasslands	Very poorly	Would sever significant area to east in northern block of Western Plains Grasslands	Very poorly	Would significantly reduce severance on northern block of Western Plains Grasslands. Would maximise intact areas of grassland to west.	Well

To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	1. Significant impact on western end of Plains Grasslands in this area 2. Would miss areas of national / state significance biodiversity but impact regional/local significance 3. Interchange would impact ESO over Bendigo-Melbourne Railway line	Poorly	1. Significant impact on western end of Plains Grasslands in this area 2. Potential to impact 2 EPBC threatened fauna species and 4 FFG listed species 3. Interchange would impact ESO over Bendigo-Melbourne Railway line	Poorly	1. Significant impact on western end of Plains Grasslands in this area 2. Potential to impact 1 EPBC threatened fauna species 3. Interchange would impact ESO over Bendigo-Melbourne Railway line	Poorly	1. Would cross 2 areas of biodiversity significance. 2. Potential to impact 2 EPBC threatened flora species, 4 FFG and 3 DSE 3. Interchange would impact ESO over Bendigo-Melbourne Railway line	Satisfactory
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts								
Impact on Post settlement cultural heritage sites	Could affect site to west of Cobbledicks Ford and HO1 in City of Wyndham.	Satisfactory	No sites currently registered.	Well	No sites currently registered.	Well	Would impact 2 Heritage Inventory sites and 6 Heritage Overlay sites (including 1 on arterial road extension from Leakes Rd to Mt Cottrell Rd)	Satisfactory
Impact on Aboriginal cultural heritage sites	Would affect 1 aboriginal heritage site	Satisfactory	Would potentially affect 4 aboriginal heritage sites	Satisfactory	Would affect 2 artefact scatters	Satisfactory	Would affect 13 artefact scatter sites (including 2 on East -West Link)	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and opportunities for urban growth and maximise opportunity for urban development								
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would impact agricultural enterprises. No impacts on quarries.	Satisfactory	Would impact agricultural enterprises and commercial development around Western Freeway. No impacts on quarries.	Satisfactory	Would impact agricultural enterprises and commercial development around Western Freeway. No impacts on quarries.	Satisfactory	1. Would impact agricultural enterprises and commercial development around Western Freeway. 2. Railway connection for Ballarat - Melbourne Railway Line would impacts Boral Quarry's future development area. Could incur high compensation claim .	Very Poorly
Industrial development. Other uses , utilities, service centres, intermodal sites		Well	Future Transmission line may be impacted	Poorly	Future Transmission line may be impacted	Poorly	Would impact on 2 service centres	Poorly
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	1. Would assist Eynesbury development. 2. Would minimise impacts on rural residential areas at Hopkins Rd 3. East-West Link may affect Chartwell	Satisfactory	1. East -West link may affect Chartwell/Tarneit rural residential area 2. Would impact rural residential development Greigs Rd.	Poorly	1. East -West link may affect Chartwell/Tarneit rural residential area 2. Would impact rural residential development Greigs Rd.	Poorly	1. Would impact Chartwell/Tarneit rural residential area 2. Would impact rural residential development around Hopkins Rd interchange and north to Calder Freeway.	Very Poorly
Impact on *Melbourne @ 5 Million* Investigation areas	1. Same impacts as Option 1 south of Western Highway. Too far away from potential development areas at Werribee. 2. Could encourage development to west of Eynesbury	Very poorly	1. Would sever any future development north and south of Western Highway	Poorly	1. Would sever any future development north and south of Western Highway	Poorly	1. Would provide maximum area for residential development in Investigation Area north of Werribee. 2. Puts transport corridor to one side providing maximum expansion area in Investigation Area closer to Melton	Very Well
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Would impact Mt Cottrell	Very poorly	Would impact Mt Cottrell	Very poorly		Satisfactory		Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**The poor to very poor performance of this option with regard to a number of objectives wesr the main factors in discarding this option.**	**Poorly**	**The perceived inferior performance of this option with respect to future land use and the environment were the main factors discarding this option and outweighed the engineering advantages.**	**Satisfactory**	**The perceived inferior performance of this option with respect to future land use and the environment were the main factors discarding this option and outweighed the engineering advantages.**	**Satisfactory**	**The perceived superior performance of this option with respect to future land use and the environment were the main factors in taking this option forward for further development. Refer Table B1-11 for revised assessment.**	**Well**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

UGB: Urban Growth Boundary
EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)
FFG: Flora and Fauna Guarantee Act 1988 (Victorian Government)
ESO: Environmental Significance Overlay
DSE: Department of Sustainability and Environment (Victorian Government)

Option 4W, while technically feasible would have similar impacts to option 3b and therefore was not supported.

Options 4E2 and 4E3 were discounted as they would require T intersections with the Western Freeway to link to Option 3c, which would be totally unacceptable. There is no route through Caroline Springs and there would be major impacts on the Deer Park Bypass and Ballarat-Melbourne Railway line. It is unlikely that a metropolitan railway with stations could co-exist with the OMR high speed freight and inter regional passenger rail lines due to the conflicting design requirements.

Option 4E1 was technically feasible but the adverse impact on the *Melbourne @ 5 million* Investigation Area north of Werribee was considered to outweigh any benefits.

Option 3c was confirmed as the superior option.

B1.4.4 NORTHERN SECTION

These options are shown in Figure B1-9 Further Variations to Preliminary Corridor Options Northern Section.

B1.4.4.1 DESCRIPTION OF OPTIONS

Option 1e also incorporates minor changes to the route of Option 1 between Jacksons Creek and Craigieburn Road resulting from more detailed design of a possible freeway to freeway interchange with an extended Tullamarine Freeway. In the north an indicative route was shown on the OMR web page following further consideration of the E14 alignment in relation to the Folkestone C98 Amendment to the Hume Planning Scheme. This route is shown in Figure B1-8 Indicative Northern OMR with Proposed Arterial Roads. Option 1e incorporated the wider arc shown on this diagram but remained on the east side of Mickleham Rd to south of Mt Ridley Rd.

Option 3c is the result of realigning the route north of the Calder Freeway following significant design work on the Sunbury Road and Tullamarine Freeway extension interchanges. The corridor was moved further west to hug the ridge of Deep Creek, crossing Mickleham Road in the vicinity of Bardwell Drive, swinging round the Melbourne Water retarding basin to a freeway to freeway interchange with the Hume Freeway in the vicinity of Donovans Lane between Kalkallo and Beveridge.

Option 3c would follow a route north of two areas of the Environmental Significance Overlay associated with Jacksons Creek and cross Jacksons Creek in the narrowest section of the overlay. The location of the bridge across Deep Ck was optimised in relation to the terrain and gully configuration. The route was developed more to the west to avoid heritage sites including the Avenue of Honour along Mickleham Road and to be as close as possible to the ridge of Deep Creek.

FIGURE B1-8: INDICATIVE NORTHERN OMR AND ARTERIALS

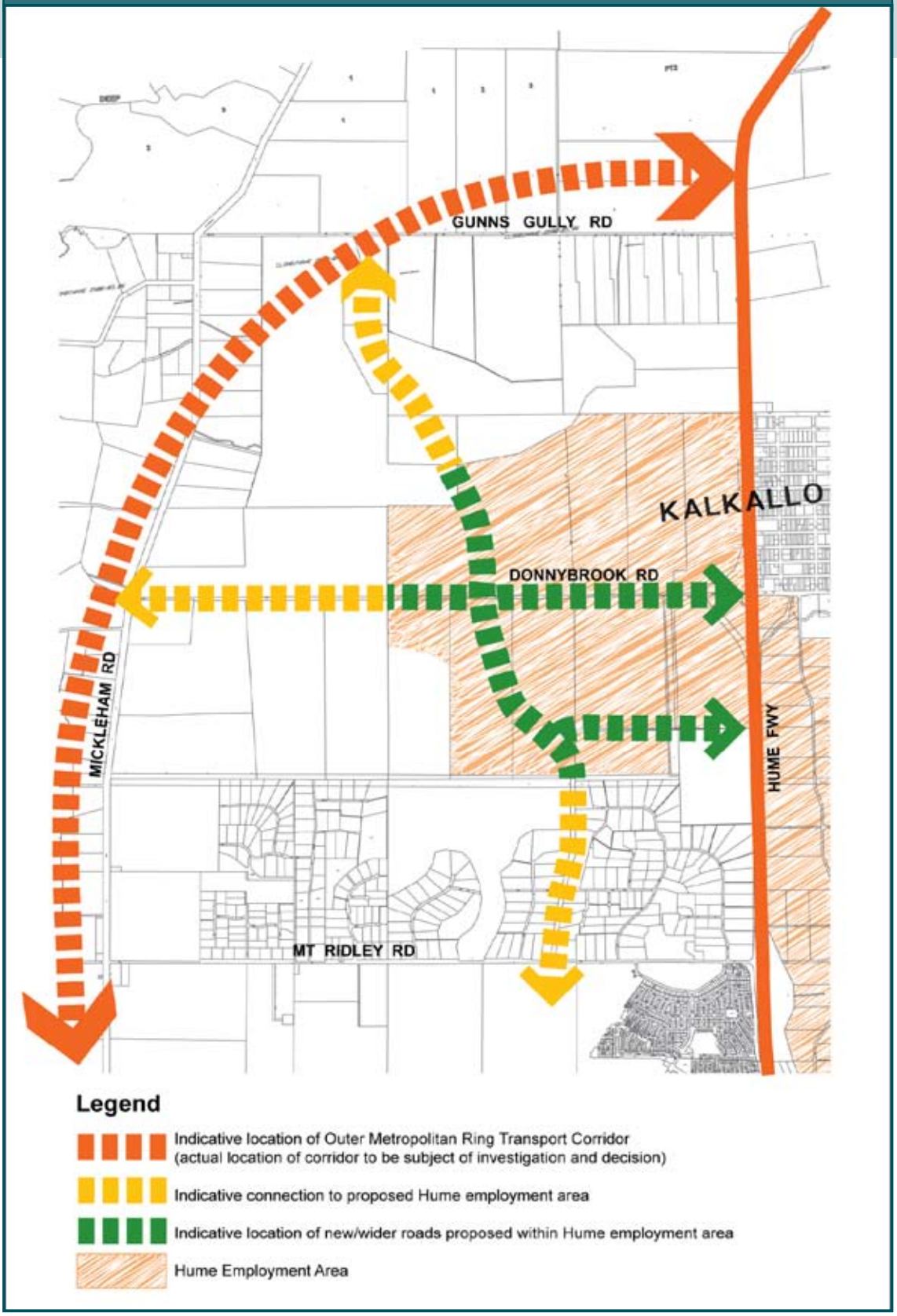


Table B1-7 Preliminary Corridor Options Variations in UGB Analysis (Assessment from Werribee River to Melton Highway)

Objective Sub objective	**Option 3b** Main Alignment Outside UGB		**Option 4W** West of Tarneit		**Option 4E1** Hopkins Road		**Option 4E2** Quarry		**Option 4E3** Christies Rd	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	From Werribee River to Shanahans/ Falkners Rd to join 3a in vicinity of Dry Creek near Riding Boundary Rd.		From Werribee River via Sewells Rd to join 3a in vicinity of Dry Creek near Riding Boundary Rd.		From Werribee River, cuts across Dry Creek then due north parallel with Hopkins Rd to cross Western Fwy and Calder Fwy just south of Diggers Rest interchange.		From Werribee River, cuts across to Leakes Rd then curves around north through Boral Quarry to Western Freeway. At interrsection would link to Western Hwy.		From Werribee River, cuts across to Leakes Rd then curves around north through Boral Quarry parallel to Christies Rd to Western Freeway. At intersection would link to Western Hwy.	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas										
Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Slightly shorter route between airports but not as good as Option 1e for Ballarat airport traffic.	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Objective 2: Serves key interstate and major regional destinations										
Serves key interstate and major regional destinations	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg. Werribee, Melton and Mickleham										
Provides better links to residential and employment growth areas to the north and west of Melbourne, eg. Werribee, Melton and Mickleham	Not optimal link between Melton and Werribee future residential and industrial development area, satisfactory to north and better for Caroline Springs	Satisfactory	Could provide link between Werribee future residential and industrial development areas to to west and north with Melton and Hume	Satisfactory	Could provide link between Werribee future residential and industrial development areas to to west and north with Melton and Hume	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Objective 4: The Project is capable of performing its function										
The Project is capable of performing its function	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	No	Very poorly	No	Very poorly
Objective 5: The project is technically feasible										
Technically feasible	Not as optimal as Option 3a but better than Option 3c.	Very Well	Feasible	Satisfactory	Feasible if replace Hopkins Road interchange	Poorly	Not feasible - Staggered T intechanges with Western Freeway unworkable for Transport Corridor.	Very poorly	Not feasible - Staggered T intechanges with Western Freeway unworkable for Transport Corridor.	Very poorly
Technically feasible interchanges	1. Difficult to provide for E-W link from Deer Park Bypass in vicinity of OMR interchange at Boundary Rd. 2. May marginally affect Hopkins Rd interchange western ramps	Satisfactory	1. Feasible as joins onto Option 3a before Western Freeway.	Satisfactory	1. Western Freeway interchange would replace Hopkins Road interchange. 2. Hopkins Rd would be downgraded and terminated. 3. Access via new interchange at Boundary or Middle Road. 4. E-W OMR interchange much closer to Deer Park Bypass	Poorly	Not feasible to connect to Western Freeway or Deer Park Bypass. No feasible interchange location between Hopkins Rd and Deer Park Bypass	Very poorly	Not feasible to connect to Western Freeway or Deer Park Bypass	Very poorly
Technically feasible rail connections	Feasible connections to all existing railway lines but not examined in detail	Satisfactory	Difficult - 1. Would need to consider short term use of OMR for freight at least and use of Standard Gauge tracks at side rather than in median, extra complexity to Geelong - Melbourne rail link 2. Combined wider Werribee River crossing	Poorly	Difficult - 1. Would need to consider short term use of OMR for freight at least and use of Standard Gauge tracks at side rather than in median, extra complexity to Geelong - Melbourne rail link 2. Combined wider Werribee River crossing	Poorly	Unable to provide high speed rail and passenger services to north except via existing railway lines	Very poorly	Unable to provide high speed rail and passenger services to north except via existing railway lines	Very poorly
Terrain constraints	Limited options for Werribee River crossing Need to avoid Mt Atkinson	Satisfactory	Probably OK, but wider Werribee River crossing	Very Well	Probably OK, but wider Werribee River crossing	Very Well	Not assessed see technical feasibility		Not assessed see technical feasibility	

Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
Environment - assessment based on modelling prior to field surveys	Would sever significant area to east in northern block of Western Plains Grasslands	Very poorly	Significant area of grasslands within UGB	Poorly	Would significantly reduce severance on northern block of Western Plains Grasslands. Would maximise intact areas of grassland to west.	Well				
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable. Assessment based on DSE modeling prior to field surveys.	1. Significant impact on western end of Plains Grasslands in this area 2. Potential to impact 1 EPBC threatened fauna species 3. Interchange would impact ESO over Bendigo-Melbourne Railway line	Poorly	1. Slightly lesser impact on northern block 2. Interchange would impact ESO over Bendigo-Melbourne Railway line with continuation on 3c	Poorly	1. Would cross 2 areas of biodiversity significance. Potential to impact 2 EPBC threatened flora species, 2 FFG and 3 DSE recorded. 2. Interchange would impact ESO over Bendigo-Melbourne Railway line	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	No sites currently registered.	Well	Would potentially impact 1 Heritage Overlay site	Satisfactory	Would potentially affect 2 Heritage Inventory sites and 1 Heritage Overlay site	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Impact on Aboriginal cultural heritage sites	Would affect 2 artefact scatters	Satisfactory	Would potentially affect 2 aboriginal heritage sites with continuation on 3c.	Satisfactory	Would potentially affect 10 Aboriginal heritage sites with continuation on 3c	Poorly	Not assessed see technical feasibility		Not assessed see technical feasibility	
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and opportunities for urban growth and maximise opportunity for urban development										
To have minimal impact on employment centres. major quarry resources and agricultural enterprises	Would impact agricultural enterprises and commercial development around Western Freeway. No impacts on quarries.	Satisfactory	Would impact agricultural enterprises and commercial employment around Western Freeway	Satisfactory	Would impact agricultural enterprisies, commercial employment around Western Highway and Boral Quarries future development area. Could incur high compensation claim	Very poorly	Not assessed see technical feasibility		Not assessed see technical feasibility	
Industrial development - other uses, utilities, service centres, intermodal sites	Future Transmission line may be impacted	Poorly	May impact on service centre	Poorly	May impact on 2 service centres	Poorly	Not assessed see technical feasibility		Not assessed see technical feasibility	
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	1. East - West Link may affect Chartwell/Tarneit rural residential area. 2. Would impact rural residential development Greigs Rd.	Poorly	1. May impact Chartwell/ Tarneit area if interchange with Boundary Rd.	Poorly	1. Would impact east side of Tarneit rural residential development.	Poorly	Not assessed see technical feasibility			
Future land use in *Melbourne @ 5 million* potential developments	Would sever future development north and south of Western Freeway	Poorly	Would sever future development north and south of Western Freeway and north of Werribee	Very poorly	Would sever future development north of Werribee to unacceptable level	Very poorly	Appropriate curves would result in severance of future development area and major impacts on Boral quarry.	Very poorly	Appropriate curves would result in severance of future development area	Very poorly
To protect the character of significant landscapes, open space and recreation values, to the extent practicable		Satisfactory		Satisfactory		Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Not assessed see technical feasibility		Not assessed see technical feasibility	
OVERALL OPTION ASSESSMENT	**The perceived inferior performance with respect to future land use and the environment were the main factors in discarding this option and outweighed the engineering advantages.**	**Satisfactory**	**This option would not perform with respect to future land use and rail issues and these were the main factors in discarding this option**	**Poorly**	**This option would not perform with respect to future land use and rail issues and these were the main factors in discarding this option**	**Poorly**	**Not feasible and undesirable**	**Very poorly**	**Not feasible and undesirable**	**Very poorly**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

UGB: Urban Growth Boundary

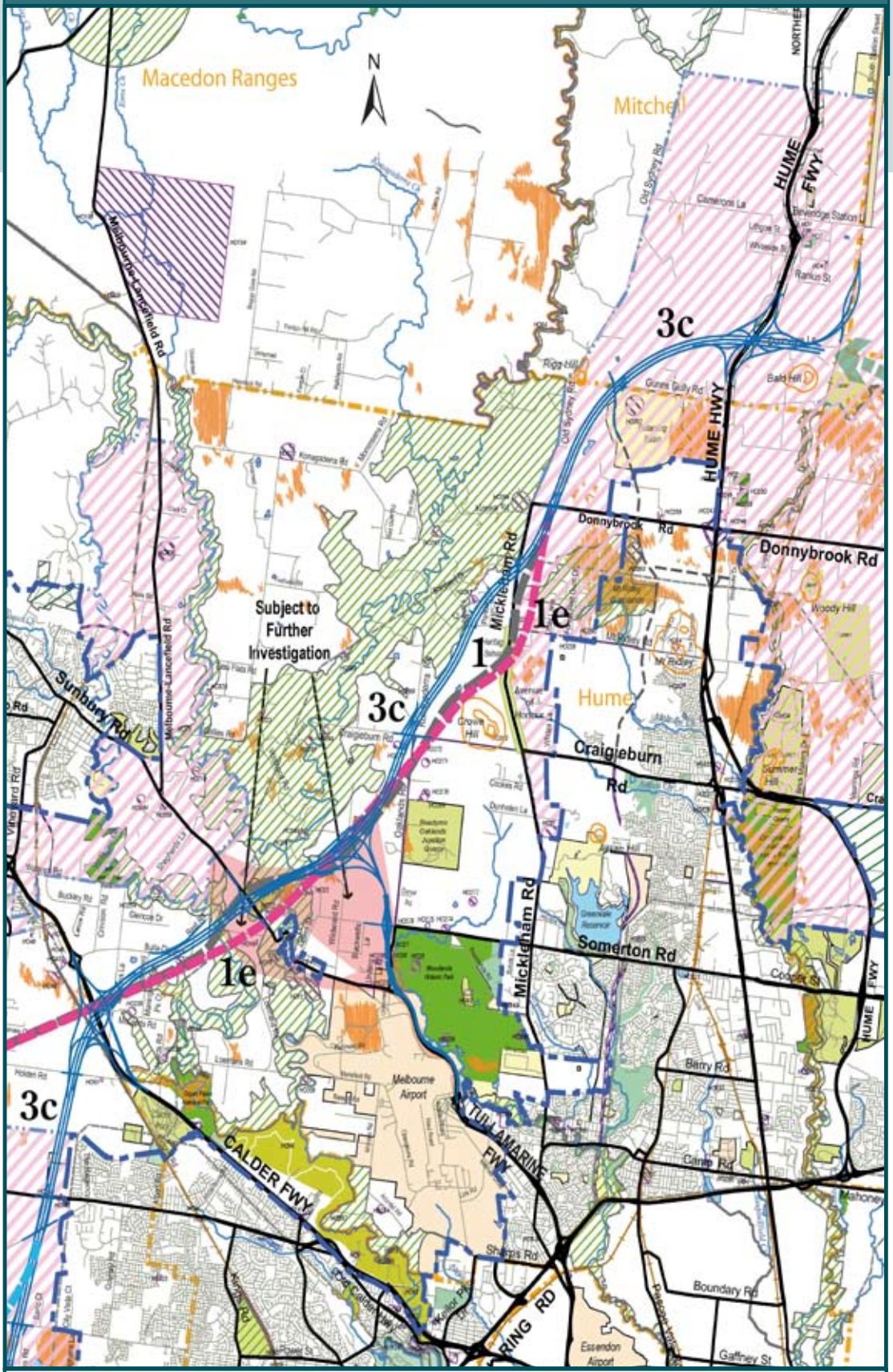
EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)

FFG: Flora and Fauna Guarantee Act 1988 (Victorian Government)

ESO: Environmental Significance Overlay

DSE: Department of Sustainability and Environment (Victorian Government)

FIGURE B1-9: FURTHER VARIATIONS TO PRELIMINARY CORRIDOR OPTIONS NORTHERN SECTION



The route would cross isolated areas of environmental sensitivity. It would also cross a quarry currently used for landfill and a potential quarry site south of Sunbury Road. The regionally significant Oakland Junction Quarry was also considered a constraint.

North of Mt Ridley Road and west of Mickleham Road Option 3c would pass though a rural residential area.

B1.4.4.2 EVALUATION OF OPTIONS

At this stage, the objective in relation to future residential and industrial development was informed by the development of the *Melbourne @5 million* Investigation Areas and the objective in relation to biodiversity by the desire to leave the largest area possible of the Western Plains Grasslands to the west of the Werribee Investigation Area. This assessment is shown in Table B1-8 Further Variations to Preliminary Options Analysis Northern Section.

CONSIDERATION OF CONSTRAINTS NORTH OF THE CALDER FREEWAY

Early in the option development process, it was apparent that the crossing of the Calder Freeway was relatively fixed as the freeway to freeway interchange could only fit between the Bulla – Diggers Rest Road interchange and a point to the north of the Calder Raceway. Further north and the corridor would begin to impact on the Vineyard Road interchange which is the main access to Sunbury and further south it would impact on the Organ Pipes National Park. In addition options to the north were constrained by the creek crossings, in particular the desire to minimise the number and length of these crossings. The corridor route therefore aimed to cross Deep Creek once, south of the confluence with Emu Creek. All options were designed to find the best location for the creek crossings in a technical sense as these creek crossings would be very long (over 1km) and high (30-70 m). This then determined the location of a possible freeway to freeway interchange with an extended Tullamarine Freeway. (It should be noted that no decision has been made on this interchange as further investigation is required.)

TableB1-8 Further Variations to Preliminary Corridor Options Analysis Northern Section (Assessment from Calder Freeway to Donnybrook Rd)

Objective **Sub objective**	**Option 1e** **New route south of Western Fwy**		**Option 3c** **Close to Werribee, next to Hopkins Rd to Calder Fwy east of 3a/3b, north of 1e over Creeks, west of 1e at Mickleham Rd**	
	Details	**Rating**	**Details**	**Rating**
Description	From Calder Fwy , north west to cross Jacksons and Deep Creeks west of 3c and closer to Bulla, across Oaklands Rd south of Craigieburn Rd, crossing Mickleham Rd south of Mount Ridley Rd and continuing north, east of Mickleham Rd to Donnybrook Rd.		From Calder Fwy , north west to cross Jacksons and Deep Creeks east of 1e, across Konagaderra Rd north of Craigieburn Rd, crossing Mickleham Rd south of Bardwell Ave and continuing north, east of Mickleham Rd to Donnybrook Rd.	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Would provide good link between airports	Satisfactory	Would provide good link between airports	Satisfactory
Objective 2: Serves key interstate and major regional destinations	Would meet this objective	Satisfactory	Would meet this objective	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham	Would provide good links to northern residential and industrial areas	Well	Would provide good links to northern residential and industrial areas	Well
Objective 5: The project is technically feasible	Yes. 1. Option 1e is technically feasible solution to Option 1 in Mickleham area. 2. Would not work as well as Option 3c across Jackson and Deep Creeks. 3. Too close to junction Oaklands Rd/ Mt Ridley Rd in Mickleham Rd area. Could be feasible if Mt Ridley Rd diverted to south	Satisfactory	Yes 1. Optimal Crossing of Jacksons and Deep Creeks. 2. Optimal near Mickleham Rd as following ridge line of Deep Creek	Well
Technically feasible interchanges	Yes. However, further work required reconnection(s) to Melbourne Airport	Satisfactory	Yes. However, further work required re connection(s) to Melbourne Airport	Satisfactory
Technically feasible rail connections	Yes	Well	Yes	Well
Terrain constraints	Jacksons and Deep Creeks, Crowe Hill, gullies and hills to north would present more engineering difficulties than Option 3c	Satisfactory	This Option resolves some of the engineering difficulties presented by Jacksons and Deep Creeks, Crowe Hill and the gullies and hills to the north	Well
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain				
Environment - assessment based on modelling prior to field surveys	1. Would pass through Mt Ridley Road Grassland and Woodland Environmental Significance Overlay. 2. Would impact Plains Grassy Woodland areas	Poorly	1. Could create hard boundary preventing development from encroaching on the Environmental Significance Overlay. 2. Would impact Plains Grassy Woodland and Plains Grassland areas	Satisfactory
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable Assessment based on DSE modeling prior to field surveys	1. Would pass through 3 areas of biodiversity significance. 2. East of Mickleham Rd there is 1 record of FFG/DSE listed threatened fauna. 3. North of Sunbury Rd to Deep Creek there are 6 records of threatened fauna (1 EPBC, 3 FFG and 6 DSE) 4. South of Bulla Diggers Rest Rd to Jacksons Creek there are 3 threatened fauna species (1 EPBC, 2 FFG and 3 DSE records)	Poorly	1.Would pass through 4 areas of biodiversity significance. 2. East of Mickleham Rd there is 1 record of FFG/DSE listed threatened fauna. 3. North of Sunbury Rd to Deep Creek there are 6 records of threatened fauna (1 EPBC, 3 FFG and 6 DSE) 4. South of Bulla Diggers Rest Rd to Jacksons Creek there are 3 threatened fauna species (1 EPBC, 2 FFG and 3 DSE records)	Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts				
Impact on Post settlement cultural heritage sites	Would impact 4 Heritage Overaly sites including Mickleham Uniting Church and Mount Ridley School and the Avenue of Honour	Very poorly	Would impact 2 Heritage Overlay sites	Satisfactory
Impact on Aboriginal cultural heritage sites	Would affect 1 artefact scatter site. Potential sites at river crossings likely	Satisfactory	Would affect an artefact scatter site and a scarred tree. Potential sites at river crossings likely	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development				
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would impact 51 properties (not designed in as much detail as 3c so could potentially be more) many of which would be agricultural enterprises and 2 current and potential quarry sites	Poorly	Would impact 82 properties (including access restoration) many of which would be agricultural enterprises and 2 current and potential quarry sites	Poorly
Industrial development. Other uses , utilities, service centres, intermodal sites	Would support Hume industrial area	Well	Would support Hume industrial area	Well
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	1. Would impact a total of 16 houses and businesses with approx. 4 of these being between south of Craigieburn Rd and Donnybrook Rd. 2. Would minimise impacts on rural residential area west of Mickleham Rd.	Poorly	1. Would impact a total of 26 houses and businesses with approx. 11 of these being between south of Craigieburn Rd and Donnybrook Rd. 2. Would sever rural residential area west of Mickleham Rd.	Very poorly

Future Land Use in *Melbourne @ 5 million* Investigation Areas	1. Would leave larger area of *Melbourne @ 5 million* Investigation Area between Mickleham Rd and Transport Corridor that would be more difficult to develop. 2. Would split *Melbourne @ 5 million* Investigation Area in four. Implications not known at this stage. 3. Would impact on existing development permit north of Mt Ridley Rd.	Satisfactory	1. Would maximise flat land available for residential development east of Mickleham Rd. 2. Would split *Melbourne @ 5 million* Investigation Area in four. Implications not known at this stage. 3. Minimal impact on existing development permit north of Mt Ridley Rd.	Well
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Open space provided by Mt Ridley Road Woodlands not preserved with this option.	Satisfactory	Open space provided by Mt Ridley Road Woodlands preserved with this option. Would impact views of Deep Creek	Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	Heritage, environmental and engineering constraints considered to outweigh lesser social imapcts	**Satisfactory**	Would provide better outcome for future land use and resolution of engineering issues. This outweighed the poorer social impacts.	**Well**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)

FFG: Flora and Fauna Guarantee Act 1988 (Victorian Government)

DSE: Department of Sustainability and Environment (Victorian Government)

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

While every effort has been made to avoid the sites of current and proposed/possible future quarries the constraints in this area meant that the quarry to the north of Sunbury Road and a potential quarry to the south could not be avoided. Moving further to the north would result in an additional creek crossing and more extensive impacts on areas protected by an Environmental Significance overlay, while moving further south would result in impacts on Bulla township along with technical difficulties related to the Deep Creek gully.

To the north topographical, environmental and heritage constraints set the location of the corridor and the crossing of Mickleham Road. The corridor could not be moved further west because it would impact on the steep Deep Creek valley and low hills in the vicinity of Old Sydney Road.

EVALUATION

As the options were designed in more detail, local constraints made Option 1e a less viable option between Oaklands Rd and Mt Ridley Road. It was found to be more difficult to cross Mickleham Road and Mt Ridley Road in this location as the route would need to be in cut, where the two roads are close together. The alignment could not avoid impacts on the heritage school at Mt Ridley Road and would impact on the Avenue of Honour along Mickleham Road. A viable route could not be found south of the Avenue of Honour due to the topography.

This route would also impact on an area of woodland of high environmental value. Previous decisions to protect parts of this woodland included the early decision not to pursue an option through the transmission line easement and ensuring that the deviation of the proposed E14 route through the Merrifield and Folkestone developments, north and south of Donnybrook Road avoided them.

This option would minimise the developable area within the Hume Investigation Area but would leave the existing Mickleham rural residential development relatively intact.

The heritage and environmental constraints together with the technical difficulties were considered to outweigh the potential impacts on the existing residences. Option 1e in the northern section was therefore discontinued.

Option 3c was confirmed as the superior option. An indicative corridor was published in the *Victorian Transport Plan*, December 2008 that took account of the *Melbourne @ 5 million*, November 2008 study. This was the basis for the broad corridor displayed on VicRoads OMR website Figure B1- 10 indicative OMR Transport Corridor December 2008.

FIGURE B1-10: INDICATIVE OMR TRANSPORT CORRIDOR DECEMBER 2008

In the next phase of the study, environmental field work, desktop cultural heritage and geotechnical studies were carried out to further inform the development of the transport corridor in conjunction with the requirements of the *Melbourne @ 5 million* investigations.

B1.5 NORTHERN INTERCHANGE OPTIONS

B1.5.1 DESCRIPTION OF OPTIONS 3C, I1, I2A, I2B, I3

The crossing point of the Hume Freeway for Option 3c was further investigated in relation to its ability to best serve the *Melbourne @ 5 million* Hume Investigation Area and any potential future industrial development related to the proposed Donnybrook/ Beveridge Interstate Rail Freight Terminal. Options are shown in Figure B1-11 Northern Interchange Options.

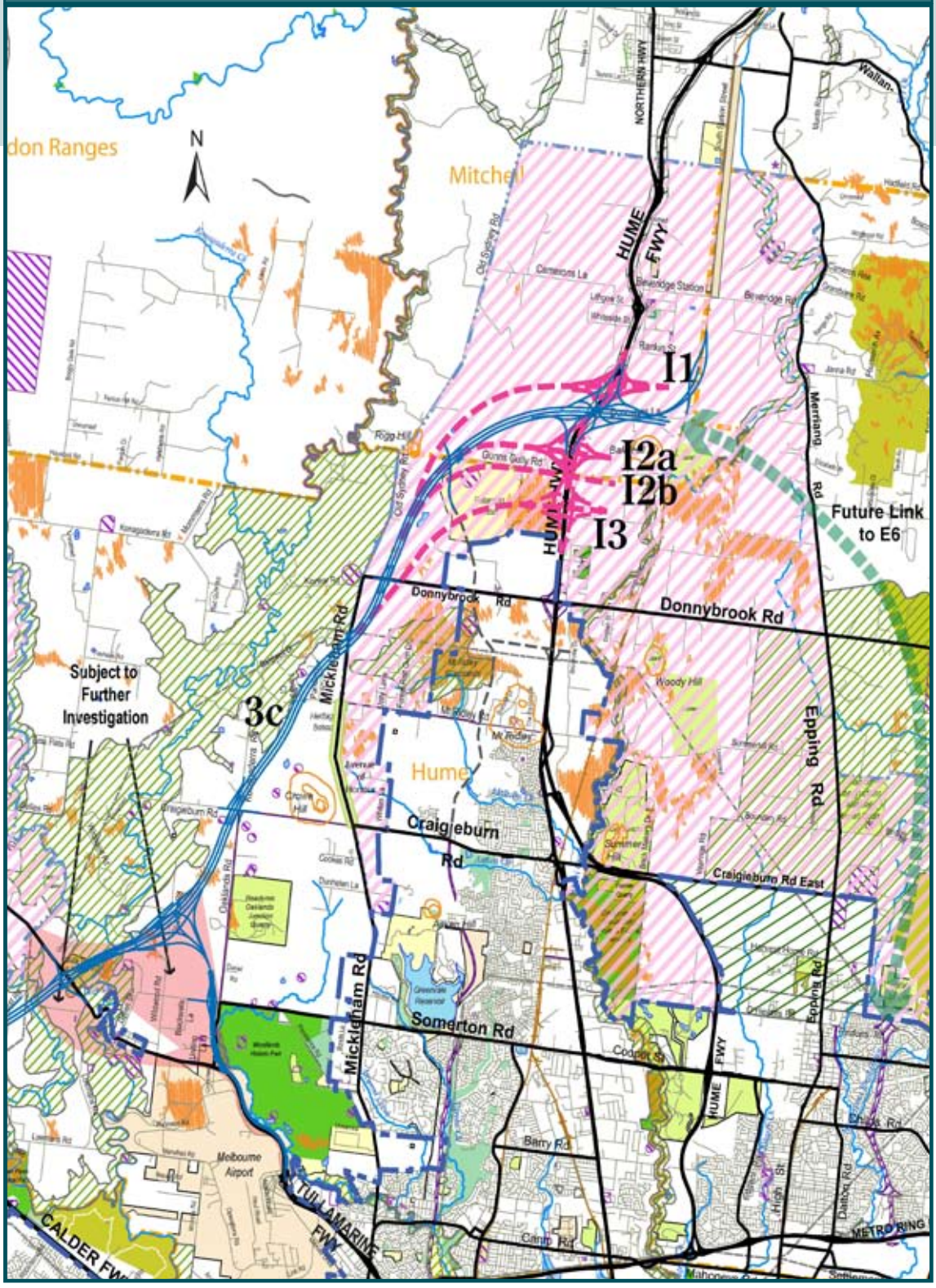
Option 3c would put the interchange between the bends of the Hume Freeway at this location with the OMR route just skirting the Melbourne Water retarding basin. The railway link into the proposed intermodal freight terminal on the east side of the Melbourne –Sydney railway between Beveridge Road and Wallan Road would be to the more technically optimal north side of Bald Hill. Any extension to the E6 would cross sensitive areas of Plains Grassy Woodlands.

Option I1 is the most northern interchange option considered in the Gunns Gully Road area. This option would put the freeway to freeway interchange on the most eastern bend of the Hume Freeway and would move the OMR corridor further north. Consequently, the railway line connection would also be moved further north encroaching further into the proposed Intermodal Freight Terminal on the east side of the Melbourne –Sydney railway between Beveridge Road and Wallan Road.

Option I2a would put the freeway to freeway interchange just north of Gunns Gully Road, with the corridor further south, just skirting the Melbourne Water retarding basin. The railway line connection would then cut into the south side of Bald Hill with attendant technical difficulties. The connection with E6 would cross a proposed Boral quarry area and sensitive areas of Plains Grassy Woodlands.

Option I2b would put the freeway to freeway interchange on Gunns Gully Road, with the OMR corridor further south, crossing the Melbourne Water retarding basin and skirting sensitive biodiversity areas in the vicinity of Kalkallo Creek Any extension to the E6 would cross sensitive areas of Plains Grassy Woodlands. The railway line connection would still cut into the south side of Bald Hill with attendant technical difficulties.

FIGURE B1-11: NORTHERN INTERCHANGE OPTIONS



Option I3 is the most southerly considered and would put the Hume Freeway interchange just north of the Kalkallo township. The ramps would extend into the township and would be insufficiently distant from the interchange at Hume Freeway/ Donnybrook Road. The OMR corridor is further south through the Melbourne Water retarding basin and the Kalkallo Creek sensitive biodiversity area. The railway connection would cross the Merri Creek twice and a proposed Boral quarry area and sensitive areas of plains grassy woodlands. Any extension to the E6 would cross sensitive areas of Plains Grassy Woodlands.

B1.5.2 EVALUATION OF NORTHERN INTERCHANGE OPTIONS

These options were developed to try and maximise the area within the *Melbourne @ 5 million* Investigation Area north of the OMR/E6 while still retaining a workable route for the transport corridor. The assessment against objectives is shown in Table B1-9 Northern Interchange Options Analysis.

The most northerly Option I1 was not supported as it would affect the Beveridge/Hume Freeway interchange and push the E14/ OMR interchange into the hills. It would not be optimal for the OMR railway connection north to the Melbourne – Sydney Railway line as it would encroach further into the proposed intermodal freight terminal. It would not perform as well in regard to future development in the *Melbourne @ 5 million* Investigation Area as it would increase severance and affect the ability to develop land to the north.

Option I2a was not supported primarily because of the technical difficulties associated with linking the OMR railway line to the Melbourne – Sydney Railway line through the south side of Bald Hill. In addition, it would impact on environmentally sensitive areas of Kalkallo Creek and Merri Creek (with the continuation to E6) and the regionally significant Melbourne Water retarding basin. It would pass though the proposed Boral Quarry site.

Option I2b was not supported as it would cut further into Bald Hill and have similar impacts to Option I2a, although is would have far less impact on environmentally sensitive areas (with the continuation to E6).

Although Option I3 would perform better than Option 3c in regard to the future development of the *Melbourne @ 5 million* Investigation Area, it was not supported as the lower terrain would increase the technical difficulty of linking the OMR railway line to the Melbourne – Sydney Railway line. Option I3 would adversely affect the northern end of Kalkallo township, interfere with the Donnybrook Road/Hume Freeway interchange ramps, impact on environmentally sensitive areas of Kalkallo Creek and Merri Creek (with the continuation to E6), although to a lesser degree than all other options except I2b, and the regionally significant Melbourne Water retarding basin. The OMR rail link would pass though the proposed Boral Quarry site.

The Option 3c Hume Freeway interchange site was confirmed as the optimal interchange site, even though it would not perform as well as Option I3 in regard to the future development of the *Melbourne @ 5 million* Investigation Area. The OMR railway connection north to the Melbourne – Sydney Railway line route north of Bald Hill is more advantageous for this connection. In addition the OMR freeway design can take advantage of the high ground at the Hume Freeway at this point to accomodate rail requirements. This option would avoid sensitive environmental areas in relation to the OMR alignment. However, later environmental assessment indicates that this option would impact (with the continuation to E6) an environmentally sensitive Plains Grassland and Plains Grassy Woodlands area either side of Merri Ck. This is further discussed in relation to the E6 Options.

TableB1 - 9 Northern Interchange Options Analysis (Assessment Donnybrook Rd to East of Melbourne - Sydney Railway line)

Objective Sub objective	Option I 1 Hume Freeway most northerly Interchange		Option I 2a Hume Freeway central Interchange		Option I 2b Hume Freeway central Interchange		Option I 3 Hume Freeway most southerly Interchange		Option 3c Hume Freeway	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	From Donnybrook Rd, north parallel to Old Sydney Rd to north of Gunns Gully Rd to Hume Fwy interchange south of Beveridge, across Merri Creek towards Donnybrook Rd		From Donnybrook Rd, north parallel to Old Sydney Rd then along Gunns Gully Rd, to Hume Fwy interchange south of Bald Hill, across Merri Creek towards Donnybrook Rd		From Donnybrook Rd, north parallel to Old Sydney Rd then along Gunns Gully Rd, to Hume Fwy interchange further south of Bald Hill, across Merri Creek towards Donnybrook Rd		From Donnybrook Rd, north parallel to Old Sydney Rd through Melbourne Water retarding basin, to Hume Fwy interchange further north of Kalkallo, across Merri Creek towards Donnybrook Rd		From Donnybrook Rd, north parallel to Old Sydney Rd to north of Gunns Gully Rd but south of I1, to Hume Fwy interchange around Donovans Lane, across Merri Creek towards Donnybrook Rd	
Objective 1: Serves Key international transport hubs, eg. Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Not optimal as rail would impact on future Donnybrook / Beveridge Interstate Rail Freight Terminal	Poorly	Would provide connection to future Donnybrook / Beveridge Interstate Rail Freight Terminal	Well	Would provide connection to future Donnybrook / Beveridge Interstate Rail Freight Terminal	Well	Would limit ability to link to industrial development within existing UGB due to impacts on Donnybrook interchange ramps	Poorly	Would provide good connection to future Donnybrook / Beveridge Interstate Rail Freight Terminal	Very Well
Objective 2: Serves key interstate and major regional destinations	Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg. Werribee, Melton and Mickleham	Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Provides better links to residential and employment growth areas to the north and west of Melbourne eg. Werribee, Melton and Mickleham										
Objective 4: The Project is capable of performing its function	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Objective 5: The project is technically feasible										
Technically feasible road	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory	Yes	Satisfactory
Technically feasible rail	Yes, but not optimal as rail connection to Melbourne - Sydney rail line would be further north	Well	Yes, but not optimal for rail as Bald Hill is to north	Very Well	Yes, but not optimal for rail as Bald Hill is to north	Very Well	Yes, but connection to Melbourne -Sydney Railway line more complex	Very poorly	Yes, provides best rail connections with minimal route length and cut as Bald Hill is to south	Very Well
Terrain constraints	Not as optimal as 3c for Hume Freeway crossing	Well	Yes, Bald Hill to north, but takes advantage of high ground at Hume Freeway	Very Well	Yes, Bald Hill to north, but takes advantage of high ground at Hume Freeway	Very Well	Yes, Lower terrain reduced level impacts on ability to provide underpasses therefore interchange / railway connection makes for 3 levels above existing highway	Very poorly	Yes, Bald Hill to south, but takes advantage of high ground at Hume Freeway	Very Well
To have minimal impact on existing or proposed road infrastructure	Yes, location, allows for rail and road under Hume Freeway	Very Well	Yes, location allows for rail and road under Hume Freeway	Very Well	Yes, location allows for rail and road under Hume Freeway	Very Well	Yes, however would impact on Donnybrook Rd interchange ramps	Very poorly	Yes, location allows for rail and road under Hume Freeway	Very Well
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	1. May avoid greater area of high value biodiversity (endangered Grassy Woodland) for possible E6 extension to west of railway line and Merri Ck 2. Would pass through 2 areas of biodiversity significance east of Mickleham Rd and north of Guns Gully Rd	Very Well	1. Would impact on high value biodiversity area (endangered Plains Grassy Woodland and endangered Plains Grassland) for possible E6 extension to west of railway line and Merri Creek 2. Would pass through 3 areas of biodiversity significance east of Mickleham Rd and north of Guns Gully Rd	Poorly	1. Would largely avoid high value biodiversity area (endangered Plains Grassy Woodland and endangered Plains Grassland) for possible E6 extension to west of railway line and Merri Creek	Satisfactory	1. Would impact high value biodiversity areas around Kalkallo Ck (EPBC species Growling Grass Frog) 2. Would impact greater area of high value biodiversity area (endangered Plains Grassy Woodland) for possible E6 extension to west of railway line and Merri Ck	Poorly	1. Reduced impact on high value biodiversity area (endangered Grassy Woodland) for possible E6 extension to west of railway line and Merri Ck	Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on Post settlement cultural heritage sites	Could potentially affect 4 Heritage Inventory sites	Satisfactory	Could potentially impact 1 Heritage Overlay site	Satisfactory	Could potentially impact 1 Heritage Overlay site	Satisfactory	Could potentially impact 4 Heritage Inventory sites	Satisfactory	Would impact 3 Heritage Overlay sites	Satisfactory
Impact on Aboriginal cultural heritage sites	Could potentially affect 4 Aboriginal heritage sites	Satisfactory	Could potentially affect 3 Aboriginal heritage sites	Satisfactory	Could potentially affect 2 Aboriginal heritage sites	Satisfactory	Could potentially affect 5 Aboriginal heritage sites	Poorly	Would affect 9 artefact scatter sites	Poorly

Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and maximise opportunity for urban development										
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	1. Potentially misses all quarries. 2. These quarry sites will become critical for future development as resources decline in Melbourne's east, more so if western quarries locked up in grasslands. 3. Would impact agricultural enterprises.	Very Well	1. Route would be on boundary between existing Quarry reserve and future resource. Would take most of reserve with railway line. 2. Potential significant compensation issues 3. Would impact agricultural enterprises.	Very poorly	1. Route would be on boundary between existing reserve and future resource. Would take most of reserve with railway line. 2. Potential significant compensation issues 3. Would impact agricultural enterprises.	Very poorly	1. Route would sever future resource. Would take most of area to north with railway line. 2. Potential significant compensation issues 3. Would impact agricultural enterprises.	Very poorly	1. Potentially misses all quarries. 2. These quarry sites will become critical for future development as resources decline in Melbourne's east, more so if western quarries locked up in grasslands 3. Would impact agricultural enterprises.	Very Well
Industrial development Other uses, utilities, service centres	Minimal impact Melbourne Water retarding basin with E14 interchange	Very Well	Minimal impact Melbourne Water retarding basin with E14 interchange	Very Well	Minimal impact Melbourne Water retarding basin with E14 interchange, but would affect northern boundary	Poorly	1. Removes hotel and service station at Kalkallo. 2. Severs Melbourne Water retarding basin may require structure.	Very poorly	Minimal impact Melbourne Water retarding basin with E14 interchange	Very Well
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Minimal impact GET numbers	Very Well	Impacts on houses/properties along Gunns Gully Road.	Very poorly	Impacts on houses/properties along Gunns Gully Road.	Very poorly	Impacts Kalkallo Township	Very poorly	Minimal impact	Very Well
Impact on *Melbourne @ 5 Million* Investigation Areas	1. Would reduce potential residential area to north of OMR 2. Would maximise area for potential residential area to south of Bald Hill	Poorly	1. Would slightly increase potential residential area to north of OMR 2. Would reduce area for potential residential area to south of Bald Hill	Satisfactory	1. Would slightly increase potential residential area to north of OMR 2. Would reduce area for potential residential area to south of Bald Hill	Satisfactory	1. Would maximise potential residential area to north of OMR 2. Would further reduce area for potential residential area to south of Bald Hill to potentially unworkable	Very Well	1. Would slightly increase potential residential area to north of OMR 2. Would slightly reduce area for potential residential area to south of Bald Hill	Satisfactory
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Would impact on Merri Creek	Satisfactory	Would impact on Bald Hill and Merri Creek	Poorly	Would impact on Bald Hill and Merri Creek	Poorly	Would impact on potential future use of retarding basin for passive recreation and Merri Creek	Poorly	Would impact on Merri Creek	Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**Would leave smaller blocks for development in all sectors and would not work for rail**	**Poorly**	**Would leave smaller blocks for development in southern sectors and not optimal for rail**	**Poorly**	**Would leave smaller blocks for development in southern sectors and not optimal for rail**	**Poorly**	**Difficult to make this option work**	**Very poorly**	**Optimal route for design and lowest impact on current constraints. Accept not as good for future residential north of Gunns Gully Rd and east of Hume Freeway**	**Very Well**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

UGB: Urban Growth Boundary

EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

USB: Urban Growth Boundary

B1.6 REFINEMENTS TO OPTION 3C

B1.6.1 DESCRIPTION OF REFINEMENTS

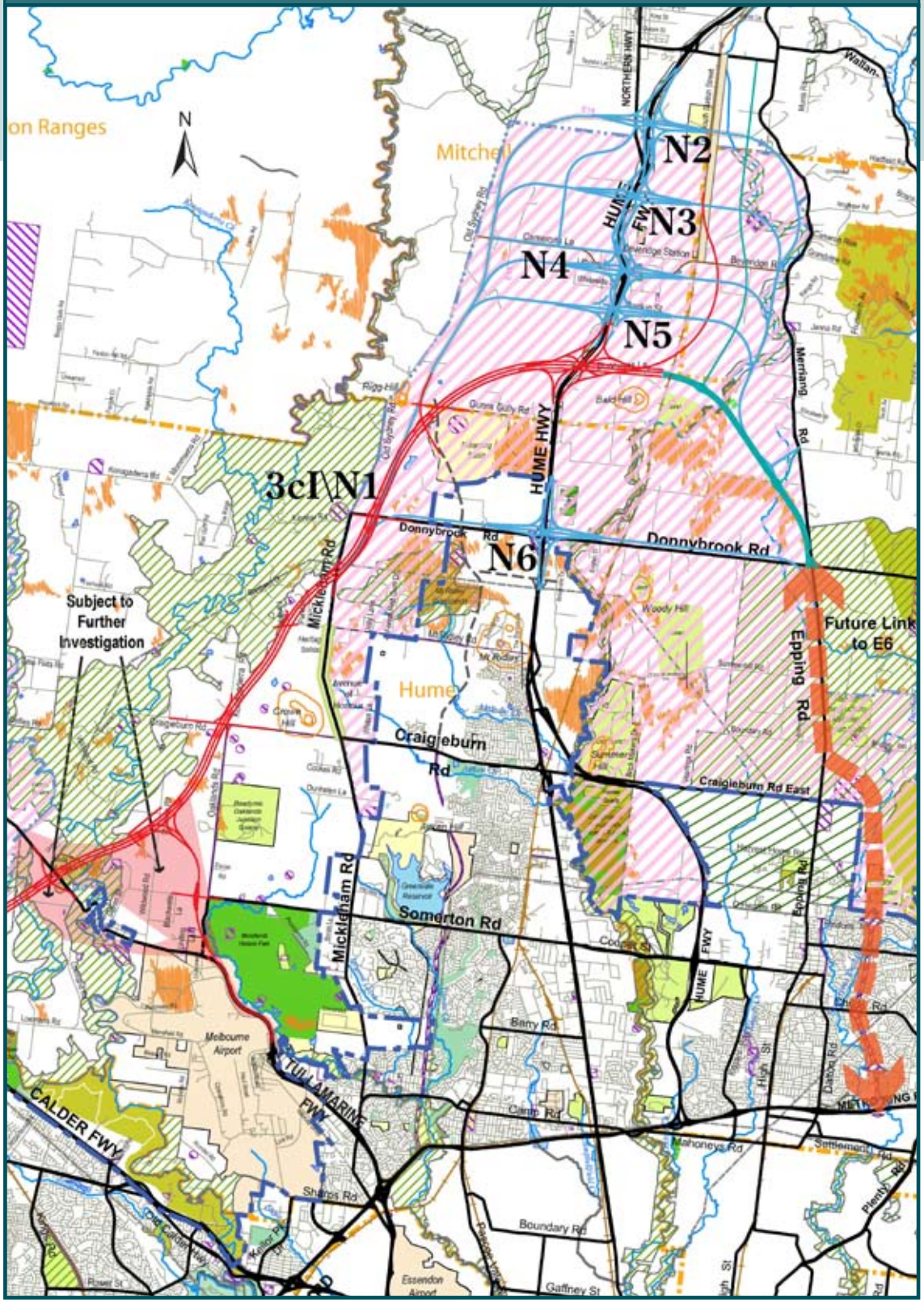
These refinements are shown as option 3cI in the following Figures B1-12, 13 and 15.

Prior to the assessment of further options, changes to the route were made as the development of the design progressed. Some changes were in response to engineering problems, for example, the changes in location of the railway links and the deviation of Riding Boundary Road to make this interchange work. Most were in response to consideration of the supporting arterial road network that would need to link to the OMR.

Thus the interchange proposed at Black Forest Road was moved to the more strategically located Greens Road. The north-south orientated interchange at Troups Road was moved to Boundary Road as it would become a strategic east – west arterial link along with Leakes Road, linking the northern part of the *Melbourne @ 5 million* Investigation Area north of Werribee with the Melton Growth Area at Toolern and the Investigation Area north and south of the Western Freeway, via Mt Cottrell Road. In order to protect the northern area of the Western Plains Grasslands, it is proposed that Mt Cottrell Road be the main north-south arterial road and the roads between it and the OMR remain 2 lane, 2 way rural roads.

Interchanges were developed between the Western and Calder Freeways at Taylors Road and the Melton Highway. Refinements were made to a potential freeway to freeway interchange with an extended Tullamarine Freeway.

FIGURE B1-12: NORTHERN CORRIDOR OPTIONS



B1.7 NORTHERN CORRIDOR OPTIONS OMR/E6 N1-N6

B1.7.1 DESCRIPTION OF OPTIONS N1-N6

These options were a further more detailed examination of options in the north to maximise the development opportunities in the *Melbourne @ 5 million* Investigation Area by increasing the area not separated by the OMR/E6 corridor. The very early Option 1d (previously discarded) was revisited and reworked. These options are shown in Figure B1-12 Northern Corridor Options.

Option N1 is Option 3cI (Option 3c with changes to the interchanges).

Option N2 (improved Option 1d) would extend the corridor to the north roughly parallel with Old Sydney Road , then it would swing round to a freeway to freeway interchange with the Hume freeway just north of the current Hume Freeway/Northern Highway interchange, continue across the proposed Donnybrook/Beveridge Interstate Rail Freight Terminal just north of Beveridge on the east side of the Melbourne – Sydney Railway line, swing round roughly parallel with Merriang Rd, veering slightly west to skirt the Hills between Glenburn Road and Grants Road before joining Epping Road. The Northern Highway would no longer link into the Hume Freeway but would be diverted to link to a possible extension of the E14 route. The proposed southern ramps on the Wallan - Whittlesea Road /Hume Freeway interchange would need to be braided with the new interchange. The railway line could not be connected to the Melbourne – Sydney Railway line or the Donnybrook/Beveridge Interstate Rail Freight Terminal at this location and would need to remain in the Option N1 location.

Option N3 would situate the OMR/E6/Hume Freeway interchange approximately midway between Option N2 and Camerons Lane/Beveridge Road, crossing the Donnybrook/Beveridge Interstate Rail Freight Terminal further south. The interchange would cut into the north side of Mt Fraser. The railway line could not be connected to the Melbourne – Sydney Railway line or the Donnybrook/Beveridge Interstate Rail Freight Terminal at this location and would need to remain in the Option N1 location.

Option N4 just south of Mt Fraser would impact the township of Beveridge.

Option N5 just to the north of Option N1 would impact a significant part of Beveridge to the south and through the Hume freeway corridor.

Option N6 would replace the existing Hume Freeway/Donnybrook Road interchange with a freeway to freeway interchange at Kalkallo, extending to the north of the township. The freeway would be to the south side of Donnybrook Road with Donnybrook Road acting as an access road but unlikely to have direct access to the Hume Freeway. The railway line could not be connected to the Melbourne – Sydney

Railway line or the Donnybrook/Beveridge Interstate Rail Freight Terminal at this location due to the steeper grades between Donnybrook Road and Donovans Lane and would need to remain in the Option N1(3cI) location.

B1.7.2 EVALUATION OF NORTHERN OPTIONS N1-N6

The initial evaluation of options against objectives is shown in Table B1-10 Northern Options N1-N6 Analysis.

Options N3, N4 and N5 were rejected as having unacceptable outcomes for the township of Beveridge and the proposed Donnybrook/Beveridge Interstate Rail Freight Terminal.

Options N1, N2 and N6 were examined in more detail.

B1.7.2.1 OPTION N6

Option N6 would perform well against environmental objectives as it would have a lesser impact on sensitive areas of Plains Grassy Woodlands than Option N1 and is considered to be the best option environmentally.

In relation to the objectives for the *Melbourne @ 5 million* Investigation Area it would provide a larger area north of Kalkallo, but once the necessary arterial roads were put in, it would only provide for a very small increase in additional housing.

Although it would provide a shorter ring road that would be advantageous for traffic, overall it would perform very poorly against road function objectives as it would severely impact on the arterial road function servicing future business/industrial areas along Donnybrook Road. It would also significantly impact on Kalkallo township and future industrial development west of the Hume Freeway. This area has already been through extensive planning processes to rezone land both north and south of Donnybrook Road, which have been finalised. It would be a significant issue to require this plan to be revisited.

This option would have a higher impact that the two remaining options on cultural heritage as it would affect one Aboriginal site, an earth feature of level 4 significance and 3 artefact scatter sites of levels 1 and 2 significance. It would also affect 8 Heritage Inventory Sites and 9 Heritage overlay sites all of local significance.

However, the most compelling reason for not supporting Option N6 is that it would not be technically feasible to link the OMR railway line to the Melbourne – Sydney railway line from this location due the steeper terrain grades. The railway would need to remain in the Option N1 (3bI) location which would create a similar separation as the original OMR corridor.

Table B1- 10 Northern Options N1-N6 Analysis (Assessment from Donnybrook Rd, Hume to Donnybrook Rd, Whittlesea)

Objective Sub objective	**Option N1**		**Option N2**		**Option N3**		**Option N4**		**Option N5**		**Option N6**	
	Details	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**	**Details**	**Rating**
Description	OMR to north of Gunns Gully Rd, E6 to south of Donovans Lane , rail in centre of OMR		OMR/E6 near Wallan, rail in N1 alignment, Northern Hwy realigned into Investigation Area, east-west arterial connection to OMR & Hume Fwy		OMR/E6 south of Hume Fwy/ Northern Hwy interchange, rail in N1 alignment, Northern Hwy realigned into Investigation Area, east-west arterial connection to OMR & Hume Fwy		OMR/E6 north of Beveridge, rail line in N1 alignment		OMR/E6 south of Beveridge, rail line in N1 alignment		OMR/E6 along Donnybrook Rd (with service roads), rail in N1 alignment	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airoports, Port of Geelong, other Intermodal freight hubs and freight service economy areas												
Provide road links to Donnybrook/Beveridge Intermodal Rail Freight Terminal (D/BIRFT)	**D/BIRFT has ready access to Hume and OMR via Wallan Rd to Hume in the north and via new North South arterial to OMR/ E6 to south**	Very Well	D/BIRFT has ready access to Hume and OMR via Wallan Rd to Hume in the north and via arterial roads to OMR/E6 to south	Satisfactory	D/BIRFT has ready access to Hume and OMR via Wallan Rd to Hume in the north and via arterial roads to OMR/E6 to south	Satisfactory	D/BIRFT has ready access to Hume and OMR via Wallan Rd to Hume in the north and via arterial roads to OMR/E6 to south	Satisfactory	D/BIRFT has ready access to Hume and OMR via Wallan Rd to Hume in the north and OMR/ E6 to south	Very Well	Indirect access by arterial roads to Hume Freeway and OMR or E6	Satisfactory
Objective 2: Serves key interstate and major regional destinations												
Serves key interstate and major regional destinations	**Would provide good regional and interstate links for road and rail**	Well	Would not provide for Northern Highway (Bendigo) traffic adequately, would only provide access for rail in N1 corridor	Very poorly	Would provide good regional and interstate links for road, would only provide access for rail in N1 corridor	Satisfactory	Would provide good regional and interstate links for road, would only provide access for rail in N1 corridor	Satisfactory	Would provide good regional and interstate links for road, would only provide access for rail in N1 corridor	Satisfactory	Would provide good road access but would become rapidly congested. Would only provide access for rail in N1 corridor	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham												
Impact on *Melbourne @ 5 Million* Investigation Areas. Consideration of area taken out by necessary arterial road and rail network and converted to equivalent number of dwellings	Base area	Satisfactory	Would provide 76 additional houses within IA once additional transport network in place	Satisfactory	Would reduce number of houses by 2343 within IA once additional transport network in place	Poorly	Would reduce number of houses by 1386 within IA once additional transport network in place	Poorly	Would reduce number of houses by 1089 within IA once additional transport network in place	Poorly	Would provide 93 additional houses within IA once additional transport network in place	Satisfactory
Rail (ha)	included in OMR		along Donovans lane 66		along Donovans lane 66		along Donovans lane 66		along Donovans lane 66		along Donovans lane 66	
Freeway and Arterial Roads (ha)	503		684		632		553		521		423	
Total transport area[1] (ha)	503	Satisfactory	750	Satisfactory	698	Very poorly	619	Very poorly	587	Poorly	489	Satisfactory
Total transport area[1] (ha) in IA	503	Satisfactory	497	Satisfactory	698	Satisfactory	619	Satisfactory	587	Satisfactory	489	Satisfactory
Effective equivalent dwelling numbers within IA[2]	6036	Satisfactory	5960	Satisfactory	8379	Very poorly	7422	Very poorly	7049	Poorly	5867	Satisfactory
Assisting Metropolitan growth by providing a network of arterial links in the medium to longer term	Provides a network of arterial links	Satisfactory	Provides a network of arterial links	Satisfactory	Provides a network of arterial links	Satisfactory	Provides a network of arterial links	Satisfactory	Provides a network of arterial links	Satisfactory	Provides a network of arterial links	Satisfactory
Objective 4: The Project is capable of performing its function												
Provides outer ring road function	Provides strategic ring function and provides ready freeway access for new IGA	Very Well	Extends ring route journey - 14.2km. Traffic is likely to choose Donnybrook Rd as alternative east - west link	Very poorly	Extends ring route journey - 10.5km. Traffic is likely to choose Donnybrook Rd as alternative east - west link	Very poorly	Extends ring route journey - 6.2km. Traffic is likely to choose Donnybrook Rd as alternative east - west link	Satisfactory	Extends ring route journey - 4km. Traffic is likely to choose Donnybrook Rd as alternative east - west link	Satisfactory	Shorter ring road	Very Well
Cost $bn (excludes rail costs)	$4.60	Very Well	$5.40	Very poorly	$5.10	Poorly	$4.90	Satisfactory	$4.80	Satisfactory	$4.30	Very Well
Total Length of OMR/E6 (km)	92.3	Very Well	106.4	Very poorly	102.8	Poorly	98.5	Satisfactory	96.3	Satisfactory	86.8	Very Well
Additional length (km) of OMR/E6 (relative to Option N1)			14.2	Very poorly	10.5	Poorly	6.2	Poorly	4	Satisfactory	-5.4	Very Well
Objective 5: The project is technically feasible												
To ensure road design standards are met	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory
To ensure rail design standards are met	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory
To have minimal impact on existing or proposed road infrastructure		Very Well	Requires relocation of Northern Highway	Very poorly	Requires relocation of Northern Highway. Interchange with Hume Highway	Very poorly	Requires relocation of Northern Highway requires deletion of Hume Fwy interchange in Beveridge $30 million	Very poorly	Requires deletion of Hume Fwy interchange in Beveridge	Very poorly	Very Poor - impacts severely on arterial road function servicing future industrial areas along Donnybrook Rd	Very poorly

Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain													
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	1. Impact on native vegetation 2. Minimal impact on VPO 3. Potential impact on Swamp Fire Weed (EPBC listed flora) on OMR rail connection to Melbourne-Sydney rail line	Satisfactory	1. Potential impact on biosite of national significance 2. Impact on native vegetation 3. Potential impact on Growling Grass Frog (EPBC listed species) 4. Impact on Merri Creek	Very poorly	1. Potential impact on biosite of state significance 2. Potential impact on Growling Grass Frog (EPBC listed species) 4. Impact on Merri Creek	Very poorly	1. Potential impact on two biosites of regional significance and one biosite of state significance 2. Impact on native vegetation 3. Potential impact on Growling Grass Frog (EPBC listed species) 4. Impact on Merri Creek	Very poorly	1. Potential impact on biosite of national significance 2. Potential impact on Growling Grass Frog (EPBC listed species) 3. Impact on Merri Creek	Very poorly	1. Potential impact on biosite of national significance 2. Potential impact on Growling Grass Frog (EPBC listed species) 3. Impact on Merri Creek 4. Impact on small areas of native vegetation	Very Poorly
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts													
Impact on post-settlement cultural heritage sites	Impact 3 Heritage Inventory sites all local significance	Satisfactory	Impact 5 Heritage Inventory sites and one Heritage Overlay all local significance	Satisfactory	Not assessed		Not assessed		Not assessed		Impact 8 Heritage Inventory sites and 9 Heritage Overlay sites all local significance	Poorly
Impact on Aboriginal cultural heritage sites	Impact 8 artefact scatter sites	Poorly	Impact 1 artefact scatter site	Satisfactory	Not assessed		Not assessed		Not assessed		Impact one earth feature and 3 artefact scatter sites	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and maximise future development													
Industrial development - Impact on Donnybrook/ Beveridge Interstate Rail Freight Terminal (D/BIRFT)	Rail access from south No impact from OMR	Very Well	Rail access from south OMR alignment bisects Storage and loading areas - minor impact to D/BIRFT	Very poorly	Rail access from south OMR alignment will require access over rail holding yards D/BIRFT will have to 'flip' operations - holding to south and loading at northern end	Poorly	Rail access from south OMR alignment will require access over rail holding yards D/BIRFT will have to 'flip' operations - holding to south and loading at northern end	Poorly	Rail access from south OMR alignment will require access over rail holding yards D/BIRFT will have to 'flip' operations - holding to south and loading at northern end	Poorly	Rail access from south	Very Well
Industrial development - Impact on Donnybrook/ Beveridge Interstate Rail Freight Terminal (D/BIRFT)	Rail access from south No impact from OMR	Very Well	Rail access from south OMR alignment bisects Storage and loading areas - minor impact toD/BIRFT	Satisfactory	Significant impact on Beveridge township. Impacts on Northen Hwy i/change with Hume Fwy	Very poorly	Significant impact on Beveridge township.	Very poorly	Significant impact on Beveridge township.	Very poorly	Significant impact on Kalkallo township. Delete $40m Hume Hwy /Donnybrook Rd i/change	Very poorly
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Minor impact on Gunns Gully Rd communities	Very Well	Significant impact on current residential development in Wallan (south of Wallan Rd) Impacts on Northen Hwy i/change with Hume Fwy	Satisfactory	Significant impact on Beveridge township. Impacts on Northen Hwy i/change with Hume Fwy	Very poorly	Significant impact on Beveridge township.	Very poorly	Significant impact on Beveridge township.	Very poorly	Significant impact on Kalkallo township. Delete $40m Hume Hwy/Donnybrook Rd i/change	Very poorly
Intrusion of external traffic on existing/ proposed development	Not applicable - has been designed to cater for existing and proposed development	Very Well	Northern Hwy traffic diverted through residential area to E14 or OMR or Hume Fwy Bisects freight/logistics area adjacent to D/BIRFT Southern D/BIRFT traffic through residential/business areas	Very poorly	Northern Hwy traffic diverted through residential area to E14 or OMR or Hume Fwy Southern D/BIRFT traffic through residential/business areas	Very poorly	Southern D/BIRFT traffic through residential/business areas	Very poorly	Southern D/BIRFT traffic through residential/business areas	Very poorly	Southern D/BIRFT traffic through residential/business areas	Very poorly
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	4 level interchange with Hume Freeway (note only three levels above Natural Surface)	Satisfactory	4 level interchange with Hume Freeway (note only three levels above Natural Surface)	Satisfactory	4 level interchange with Hume Freeway (note only three levels above Natural Surface) Major excavation for i/change on Mt Frazer and diagonally adjacent hill	Poorly	4 level interchange with Hume Freeway (note only three levels above Natural Surface)	Satisfactory	4 level interchange with Hume Freeway (note only three levels above Natural Surface)	Satisfactory	4 level interchange with Hume Freeway, would impact on Merri Creek	Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**This option rated very well or well in key objectives. It would provide the best transport solution**	**Very Well**	**Would not provide much additional housing in the IA or perform its transport function as a ring road**	**Very poorly**	**Unacceptable impact on Beveridge. Would reduce number of houses in IA and would not perform its transport function**	**Very poorly**	**Unacceptable impact on Beveridge. Would reduce number of houses in IA**	**Very poorly**	**Unacceptable impact on Beveridge. Would reduce number of houses in IA.**	**Very poorly**	**Very high impacts on Kalkallo, limited ability to service industrial areas and heritage impacts outweighed better environmental performance**	**Poorly**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

OMR Outer Metropolitan Ring Transport Corridor
D/BIRFT Donnybrook/Beveridge Interstate Rail Freight Terminal
IA *Melbourne @ 5 Million* Investigation Area

1. Includes rail freeway and arterial roads.
2. Assumes 15% area = local roads, 5% = open space, & 15 dwellings per 'developable' ha

B1.7.2.2 OPTION N2

Option N2 would perform well against environmental objectives as it would have a lesser impact on sensitive areas of Plains Grassy Woodlands than Option N1.

Again in terms of the *Melbourne @ 5 million* Investigation Area it would provide for even fewer additional houses. Moreover it would impact on current residential development in the Shire of Mitchell to the east of Wallan.

Option N2 would perform poorly in its function as it would extend the ring route by some 14 kilometres, so that road traffic would be likely to leave the freeway and use Donnybrook Road instead, as an east-west link. Donnybrook Road is designed to be a 6 lane arterial road with access to the industrial areas either side. With the addition of OMR traffic, it is likely to become congested. In addition the Northern Highway would need to be diverted and the traffic, including heavy trucks, diverted through residential areas to an extended E14 or the OMR or Hume Freeway,

The rail way line could not link to the Melbourne – Sydney Railway line in this location and the original N1 alignment would need to remain for the railway.

Option N1 (3bI) was confirmed as the better option, although it would not perform as well in terms of the environment as it would impact on two areas of Plains Grassy Woodlands. This was considered to be outweighed by its better performance as a strategic ring road and its ability to provide a good link to the Melbourne - Sydney Railway Line and the Donnybrook/Beveridge Interstate Rail Freight Terminal.

While it would provide for fewer houses that the other two options the number was not sufficiently great for this to override the transport advantages. The fact that the other two options could not adequately provide for the railway link and the rail corridor would need to remain in the N1 (3bI) location was a major factor in this decision.

B1.8 CAROLINE SPRINGS OPTIONS

B1.8.1 DESCRIPTION OF OPTIONS CS1 (3BI), CS2, CS3, CS4 AND CS5

In response to a submission received as part of the *Melbourne @ 5 million* planning process a final review was carried out from Boundary Rd to the Calder Freeway to determine whether the transport corridor could be optimised to utilise land closer to the transmission lines next to Caroline Springs and a route west of Plumpton Road was revisited. Further information from analysis of environmental field studies regarding the quality of the grasslands south of the Western Freeway prompted a review of the potential future land use east of Troups Rd which in turn required the consideration of further OMR options. These options are shown on Figure B1 – 13 Caroline Springs Corridor Options.

Option CS1 is Option 3bI. Option CS1 would be located to the west of Hopkins Road to allow access to the OMR from this strategic north-south arterial road from the North Werribee area and retain local access across the Western Highway. The route would veer to the east to link up to the Calder Freeway Interchange in the most direct route.

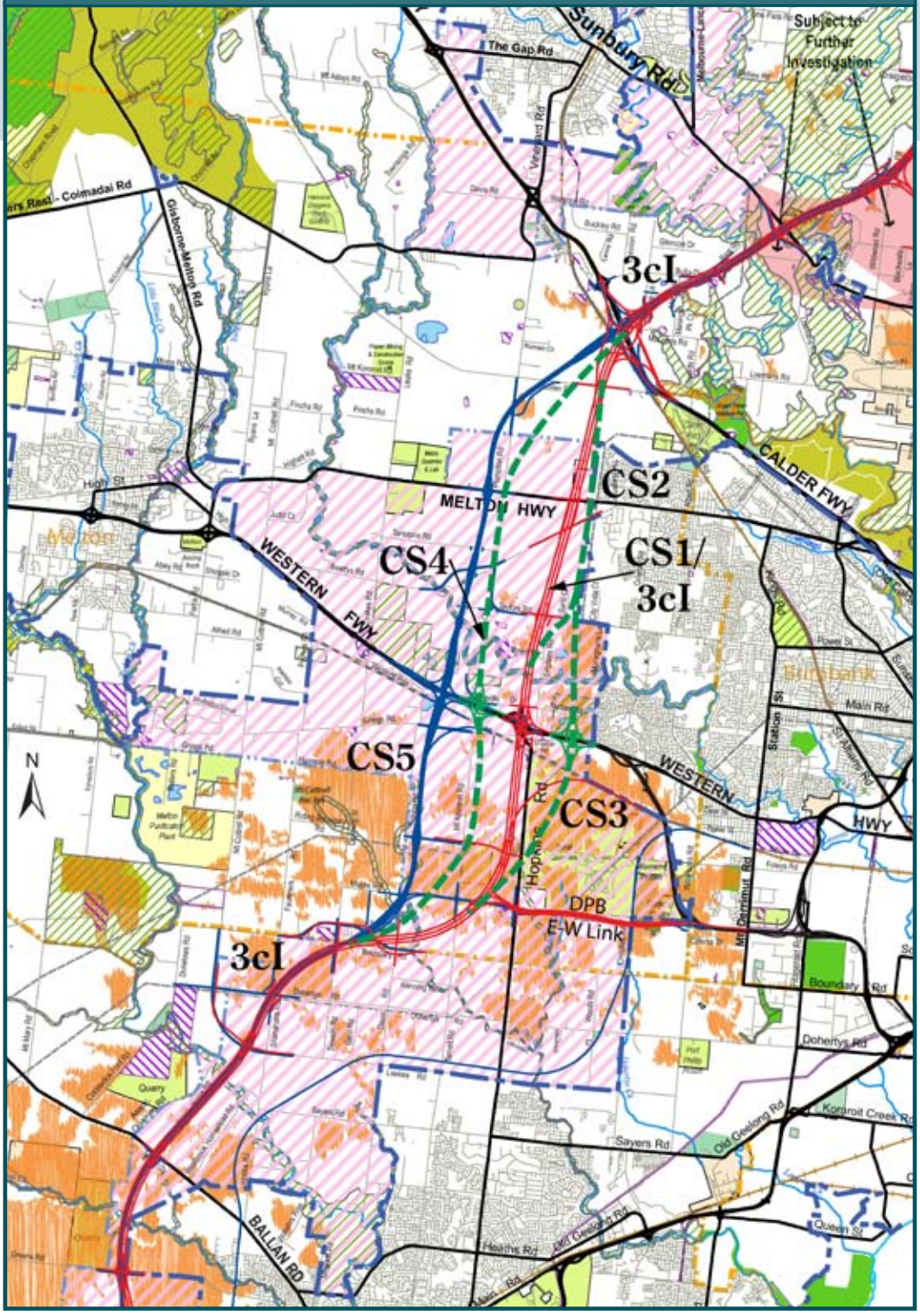
Option CS2 would move the corridor closer to the transmission lines utilising land perceived to be less viable for future development due to its proximity to the transmission lines.

Option CS3 would move the corridor into the Boral quarry, placing the Western Freeway Interchange further east, partly into Caroline Springs with the corridor more closely aligned to the transmission lines over a longer distance. A detail of this option is shown in Figure B1-14 with the CS1 Option to demonstrate the engineering challenges this option would present in relation to Caroline Springs residential development and existing infrastructure.

Option CS4 is a variation on the earlier Option 2 west of Plumpton Road, but remaining east of Mt Atkinson Rd south of the Western Freeway Interchange linking back to 3cI at Boundary Road.

Option CS5 is also a variation on the earlier Option 2 west of Plumpton Road, but remaining east of Troups Rd, south of the Western Freeway interchange and linking back to 3cI at Boundary Road.

FIGURE B1-13: CAROLINE SPRINGS CORRIDOR OPTIONS



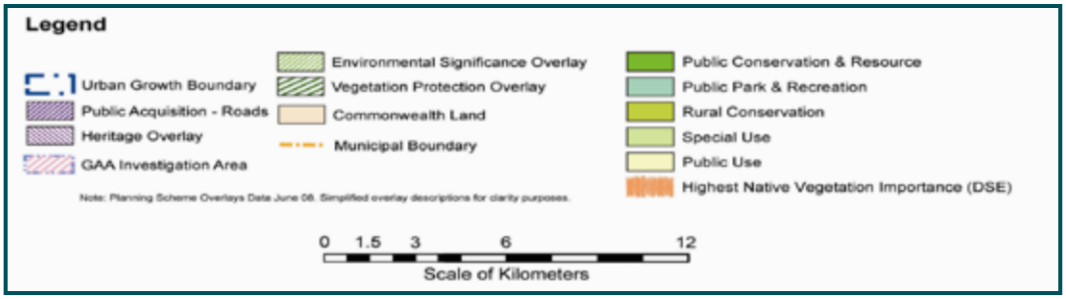
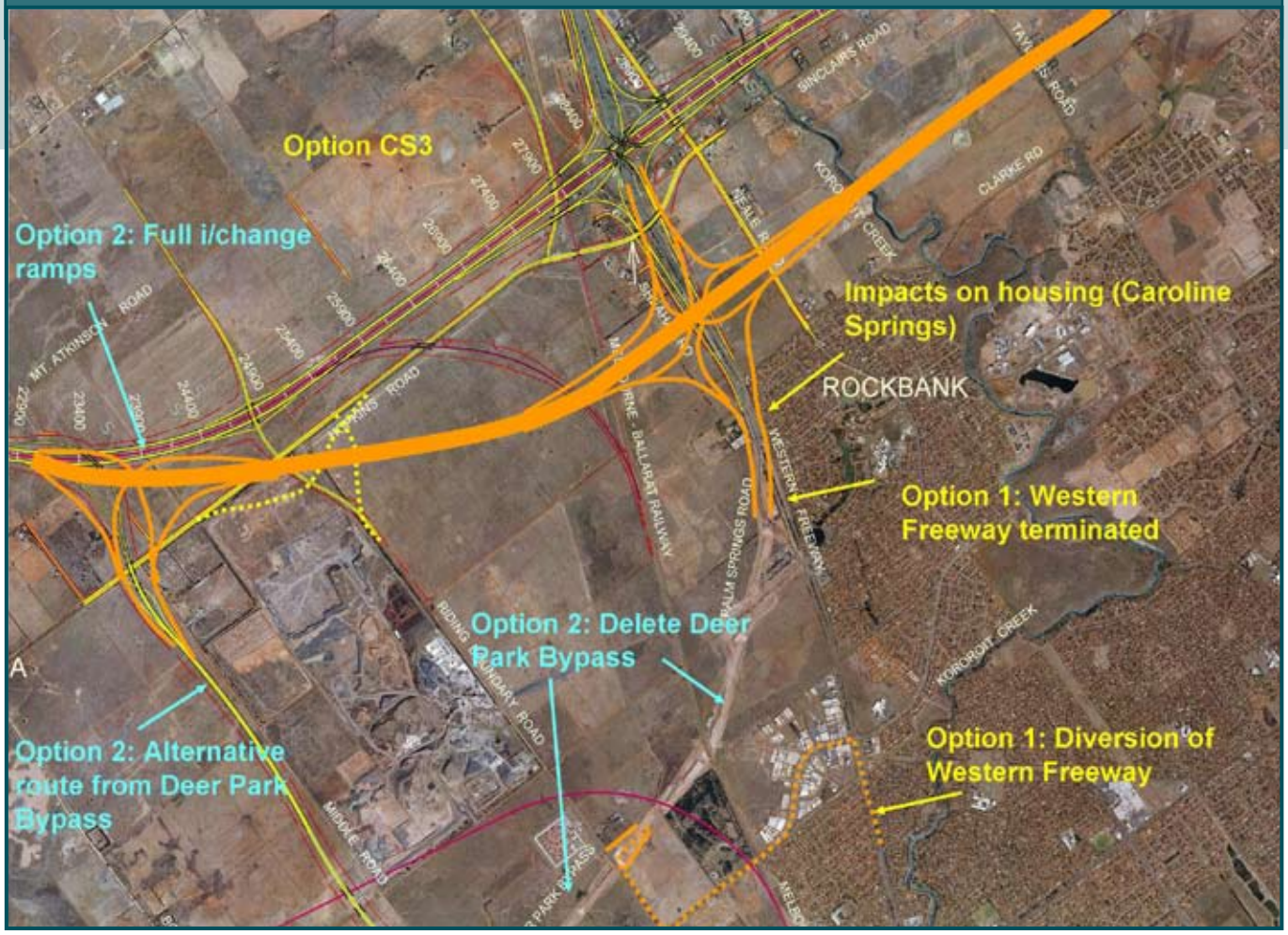


FIGURE B1-14: DETAIL OF WESTERN FREEWAY INTERCHANGE OPTIONS CS1 AND CS4



B1.8.2 EVALUATION OF OPTIONS CS1 (3BI), CS2, CS3, CS4 AND CS5

The evaluation against objectives is shown in Table B1-11 Caroline Springs Options Analysis.

Option CS1 would be a more direct line and would require the acquisition of 46 houses/businesses and affect two temples. It would have a greater impact on the grasslands than Option CS4 and CS5 as following field studies, the grasslands in this area were found to be of marginally higher quality. However, overall the environmental assessment downgraded the quality of the grasslands between Troups Road and Hopkins Road. Thus the need for the OMR to be located so far east on environmental grounds was diminished. This also allowed for a superior future land use in terms of the *Melbourne @ 5 Million* Investigation Area, which was expanded slightly.

Thus Option CS1 would no longer provide the best performance outcome in terms of environmental impacts and future land use. Therefore the trade offs with respect to social and cultural impacts and impacts on existing infrastructure were no longer tenable and option CS1 was discarded.

Table B1- 11 Caroline Springs Options Analysis (Assessment from Boundary Rd to Calder Freeway)

Objective Sub objective	Option CS1 - Details	Rating	Option CS2 - Details	Rating	Option CS3 - Details	Rating	Option CS4 - Details	Rating	Option CS5 - Details	Rating
Description	Central option, would be located just west of Hopkins / Sinclairs Roads. Complete redesign of Hopkins Rd interchange at Western Freeway, interchanges at Middle Rd (east - west link), Riding Boundary Rd, Taylors Rd, Keilor - Melton Rd and overpass at Beattys Rd and Holden Rd.		Central option - modified - would be located just west of Hopkins / Sinclairs Roads when crossing Western Freeway, then deviated east to parallel the power lines, north of the Western Fwy. Northern interchanges and over passes moved east.		Eastern Option, would be located east of Hopkins road through Boral quarry, then parallel to power lines, north of the Western Freeway. Interchange and overpass locations moved east.		Western option, would be located in vicinity of Plumpton / Mt Atkinson Roads. Interchange and overpass locations moved west.		Far Western option, would be located in vicinity of Plumpton / Troups Roads South. Interchange locations Riding Boundary Rd, Western Freeway, Beattys Rd, Keilor-Melton Rd, changed configuration Calder Freeway, overpasses at Greigs Rd and Plumpton Rd with realignment of Holden Rd.	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas			Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Objective 2: Serves key interstate and major regional destinations			Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham			Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Objective 4: The Project is capable of performing its function			Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment		Not relevant to this assessment	
Objective 5: The project is technically feasible										
To ensure road design standards are met	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory	Would meet road design requirements	Satisfactory
To ensure rail design standards are met	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory	Would meet rail design requirements	Satisfactory
To have minimal impact on existing or proposed road infrastructure	Hopkins Rd interchange removed by freeway to freeway interchange with Western Freeway	Satisfactory	Hopkins Rd interchange removed by freeway to freeway interchange with Western Freeway	Satisfactory	1. Western Fwy interchange impact current Hopkins Rd interchange. 2. Major impact on Deer Park Bypass (DPB) interchange with Western Freeway (WF). OMR could link to either DPB or WF but not both. 3. Option 1: OMR links to DPB WF would terminate. WF would link south along Westwood Drive to Riding Boundary Rd then access the DPB via a new half diamond interchange with DPB at Riding Boundary Rd 4. Option 2: OMR links directly to WF. Delete DPB connection to Western Freeway. Provide alternative East West freeway link to OMR with northerly ramps from East West link. This is an indirect connection with an additional trip distance of approximately 3km through 3 sets of traffic lights	Very Poorly	Freeway interchange with Western Highway would continue to impact Hopkins Rd interchange	Satisfactory	Would require realignment of Western Highway to avoid significant impact of interchange on homes in Rockbank	Satisfactory
To have minimal impact on existing Rail infrastructure	Current interchange requires lowering of Ballarat - Melbourne railway line by 3.8m. Will not interfere with any existing or proposed stations and can be graded out without pumping and before Regional Rail Line (RRL) links in	Satisfactory	Current interchange requires lowering of Ballarat - Melbourne railway line by 3.8m. Will not interfere with any existing or proposed stations and can be graded out without pumping and before Regional Rail Line (RRL) links in	Satisfactory	Interchange would continue to require lowering of Ballarat - Melbourne railway line by approx. 3.8m. Rail line is on 1% downslope and more difficult to grade out to west. May also interfere with proposed Christies Rd station on Regional Rail Line (RRL) to east	Very Poorly	Would not require lowering of Ballarat - Melbourne railway line.	Satisfactory	No impact on existing rail line. Link would be consistent with any future rail staion at Hopkins Rd.	Satisfactory
Impacts on network and road access	Provision made for local access Hopkins Rd and across Western Freeway (Hopkins Rd; Neale Rd; extension of Deanside Dr; Greigs Rd) Sinclair Rd, Riding Boundary Rd various other local accesses. Some consolidation anticipated	Satisfactory	Provision made for local access Hopkins Rd and across Western Freeway (Hopkins Rd; Neale Rd; extension of Deanside Dr; Greigs Rd) Sinclair Rd, Riding Boundary Rd various other local accesses. Some consolidation anticipated	Satisfactory	Access restoration at Caroline Springs would be extremely complicated as ramps could potentially extend to Caroline Springs Boulevard and any new access road would cut across the existing local road network. May simplify north south access across WF through remodelled Hopkins Rd interchange. It may not be feasible to provide an interchange at Hopkins Rd/ Riding Boundary Rd. Therefore this road may have to be terminated	Poorly	No additional impact. May simplify north south access across Western Freeway through remodelled Hopkins Rd interchange	Satisfactory	No additional impact. Would simplify north south access across Western Freeway through remodelled Hopkins Rd interchange plus better connection from Western Fwy to local communities. Would need to link Taylors Rd to Beattys Rd. Could provide good access to potential railway station via Greigs Rd	Satisfactory
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain										
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	Would avoid a large patch of Plains Grassland (endangered). Potential to impact on 4 EPBC listed flora species	Satisfactory	Would impact on a small amount of Plains Grassland (endangered). Potential to impact on 2 EPBC listed flora species	Satisfactory	Would impact on a significant areas of Plains Grassland (endangered). Potential to impact on 3 FFG listed flora species. Would impact on Boral grasslands offsets	Poorly	Would have a reduced impact on Plains Grasslands (endangered), passing through lower value vegetation than Option CS1	Well	Would impact on a small amount of Plains Grasslands (endangered)	Satisfactory

To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory	Acceptable with suitable mitigation	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts										
Impact on post-settlement cultural heritage sites	Would affect 1 Heritage Inventory site and 5 Heritage Overlay sites, local significance	Satisfactory	Would affect 1 Heritage Inventory /Heritage Overlay site of State significance and 4 Heritage Inventory sites, local significance	Very Poorly	Not assessed		Not assessed		Would affect 1 Heritage Inventory site and 5 Heritage Overlay sites, local significance	Satisfactory
Impact on Aboriginal cultural heritage sites	Would affect 13 artefact scatter sites (2 on East West Link)	Poorly	Would affect 2 additional artefact scatter sites compared with CS1	Poorly	Not assessed		Not assessed		Would affect 11 artefact scatter sites	Poorly
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and maximise future development										
5. Impact on Boral Quarry. This quarry is according to the Department of Primary Industries, one of two regionally significant quarries for the Melbourne metropolitan area. It has a future life of up 100 years. It has permits to conduct operations. Subsequent to mining it is proposed to be used for gas sequestration as a carbon offset. Its overall value would be of many hundreds of $million.	OMR rail link to Ballarat- Melbourne railway line would have future long term impacts on north west corner of Boral quarry plus minor impacts due to local access restoration NW corner Hopkins Rd and deviation of Riding Boundary Rd	Satisfactory	OMR rail link to Ballarat- Melbourne railway line would have future long term impacts on north west corner of Boral quarry plus minor impacts due to local access restoration NW corner Hopkins Rd and deviation of Riding Boundary Rd	Satisfactory	Major impact on Boral quarry due to OMR plus further impact due to rail connection to Ballarat - Melbourne rail line, essentially dividing the quarry into 3 separate parts. Hundreds of $million in compensation expected. Access restoration at Caroline Springs would be extremely complicated as ramps could potentially extend to Caroline Springs Boulevard and any new access road would cut across the existing local road network. May simplify north south access across WF through remodelled Hopkins Rd interchange	Very Poorly	Would lessen impact on Boral quarry as a the OMR rail link to the Ballarat - Melbourne railway line would be further north-west	Very Well	No impact	Very Well
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable	Would impact on 46 houses/ businesses, including a service centre	Poorly	Would impact on 59 houses/ businesses including a service centre	Poorly	May reduce by one or two properties impacts on houses/businesses at Hopkins Rd interchange. Would require acquisition of approx. 160 houses in Caroline Springs. If Deer Park Bypass realigned may impact on businesses at Ravenhall. No additional impact on known potential developments	Very Poorly	Would impact on 41 houses/ businesses (estimated) including at least one service centre; Western Freeway interchange would impact on known development proposal north of Rockbank	Satisfactory	Would impact on 34 houses/ businesses including two service centres (under construction and proposed); Western Freeway interchange would impact on known development proposal north of Rockbank	Satisfactory
Cultural Impacts	Would impact on Hindu Shrine adjacent to a sacred tree. Would also be close to the temple building complex	Very Poorly	Would impact on Murugan Hindu Temple (currently under construction) as well as Hindu Shrine adjacent to tree	Very Poorly						
Impact on *Melbourne @ 5 million* Investigation Areas	Takes account of proposed land uses being considered in *Melbourne @ 5 million* investigation areas	Well	Improvement on CS1 by maximising flexibility for land use outcomes between Melton and OMR	Well	Future improvement on CS2 as some potential to increase flexibility of land use south of railway	Satisfactory	While it allows for the short term expansion of Caroline Springs area, it significantly reduces the flexibility to maximise employment and residential outcomes between Melton and Caroline Springs. An important outcome for Melton is to include improved residential and employment outcomes. Adopting CS4 alignment to the west would embed the historic perceived differences between the two areas	Poorly	Allows flexibility to maximise employment and residential outcomes between Melton and Caroline Springs	Very Well
To protect the character of significant landscapes, open space and recreation values, to the extent practicable		Satisfactory		Satisfactory		Satisfactory	Would result in a 12 m deep cut through saddle adjacent to Mt Atkinson as a landscape impact	Poorly		Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**Would be possible to shift the line to have a lesser impact on the Murugan HinduTemple complex,but would result in a more significant impact on homes along Sinclairs Road, or on potential development land to the north of the Kororoit Creek**	**Very poorly**	**This option is rated very poorly because of its significant impact on the Murugan Hindu Temple complex**	**Very poorly**	**This option is rated very poorly due to the major impacts on Caroline Springs, Boral Quarries and existing infrastructure**	**Very poorly**	**This option is rated poorly due to the adverse long term adverse impact on the future development potential of the growth area**	**Poorly**	**Field survey of grasslands has allowed improved development outcomes in Investigation Area, thus improving the performance of this option**	**Very Well**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

Option CS2 demonstrated that Option CS1 could only be moved marginally to the east, north of the Western freeway interchange to take advantage of the transmission line corridor. This move resulted in an increase to 59 in the number of houses/businesses to be acquired as well as affecting the 2 temples. With the discarding of Option CS1 this option became redundant.

Option CS3 was not supported primarily because it would require the acquisition of some 160 houses in Caroline Springs and would severely affect the Deer Park Bypass. The OMR could only be linked to either the Western Freeway or the Deer Park Bypass.

If it was linked to the bypass then the Western Freeway would have to be diverted via Robinsons Road to the Riding Boundary Rd interchange and northerly ramps built.

If it was diverted on to the Western Freeway much of the Bypass would become redundant resulting in the need for northerly orientated ramps on the east – west connection at Middle Road.

In both cases Option CS3 would require the relocation of the Riding Boundary Road interchange and the realigning of Hopkins Road into the Boral quarry. This would impact on a very large area of this regionally significant quarry and would potentially affect future activities, resulting in large compensation costs.

Option CS4 would impact on less significant vegetation in the Western Plains Grasslands than Option CS1 (following detailed ground survey) and may affect slightly fewer houses/businesses (would require the acquisition of an estimated 41, but based on a design that was not fully developed). However these advantages were considered to be outweighed by this option's poor performance in relation to future development of the *Melbourne @ 5 million* Investigation Area.

Option CS5 was developed to provide a superior outcome for the future development of the *Melbourne@ 5 million* Investigation Area. It would require the acquisition of 34 houses/businesses (including one freeway service centre), would not affect the proposed area of the Western Plains grasslands to be formally protected and would provide a hard boundary between the grasslands and proposed future development. These advantages were considered to outweigh all other impacts and Option CS5 was incorporated into the preferred corridor alignment.

B1.9 SOUTHERN OPTIONS

B1.9.1 REVIEW OF OPTIONS 3B AND 3C SOUTH OF GREENS RD TO PRINCES FREEWAY WEST

In response to a submission received as part of the *Melbourne @ 5 million* planning process from the City of Wyndham, a final review was carried out on Options 3b and 3c south of Greens Road to the Princes Freeway West. These options are shown in Figure B1-15 Southern Corridor Options.

The City of Wyndham considers that the land between these two options should be developed. The land to the north of the Geelong-Melbourne Railway line is within the *Melbourne @ 5 million* Investigation Area.

Option 3b would start at the Little River interchange with the Princes Freeway West , crossing the Geelong-Melbourne Railway line where the OMR railway line would link in, and would run north across Lollipop Creek linking into Option 3c south of Greens Rd. It would pass to the west of the quarries in the vicinity of Wests and Balls Roads.

B1.9.2 EVALUATION OF SOUTHERN OPTIONS

Although Option 3b would impact a greater area of the grasslands, this was offset by the downgrading of the quality of this area following the field survey. While offering marginally extra land (120 ha) for urban development consideration, the future use of the quarry area for long term potential industrial development was also taken into consideration.

From a transport viewpoint, Option 3c would be cheaper by approximately $50 million, while Option 3b would offer a 1.8 km shorter travel distance for traffic travelling along the OMR Transport Corridor to and from Geelong. An assessment of Options 3b and 3c is provided in Table B1-12 Southern Options.

Option 3c would not allow for the future development of the quarry area and with the downgrading of the quality of the grasslands, the future development advantages of Option 3b were considered to outweigh the environmental advantages of Option 3c and this option was discarded.

B1.10 CONCLUSION

Option 3cI was confirmed as the Preferred Option with variation CS5 at Caroline Springs 3b in the Southern Section, Wyndham.

Table B1-12 Southern Options Analysis (Assessment from Princes Freeway West to Greens Road)

Objective Sub objective	Option 3C		Option 3b	
	Details	**Rating**	**Details**	**Rating**
Description	OMR aligned to east of Quarry closer to Werribee. Rail leaves Geelong-Melbourne rail line at grade to link into centre of OMR south of Kirks Bridge Rd.		OMR aligned to west of Quarry closer to Little River. Rail leaves Geelong-Melbourne rail line at grade to link into centre of OMR south of Bulban Rd.	
Objective 1: Serves Key international transport hubs, eg Melbourne and Avalon Airports, Port of Geelong, other Intermodal freight hubs and freight service economy areas	Would provide marginally less direct access from Geelong and Avalon airport (1.8km longer)	Satisfactory	Would provide more direct access to Geelong and Avalon airport	Well
Objective 2: Serves key interstate and major regional destinations	Yes	Satisfactory	Yes	Satisfactory
Objective 3: Provides better links to residential and employment growth areas to the north and west of Melbourne, eg Werribee, Melton and Mickleham	Would provide ready freeway access for new IA at Werribee from Geelong Freeway.	Very Well	More distant from Werribee for access from Geelong Freeway.	Satisfactory
Total Length of OMR Geelong Freeway to Greens Road	7.1km	Very Well	8.1km	Satisfactory
Total length of travel Little River interchange to Greens Road (from Geelong)	12.1km	Satisfactory	10.3km	Very Well
Cost $m (excludes rail costs)	$355m	Very Well	$405m	Satisfactory
Total length of travel Werribee interchange to Greens Road (from Werribee)	10.2km	Very Well	14km	Satisfactory
Difference in rail length of travel from Geelong-Melbourne Railway line to Greens Rd		Satisfactory	Reduces OMR rail distance by approx. 2.8km relative to Option 3c	Very Well
Objective 4: The Project is capable of performing its function				
Provides outer ring road function	Provides strategic ring function	Very Well	Provides strategic ring function	Very Well
Objective 5: The project is technically feasible	Yes	Very Well	Yes	Very Well
Impacts on existing road Infrastructure	Would require deviation of Bulban Rd	Satisfactory	Would require deviation of Little River Road Interchange with Princes Freeway West	Poorly
Technically feasible rail connections	1. Close to Regional Rail Line departure from Geelong-Melbourne Railway line but catered for in design. 2. Better for Geelong- Melbourne Railway line as only need to raise line once	Satisfactory	1. No impacts on Regional Rail Line 2. Would need to raise Geelong - Melbourne Railway line twice	Poorly
Objective 6: Avoid as far as possible, minimise where unavoidable and provide offsets for any Biodiversity impacts to achieve net gain				
To protect species and ecological communities listed under the *Flora and Fauna Guarantee Act 1988* (Vic) and *Environment Protection and Biodiversity Conservation Act 1999* (Cth) and minimise impacts on other indigenous species and ecological communities to the extent practicable	1. Would impact on three smaller sections of native grassland at Black Forest Rd, NW corner of quarry and north and south of rail way line 2. As a result of further modelling there is no longer a need to maximise the area to be considered for future protection in this area. 3. Would impact on floodplain of Lollipop Creek. 4. Would cross into Ramsar Wetland (small area of Western Treatment Plant immediately south of Princes Freeway), but would not have a significant impact on its ecological character as it would be well clear of any wetlands.	Satisfactory	1. Would impact on three larger sections of western plains native grasslands to west of quarry, south of quarry (road and rail separate) and Princes Fwy interchange area, plus one smaller section at Black Forest Rd. 2. Further modelling after field work indicates that the quality of the grasslands in this area is not as high as previously thought therefore there would be a lesser overall effect. 3. Would impact on floodplain of Lollipop Creek. 4. Would cross into Ramsar Wetland (small area of Western Treatment Plant immediately south of Princes Freeway), but would not have a significant impact on its ecological character as it would be well clear of any wetlands. 5. Could potentially impact 1 EPBC threatened fauna species.	Satisfactory
To protect catchment values including surface water quality, stream flow, aquatic health and groundwater values, to the extent practicable	Would affect floodplain of Lollipop Creek. Mitigation measures would enable acceptable performance	Satisfactory	Mitigation measures would enable acceptable performance	Satisfactory
Objective 7: Avoid as far as possible, minimise where unavoidable and prepare a Cultural Heritage Management Plan to mitigate any Cultural Heritage Impacts				
Impact on Post settlement cultural heritage sites	Would affect 3 Heritage Overlay sites and 1 Heritage Inventory site of local significance	Satisfactory	No sites currently registered	Well
Impact on Aboriginal cultural heritage sites	Would affect 1 artefact scatter site and 1 earth feature site. Potential sites at river crossings likely, especially Werribee River	Satisfactory	Would affect 6 artefact scatter sites and 2 earth feature sites. Potential sites at river crossings likely, especially Werribee River	Poorly

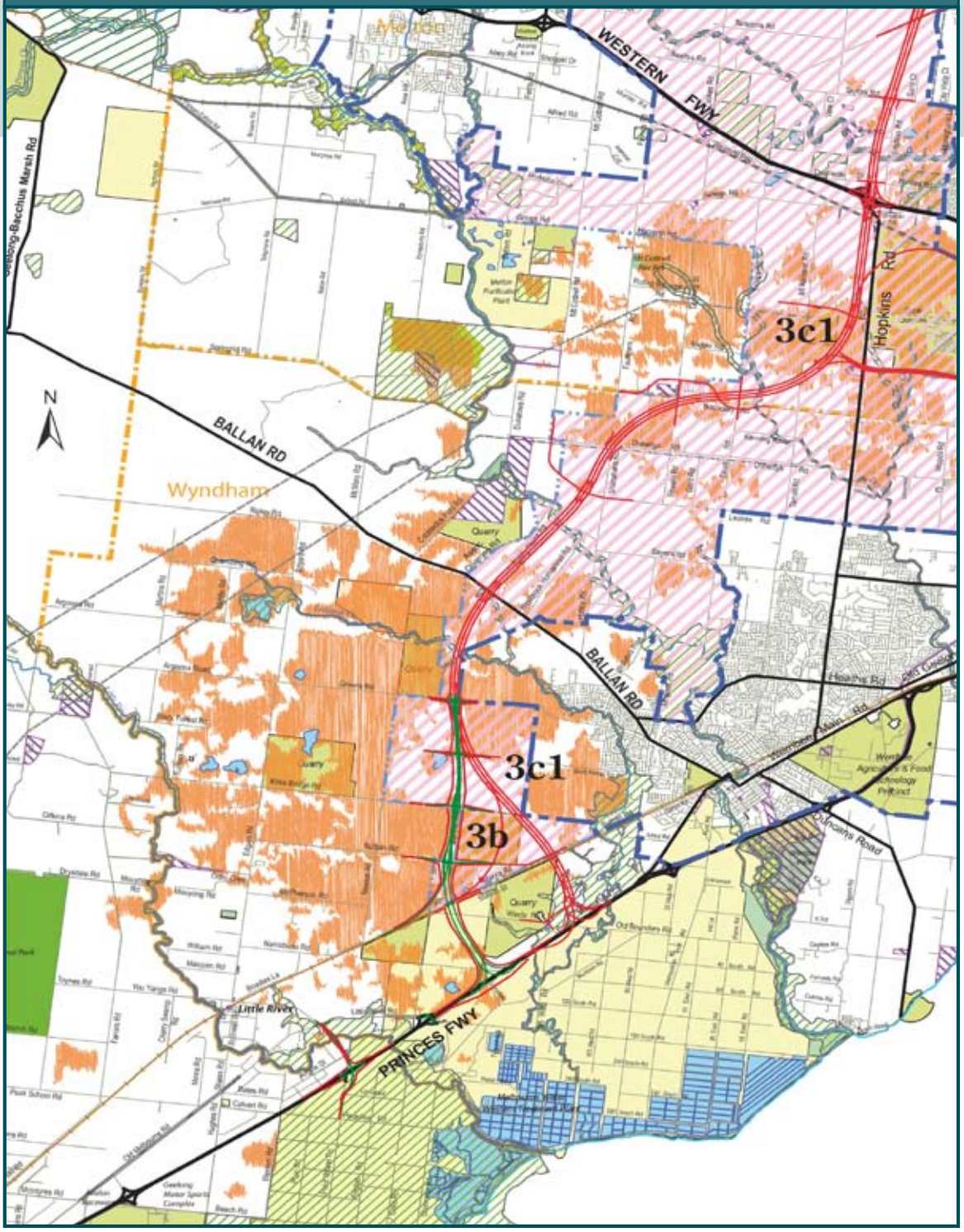
Objective 8: Minimise socio-economic impacts in relation to existing and future residential and industrial development and maximise future development opportunities				
To have minimal impact on employment centres, major quarry resources and agricultural enterprises	Would avoid quarries to west, would impact 18 properties, many of which would be agricultural enterprises	Satisfactory	Would avoid quarries to east, would impact 25 properties many of which would be agricultural enterprises	Satisfactory
Industrial development. Other uses , utilities, service centres, intermodal sites	Would impact City West Water and encroach into Western Treatment Plant land. Would cross sections of high pressure gas pipeline	Poorly	Would impact City West Water and encroach into Western Treatment Plant land. Would cross sections of high pressure gas pipeline	Poorly
Future Land Use in *Melbourne @ 5 million* potential developments	Werribee confined to smaller area for future development	Satisfactory	Could potentially expand urban area to extend industrial development of Weribee to OMR (approx. 120ha) with larger area possible if proposed quarry were to become residential use.	Very Well
Relative difference Freeway (ha) *Melbourne @ 5 million* Investigation Area	0	Very Well	20	Satisfactory
To protect residents' amenity and well-being, and minimise any dislocation of residents, to the extent practicable - Impacts on existing townships on the potential developments	Would impact 4 houses/business premises	Satisfactory	Would impact 1 house/business premises	Satisfactory
To protect the character of significant landscapes, open space and recreation values, to the extent practicable	Would impact on Lollipop Creek	Satisfactory	Would impact on Lollipop Creek	Satisfactory
Air Quality - to have no exceedances of the SEPP intervention levels for all pollutants	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
Noise - increase in noise after construction of noise barriers	Acceptable (with suitable mitigation)	Satisfactory	Acceptable (with suitable mitigation)	Satisfactory
OVERALL OPTION ASSESSMENT	**This option was downgraded from Well to Satisfactory due to the more informed assessment of environmental impacts and future land use. The environmental benefits of this option are no longer considered to be more important than the land use benefits**	**Satisfactory**	**This option was upgraded from Poorly to Well due to the increased benefits for future land use development which were considered to outweigh the environmental impacts on the reassessed grasslands**	**Well**

Note: The precautionary principle has been adopted in relation to the assessment of Aboriginal cultural heritage. Most assessments have been rated as "Poorly" as detailed studies are yet to be carried out.

EPBC: Environment Protection and Biodiversity Conservation Act 1999 (Australian Government)

Ratings of Performance: Very well | Well | Satisfactory | Poorly | Very Poorly

FIGURE B1-15: SOUTHERN CORRIDOR OPTIONS



Legend

- Urban Growth Boundary
- Public Acquisition - Roads
- Heritage Overlay
- GAA Investigation Area
- Environmental Significance Overlay
- Vegetation Protection Overlay
- Commonwealth Land
- Municipal Boundary
- Public Conservation & Resource
- Public Park & Recreation
- Rural Conservation
- Special Use
- Public Use
- Highest Native Vegetation Importance (DSE)

Note: Planning Scheme Overlays Data June 08. Simplified overlay descriptions for clarity purposes.

0 1.5 3 6 12
Scale of Kilometers