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Amendment C243 to the Hume Planning Scheme
Infrastructure Contributions Plan

Expert Witness Statement - 170 Lancefield Road & 45 Gellies Road Sunbury, Victoria

Reference No. [Client Reference No.]
Prepared for Lancefield Road Development Partners Pty Ltd, c/o Best Hooper Lawyers Pty Ltd
23 October 2020

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This report is confidential and is provided solely for the purposes of assisting Planning Panels Victoria with respect to the proposed Amendment C243 to the Hume Planning Scheme which seeks to outline how infrastructure costs are to be apportioned among parties to enable development in the Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan, as well as detailing how land will be provided for the construction of these infrastructure items.

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Table of Contents

List of Tables

List of Figures

1 Statement of Witness

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Qualifications:

- Master of Business Administration, MBA, University of Cape Town School of Business, 1994
- Diploma of Project Management, Damelin School of Management, 1990
- Bachelor of Science in Civil Engineering, BSc(Eng)Civil, University of Cape Town, 1984
- Chartered Professional Engineer (CPEng) Civil College – Certificate No. 1423734
- National Engineering Register (NER) - Certificate No. 1423734
- Registered Professional Engineer Queensland (RPEQ) – Certificate No. 14910

Memberships:

- Member of the Institution of Engineers Australia (Civil College) – IEAust
- Fellow of the Australian Institute of Traffic Planners and Managers – AITPM
- Immediate Past President of the Queensland Branch of the Australian Institute of Traffic Planners and Managers - AITPM
- Past President of the Institution of Professional Engineers Australia New Zealand Section - ITEANZ
- Company Director and member of the National Board of the AITPM

Experience:

I have over 35 years engineering experience in the civil and transportation sectors in Australia, New Zealand, South Africa and the United Kingdom. I am an active communicator and network widely during the course of my work.

I was the Director Traffic and Transportation with Hyder Consulting (now renamed Arcadis) from a 2003 – 2009. I joined SMEC Australia in 2009 and am currently the National Sector Leader Transport Planning, Logistics & Analytics (Australia New Zealand) responsible for the diversification, growth and financial performance of the Transport Planning, Logistics & Analytics team overall.

In my current role with SMEC Australia, I am technically responsible for the investigation, design, delivery of the larger planning studies being undertaken by the firm. Over the past decade, I have been a member of numerous consultant teams delivering some of Australia's most complex transport infrastructure projects in Sydney, Melbourne, Adelaide, Perth and Brisbane.

Area of Expertise:

- Traffic engineering
- Transport modelling
- Strategic Corridor Planning Studies

- Urban Master Planning
- Integrated transport planning
- Intelligent Transport Systems
- Project Management

Disclosure of Interests:

SMEC Australia is currently assisting Lancefield Road Development Partners Pty Ltd ("Moremac Property Group") with the greenfield development of their site. I am not aware of any conflicts of interest that need to be declared.

Identity of people assisting with the preparation of this Statement:

- Vikas Sharma, Principal Transport Modeller
- James Parrot, Team Leader Transport Planning Logistics and Analytics (SA/WA)

Report Completeness:

Final Report

2 Introduction

2.1 Overview

Amendment C243 to the Hume Planning Scheme (Amendment) seeks to outline how infrastructure costs are to be apportioned among parties to enable development in the Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan, as well as detailing how land will be provided for the construction of these infrastructure items.

2.2 Instructions

On behalf of Lancefield Road Development Partners Pty Ltd, I have been engaged by Best Hooper Lawyers Pty Ltd to assisting Planning Panels Victoria ("the Panel") with respect to the proposed amendments to the Hume Planning Scheme to accord more closely with the proposed Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan, including:

1. the need for the northern bridge in the context of the future land use projections for the region and associated future regional road network demands, and
2. the how the cost of the two bridges across Jacksons Creek in the Lancefield Road PSP Sunbury South PSP may be most equitably apportioned among parties concerned, once agreed.

In particular, I have been asked to undertake a peer review of the traffic model relied upon by VPA and to provide evidence in respect of the outputs produced by GTA Consultants in support of the need for a northern bridge crossing of Jacksons Creek within the Lancefield Road PSP area, and a southern bridge crossing of Jacksons Creek within the Sunbury South PSP area.

2.3 Facts, Matters and Assumptions

On 15 Sept 2020 SMEC requested the following information:

- Confirmation on VITM version used
- Confirmation of Cube Version used
- Copies of the following files for all options modelled and reported:
    - **Land use files used (with/without development**) - The report shared with us (i.e. Sunbury Supplementary Modelling Report) includes conflicting statements about the land use data used for the modelling. We would like to check this input for the zones in the study area (Sunbury and Diggers Rest Growth Corridor) and their comparison with VIF/ DELWP growth forecasts as well as the final forecast population of the PSPs in question.
    - **GIS zoning system adopted (where splitting of zones may have occurred)** - The Zoning system is a key network input. Along with the location of sources for traffic flow, it also determines the location where the traffic is loaded on the represented network. Together, these attributes can have a large impact on the traffic forecast
    - **Highway script files (all time periods) -** The VITM model loads the demand onto the network using an algorithm customised by DoT. The settings for this are described in a brief script file. We need this to accurately replicate the traffic loading and confirm the distribution of traffic on selected links
    - **Highway Assignment files (all time periods) -** The above input files are required to replicate the traffic loading as mentioned above so we can conduct further analysis of those results. We aim to ascertain the extent to which the bridges will serve the predicted population growth for the new PSPs.

Supplementary Modelling Report #2 dated 25 Sept 2020 has provided a response of sorts to our initial request for further information regarding the modelling inputs and assumptions. However, whilst this response has been helpful, it has not allowed my traffic modellers to undertake any actual review of the VITM model other than providing comment on the outputs.

Select link plots for Lancefield Road bridge and Sunbury Road bridge have been provided in the supplementary report dated 08 Oct 2020. The previous request for highway assignment model files was to undertake custom select link plots to gain a greater understanding of the demand using the bridge. Although these select links provide information when the bridge is included, they do not inform on the movements of vehicles when the bridge is not included.

2.4 Reference Documents

05 Oct 2015	Strategic Transport Modelling of the Sunbury and Diggers Rest Growth Corridor (Sunbury South PSP 1074 & Lancefield Road PSP 1075), GTA Consultants
Jun 2018	Lancefield Road Precinct Structure Plan, Victorian Planning Authority
Jun 2018	Sunbury South Precinct Structure Plan, Victorian Planning Authority
09 Sep 2020	Sunbury Growth Corridor Strategy Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report, GTA Consultants
25 Sep 2020	Sunbury Growth Corridor Strategic Transport Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report #2, GTA Consultants
25 Sep 2020	Sunbury Growth Corridor Strategic Transport Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report #3, GTA Consultants
08 Oct 2020	Sunbury Growth Corridor Sunbury South & Lancefield Road Infrastructure Contributions Plan, GTA Consultants

2.5 Summary of Opinions

2.5.1 Suitability of the VITM model

All the modelling commissioned by VPA has utilised the strategic model for the Melbourne metropolitan area (VITM). While the models are useful and highly efficient in evaluating large infrastructure projects, the low resolution of such models limits their use in neighbourhood planning schemes. This is mainly due to their inability to model delays at the intersections. While we note that reasonable attempts were made to increase the modelling resolution, we strongly feel that mesoscopic or microscopic modelling is required to fully evaluate the network performance of PSPs and understand their impact on the surrounding area network.

2.5.2 Key findings from the review

We have been provided with five modelling-related reports commissioned by VPA between October 2015 and October 2020. However, whilst the technical parameters of the modelling have remained unchanged in all these reports, the population forecasts have been gradually increased. The first report concluded that none of the bridges are required. The last report argued that both the bridges are needed.

5 October 2015

VPA commissioned traffic modelling of Sunbury area in 2015. The project tested nine network options. All options showed very similar results with only minor differences. The modelling stated that the additional bridges are part of local road network and are expected to function satisfactorily in the road hierarchy as a collector or a lower order arterial.

The commission concluded that neither of the two bridges across Jacksons Creek are required.

9 September 2020

VPA commissioned an update of the modelling. More recent 2018 population forecasts (with a higher population and employment forecast) as provided by Victoria in Future (VIF) were released by DELWP were incorporated into the model. However, only one of the nine network options tested in 2015 was tested again in 2020. This option, Option 5, included the two additional creek crossings, the Outer Metro Ring Road and an additional connection to Calder Highway. The updated modelling showed only minor changes with respect to the 2015 modelling results. Forecast traffic volumes on the overall network, including the new creek crossings, remained similar.

Of note however is that whilst the model was updated with the latest land use forecasts in line with VIF, this resulted in a reduction in the forecast for the PSPs by up to 27%. In response, the author has decided to retain the higher forecast figures used in the earlier modelling undertaken in the year 2015. Thus, while rest of the metropolitan Melbourne land use was updated (mostly increased), the reduced forecast for the Sunbury area was not incorporated. It is unfortunately unclear as to why this decision was taken and by who.

The report concluded that the population update has marginal impact on the study area and modelling conducted in 2015 holds good.

25 September 2020 (x2)

VPA commissioned a further update of the modelling. This time, it was to change the forecast population in the four PSPs (Sunbury, North, Sunbury South, Sunbury West and Lancefield Road). As before, only one of the nine options were tested which included the two additional creek bridges, Outer Metro Ring Road and additional connection to Calder Highway. This update showed 7-9% increase in traffic on the two proposed bridges and on Lancefield Road.

For comparison purposes, modelling without the northern bridge in PSP 1075 was also done. The comparison showed that traffic on Lancefield Road will increase by 12% and on Sunbury Road (near Sunbury Town Centre) by 18% if the northern bridge is not built.

What the report concluded was that Lancefield Road north of Francis Boulevard and Sunbury Road/Macedon Street north of Lancefield Road continues to perform at an acceptable level of service C through to D, that is, as far out into the future until at least 2046. And whilst an increase in traffic along Macedon Street has been noted, this is very much a local town centre issue rather than as a result of a significant and unacceptable increase in traffic along the other surrounding major roads in the network.

The volume difference plots reinforce the above analysis. Lancefield Road and Sunbury Road (both 6 lane arterial roads) contain the highest increases in volumes when the northern bridge is not included. However, including the northern bridge actually encourages significantly more traffic onto secondary and local collector roads (especially towards the north) whereas the strategic purpose of arterial roads is to carry more through traffic, while local collectors are to provide access to local precincts from arterial roads, not act as thoroughfares.

8 October 2020

GTA Consultants have provided an expert evidence report regarding supplementary levy ICP to the PSPs. Among other things, the report needed to address the need for the northern bridge (LR-BR-01), provide a strategic justification and describe the extent of its usage by the residents within the ICP area.

It was noted that up to 57% of the traffic on the northern bridge has a nexus with PSP 1075. However, in terms of overall network performance, the bridge provides extremely marginal benefits:

- It increases the overall speed in the area of interest by about 0.1 kmph
- It decreases overall vehicle kilometres by 0.7% (AM)
- It decreases overall vehicle hours by 0.6% (AM)

What the Select Link for the southern bridge indicates is that traffic coming off the Calder Highway appears quite happy to divert and use the southern bridge just as easily as they might go around the north. Moreover, it would appear likely that the travel time using the southern route would be quicker given that it avoids the town centre, and once on Lancefield Road, there are no major east-west roads to cause any significant delays.

In conclusion, the report notes that

- "the general level of traffic in and around Sunbury is manageable" and
- "(increased) volumes are not significant enough to require duplication (of the Lancefield Road)

All of the above therefore shows that the increased traffic volumes without the northern bridge are completely manageable, provided the intersections along Lancefield Road are upgraded, including especially the one with Sunbury Road.

3 Review of Strategic Transport Modelling of the Sunbury & Diggers Rest Growth Corridor (Sunbury South PSP 1074 & Lancefield Road PSP 1075), GTA Consultants dated October 2015

3.1 Background

GTA was commissioned by VPA in late 2014/ early 2015 to test the future transport network in PSP 1074 and PSP 1075 with the introduction of two additional Jackson Creek crossings. GTA initially worked on the base year model calibration and provided the calibration and validation report in July 2015. This was later followed by a forecast year option testing report in October 2015.

3.2 Base year calibration

GTA utilised the VITM Northern Growth Corridor Model developed by SKM in 2012 as part of Hume Strategy and made link adjustments to recalibrate the model to match the traffic count data.

Gellies Road and Wildwood Road capacities were halved, and speed reduced by 30% (Ref Section 2.2 Page 5). Sunbury Road was promoted in class by adopting a 35% higher capacity, a 20% higher speed and hence a markedly reduced sensitivity to congestion (Section 2.4 Page 7). It should be noted that in both cases these north-south links provide alternatives to Lancefield Road. GTA also disaggregated the zoning system in the study area and added 15 additional zones along with latest land use data. The zone connectors were refined to include links to both intersection nodes and mid-block road links.

VicRoads guidelines were adopted to report on the quality of calibration achieved. However, it should be noted that whilst most published guidelines are suitable for the metropolitan scale strategic models, the guidelines do not always lend themselves very well to local area modelling.

The calibrated modelled was found to consistently overestimate travel times on all the routes by 50% to 100% (Ref Section 5.8 page 28) including along Lancefield Road and Sunbury Road. This means that the model is running slower than actual, thereby adding to the overall comparative travel times able to be reported.

The model calibration was also checked using a set of five screenlines. Three of the five screenlines showed a difference of 20% or more in at least one direction and one peak period. One of the screenlines in AM peak period outbound direction had a difference of about 65% (Refer Section 5.5 and Table 5.3 on Page 17). Screenlines provide a way of describing the volume of traffic movement across the modelled area using the available transport network.

The report concludes that while the criteria could not be met in all cases, the model was suitable to test future land use and Jacksons Creek bridge (Refer to Section 6.2 page 13), but immediately thereafter it goes on to suggest that, even so, caution should be applied when interpreting the full results of the future scenarios, particularly in and around the Sunbury Town Centre. As such, I cannot agree with this statement in its entirety, especially since the level of accuracy able to be reported at a local street level must be in some doubt.

3.3 Option testing

The calibrated base year model was used to test future year scenarios. Demand and network information for five PSPs was included in the future year models.

- PSP 1072 Sunbury North
- PSP 1073 Diggers Rest
- PSP 1074 Sunbury South
- PSP 1075 Lancefield Road
- PSP 1095 Sunbury West

Nine network options were tested. All nine options include six-lanes of Sunbury Road and Lancefield Road and Bulla Bypass. The options were established based on the presence or absence of four key road infrastructure elements:

- Southern Bridge

- Northern Bridge
- Additional connection to Calder Highway south of the Sunbury South PSP
- Outer Metropolitan Ring Road

Table 1 - 2046 options

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

3.4 Results

3.4.1 Network performance

Overall network performance, when compared across the nine options, has been found to be extremely resilient to any changes introduced in the network. The only exception to this is the inclusion of the Outer Metropolitan Ring Road which attracts additional traffic to the area.

Based on the overall network performance, the GTA final report recommends Option 5 as the preferred option to take forward (Refer Section 8.2 Table 8.1 and Table 8.2 on Page 23). However, it is noted that the Option 2, which excludes the northern bridge across Jacksons Creek, provides similar results to Option 5, but with only a minor increase of 0.7% in VKT, 1.7% in VHT and only a 0.4 km/h drop in average speed.

If options without the OMR are compared, then Option 6 (with both bridges) shows similar results to Option 7 (without the northern bridge), but Option 6 is the preferred on the basis that the speed during AM peak period is slightly higher and VHT are reduced.

3.4.2 Link volumes

Link volumes presented in Section 8.3 on page 26 and Page 27 show that, as compared to Option 5, Option 2 (without the northern bridge) shows similar results and mostly with less than 7% increase in traffic on all roads. Sunbury Road and Lancefield Road show large increases of 10-20%. However, given that these roads are planned to be six lane divided carriageways, the absolute increase is not expected to cause any measurable increase in congestion.

3.4.3 Degree of Saturation

Level of Service as reported using Degree of Saturation (DOS) in Section 8.3 on pages 30 to 33, and supports Option 5. However, as in the case with Link Volumes, the benefits of Option 5, as compared to Option 2 (without the northern bridge) are minor. LOS on all roads are the same except for Sunbury Road which shows minor worsening from 0.46 to 0.51/0.58 in the AM peak period. LOS during PM peak period is also the same between the two options with the exception of Lancefield Road which shows only minor worsening from 0.74 to 0.83.

3.5 Conclusions

The report (Section 9, page 37) concludes that:

- the bridges are expected to carry mostly local traffic and will be part of the lower order road hierarchy (i.e. a Connector road or a lower order Arterial).
- Most notable however is a comment by the author which states that: “The two PSPs can function well without building the bridges”.

4 Review of Sunbury Growth Corridor Strategy Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report, GTA Consultants dated 09 Sept 2020

4.1 Previous modelling undertaken

In February 2017, GTA Consultants prepared a report titled "Sunbury Growth Corridor – DCP Modelling Supplementary Report". The purpose of the report and the modelling task was to assess the impact of the construction of up to 25% of the potential future development of PSP 1074 and PSP 1075 (i.e. up to 5000 lots in Sunbury South and Lancefield Road PSPs) on Sunbury Road and the Sunbury Town Centre as a result of this initial stage of development.

4.2 Modelling updates included in this report

The purpose of this report and modelling task was to advise relevant stakeholders on the outcomes of the additional growth for the Sunbury Growth Corridor. The report focused on Option 5 which included the Creek Crossing in PSP 1074 and the Creek Crossing in PSP 1075 as well as the two new railway stations on the Sunbury line.

This report was to be read in conjunction with the GTA Report dated 5th October 2015, utilising the same model structure and assumption changes outlined in this report.

4.3 Review of Model Inputs

4.3.1 Land Use Assumptions and Distribution

The two proposed bridges across the Jackson's Creek provide alternative paths to the existing crossing along the Sunbury Road. For key and expensive infrastructure elements such as bridges and underpasses, it is essential to establish their catchment area / target population. This is in addition to the overall patronage and the marginal impact on the rest of the network and is essential to ensure their cost can be apportioned in an equitable and justifiable manner.

We have been unable to check the land use inputs for the zones in the study area (Sunbury and Diggers Rest Growth Corridor) and their comparison with VIF/ DELWP growth forecasts as well as the final forecast population of the PSPs in question. However, the report notes that a review of the data indicates that a high proportion of the growth is situated in the nearby areas of Hume (8%), Melton (7%), Wyndham (10%) and Whittlesea (9%) accounting for a combined 35% of the additional 1.59 million people.

In terms of the Sunbury Growth Corridor, some of the land use for Sunbury South and Lancefield Road has been included into the 2018 population forecasts, however the total for Sunbury was estimated at just over 88,000 people which is approximately 33,000 less than the figures used in the 2015 report. In response, it appears as if the author has been instructed to "maintain consistency with the previous work", and has therefore not updated the land use estimates for Sunbury.

4.3.2 Zoning System and Connectors

As mentioned above, it is important to understand the catchment area of these bridges to understand to what extent they serve the PSPs. Conversely, it is also important to understand the traffic evacuation from / attraction to the PSPs and to what extent the bridges are utilised in doing so.

The Zoning system is a key network input. Along with the location/orientation of the zone connectors used for assigning the traffic flow, the positioning of zone connectors also determines the location where the traffic is loaded onto the road network. Together, these attributes can have a large impact on the traffic forecast. We have been unable to check this for all the zones in the study area and its surroundings along with the connector definitions.

One observation of significance however is that it would appear as if traffic from the east of Lancefield Road is being loaded onto the road network at the very north end of Lancefield Road. One might argue that this is being done so as to encourage the residents of the new PSPs in this area to use the proposed northern bridge crossing, rather than

travel south. This is also apparent from the way that traffic is being encouraged to travel all the way down south to Sunbury Road before doubling back to the Sunbury town centre.

4.4 Review of Model Outputs

4.4.1 Link Attributes and Traffic Volumes

Francis Boulevard appears strangely unattractive as a short cut between Macedon Street and Lancefield Road even thought this would be an attractive proposition if the link was to be coded as a normal 2-lane road. We would be very interested in reviewing what the attribute for the link might be in terms of the theoretic maximum capacity. As such, we have been unable to test the attractiveness of this link from a vehicle travel time perspective.

The Daily Volume Difference plot has been somewhat difficult to interpret. We are unclear as to why some of the traffic numbers reduce for the zones in the east when the northern bridge is removed. There is also a significant step up in the traffic volumes along Lancefield Road, most likely because of the way in the which the model network and zone connectors have been coded.

Of note also is that we can see a significant imbalance of daily traffic flows along Francis Boulevard on a 24 hr basis. This might be due to the junction coding in the model or the link type attributes for this minor road link being coded slightly differently.

It is noted that the report does conclude with a closing remark confirming 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.

5 Review of Sunbury Growth Corridor Strategic Transport Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report #2, GTA Consultants dated 25 Sept 2020

5.1 Previous modelling undertaken

GTA Consultants used DOT's VITM Reference Case model to establish a project specific model in 2015 and 2017. These models included full development of the PSPs up to year 2046.

In February 2017, GTA Consultants prepared a report titled "Sunbury Growth Corridor – DCP Modelling Supplementary Report1". The purpose of the report and the modelling task was to assess the impact of a 25% uptake of the potential future development of PSPs 1074 and 1075 (i.e. a total of up to 5,000 lots in Sunbury South PSP and Lancefield Road PSP), and assess impact of this change on Sunbury Road and the Sunbury Town Centre in response to the initial stages of development whilst still maintaining the functionality of the road network.

Most recently, GTA were requested to update the VITM project model with the updated 2018 land use data to align more closely with the Victoria in Future (VIF) population projections. Zone structure and transport networks were left unchanged as at year 2015. Major projects in the vicinity of the project were also retained such as the railways stations at Jackson Hill and Raes Road and the full development of Outer Metropolitan Ring Road (OMR).

5.2 Modelling updates included in this report

The 2015 assessment estimated that at full development of the two PSP's metropolitan Melbourne would have a population in the order of 6.46 million people. Recent forecasts provided from the Department of Planning now estimate Melbourne will reach a population of some 8.13 million people in the same time period.

The purpose of this report and modelling task was to advise relevant stakeholders on the outcomes of the modelling with the population figures that match the exhibited figures in the Sunbury South and Lancefield Road PSP's

- 'in accordance with the PSPs for Sunbury South and Lancefield Road; and
- in accordance with the Council's current figures for Sunbury North and Sunbury West precincts.'

The material presented in this report was to be read in conjunction with the GTA Report dated 5th October 2015 and the addendum report dated 9th September 2020, utilising the same model structure and assumption changes outlined in these reports.

5.3 Additional information requested/provided

5.3.1 Model Inputs

The report has made reference to a request for further information by SMEC on 16 Sept 2020 via Best Hooper Lawyers, and as directed by the Panel on the 21st of September 2020. In response, GTA has advised that VITM is under a license agreement with the DoT and it is therefore unable to accede to the request. What this information would have allowed us to check is a few key inputs and establish a skeletal (traffic loading only) network model to better understand to what extent the bridges in the study area serve the two PSPs.

The following information has however provided within the report

Table 2 - VITM Model Input Clarifications

Model Element	Model as exhibited in 2015	2020 Updated Model
Model Version	VITM2012_V120110 GAA NGC	VITM2012_V120110 GAA NGC
Cube Version Used	Cube 6.1	Cube 6.4
Land Use Files Used	The land use forecasts for 2046 were based on VIF11. The land use for Sunbury Growth Corridor are detailed in the GTA report dated 05/10/2015.	2046 Sunbury Demographics SALUP19 (VIF18 projections adopted for MSD) as detailed in this report.
GIS zoning system adopted	Refer to the structure detailed in the GTA report dated 05/10/2015.	Refer to the structure detailed in the GTA report dated 05/10/2015.
Highway script files	As per the DoT version VITM2012	As per the DoT version VITM2012
Highway Assignment files	As per the DoT standard file	As per the DoT standard file

5.3.2 Model Outputs

We have been provided with are the following model outputs as extracted by GTA Consultants to assist in understanding the performance of the network as a result of the removal of the northern bridge.

- Number of Lanes –Two Bridge Crossings and Calder Connection
- Link Class –Two Bridge Crossings and Calder Connection
- Posted Speed –Two Bridge Crossings and Calder Connection
- 2046 Vehicle Volume plots AM Peak (2-hours), PM Peak (2-hours) and Daily– Option 5 only
- 2046 Volume Capacity Ratio plots AM and PM – Option 5 only

Table 3 - Option 2 and Option 5 key network features

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

5.4 Review of Model Inputs

5.4.1 Land Use

The population, households, employment and enrolments for the Melbourne Statistical Division as outlined in the Supplementary Report dated 09 Sept 2020 were retained by GTA for the purposes of preparing their report. When compared to the previous assumptions (i.e. 2015), the land use changes amount to a total increase of 16,522 people in the Sunbury region

- 2,730 people in the Sunbury South PSP
- 420 people in the Lancefield Road PSP
- 4,430 people in the Sunbury West PSP
- 8,942 people in the Sunbury North PSP

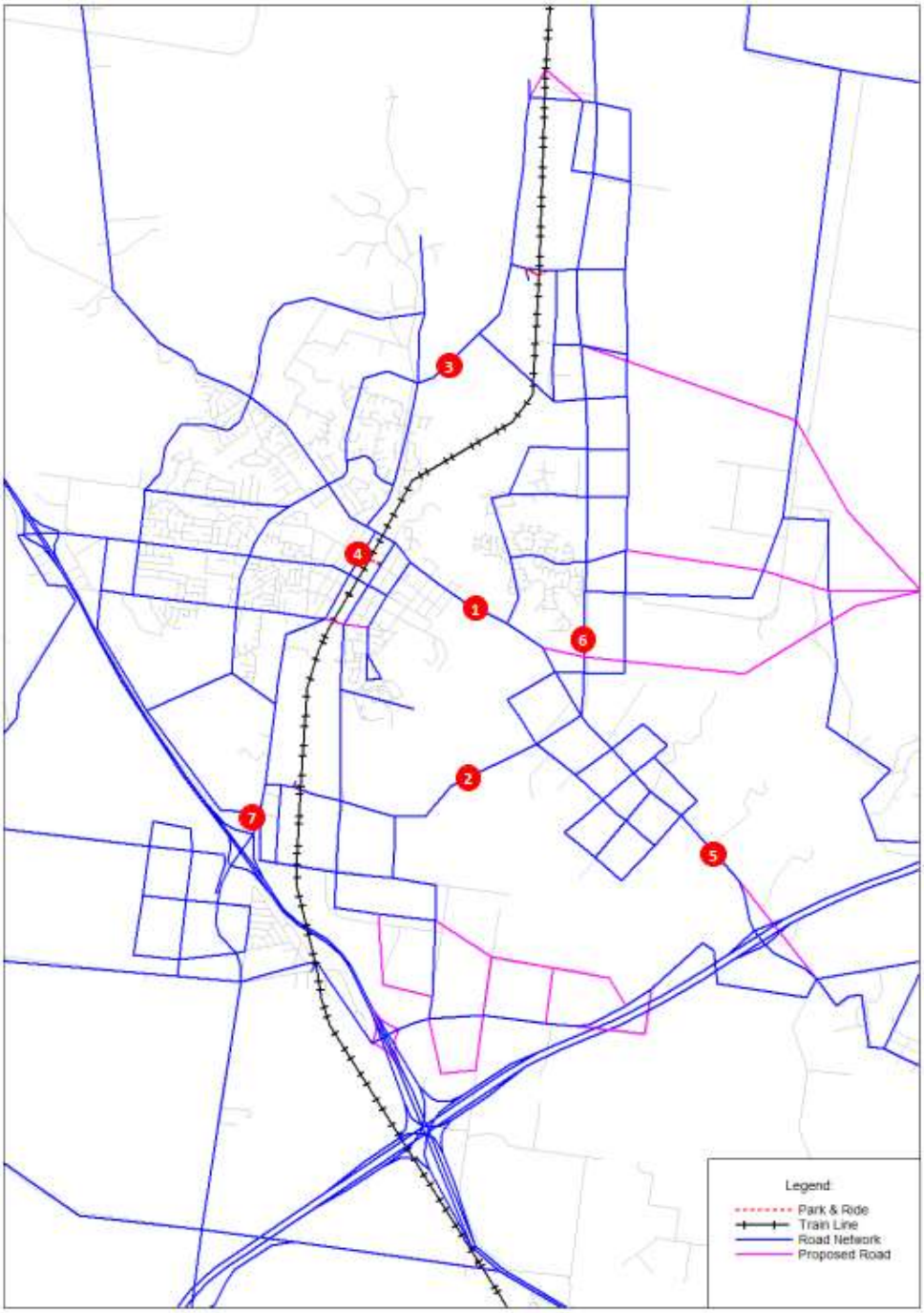
This population increase of 14% is higher than the overall employment increase of 8% and the enrolment increase of 1% meaning that there will likely be a need for more residents to travel outside of Sunbury to access jobs and education. Of note however in response to this increase in the population projection affecting the Sunbury region, no commensurate changes to the road network over and above what was originally provided for in the 2015 assessment has been introduced. This is not normal practice and ignores the more likely response which is that Councils and State Road Authorities will over time continue to improve the road network, manage bottlenecks, and in an overall sense, keep congestion at an acceptable level. What not doing so does over time is place more pressure on the higher order roads in the absence of more lower order roads being coded into the model to reflect a more likely response.

5.5 Review of Model Outputs

5.5.1 Road Link Capacity

GTA has reported the changes in traffic volume at the seven key locations that were reported upon in the October 2015 report. The figure below has been extracted from this report for ease of reference.

Figure 1 - Key Locations for Link Volumes and Capacity Reporting



The updated modelling results show that the land use changes will increase volumes on all of the roads except for Sunbury Road between Evans Street and Francis Boulevard (also referred to as Macedon Street) which reduces by 500 vehicles (1%). The traffic volume over the northern bridge is expected to increase by around 1,000 vehicles per day

which is an increase of 7%. Increases on Lancefield Road (3,500 vehicles per day) and Sunbury Road (3,200 vehicles per day) are expected as a result of the updated land use forecasts when compared to the 2015 assessment.

What is not reported however is what these increases mean in terms of the available capacity of the roads. In all cases, except Sunbury Road north of Bulla-Diggers Road, the increases are of little consequence and do not impact in any way on the theoretical maximum Link Capacities of the roads.

Table 4 - Daily Link Volumes for Option 5 - 2046 (two way combined)

No.	Road Name	Report #2 Daily Volume	Link Type Description	Maximum Link Capacity
1	Sunbury Road between Evans Street and Francis Boulevard	35,300	6-lane Primary	54,000 – 60,000 vpd
2	Jacksons Creek Crossing in Sunbury South PSP	12,300	2-lane Primary	18,000 – 20,000 vpd
3	Jacksons Creek Crossing in Lancefield Road PSP	15,700	2-lane Primary	18,000 – 20,000 vpd
4	Horne Street Between Gap Road and Riddles Road	24,600	4-lane Secondary	30,000 – 36,000 vpd
5	Sunbury Road north of Bulla-Diggers Road	80,000	6-lane Highway	65,000 – 75,000 vpd
6	Melbourne-Lancefield Road south of Gellies Road	44,300	6-lane Primary	54,000 – 60,000 vpd
7	Vineyard Road north of interchange	53,900	6-lane Primary	54,000 – 60,000 vpd

5.5.2 Volume Capacity Ratios

According to the Highway Capacity Manual (HCM), there are a number of factors that can affect the level of service (LOS) of a road. Capacity and Level of service are two related terms. V/C is a conventional level-of-service measure for roadways, comparing roadway demand (vehicle volumes) with roadway supply (carrying capacity). The value of the V/C ratio can vary between 0 and 1. Level of service is a qualitative measure that describes the general traffic condition that will be experienced by a motorist using the road. Level A represents the best quality of traffic where the driver has the freedom to drive with free flow speed and level F represents the worst quality of traffic.

Table 5 - V/C ratio versus Level of Service comparison | Source: 2012 Highway Capacity Manual (TRB) 2000

V/C Ratio	Equivalent Level of Service (LOS)	Description
0.00	A	Drivers will be experiencing complete freedom to choose their desired speed and position on the road.
0.00 – 0.12	B	Free flow speeds are still maintained at this level with desired speed only slightly restricted
0.12 – 0.75	C	The presence of other vehicles begins to restrict the manoeuvrability within the traffic stream. Average speeds remain at or near the free flow speed.
0.75 – 0.95	D	Average speeds begin to decline with increasing flows. Freedom to manoeuvre within the traffic stream is noticeably restricted.
0.95 – 1.00	E	Traffic flow reaches its maximum density limit. There will be no usable gaps in the stream and even slight disruptions will cause a breakdown.
>1.0	F	Represents a region of forced flow, with low speeds and stop start conditions, even though operations downstream of such a breakdown may appear good.

What the table below shows is that Lancefield Road north of Francis Boulevard and Sunbury Road/Macedon Street north of Lancefield Road continues to perform at an acceptable level of service C through to D, that is, as far out into

the future until at least 2046. And whilst a significant increase in traffic along Macedon Street has been noted, this is very much a local town centre issue rather than as a result of a significant and unacceptable increase in traffic along the other surrounding major roads in the network.

Congestion towards the south increases over time as motorists seek to access the Freeway, but these trips were always going to happen irrespective of whether the northern bridge is constructed or not. Congestion along the approaches to the diamond interchange on the OMR is severe with level of service F conditions occurring in both the AM and PM peaks. The freeway on and off ramps also appear to be affected.

Elizabeth Street between Gap Road and Riddell Road runs around the north-west of the Sunbury town centre. It is interesting to note that this street performs well in the AM but not so well in the PM for reasons that cannot be ascertained at this point in time. Possible reasons could include the occurrence of increased turning delays, poor signal timing or increased afternoon shopping and recreation/education activities. It is likely that this congestion will be exacerbated by a northern bridge connection.

Table 6 - Key location comparison by attribute as interpreted from Appendix A and Appendix C

No.	Road Name	Number of Lanes	Link Class	Posted Speed Limit	Addendum Report #2 V/C Ratio	
					AM	PM
	Sunbury Road between Evans Street and Francis Boulevard (also referred to as Macedon Street)	6-lanes	Primary Divided	80km/h	0.00 – 0.60	0.62 - 0.64
	Sunbury Road between Francis Boulevard and Lancefield Road	6-lanes	Freeway/ Highway	80km/h	0.00 – 0.60	0.00 – 0.60
	Sunbury Road north of Bulla-Diggers Road	6-lanes	Freeway/ Highway	80km/h	0.62 - 1.03	0.71 – 1.05
	Lancefield Road north of Gellies Road	6-lanes	Primary Divided	80km/h	0.66 – 0.72	0.67 – 0.79
	Lancefield Road south of Gellies Road	6-lanes	Primary Divided	80km/h	0.78 – 0.84	0.68 – 0.88
	Elizabeth Street between Gap Road and Riddell Road	4-lanes	Secondary	60km/h	0.00 – 0.60	0.61- 0.78
	Francis Boulevard between Lancefield Road and Sunbury Road	2-lanes	Local Collector	50km/h	0.63 – 0.83	0.63 – 0.83

As an aside, it is also noted in Appendix A that Lancefield Road, Sunbury Road and Macedon Street are all coded as 6-lane divided roads in the model which suggests that these roads are of significance and are therefore intended to carry a proportionately larger share of the traffic in the Sunbury area in an overall sense.

6 Review of Sunbury Growth Corridor Strategic Transport Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075) Supplementary Modelling Report #3, GTA Consultants dated 25 Sept 2020

6.1 Modelling updates included in this report

The purpose of this report and modelling task is to advise relevant stakeholders on the outcomes of the modelling with the population figures that match the exhibited figures in the Sunbury South and Lancefield Road PSP's. The report focuses on the scenario that does not include the Jacksons Creek Crossing in the Lancefield Road PSP and with the Creek Crossing in Sunbury South PSP.

The material presented in this report was to be read in conjunction with the GTA Report dated 05 Oct 2015 and the two addendum reports dated 09 Sept 2020 and 25 Sept 2020, utilising the same model structure and assumption changes outlined in these reports.

6.2 The focus of this review

Modelling or Supplementary Report #3 (the subject of this review) has been undertaken for a design year of 2046 assuming full development of the two PSP's and the supporting transport networks excluding the northern bridge crossing of Jacksons Creek.

The following two options have been used to provide a comparison:

Table 7 - Option 2 and Option 5 key network features

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

6.3 Information requested/provided

6.3.1 Model Outputs

Information that has not been provided, but that would have enhanced this review include:

- Link volumes and V/C ratios which are not possible to obtain from the plots supplied
- Network-wide VKT and VHT statistics used for economic evaluation (it is unclear for the statistics provided what specific area they relate to)
- Travel time route calculations for key roads such as Lancefield Road, Sunbury Road, Macedon Street and Francis Boulevard.

However, what we have been provided with are the following model outputs to assist in our understanding of the performance of the network with and without the northern bridge.

- 2046 Daily, AM and PM Volume plots – Option 2 only
- 2046 Daily, AM and PM Volume Difference plots
- 2046 AM and PM Volume Capacity Ratio plots – Option 2 only

It should be noted that the above plots did not provide volumes / volume differences / VC ratios on all links, thus we have had to interpret what has been supplied.

6.4 Review of model outputs

6.4.1 Comparison of Link Flows

The seven key locations across the network as identified by GTA Consultants have been compared between the with and without the northern bridge. The table below is however somewhat incomplete in that it does not include any references to the key roads (as opposed to the key locations) such as Lancefield Road, Sunbury Road, Macedon Street, Elizabeth Boulevard and Francis Boulevard which are more topical in the case of this review. The table does also not provide any context as to the significance or relevance of these roads; a local collector has a different functionality to an arterial road and where traffic should be diverted towards. Likewise, an increase in demand on a 6 lane highway has a completely different context to a 2 lane local collector with regards to impacts on traffic performance and management of movements (including safety).

Table 8 - Daily Link Volumes for with and without the Northern Bridge - 2046 (two way combined)

No	Road Name	With Northern Bridge	Without Northern Bridge	Difference	%
1	Sunbury Road between Evans Street and Francis Boulevard	35,300	42,900	7,600	18%
2	Jacksons Creek Crossing in Sunbury South PSP	12,300	12,800	500	4%
3	Jacksons Creek Crossing in Lancefield Road PSP	15,700	0	N/A	N/A
4	Horne Street between Gap Road and Riddell Road	24,600	24,800	200	1%
5	Sunbury Road north of Bulla-Diggers Road	80,000	80,800	800	1%
6	Melbourne-Lancefield Road south of Gellies Road	44,300	50,100	5,800	12%
7	Vineyard Road north of interchange	53,900	53,900	0	0%

Sunbury Road between Evans Street and Francis Boulevard is a 6-lane divided highway and has a posted speed limit of 80km/hr. Also referred to as Macedon Street, this road provides a direct link into the Sunbury town centre from the south, and so it is not surprising that traffic would prefer to use this link as the most feasible alternative to not having to access the town centre from the north. The 18% increase in traffic as noted above remains well within the carrying capacity of a 6-lane divided road.

Similarly, the section of Lancefield Road north and south of Gellies Road has the same number of lanes, speed and road classification as Sunbury Road. There appears to be a preference for motorists wishing to access the Sunbury town centre to either use Francis Boulevard or the new east-west link to travel north-west along Sunbury Road towards the city centre, and hence contribute to the traffic increase along Macedon Street as noted above. The increase in traffic south of Gellies Road will include those heading to Sunbury (at least part of the 12% increase), but as with Sunbury Road, the volumes remain well within the carrying capacity of a 6-lane arterial road.

6.4.2 Volume Difference Plots

The volume difference plots reinforce the above analysis. Lancefield Road and Sunbury Road (both 6 lane arterial roads) contain the highest increases in volumes when the northern bridge is not included (Option 2). Other roads with noticeable increases in Option 2 includes Francis Boulevard (2 lane road), though the majority of the increase is one way (southbound). Conversely, when the northern bridge is included (Option 5), Racecourse Road (2 lanes local collector) and Elizabeth Drive (4 lanes secondary road) and the new road (2 lanes secondary road) adjacent to the rail line near Raes Road increase with the northern bridge.

The above results show that Option 5 encourages significantly more traffic onto secondary and local collector roads which are at best 4 lanes, and mostly 2 lanes, while Option 2 without the bridge increases demand on primary arterial roads (6 lanes) with only one way on a local collector noticeably increasing (which was lower than Racecourse Road and new road parallel to the railway increases which are 2 lane roads). The strategic purpose of arterial roads is to carry through traffic, while local collectors are to provide access to local precincts from arterial roads, not act as thoroughfares.

6.4.3 Volume Capacity Ratios

A further check carried out on the impact of this additional traffic on the selected key road links has revealed an almost imperceptible difference in the V/C ratios able to be reported on the V/C ratio plot. Once again, this is attributable to the roads in question continuing to operate well within their theoretical maximum link capacities. The table below provide more details in relation to the comparison of these links.

Table 9 - Key location V/C comparison with and without the northern bridge

No.	Road Name	Addendum Report #2 With northern bridge V/C Ratio		Addendum Report #3 Without northern bridge V/C Ratio	
		AM	PM	AM	PM
	Sunbury Road between Evans Street and Francis Boulevard (also referred to as Macedon Street)	0.00 – 0.60	0.62 - 0.64	0.0 – 0.6	0.61 – 0.64
	Sunbury Road between Francis Boulevard and Lancefield Road	0.00 – 0.60	0.00 – 0.60	0.0 – 0.6	0.00 – 0.60
	Sunbury Road north of Bulla-Diggers Road	0.62 - 1.03	0.71 – 1.05	0.62 - 1.03	0.75 – 1.05
	Lancefield Road north of Gellies Road	0.66 – 0.72	0.67 – 0.79	0.66 – 0.80	0.67 – 0.90
	Lancefield Road south of Gellies Road	0.78 – 0.84	0.68 – 0.88	0.78 – 0.84	0.80 – 0.88
	Elizabeth Street between Gap Road and Riddell Road	0.00 – 0.60	0.61- 0.78	0.00 – 0.60	0.62 – 0.78
	Francis Boulevard between Lancefield Road and Sunbury Road	0.63 – 0.83	0.63 – 0.83	0.00 – 1.00	0.63 – 0.83

7 Review of Sunbury Growth Corridor Sunbury South & Lancefield Road Infrastructure Contributions Plan, GTA Consultants dated 08 Oct 2020

7.1 Modelling updates included in this report

No new model runs have been completed.

7.2 The focus of this review

This report was produced at the request of Hall & Willcox Lawyers in September 2020. The purpose of the report was to provide an expert evidence report which addressed the key issues at an upcoming hearing.

7.3 Information requested/provided

Select link plots for Lancefield Road bridge and Sunbury Road bridge have been provided in the report. The previous request for highway assignment model files was to undertake custom select link plots to gain a greater understanding of the demand using the bridge. Although these select links provide information when the bridge is included, they do not inform on the movements of vehicles when the bridge is not included, i.e. four select links should have been provided.

7.4 Review of model outputs

7.4.1 Select Link Analysis for the Northern Bridge

Refer Page 12, Figure 4.1 - Select Link for the Northern Bridge

The GTA modelling indicates that the northern bridge performs mainly a local function and that up to 40% of the traffic is local traffic emanating from the northern development. Only about 10% extends to the Calder Highway. Of the nearly 16,000 trips, 3,500 are travelling to just the other side of the bridge. With the northern bridge, traffic would access the Town Centre from the north-west (yielding high right turn vols to/from Racecourse Road). However, without the northern bridge, they will simply access this area of the model via Macedon Street, entering from the south.

GTA modelling also indicates that another 4,000 of the nearly 16,000 trips are heading to the Sunbury Town Centre or just beyond to the south-west. In addition, what the select link plot for the northern bridge shows is that a proportionately larger amount of traffic is travelling through the Sunbury Town Centre, as opposed to using Elizabeth Drive. Furthermore, the desire line, and therefore most of the traffic from Sunbury North to the Calder Highway, chooses to drive right through the Town Centre, which somewhat contradicts any previous reasoning which suggests that northern bridge will create a ring road around the Town Centre instead.

Of note however, is that the select link analysis only tells half the picture as we don't know how much the bridge influences the distribution of traffic and induces demand, i.e. does every trip using the northern bridge still need to occur or is there an alternative trip type or mode choice decision being made. Given the distribution model will favour short trips, what is not clear is how many of these trips would occur, were the northern bridge not constructed. That is, the select link only tells us that the bridge would be used, but not what the induced demand is (and this is quite important for the relative attractiveness). If the amount of traffic reduces from our catchment, then these trips are induced, and are in fact therefore non-essential.

7.4.2 Select Link Analysis for Southern Bridge

Refer Page 14, Figure 4.2 – Select Link Analysis for the Southern Bridge

For the southern bridge, the plot shows that Lancefield Road is collecting traffic reasonably uniformly along its length and from either side of the corridor. This not the case with the northern bridge which appears to be dragging in a lot more traffic from even further north than just Sunbury North (and adding to the 42%) and mainly from the west of Lancefield Road (possibly the majority of the 57%). However, without a better understanding of the zone structure and zone connector configuration, the reasons for these proportions still remain quite unclear.

What the Select Link for the southern bridge indicates is that traffic coming off the Calder Highway appears quite happy to divert and use the southern bridge just as easily as they might go around the north. Moreover, it would appear that it is likely that the travel time using the southern route would be quicker given that it avoids the town centre, and once on Lancefield Road, there are no major east-west roads to cause any significant delays.

I am also aware that there is a real risk that the OMR may not be completed as a 6-lane divided freeway by 2046. If this is the case, then the southern bridge will have a much more significant regional function that currently being proposed. In addition, all of the PSPs along Lancefield Road corridor will use the southern bridge if the northern one was not constructed.

7.4.3 Network Statistics

Refer Page 20, Table 6.1

Table 10 – Network Statistic Summary for Sunbury Growth Corridor (Ref: GTA Table 6.1)

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

Another way of assessing the impact of the northern bridge is by reviewing the broader effect on the performance of the overall road network with / without the bridge. Total vehicle kilometres travelled (VKT), daily vehicle hours travelled (VHT) and average speeds for the Sunbury & Diggers Rest Corridor have been extracted from the model by GTA. However, the catchment of the statistics remains unclear. How far north, east, south and west the area for these results go is important to understand whether the statistics are reporting the true impact or might be understating the effect with/without the bridge due to ripple effect it has on route choice and road volumes within the broader Sunbury area. An image of the area (showing the modelled network) would have been useful.

What the table shows is that the case for a northern bridge is extremely weak. In essence, what the table says, is that based on the updated VITM project model with the updated 2018 land use data to align more closely with the Victoria in Future (VIF) population projections, that constructing both bridges will:

- increase the overall speed in the modelled area by about 0.4 km/hr
- decrease the overall vehicle kilometres travelled (VKT) by about 0.7%
- decrease the overall vehicle hours travelled (VHT) by about 0.6%

The argument that both bridges are equally required based solely on the significant increase in these network statistics extrapolated out from the 2015 model year is therefore incorrect as the resultant difference in the overall network performance would be hardly discernible from each other in absolute terms. Discounting the difference from an economic perspective, would amount to a very little difference in economic return.

7.4.4 V/C Plots

Page 21, Figure 6.1 and Page 22, Figure 6.1

Figure 2 – PM Volume to Capacity Plot for Option 5 (both bridges) – GTA Figure 6.1

Figure 3 - PM Volume to Capacity Plot for Option 2 (southern bridge only) – GTA Figure 6.2

Figure 2 shows that the northern bridge, is starting to become constrained (i.e. V/C ratio in the 0.68 – 0.85 range), but that without the bridge, the traffic simply diverts to the main arterials (which is where the traffic should be). The plots also show that there is a negligible impact on the road network south of Macedon Street/Sunbury Road under both scenarios, (i.e. the V/C ratio remains in the 0.0-0.6 range).

If anything, this highlights why the bridge is not essential but may also yield a negative outcome for the community as it attracts more traffic through suburbia via the northern bridge, as opposed to encouraging the use of Lancefield Road and Sunbury Road, the main arterials that were designed for that very purpose.

Page 23, Point no.3

"*There will be an increase in congestion in the Sunbury Town Centre, mainly Sunbury Road and Vineyard Road",* is likely to happen regardless of options.

If you look at the V/C plots, Vineyard Road in actual fact has a higher V/C ratio with the northern bridge in than without. This indicates that the northern bridge will make the Town Centre even more congested in this location, not less. This also doesn't account for the dog-leg movement from Vineyard to Racecourse which is not ideal from a traffic management perspective

Page 23, Table 6-2

"The model does not consider the delays at specific intersections or intersection types (i.e. signals etc.) and as such the operating speeds reported in Table 6.2 are likely to be overstated".

This statement is incorrect as it overlooks the fact that the Free Flow Speed (as coded into the model) is usually adjusted downward to reflect the impact of the existing and potentially any new intersections that may be introduced along the route over time. Yes, higher speeds are possible, but if Lancefield Road has more intersections than assumed and/or these are not co-ordinated, the opposite could in my opinion also potentially be true.

Page 24, Table 6-3

Whilst showing changes in road vols provides some of the info, it ignores the overall capacity of the road and how it impacts on performance.

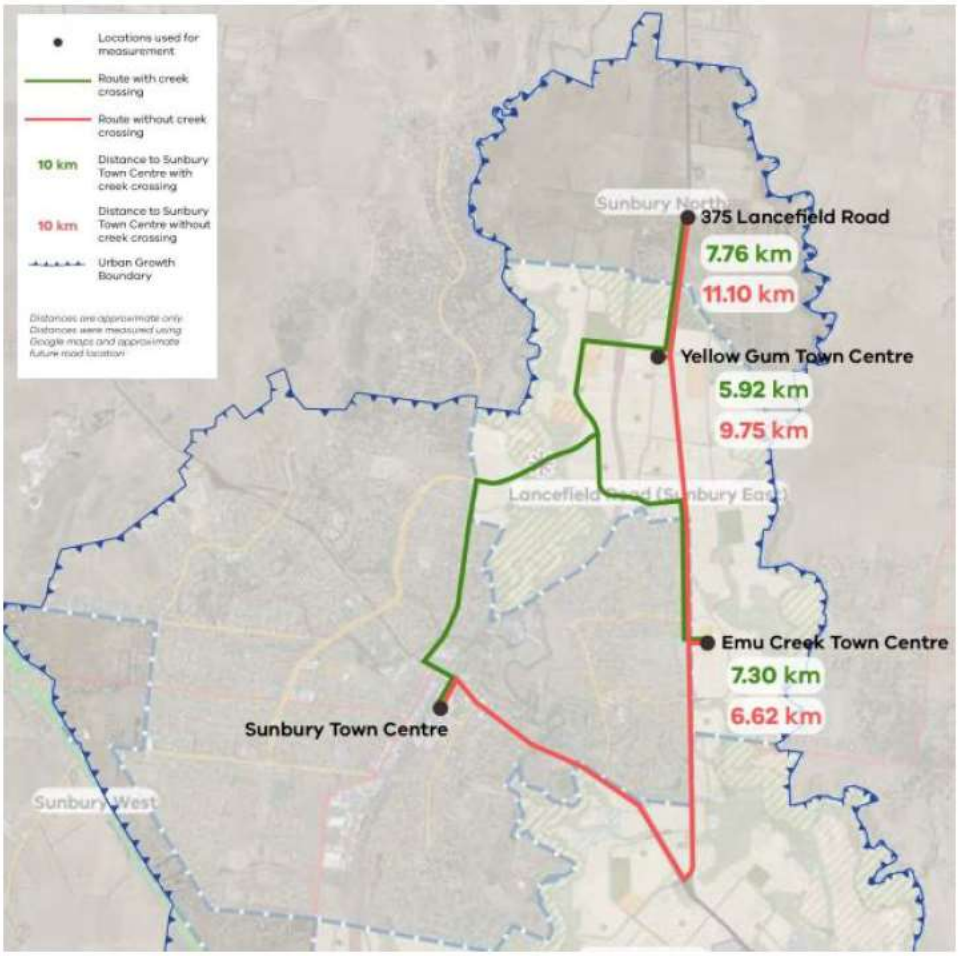
Missing from the table are Racecourse Road and Elizabeth Drive. Two sets of local connectors which have significant linkages to the northern bridge.

If you include V/C ratios in the table, it will tell a much more important picture of whether roads can accommodate the increase or start to suffer (and we know that it would show just as favourable results for and without the northern bridge).

7.4.5 Accessibility

Refer Page 25, Figure 6.4 – Travel distance comparisons

Figure 4 - Northern bridge travel distance comparison (Source: VPA) Ref: GTA Figure 6.4



What GTA Consultants is suggesting by this travel distance plot is that all of the trips in the model that have their origins in the Lancefield Road PSP and the Sunbury South PSP have their destinations as the Sunbury Town Centre. This assumption is fundamentally incorrect and therefore quite misleading. Accessibility can be measured in many different ways and moreover needs to take into account many factors other than just travel distance along a couple of major road corridors. The conversion to time is also incorrect based on the underlying assumption that the average speed along the two routes being compared is 50km/hr for each. Lancefield Road, for example, is coded at 80km/h, whereas the Secondary roads to the north of the Sunbury Town Centre are coded mostly as 50km/h, by comparison.

We have also recognised a number of alternative lower order routes/roads such as Sunningdale/Francis Boulevard that have not been included in such an analysis. Again, true distance would be shorter, but travel time could be equivalent at certain times of the day.

A review of data presented in an earlier 2017 GTA report also suggests that the network in Sunbury experiences AM and PM which are short and sharp and in the order 15 and 45 minutes long. Why the phenomenon of peak spreading has been introduced into the discussion as a point of contention when the VITM model assumes a peak period lasting for up to 2-hours in the AM and PM each day, is beyond my current comprehension. This is a global phenomenon best represented in the daily flow of commuters in and out of our major cities and in most cases only measurable along our major arterial and freeway corridors.

7.4.6 Network Resilience

Refer Page 26, Section 6.1.3

"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".

Unfortunately, I am unable to agree with this statement for a number of reasons. It is unclear if the author is:

- Questioning the suitability of the model for its intended purpose based on the degree of calibration of the base model achieved in 2015. [See my earlier comment re this finding in Section 3.2 of this report], or
- Sowing doubt on the Link Volumes reported in the table below because the model is unable to report the volumes at these locations with sufficient accuracy, and/or
- Advising the reader that these results need to be viewed with some discretion because of the inherent limitations within the model which does not allow it to consider the operational elements of the network?

In my opinion, this statement is therefore somewhat confusing and begs the question as to why a more detailed mesoscopic or even microscopic model was not been produced for the Sunbury area from the outset.

Table 11 - Link Volumes (vehicles) for with and without the northern bridge - 2046 (two way combined) – Ref: GTA Table 6.3

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%

Page 27, Table 6.3

What Table 11 shows is a general increase in traffic on a number of lower order roads and mostly alongside Lancefield Road. However, whilst the percentage increases may appear large, the actual increase in the traffic volumes along these roads are relatively small and are (as noted by GTA Consultants):

- "mainly from people seeking to access services in the Sunbury Town Centre",
- "not significant enough to require duplication", and

- "require the Connector Road between SS-IN-12 and SS-IN-04 to be upgraded to Trunk Connector'

All of the above therefore shows that the increased traffic volumes shown in Table 6.3 are completely manageable, provided the intersections are upgraded along Lancefield Road, including especially the one with the Sunbury Road.

8 Conclusion

On behalf of Lancefield Road Development Partners Pty Ltd, I have been engaged by Best Hooper Lawyers Pty Ltd to assisting Planning Panels Victoria ("the Panel") with respect to the proposed amendments to the Hume Planning Scheme to accord more closely with the proposed Sunbury South Precinct Structure Plan and Lancefield Road Precinct Structure Plan. In particular, I have been asked to undertake a peer review of the traffic model relied upon by VPA and to provide evidence in respect of the outputs produced by GTA Consultants in support of the need for a northern bridge crossing of Jacksons Creek within the Lancefield Road PSP area, and a southern bridge crossing of Jacksons Creek within the Sunbury South PSP area.

We have been provided with five modelling-related reports commissioned by VPA between October 2015 and October 2020. The first report concluded that none of the bridges are required. The last report argued that both the bridges are needed.

Key findings that have been able to be concluded include:

1. The 2018 population update had only a marginal impact on the study area and therefore the modelling undertaken in 2015 holds good.

2. Lancefield Road north of Francis Boulevard and Sunbury Road/Macedon Street north of Lancefield Road continues to perform at an acceptable level of service C through to D, that is, as far out into the future until at least 2046.

3. The increase in traffic along Macedon Street is very much a local town centre issue rather than as a result of a significant and unacceptable increase in traffic along the other surrounding major roads in the network.

4. It was noted that up to 57% of the traffic on the northern bridge has a nexus with PSP 1075. However, in terms of overall network performance, the bridge provides extremely marginal benefits.

5. The general level of traffic in and around Sunbury without the northern bridge will remain manageable provided the intersections along Lancefield Road are upgraded, including especially the one with Sunbury Road.

9 Declaration

I have been assisted in the preparation of this Statement by:

- Vikas Sharma, Principal Transport Modeller, SMEC Australia Pty Ltd
- James Parrot, Team Leader Transport Planning Logistics and Analytics (SA/WA), SMEC Australia Pty Ltd

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.

Derrick Hitchins CPEng RPEQ FAITPM MIEAust
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SMEC Australia Pty Ltd

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