Amendment C243

Hume Planning Scheme
Evidence Report

Sunbury Growth Corridor
Sunbury South & Lancefield Road Infrastructure Contributions Plan

Prepared by: GTA Consultants (VIC) Pty Ltd for Victorian Planning Authority
on 08/10/2020
Reference: V198070
Issue #: A

GTAconsultants

Amendment C243

Hume Planning Scheme
Evidence Report

Client: Victorian Planning Authority

on 08/10/2020

Reference: V198070

Issue #: A

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	08/10/2020	Final	Reece Humphreys	Matthew Raisbeck	Reece Humphreys	

GTAconsultants

Melbourne | Sydney | Brisbane
Adelaide | Perth

CONTENTS

Appendices

Figures

Tables

1. INTRODUCTION

1.1. Background

Amendment C243 makes changes to the Hume Planning Scheme to incorporate the final Sunbury South and Lancefield Road Infrastructure Contributions Plan (ICP). The Amendment seeks to incorporate a supplementary levy ICP which will be applied to the PSP's. Of relevance to my evidence, the ICP is necessary to deliver the infrastructure items that are required within the respective precincts. The infrastructure items listed in the PSP include two new bridge crossings of the Jacksons Creek in Sunbury.

As part of the exhibition process for the Amendment, a number of submissions were received opposing the high cost of the proposed ICP levies primarily around the two bridges.

In October 2015, GTA Consultants prepared a report titled "Strategic Transport Modelling of the Sunbury and Diggers Rest Growth Corridor (Sunbury South PSP 1074 & Lancefield Road PSP 1075)". That report outlined the impacts of potential new road crossings of Jacksons Creek, with nine potential options for works to improve transport in the area.

The modelling work has been revisited as part of this Amendment to reflect changes to land use for metropolitan Melbourne and align with the Sunbury Growth Corridor. These have been circulated in three separate reports in September.

I have now been instructed by Hall & Willcox Lawyers in September 2020 to prepare and provide an expert evidence report to address the key issues for presentation at the upcoming hearing.

1.2. Expert Witness Details

Reece Humphreys BE (Civil)
Director – GTA Consultants
L25, 55 Collins Street, Melbourne
Areas of Expertise: Traffic Engineering & Transport Planning

I have a Bachelor of Engineering degree and almost two decades' experience spanning transport planning, transport modelling, transport engineering, traffic engineering, land use development and strategic assessments. This experience covers a mixture of assignments ranging from traffic and transport modelling on large-scale projects in Melbourne and Sydney to transport planning, engineering analysis, and advice on projects across Australia.

I have completed several projects for the Department of Transport (Vic), VPA, the NSW Roads and Maritime Services (RMS) and a number of local Government agencies that include a series of large regional transport models, strategic corridor planning, congested corridor management and transport corridor planning. I have provided expert evidence for both Government and private clients, as well as on several high-profile transport corridor and growth area panels. I also play an active role in industry organisations; I am the President of the AITPM Victoria Committee and am an inaugural member of the National Council of Transport Modellers Network.

Further details of my experience are provided in Appendix A.

1.3. Relationship to Applicant

I have been retained to provide expert witness services at this hearing for a mutually agreed fee. GTA have previously provided advice to the Victorian Planning Authority (VPA) for the Sunbury Growth Corridor and have prepared a number of strategic transport modelling reports for the Corridor.

1.4. Instructions & Scope of Report

I have been engaged to prepare and present expert traffic and transport evidence as part of the Panel Hearing to consider the Amendment. Prior to preparing this evidence I was briefed by Hall & Wilcox via both verbal and written instructions.

In undertaking an assessment of documents and background materials, I have been asked to prepare an expert witness statement which seeks to address the following:

1. *an overview of your role in any reports prepared to date in relation to the Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan;*
2. *an overview of your role (if any) in relation to the Sunbury South and Lancefield Road Infrastructure Contributions Plan (or the interim ICP);*
3. *whether, and to what extent, your updated modelling has any material impact on the need for, or benefits conferred by, the northern bridge from a traffic and transport perspective (as compared to the modelling considered by the Amendment C207 and C208 Panel);*
4. *the proportion of anticipated future usage of LR-BR-01 and SS-BR-01 on the basis of anticipated traffic generated by future residents and workers within the ICP area, within other growth areas within the Sunbury growth corridor and usage from outside the proposed growth areas; and*
5. *respond to the unresolved key issues identified within submissions, in so far as they are within your expertise including:*
    - *the strategic justification for LR-BR-01 from a traffic and transport perspective;*
    - *the extent to which LR-BR-01 and SS-BR-01 serve a regional, local or broader role in the road network; and*
    - *the nexus between the development of the relevant growth areas and LR-BR-01 and SS-BR-01*

As part of my review, GTA have undertaken additional strategic modelling of the PSP which has been documented in the supplementary reports and summarised within this report, and a review of relevant materials within the exhibited PSP documentation.

1.5. References

In preparing this evidence, reference has been made to the following:

- the Hume Planning Scheme
- reports prepared by GTA Consultants listed in Section 1.6
- relevant Government policies and documents
- various technical data as referenced in this report.

1.6. List of Previous Reports

A list of completed reports that have been prepared by GTA for the Sunbury Growth Corridor are as follows:

1. "Jacksons Creek Road Crossings, Options Assessment & Development" prepared by GTA Consultants, Reference 14M1881000, dated 16 October 2014
2. "Sunbury & Diggers Rest Growth Corridor – Strategic Model Calibration and Validation Modelling" prepared by GTA Consultants, Reference 15M1526000, dated July 2015
3. "Strategic Transport Modelling of the Sunbury & Diggers Rest Growth Corridor (Sunbury South PSP 1074 & Lancefield Road PSP 1075)" prepared by GTA Consultants, Reference 15M1526000, dated October 2015
4. "Sunbury Growth Corridor DCP Modelling Supplementary Report" prepared by GTA Consultants, Reference 16M1998000, dated February 2017
5. "Amendments C207 and C208 Hume Planning Scheme Panel Hearing" prepared by GTA Consultants, Reference V133670, dated August 2017
6. "Sunbury PSP Supplementary Modelling Report" prepared by GTA Consultants, Reference V198070, dated 09 September 2020
7. "Sunbury PSP Supplementary Modelling Report #2" prepared by GTA Consultants, Reference V198070, dated 25 September 2020
8. "Sunbury PSP Supplementary Modelling Report #3" prepared by GTA Consultants, Reference V198070, dated 25 September 2020.

1.7. Tests, Experiments & Assistance

In preparing this evidence, I received assistance from the following people:

Renuka Janga	Senior Modeller	BE M. Tech
Matthew Raisbeck	Associate	BIS Bus

2. WORK COMPLETED TO DATE

2.1. Introduction

As part of my instructions I have been requested to provide *'an overview of your role in any reports prepared to date in relation to the Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan.'* I confirm that I was the Project Director in the preparation of the reports listed in Section 1.6. In addition, the following sub sections provide an overview of the strategic modelling work completed to date in the context of the project.

2.2. Transport Modelling Work Completed

In October 2015, GTA Consultants prepared a report titled "Strategic Transport Modelling of the Sunbury and Diggers Rest Growth Corridor (Sunbury South PSP 1074 & Lancefield Road PSP 1075)". That report outlined the impacts of potential new road crossings of Jacksons Creek, with nine potential options for works to improve transport in the area. These are summarised in Table 2.1.

Table 2.1: Previously Identified Options to Improve Access to Sunbury Growth Corridor

Option	Creek Crossing in Sunbury South (PSP 1074)	Railway Station in PSP 1074 (Jacksons Hill Station)	Creek Crossing in Lancefield Road (PSP 1075)	Railway Station in PSP 1075 (Raes Road Station)	Additional Connection to Calder Highway south of PSP 1074	Outer Metropolitan Ring Road (OMR)
1	✓	✓	✓	✓		Includes OMR
2	✓	✓		✓		Includes OMR
3			✓	✓		Includes OMR
4				✓		Includes OMR
5	✓	✓	✓	✓	✓	Includes OMR
6	✓	✓	✓	✓	✓	No OMR
7	✓	✓		✓	✓	No OMR
8			✓	✓	✓	No OMR
9				✓	✓	No OMR

Note: OMR = Outer Metropolitan Ring Road

The options assessed as part of the 2015 report were undertaken for an interim (2031 @ 75%) and ultimate (2046 @ 100%) development of the PSPs of Lancefield Road, Sunbury South, Sunbury North, Diggers Rest and Sunbury West.

In February 2017, GTA Consultants prepared a report titled "Sunbury Growth Corridor – DCP Modelling Supplementary Report[1]". The purpose of the report and the modelling task was to assess the impact of 25% of the potential future development of PSPs 1074 and 1075 (5000 lots in Sunbury South and Lancefield Road PSPs), and the impact on Sunbury Road and the Sunbury Town Centre for the initial stages of development.

[1] GTA Consultants, Sunbury Growth Corridor DCP Modelling Supplementary Report dated 2 February 2017

Four options for mitigating works were identified and tested to determine the most effective way to accommodate the initial stages of development, while best maintaining the functionality of the road network.

The report concluded that the introduction of the southern Jacksons Creek crossing provides reductions in peak hour traffic flows through the Sunbury Town Centre, as it is an attractive alternative for traffic accessing the Calder Freeway.

The Stage 1 Report circulated on 9th September 2020 found that the *'changes to the projections for metropolitan Melbourne have a marginal impact on the travel patterns for Sunbury at full development, indicating a robust model that is suitable to inform discussions as part of Infrastructure Contributions.'*

2.3. Work completed this year

2.3.1. Overview

All of the work that has informed this report is based on the recent updates documented in the three reports circulated on the 9th of September (Supplementary Modelling Report) and the 25th of September (Supplementary Modelling Report #2 & #3).

Since the completion of the October 2015 report, the land use projections for Metropolitan Melbourne and Victoria have undertaken significant change. Victoria has grown by a million people between 2011 and 2019 and is expected to grow by a further million by 2026. The increased population forecast for Melbourne will have an impact on the level and the movement of traffic across the statistical division.

In this regard, the modelling work was updated to understand the impact to traffic demand in Sunbury as a result of these changes.

All of the updated work was undertaken for a design year of 2046 which assumes full development of the two PSP's and the supporting transport networks including the southern bridge crossing of Jacksons Creek (Option 2 and 5), the northern bridge crossing of Jacksons Creek (option 5), the OMR and road network upgrades within the Sunbury Growth Corridor including Lancefield Road and Sunbury Road.

2.3.2. Land Use Inputs – Metropolitan Melbourne

The population, households, employment and enrolments for the Melbourne Statistical Division are outlined in the Supplementary Modelling Report dated 9th September 2020 which are reproduced in Table 2.2.

Table 2.2: Land Use Inputs for Melbourne Statistical Division in 2046

Model	Population (People)	Household (Dwelling)	Employment (No. of Jobs)	Enrolment (No. of Students)
Sunbury Model (based on 2011 projections)	6,421,000	2,553,000	3,577,000	1,635,000
VIF 2018	8,009,000	3,106,000	4,281,000	2,188,000
Difference	*+1,588,000*	*+553,000*	*+704,000*	*+553,000*

2.3.3. Land Use Inputs – Sunbury Growth Corridor

The land use forecasts and assumptions for the Sunbury Growth Corridor are documented within the Supplementary Report #2. For reference, the land use inputs for the particular precincts are provided in Table 2.3.

Table 2.3 Land Use Projections in the Sunbury Area - 2046

Area	Population (People)	Household (Dwelling)	Employment (No. of Jobs)	Enrolment (No. of Students)
Revised Land Uses				
Sunbury Township	45,915	17,518	9,939	8,002
Sunbury South PSP	32,100	11,470	4,570	2,488
Lancefield Road PSP	22,000	7,965	1,672	11,588
Sunbury West PSP	11,585	3,737	280	463
Sunbury North PSP	26,315	8,489	1,520	925
Total	**137,915**	**49,179**	**17,981**	**23,465**
Previous Land Uses				
Sunbury Township	*45,915*	*17,518*	*9,939*	*8,002*
Sunbury South PSP	*29,370*	*10,490*	*4,113*	*2,853*
Lancefield Road PSP	*21,580*	*7,707*	*1,664*	*11,502*
Sunbury West PSP	*7,155*	*2,650*	*350*	*450*
Sunbury North PSP	*17,373*	*6,205*	*552*	*451*
Previous Total	***121,394***	***44,569***	***16,618***	***23,258***
Difference	**16,521**	**4,610**	**1,363**	**207**

When compared to the previous assumptions, the land use changes amount to an increase of 2,730 people in the Sunbury South PSP, 420 people in the Lancefield Road PSP, 8,942 people in the Sunbury North PSP and 4,430 people in the Sunbury West PSP representing a total increase of 16,521 people. The population increase of 14% is higher than the overall employment (8%) increase and enrolment (1%) increase meaning that there will likely be a need for more residents to travel outside of Sunbury to access jobs and education.

2.3.4. Transport Networks

In order to inform my opinion and the preparation of this report, I have been instructed to model two options, one with all infrastructure provisions and a second without the northern bridge. These are documented within the Supplementary Modelling Reports.

The key network features used for these assessments are summarised in Table 2.4.

Table 2.4: Option 2 and Option 5 Transport Infrastructure Items

Option	Creek Crossing in Sunbury South (PSP 1074)	Railway Station in PSP 1074 (Jacksons Hill Station)	Creek Crossing in Lancefield Road (PSP 1075)	Railway Station in PSP 1075 (Raes Road Station)	Additional Connection to Calder Highway south of PSP 1074	Outer Metropolitan Ring Road (OMR)
2	✓	✓		✓	✓	Includes OMR
5	✓	✓	✓	✓	✓	Includes OMR

The modelled networks and outputs used in this assessment are documented in the three Supplementary Reports circulated in September.

2.4. Previous involvement in Infrastructure Contributions

Other than the preparation of this report, I have had no direct involvement in the preparation of the Sunbury South and Lancefield Road Infrastructure Contributions Plan (or the interim ICP).

3. SITE CONTEXT

3.1. Sunbury Growth Corridor

The Sunbury South and Lancefield Road Precinct Structure Plans (PSP 1074 & 1075) are located in the Sunbury-Diggers Rest Growth Corridor in Melbourne's northwest. Both Sunbury South and Lancefield Road are located in the City of Hume and will ultimately form part of an expansion of Sunbury, along with the Sunbury North, Sunbury West and Diggers Rest PSPs.

The location of the Sunbury and Diggers Rest Growth Corridor in its local context are illustrated in Figure 3.1.

Figure 3.1: Sunbury and Diggers Rest Growth Corridor

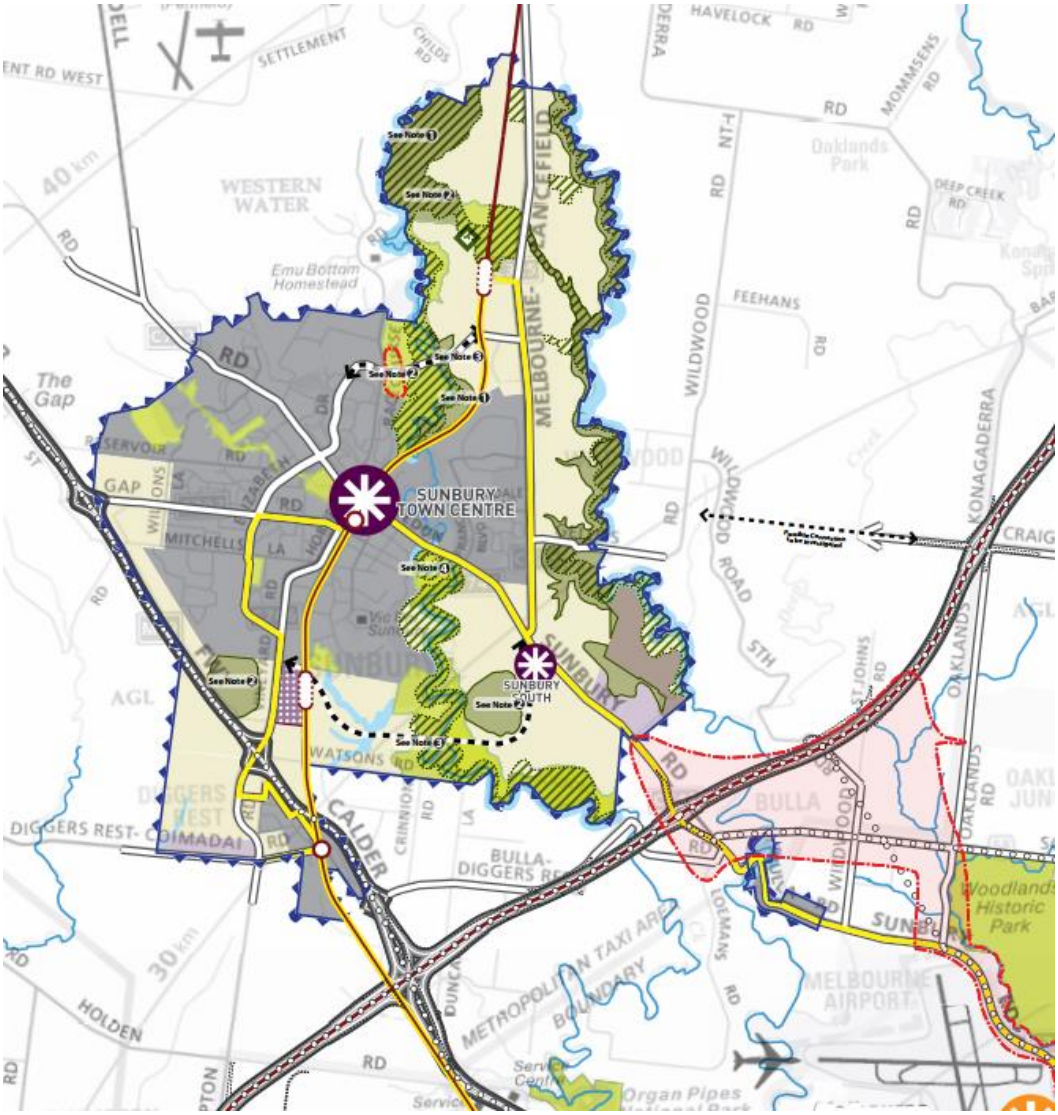
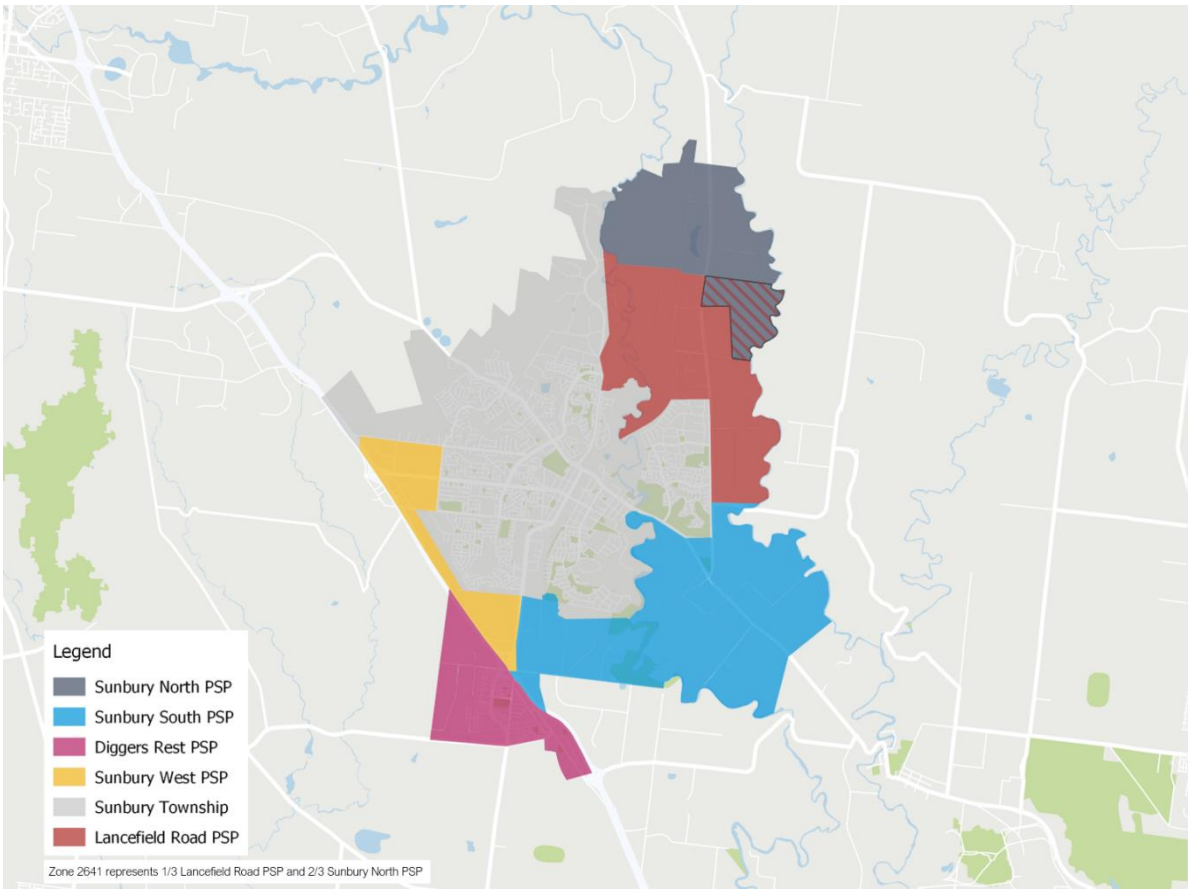


Figure 3.2 on the following page has also been prepared to show the location of the two PSP's in the context of Sunbury, as well as the location of Sunbury West and Sunbury North PSP's which are yet to be gazetted.

Figure 3.2: Sunbury Growth Corridor



Jacksons Creek plays an important role within Sunbury not only in a transport sense but the inability to provide connectivity between existing and future communities within the Corridor. Two bridges crossing Jacksons Creek have been gazetted in the Hume Planning Scheme, one in the Sunbury South PSP and one located in the Lancefield Road PSP.

The Sunbury North PSP, which is yet to commence planning, is located immediately north of the Lancefield Road PSP. It plays an important role in the ultimate assessment of the road network in the corridor, particularly Lancefield Road and the northern bridge. This is explored in more detail within this report.

4. TRANSPORT MODELLING

4.1. Introduction

Strategic transport modelling uses future population, employment and land use data projections to model the impact of changes to land use and road and public transport networks. The Victorian Integrated Transport Model (VITM) is developed by the Department of Transport (DoT) to assist in the planning of road and public transport infrastructure and contains all major freeways, main arterials and connector roads within the Melbourne Statistical Division.

The model is a link-based traffic model that uses a range of metrics to determine how traffic is assigned to the model (mainly these are cost and time). In assigning traffic to the network, the model uses the capacity and speed of the links to assign the shortest and quickest route for trips based on the link capacities. It is not uncommon in strategic models that the capacity of the route be exceeded, in these cases the travel time for the link becomes so congested that alternate paths (or routes) are calculated and determined.

4.1.1. Limitation of Strategic Transport Modelling

It is important to note the limitations that a strategic transport model has. Principally, it is a tool used to evaluate the performance of a transport network based on the travel decisions that people make on a day to day basis. Travel demand is generated in a strategic model based on demographic information including the households, education, retail and employment-based trips.

They are *not* generally used to *predict* exact volumes on roads (or patronage on public transport) rather they are used to analyse the travel *demand* for a specific scenario (and to compare against). They can be used for corridor studies, wide area impact studies, major road projects, major public transport projects, different land use change scenarios, travel demand change / mode shift assessments and policy settings (i.e. public transport fares, parking charges, toll charges etc.).

This project used the model to determine the impacts of the introduction of the Sunbury South and Lancefield Road PSPs with the proposed networks including the two Jacksons Creek crossings.

4.2. Updated Modelling

The updated modelling, using the land use inputs outlined in Section 2.3, focused on the growth in metropolitan Melbourne, forecasts that aligned with the exhibited information for the Lancefield Road and Sunbury South PSP's and updated information for Sunbury North and Sunbury West to align with policy.

Whilst metropolitan Melbourne increased its forecasts by some 1.6 million people since the 2015 analysis, the modelling showed that this population growth had a marginal impact on the daily traffic volumes in and around Sunbury. This highlights that the location of Sunbury whilst on the north western fringe of Melbourne relies heavily on the two key routes into and out of it being Sunbury Road and the Calder Freeway.

Within Sunbury, the land use changes represented a significant increase in the overall population forecast with the majority of this increase located in Sunbury North which represents more than half of the growth. This was a result of the lot yield used to forecast the population aligning with Policy. The population increase of 14% is higher than the overall employment (8%) increase and enrolment (1%) increase meaning that there will likely be a need for more residents to travel outside of Sunbury to access jobs, retail and education uses.

4.3. Who travels on the two bridges?

4.3.1. Northern Bridge (LR-BR-01)

In order to determine the proportion of traffic that travel on the two respective bridges, a Select Link Analysis (SLA) plot was completed. The SLA plot provides information on where trips come from and travel to via a particular link, in this case the northern bridge.

Table 4.1 has been prepared to summarise the proportion of trips that cross the northern bridge that either have an origin or destination in the Lancefield Road, Sunbury North and Sunbury South PSP's. This assessment has been undertaken for the Option 5 modelled scenario which includes both bridges and the OMR.

Table 4.1: Origin and/or destination of Traffic crossing LR-BR-01 (northern bridge) for Option 5

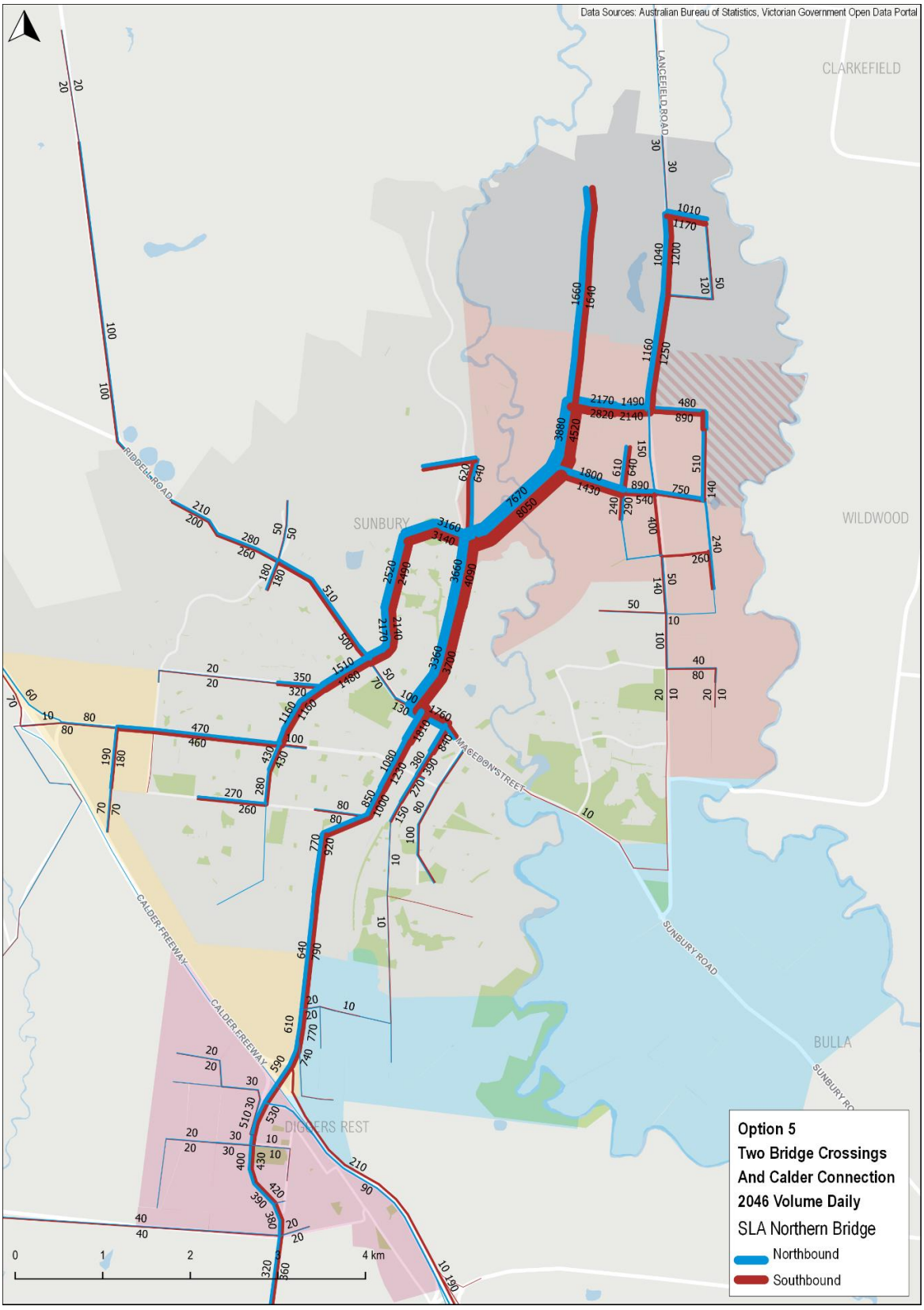
	Lancefield Road PSP (1074)	Sunbury South PSP (1075)	Sunbury North PSP	Sunbury West PSP	Other	Total
	Number of Trips					
AM Peak	1,469	17	1,012	0	7	*2,505*
PM Peak	1,787	20	1,246	0	7	*3,060*
Daily	8,944	103	6,623	4	42	*15,716*
	Proportion (%)					
AM Peak	59%	1%	40%	0%	0%	*100%*
PM Peak	58%	1%	41%	0%	0%	*100%*
Daily	57%	1%	42%	0%	0%	*100%*

The analysis shows that across the day, 57% of trips that travel across the bridge are travelling to or from Lancefield Road PSP. This proportion marginally increases to 59% (AM peak) and 58% (PM Peak) which is due to the congestion on Lancefield Road during the peak times, forcing more users to travel via the bridge which is a quicker route.

Of the remaining traffic utilising the bridge across the day, 42% are travelling either to or from the Sunbury North PSP and 1% are travelling to or from Sunbury South. Four trips across the day form Sunbury West travel across the northern bridge that is not associated with the Lancefield Road or Sunbury North PSP's.

Figure 4.1 has been prepared to graphically show the usage of trips on the northern bridge, with trips travelling northbound on the bridge shown in blue and trips travelling southbound on the bridge shown in red. The high proportion of trips (12,781) travelling on the bridge use it to access the Sunbury Town Centre and Sunbury West PSP with the remaining travelling to Plumpton Road or the Calder Freeway.

Figure 4.1: Select Link Analysis for the northern bridge in Option 5 (Daily Volumes)



4.3.2. Southern Bridge (SS-BR-01)

A Select Link Analysis (SLA) plot was also completed for the southern bridge in Option 5. Table 4.2 has been prepared to summarise the proportion of trips that cross the Southern bridge that either have an origin or destination in the Sunbury South PSP.

Table 4.2: Origin and/or destination of Traffic crossing SS-BR-01 (southern bridge) for Option 5

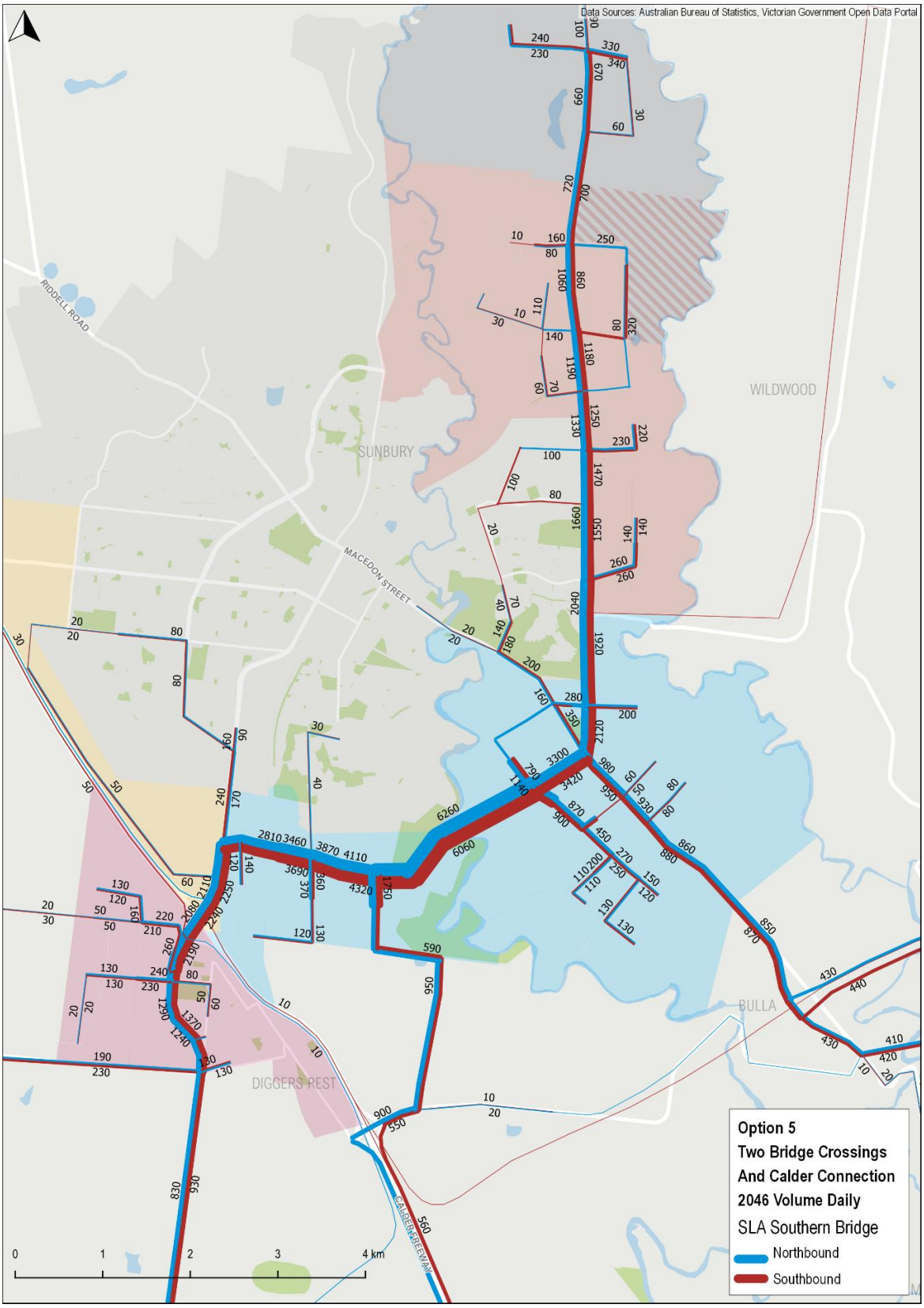
	Lancefield Road PSP (1074)	Sunbury South PSP (1075)	Sunbury North PSP	Sunbury West PSP	Other	Total
	Number of Trips					
AM Peak	156	2,082	140	0	176	*2,554*
PM Peak	192	2,435	183	0	75	*2,885*
Daily	450	11,162	387	2	297	*12,298*
	Proportion (%)					
AM Peak	6%	82%	5%	0%	7%	*100%*
PM Peak	7%	84%	6%	0%	3%	*100%*
Daily	4%	91%	3%	0%	2%	*100%*

The data shows that of all trips that will use the southern bridge throughout the day that 91% either travel to or from the Sunbury South PSP. The daily proportion is higher than the AM peak (82%) and PM peak (84%) which is likely to be due to the congestion during those periods, particularly at the connections to Vineyard Road and Sunbury Road.

A further review of the data suggests that 4% of trips that use the bridge are associated with the Lancefield Road PSP and 3% with the Sunbury North PSP whilst no trips from the Sunbury West PSP are using the southern bridge. For clarity, these represent trips that start in the PSP that cross the bridge that are not associated with the Sunbury South PSP.

Figure 4.2 has been prepared to graphically show the usage of trips on the southern bridge, with trips travelling northbound on the bridge shown in blue and trips travelling southbound on the bridge shown in red. The bridge has almost no traffic that use it to access the Sunbury Town Centre.

Figure 4.2: Select Link Analysis for the southern bridge in Option 5 (Daily Volumes)



5. STRATEGIC JUSTIFICATION

5.1. Policy Review

As Sunbury's population is growing, along with increasing employment and retail activity, there will be more people needing to travel within, to and from Sunbury for work, study and shopping.

As a fringe township of Melbourne, Sunbury will have high frequency rail access to Melbourne via the Melbourne Metro tunnel, and connect regionally by the Calder Freeway and the future Outer Metropolitan Ring Road. A significant amount of planning and strategy work has been completed in the Sunbury Growth Corridor to establish the vision and objectives to respond to growth in population and the investments required to support them. I have reviewed a number of relevant documents that relate to the strategic need for a bridge crossing over Jacksons Creek in Sunbury North which are summarised in Table 5.1.

Table 5.1: Policy context in Sunbury relating to the bridges

Document name	Implications for transport in the Sunbury Growth Corridor
Plan Melbourne	The Victorian Government's Metropolitan Planning Strategy, Plan Melbourne (The Plan) is intended to guide Melbourne's housing, commercial and industrial development through to 2050. The Plan identifies the role that transport plays in underpinning the liveability, efficiency and productivity of Melbourne. The Plan Melbourne strategy is underpinned by six outcomes for Melbourne: 1. Melbourne is a productive city that attracts investment, supports innovation and creates jobs. 2. Melbourne provides housing choice in locations close to jobs and services. 3. Melbourne has an integrated transport system that connects people to jobs and services and goods to market. 4. Melbourne is a distinctive and liveable city with quality design and amenity. 5. Melbourne is a city of inclusive, vibrant and healthy neighbourhoods. 6. Melbourne is a sustainable and resilient city. One of its most referenced policies is "create a city of 20-minute neighbourhoods close to existing services, jobs and public transport" and it also has a policy to "Improve roads in growth areas and outer suburbs". A focus of Plan Melbourne will be ensuring access to the places where people work as well as services such as education, health care, shopping and recreation in the growth areas. The arterial road network in growth areas suburbs will ensure access for businesses to Major activity centres, which includes Sunbury.
Department of Transport Strategic Plan	The Department of Transport (DoT) was formed in 2018 and is the result of combining VicRoads and Public Transport Victoria with DoT, to create an integrated State Government department that will plan, deliver and operate Victoria's transport system. To achieve this DoT has released their first Strategic Plan "Simple, Connected Journeys", which includes the vision, role, challenges and focuses. It noted that for the first time in Melbourne by 2050, as many people will live to the west of the Yarra as they do to the east. The plan has initiatives that include upgrading suburban arterial roads in the north, and west suburbs, cutting travel times and connecting communities. A recent example of this is the Sunbury Road as part of the suburban roads upgrade program which is due for construction in 2021. The inclusion of the two bridges achieves the goal of connecting communities.
Victorian Infrastructure Plan (VIP)	The VIP is a whole of Victorian Government Plan responding to the infrastructure needs of the State and responds to recommendations of Infrastructure Victoria's first 30 year infrastructure strategy. With regards to growth areas, the VIP acknowledges developers make significant contributions to the infrastructure required to service their developments through Infrastructure Contributions Plans and payment of Growth Areas Infrastructure Contributions (GAIC). The Plan recognises, growth must be planned in a way that maintains liveability in all parts of Victoria, including fringe townships. Melbourne's growth areas require new public transport, schools, roads, hospitals and jobs to serve new residents and it is rare that transport infrastructure is provided through GAIC.
Sunbury HIGAP	The Sunbury Hume Integrated Growth Area Plan (HIGAP) is a Hume City Council report that details how the growth areas and their transport and social infrastructure and services will be developed and delivered. The report highlights the need for the Elizabeth Drive extension across Jackson Creek into the Lancefield Road and Sunbury North PSP's – called the Northern Link – to connect communities and improve access to the Sunbury Town Centre. It also recommends the Southern Link across Jackson Creek through Sunbury South PSP as part of the orbital road and public transport connection around Sunbury. The southern link also provides access to the future Jackson Hill railway station.
Growth Corridor Plan	The Sunbury / Digger Rest Growth Corridor Plan was produced in 2012 by the GAA, a predecessor organisation to the VPA. The plan indicates that the two bridges of Jackson Creek are marked as new road link under investigation. These have now been included in the Sunbury South and Lancefield Road PSP's.

5.2. Transport Integration Act (2010)

The Act is Victoria's main transport statute; it sets out the legislative framework for the various transport and land use authorities to work together to achieve a fairer, safer and more environmentally sustainable transport system.

In doing so The Act:

- Unifies all elements of the transport portfolio to ensure that transport agencies work together towards the common goal of an integrated transport system.
- Provides a framework for integrated and sustainable transport policy and operations.
- Recognises that the transport system should be conceived and planned as a single system performing multiple tasks rather than separate transport modes.
- Integrates land use and transport planning and decision-making by extending the framework to land use agencies whose decisions can significantly impact on transport ("interface bodies").
- It enshrines the use of triple bottom line assessments of economic prosperity, social and economic inclusion and environmental stability.

The Act forms an overarching legislative framework for transport related state planning policies and has been integrated within the Victoria Planning Provisions (VPP).

Relevant aspects of The Act (within Part 2 Division 2) for the bridges in Sunbury include:

- Minimising barriers to access so that so far as is possible the transport system is available to as many persons as wish to use it.
- Enabling efficient and effective access for persons and goods to places of employment, markets and services
- Facilitating better access to, and greater mobility within, local communities.
- Provide predictable and reliable services and journey times and minimise any inconvenience caused by disruptions to the transport system.

5.3. VAGO Reports

The Victorian Auditor-General's Office is a public sector audit organisation providing auditing services to the Victorian Parliament and Victorian public sector agencies and authorities.

The office assists the Auditor-General, who is an independent officer of Parliament, appointed under legislation to examine and report to Parliament and the community on the efficient and effective management of public sector resources, and provide assurance on the financial integrity of Victoria's system of government.[2]

Managing Traffic Congestion (April 2013)

The Victorian Auditor General released its audit report on *Managing Traffic Congestion (April 2013)*. The study highlights the primary trip generators in peak periods as those associated with employment and education. It examined how well key institutional arrangements support strategic planning, cross-government coordination for, and management of traffic congestion, and the effectiveness of key strategies and initiatives for managing congestion.

[2] Source: http://www.audit.vic.gov.au/about_us.aspx

Most importantly, the report notes that in recent times:

the absence of a statewide traffic congestion and demand management framework linked to broader transport and land use strategies means it is not clear whether strategic planning and investment by agencies in congestion relief is soundly based, integrated and aligned.

Recent improvements in planning for road use, land use and public transport have significant potential to assist with alleviating road congestion and improving accessibility and productivity.

A key outcome of the VAGO report is the need to plan the road network to ensure that it has the ability to operate and function for vehicles and public transport services.

The report also makes a number of recommendations relating to the Department of Transport (as they were known at the time), Public Transport Victoria and VicRoads insofar as developing a balanced approach to delivering network upgrades under the regulatory framework established under the Transport Integration Act (2010).

Developing Transport Infrastructure and Services for Population Growth Areas (August 2013)

The Victorian Auditor General released its audit report on *Developing Transport Infrastructure and Services for Population Growth Areas (April 2013)*. This audit assessed the effectiveness of state agencies in planning and delivering transport infrastructure and services for population growth areas. It examined whether planning for growth areas is effective in identifying current and future transport needs, and whether implementation and funding strategies support the timely delivery of required transport infrastructure and services.

The audit report noted that PSPs establish a sound framework for identifying required transport infrastructure for new suburbs. These plans have strengthened integration between transport and land use. However, the absence of a supporting funding and implementation strategy integrated with broader statewide transport and land use plans remains a key shortcoming. Without such a strategy the audit noted, would likely see the state transport infrastructure identified within current plans not be provided in a timely manner, and that the growing challenge of inadequate transport infrastructure in growth areas will not be satisfactorily addressed.

5.4. Existing examples of Strategic Bridges connecting communities

In this section I highlight examples of bridges in Victoria that have a strategic nature with their community. Moreover, these examples are intended to highlight the impact that bridges can have on the way people access and travel and connect with their communities.

In north east Melbourne, the limited crossings of the Yarra River have been highlighted as a risk in the preparation for an emergency such as a bushfire. The **Warrandyte** Fire Bridge is a single road crossing of the river is a fire trap and can create a significant bottleneck of traffic. The relevance to this on the Lancefield Road PSP is that the inclusion of the northern bridge will provide alternative travel options in the case of an emergency.

Other examples of limited road connections impacting on-road public transport can be found in the north east of Melbourne. Those with public transport connections that experience delays due to congestion, particularly at bottlenecks at existing crossings of the Yarra River for services between the northern and eastern suburbs, are bridges in **Eltham and Templestowe**. Bus services that run through these areas are inefficient, and indirect in serving the diverse movements of people. The northern bridge will not only provide the ability for direct public transport connections into Sunbury but will reduce congestion on Lancefield Road.

In northern Victoria at **Echuca**, the limit of one crossing point highlighted the diversions without a second alternative river crossing. By not providing an additional crossing the potential for a severed community for Lancefield Road PSP from the Sunbury Town Centre will be a likely outcome.

The term 'community severance' describes the effects of transport infrastructure or motorised traffic as a physical or psychological barrier separating one built-up area from another built-up area or open space.

The problem has gained increased social and political relevance. The emphasis in this case should be on the group of people moving about within the Sunbury Growth Corridor, which includes workers and shoppers, as well as residents.

5.5. Summary

The two bridges will play an important role in the growth of Sunbury which is consistent with the Growth Corridor Plan. I note that the submission from Norton Rose Fulbright which states:

> *Indeed, the Sunbury Ring Road was first touted as a vital road connection for Sunbury commuters three decades ago and proposed to be built by the Hume City Council more than two decades ago.*

I am unaware of the proposal to build the bridge by Council however it is identified in the HIGAP report and is clearly earmarked to support growth. Without population growth there is no need for the bridges.

Having regard for the review and discussion presented in this section of the report, it is clear that there is sufficient strategic justification for both bridges as they align with policy and assist in ensuring that the future residents of the PSP's are able to access services and the community of Sunbury.

Further discussion on the strategic justification is addressed in Section 6 which focuses on the unresolved issues as part of my instructions.

6. UNRESOLVED ISSUES

6.1. Discussion

In order to understand the role that the two crossing serve in a local or regional context, I have investigated a number of factors from a traffic and transport perspective being:

1. The impact that the bridges have on congestion in the Sunbury Growth Corridor
2. Residents access to jobs, amenities and services in Sunbury (Accessibility)
3. The need to provide network resilience for the region.

Each of these items are discussed in more in the following sections.

6.1.1. Congestion in the Sunbury Growth Corridor

Congestion can be measured in many ways, at an intersection, corridor or regional level. For this assessment I will focus on the performance of the broader network with and without the bridge. A way of understanding the performance is via the total vehicle kilometres travelled (VKT), vehicle hours travelled (VHT) and average speeds for the Sunbury & Diggers Rest Corridor which have been extracted from the model and provided in Table 6.1.

Table 6.1: Network Statistic Summary for Sunbury Growth Corridor

Options	VKT (km)	VHT (Hr)	Average Speed (km/hr)
	AM Peak		
Existing (2015)	83,665	1,950	42.90
Option 2 (southern bridge)	234,581	5,891	38.94
Option 5 (both bridges)	232,995	5,854	39.11
	PM Peak		
Existing	90,334	2,179	41.13
Option 2 (southern bridge)	274,639	7,330	37.92
Option 5 (both bridges)	271,992	7,193	38.23

The VKT is a measure of the travel distance for within the model which shows that the total distance that people travelled across the network will more than triple by 2046 when compared to the calibrated 2015 existing conditions. The total travel time (VHT) will also increase more than three times the existing meaning that congestion comparatively will also increase. This is reflected by the average speeds reducing by between 7% and 8% when compared to the existing conditions.

One reason that the average speeds drop by less than 7-8% between 2015 and 2046 is the fact that the networks are predicted to have significant upgrades provided by the state by 2046 such as Lancefield Road (Upgraded to 6 lanes) and Sunbury Road. Notwithstanding, the network shows that there is a drop in performance (speed) with and without the bridge.

Further exploration is provided in the volume to capacity plots for the with (Option 5) and without (Option 2) bridge scenarios for the PM peak period which are shown in Figure 6.1 and Figure 6.2.

Figure 6.1: Volume to Capacity Plot for Option 5 (both bridges) PM Peak

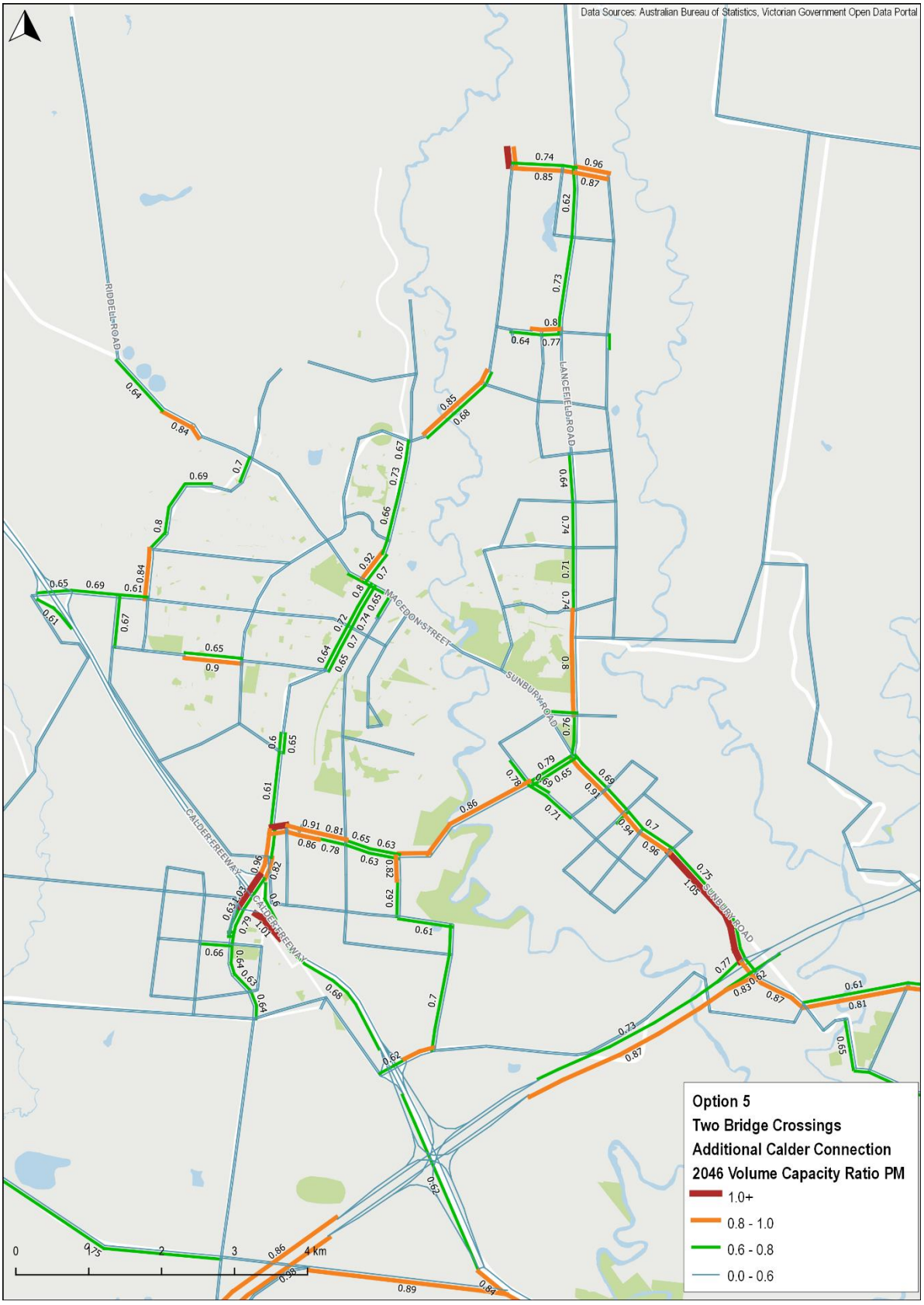
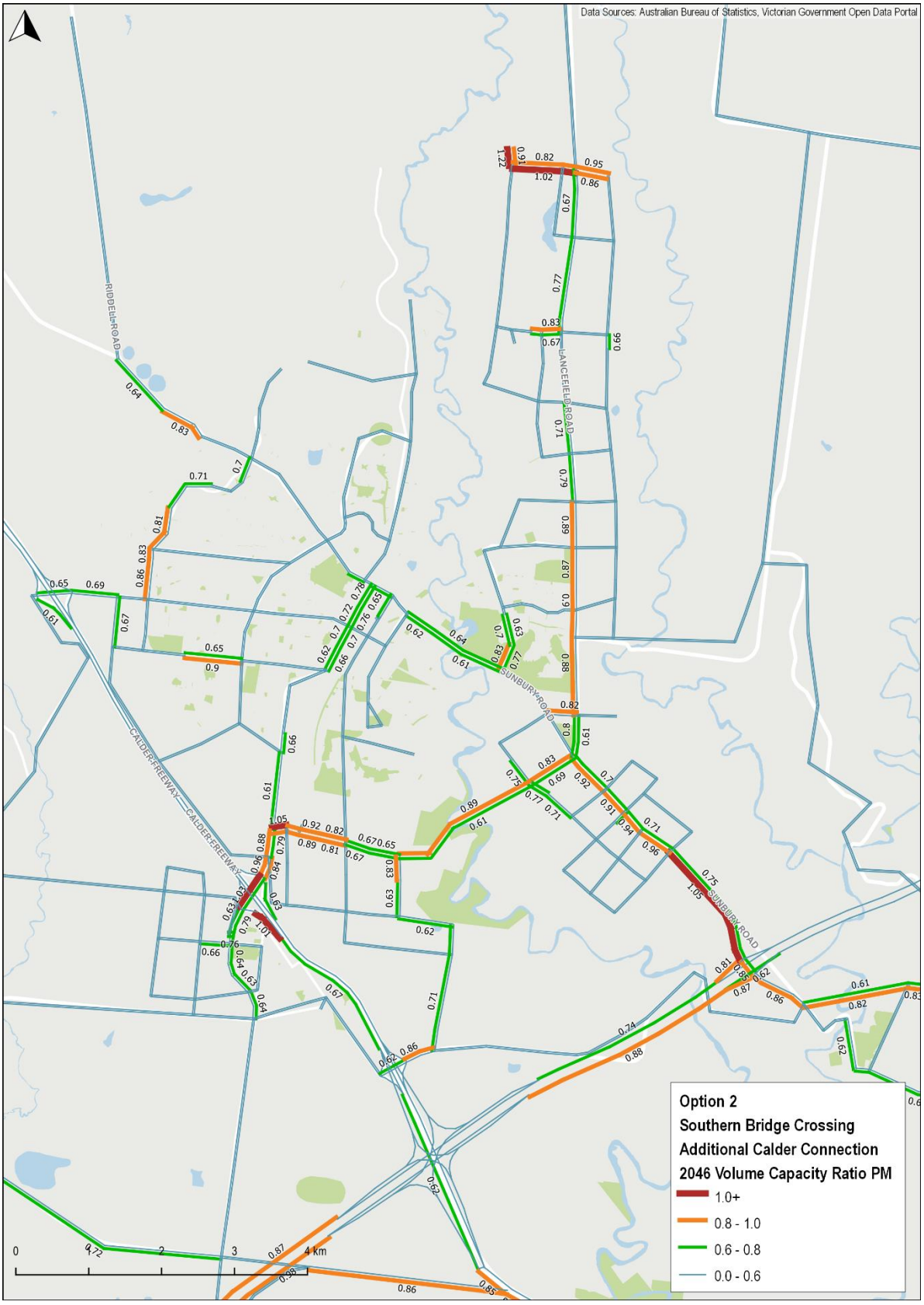


Figure 6.2: Volume to Capacity Plot for Option 2 (south bridge only) PM Peak



These figures show that the removal of the northern bridge will have three key outcomes:

1. There will be an increase in the level of congestion on Lancefield Road. This will increase the risk of delay for drivers who will experience a poor level of service and experience.
2. The level of congestion within the Sunbury South PSP will also increase as drivers will prefer to travel to the southern parts of Sunbury and the Calder Freeway via the southern bridge. Whilst the increase on the bridge is relatively minor compared to Option 5, there will be more congestion in and around the Sunbury South town centre.
3. There will be an increase in congestion in the Sunbury Town Centre, mainly Sunbury Road and Vineyard Road. Whilst the plots show the level of congestion at around 0.8 or less, the resultant levels will increase the risk of more localised congestion as these are more akin to a regional city's level of congestion which occur over a short period (in the order of 15 minutes).

I have also extracted the modelled speeds along Lancefield Road with and without the northern bridge to understand the impact that this would have. Table 6.2 has been prepared to show the change in speed that can be expected on Lancefield Road with and without the northern bridge.

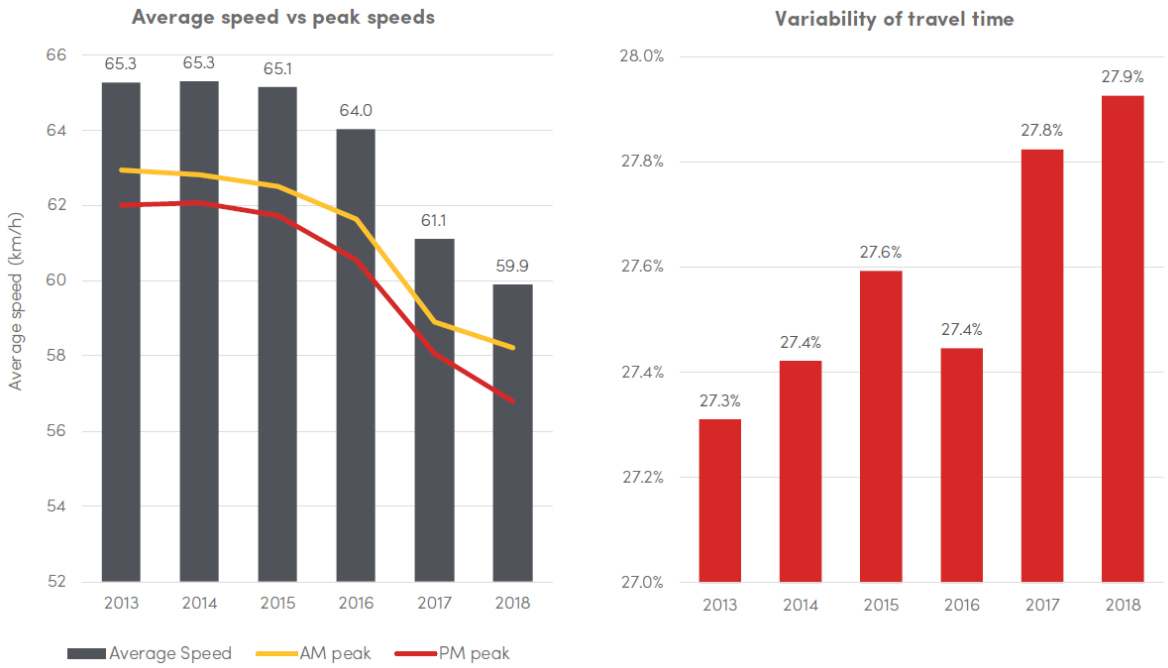
Table 6.2: Model speeds on Lancefield Road with and without the northern bridge - 2046 (two way combined)

Location on Lancefield Road	Peak (direction)	With Northern Bridge (Option 5)	Without Northern Bridge (Option 2)	Difference	% Difference
North of Rolling Meadows Road	AM Peak (Southbound)	59	57	-2	-4%
	PM Peak (Northbound)	58	55	-3	-5%
Between Rolling Meadows Road and Sunningdale Road	AM Peak (Southbound)	57	50	-7	-14%
	PM Peak (Northbound)	55	43	-12	-28%
South of Gellies Road	AM Peak (Southbound)	55	52	-3	-6%
	PM Peak (Northbound)	50	41	-9	-22%

The model does not consider the delays at specific intersections for intersection types (i.e. signals etc.) and as such the operating speeds reported in Table 6.2 are likely overstated. Notwithstanding, these show the level of change that can be expected on Lancefield Road which will impact on the reliability of the network.

To provide some context on the implications on the changes in speed, a recent national study into road congestion in Australia, completed by the Australian Automobile Association, highlighted empirical data of the relationship between network speeds and the reliability of the network: as speeds reduce, variability of travel times increases, and reliability reduces. Data from Melbourne is shown in Figure 6.3.

Figure 6.3: Relationship between speed and variability[3]



As the modelling demonstrates, speeds on Lancefield Road will reduce without the northern bridge which in a higher level of variability for drivers. The concept of travel time reliability is increasingly being used in scheme appraisals, as research outlines that people value travel time reliability in the same way as they value reductions in travel time.

A lower travel time reliability on Lancefield Road and in the Sunbury Growth Corridor has the potential to impact on its residents and the way they travel to their jobs, schools and retail activities.

6.1.2. Accessibility

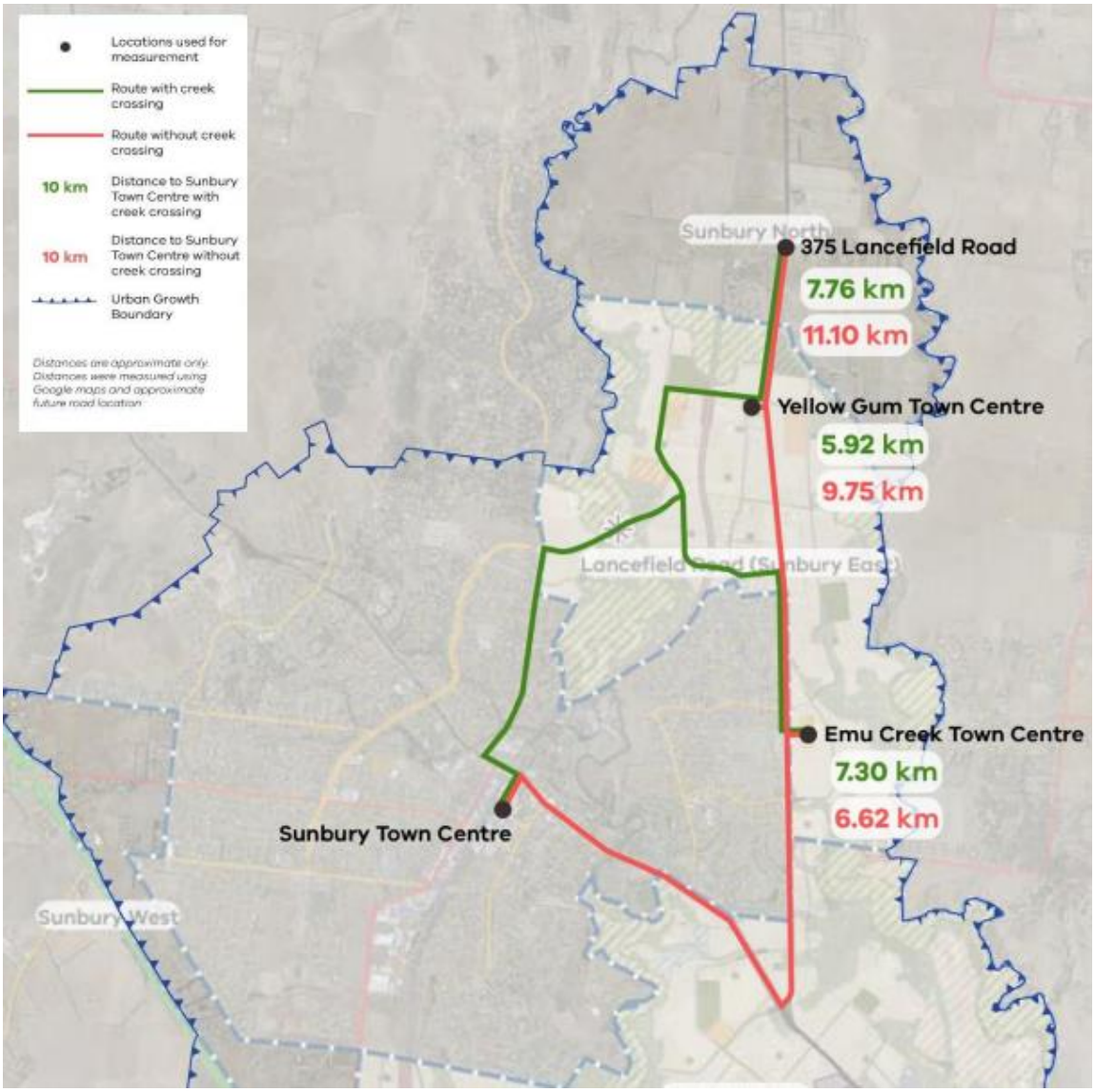
Accessibility (or just access) can refer to a number of things but from a transport perspective it refers to the ease of reaching goods, services, activities and destinations. As it relates to the northern bridge, access should not be defined only about connectivity but can also consider other reasons for travel (e.g., jogging, walking, cycling and leisure). There are a number of ways that accessibility is measured, but for this discussion I will focus on:

1. Geographic accessibility (distance) which is measured by land use planners.
2. Mobility, particularly vehicle travel which transport planners are able to measure.

For the geographic accessibility, I refer to the VPA document (September 2017 entitled the "Northern Jacksons Creek Crossing – Supplementary Information") which highlighted, amongst other things, the differences in distance for residents of the Lancefield Road and Sunbury North PSP's in accessing the Sunbury Town Centre with and without the bridge. Figure 3 from the VPA report has been reproduced below.

[3] Road Congestion in Australia, Australian Automobile Association, October 2018

Figure 6.4: Northern bridge travel distance comparison (Source: VPA)



The VPA report indicates that the addition of the northern bridge will reduce the travel distance by some 3.83km between the Sunbury Town Centre and the Yellow Gum Town Centre in the Lancefield Road PSP. Applying an average speed of 50km/hr this is represents a travel time saving of around 4min 35sec. Whilst I have not been able to explore in detail the operational performance of Lancefield Road into the future it is likely that with a number of new signalised intersections that the travel speed be lower thus making the bridge a more attractive alternative.

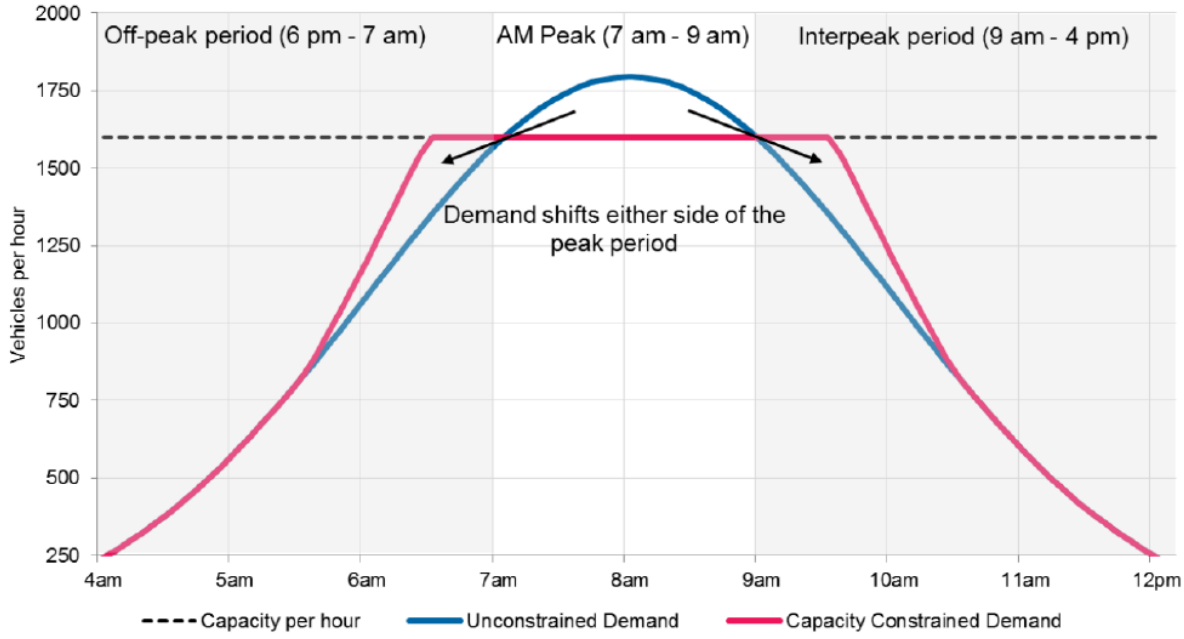
Whilst the modelling completed does show that the level of congestion in and through the Sunbury road network will only exceed a DOS value of 1 in a few locations there are several areas that will experience levels of greater than 0.9, mainly Lancefield Road. Whist the DOS values of less than 1 indicate that these locations have the ability to cater for additional demand, it is highlighted that the modelling averages the demand over a two hour period but does not consider the existing travel behaviour and characteristics of Sunbury itself.

A review of data presented in my 2017 evidence indicated that the network in Sunbury experiences AM and PM peaks consistent with a typical day, however the peaks are shorter with sharp peaks occurring for

between 15 and 45 minutes depending on the time of date. A resultant outcome of growth in Sunbury is that peak spreading will occur. As road network congestion increases, existing motorists will be required to change their travel patterns, this will result in trip reprogramming (travel at a different time), trip substitution (use an alternate mode) or trip redistribution (use an alternate route).

The phenomenon of peak spreading describes a dynamic process whereby the pattern of demand changes over time from one where there is heavy peaking, to one where the demand spreads out over a longer period. Typically, this results in the peak period lengthening, either side of the highest peak flow as in Figure 6.5. Because of the constraints of road capacity, peak spreading is one way of accommodating increasing traffic volumes.

Figure 6.5: Graphical representation of peak spreading



In my experience, peak spreading can be viewed as either a natural market correction that limits the need to provide extra road capacity, or it can be considered as an indication of a failure of the system, as peak spreading can typically result in delays for people and goods.

6.1.3. Network Resilience

With peak spreading, I am confident that the general level of traffic in and around Sunbury is manageable which is consistent with my previous assertions. However, I am concerned about the implications on the operation of Lancefield Road and the existing road network in Goonawarra (the existing residential areas that the Lancefield Road and Sunbury South PSP's surround).

The modelling completed for this assessment is strategic which is suitable for this type of assessment however its limitation is that is does not consider the operational elements of the network, in this instance the intersection delays on Lancefield Road and its side roads.

The level of traffic with and without the bridge on the key existing roads in the vicinity of Lancefield Road are shown in Table 6.3.

Table 6.3: Link Volumes (vehicles) for with and without the northern bridge - 2046 (two way combined)

Road	Peak	With Northern Bridge (Option 5)	Without Northern Bridge (Option 2)	Difference	% Difference
Melbourne-Lancefield Road south of Gellies Road	AM Peak (2 hrs)	6,760	7,800	1,040	13%
	PM Peak (2 hrs)	7,870	8,790	920	10%
	Daily	44,292	50,130	5,838	12%
Sunningdale Avenue west of Lancefield Road	AM Peak (2 hrs)	530	920	390	42%
	PM Peak (2 hrs)	570	1,410	840	60%
	Daily	3,170	6,590	3,420	52%
Connector Road between SS-IN-12 and SS-IN-04	AM Peak (2 hrs)	850	1240	390	31%
	PM Peak (2 hrs)	1,220	1520	300	20%
	Daily	6,030	9,050	3,020	33%
Francis Boulevard north of Sunbury Road	AM Peak (2 hrs)	1,260	1560	300	19%
	PM Peak (2 hrs)	1,380	2240	860	38%
	Daily	7,580	10,990	3,410	31%
Rolling Meadows Drive west of Lancefield Road	AM Peak (2 hrs)	260	190	-70	-37%
	PM Peak (2 hrs)	180	230	50	22%
	Daily	1,020	1,070	50	5%
Sunbury Road west of Francis Boulevard	AM Peak (2 hrs)	5,000	6,090	1,090	18%
	PM Peak (2 hrs)	5,880	7,240	1,360	19%
	Daily	35,030	42,870	7,840	18%

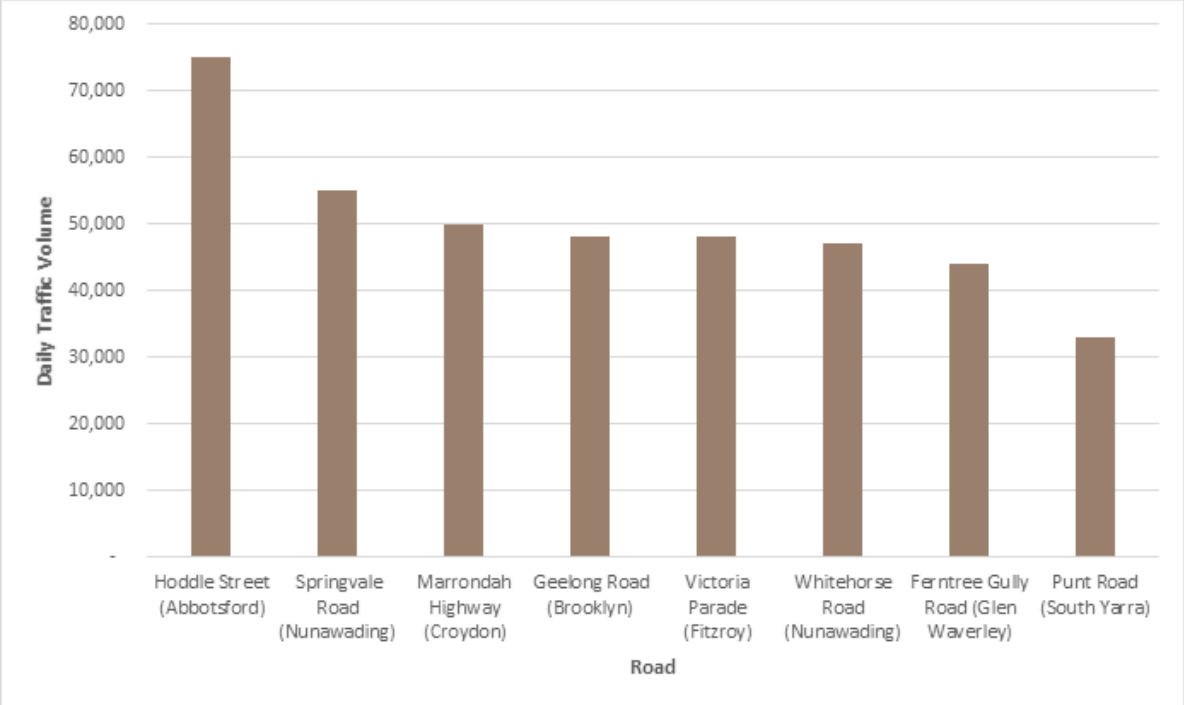
The majority of roads will see an increase in volumes without the northern bridge with traffic from the Lancefield Road and Sunbury North PSP's seeking to access services in the Sunbury Town Centre. These volumes are not significant enough to require duplication however Sunningdale Avenue will more than double its anticipated volumes and Francis Boulevard will increase to almost 11,000 vehicles per day.

Further, these increases will change the functionality of the Connector Road between SS-IN-12 and SS-IN-04 from a 'Connector' classification to a 'Trunk Connector' classification (VPA Engineering Design and Construction Manual December 2019). There are subtle differences in the differences between the two classifications however these would have implications in the delivery of the subdivision.

These increases are a matter for the Hume City Council to consider and how these could be managed, which I would suggest they would find it difficult to support.

To provide context for Sunbury Road and Lancefield Road, the existing traffic volumes for key arterial roads from Metropolitan Melbourne are presented in Figure 6.6.

Figure 6.6: Existing (2017) Traffic Volumes on Key Arterial Roads in Melbourne



[traffic volume data sourced from VicRoads website for 2017 – some volumes may be higher at key junctures/interchanges]

In this respect, the future daily traffic volumes on Lancefield Road will be akin to Maroondah Highway in Croydon without the northern bridge and Ferntree Gully Road with the northern bridge. I also note that each of the key roads in Figure 6.6 have some form of public transport priority either at intersections or at mid-block locations. Without the northern bridge, more investment into the intersection improvements for public transport priority will be required to on Lancefield Road.

Another outcome without the northern bridge is that there will be an increase in turning traffic to and from Lancefield Road and Sunbury Road into the local network. Through my discussions with the Department of Transport they have advised that Sunbury Road is and will remain the priority for its role of connecting Sunbury to metropolitan Melbourne. I am concerned that there will be additional vehicles seeking to perform a right turn at the Sunbury Road and Lancefield Road intersection which will have implications for the through traffic on Sunbury Road. Whilst this is a detailed operational issue, the inability to cater for right turning movements at this intersection will likely result in more traffic seeking to rat run through the local road network to access Sunbury.

I have not quantified the increased turning movements as the assessment is of a strategic nature, however without the northern bridge I recommend, at a minimum, the following improvements to the network be provided:

1. Allowance for local area improvements to the Goonawarra Estate including improvements to the Sunningdale Road / Francis Boulevard and Rolling Meadows Drive and Curtis Avenue Intersection
2. Increasing the size and function of the Sunbury Road and Lancefield Road Intersection for its ultimate configuration.
3. Local Area Traffic Management Improvements on Sunningdale Road, Rolling Meadows Drive, Curtis Avenue and Francis Boulevard. These would consist of safety and speed management treatments.
4. Increasing the intersection turn lanes on Lancefield Road at the intersections of Sunningdale Road and Rolling Meadows Drive and SS-IN-12.

5. The inclusion of bus lanes at the intersections on Lancefield Road at the intersections of Sunningdale Road and Rolling Meadows Drive and SS-IN-12.
6. Upgrading the intersection of Francis Boulevard and Sunbury Road to a signalised intersection dedicated public transport (bus) lanes.

The expected development within the PSP's will result in a significant increase in population with only one road that provides access to it. The need for network resilience is not only required for a functioning network but also to assist in emergency management (e.g. bushfire). In the case of an emergency, should Lancefield Road be inaccessible, the residents will be severely restricted in their travel. The quantum of the restrictions will be directly related to the amount of delivery of land use in Lancefield Road and Sunbury North PSP's. The delivery of the northern bridge will provide significant benefits to these residents in the case of emergency with respect to network resilience.

All of these considerations form part of my decision in support of the strategic justification for the northern bridge, which play an important role and is a required piece of infrastructure for the Sunbury Growth Corridor.

6.2. Does the northern bridge serve a regional or local role?

The term 'regional role' in the context of this discussion is a link that plays a meaningful role in the movement of people and goods between destinations within the broader Melbourne region. In the context of the Growth Corridor, Sunbury Road plays an important role as it connects people and goods of Sunbury to key employment areas in metropolitan Melbourne such as the Melbourne Airport. Lancefield Road on the other hand, currently plays a localised role in connecting the towns and communities along its length to Sunbury Road and the regional network.

The northern bridge is an important piece of infrastructure for the Sunbury Growth Corridor, but it is more important to the future residents of Lancefield Road and Sunbury North PSP's. In the context of local versus regional, the northern bridge is directly linked to the proposed communities in Lancefield Road and Sunbury North PSP's – if these developments do not occur, there is no need for the bridge.

The realisation of the anticipated growth on the road network will change the way in which people think about travelling in Sunbury. Whilst the additional congestion will be complimented with the appropriate road upgrades that are outlined in the framework plan and the supporting strategic documentations, I do not consider the increase will restrict or limit people's ability to travel.

I do have concern that at full development of the Lancefield Road and Sunbury North PSP's that there will only be one road into and out of the area that will ultimately cater for a population of some 40,000 people. For context, the expected volumes are higher than the current volumes on Sunbury Road which is in the order of 28,000 vehicles per day. Authorities have been advocating for the upgrade of Sunbury Road and the State Government is about to commence construction of its upgrade. Existing residents of Sunbury also have an alternative for travelling into metropolitan Melbourne in the Calder Freeway which supports the need for an alternative for these residents to travel to work, education and retail activities. The planning for Sunbury North has not commenced and I recommend that the VPA consider increasing level of employment and retail land uses. This would reduce the reliance for drivers to travel outside of the PSP however I do not think that this will change my opinion that the bridge performs a local role.

The increased traffic on Lancefield Road, whilst substantial when compared to the existing volumes, will be complimented with the appropriate capacity upgrades. These are currently proposed as part of the ICP's for the Lancefield Road and Sunbury South PSP's.

These improvements will ensure that Lancefield Road will play its role in connecting the communities of Lancefield Road and Sunbury Norther PSP's to the regional network in the Growth Corridor. In conclusion, it is my view that the northern bridge will serve a local role to both the Lancefield Road and Sunbury North PSP's.

6.3. Does the southern bridge serve a regional or local role?

The additional modelling undertaken as part of this amendment did not update options without the southern bridge. In this instance to understand the role of whether or not the southern bridge serves a regional context or benefit, I refer to Section 7.1 of my 2017 evidence for Amendment C207 & C208 which quotes:

> *"The modelling demonstrates that in each of the options that include an additional river crossing, volumes in Sunbury reduce accordingly. Of note is Sunbury Road south of Barkley Street, which will experience significant benefit with the introduction of one and two crossings. The southern crossing is more likely to provide increased benefit to the Sunbury Town Centre as this provides the higher reduction when compared to the northern crossing in isolation.*
>
> *A second crossing will result in reduced traffic travelling through the Sunbury Town Centre as well as improved levels of congestion."*

The 2017 report also goes on to discuss the benefits of the bridge with and without the Outer Metropolitan Ring Road (OMR) which concludes that:

> *"In the years leading to the 2046 time-period, the resultant volumes on the bridges will likely depend on a number of factors including the timing of the delivery of infrastructure and wider capacity increases such as the OMR. It is clear that the OMR makes a difference to the demand on the bridges as it fundamentally alters the travel behaviour for motorists travelling from Sunbury into their destinations in Melbourne."*

In response to whether or not the southern bridge serves a regional role, my position has not changed. There is a sub-regional role that the southern bridge will play prior to the delivery of the OMR. After the OMR is constructed, the bridge will primarily be used by the residents of Sunbury South as shown by the proportions obtained from the updated modelling.

With respect to the OMR, and the freeway/motorway networks in Melbourne, when delivered these will result in the ability for people to travel regionally across Melbourne to their places of work and other destinations. The supporting or complementary networks will allow the ability for localised opportunities for people to travel to local town centres, schools and services. The network proposed in the Sunbury Growth Corridor will allow its residents to travel locally to their relative destinations.

Having regard for the high proportion of users that will utilise the bridge at from the Sunbury South PSP, the role that the OMR will play, I am satisfied that the southern bridge serves a local role.

6.4. Nexus between the PSP's and the two bridges

There are a number of approaches that can be adopted for determining the nexus or connection between the PSP's and the two bridges. The discussion provided in the previous two sub sections outlined that in my view both bridges will play a local role rather than a regional role. This is consistent with the recommendation from the 'Infrastructure Contributions Plan Guidelines' (DELWP, 2019) which states the following:

> *'In general, external apportionment of the cost of a supplementary levy allowable item should only be required where the project is located on the edge of the ICP plan area and the need for that infrastructure is also generated by development outside the plan area.'*

In applying this rule to the northern bridge, it is difficult to conclude that there is a need for the two bridges without the two PSP's. Indeed, the data presented as part of the updated modelling shows that almost all of the traffic that uses both bridges are associated with the three PSP's (Sunbury South, Lancefield Road and Sunbury North).

The approach that has been used for the apportionment of the bridges in the Sunbury South and Lancefield Road Infrastructure Contributions Plan (ICP) has been to apply the recommendation of the panel report for

Amendment C207 and C208. This report recommended that the apportion of infrastructure costs for the two bridges be based on the anticipated level of population, which states:

> *"Apportioning infrastructure costs associated with the Sunbury Ring Road between the Sunbury South PSP, the Lancefield Road PSP, the Sunbury North PSP and the Sunbury West PSP should be on the basis of each PSP's proportion of population growth."*
>
> *Page 26, Hume Planning Scheme Amendments C207 and C208 Panel Report 15 December 2017*

Applying the approach recommended by the panel resulted in an apportionment for both bridges for the two PSP's of 74%, which I have assumed is based on the forecast land use stated in the PSP documentation and the previous estimates for Sunbury North and Sunbury West. I have summarised how I believe that this has been calculated along with a revised estimate based on the updated population forecasts for the Sunbury Growth Corridor provided by the VPA in Table 6.4.

Table 6.4 Apportionment by population (applied across both bridges evenly)

PSP	Previous Land Use		Updated Land Use	
	Population (People)	Proportion (%)	Population (People)	Proportion (%)
Sunbury South PSP	32,100	44%	32,100	35%
Lancefield Road PSP	22,000	30%	22,000	24%
Sunbury West PSP*	5,724	8%	11,585	13%
Sunbury North PSP*	13,898	19%	26,315	29%
Total	**73,722**	**100%**	**92,000**	**100%**

*Sunbury West and North PSP previous population numbers have been adjusted to reflect the 74% proposed apportionment

The updated population figures provided by the VPA indicate that the apportionment for the two bridges could be amended to 59%.

I cannot provide a strong opinion on the population method that the panel has recommended, however I can provide my view on apportionment from a traffic and transport perspective. The panel report also documented the Hume Council submission which suggested a preference for the apportionment to be prepared based on traffic utilisation of the two bridges.

Based on the modelling, the proportion of traffic utilising the two bridges from the respective PSP's is summarised in Table 6.5 which also provides a total proportion based on the traffic.

Table 6.5 Apportionment by traffic volumes

PSP	Northern Bridge (LR-BR-01)		Southern Bridge (SS-BR-01)		*Total*	
	Traffic	Proportion (%)	Traffic	Proportion (%)	*Traffic*	*Proportion (%)*
Sunbury South PSP	103	1%	11,162	93%	*11,265*	*41%*
Lancefield Road PSP	8,944	57%	450	4%	*9,394*	*34%*
Sunbury West PSP*	4	0%	2	0%	*6*	*0%*
Sunbury North PSP*	6,623	42%	387	3%	*7,010*	*25%*
Total	**15,674**	**100%**	**12,001**	**100%**	**27,675**	**100%**

*Excludes traffic not related to the PSP's

The traffic volumes do indicate that a combined traffic proportion of 75% could be applied to the total cost of the two bridges.

I note that the analysis has included Sunbury North PSP which yet to commence formal planning. When developed, Sunbury North will contribute a significant proportion of the traffic to Lancefield Road and will contribute to its congestion levels, particularly at the southern end near Sunbury Road. I believe that these increases will result in the need for the northern bridge.

There are a number of intersections along Lancefield Road that will be upgraded as part of the Lancefield Road and Sunbury South PSP's. These upgrades will benefit the Lancefield Road PSP but moreover they will benefit the Sunbury North PSP when it is fully developed.

In addition to the traffic utilisation, there are a range of benefits that are realised for connecting the neighbourhoods of Sunbury to the Lancefield Road and Sunbury South PSP's. From a traffic and transport perspective the two bridges will result in reduced congestion, improved accessibility and network resilience for the PSP's on Lancefield Road. These considerations have been included in my recommendation.

It is reiterated that this assessment focuses on Option 5 which assumes the delivery of all key infrastructure in the Sunbury Growth Corridor including the OMR. The two bridges would provide some benefit to the region in the medium term without broader transport improvements that serve a regional role such as the OMR, conversely these projects will also serve a regional role once constructed.

In considering the implications of congestion along Lancefield Road, the benefits of connecting the community, improving amenity and reducing the impact on the existing network, the apportionment for the northern bridge is recommended to be amended so that the Sunbury North PSP have a higher weighting (multiplier of two) in the calculations. My resultant recommendation for apportionment is set out in Table 6.6.

Table 6.6 Reccomended apportionment based on traffic and transport considerations

PSP	Northern Bridge (LR-BR-01)	Southern Bridge (SS-BR-01)	Total
Sunbury South PSP	0%	90%	32%
Lancefield Road PSP	40%	4%	27%
Sunbury West PSP*	0%	0%	0%
Sunbury North PSP*	59%	6%	40%
Total	**100%**	**100%**	**100%**

This total apportionment could be applied evenly across the two PSP's which is consistent with the proposed ICP or applied for each bridge individually to the respective PSP's.

7. RESPONSE TO INSTRUCTIONS

7.1. Overview

Table 7.1 provides a summary of the opinion in response to the instructions.

Table 7.1: Summary of Response to Instructions

To respond to the unresolved key issues identified within submissions, in so far as they are within your expertise including:	Response
an overview of your role in any reports prepared to date in relation to the Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan;	Refer to Section 2 of this report.
an overview of your role (if any) in relation to the Sunbury South and Lancefield Road Infrastructure Contributions Plan (or the interim ICP);	Refer to Section 2.4 of this report.
whether, and to what extent, your updated modelling has any material impact on the need for, or benefits conferred by, the northern bridge from a traffic and transport perspective (as compared to the modelling considered by the Amendment C207 and C208 Panel);	The updated modelling, summarised in Section 4, shows that the increased population forecasts for Sunbury will have increase the demand on both bridges. When compared to the 2015 work, the expected traffic demand on the network increases meaning there will be more congestion on Lancefield Road without the bridge.
the proportion of anticipated future usage of LR-BR-01 and SS-BR-01 on the basis of anticipated traffic generated by future residents and workers within the ICP area, within other growth areas within the Sunbury growth corridor and usage from outside the proposed growth areas; and	Refer to Table 4.1 for the northern bridge (LR-BR-01) and Table 4.2 for the southern bridge (SS-BR-01).
respond to the unresolved key issues identified within submissions, in so far as they are within your expertise including: the strategic justification for LR-BR-01 from a traffic and transport perspective;	Refer to Section 5 and Section 6 of this report.
the extent to which LR-BR-01 and SS-BR-01 serve a regional, local or broader role in the road network; and	Refer to Section 6.3 of this report.
the nexus between the development of the relevant growth areas and LR-BR-01 and SS-BR-01	Refer to Section 6.4 of this report, with supporting discussion throughout Section 6.

8. SUMMARY OF OPINION & OTHER STATEMENTS

8.1. Summary of opinion

On the basis of the information set out within this report, I provide the following closing comments:

1. The modelling prepared as part of the October 2015 report has been updated to reflect the current land use forecasts for both metropolitan Melbourne and the Sunbury Growth Corridor.
2. The increases in land use resulted in more congestion on the road network in the Sunbury Growth Corridor when compared to the 2015 report.
3. The assessment undertaken only considers the full development of the infrastructure provisions which include the delivery of the OMR and other network upgrades.
4. The assessment of the northern bridge has included the Sunbury North PSP which has yet to commence planning. The transport modelling showed that 57% of trips that travel across the bridge originate from or have a destination in the Lancefield Road PSP, and 42% of trips that travel across the bridge originate from or have a destination in the Sunbury North PSP.
5. The assessment of the southern bridge suggests that in the order of 91% of trips that travel across the bridge originate from or have a destination in the Sunbury South PSP.
6. The northern bridge is an important piece of infrastructure for the Sunbury Growth Corridor and is supported through policy.
7. By not delivering the northern bridge, Lancefield Road will ultimately experience significant congestion and increased traffic on the road network through Goonawarra. Whilst the traffic is able to be managed, it has the potential to impact on the amenity of those neighbourhoods.
8. At full development of the Growth Corridor, the northern bridge serves a local role for both the Lancefield Road and Sunbury North PSP's.
9. Similarly, at full development of the Growth Corridor, it is my view that the southern bridge serves a local role for the Sunbury South PSP.
10. The apportionment for the northern bridge is recommended to include the Sunbury North PSP in its delivery and could be applied evenly or individually across the two PSP's.

8.2. Declaration

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

A.CURRICULUM VITAE

A

REECE HUMPHREYS

Director

BE, Civil,
Victoria University 2000

MY STORY

I have a Bachelor of Engineering degree and almost two decades' experience spanning transport planning, transport modelling, transport engineering, traffic engineering, land use development and strategic assessments. This experience covers a mixture of assignments ranging from traffic and transport modelling on large-scale projects in Melbourne and Sydney to transport planning, engineering analysis, and advice on projects across Australia.

I have also completed several projects for the Department of Transport (Vic), VicRoads and the NSW RMS that include a series of large regional transport models, strategic corridor planning, congested corridor management and transport corridor planning. I have provided expert evidence for both Government and the private clients, as well as on several high-profile transport corridor and growth area panels. I also play an active role in industry organisations; I am the Vice President of the AITPM Victoria Committee and am an inaugural member of the National Council of Transport Modellers Network.

'I'm an experienced professional who applies a personable approach to developing holistic solutions to complex transport issues'

SELECTED PROJECT EXPERIENCE

Suburban Roads Project - Victoria
Role: Technical Director (Transport)

The Western Roads Upgrade is a $1.8 billion project that will deliver a combination of road widening, duplications and intersection upgrades on eight arterial roads in the western suburbs. GTA is part of the Netflow consortium that was successful in delivering the project. As Technical Director, Reece was responsible for leading the traffic and transport analysis of the eight corridors which comprised 48 intersections and freeway interchanges. The work completed through the bid phase included a range of solutions that resulted in the submission having no departures from the scope requirements, resulting in a successful award for the consortium.

Western Growth Corridor – Transport Network Plan
Role: Project Director

GTA completed the Strategic Transport Modelling of the Western Growth Corridor in Melbourne, which is forecast to accommodate an additional 500,000 people in the next 30 years. The project investigated short and medium-term transport improvements as well as a range of public transport enhancements designed to improve people's journeys on a day to day basis. The project was completed for the City of Wyndham and City of Melton who will experience the majority of the predicted growth. Leading the delivery of the project drew upon Reece's extensive range of experience in preparing transport assessments of PSPs and developments within Melbourne's growth corridors, including an understanding of the transport challenges that growth brings. This work was completed in close consultation with the Department of Transport (formerly Transport for Victoria) and VicRoads.

SKILLS & EXPERTISE

- Transport Planning
- Transport Modelling (strategic and operational)
- Transport Engineering
- Corridor and Area Traffic Management Project Development and Design
- Network Management and Optimisation
- Peer Review and Expert Witness

ACHIEVEMENTS

"Developing a Framework for modelling regional Australian cities", AITPM National Conference 2019

"Latest Developments in Australian Modelling", NZ Modelling User Group, 2014

"Transport Planning or Land Use – Who Controls What?", AITPM National Conference, 2015

"Young Engineer of the Year", Finalist, Engineers Australia, 2012

MEMBERSHIPS AND AFFILIATIONS

AITPM Committee Member (VIC)
Victorian Vice President

Engineers Australia (MIEAust)

ADDITIONAL RELEVANT EXPERIENCE

Geelong Growth Areas Transport Infrastructure Strategy – Victoria
Role: Project Director and Modelling Lead

GTA have been engaged to assist the City of Greater Geelong and the Department of Transport to develop a transport strategy for Gelong to support extensive growth as a result of its three growth areas. The work includes the calibration of the Victorian Integrated Transport Model (VITM) to inform the strategy for all modes of transport in Geelong as a result of the Northern, Western and Armstrong Creek Growth Areas which will double the size of Geelong over the next 30 years. The project is currently in progress.

Gunns Gully Interchange - Victoria
Role: Project Director and Technical Lead

The Gunns Gully Interchange on the Hume Freeway will unlock the development of the Cloverton and Merrifield City Centres in Melbourne's Northern Growth Corridor. The scope of the project includes the preparation of supporting traffic analysis and assessment that informs the design and economic benefit of the project using a bespoke VITM. The project is currently in progress working closely with the DoT, VPA and the Planning Minister in order to release GAIC WIC funding.

Calder Highway Traffic Analysis and Economic Assessment - Victoria
Role: Project Director and Modelling Lead

The Calder Highway between Maiden Gully and ironbark in Bendigo is experiencing increased congestion as a result of population growth. Regional Roads Victoria (RRV) developed a range of concept options and solutions for the upgrade of intersections and the corridor as a whole. A transport assessment was undertaken with the use of a multi-layered traffic model that was also used to inform an economic assessment that recommended the preferred option.

Northern Highway Economic Assessment - Victoria
Role: Director

VicRoads is preparing a business case to upgrade a section of the Northern Highway between the Hume Freeway and Wallan township. As Project Director Reece was responsible for preparing an economic assessment using strategic transport modelling to understand the benefits of the upgrade. The project utilised and updated the Statewide Victorian Integrated Transport Model (S-VITM) and included several workshops with various stakeholders to develop the inputs into two project cases for testing. The economic assessment will form part of a business case that will be submitted to the State Government.

Albury Traffic Study - NSW
Role: Director

Reece was the project lead responsible for the delivery of a multi-layered integrated model of Albury that was prepared for Albury City Council and the NSW RMS in 2017. The model is an all-encompassing four step strategic model with mesoscopic and microscopic capabilities. The model was used to test the performance of the network as a result of forecast growth and included detailed assessment of the Hume Freeway interchanges and other key intersections within the city.

Ararat Bypass Study – Victoria
Role: Project Director

Regional Roads Victoria (RRV) are investigating a new bypass of the Western Highway in Ararat. The work involved calibration of the Statewide Victorian Integrated Transport Model (S-VITM) to test the three possible alignments for the bypass. The work was also used to inform the design of the interchanges and fed directly into the Environmental Impact Assessment.

GTAconsultants

www.gta.com.au