

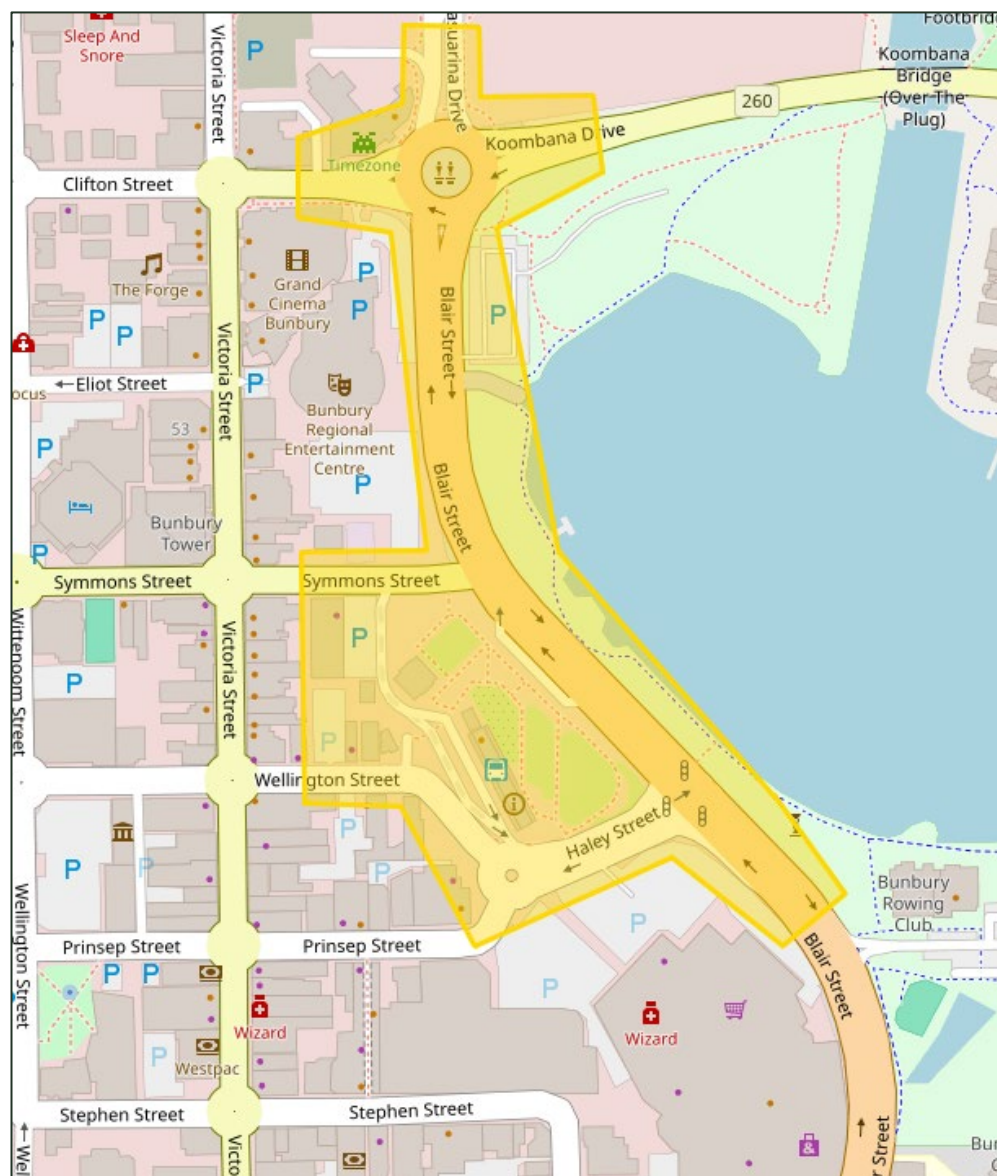
Technical Memorandum

Subject	Bunbury Bicentennial Square – Option 5 Sensitivity Analysis		
Client	City of Bunbury	Project No.	PTG/00814
Date	24/06/2025	Revision	A
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1 INTRODUCTION

PTG Consulting Pty Ltd (PTY) has previously developed an Aimsun microsimulation model for the Bunbury Bicentennial Square area shown in **Figure 1**. This model was used as basis for assessing the traffic network performance for 5 different road network options for the area, with the results of the assessment documented in the *Bunbury Bicentennial Square – Transport Modelling and MCA Report* (Rev B, dated 13th June 2025).

Figure 1 Bunbury Bicentennial Square Study Area



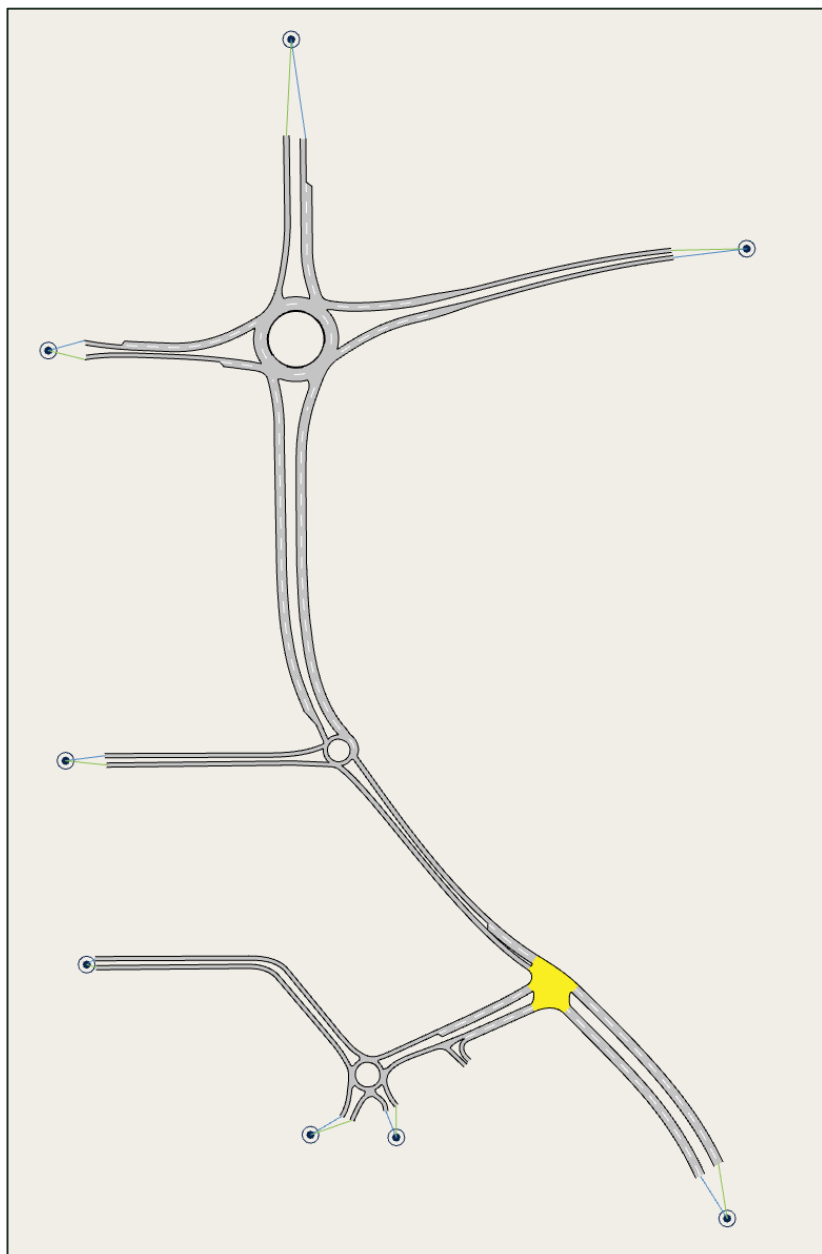
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Following the outcomes of the assessment, it is understood that the City's preferred option was Option 5, which involved the following key elements:

- » Reduction in Blair Street to a single lane in each direction between Symmons Street and Haley Street.
- » A reduced speed limit of 40 km/h on Blair Street for the single lane sections.
- » Traffic signals at Haley street intersection retained.
- » Zebra crossing across Symmons Street, west of Blair Street
- » Pedestrian walkway from Bicentennial Square across to foreshore
- » Relocation of the bus station, repurposing the space behind the station into a parking area.
 - The existing carpark near BREC will be reduced to accommodate a future hotel development.
- » Retention of carpark off Wellington Street
- » Closure of Victoria Street between Wellington and Symmons Streets (noting that this is outside of the study area).

Figure 2 shows the assumed lane configuration for this option.

Figure 2 Aimsun Network for Option 5



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2 SENSITIVITY ANALYSIS

To understand the capacity of the Option 5 network to accommodate further traffic growth, the City has commissioned PTG to utilise the Aimsun model to undertake a sensitivity analysis of the Option 5 network. This sensitivity analysis was undertaken by incrementally increasing the traffic demands for each of the peak periods in the model (i.e. AM peak, PM peak and Midday Noon peak) by 10% until either the average delay for one intersection turn movements reach the equivalent of Level of Service (LOS) F (refer to **Table 1** for the LOS definitions) or the average intersection delays reach the equivalent of LOS E.

Table 1 Level of Service (LOS) Performance Criteria

LOS	Description	Signalised Intersection	Roundabout	Unsignalised Intersection
A	No or minimal delays (best condition). Queues are rarely more than one vehicle	≤10 sec	≤10 sec	≤10 sec
B	Short traffic delays. Occasionally more than one queued vehicle.	10-20 sec	10-20 sec	10-15 sec
C	Average traffic delays. Often more than one queued.	20-35 sec	20-35 sec	15-25 sec
D	Long traffic delays. Regularly more than one queued vehicle.	35-55 sec	30-50 sec	25-35 sec
E	Very long traffic delays. Traffic demand is near or equal to the practical capacity of the intersection. Almost always more than one queued vehicle.	55-80 sec	50-70 sec	35-50 sec
F	Forced flow conditions with extensive delays caused by geometric and/or operational constraints external to the intersection.	≥80 sec	≥70 sec	≥50 sec

Source: Highway Capacity Manual

2.1 Sensitivity Analysis Results

The model results suggested that the network could accommodate an additional 40% increase in traffic before the criteria outlined in Section 2 was reached. This was found to occur in the PM peak period at the intersection of Blair Street / Symmond Street, where the average delays on the western approach (Symmons Street) increased to above 70 seconds (i.e. the equivalent of LOS F).

It is important to note that these results are based on an assumed intersection layout and the capacity of the intersection to accommodate the traffic demands is directly related to the assumed layout. If required, amendments to the assumed layout could be investigated further to further increase the capacity of the roundabout. This could be explored further if the Option 5 network is progressed to the detailed design stage.