Sunbury Growth Corridor

Strategic Transport Modelling for Sunbury South PSP (1074) & Lancefield Road PSP (1075)

Supplementary Modelling Report #3

Prepared by: GTA Consultants (VIC) Pty Ltd for Victorian Planning Authority
on 25/09/2020
Reference: V198070
Issue #: A

GTAconsultants

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Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	25/09/2020	Final	Reece Humphreys	Matthew Raisbeck	Reece Humphreys	

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1. INTRODUCTION

1.1. Overview

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. Specifically, the Infrastructure items listed in the PSP include two new bridge crossings of the Jacksons Creek in Sunbury.

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.

Since the completion of the 2015 report, Sunbury has experienced recent transport investments including the electrification of the Sunbury Rail Line and upgrades of the Calder Freeway and Vineyard Road. In addition, there has been a number of changes to the forecast growth in the last five years. In particular, 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 eight million people in the same time period. This increase has the potential to impact on travel behaviour in Sunbury and specifically the two bridges.

As part of the preparation for the Amendment, on the 2nd September my firm was instructed to:

> *'Re-run and update the model based on current information and data, and prepare an updated report for release….'* Also noting that *'…you are not required to re-run all of the options that were considered in your original 2015 report. Rather, your updated report should be based upon the road network and PIP contained in the gazetted PSP*.'

The Stage 1 Report documenting the findings of the updated data was circulated on 9th September 2020.

On the 11th of September I was further instructed to prepare an addendum report which updates the population figures in the modelling:

- *'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 instructions also directed my firm to:

> *'Please run the traffic model without LR-BR-01 and prepare an addendum report which sets out the results of that modelling exercise. You should use the updated population figures from your Stage 2 report.'*

1.2. Purpose of 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. It 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 should

be read in conjunction with the GTA Report dated 5th October 2015 and the two addendum reports dated 9th September 2020 and 24th September 2020, utilising the same model structure and assumption changes outlined in these reports.

1.3. Definitions

DoT – Department of Transport (note that the functions of DoT were previously covered by DEDJTR, DTPLI, VicRoads, and PTV).

2. PROJECT CONTEXT

2.1. Transport Modelling Work Completed to Date

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.

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.

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

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.'*

2.2. Site Context

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 in Figure 2.1.

Figure 2.1: Sunbury and Diggers Rest Growth Corridor

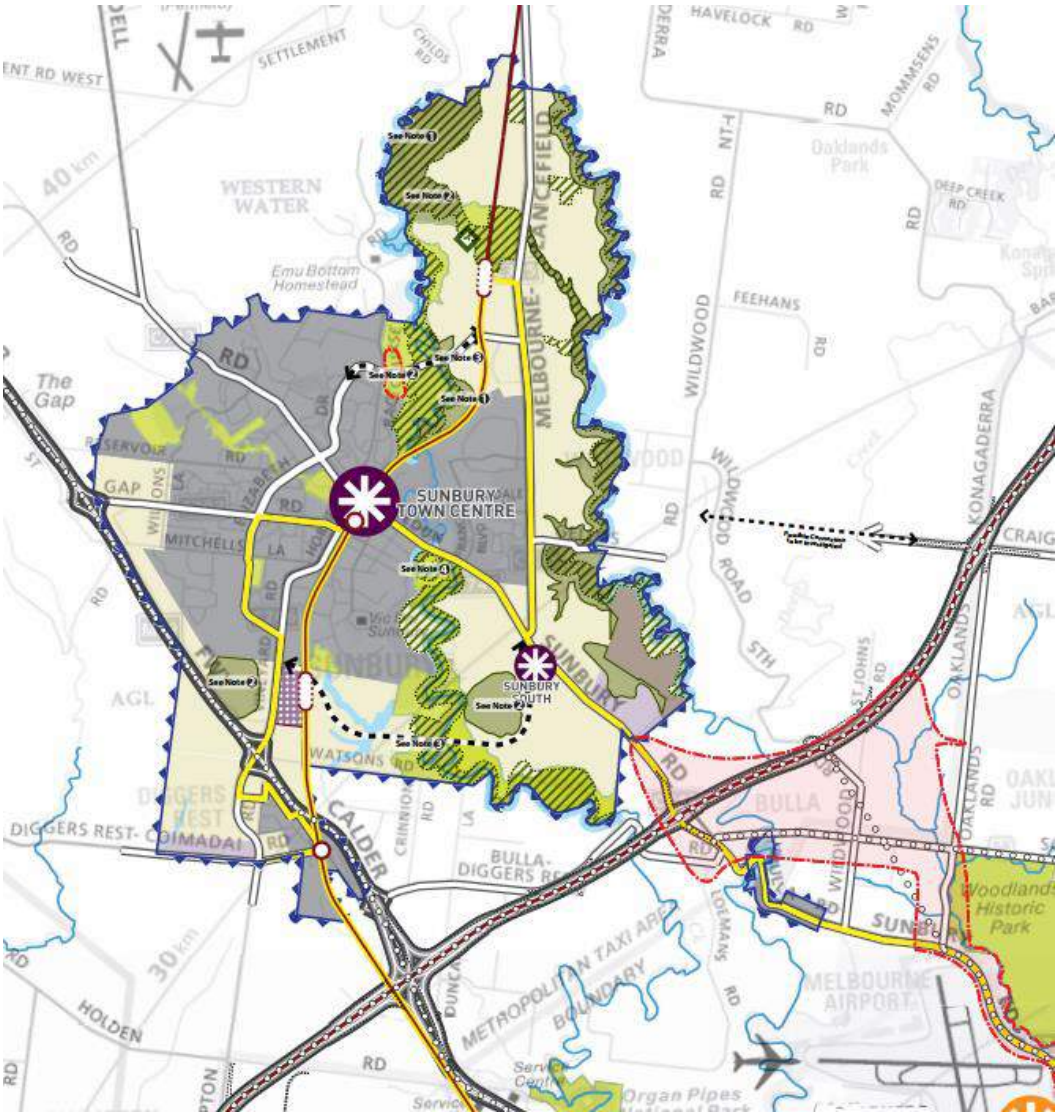
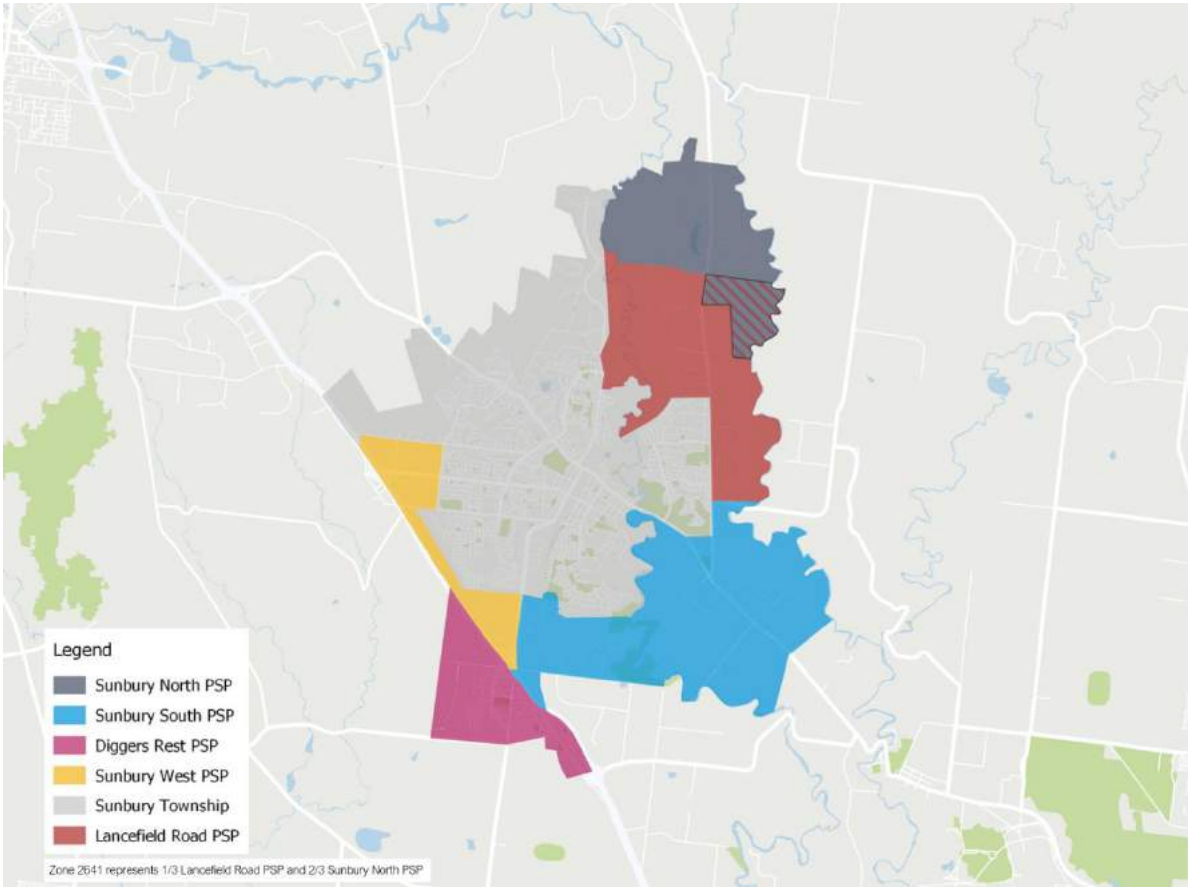


Figure 2.2 has also been prepared to show the location of the two PSP's in the context of Sunbury, as well as the location of Sunbury West and Sunbury North PSP's which are yet to commence the PSP process.

Figure 2.2: 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.

2.3. Transport Modelling - VITM Reference Case

All modelling in the growth area relies upon the information provided in the Victorian Integrated Transport Model (VITM) Reference Case as a starting point for analysis. The VITM Reference Case includes a list of transport projects and policies together with a set of land uses for a given year. It is important to note that the inclusion of projects in future year networks in the Reference Case does not imply there is any commitment from the Government or the Department of Transport (DoT) to undertake these projects. DoT advises that the projects within the Reference Case represent a reasonable estimate of investment in the future network for the purposes of modelling demand in the transport system.

The land use (population, employment and enrolment) forecasts within VITM align with the Victoria in Future (VIF) population projections produced by the Department of Environment, Land, Water and Planning (DELWP), both in terms of the level and distribution of growth. While established land use development

trends are relied upon in these forecasts, a degree of policy shift is also captured, along with planned land release, renewal sites and infrastructure projects.

The transport modelling completed in 2015 was underpinned by land use projections from DELWP that were prepared in 2012.

The Reference Case is owned and controlled by DoT and is provided to GTA for use under a license agreement.

3. MODEL UPDATES

3.1. Introduction

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.

In this regard, the modelling work has been updated to understand the impact to traffic demand in Sunbury of these changes. Updating the land use (population and employment forecasts) for the areas outside of the Sunbury Growth Corridor have the potential to impact travel patterns within and through the Sunbury South and Lancefield Road Precinct Structure Plans (PSP 1074 & 1075).

Supplementary Report #3 (this report) has been undertaken for a design year of 2046 which assumes full development of the two PSP's and the supporting transport networks excluding the northern bridge crossing of Jacksons Creek, with the specific details set out in the following sections. More specifically, the land use inputs for the two PSP's have been updated to reflect the exhibited information as well as updated information for Sunbury North and Sunbury West to align with policy.

3.2. Land Use Inputs – Metropolitan Melbourne

The population, households, employment and enrolments for the Melbourne Statistical Division are outlined in the Supplementary Report dated 9th September 2020 which are reproduced in Table 3.1.

Table 3.1: Land Use Inputs for Melbourne Statistical Division

Model	Population (People)	Household (Dwelling)	Employment (No. of Jobs)	Enrolment (No. of Students)
VIF 2018	8,132,000	3,145,000	4,285,000	2,208,000

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 3.2.

Table 3.2 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**

3.4. Transport Networks

This report uses the same networks as the previous Option 2 plus the Calder Highway connection south of the Sunbury South PSP. The purpose for maintaining the Calder Highway connection is to provide a direct comparison on the performance of Option 5. Table 3.3 summarises the two options for this assessment.

Table 3.3: 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 used in this assessment are provided in Appendix A.

4. RESULTS

4.1. Model Outputs

Model outputs have been extracted to assist in the understanding the performance of the network as a result of the removal of the northern bridge as outlined in Section 3 of this report. The following outputs are located within Appendices:

1. AM Peak (2-hours), PM Peak (2-hours) and Daily vehicle volume plots (Appendix B)
2. Volume Difference Plots between Option 5 and Option 2 (Appendix B)
3. Volume to Capacity Plots for the AM and PM peak periods (Appendix C)

4.2. Daily Volume Plots

The daily volume plot is provided in Figure 4.1. Further, a daily difference plot between the with and without northern bridge has been prepared and is presented in Figure 4.2, showing the links that increase in volume (shown in red) and links that decrease in volume (shown in blue) without the northern bridge.

Figure 4.1: 2046 Daily Volume without the Northern Bridge

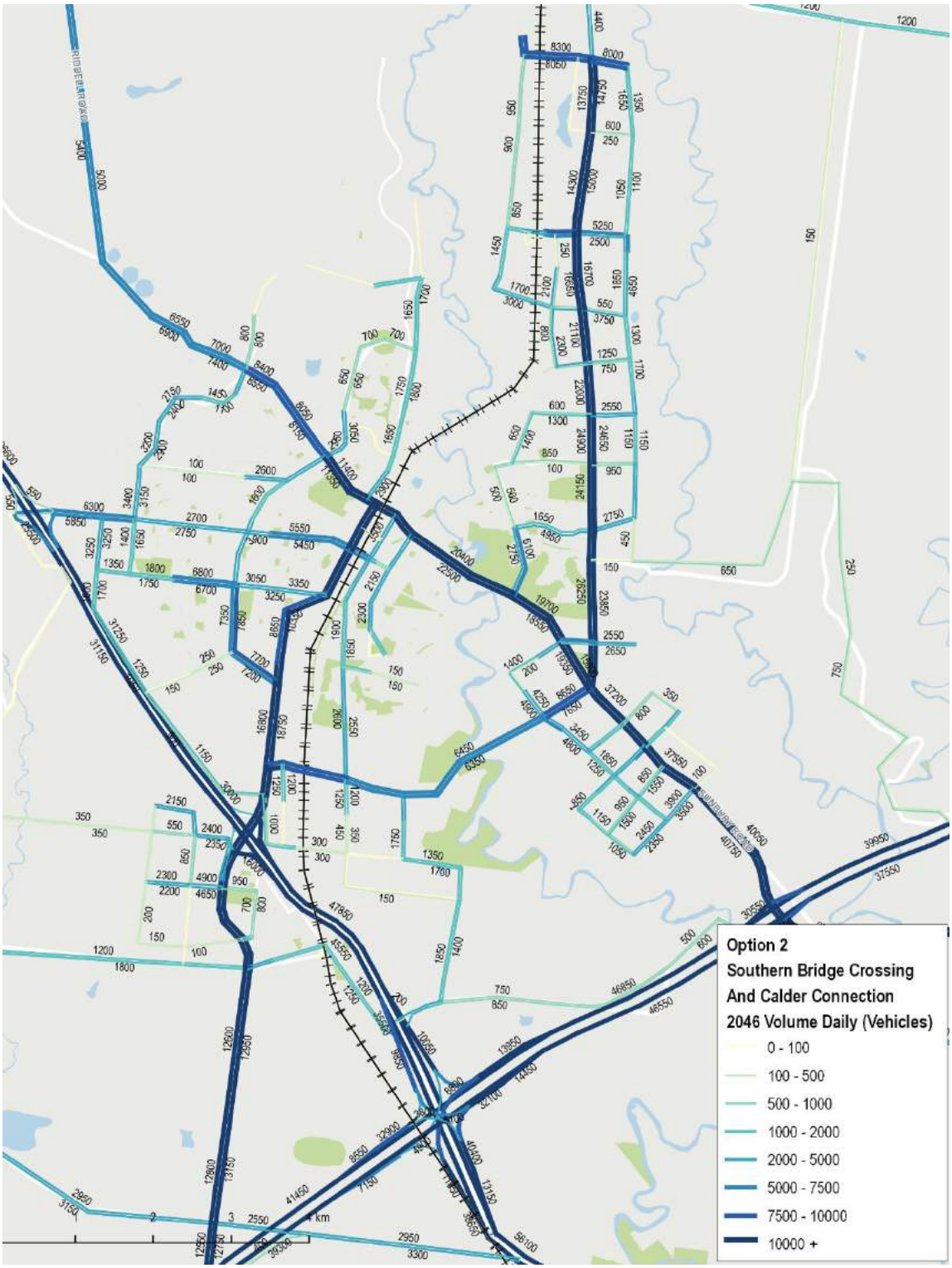
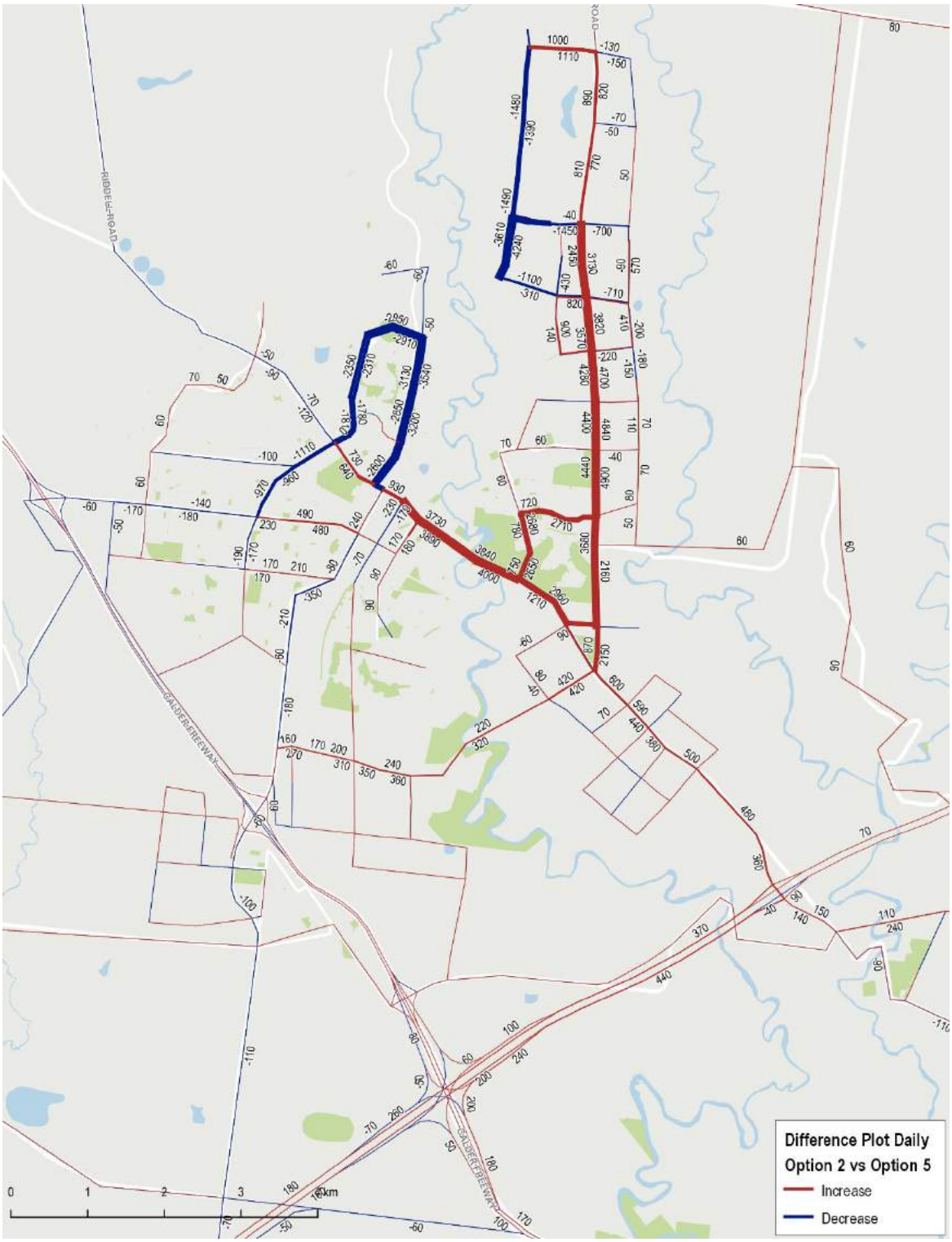


Figure 4.2: 2046 Daily Volume Difference Plot (with and without the Northern Bridge)



The difference plot shows that without the northern bridge, there will be a variation of volume changes in and around the Sunbury Town Centre with the majority of increases occurring on Lancefield Road and Sunbury Road.

The seven key locations across the network that reported traffic volumes have also been compared between the with and without bridge options which are shown in Table 4.1.

Table 4.1: 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%

The updated modelling results show that the removal of the bridge will result in increases at all the seven key locations with the largest increases on Sunbury Road (18%) and Lancefield Road (12%).

5. SUMMARY

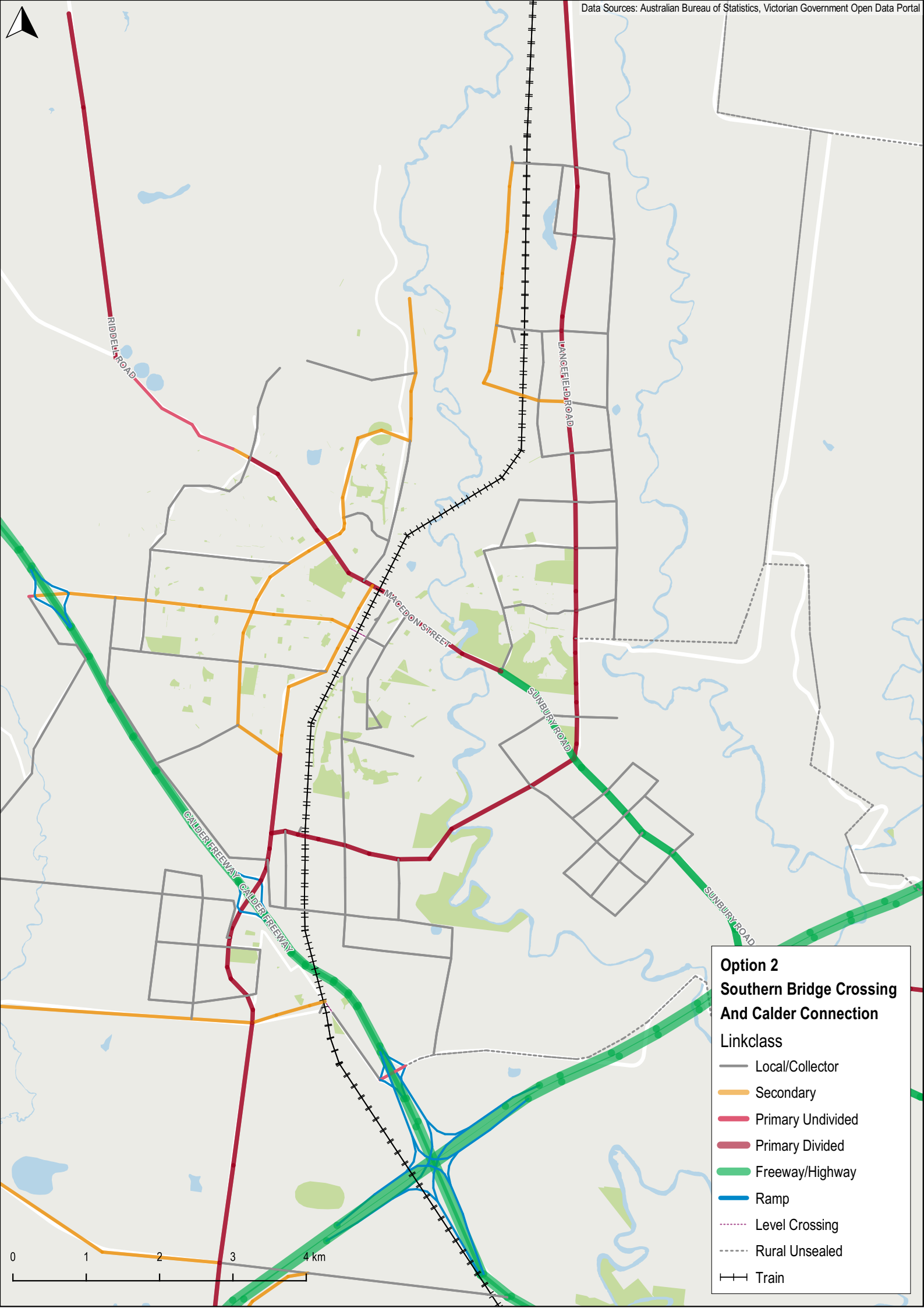
Transport modelling has been undertaken with an increase of some 16,500 people in the Sunbury Growth Corridor as well as a population for Melbourne that is reflective of the more recent forecasts. The modelling presented in this report showed the following:

1. Without the northern bridge there will be a variable change to traffic volumes in and around the Sunbury Town Centre.
2. Racecourse Road will reduce its traffic in the order of 6,000 vehicles per day without the northern bridge.
3. When compared to Option 5, the largest increase in volumes will be on Sunbury Road, which will experience in the order of 42,900 vehicles per day in the town centre and Lancefield Road which will experience in the order of 50,100 vehicles per day.

A. TRANSPORT NETWORKS

A

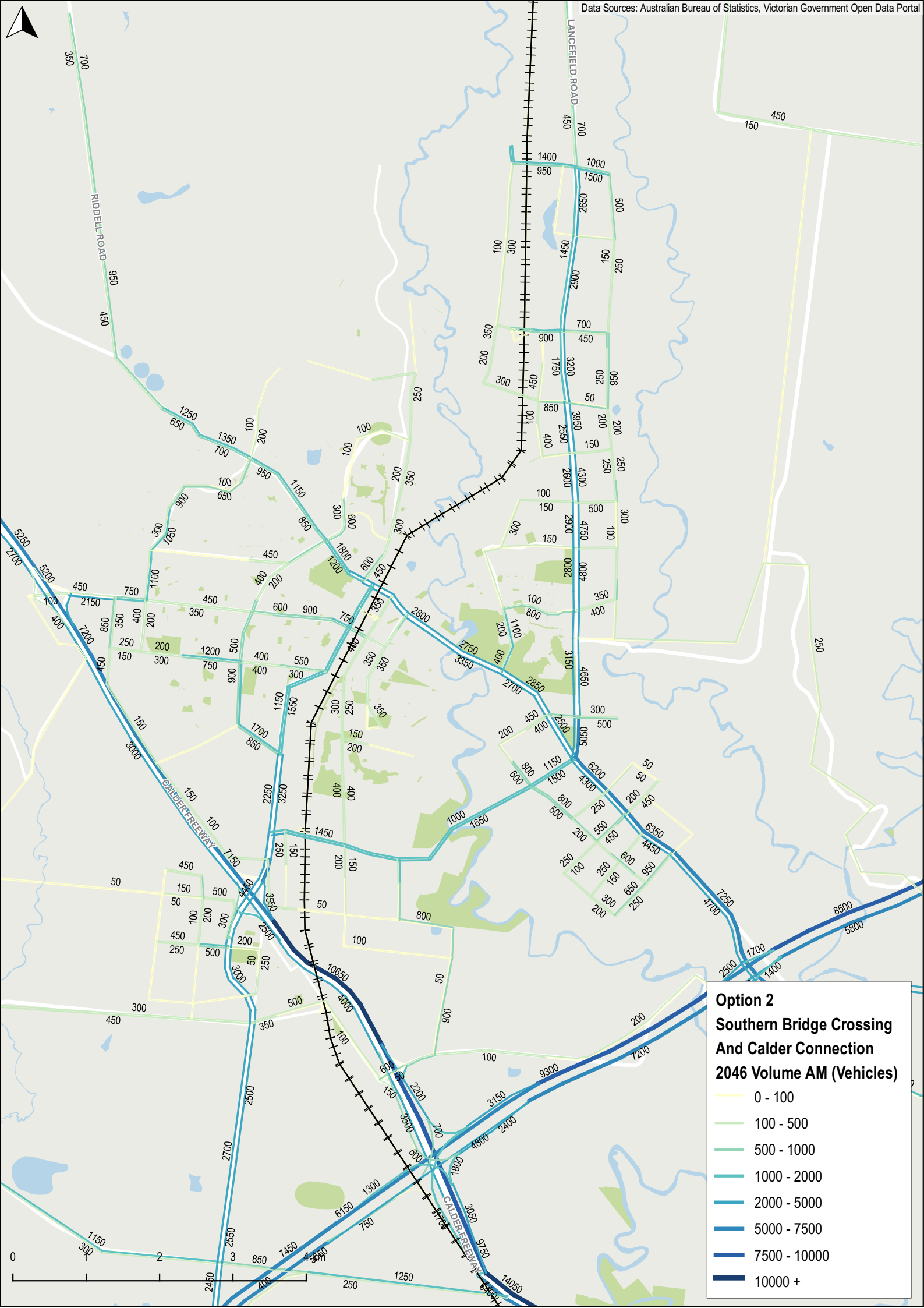

Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANCEFIELD ROAD
MACEDON STREET
SUNBURY ROAD
CALDER FREEWAY
CALDER FREEWAY
SUNBURY ROAD
0
1
2
3
4 km
Option 2
Southern Bridge Crossing
And Calder Connection
Number of Lanes
1
2
3
4
5

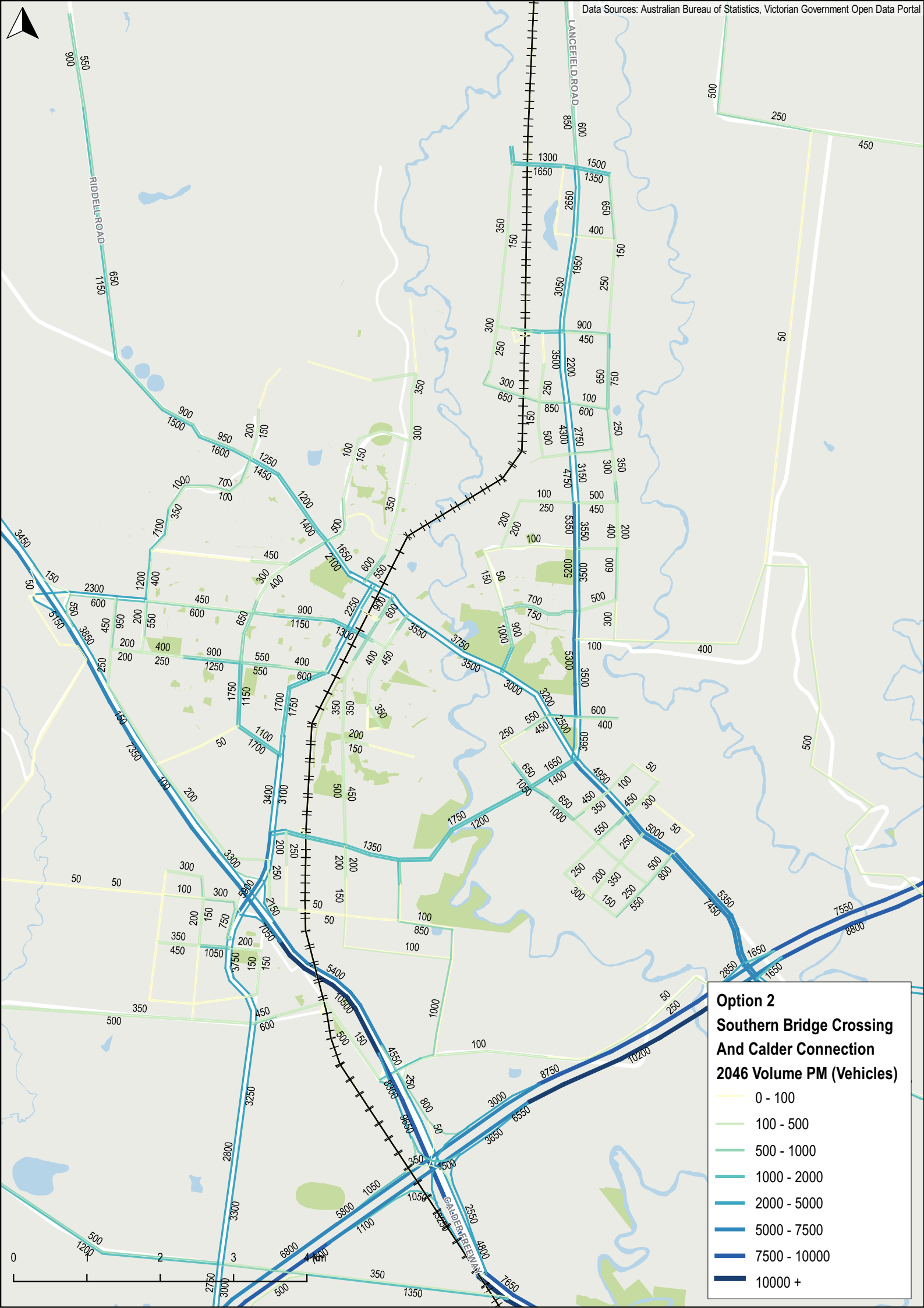

Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGEFIELD ROAD
MACEDON STREET
SUNBURY ROAD
CALDER FREEWAY
CALDER FREEWAY
SUNBURY ROAD
0
1
2
3
4 km
Option 2
Southern Bridge Crossing
And Calder Connection
Linkclass
Local/Collector
Secondary
Primary Undivided
Primary Divided
Freeway/Highway
Ramp
Level Crossing
Rural Unsealed
Train


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGFIELD ROAD
MACEDON STREET
SUNBURY ROAD
CALDER FREEWAY
CALDER FREEWAY
SUNBURY ROAD
0
1
2
3
4 km
Option 2
Southern Bridge Crossing
And Calder Connection
Posted Speed
<40kmh
50kmh
60kmh
70kmh
80kmh
90kmh
100kmh
100kmh+

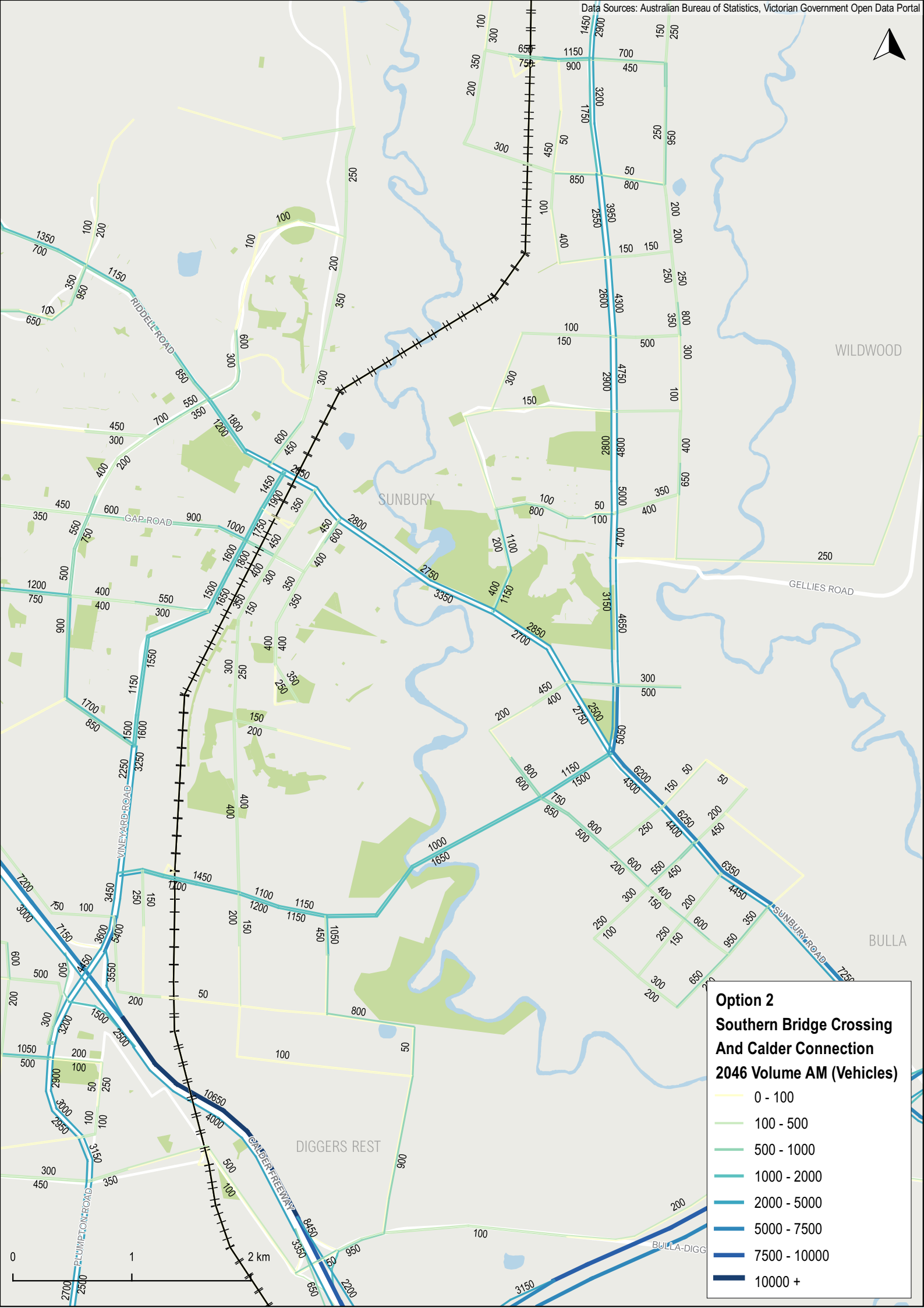
B.VOLUME PLOTS

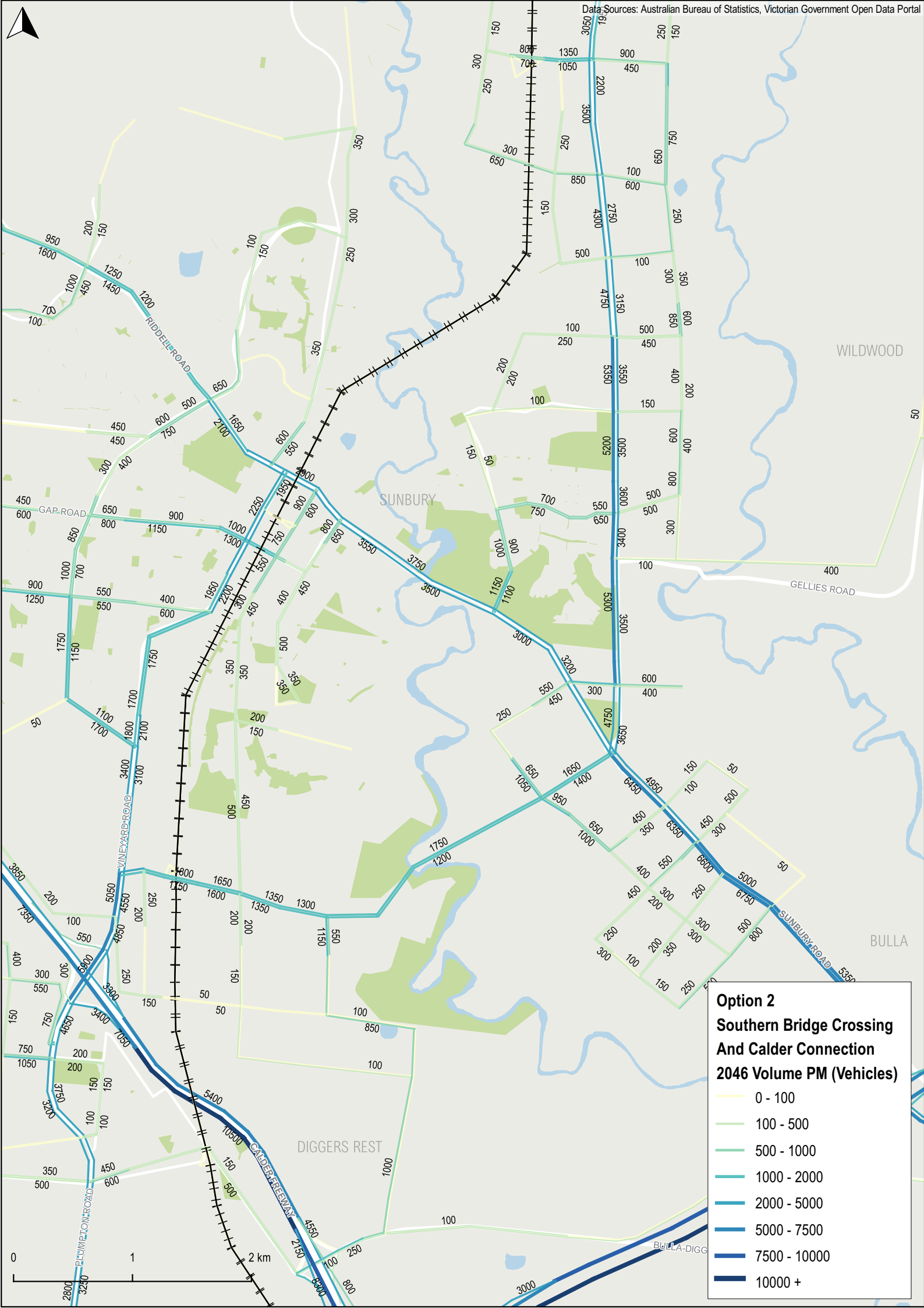
B

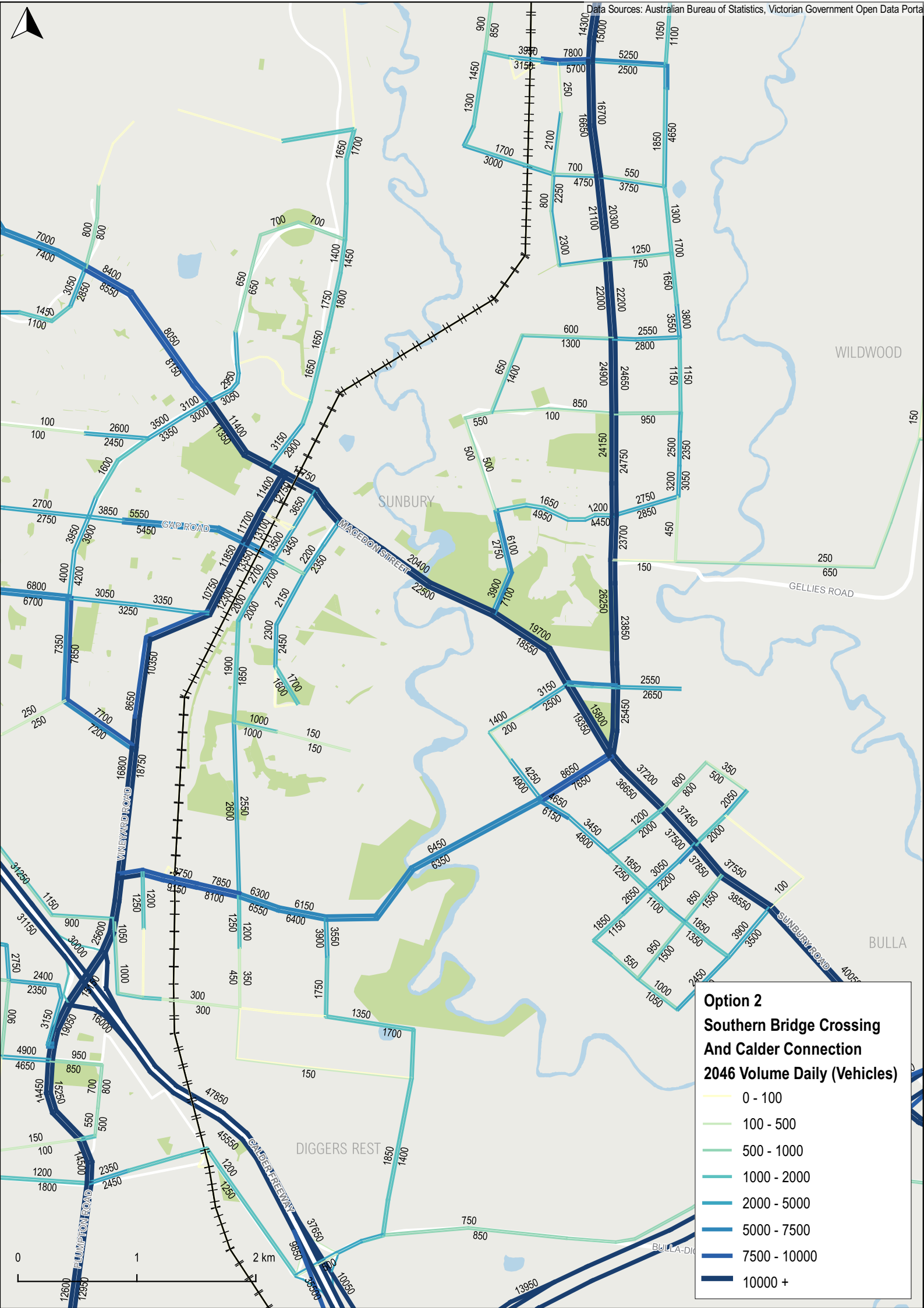

Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGFIELD ROAD
CALDER FREEWAY
CALDER FREEWAY
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume AM (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +
0
1
2
3
km


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGEFIELD ROAD
GALDER FREEWAY
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume PM (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +
0
1
2
3


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
SUNBURY ROAD
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume Daily (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +
0
1
2
3
4 km


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
GAP ROAD
VINEYARD ROAD
PLUMPTON ROAD
GELLIES ROAD
SUNBURY ROAD
BULLA-DIGG
CALDER FREEWAY
SUNBURY
WILDWOOD
BULLA
DIGGERS REST
0
1
2 km
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume AM (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
WILDWOOD
SUNBURY
GELLIES ROAD
GAP ROAD
RIDDELL ROAD
VINEYARD ROAD
SUNBURY ROAD
BULLA
DIGGERS REST
CALDER FREEWAY
PLUMPTON ROAD
BULLA-DIGG
0
1
2 km
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume PM (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +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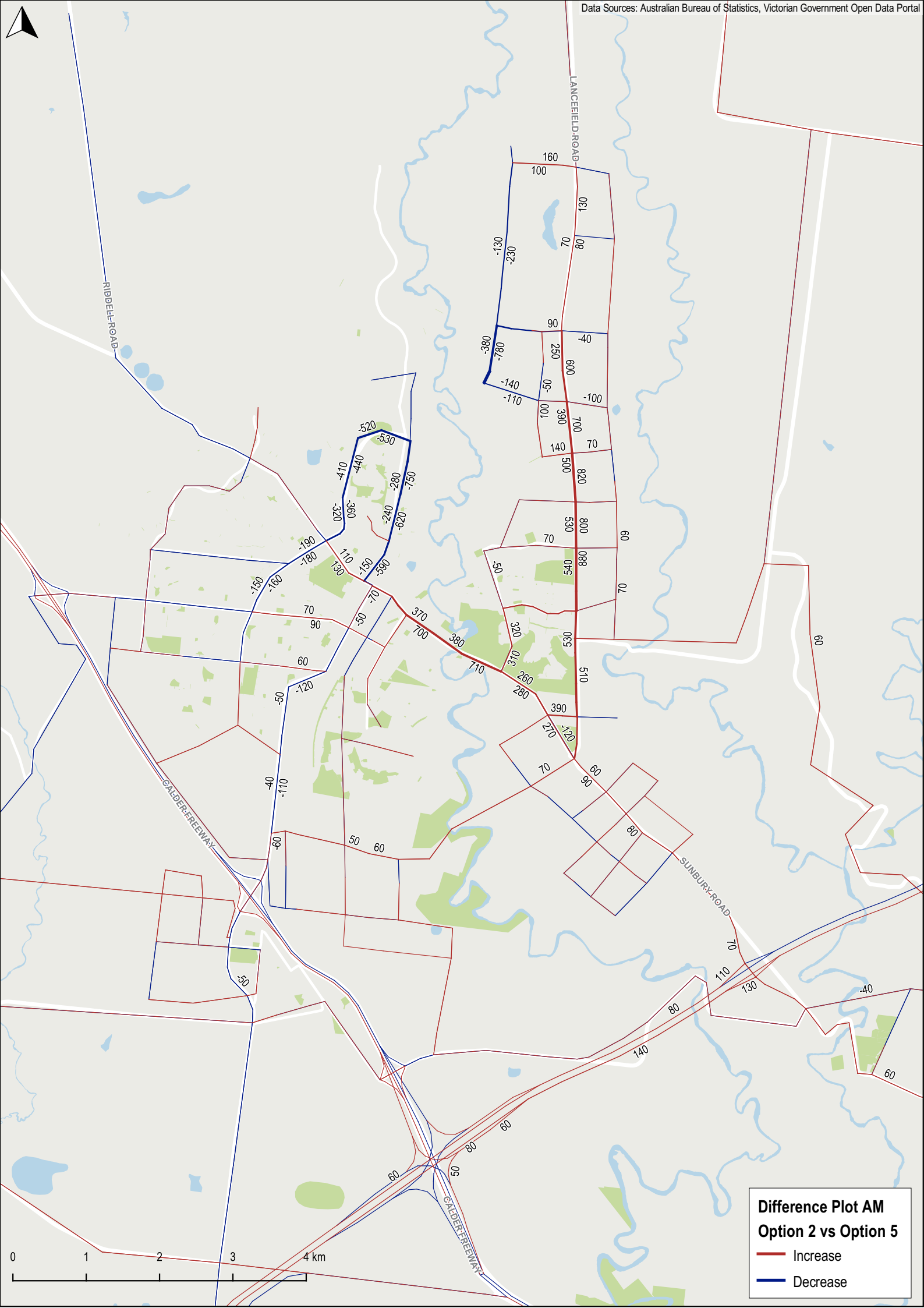
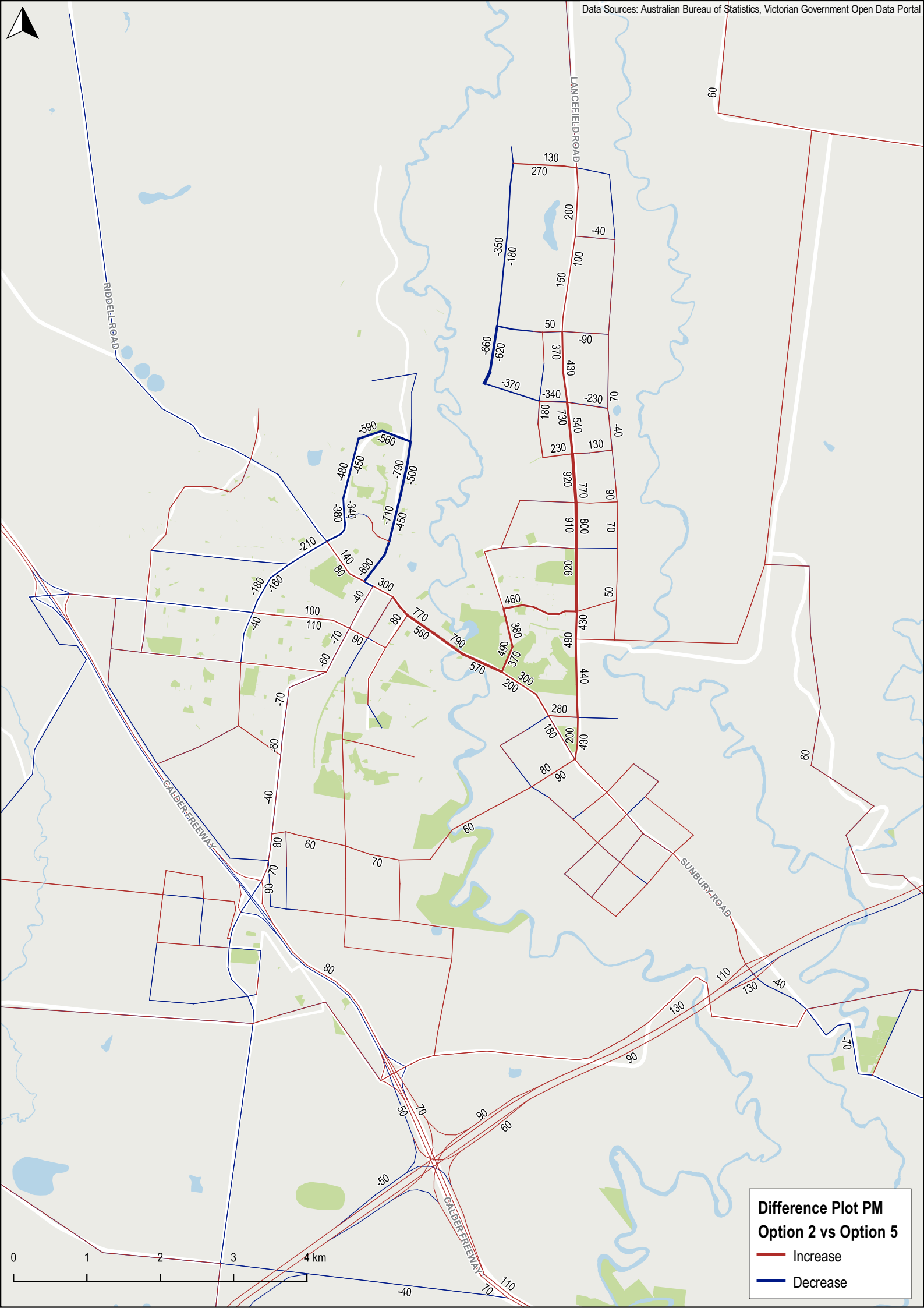
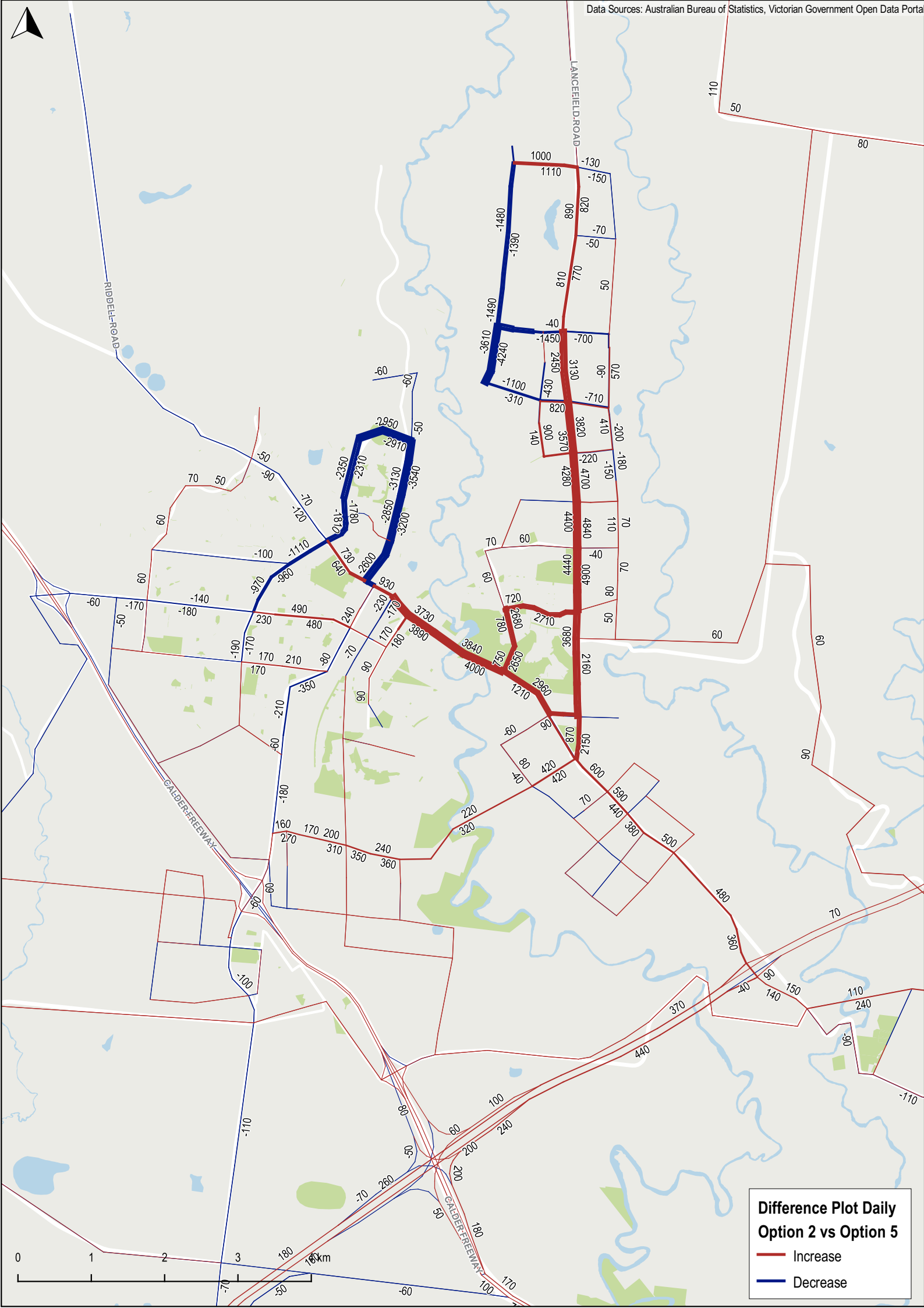
SUNBURY
WILDWOOD
BULLA
DIGGERS REST
GELLIES ROAD
CAP ROAD
MACEDON STREET
VINEYARD ROAD
SUNBURY ROAD
CALDER FREEWAY
PLUMPTON ROAD
0
1
2 km
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume Daily (Vehicles)
0 - 100
100 - 500
500 - 1000
1000 - 2000
2000 - 5000
5000 - 7500
7500 - 10000
10000 +

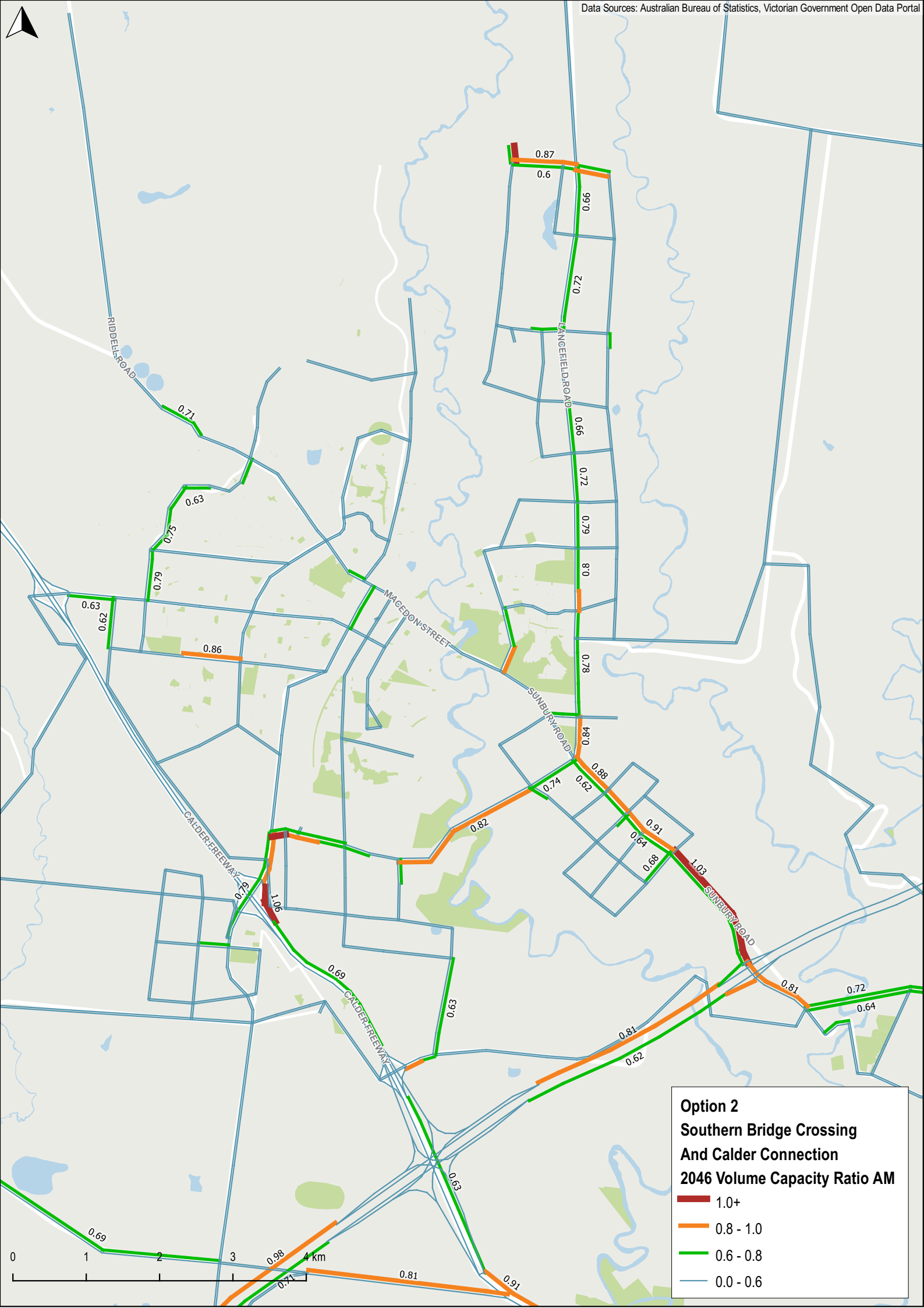

Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
LANCEFIELD ROAD
RIDDELL ROAD
CALDER FREEWAY
SUNBURY ROAD
CALDER FREEWAY
0
1
2
3
4 km
Difference Plot AM
Option 2 vs Option 5
Increase
Decrease

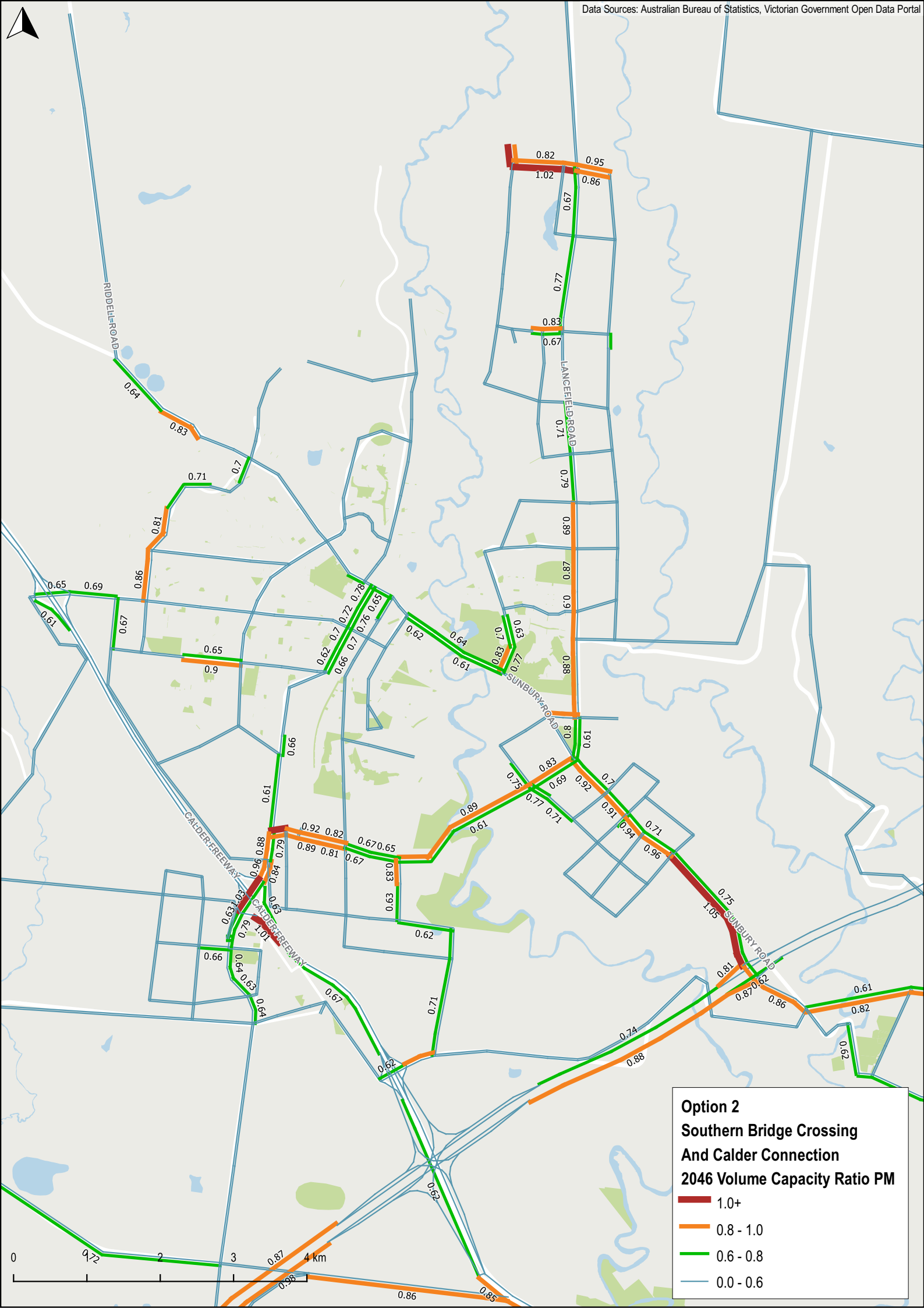

Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
LANCEFIELD-ROAD
RIDDELL-ROAD
CALDER-FREEWAY
SUNBURY-ROAD
0
1
2
3
4 km
Difference Plot PM
Option 2 vs Option 5
Increase
Decrease


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
LANCEFIELD ROAD
RIDDELL ROAD
CALDER FREEWAY
CALDER FREEWAY
Difference Plot Daily
Option 2 vs Option 5
Increase
Decrease
0
1
2
3
4 km

C. VOLUME TO CAPACITY PLOTS

C


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGFIELD ROAD
MACEDON STREET
SUNBURY ROAD
CALDER FREEWAY
0.87
0.6
0.99
0.72
0.66
0.72
0.79
0.8
0.78
0.84
0.88
0.74
0.62
0.91
0.64
0.68
1.03
0.82
0.71
0.63
0.75
0.79
0.63
0.62
0.86
1.06
0.79
0.69
0.63
0.81
0.62
0.81
0.72
0.64
0.69
0.98
0.71
0.81
0.91
0
1
2
3
4 km
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume Capacity Ratio AM
1.0+
0.8 - 1.0
0.6 - 0.8
0.0 - 0.6


Data Sources: Australian Bureau of Statistics, Victorian Government Open Data Portal
RIDDELL ROAD
LANGFIELD ROAD
SUNBURY ROAD
CALDER FREEWAY
0.82
0.95
1.02
0.86
0.67
0.77
0.83
0.67
0.71
0.79
0.89
0.87
0.91
0.64
0.83
0.71
0.7
0.81
0.86
0.65
0.69
0.61
0.67
0.65
0.9
0.62
0.7
0.72
0.78
0.65
0.76
0.66
0.62
0.64
0.61
0.63
0.7
0.83
0.77
0.88
0.8
0.91
0.66
0.61
0.83
0.75
0.69
0.92
0.7
0.77
0.71
0.89
0.61
0.94
0.71
0.96
0.92
0.82
0.89
0.81
0.67
0.67
0.65
0.88
0.79
0.96
0.84
0.83
0.63
0.63
1.03
0.79
1.01
0.62
0.66
0.94
0.63
0.64
0.67
0.71
0.62
0.75
1.05
0.81
0.87
0.62
0.86
0.61
0.82
0.74
0.88
0.62
0.62
0.87
0.98
0.86
0.85
0
1
2
3
4 km
Option 2
Southern Bridge Crossing
And Calder Connection
2046 Volume Capacity Ratio PM
1.0+
0.8 - 1.0
0.6 - 0.8
0.0 - 0.6

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