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## Author, Reviewer and Approver details

<table>
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<th>Prepared by</th>
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<td>Peter Kelly &amp; Lachlan Piper</td>
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<table>
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<td>Rod Paynter &amp; Russell Roberts</td>
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<th>Date: 02/03/2015</th>
<th>Signature:</th>
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## Distribution

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<td>5.13 Submission 13 – RACV</td>
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<td>5.14 Submission 14 – Department of Environment and Primary industries</td>
<td>26</td>
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5.15 Submission 15 – 1400 Somerton Road  
5.16 Responses to Community Questions  

6. Declaration
### Table 0.1  Details of expert witness

<table>
<thead>
<tr>
<th>Name</th>
<th>Peter Kelly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Address</td>
<td>Parsons Brinckerhoff, Level 15, 28 Freshwater Place, Southbank, VIC, 3006</td>
</tr>
</tbody>
</table>
| Qualifications and experience | 18 years’ experience in traffic and transport engineering  
Master of Transport, Monash University  
Bachelor of Engineering (Civil), University of Melbourne  
Graduate Certificate of Information Technology, Swinburne University of Technology  
Member: Australian Institute of Traffic Planning and Management (AITPM) |
| Key Project Roles |  
- East West Connect Tender Design (2014)  
  - Executive traffic/transport engineer  
- Regional Rail Link - Footscray to Deer Park Alliance (2012)  
  - Principal traffic/transport engineer  
- M80 (Ring Road) Upgrade (2011–2012)  
  - Project director, Principal traffic/transport engineer.  
- Tulla-Sydney Alliance (2009-2012)  
  - Transport planning/modelling manager  
- West Gate Freeway Alliance (2006–2009)  
  - Team Leader – Traffic engineering and modelling |
| Expert’s area of expertise statement | Peter Kelly is an Executive Traffic Engineer with 18 years of engineering experience in Melbourne, Western Australia and regional Victoria.  
Peter has been involved in many of the key road infrastructure planning and design projects recently undertaken in Melbourne, including his role as Transport Planning, Modelling and ITS Manager for the Tulla-Sydney Alliance section of the M80 upgrade. He has also worked on traffic impact assessments for a variety of land-use developments, undertaken road safety audits and completed traffic management strategies. Peter has also spent three years in the mining industry, and a further three years’ experience in business systems analysis, from both a cost and data management perspective.  
Peter’s areas of expertise include: Freeway planning and network strategy, Traffic modelling at the strategic, mesoscopic and microscopic levels, Traffic engineering, planning of Intelligent Transport Systems, major highway projects, including project alliances, and economic options assessments in the pursuit of Value for Money.  
Career highlights include the West Gate Freeway Alliance, Tulla-Sydney Alliance (M80 Ring Road), Tulla-Calder Alliance, Regional Rail Link Package C – Footscray to Deer Park, Springvale Road Rail Grade Separation Alliance and the East-West Link Tender Design. |
| **Other contributors to the report** | Rod Paynter  
Rod has over 25 years’ experience in design, project and construction management including almost 10 years in management/senior roles working on the three largest road projects in Victoria’s history – Eastlink, Citylink and M1 Upgrade.  
Russell Roberts  
Russell is a civil designer with close to 40 years of experience in major highway projects. He has worked on many of Melbourne’s landmark projects including Melbourne City Link, Eastlink, West Gate Fwy M1 Upgrade and others.  
Lachlan Piper  
Lachlan is a transport designer with 3 years of experience in traffic engineering and modelling. He has worked on a variety of traffic impact assessments and strategic, mesoscopic and microsimulation modelling tasks across Australia. |
| **Instructions defining the scope of the report** | Attached as Appendix A |
| **Identity of persons who carried any further tests** | n/a |
1. Introduction

Peter Kelly of Parsons Brinckerhoff has been engaged by VicRoads to provide a traffic and transport engineering assessment in relation to Amendment C190 of the Hume Planning Scheme, which seeks to apply a public acquisition overlay and other planning controls for the future Bulla Bypass and Melbourne Airport Link.

2. Summary of the proposal

This section examines the existing road network, and factors which will affect it over the planning horizon of this project. It will specifically address the need for the Bulla Bypass (BB) and the Melbourne Airport Link (MAL).

2.1 Existing conditions

2.1.1 Road Network

Melbourne-Lancefield Road, known locally as Sunbury Road, is a declared Arterial Road for which the Roads Corporation (VicRoads) is the Responsible Authority. Locally, it extends as the continuation of the Tullamarine Freeway at Melbourne Airport through to Sunbury, via Bulla, where it is locally known as Bulla Road. The road is generally configured as a two-lane undivided carriageway, and runs mostly through unimproved land, including the commonwealth land of Melbourne Airport, green wedge rural zones and farmland. The township of Bulla is bisected by Bulla Road, and presents the only major intensive land use directly adjacent to the road between Sunbury and the Tullamarine Freeway. In peak times Sunbury Road experiences congestion within the Bulla township. The road currently carries approximately 25,000 vehicles per day at Bulla.

Sunbury Road provides one of the two main connections between the greater Sunbury region and Melbourne, the other connection being via the Calder Freeway. The road also provides

- A link to Melbourne Airport from the Hume Highway via Oaklands Rd
- A link to Melbourne Airport from the Calder Freeway via Bulla-Diggers Rest Road

Sunbury (Bulla) Road is currently constrained by the 1+1 lane bridge across Deep Creek, and the steep road grades adjacent to the bridge.

Other major roads in the area include:

- Somerton Road which provides a connection to the industrial region north on Broadmeadows
- Oaklands Road which provides a route to the Hume Freeway and northern Victoria
- Bulla-Diggers Rest Road which connects from Diggers Rest and the Calder Freeway, linking to northwest Victoria
- Wildwood Road, which connects north to local townships

1 VicRoads 2015, refer table 2.1
These roads, in relation to the greater network, are shown in Figure 2.1.

![Figure 2.1 Major roads in the study area](image)

Existing traffic volumes, where available, are shown in Table 2.1.

### 2.1.2 Traffic Modelling

Significant traffic modelling of Options was undertaken by VicRoads. This will be discussed further in Section 2.5. A traffic volume plot of the AM peak period (2 hour) 2011 ‘existing conditions’ case is shown as Figure 2.2, with existing traffic volumes shown in Table 2.1.

It should be noted that the actual link volumes of a strategic model are unlikely to correspond exactly with actual survey results. This is because strategic models are calibrated to screen lines and not to single links. However, the models are very useful for comparing existing with future options in a relative sense.
### Table 2.1 Existing daily, AM peak and PM peak period traffic volumes in the Study area

<table>
<thead>
<tr>
<th>Road</th>
<th>Between</th>
<th>Direction</th>
<th>Daily (vehs)</th>
<th>AM peak (vehs/hr)</th>
<th>PM Peak (vehs/hr)</th>
<th>%hv (daily)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildwood Road</td>
<td>Sunbury Road and Somerton Road</td>
<td>NB</td>
<td>310</td>
<td></td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>190</td>
<td></td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Wildwood Road</td>
<td>north of Somerton Road</td>
<td>NB</td>
<td>310</td>
<td>11</td>
<td>37</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>190</td>
<td>34</td>
<td>13</td>
<td>9%</td>
</tr>
<tr>
<td>Somerton Road</td>
<td>Wildwood Road and Oaklands Road</td>
<td>WB</td>
<td>3700</td>
<td></td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EB</td>
<td>3700</td>
<td></td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Somerton Road</td>
<td>east of Oaklands Road</td>
<td>WB</td>
<td>9500</td>
<td></td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EB</td>
<td>10000</td>
<td></td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Sunbury Road</td>
<td>Wildwood Road and Oaklands Road</td>
<td>WB</td>
<td>12000</td>
<td></td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EB</td>
<td>13000</td>
<td></td>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Sunbury Road</td>
<td>Green Street and Wildwood Road</td>
<td>WB</td>
<td>12000</td>
<td>430</td>
<td>1258</td>
<td>7%</td>
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<tr>
<td></td>
<td></td>
<td>EB</td>
<td>12000</td>
<td>1650</td>
<td>493</td>
<td>6%</td>
</tr>
<tr>
<td>Sunbury Road</td>
<td>east of Oaklands Road</td>
<td>WB</td>
<td>433</td>
<td></td>
<td>1569</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>EB</td>
<td>1635</td>
<td></td>
<td>566</td>
<td></td>
</tr>
<tr>
<td>Oaklands Road</td>
<td>Sunbury Road and Somerton Road</td>
<td>NB</td>
<td>7800</td>
<td></td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>7800</td>
<td></td>
<td></td>
<td>9%</td>
</tr>
<tr>
<td>Oaklands Road</td>
<td>north of Somerton Road</td>
<td>NB</td>
<td>1600</td>
<td>79</td>
<td>271</td>
<td>9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SB</td>
<td>1400</td>
<td>219</td>
<td>96</td>
<td>9%</td>
</tr>
</tbody>
</table>

Source: VicRoads, 2015
Figure 2.2 Modelled 2011 AM peak volumes (2 hours)

Source: AECOM Bulla Bypass/Melbourne Airport Link Planning Study 2013
2.2 Future conditions (‘Do minimum’ Case)

The proximity of the Melbourne Urban Growth boundary to Sunbury is expected to have a significant effect on the population of Sunbury, with intensive development likely to occur over the medium to long term. Currently growth to the north of Sunbury is somewhat constrained by Sunbury Road.

Population and employment growth (2046) in ‘Hume – Sunbury’ and ‘Hume – Craigieburn’ is forecast to exceed the growth expected in the wider Melbourne region, as shown in Table 2.2 and Figure 2.3. While it is expected that the percentage growth in employment will outstrip the percentage growth in population, the absolute number of workers commuting from Sunbury is expected to increase over the period 2011 to 2046.

Table 2.2 Employment and population affecting Sunbury Road

<table>
<thead>
<tr>
<th>Location</th>
<th>Population</th>
<th>2011</th>
<th>2046</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hume – Sunbury</td>
<td>37,602</td>
<td>106,941</td>
<td>+184%</td>
<td></td>
</tr>
<tr>
<td>Hume – Craigieburn</td>
<td>73,777</td>
<td>220,600</td>
<td>+199%</td>
<td></td>
</tr>
<tr>
<td>Total Melbourne</td>
<td>4,149,505</td>
<td>6,281,273</td>
<td>+51%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment</th>
<th>2011</th>
<th>2046</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hume – Sunbury</td>
<td>8,465</td>
<td>27,872</td>
<td>+229%</td>
</tr>
<tr>
<td>Hume – Craigieburn</td>
<td>31,052</td>
<td>46,422</td>
<td>+49%</td>
</tr>
<tr>
<td>Total Melbourne</td>
<td>2,176,155</td>
<td>3,479,035</td>
<td>+60%</td>
</tr>
</tbody>
</table>

(1) See Figure 2.3 for location definitions

Source: AECOM Bulla Bypass/Melbourne Airport Link Planning Study 2013
The 2013 Melbourne Airport Master Plan shows that total trips generated by the airport (comprising passengers + employees + freight) are expected to grow by approximately 90% from 120,000 trips per day in 2013 to 225,000 trips per day in 2033. The expected peak hour increase of passenger trips only (excluding freight and employees) is projected to increase from 6,000 veh/hr to 16,000 veh/hr. To put this into perspective, 16,000 veh/hour is approximately equivalent to the unconstrained capacity of 8 freeway lanes.

When constructed, the proposed Outer Metropolitan Ring Road (OMR) will provide a high quality orbital freeway linking the Princes Freeway near Little River to the Hume Freeway near Beveridge, with freeway interchanges at key roads. The OMR is proposed to pass near the Bulla Township (refer to Figure 2.1). The OMR will provide an alternate route to the airport from Geelong, western Victoria, northern Victoria and the outer northern and western suburbs of Melbourne. The ‘Do Minimum’ OMR includes an interchange with Sunbury Road to the west of Bulla, and an interchange on Craigieburn Road, near Oaklands Road (see Figure 2.4). A construction timeframe for the OMR is not currently known.

Figure 2.4 shows the modelled traffic conditions under the ‘Do Minimum’ reference case. Under this scenario, volumes on Bulla Road in Bulla remain constant; with 2011 volumes in the peak direction (eastbound) of 1,050 vehicles per hour (vph), versus 1,100 vph in 2046. Growth is constrained due to Bulla Road operating at capacity.
2.3 Project proposal

2.3.1 Description

VicRoads has proposed to amend the planning scheme to facilitate the construction of:

- the Bulla Bypass to the north of the Bulla township (approximately 4.7km), which will provide an east-west arterial link between Sunbury and the Melbourne Airport Precinct. The alignment of the Bulla Bypass begins immediately east of Oaklands Road, and follows the path of Somerton Road, with widening on the north side. It diverts northwest of Wildwood Road and turns south to cross Deep Creek before connecting with Sunbury Road west of Bulla-Diggers Rest Road. Ultimately, the Bulla Bypass is expected to be configured as a six-lane divided carriageway.

- the Melbourne Airport Link (MAL), which is a direct connection from the Tullamarine Freeway to the OMR and follows a relatively north-south alignment (approximately 8.0 km). Ultimately, the MAL is expected to be configured as a six-lane freeway with grade separated interchanges at Sunbury Road (partial), Bulla Bypass (full diamond) and OMR (full system interchange).

While both road projects will provide a link from the Airport to the OMR, their functions are distinct. The Bulla Bypass will remove traffic from the currently congested Sunbury Road in Bulla, allowing for safe and efficient movements between Sunbury and Melbourne’s northwest. The MAL is essentially an extension of the Tullamarine Freeway through to the OMR. It will be a road of state significance, and will provide a high speed freeway connection between the Hume Freeway and the airport, via the OMR, and beyond to Melbourne via the Tullamarine Freeway.

Figure 2.5 shows the proposed routes for the Bulla Bypass and MAL.
The project will potentially include signalisation at the intersections of Bulla Bypass with Bulla-Diggers Rest Road, Wildwood Road and MAL Interchange, as well as the Somerton Road / Oaklands Road intersection.

Median breaks with auxiliary turn lanes for U-turns will be provided in both directions either side of Blackwells Lane and Green Street. U-turns are also expected to be permitted at signalised intersections.

2.3.2 Staging

It has been proposed that the Bulla Bypass / MAL projects be constructed as two stages.

The Stage 1 scope includes:

- the development of Bulla Bypass between (just east of) Oaklands Road and Sunbury Road (highlighted yellow in Figure 2.5)
- The duplication of Sunbury Road (configured as a four-lane facility) between the Tullamarine Freeway and Oaklands Road, with a view to upgrade to freeway standard at Stage 2 (highlighted blue in Figure 2.5). This section is considered part of the MAL
- The construction of the part of MAL between Sunbury Road and Somerton Road as a four-lane facility, with the view to upgrade to a six-lane freeway at Stage 2 (highlighted pink in Figure 2.5)
- Provision of a grade separated interchange between Sunbury Road and MAL (highlighted blue in Figure 2.5)

The Stage 2 scope includes:

- The further construction of the northern part of the MAL to the OMR as a freeway standard six-lane facility (highlighted pink in Figure 2.5), including grade separated interchange at Bulla Bypass
- The upgrade of the southern part of the MAL (highlighted pink and blue in Figure 2.5) to a six-lane freeway, including the former Sunbury Road section east of Oaklands Road
- Construction of the realigned Sunbury Road at the Sunbury Road / OMR interchange (shown as a dashed grey line, west of the Bulla Bypass)

It should be noted that Stage 2 will not be required until the OMR is constructed.

Further, it should also be noted that once the OMR / MAL is in place, the benefit of the Bulla Bypass would be eroded as it will be replicated by the OMR/MAL route, i.e. they would essentially fulfil a similar purpose. A high level, Value-For-Money cost-benefit assessment of the Bulla Bypass undertaken by Parsons Brinckerhoff showed that the Bulla Bypass, in its proposed four-lane configuration, would break even in terms of costs and benefits should it be completed at least 20 years prior to the full availability of the OMR / MAL route.
Figure 2.5 Bulla Bypass and Melbourne Airport Link

Source: Amendment C190 Hume Planning Scheme, Explanatory Report, November 2014
2.4 Traffic Modelling

Significant traffic modelling of the proposed Bulla Bypass and MAL was undertaken by VicRoads to aid in the analysis of options and consequent decision making. In particular, the following combinations of options were modelled, including MAL:

- No Bulla Bypass
- Bulla Bypass as options BB1, BB2, BB3 and BB5
- OMR / Sunbury Road interchange as a full and half diamond (southerly ramps only) interchange

2.4.1 Review modelling

2.4.1.1 Overview

The traffic volumes for this study were sourced from the “Bulla Bypass / Melbourne Airport Link Planning Study” report (August 22, 2013).

The strategic modelling was carried out using the Victorian Integrated Transport Model (VITM). Model validation was undertaken for the study area by comparing the 2011 model results to the survey data. The forecast years were 2021, 2031 and 2046.

2.4.1.2 Limitations of modelling

Model calibration / validation

Overall the 2011 modelled traffic volumes were around 10% higher than the surveyed traffic volumes in the AM Peak. It is likely that the model forecast may continue to overestimate the traffic volume in the future years.

Because the model validation focused on the study area, traffic forecasts for roads that are outside the study area are less reliable.

From my review, the modelling has been undertaken within VicRoads accepted guidelines for strategic modelling.

Model stability

Our modelling tests showed that traffic assignment became less stable in 2046 due to the highly congested road network. In other words, small changes to the road network might have significant impacts on route choices in the model. This was confirmed by our discussion with AECOM.

Level of detail

Strategic models are designed to provide an understanding of the likely future traffic flows and their network impacts at high level. The results should be treated with care when using them to undertake traffic impact assessment as detailed level, e.g. turning movements at intersections.

Future network assumptions

The 2046 traffic modelling undertaken includes the following key infrastructure upgrades:

- E14 (or Aitken Boulevard) extension to the M80, including both east facing and west facing freeway ramps to the M80
The Outer Metropolitan Ring Road (OMR)

The M80 upgrade

Upgrade of the Tullamarine Freeway to six-lanes (three-lanes in each direction) between the M80 and Melbourne Airport.

2.4.2 Discussion

Strategic traffic modelling of the proposed Bulla Bypass alignment was undertaken for design year 2046. The option assumes the OMR and MAL are constructed as six-lane facilities.

The modelling shows a comparison between the ‘Do Minimum’ Project Reference Case and the proposed Bulla Bypass alignment Option BB5. These results are provided in Table 2.3.

The table shows the significant decrease in estimated traffic through Bulla township following the construction of Bulla Bypass. Notably, traffic volumes along Oaklands Road are expected to decrease compared to the case where Bulla Bypass is not constructed.

**Table 2.3 2046 Traffic Volumes through Bulla Screenline (Weekday 2-way vehicles)**

<table>
<thead>
<tr>
<th>Year</th>
<th>2046</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calder Freeway</td>
</tr>
<tr>
<td>Do Minimum</td>
<td>77,200</td>
</tr>
<tr>
<td>Option BB5</td>
<td>71,400</td>
</tr>
</tbody>
</table>

Source: AECOM Bulla Bypass/Melbourne Airport Link Planning Study 2013, Table14.

3. Consideration of the alignments

3.1 Evolution of options: Long List

Detailed consideration of the potential alignments for the Bulla Bypass (BB) and MAL was undertaken by VicRoads. The suitability of 12 options under five broad categories was analysed. These were:

- BB options passing to the south of Bulla – Option A, B, unnamed option
- BB options passing to the north of Bulla – Option C, D, H
- BB options passing through Bulla – Option E, F, G, FG
- MAL option – Option I
- Do minimum
VicRoads recommended that the Northern options be taken forward for further analysis, discounting the alternatives as shown below.

- **South (Alignments A & B)**
  - Broadly speaking, southern options were dismissed for their impact on either the future operations of Melbourne Airport, or the impact on culturally sensitive locations. While allowing for a higher east-west movement of vehicles, modelling showed that traffic through Bulla is not reduced under the southern alignments.

- **Through (Alignments E, F & F_G)**
  - It was thought that options through Bulla would eventuate in cost savings, however these options were not appreciably cheaper than the bypass options, and were discounted due to their high social and cultural impacts.

- **North (Alignments C, D & H)**
  - Alignments C and H were progressed for further analysis. Option D was developed in an attempt to lower the price of option C by reducing the total length of bridge required, however the alternative alignment did not save on costs and was discounted.

---

**Figure 3.1 ‘Long List’ Options**

Source: VicRoads August 2011

---

Not shown are the unnamed southern option which follows a more southerly alignment than Option A, the proposed Craigieburn Road extension to the north of the study area, and the Do Minimum upgrades which would be along the existing reserve.
MAL
  - Development of the MAL as an option for bypassing Bulla was not supported, due to its prohibitive cost and as it does not divert enough of the traffic to change the character of the town.

Do Minimum
  - The do minimum case was discounted as it was found that it was not economically viable to undertake road realignment works.

Options to extend Craigieburn Road through to Sunbury were also considered, but were discounted as they fell outside the scope of this project to deliver a Bulla Bypass. While the MAL was discounted as a viable option for a Bulla Bypass, this alignment was subject to further analysis.

3.2 Evolution of Options: Short List

In 2012, five proposed northern alignments, shown in Figure 3.2, were examined in more detail. These options all include the MAL, and include five different options for Bulla Bypass.

Of these options, BB4 was discounted, as it could not integrate with the OMR, required a large bridge structure, and disturbed flora communities of commonwealth significance.

A further option, BB5 was developed. This option included a modified alignment of the western end of Somerton Road to reduce impact on properties and avoid culturally sensitive locations.
3.3 Evolution of options: Final Option

VicRoads undertook an assessment of all options following a review of the various consultants’ reports, and consideration of issues raised by the community, through the community consultation. Option BB5 was chosen as the preferred option which, on balance, had the least impact. A summary of the evaluation is shown in Figure 3.3.

Figure 3.2 ‘Short List’ Options
Source: VicRoads February 2012
<table>
<thead>
<tr>
<th>PROJECT OBJECTIVES</th>
<th>BB1 North/modified</th>
<th>BB1 South</th>
<th>BB2</th>
<th>BB3</th>
<th>BB5</th>
<th>MAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To effectively link the Outer Metropolitan Ring Transport Corridor to Melbourne Airport and employment in Metropolitan Melbourne</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
</tr>
<tr>
<td>2. To support the long term objectives for the future development of Metropolitan Melbourne, including land use objectives for Sunbury</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
</tr>
<tr>
<td>3. To improve safety and functionality of the road network for all road users, including in Bulla township and surrounds</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Very well</td>
<td>Well</td>
</tr>
<tr>
<td>4. To protect and improve residents’ amenity and wellbeing, and minimize any dislocation or severance of communities, to the extent practicable (includes noise)</td>
<td>Moderately well – Well</td>
<td>Moderately well</td>
<td>Moderately well – Well</td>
<td>Moderately well – Well</td>
<td>Moderately well – Well</td>
<td>Moderately well – Well</td>
</tr>
<tr>
<td>5. To minimize impacts on biodiversity, including catchment values/waterways</td>
<td>Well</td>
<td>Well</td>
<td>Moderately well</td>
<td>Moderately well</td>
<td>Moderately well</td>
<td>Very well</td>
</tr>
<tr>
<td>6. To protect existing land uses and the character of significant landscapes, open space, recreational values, to the extent practicable (includes landscape)</td>
<td>Moderately well</td>
<td>Moderately well – Poor</td>
<td>Moderately well – well</td>
<td>Moderately well – Well</td>
<td>Moderately well – Well</td>
<td>Moderately well – Well</td>
</tr>
<tr>
<td>7. To minimize impacts on cultural heritage to the extent practicable</td>
<td>Poor</td>
<td>Poor</td>
<td>Very poor</td>
<td>Very poor</td>
<td>Moderately well</td>
<td>Poor</td>
</tr>
<tr>
<td>8. To support economic performance for the local and regional economy</td>
<td>Well</td>
<td>Well</td>
<td>Moderately well</td>
<td>Moderately well</td>
<td>Well</td>
<td>Well</td>
</tr>
<tr>
<td>No. of houses impacted</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>TEC ($M) (Ultimate 6 lanes)</td>
<td>$245</td>
<td>$235</td>
<td>$175</td>
<td>$180</td>
<td>$200</td>
<td>$140</td>
</tr>
<tr>
<td>BCR</td>
<td>17</td>
<td>2.1</td>
<td>2.1</td>
<td>2.2</td>
<td>2.4</td>
<td>7.8</td>
</tr>
</tbody>
</table>

Figure 3.3 Summary of assessment of ‘Short List’ options
Source: Bulla Bypass / Melbourne Airport Link to Outer metropolitan Ring Road Planning Study, Planning and Environment Assessment Report

The ultimate BB5 and MAL alignments are shown in Figure 3.4.
Figure 3.4 Bulla Bypass (BB5) and Melbourne Airport Link
4. Review of the Ultimate Proposal

4.1 Melbourne Airport Link

The alignment of the MAL is controlled by a set of constraints. These include:

- Minimising impact on Commonwealth land (Melbourne Airport),
- Minimising impact on Woodlands Historic Park,
- Avoiding the cemetery behind 75 Oaklands Road,
- Avoiding the St Mary’s Church site, corner of Oaklands Road and Sunbury Road,
- Maintaining a reasonable distance between the MAL / Bulla Bypass interchange and the Oaklands / Somerton Road intersection,
- Avoiding historic markers and homesteads,
- Avoiding sites of cultural significance.

In order to minimise impact on the airport land, the route needs to be located to the east of the cemetery. Locating the route to the west of Oaklands Road minimises the impact on the Woodlands Historic Park. Consequently, there is a fairly narrow band of approximately 250m between the cemetery and Woodlands historic park where the alignment of the MAL can be located.

North of the cemetery, there is some leeway to move the MAL within the boundary of the east-west elongated properties fronting the west side of Oaklands Road, south of Somerton Road.

In order to minimise impact on properties, the MAL has been aligned east of 1290 Somerton Road. Pushing the MAL further west would impact on this property, plus additional east-west elongated properties fronting the east side of Blackwell’s Lane, along with those already impacted by the current alignment. The alignment has been aligned to the western side of the narrow band at Somerton Road, in order to maintain a reasonable distance to the Oaklands Road / Somerton Road intersection.

Given the constraints, it is clear that VicRoads has tried to minimise property impacts through the corridor.

4.2 Bulla Bypass – Option BB5

The widening of Somerton Road to cater for the Bulla Bypass between Oaklands Road and Green Street has been done on the north side of Somerton Road to minimise impact on properties. Any widening on the southern side would have impacted 13 properties, while on the north side of Somerton Road, the number of properties impacted is seven, of which none are the smaller allotments evident on the south side.

Option BB5 includes diverting the alignment into 145 Green Street in order to minimise the length of the Deep Creek Bridge and avoid sites of cultural significance and sensitivity.
Bulla Bypass curves to join with the current Sunbury Road alignment for Stage 1. When the OMR is constructed (Stage 2), the Bulla Bypass will swing further to the west to meet the new OMR / Sunbury Road interchange. This realignment has been designed so the OMR and interchange can be built without impacting on Sunbury Road traffic during construction.

4.3 Geometric Review

The drawings (document no’s 3004912-ID-0046-140227 and 3004912-ID-0047-140227) were checked for design speeds of 90km/h (Bulla Bypass BB5) and 110km/h (MAL). These design speeds are considered appropriate.

Horizontal and Vertical Alignment checks for Bulla Bypass and MAL revealed:

- Horizontal Minimum Radii conforms with AGDR part 3 table 7.5 for both (BB5 90km/h) and (MAL 110km/h)
- Vertical crest curve K value checked for Desirable Minimum RT=2.0s (table 8.7). There were a number of non-conformances observed. These are listed below:
  - MAL Alignment Kcrest 110km/h minimum K=83.6
  - I.P. 10596.928 K=66.6
  - Bulla Bypass Kcrest 90km/h minimum K=42.9
    - I.P. 52094.445 K=41.5
    - I.P. 54600.000 K=33.3

Recent urban projects have been designed at the posted speed limit due to geographical constraints and better compliance with management of roadways using ITS.

A check against lesser standard of 80km/h (BB5) and 100km/h (MAL) reveals that the current design would conform.

- 80km/h Kcrest for RT =2.0s minimum K = 29.3
- 100km/h Kcrest for RT=2.0s minimum K = 60.8

Overall, there does not appear to be any geometric issues with the Reference Design that cannot be addressed at detail design stage of the project.

4.4 MAL / Bulla Bypass Interchange

The Bulla Bypass / MAL interchange has been designed as a single point diamond. This is shown in Figure 4.1.

A single point diamond is an alternative layout to the conventional diamond interchange. A conventional diamond interchange is configured as two signalised interchanges (one on each side of the freeway overpass), intersecting the arterial road and freeway ramps. There are often operational inefficiencies common to this arrangement, due to the two intersections being required to operate in tandem, and consequent dead green time on some movements.

An alternate arrangement is the single point diamond interchange. The single point diamond interchange configuration allows the right turns from the east and west approaches to operate concurrently, as well as the
north and south approaches concurrently. The single point diamond configuration allows the flexibility for the intersection to then operate as a single point intersection, split phase, or an alternative phase layout to provide the most efficient operation.

**Figure 4.1 Layout of Single Point Diamond Interchange at Bulla Bypass / MAL**
5. Consideration of submissions

5.1 Submission 1 – Department of State Development, Business and Innovation

No element of the submission is relevant to traffic and transport matters.

5.2 Submission 2 – 475 Sunbury Road, Bulla

“We purchased 475 Sunbury Rd Bulla because it currently has direct frontages to 3 roads – Sunbury Rd, Loemans Rd and Bulla-Diggers Rest Rd. The proposed BB5 route would mean that we no longer have direct road frontage to Sunbury Rd…”

Following the construction of Bulla Bypass, the subject property would maintain direct access to Loemans Rd and Bulla-Diggers Rest Rd. It would also front the discontinued section of Sunbury Road, although it is unclear if this cul-de-sac will be retained. Consequently, access to roads on three frontages can be maintained.

5.3 Submission 3 – 120 Sunbury Road

“...I object to the fact that there is NOT a slip stream coming off the Melbourne Airport Link allowing drivers to turn right directly into Sunbury Rd.”

The proposed layout of the MAL / Sunbury Road interchange allows for south facing ramps between Sunbury Road west and the MAL. Provision of north facing ramps at this location is not in scope.

Given the full-diamond interchange at the Bulla Bypass / MAL located approximately 1700m north of the MAL / Sunbury Road interchange, there appears to be little need for additional north facing ramps. In this regard the following is noted:

- Strategic modelling of the suggested north facing ramps shows that negligible traffic would use the ramps. It is noted that the zone sizes in the strategic model for the study area are quite large, so would not reflect local traffic. Trips between the MAL and Bulla township were modelled, and these were shown to travel via the Bulla Bypass and Wildwood Road. In reality, there would only be a small number of trips that would use the ramps.

- In order for north facing ramps to be provided at the MAL / Sunbury Road interchange, the exit ramp from MAL would need to be grade separated from both the MAL and south facing ramps. Given the proximity to the Melbourne Airport, and consequent restrictions on height due to the PanOPS and OLS, the grade separation would need to be deeper than the south facing ramps, which would already need to be submerged. Figure 4.1 shows an example of how such a north facing ramp arrangement may look, which also avoids the St Mary’s Church Historic Site on the northwest corner of the Oaklands Road / Sunbury Road intersection. The works would be significant, potentially in the order of $5-10 million dollars, with minimal benefit.
The Austroads *Guide to Road Design – Part 4C: Interchanges* (2009) provides guidance on the minimum spacing of freeway interchanges, which is 3km on six-lane facilities in urban areas and between 5-8km in rural areas. The *Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings* (2007) adds that “the absolute minimum spacing between successive urban freeway interchanges is 1.5-2.0 km. This is based on the minimum lengths required to accommodate ramps, merge and diverge tapers at ramps, auxiliary lanes and minimum separation between the entry and exit tapers.” In this instance, the proximity of the Bulla Bypass / MAL interchange would result in potential geometric issues due to merging and diverging ramps, and / or weaving issues, depending on traffic volumes and the layout chosen.

The subject property at 120 Sunbury Road, and all adjacent properties, can be accessed easily via Bulla Bypass, Wildwood Road and Sunbury Road.

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**Figure 5.1 Possible layout of north facing ramps at Sunbury Road / MAL interchange**

Given the lack of traffic expected to use the suggested ramps, significant cost with negligible economic benefit, geometric and other issues described above, I see no reason to provide north facing ramps at the MAL / Sunbury Road interchange.

### 5.4 Submission 4 – City of Hume

“**Full duplication of Sunbury Road should be commenced prior to or simultaneously with the delivery of the Bulla bypass**”

The section of Sunbury Road through the Commonwealth Land, i.e. between the Tullamarine Freeway and Oaklands Road will be duplicated as part of Stage 1 and upgraded to freeway standard as part of Stage 2. West of the Bulla Bypass, Sunbury Road will also need to be configured as four-lanes to cater for the expected traffic volumes carried by the Bypass.

“…80 St Johns Road…will lose access once the Outer Metropolitan Ring Road (OMRR) has been constructed.”
I agree, and recommend that the access restoration road along the northern boundary of 265 Oaklands Road should be extended to allow such access. VicRoads has amended this, as shown in Figure 5.2 below.

Figure 5.2   Extension of Access Restoration Road

5.5  Submission 5 – confidential

This submission is confidential. However, from a traffic perspective, the issue is consistent with the response to submissions 6, 8 and 10.

5.6  Submission 6 – 105 Oaklands Road

The issue in this submission concerns the alignment of the MAL through the properties fronting the west side of Oaklands Road between Sunbury Road and Somerton Road.

The road alignment and constraints governing the alignment chosen has been discussed in Section 4 of this Report.

5.7  Submission 7 – Melbourne Airport

No element of the submission is relevant to traffic and transport matters.
5.8 Submission 8 – 135 Oaklands Road

The issue in this submission concerns the alignment of the MAL through the properties fronting the west side of Oaklands Road between Sunbury Road and Somerton Road.

The road alignment and constraints governing the alignment chosen has been discussed in Section 4 of this Report.

5.9 Submission 9 – 1180 Somerton Road

“…the loss of up to nine metres from the front of the garden would have a devastating effect.”

VicRoads has determined an alignment of the Somerton Road tie-in that avoids the proposed impact on the subject property based on the Bulla Bypass / MAL construction. This is shown below in Figure 5.3.

Figure 5.3 Updated Bulla Bypass / Somerton Road tie-in

The geometry of the merge looks to be in accordance with Austroads standards. Part of the merge is located in a large radius (750m). Although not as preferable as being located on a straight, is still acceptable under Austroads guidelines.

However, it is likely that at some point in the future, Somerton Road will need to be duplicated. Should the constraint of no impact on the Woodlands Historic Park be maintained, then this potential duplication would
need to be undertaken on the north side of Somerton Road, thereby necessitating widening on the north side and consequent land acquisition along the frontage.

5.10 Submission 10 – 115 Oaklands Road

The issue in this submission concerns the alignment of the MAL through the properties fronting the west side of Oaklands Road between Sunbury Road and Somerton Road.

The road alignment and constraints governing the alignment chosen has been discussed in Section 4 of this Report.

5.11 Submission 11 – CFA

No element of the submission is relevant to traffic and transport matters.

5.12 Submission 12 – Heritage Victoria

The issue in this submission concerns the alignment of the MAL through the properties fronting the west side of Oaklands Road between Sunbury Road and Somerton Road.

The road alignment and constraints governing the alignment chosen has been discussed in Section 4 of this Report.

5.13 Submission 13 – RACV

No element of the submission is relevant to traffic and transport matters.

5.14 Submission 14 – Department of Environment and Primary industries

‘There will be a negative impact on the public’s ability to access the Living Legend and access for emergency vehicles’

The Woodlands Historic Park is currently access from Oaklands Road. Following the construction of MAL, the park will no longer have direct access to the southern part of Oaklands Road due to the MAL, which bisects Oaklands Road.

It is proposed that access to the Park will remain via Oaklands Road, but will be via the northern section of Oaklands Road. This section of Oaklands Road will be a cul-de-sac, providing property access to those properties on the east/north side of the MAL.

Access to the Woodlands Historic Park will be provided via Somerton Road and Oaklands Road, with an short link road between the Oaklands Road termination at MAL and the existing Park access road.

The concept is shown in Figure 5.4.

5.15 Submission 15 – 1400 Somerton Road

“In relation to our land that has been affected by the Bulla bypass land acquisition…”
Section 4.2 of this statement addresses the reasoning for widening on the north side of Somerton Road. In summary, the widening of Somerton Road to cater for the Bulla Bypass between Oaklands Road and Green Street has been done on the north side of Somerton Road to minimise impact on properties. Any widening on the southern side would have impacted 13 properties, while on the north side of Somerton Road, the number of properties impacted is seven, of which none are the smaller allotments evident on the south side.

**Figure 5.4  Proposed Woodland Historic Park access**

5.16 Responses to Community Questions

The following queries were received during the Community Consultation phase of the Study, at various information sessions, one-on-one interviews, and Bulla Bypass committee meetings between 2011 and 2013.

5.16.1 Question 1

“Access restoration issues relating to the BB5 allowing for left in, left out movements”

VicRoads Response:
BB5 will provide for a reduction in local access due to abutting landowners not being able to negotiate a right turn movement out of the properties. BB5 will provide a number of U-turn movement opportunities which will provide better and safer access.

Author’s Response:

Such a proposal is consistent with the Access Management Policy classification for Bulla Bypass (AMP2), and is considered appropriate.

5.16.2 Question 2

“U turn at Wildwood Road to cater for trucks & semis - signalised intersection with U-Turn provision”

VicRoads Response:

BB5 will provide median breaks for U-turn movement opportunities at locations that assist local (including businesses) access requirements provided they do not compromise safety and road operation.

Author’s Response:

Such a proposal is consistent with the Access Management Policy classification for Bulla Bypass (AMP2), and is considered appropriate.

5.16.3 Question 3

“Median opening at Blackwells Lane - left in, left out with medium (sic) openings to both east and west of Blackwells Lane to allow for U-Turns”

VicRoads Response:

Median breaks are proposed to be provided on BB5 at certain locations/intersections taking into account local access requirements, emergency services requirements, safety and road capacity issues to minimise inconvenience by a divided highway to local residents and business.

Author’s Response:

Such a proposal is consistent with the Access Management Policy classification for Bulla Bypass (AMP2), and is considered appropriate.

5.16.4 Question 4

“Allow for public transport connections between Sunbury and Airport”

VicRoads Response:

BB5 and MAL will provide more predictable and reliable journey times than the existing road network. The proposed arterial road/freeway will have greater capacity than existing road infrastructure. Provision of Public Transport facilities between Sunbury and the Airport will need to be considered by Public Transport Victoria.

Author’s Response:

I agree with VicRoads response.
5.16.5 Question 5

“Discourage ‘rat run’ in peak hour along Cahill Street once the BBS is operational”

VicRoads Response:

By providing more predictable and reliable journey times on BB5 and MAL, it is expected that “rat running” through local roads will be reduced.

Author’s Response:

I agree with VicRoads response.

5.16.6 Question 6

“Pedestrian and bicycle connections with local roads and the airport was identified”

VicRoads Response:

Pedestrians and cyclists will be accommodated by a 3m shared path along the side of BB5 and MAL. The shared path will connect to existing trails within the Woodlands Historic Park and connect to the Melbourne Airport and the Principle Bicycle Network.

Author’s Response:

I agree with VicRoads response.

5.16.7 Question 7

“Consider moving the Somerton Road interchange further east to minimise impacts on houses”

VicRoads Response:

VicRoads has reviewed the design and alignment at this location and has shifted the Right of Way to reduce the impact on 1290 Somerton Road.

Author’s Response:

VicRoads has responded to the request.

5.16.8 Question 8

“Oaklands Road duplication - can it fit within the existing road reservation”

VicRoads Response:

Oaklands Road is no longer required to be duplicated.

Author’s Response:

I agree with VicRoads response.
5.16.9  Question 9

"Identified the alignment to extend the Somerton Road reserve across Deep Creek"

VicRoads Response:

VicRoads preferred alignment, BB5, begins east of Oaklands Road and generally travels west along Somerton Road with widening on the north side, diverts north between Wildwood Road and Green Street before turning south and crossing Deep Creek and connecting with OMR interchange.

Author's Response:

I agree with VicRoads response.

5.16.10  Question 10

"Residents concerns with the timing for construction, mainly the issue relates to the BB5 needing to be constructed now to reduce current congestion levels"

VicRoads Response:

Construction of BB5 and MAL will depend on Government funding being made available.

Author's Response:

I have no comment.

5.16.11  Question 11

"Respond to CFA issues raised in its submission to the Roads Corporation in relation to Amendment C190 to the Hume Planning Scheme."

Author's Response:

See Submission 11 at Section 5.11 above.

5.16.12  Question 12

"Estimated timing of commencement and completion of BB5 and MAL"

VicRoads Response:

Waiting for further information on this.

Author’s Response:

I have no comment.
6. Declaration

I have made all the inquiries that I believe are desirable and appropriate and no matters of significance which I regard as relevant have to my knowledge been withheld from the panel.
Appendix A

Instructions given to define the scope of the report