ACT Government
Transport Canberra and City Services

FREEDOM OF INFORMATION COVERSHEET

The following information is provided pursuant to section 28 of the *Freedom of Information Act 2016*.

FOI reference: TCCSFOI 20-006

Information to be published	Status
1. Access application	Published
2. Decision notice and schedule	Published
3. Documents	Published
4. Additional information identified	n/a
5. Fees	n/a
6. Processing time (in working days)	41 days
7. Decision made by Ombudsman	n/a
8. Additional information identified by Ombudsman	n/a
9. Decision made by ACAT	n/a
10. Additional information identified by ACAT	n/a

ACT Government
Transport Canberra and City Services

REQUEST UNDER
Freedom of Information Act 1989

Privacy Notice

This form is to be used for requesting information from the Transport Canberra and City Services Directorate (**TCCS**) under the *Freedom of Information Act 1989*. The personal information you supply on this form will only be used for the purpose of processing your request. If all or some of this information is not collected, TCCS may not be in a position to process your request. Your personal information will not be disclosed to a third party without your consent unless statutory obligations require otherwise.

The TCCS Information Privacy Policy contains information on how you can access or seek to correct any of your personal information that is held by the Directorate, as well as the process for lodging a complained about an alleged breach of the *Information Privacy Act 2014*. The TCCS Information Privacy Policy is available on the TCCS website, www.tccs.act.gov.au.

Online Freedom of Information Policy

Please be aware that under the ACT Government's Online FOI Publication Policy, information released to you under this FOI application may be publicly released on the internet.

PART 1: YOUR DETAILS

Name:	[redacted]
Address:	
Telephone contact:	
Email contact:	

PART 2: DETAILS OF FOI REQUEST

Please provide as much information as you can about the specific documents that you are seeking to access.

I would like to access the following document(s):

All relevant documents relating to the decision to change traffic arrangements at the intersection of Cotter Road and Yarra Glen. Please see overleaf for more details.

PART 3: REMISSION OF FEES

There is no application fee. Processing charges may still be levied for work in excess of 10 hours processing time and/or 200 A4 photocopies. Applicants may wish to bear this in mind when formulating their request. You will be notified if charges apply to your request.

In relation to this request, I seek remission of any processing charges pursuant to section 29 of the *Freedom of Information Act*, on the grounds of:

Public Interest ☑	Financial Hardship ☐	Personal Affairs ☐

Post to:
FOI Coordinator
Transport Canberra and City Services Directorate
GPO Box 158
CANBERRA ACT 2601

Deliver to:
Attention: FOI Coordinator
Transport Canberra and City Services Directorate
490 Northbourne Avenue
DICKSON ACT 2602

Email to:
tccs.foi@act.gov.au

Phone:
(02) 6205 5408

FOI request addendum

[redacted]

22 January 2020

Please provide

All relevant documentation within TCCS and between TCCS and the Minister's office, relating to the decision to change traffic arrangements at the intersection of Cotter Road and Yarra Glen, including:

1. The traffic modelling that was conducted to inform this decision, including:
    a. Analysis of the impact on buses and bus travel time for bus routes travelling to the city from both Woden Town Centre and from Weston Creek / Molonglo, both during peak times as well as averaged across the day.

2. Any modelling or analysis that was conducted which examined the impacts of these changes on people cycling on Yarra Glen towards the city; and cycling on Cotter Road towards the city, including:
    a. Number of people currently cycling on each road in peak and off-peak periods and the number forecast for all options for change at this intersection that were considered;
    b. Impact on the travel time of people cycling who use that road for each option for change considered;
    c. Potential safety risks to people cycling arising from changes in lane marking for each option for change considered; and
    d. Mitigation strategies to reduce risk to people cycling for each option for change considered.

3. Documentation, including summary documentation and any information passed to the Minister's office, from any consultation that was conducted with:
    a. Bus drivers and/or their representatives, for example the Transport Workers Union;
    b. Cyclists and/or their representatives, for example Pedal Power;
    c. Community groups or councils, for example Woden Valley Community Council.

4. Details of what, if any, alternative options for this intersection were considered, including information about the problem definition and the rationale for making the changes to this intersection.

5. What future changes to this intersection, if any, have been investigated. For example:
    a. An additional traffic lane; or
    b. Signalising Cotter Road where it meets Yarra Glen; or
    c. Providing a pedestrian crossing, bridge, or underpass for city bound cyclists travelling on Yarra Glen; or
    d. A reduction in speed limit for vehicles on Cotter Road; or
    e. An alternative crossing point for city bound cyclists travelling on Yarra Glen.

6. What consideration, if any, was given to changes to intersections and traffic flow along Cotter Road before it meets Yarra Glen, for example at Dudley Street, Lady Denman Drive, or McCulloch Street.

ACT Government
Transport Canberra and City Services

[redacted]

Dear [redacted],

Freedom of information request: Reference 20-006

I refer to your access application made under the *Freedom of Information Act 2016* (FOI Act), dated 22 January 2020, in which you sought access to all relevant documents relating to the decision to change traffic arrangements at the intersection of Cotter Road and Yarra Glen, and as specified in attachment A.

On 6 April 2020, you agreed to exclude ANG format files from your request.

Thank you for agreeing to an extension until 24 April 2020.

I am an officer authorised by the Director-General of the Transport Canberra and City Services to make decisions about access to government information, in accordance with section 18 of the FOI Act.

Transport Canberra and City Services (TCCS) have completed a search and have identified 73 records in scope of your request. A list of these records is provided in the schedule of documents at Attachment A.

I have decided to:

- grant full access to sixty-four records; and
- grant partial access to nine records.

Reasons for decision
As an Information Officer, I am required to decide where, on balance, public interest lies. As part of this process I must consider factors favouring disclosure and non-disclosure.

Favouring disclosure (Schedule 2.1):

- 2.1(i), promote open discussion of public affairs and enhance the government's accountability;
- 2.1 (ii) contribute to positive and informed debate on important issues or matters of public interest;
- 2.1 (iii), inform the community of the government's operations, including the policies, guidelines and codes of conduct, followed by the government in its dealings with members of the community;
- 2.1(iv) ensure effective oversight of expenditure of public funds; and

- 2.1 (viii) reveal the reason for a government decision and any background or contextual information that informed the decision.

Favouring non-disclosure (Schedule 2.2):

- 2.2(ii), prejudice the protection of an individual's right to privacy

I consider that it is in the public interest to release most of the information identified as falling within the scope of your request. Release of the information is in the public interest as it informs the community of the government's operations which can affect members of the community and the process followed by government in relation to such matters. It also improves the Directorate's accountability for decisions it makes by being transparent in releasing the information.

I note however that these documents do contain personal information of third parties, and I have decided people's names and contact details should not be released because the release could identify an individual and could prejudice their right to privacy. I find the protection of this information outweighs disclosure in this instance. As such, redactions have been applied to information in records 25, 41, 68, 69, 71, and 73.

In addition, four of these records contains information which is outside of the scope of your request. Redactions have been applied to out of scope information in records 25, 44, 60 and 67.

In consideration of the type of information I propose to withhold from release, I am satisfied that the factors in favour of release can still be met. Please see Folios 1-4 at attachments B-E.

Charges

In accordance with section 107 of the FOI Act, I have waived all associated fees as you are a Member of the Legislative Assembly.

Disclosure log

Section 28 of the FOI Act requires maintains a public disclosure log. This can be viewed at www.tccs.act.gov.au/about-us/freedom_of_information.

In this instance, I have decided that the information to be released to you is also of interest to the public. Therefore, publication will occur within 3-10 business days from the date of this letter. The publication will include your original access application, this decision notice and attached documents, with your personal information removed.

Review rights
You may apply to the ACT Ombudsman to review my decision under section 73 of the FOI Act. An application for review must be made in writing within **20 days** of my decision being published in the disclosure log.

You may submit a request for review of my decision to the ACT Ombudsman by writing in one of the following ways:

Email (preferred):

actfoi@ombudsman.gov.au Post: The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601

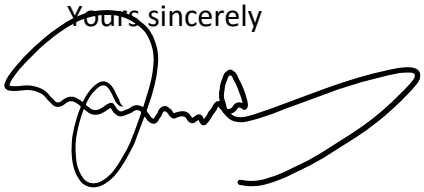
More information about ACT Ombudsman review is available on the ACT Ombudsman website at: http://www.ombudsman.act.gov.au/Freedom-of-Information.

ACT Civil and Administrative Tribunal (ACAT) review
Under section 84 of the FOI Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision.

Further information may be obtained from the ACAT at:
ACT Civil and Administrative Tribunal
Level 4, 1 Moore Street
GPO Box 370
Canberra City ACT 2601
Telephone: (02) 6207 1740
www.acat.act.gov.au

If you have any queries concerning the directorate's processing of your request, or would like further information, please contact the TCCS FOI team on (02) 620 72987 or email tccs.foi@act.gov.au.

Yours sincerely



Daniel Childs
Information Officer
23 April 2020

FREEDOM OF INFORMATION REQUEST SCHEDULE

Please be aware that under the *Freedom of Information Act 2016*, some of the information provided to you will be released to the public through the ACT Government's Open Access Scheme. The Open Access release status column of the table below indicates what documents are intended for release online through open access.

Personal information or business affairs information will not be made available under this policy. If you think the content of your request would contain such information, please inform the contact officer immediately.

Information about what is published on open access is available online at www.tccs.act.gov.au/about-us/freedom_of_information

Factors favouring non-disclosure:

- Schedule 2.2 (a)(ii), prejudice the protection of an individual's right to privacy.

REFERENCE NUMBER			WHAT ARE THE PARAMETERS OF THE REQUEST					
20-006			Documents relating to the decision to change traffic arrangements at Cotter Road + Yarra Glen					
Folio	**Record**	**Format**	**Description**	**Page Number**	**Date**	**Status**	**Reason for non-release or deferral**	**Open Access release status**
1. Modelling documents	1	PDF	Modelling Reports - Cotter Rd On-ramp continuous lane proposal - Modelling report - Draft V1	1 - 34	23 September 2019	Full release	N/A	To be published with personal information removed
	2	PDF	Modelling Drawings - TC-599878(Draft)-Cotter Rd Off-ramp_Upgrade_Option	35	13 July 2018	Full release	N/A	

	3	PDF	Modelling outputs & Simulation videos - Option2_YarraGlen General Lanes Merge_Traffic Performance comparison	36	Undated	Full release	N/A	
	4	PDF	Modelling outputs & Simulation videos - PT Bus operation	40	Undated	Full release	N/A	
2. Modelling videos	5	WEBM	Modelling outputs & Simulation videos - Cotter Rd continuous on-ramp_and_Cycle lane _Based on counts	N/A	2019	Full release	N/A	
	6	WEBM	Modelling outputs & Simulation videos - Morning_Cotter Rd continuous on-ramp_and_Cycle lane (0815-0850)	N/A	2019	Full release	N/A	
	7	WEBM	Modelling outputs & Simulation videos - Morning_Cotter Rd continuous on-ramp_Yarra Glen merge	N/A	2019	Full release	N/A	
	8	MP4	Modelling outputs & Simulation videos – Morning Peak_ Test 1_	N/A	2019	Full release	N/A	

			Cotter Rd continuous on-ramp (0815-0915am)					
	9	MP4	Modelling outputs & Simulation videos – Morning Peak_Existing Road Network (0815-0915am)	N/A	2019	Full release	N/A	
3. Ministerial Briefs	10	PDF	MIN S2019_3095 - Adelaide Avenue Cotter Road - Options	1 - 6	20 December 2019	Full release	N/A	
	11	PDF	Attachment A	7 - 11		Full release	N/A	
	12	PDF	Attachment B	12		Full release	N/A	
	13	PDF	Attachment C	13		Full release	N/A	
4. Communication	14	PDF	Email - RE Added Lane - Cotter Road to...	1	9 July 2018	Full release	N/A	
	15	PDF	Email - _RE_ Added Lane - Cotter Road to..._ - Attachment _Draft Sketch for Cotter Rd_Adelaide Av_Deakin_	2		Full release	N/A	
	16	PDF	Email - Draft TCD(Concept Plan) Added Lane	3-4	17 July 2018	Full release	N/A	

	17	PDF	Email - _Draft TCD(Concept Plan) Added Lane_ - Attachment _TC-599878(Draft)-Layout1.pdf(Concept Plan)_	5		Full release	N/A	
	18	PDF	Email - _Draft TCD(Concept Plan) Added Lane_ - Attachment _TC-599878(Draft)-Layout2.pdf(Concept Plan)_	6		Full release	N/A	
	19	PDF	Email - FW Draft TCD(Concept Plan) ...	7 - 9	17 July 2018	Full release	N/A	
	20	PDF	Email - _FW_ Draft TCD(Concept Plan) ..._ - Attachment _TC-599878(Draft)-Location Plan_	10		Full release	N/A	
	21	PDF	Email - Added Lane - Cotter Road to	11 - 14	19 July 2018	Full release	N/A	
	22	PDF	Email - _Added Lane - Cotter Road to_ - Attachment _AimsunNetwork_1_	15		Full release	N/A	

	23	PDF	Email - _Added Lane - Cotter Road to_ - Attachment _AimsunNetwork_2_	16		Full release	N/A	
	24	PDF	20180723 - Email - FW Cotter Road off-ramps - Modelling	17 - 20	23 July 2018	Partial Access	Out of scope Schedule 2.2 (a)(ii)	
	25	PDF	Email - _FW_ Cotter Road off-ramps - Modelling_ - Attachment _A63 MESO19 - Yarra Glen & Carruthers St - On&Off Ramps_	21 - 22		Full Access	N/A	
	26	PDF	Email - _FW_ Cotter Road off-ramps - Modelling_ - Attachment _A63 MESO20 - Cotter Rd & Lady Denman Dr_	23 - 26		Full Access	N/A	
	27	PDF	Email - _FW_ Cotter Road off-ramps - Modelling_ - Attachment _A63 Site 42 - Adelaide Ave & Hopetoun Circuit - On&Off Ramps_	27 - 30		Full Access	N/A	

	28	PDF	mail - _FW_ Cotter Road off-ramps - Modelling_ - Attachment _A63 Site 44 - Yarra Glen & Cotter Rd	31 - 34		Full Access	N/A	
	29	PDF	Email - _FW_ Cotter Road off-ramps - Modelling_ - Attachment _A63 Site 44 - Yarra Glen & Cotter Rd	35 - 38		Full Access	N/A	
	30	PDF	Email - Cotter Road to Adelaide Avenue...	39 - 45	7 August 2018	Full Access	N/A	
	31	PDF	Cotter Road to Adelaide Avenue..._ - Attachment _PTBuses_AM(0800-0900am)	46		Full Access	N/A	
	32	PDF	20180822 - Email - Cotter Road On Ramp...	47 – 48	22 August 2018	Full Access	N/A	
	33	PDF	20180822 - Email - _Cotter Road On Ramp..._ - Attachment _CotterRd_OnRamp_Base_vs_..._	49 - 53		Full Access	N/A	
	34	PDF	Draft TCD(Concept Plan) Added Lane	54	25 September 2019	Full Access	N/A	
	35	PDF	Draft TCD(Concept Plan) Added Lane_- Attachment _TC-	55		Full Access	N/A	

			599878(Draft)_Opt_2-Layout1_					
	36	PDF	Draft TCD(Concept Plan) Added Lane_-Attachment _TC-599878(Draft)_Opt_2-Layout2_	56		Full Access	N/A	
	37	PDF	Email - FW Cotter Road/ Bus Lane Proposal - TWU Feedback	57	10 October 2019	Full Access	N/A	
	38	PDF	Email - Cotter Road off-ramp continuous...	58	3 December 2019	Full Access	N/A	
	39	PDF	Email - _Cotter Road off-ramp continuous..._ - Attachment _Option2_..._Traffic Performance comparison_	59 - 62		Full Access	N/A	
	40	PDF	20191210 - Email - FW Cotter Road off ramp...	63 - 64	10 December 2019	Partial Access	Schedule 2.2 (a)(ii)	
	41	PDF	Email - FW Draft TCD(Concept Plan) (Option-3)	65 - 66	17 December 2019	Full Access	N/A	

	42	PDF	Email - _FW_ Draft TCD(Concept Plan) (Option-3)_ - Attachment _TC-599878(Draft)_Opt_3-Layout1_	67		Full Access	N/A	
	43	PDF	Email - Ministers meeting notes - 13 January	68 - 69	13 January 2020	Partial Access	Out of scope	
	44	PDF	Email - RE Request for contact number - Weston Creek Community Council	70	14 January 2020	Full Access	N/A	
	45	PDF	Email - _FW CSTM AM Peak Traffic Volumes	71 - 72	15 January 2020	Full Access	N/A	
	46	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment A	73		Full Access	N/A	
	47	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment B	74		Full Access	N/A	
	48	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment C	75		Full Access	N/A	
	49	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment D	76		Full Access	N/A	

	50	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment E	77		Full Access	N/A	
	51	PDF	Email - _FW_ CSTM AM Peak Traffic Volumes_ - Attachment F	78		Full Access	N/A	
	52	PDF	Email - Chris Steel media release - Congestion reduced...	79 - 80	16 January 2020	Full Access	N/A	
	53	PDF	Email - Cotter Rd on-ramp cyclist crossing - traffic gaps	81	17 January 2020	Full Access	N/A	
	54	PDF	Email - _Cotter Rd on-ramp cyclist crossing - traffic gaps_ - Attachment A	82 – 83		Full Access	N/A	
	55	PDF	Email - FW Chris Steel media release... - Weston Creek Community Council	84 - 88	17 January 2020	Full Access	N/A	
	56	PDF	Email - RE Chris Steel media release - Congestion - Weston Creek Community Council	89 - 94	17 January 2020	Full Access	N/A	
	57	PDF	Email - FW WVCC Media Release	95 - 101	20 January 2020	Full Access	N/A	

	58	PDF	Email - FW_ WVCC Media Release - Attachment _PT Bus operation	102 - 103		Full Access	N/A	
	59	PDF	Email - RE Pedal Power - Minister Steel briefing tomorrow	104 - 106	20 January 2020	Partial Access	Out of scope	
	60	PDF	Email - RE Cotter Rd Adelaide Ave - Pedal Power and modelling	107 - 111	21 January 2020	Full Access	N/A	
	61	PDF	Email - FW Different options for T2 Land...	112 - 113	28 January 2020	Full Access	N/A	
	62	PDF	Email - _FW_ Different options for T2 Land..._ - Attachment _TC-599878_ Merge Option_1_Current-Layout1_	114		Full Access	N/A	
	63	PDF	Email - _FW_ Different options for T2 Land..._ - Attachment _TC-599878_ Merge Option_2-Layout1_	115		Full Access	N/A	
	64	PDF	Email - _FW_ Different options for T2 Land..._ - Attachment _TC-599878_ Merge Option_3-Layout1_	116		Full Access	N/A	

	65	PDF	Email - _FW_ Different options for T2 Land..._ - Attachment _TC-599878_ Merge Option_4-Layout1_	117		Full Access	N/A	
	66	PDF	Email - RE Cotter Rd Adelaide Ave - Pedal Power and modeling	118 - 123	28 January 2020	Partial Access	Out of scope	
	67	PDF	Email - Cotter Road on-ramp - bicycle crossing - revised	124 - 126	30 January 2020	Partial Access	Schedule 2.2 (a)(ii)	
	68	PDF	RE Cotter Road + Yarra Glen	127 - 129	6 February 2020	Partial Access	Schedule 2.2 (a)(ii)	
	69	PDF	RE Adelaide Ave Our Canberra article	130	7 February 2020	Full Access	N/A	
	70	PDF	20200207 - RE Cotter Road PTCBR	131	7 February 2020	Partial Access	Schedule 2.2 (a)(ii)	
	71	PDF	Re Urgent dot points - Cotter Road	132 - 134	10 February 2020	Full Access	N/A	
	72	PDF	Fwd Cotter Road+Yara Glen	135 - 137	13 February 2020	Partial Access	Schedule 2.2 (a)(ii)	

Total: 4 Folios, 72 Records, 189 Pages and 5 video files								

Cotter Road On-Ramp to Yarra Glen Option Study

Traffic Modelling Study

Cotter Road On-Ramp to Yarra Glen Option Study

Traffic Modelling Study

Prepared by

Rama Paluri, Traffic Signals Engineer

Roads ACT

Table of Contents

1 Executive Summary

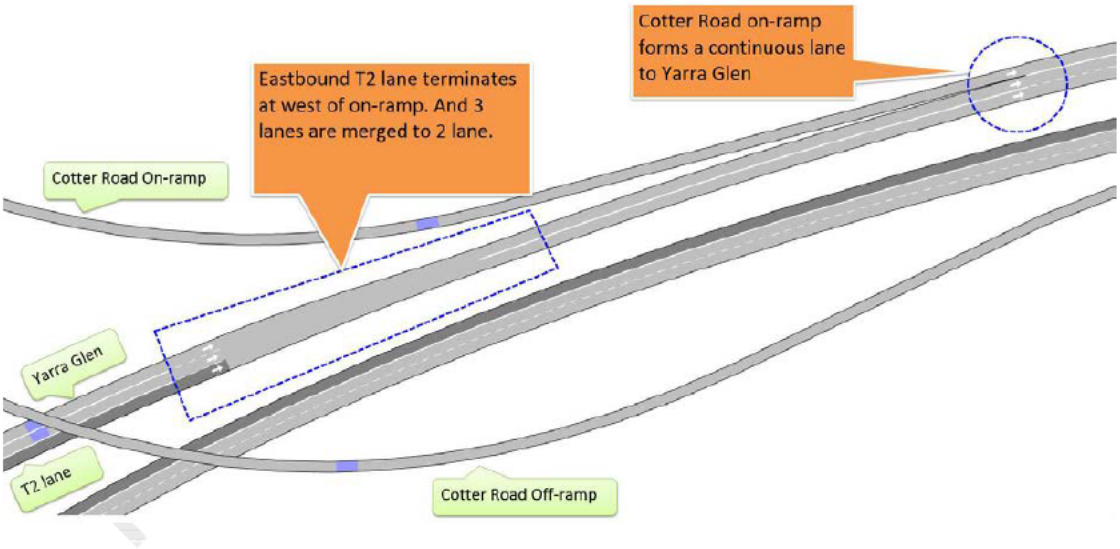
1.1 Introduction

In the morning peak, the city bound traffic on Cotter Road on-ramp has been experiencing bottleneck issues when merging into Yarra Glen traffic. As a result, the traffic on this road section is experiencing extensive delays over 6-8 minutes and queues extending beyond Lady Denman Drive. Consecutively, Lady Denman Drive is also affected with similar traffic issues.

To alleviate the traffic congestion, the option of replacing the existing give-way on-ramp merging lane with a continuous lane is considered. With this option, Cotter Road traffic is anticipated to flow freely onto Yarra Glen and thereby reduces the congestion.

However, to achieve the Cotter Road on-ramp to a continuous lane within the foot print, it is also proposed to terminate the eastbound T2 lane on Yarra Glen section between the west of Cotter Road on-ramp merge and the east of Hopetoun Circuit on-ramp, and merge 3 lanes into 2 lane. This way the on-ramp lane can be aligned to Yarra Glen left lane to form a continuous lane (details shown in **Figure 1**).

Figure 1 Cotter Road on-ramp continuous lane arrangement



1.2 Summary

Roads ACT has undertaken a microsimulation study (using AIMSUN Next application) and developed following morning peaks models:

- Base model – a traffic network model which represents the existing road lane infrastructure, traffic management & operation. This base model generally mimics the current traffic flow conditions on the road network such as queueing, delays, travel times.

- Option model – a traffic network model which includes the 'continuous on-ramp lane connection to Yarra Glen' option to the base model.

Upon developing base and option models, the key traffic flow outputs such as queues, delays, density, travel speed are compared to assess the effectiveness of on-ramp continuous lane option.

The analysis has clearly indicated that the proposed option (i.e. Cotter Road on-ramp continuous lane into Yarra Glen) will significantly improve the traffic operation not only on Cotter Road (eastbound) section, but also cross whole road network. The simulations from the option scenario models have clearly show less traffic congestion, when compared to the base model.

The traffic flow improvements under the option scenario are summarised below:

- Whole network
  - The total travel time spent by all vehicles in the option model is expected to improve by 40 to 70 hours.
  - The average travel speed has improved by 10-15 km/h.

- Cotter Road
  - Travel speed will improve from 10-30 km/h to 60 km/h.
  - Traffic queues will reduce from 700-850 m to 120-200m.
  - Traffic delays will reduce from 6-8 minutes to 1 minute.
  - Traffic density will reduce from 70-105 vehicles per kilometre to 20-25 vehicles.

- Lady Denman Drive
  - Traffic delays are expected to reduce from 1 minute to less than 5 seconds.
  - Travel speed will increase from 45-55 km/h to 70km/h.

- Dudley Street
  - With the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic.

Also, the PT bus transit services along Cotter Road are expected to improve significantly, with the reduced delay time from 6-8 minutes to 1 minute, and increased travel speed from 14 km/h to 60km/h.

The model outputs clearly indicate that the removal T2 lane along Cotter Road eastbound will not impact PT Bus transit operation. Under the option scenario, the travel speed is expected to reduce by 2 km/k (from 67 to 65 km/h), and travel delays by 4 sec max.

1.3 Conclusions

Based on the analysis outputs, the proposal of replacing the Cotter Road on-ramp merge with a continuous lane will significantly improve the traffic operation not just on Cotter Road, but also across the road network. Also, the PT bus service on Cotter Road is expected to improve by reduced delays up to 5-7 minutes and increased travel speeds by 45km/h.

The analysis results also showed that, the removal of this T2 lane section will not affect the bus transit operation.

1.4 Suggestions

At present, the eastbound queuing on Dudley Street reaches close to Cotter Road signalised intersection, because of difficulties on exiting the Kent Street roundabout intersection. However, with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic.

Therefore to avoid the queue spilling, it is suggested to consider extending the left turn slip lane storage capacity.

2 Introduction

2.1 Existing Issue

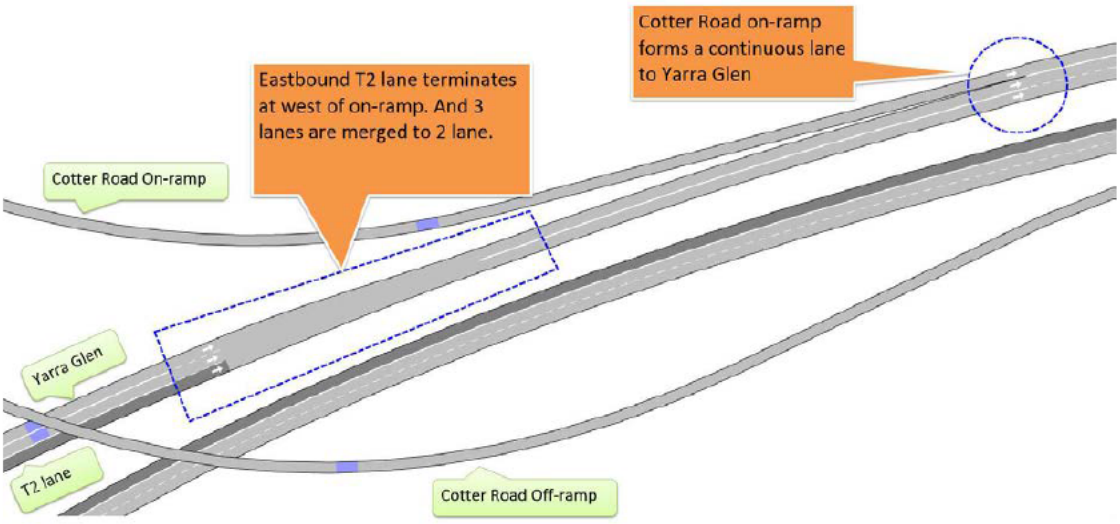
In the morning peak, the city bound traffic on Cotter Road on-ramp to Yarra Glen has been experiencing merging issues (see **Figure 3**). As a result, the traffic on this road section is experiencing extensive delays over 6 minutes and queues extending beyond Lady Denman Drive (see **Figure 4**), and thus also affecting left turn traffic from Lady Denman Drive into Cotter Road (see **Figure 5**).

2.2 Option – Cotter Road On-Ramp Continuous Lane

To alleviate the congestion issue, an option of replacing the existing give-way on-ramp merging lane with a continuous lane is considered (see **Figure 2**). With this option, it is anticipated the traffic will flow freely onto Yarra Glen and therefore improves traffic flow conditions on Cotter Road.

However, to achieve the Cotter Road on-ramp to a continuous lane within the foot print, it is also proposed to terminate the eastbound T2 lane on Yarra Glen section between the west of Cotter Road on-ramp merge and the east of Hopetoun Circuit on-ramp, and merge 3 lanes into 2 lane. This way the on-ramp lane can be aligned to Yarra Glen left lane to form a continuous lane.

Figure 2 Cotter Road on-ramp continuous lane arrangement



2.3 Microsimulation modelling

To test the effectiveness of 'continuous on-ramp' option, Roads ACT has undertaken a microsimulation modelling study (by using AIMSUN Next). As part of the study, the following models are developed:

- Base model – a traffic network model which represents the existing road lane infrastructure, traffic management & operation. This base model generally mimics the current traffic flow conditions on the road network such as queueing, delays, travel times.
- Option model – a traffic network model which includes the 'continuous on-ramp lane connection to Yarra Glen' option to the base model.

Upon developing Base and Option models, the key traffic flow outputs (such as queues, delays, density, travel speed) are compared to assess the effectiveness of continuous on-ramp option.

3 Existing Traffic Conditions

As mentioned in Section 2.1, in the morning peak the city bound traffic on Cotter Road on-ramp has been experiencing bottleneck issues when merging into Yarra Glen traffic (see **Figure 3**). As a result, the traffic on this road section is experiencing extensive delays over 6-8 minutes and queues extending beyond Lady Denman Drive. Consecutively, Lady Denman Drive is also affected with similar traffic issues.

Figure 3 Cotter Road on-ramp merging into Yarra Glen (looking towards Kent Street bridge)

3.1 Cotter Road

Cotter Road is a 4 lane road section and operates at 80 km/h road speed limit. Due to the on-ramp merging issue at Yarra Glen, the eastbound traffic queue on this road is extended up to between Dudley Street and Lady Denman Drive, which is 850m approx (see **Figure 4**). However, during the peak of peak period the queueing is often extended further beyond Lady Denman Drive(1.2 km). Because of the congestion, the traffic is travelling under 15 km/h and experiencing delays over 6-8 minutes.

Figure 4 Cotter Road eastbound queueing (looking from Dudley Street towards Lady Denman Drive)

3.2 Lady Denman Drive

Lady Denman Drive two lane road section, and operates at 70 km/h road speed limit. As mentioned in Section 3.1, the queueing on Cotter Road often extends beyond the signalised intersection of Lady Denman Drive/ Cotter Road. As a result, the left turn traffic from Lady Denman Drive into Cotter Road is unable to access Cotter Road and therefore undergoing longer queuing and delays (see **Figure 5**).

Figure 5 Lady Denman Drive southbound queueing (looking from Cotter Road signalised intersection)

3.3 Dudley Street

Dudley Street is a two-lane road section, and operates at 60 km/h road speed limit. Similar to Cotter Road on-ramp issue at Yarra Glen, traffic on Dudley Street is also experiencing difficulties to exit the roundabout intersection at Kent Street. As such, the eastbound traffic often extends back to Cotter Road intersection, with occasional spilling onto through traffic lanes (see **Figure 6**).

Figure 6 Dudley Street queueing towards Yarralumla (looking from Cotter Road signalised intersection)

4 Cotter Road On-ramp Option

4.1 On-ramp Option

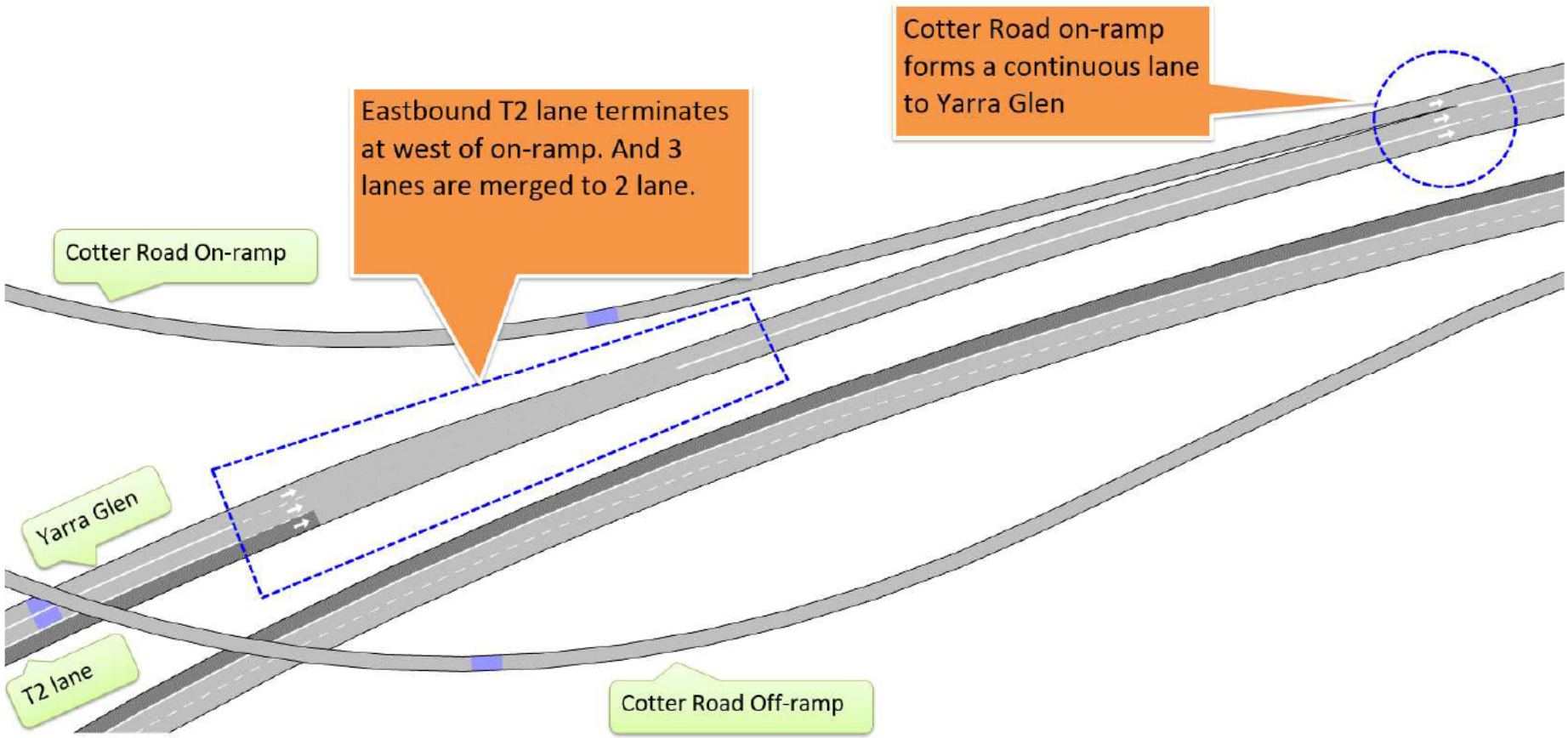
To alleviate the congestion issue, an option of replacing the existing give-way on-ramp merging lane with a continuous lane is considered (see **Figure 7**). With this option, it is anticipated the traffic will flow freely onto Yarra Glen and therefore improves traffic flow conditions on Cotter Road.

4.2 T2 lane changes

In order to form Cotter Road on-ramp to a continuous lane, it is also proposed to terminate the eastbound T2 lane on Yarra Glen section between the west of Cotter Road on-ramp merge and the east of Hopetoun Circuit on-ramp, and merge 3 lanes into 2 lane. This way the on-ramp lane can be aligned to Yarra Glen left lane to form a continuous lane (see **Figure 7**).

The lane transition and merging arrangements should be examined in the design stage.

Figure 7 Cotter Road on-ramp option – A continuous lane to Yarra Glen



(Note: This is a conceptual layout only. The lane merging arrangements and alignments should be further examined during the Design Stage.)

5 Modelling Study

5.1 Microsimulation Modelling

A microsimulation modelling study was undertaken to assess the effectiveness of proposed on-ramp option. As part of the study, the following models are developed:

- Base model – a traffic network model which represents the existing road lane infrastructure, traffic management & operation. This base model generally mimics the current traffic flow conditions on the road network such as queueing, delays, travel times.
- Option model – a traffic network model which includes the 'continuous on-ramp lane connection to Yarra Glen' option to the base model.

Upon developing the base and option models, the key traffic flow outputs such as queues, delays, density, travel speed are compared to assess the effectiveness of on-ramp continuous lane option.

5.2 Base Model

5.2.1 Road network

Figure 8 shows the modelling road network which includes:

- Cotter Road section from the west of Ladyman Drive
- Yarra Glen from south of Carruthers Street to east of Hopetoun Circuit ramps
- Dudley Street
- Kent Street near the bridge section and ramps
- Hopetoun Circuit and ramps

The modelled road network is included current lane infrastructure, capacity, and the road speed limits. All the non-signalised intersections are modelled with appropriate give-way and right of way parameters to ensure queues and delays are replicated as per the existing traffic conditions.

5.2.2 Public transport

Based on the information available from Transport Canberra and Google, public transport services and frequencies are included in the models.

5.2.3 Signalised intersections

Based on the SCATS data the intersections at Lady Denman Drive and Dudley Street are modelled to ensure models are replicating the current signals operation.

Figure 8 Modelled road network

5.2.4 Calibration and validation

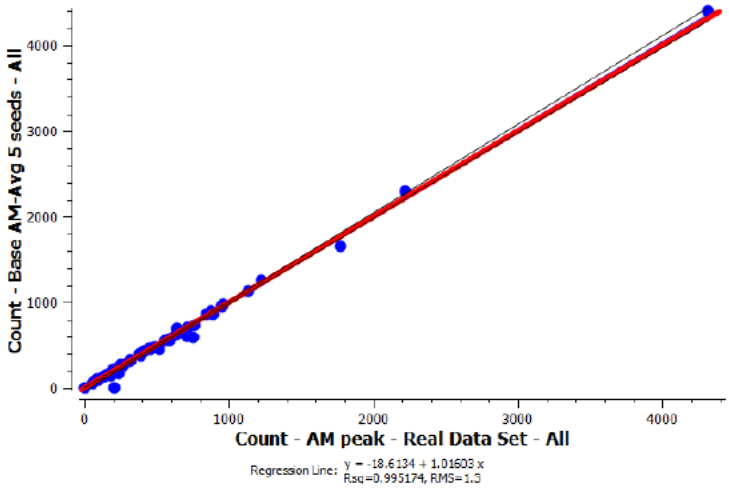
To ensure the base model is replicating the 'real' traffic flow conditions, the modelled traffic volume outputs are compared against the observed traffic data. This process is known as Model Validation. For this purpose, RMS Traffic Modelling Guidelines (2013) details on the GEH [1] and R^2 statistics [2] criteria, and the required targets.

The modelled traffic data volumes from the base model are compared with the observed traffic data using GEH and R^2 statistic criteria. The validation outcomes are illustrated in **Table 1** and **Figure 9**. The results clearly show that the base model met all criteria and therefore considered as 'fit for purpose'.

Table 1 Calibration & Validation criteria

Criteria	Target	Achieved	Criteria met
Percentage of link volumes with GEH ≤ 5	85%	94.55%	Yes
Percentage of link volumes with GEH ≤ 10	100%	100%	Yes
R^2 statistic for observed vs modelled traffic data volumes	0.95	0.995	Yes

Figure 9 R^2 statistic Regression Line for observed and modelled traffic flow



[1] GEH Statistic is a performance measure based on Chi-Square statistic.

$$GEH=\sqrt{\frac{2(M-C)^2}{(M+C)}}$$

where:

M is the modelled traffic flow and
C is the observed traffic flow

GEH less than 5.0 indicates a good match between modelled and observed volumes.
GEH between 5.0 and 10.0 may warrant investigation.
GEH greater than 10.0 indicates a high probability that there is a problem and so requires investigation.

[2] R^2 statistic is also called as Coefficient of Determination and provides a measure of how well the observed outcomes are predicated by the model.

5.2.5 Queuing outputs

The queues displayed in the model simulations are compared with the site observations (**Figure 10** to **Figure 13**), and appear replicating the existing traffic conditions satisfactorily.

Figure 10 Cotter Road on-ramp – Observed vs model queues

Figure 11 Lady Denman Drive southbound (from Cotter Road) – Observed vs model queues

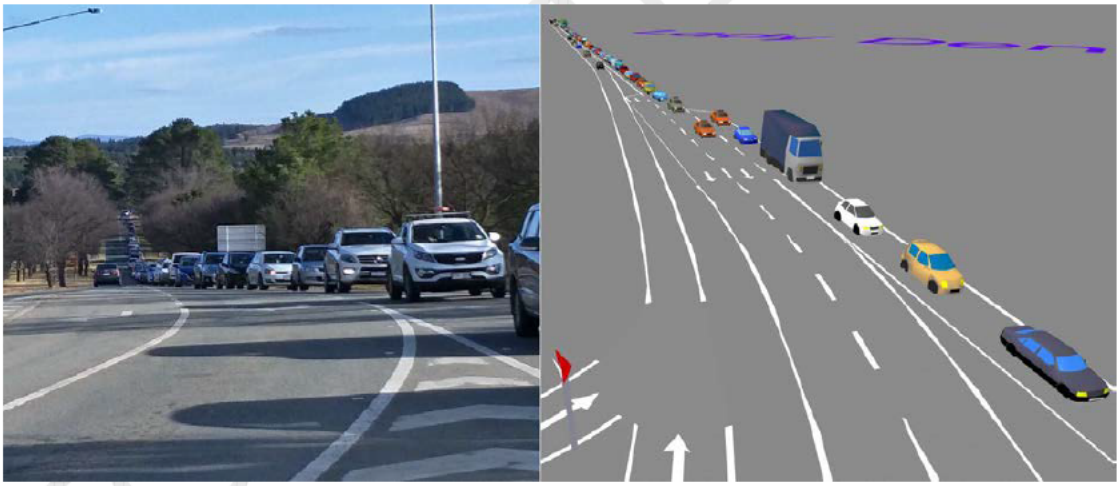


Figure 12 Cotter Road eastbound (from Lady Denman Drive signals) – Observed vs model queues

Figure 13 Dairy Road eastbound (from Cotter Road signals) – Observed vs model queues

5.3 Option Model

Upon validating the base model and confirming that it is replicating the existing traffic flow conditions on the road network with a higher degree of confidence, the proposed on-ramp continuous lane is included to the modelled road network (as shown in **Figure 7**).

6 Analysis

6.1 Analysis

To assess the effectiveness of continuous on-ramp option, key traffic flow outputs such as queues, delays, density, travelling speed from base and option models are compared. The analysis is carried out at:

- Network level – in which whole road network operation is assessed by examining the 'accumulated time spent' and 'average travel speed experienced' by all vehicles when travelling across the network.
- Individual section level – in which traffic operation on a specific road section is assessed by examining the key parameters such as maximum queueing (m), delay (sec/ min), density (vehicles per km), travelling speed (km/h).

6.2 Network Level Analysis

Figure 14 and **Figure 15** illustrate the overall traffic operation across the modelled road network. The results clearly indicate that the traffic flow conditions on Cotter Road eastbound are expected to improve significantly, with less congestion and delays. When compared to the existing/ base operation:

- The total travel time spent (by all vehicles) in the option model has significantly improved by 40 to 70 hours, during the peak of period.
- Also, the average travel speed has improved by 10-15 km/h.

However, with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic.

Figure 14 Base Vs Option model – Whole network – Traffic operation

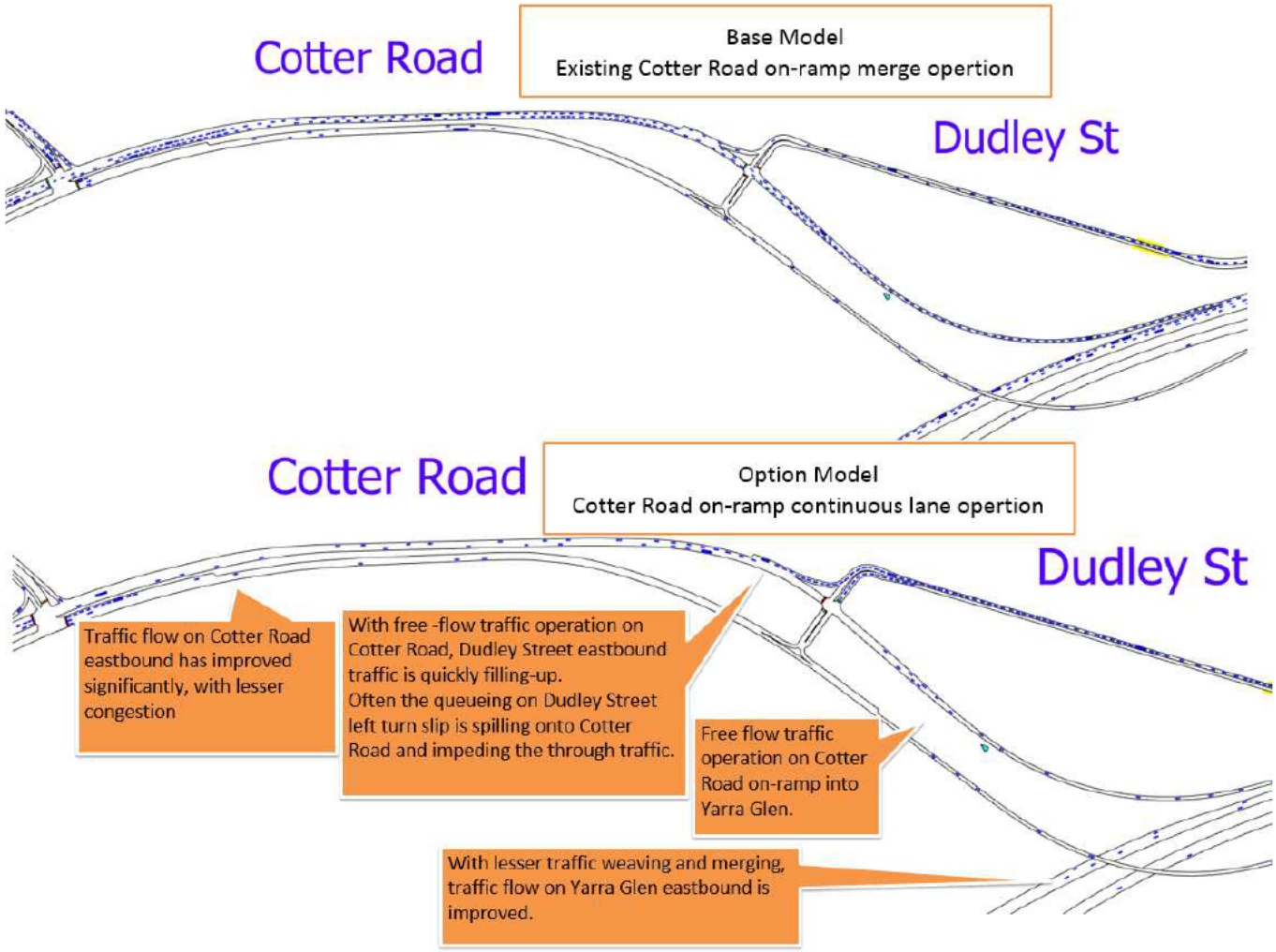
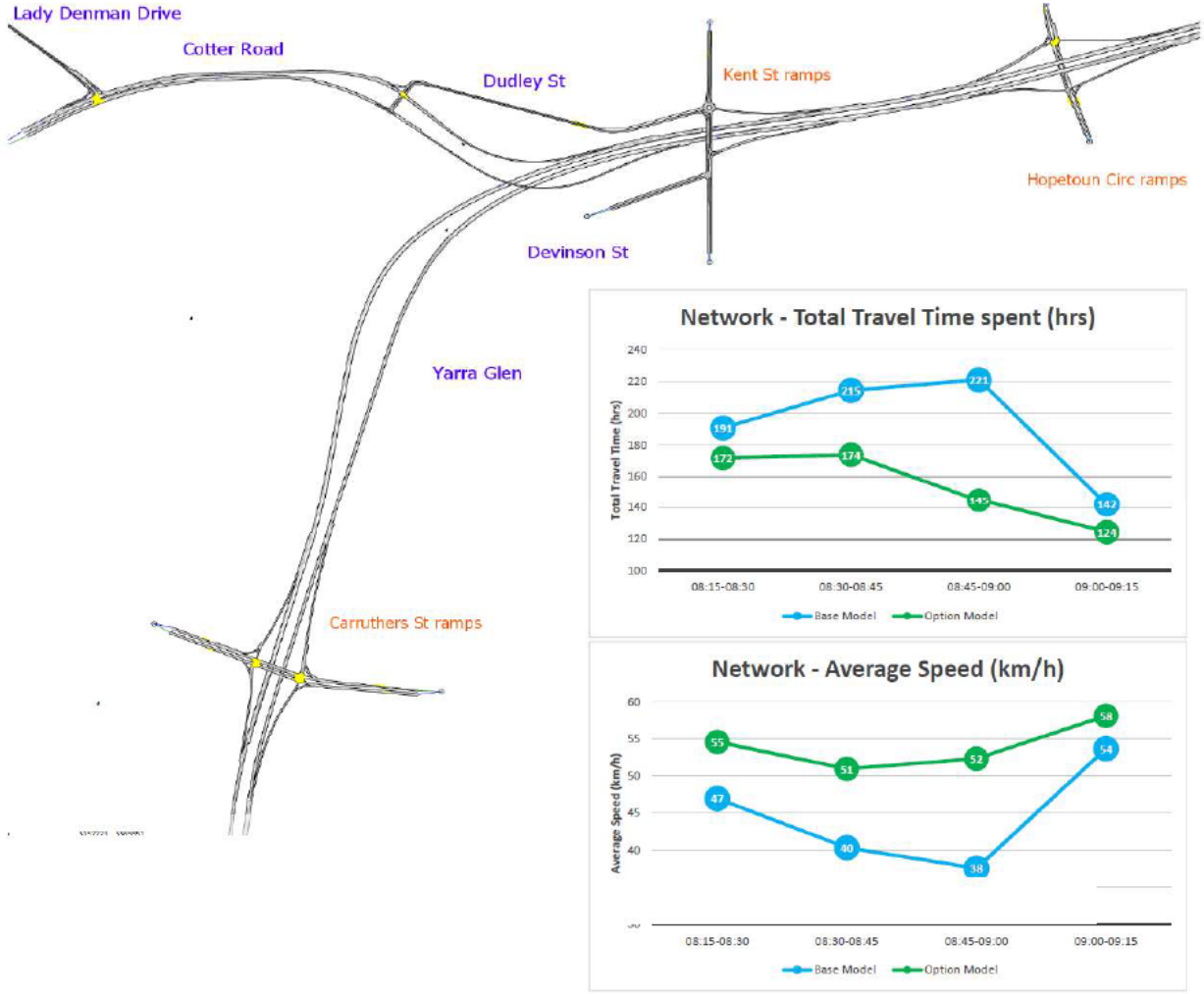


Figure 15 Base Vs Option model – Whole Network – Total Travel Time & Total Hours Spent on the network



6.3 Cotter Road Traffic Operation

Figure 16 to Figure 18 show Cotter Road traffic operation in the existing and option model scenarios. In the option scenario, the traffic operation between Lady Denman Drive and Yarra Glen on-ramp is significantly improved with no congestion. Some of the key improvements in the option scenario model are (shown in **Figure 19**):

- Travel speed is improved from 10-30 km/h to 60 km/h, which suggesting an improved traffic flow conditions.
- Traffic queueing is reduced from 700-850 m to 120-200m.
- Delay time is reduced from 6 minutes to 1 minute, which suggesting an improved traffic flow conditions.
- Traffic density is reduced from 70-105 vehicles per kilometre to 20-25 vehicles, which suggesting the improved traffic congestion.

6.3.1 Public transport Bus operation

Under the option scenario, the public transport bus service is also improved with the reduced delays from 6-8 minutes to 1 minute, and travel speed from 14 km/h to 60 km/h (see **Figure 20**).

Figure 16 Base Vs Option model – Cotter Road on-ramp traffic operation (looking towards Cotter Road off-ramp bridge)

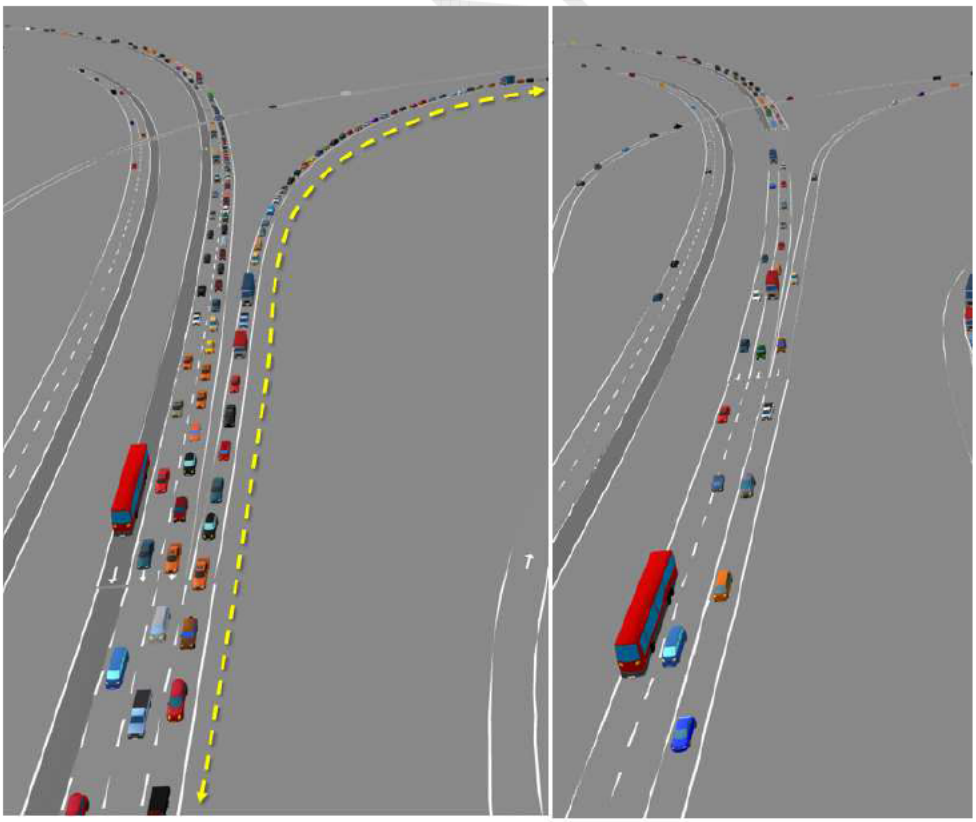


Figure 17 Base Vs Option model – Cotter Road traffic operation near Daley Road (looking towards Lady Denman Drive)

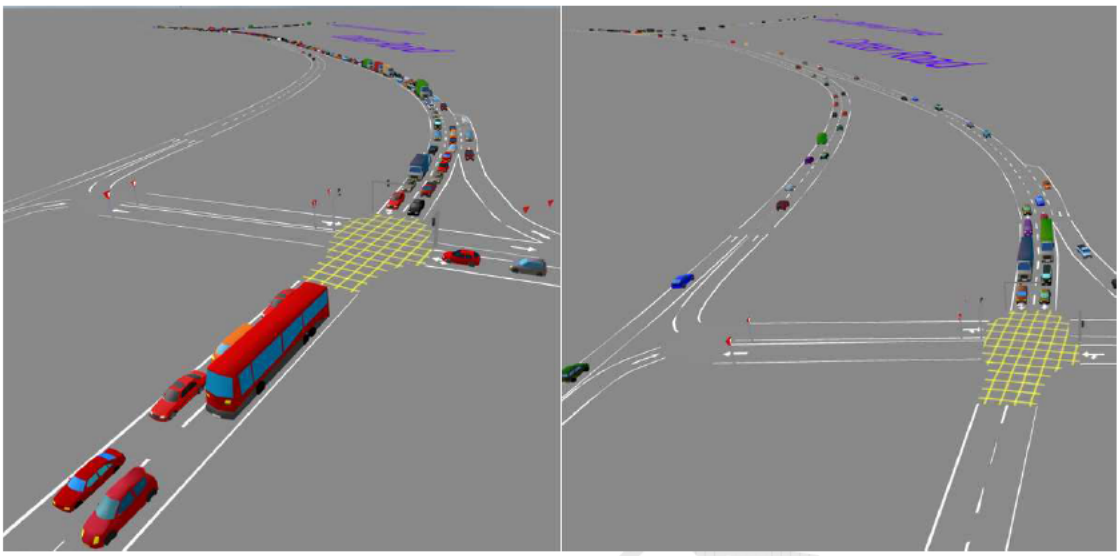


Figure 18 Base Vs Option model – Cotter Road traffic operation near Lady Denman Drive (looking towards McCulloch Street)

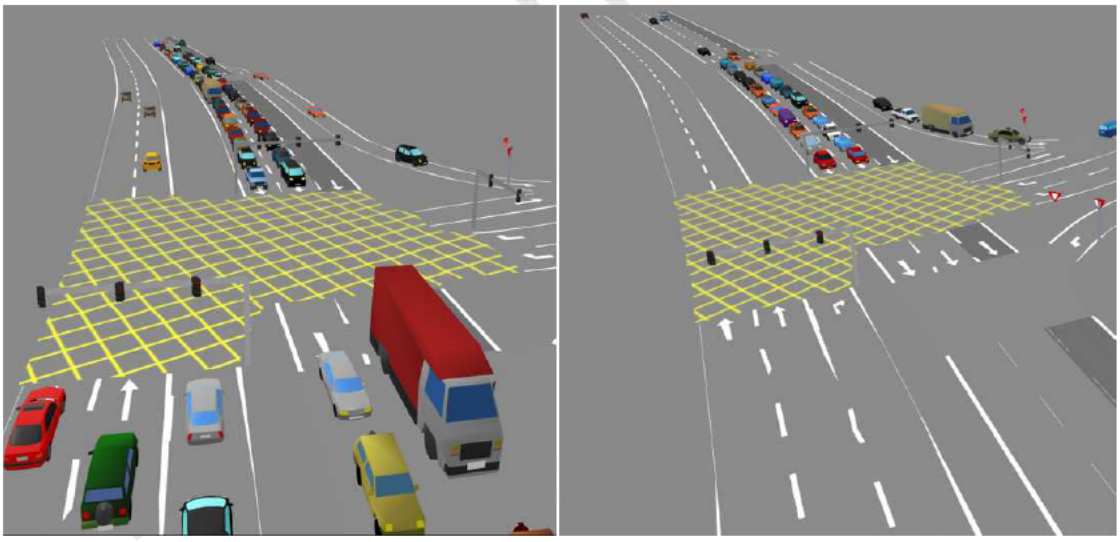


Figure 19 Base Vs Option model – Cotter Road – Travel Speed & Max Queue & Delay Time & Density

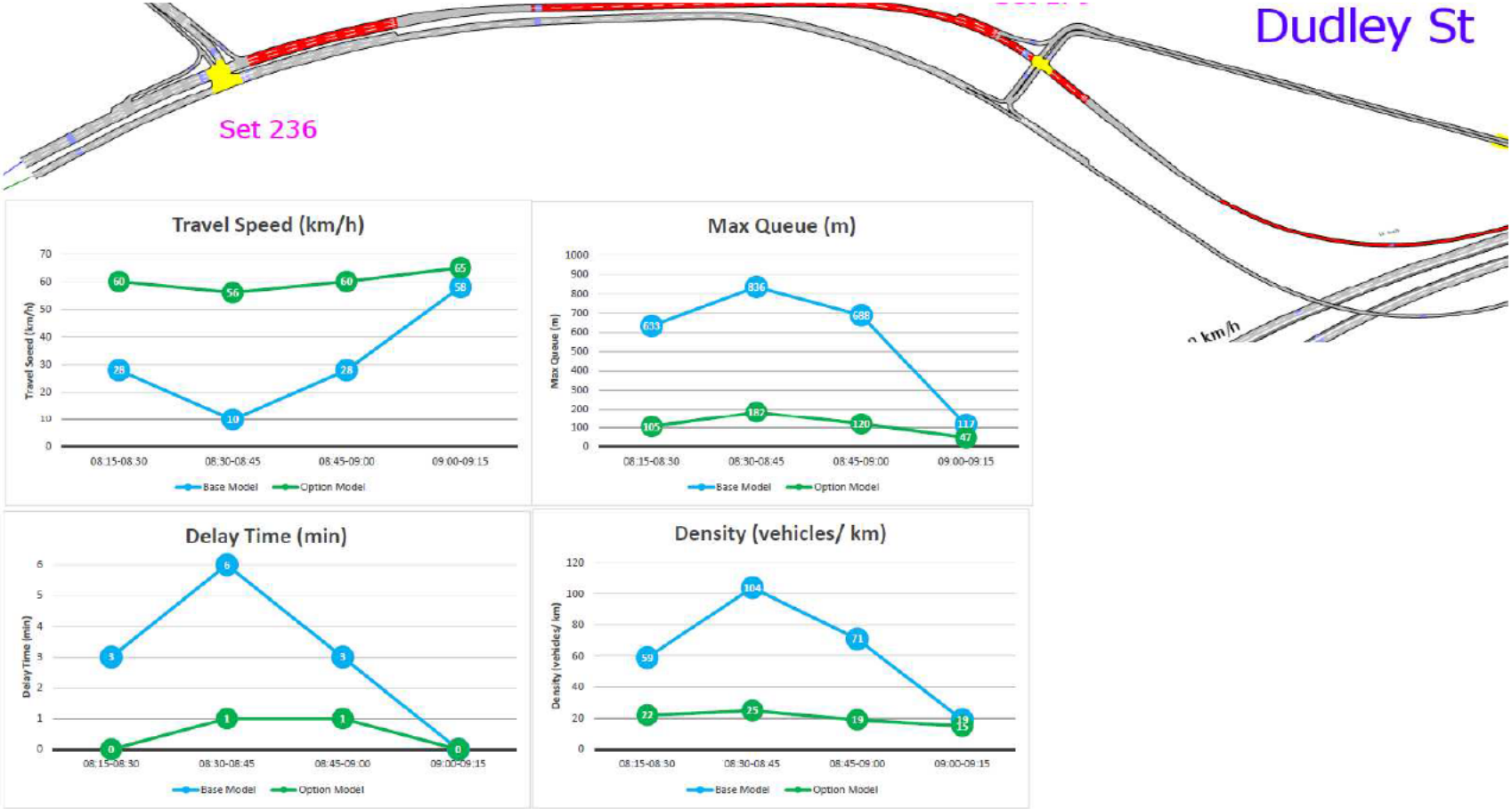
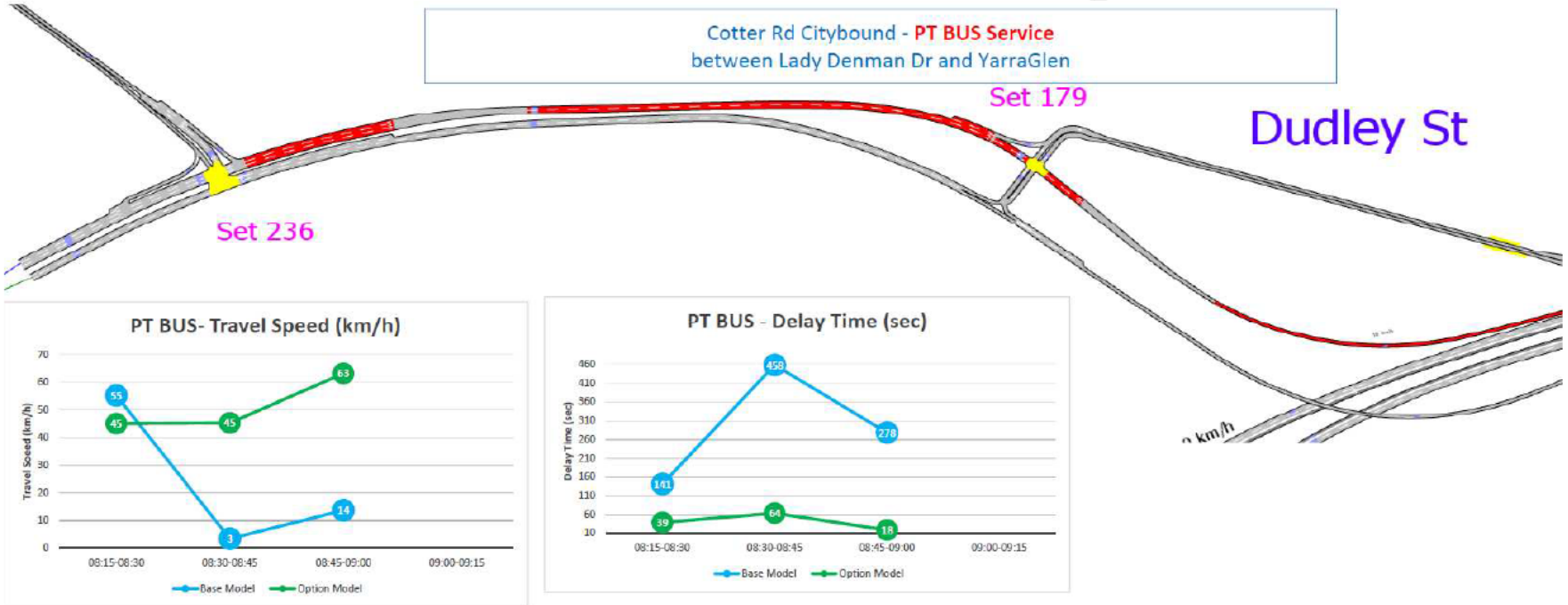


Figure 20 Base Vs Option model – Cotter Road – Public Transport Bus Service - Travel Speed & Delay Time



6.4 Yarra Glen Traffic Operation

Due to the Cotter on-ramp merging traffic, Yarra Glen eastbound traffic is currently experiencing interference and therefore undergoing traffic disruption (especially on left lane) such as lane changing, weaving, merging, and vehicles breaking. Whereas with the proposed option, this traffic disruption is expected to disappear fully as the Cotter Road on-ramp vehicles remain on continuous lane(see **Figure 21**). As a result, the delays are expected to reduce from 1 minute to less than 5 seconds, and travel speed to increase from 45-55 km/h to 70km/h (see **Figure 22**).

6.4.1 Public transport bus transit operation

Figure 23 shows the public transit operation under the existing and option scenarios. The model outputs clearly indicate that the removal T2 lane along Cotter Road eastbound will not impact PT Bus transit operation. Under the option scenario, the travel speed is expected to reduce by 2 km/k (from 67 to 65 km/h), and travel delays by 4 sec max.

Figure 21 Base Vs Option model – Yarra Glen traffic operation near Cotter Road on-ramp (looking towards Cotter Road off-ramp)

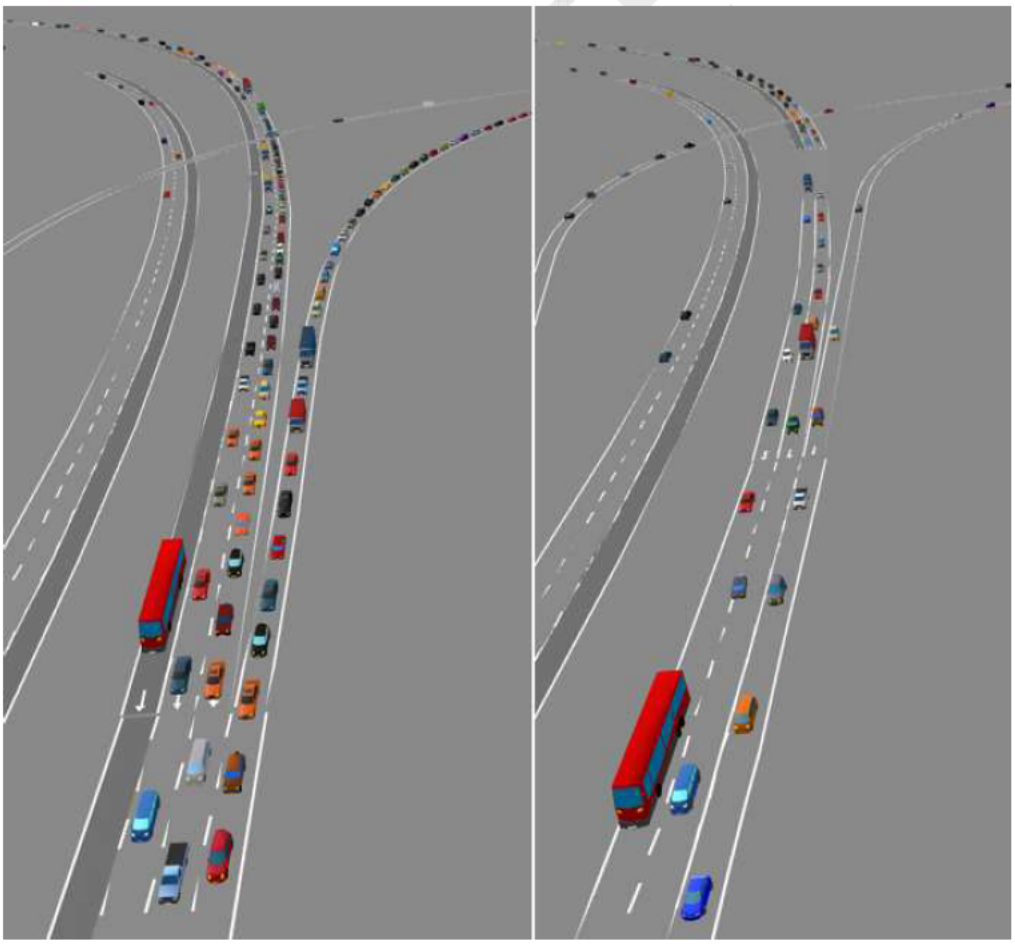


Figure 22 Base Vs Option model – Yarra Glen eastbound – Travel Speed & Max Queue & Delay Time

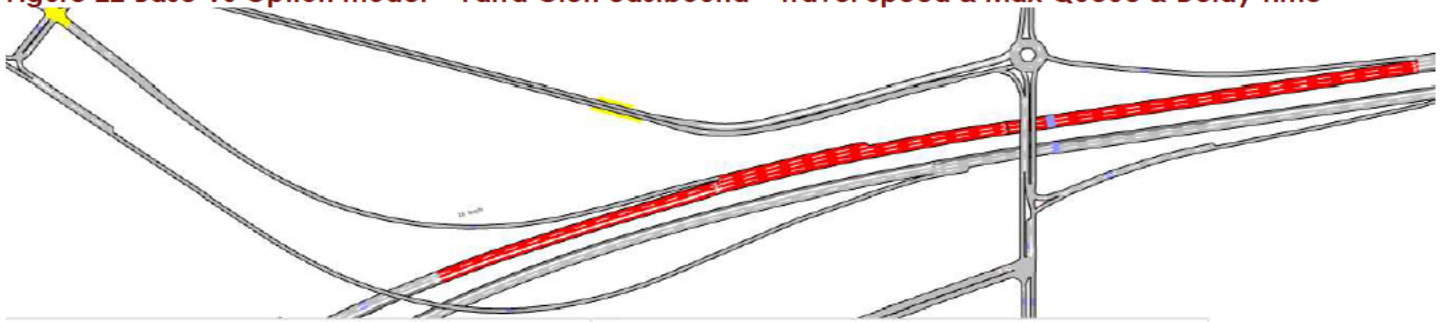
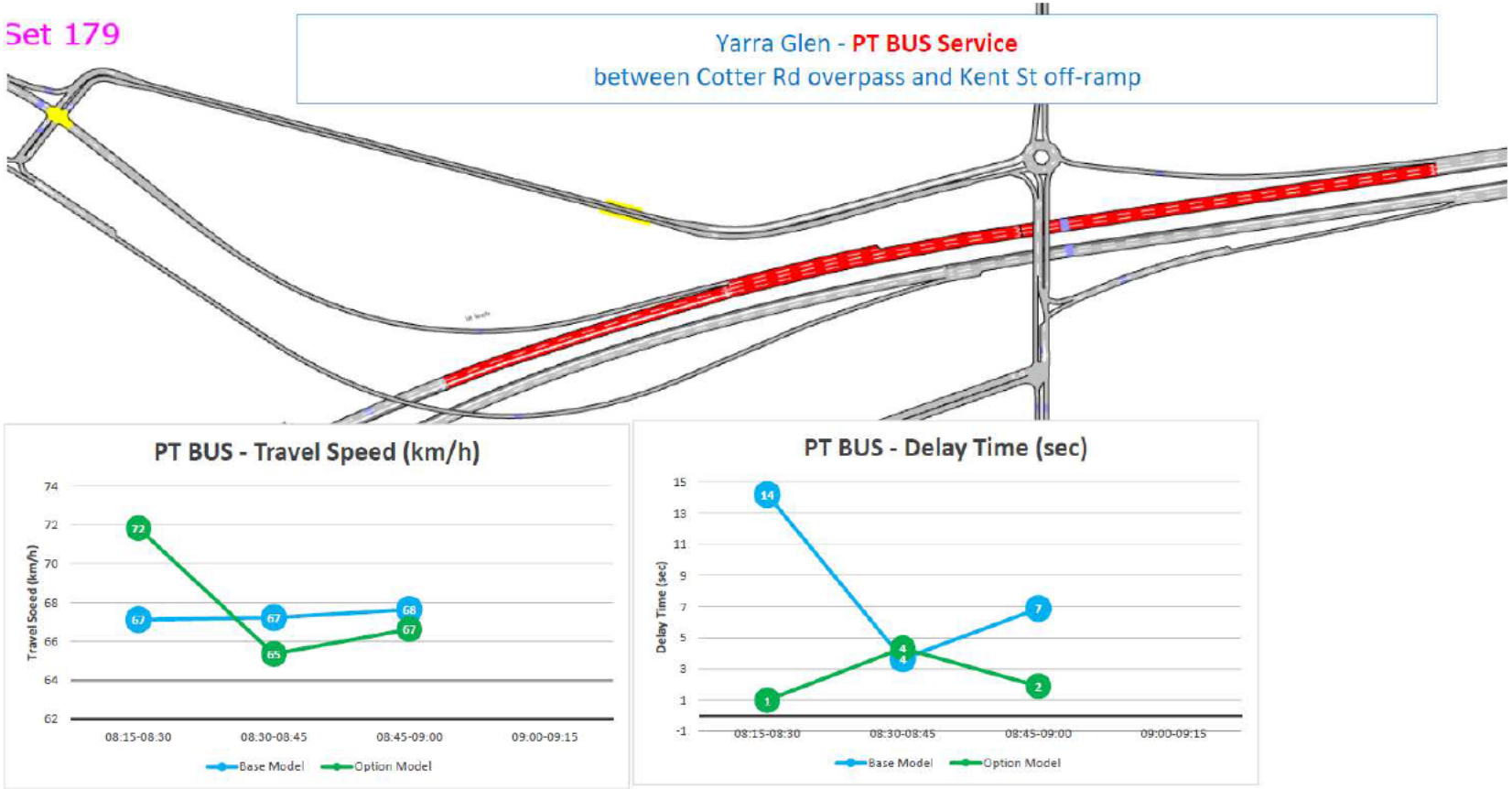


Figure 23 Base Vs Option model – Yarra Glen – Public Transport Bus Service - Travel Speed & Delay Time



6.5 Lady Denman Drive Traffic Operation

With the Cotter Road operation improved (in the option scenario), the traffic on Lady Denman Drive will be able to access Cotter Road without any delays. (see **Figure 24**).

6.6 Dudley Street Traffic Operation

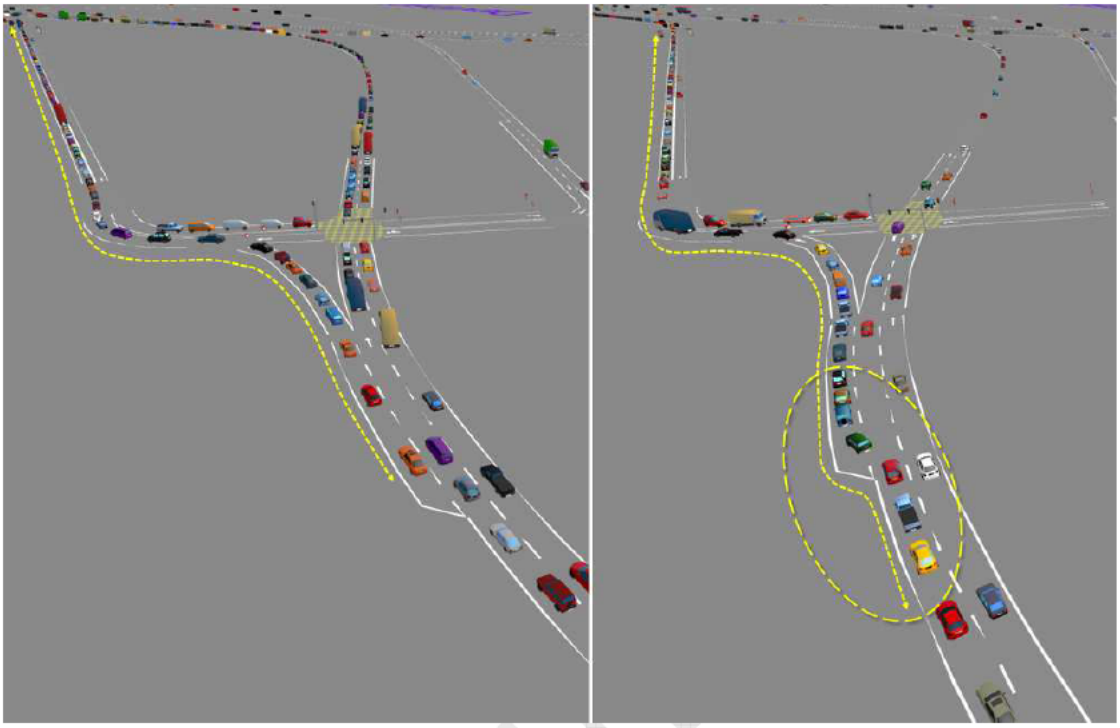
At present, the eastbound queuing on Dudley Street reaches close to Cotter Road signalised intersection, because of difficulties on exiting the Kent Street roundabout intersection. However, with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic (see **Figure 24**).

Figure 24

6.7 Dudley Street Traffic Operation

At present, the eastbound queuing on Dudley Street reaches close to Cotter Road signalised intersection, because of difficulties on exiting the Kent Street roundabout intersection. However, with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic (see **Figure 24**).

Figure 24 Base Vs Option model – Dudley Street traffic operation near Cotter Road signalised intersection



7 Summary an Conclusions

7.1 Summary

The analysis outputs have clearly indicated that the proposed option (i.e. Cotter Road on-ramp continuous lane into Yarra Glen) will significantly improve the traffic operation not only on Cotter Road (eastbound) section, but also cross whole road network. The simulations from the option scenario models have clearly show less traffic congestion, when compared to the base model.

The traffic flow improvements under the option scenario are summarised below:

- Whole network
  - The total travel time spent by all vehicles in the option model is expected to improve by 40 to 70 hours.
  - The average travel speed has improved by 10-15 km/h.

- Cotter Road
  - Travel speed will improve from i0-30 km/h to 60 km/h.
  - Traffic queues will reduce from 700-850 m to 120-200m.
  - Traffic delays will reduce from 6-8 minutes to 1 minute.
  - Traffic density will reduce from 70-105 vehicles per kilometre to 20-25 vehicles.

- Lady Denman Drive
  - Traffic delays are expected to reduce from 1 minute to less than 5 seconds.
  - Travel speed will increase from 45-55 km/h to 70km/h.

- Dudley Street
  - with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic.

Also, the PT bus transit services along Cotter Road are expected to improve significantly, with the reduced delay time from 6-8 minutes to 1 minute, and increased travel speed from 14 km/h to 60km/h.

The model outputs clearly indicate that the removal T2 lane along Cotter Road eastbound will not impact PT Bus transit operation. Under the option scenario, the travel speed is expected to reduce by 2 km/k (from 67 to 65 km/h), and travel delays by 4 sec max.

7.2 Conclusions

Based on the analysis outputs, the proposal of replacing the Cotter Road on-ramp merge with a continuous lane will significantly improve the traffic operation not just on Cotter Road, but also across the road network. Also, the PT bus service on Cotter Road is expected to improve by reduced delays up to 5-7 minutes and increased travel speeds by 45km/h.

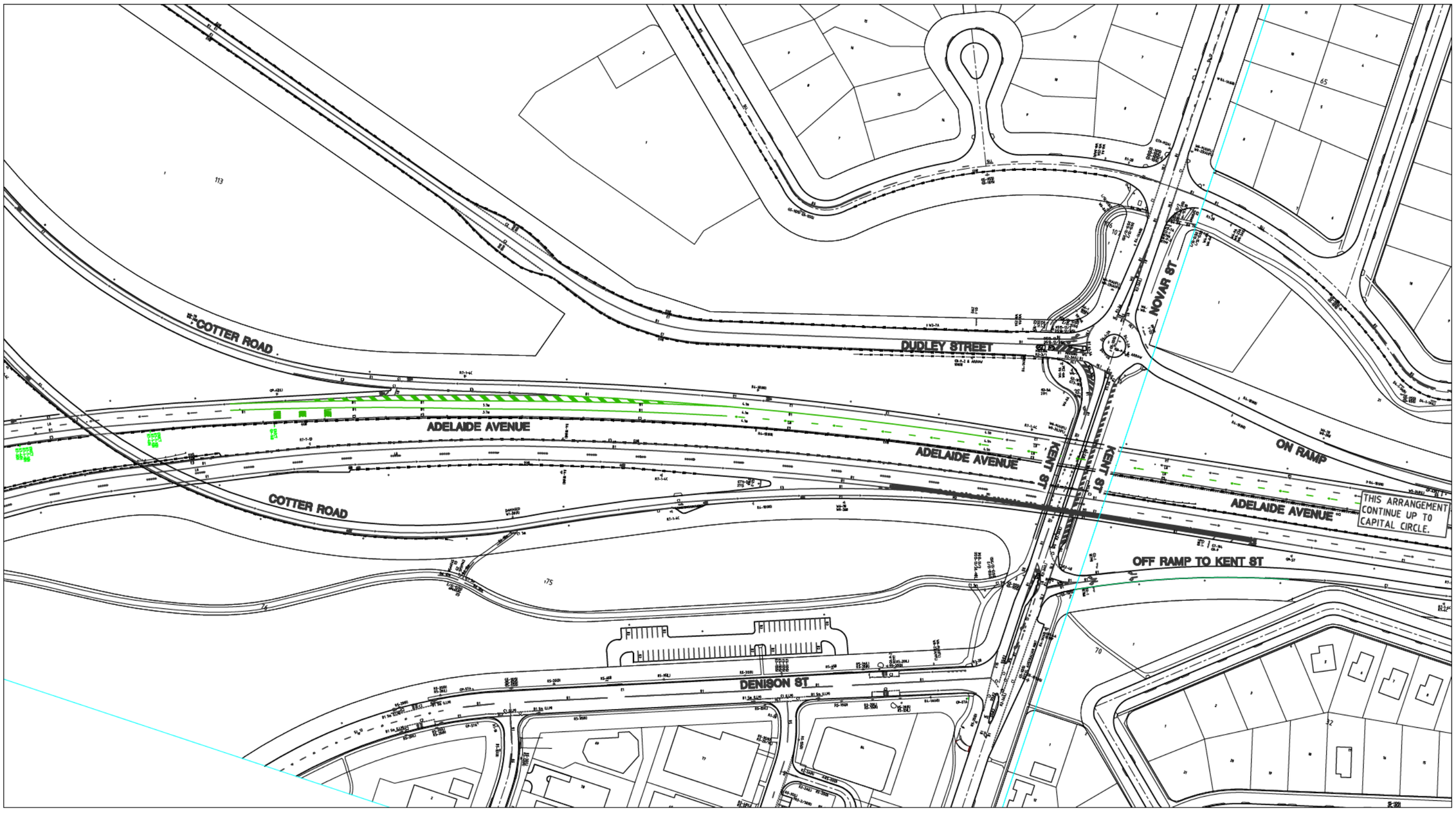
To cater the Cotter Road on-ramp to a continuous lane, it is also proposed to terminate the eastbound T2 lane on Yarra Glen section between the west of Cotter Road on-ramp merge and the east of Hopetoun Circuit on-ramp, and merge 3 lanes into 2 lane. This way the on-ramp lane can be aligned to Yarra Glen left lane to form a continuous lane.

The analysis results also showed that, the removal of this T2 lane section will not affect the bus transit operation.

7.3 Other Suggestions

At present, the eastbound queuing on Dudley Street reaches close to Cotter Road signalised intersection, because of difficulties on exiting the Kent Street roundabout intersection. However, with the improved traffic congestion Cotter Road in the option scenario, the destined Dudley Street traffic is expected to reach Cotter Road signalised intersection quickly and join the queuing. As a result, the Dudley Street queueing often expected to spill onto Cotter Road and likely to impede through traffic.

Therefore to avoid the queue spilling, it is suggested to consider extending the left turn slip lane storage capacity.



NO	AMENDMENTS	APPROVED	DATE

SIGNS TO BE ERECTED

SIGNS TO BE REMOVED OR RELOCATED

SIGN	DESCRIPTION	HAND	SIZE	NO. OF

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PRW NUMBER: 1057555
DOCUMENT STATUS: APPROVED
PROJECT OFFICER: BM/BH
PHONE NO | SIGNATURE
DRAFTED: JM
ACTION DATE: 13-08-2018
DATE PLOTTED: 13-07-2018
SCALE: NTS
DOCUMENT NUMBER: TC-599878
SHEET No: 2/2
REVISION

ACT GOVERNMENT

Authorised pursuant to Part 5 of Road Transport (Safety and Traffic Management) ACT 1999
Authorising Signature

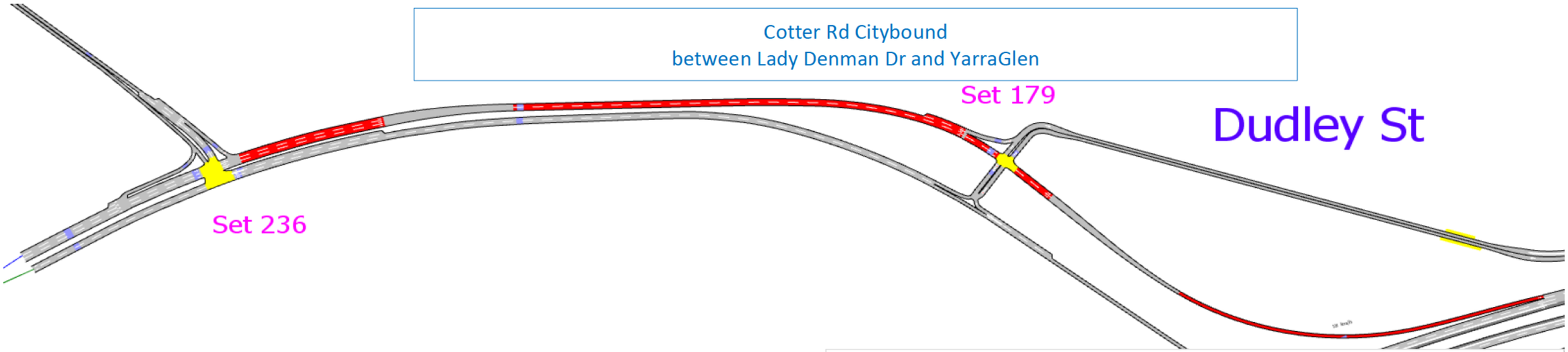
ACT Government
Transport Canberra and City Services

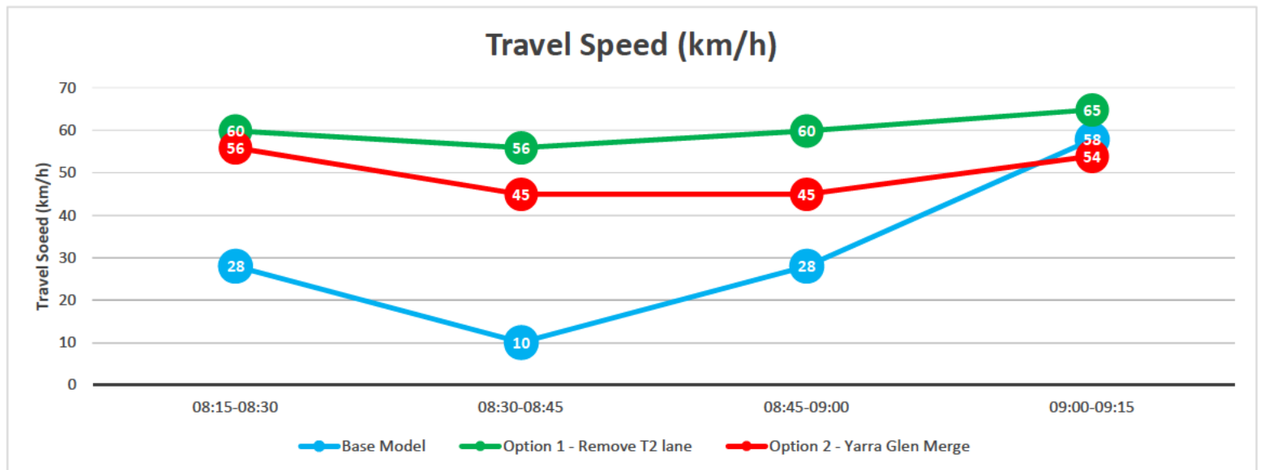
DEAKIN

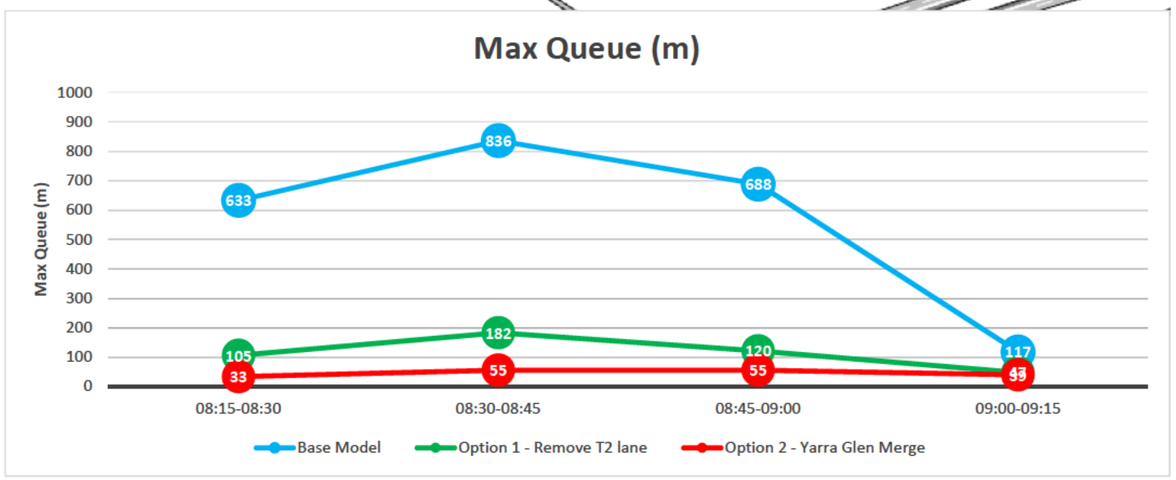
Cotter Rd/Adelaide Av

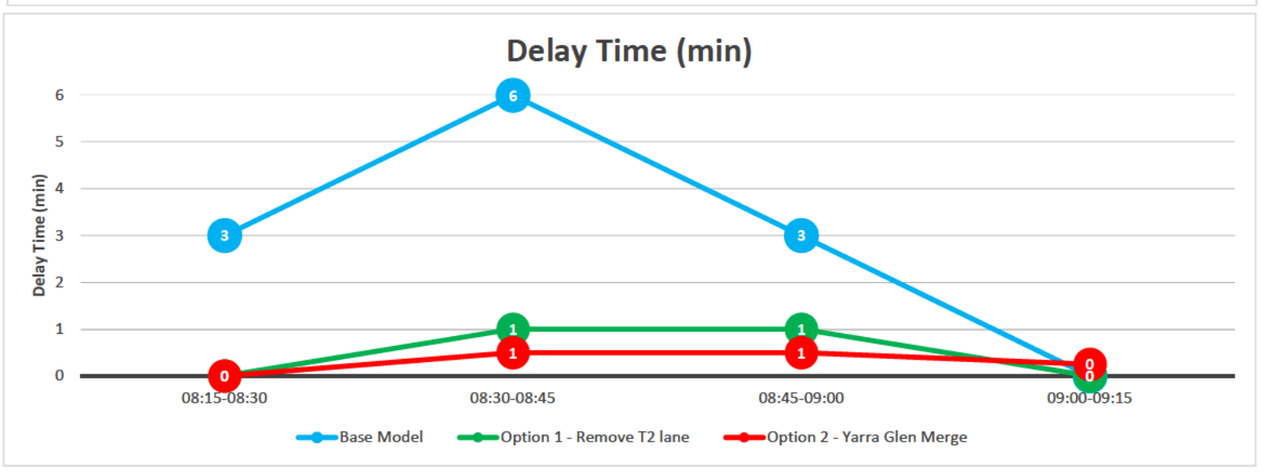
Traffic Control Devices

Cotter Rd Citybound
between Lady Denman Dr and YarraGlen

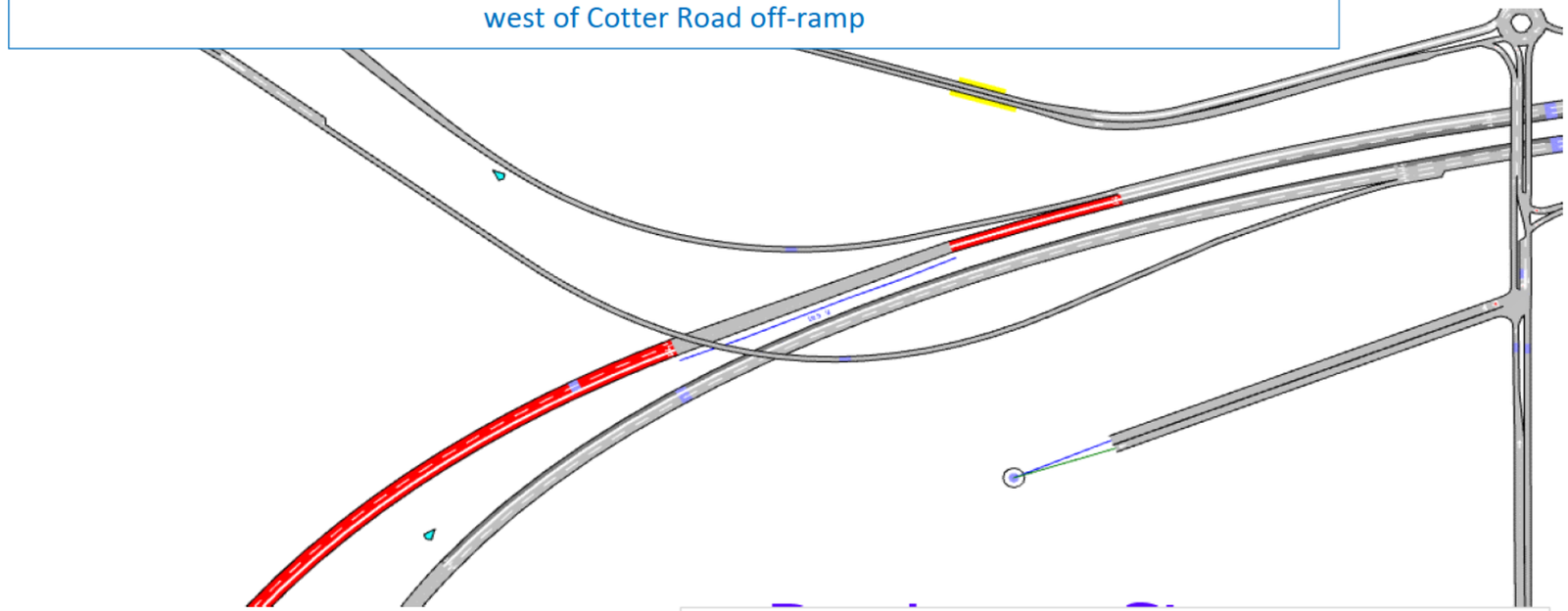


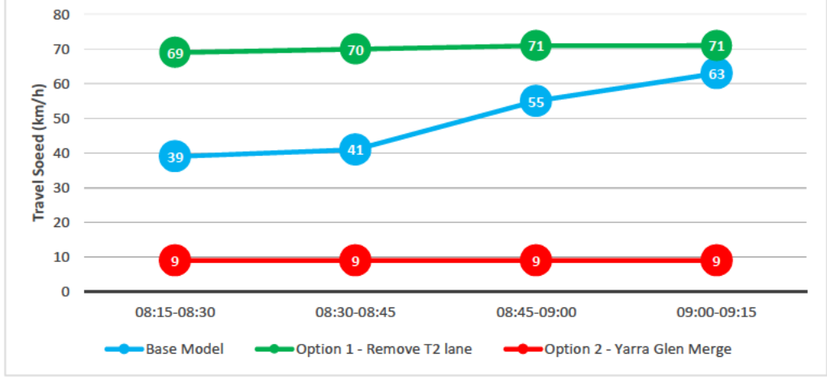


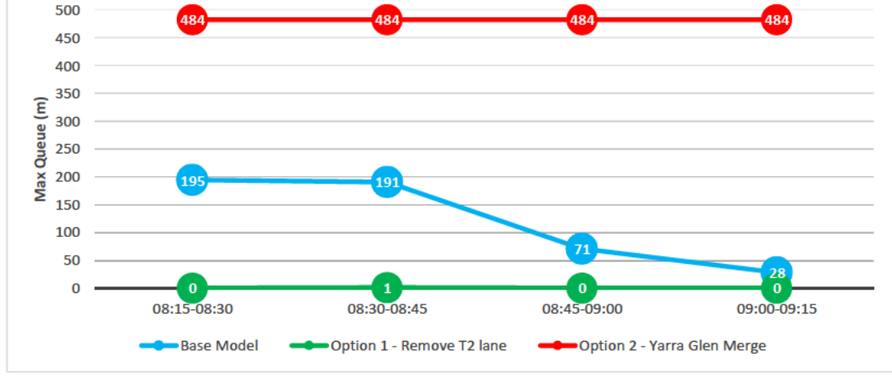


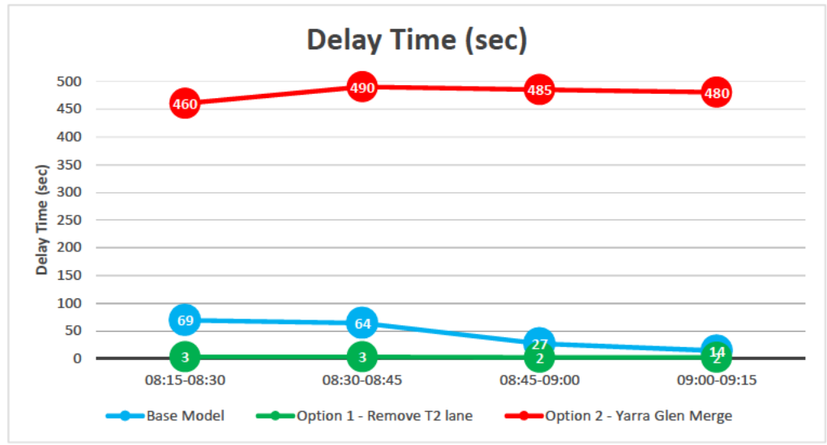


Yarra Glen eastbound
west of Cotter Road off-ramp

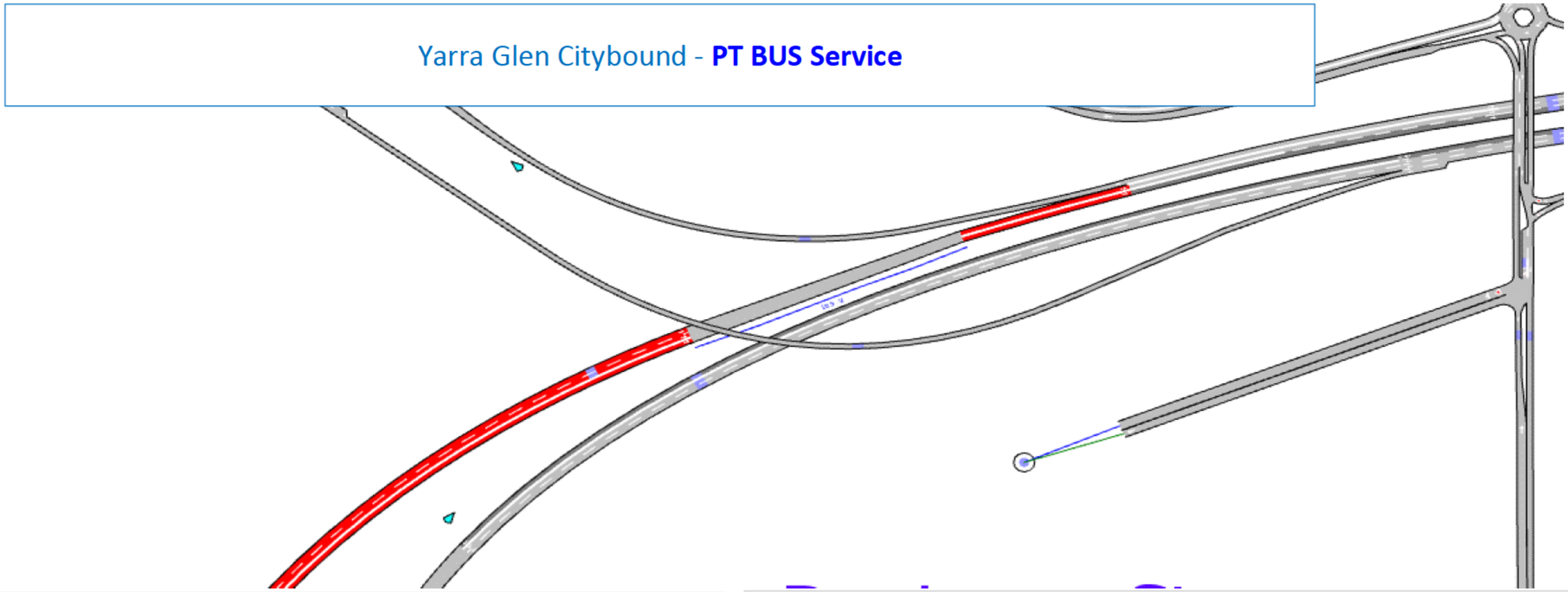


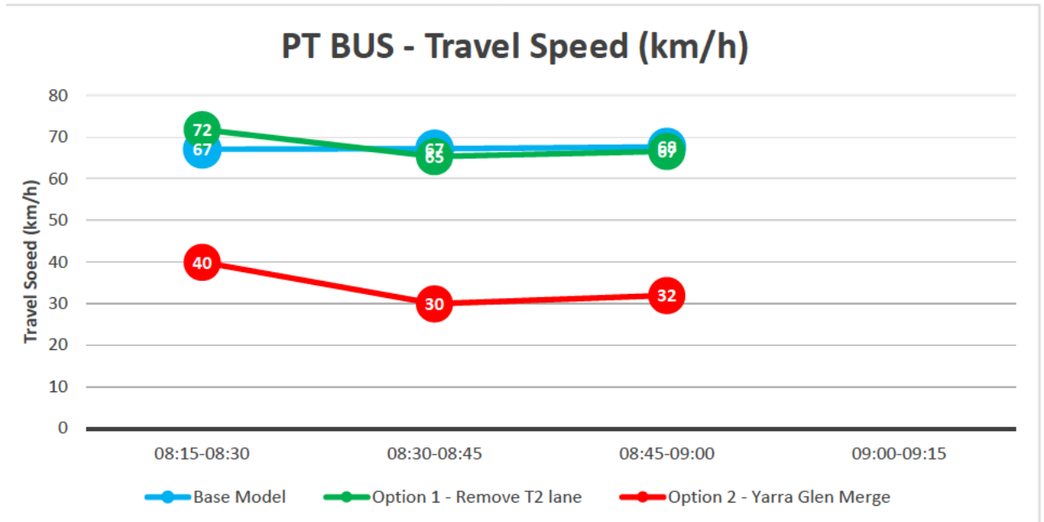


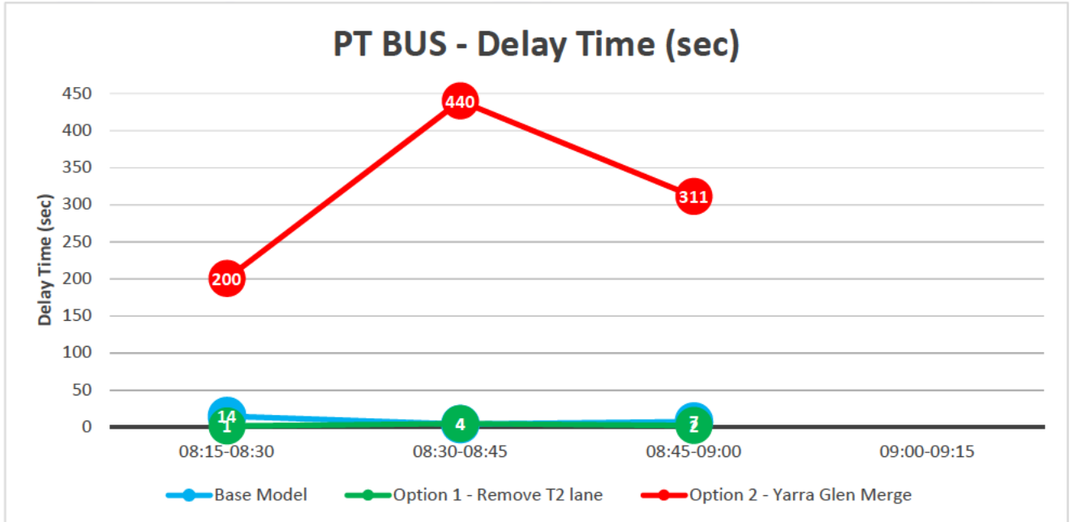




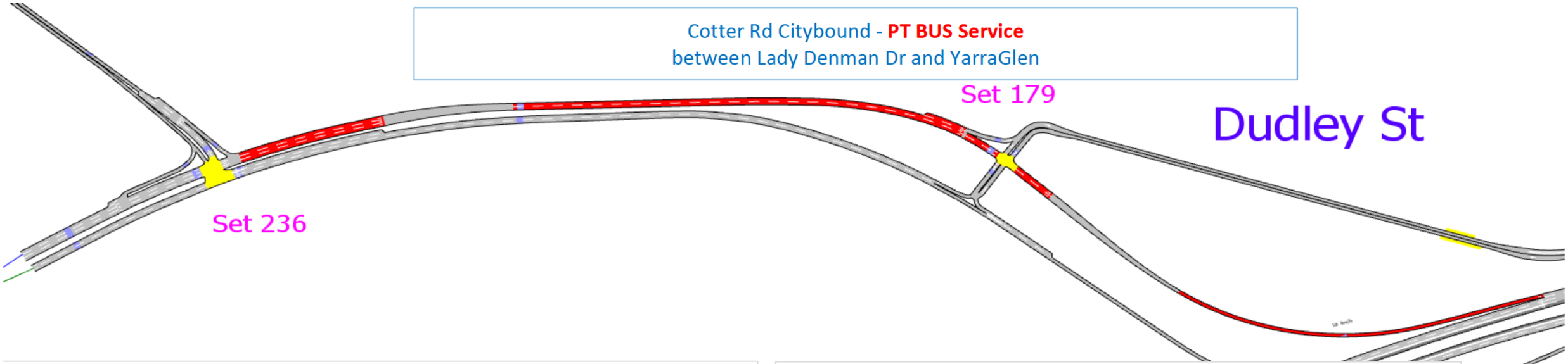
Yarra Glen Citybound - **PT BUS Service**

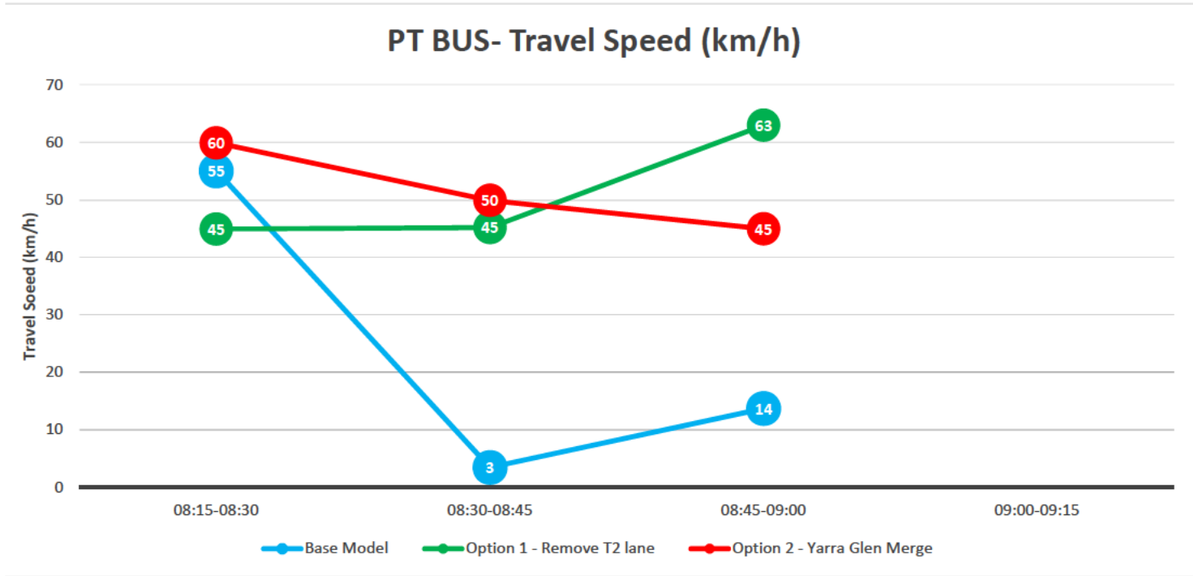


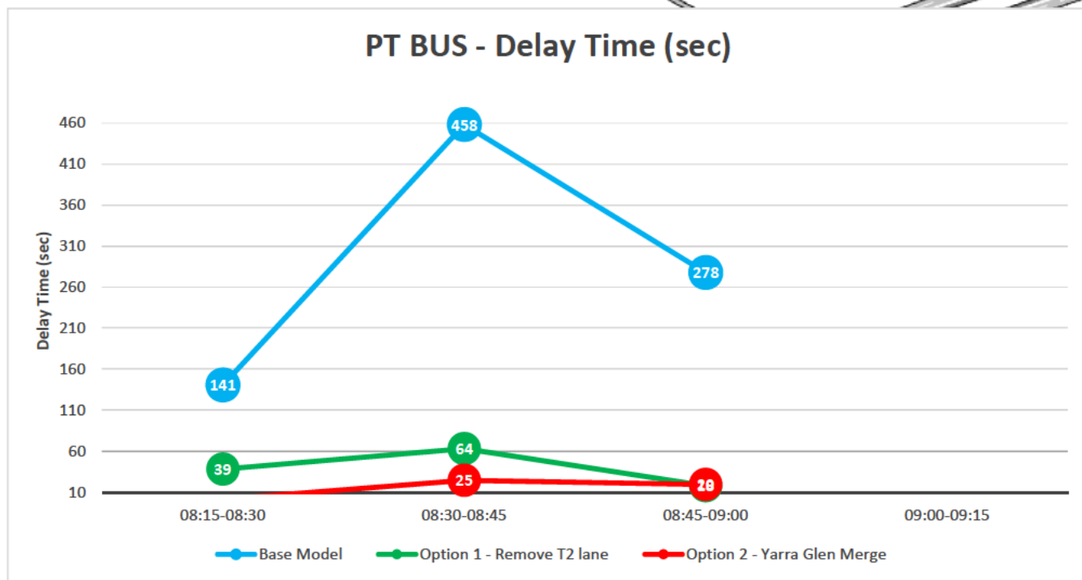




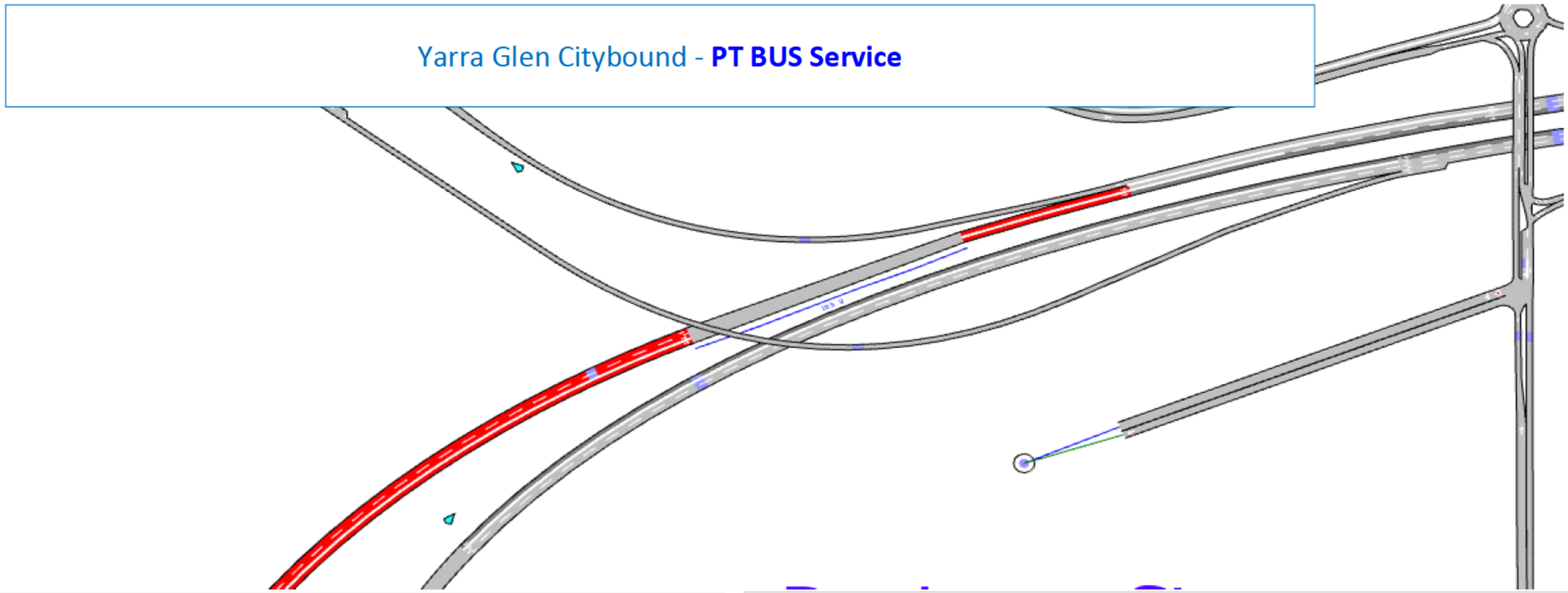
Cotter Rd Citybound - **PT BUS Service**
between Lady Denman Dr and YarraGlen

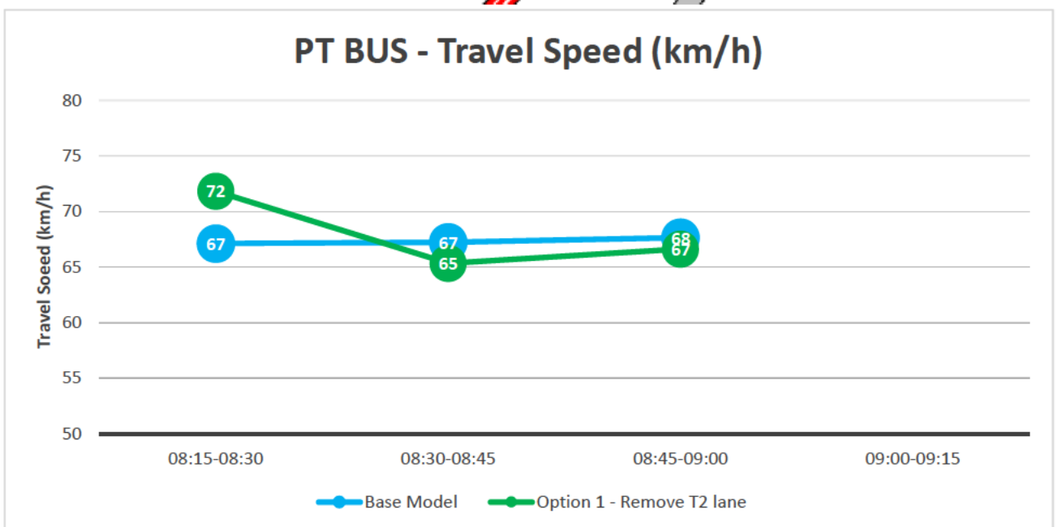


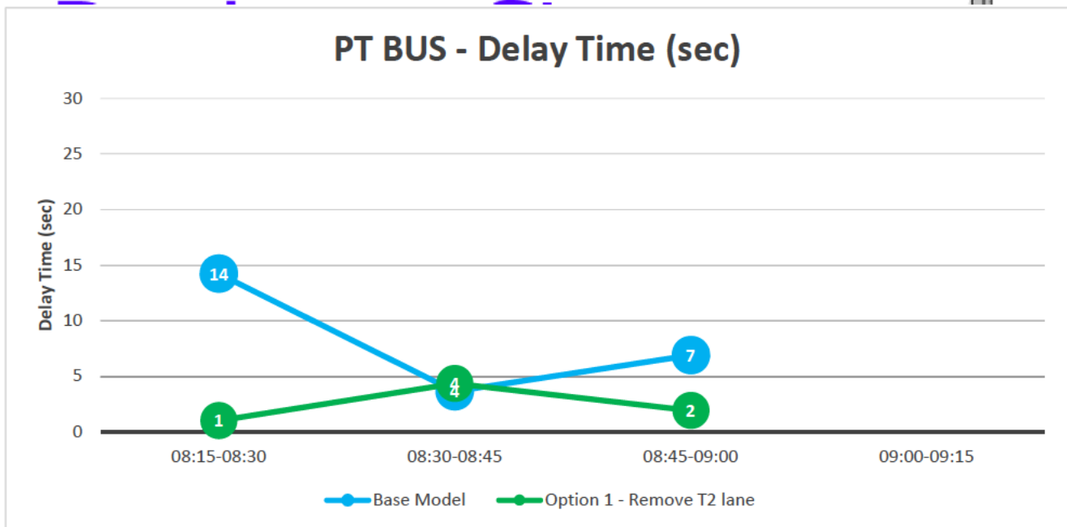




Yarra Glen Citybound - **PT BUS Service**







Cotter Rd Citybound - **PT BUS Service**
between Lady Denman Dr and YarraGlen