

POST OPENING STAGE ROAD SAFETY AUDIT REPORT
Traffic Signals Installation and Access Road Connection
GEELONG-PORTARLINGTON ROAD / TIVOLI DRIVE - Curlewis

VCD Map 572 F-2

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1. INTRODUCTION

1.1 Auditor and Audit Process

This report presents the results of a “Post Opening Stage” Road Safety Audit on new traffic signals and associated works. The site is located on the Geelong-Portarlington Road, immediately east of the Curlewis golf course, at the new north side T-intersection of Tivoli Drive. Tivoli Drive is a new connection road to new residential subdivisions in Curlewis.

This audit was carried out by: **Michael Stirrat** (Senior Road Safety Auditor).

This audit was requested by **Paul Frew**, for the **City of Greater Geelong**.

The audit has been carried out following the procedures set out in the Austroads – GUIDE TO ROAD SAFETY -Part 6: Road Safety Audit, Third Edition 2009. The audit covers physical features of the installation and the site which may affect user safety, and it has sought to identify potential safety hazards. However, no guarantee is made that every deficiency has been identified. Further, if all the recommendations in this report were to be followed, this would not guarantee that the design is ‘safe’; rather, adoption of the recommendations should improve the level of safety of the facility.

1.2 Description of the Project

This project involved the installation of a new T-intersection with the Geelong-Portarlington Road that is controlled by traffic signals. It includes a left turn lane and a right turn lane into Tivoli Drive. Bicycle lanes are included for both sides of the Geelong-Portarlington Road and Tivoli Drive, at the intersection. Tivoli Drive has a duplicate carriageway at the intersection and narrows to a single carriageway (7.5m wide) as it extends northward.

1.3 Documentation

Construction Plan Set 2012161-PI-D1-D22.pdf, by City of Greater Geelong (COGG), was supplied for the audit.

1.4 Consultation

The design was briefly discussed with Paul Frew prior to and after the site inspection.

1.5 Site Inspection

The site was inspected on Wednesday 29th July at 5:30 to 6:30pm. A follow up inspection was done on Friday 31st July at 4:50 to 5:30pm. The weather during the inspections was fine and cool.

1.6 Classification of Concerns.

In the Table of Findings and Recommendations, at Appendix 2 in this report, the safety concerns identified and the recommended actions from the audit are graded into three classes:

URGENT – Indicate a safety hazard requiring immediate attention

IMPORTANT – Indicate a safety hazard that is considered to have a potential danger

NOTE – Indicate other matters of concern.

1.7 Responding to the Audit Report

As set out in the road safety audit guidelines, clause 1.1, responsibility for the project always rests with the project manager, and not with the auditor. A project manager is under no obligation to accept the audit recommendations. Also, it is not the role of the auditor to agree to or approve of the project manager's response to the audit. Rather, the audit provides the opportunity to highlight potential problems and have them formally considered by the project manager, in conjunction with all other project considerations.

2. RECOMMENDATIONS FROM PREVIOUS STAGE AUDITS

The auditor conducted a previous audit at Draft Design Stage of the Geelong-Portarlington Road / Tivoli Drive Traffic Signals design in July 2018. Some recommendations were included in the final design.

3. SAFETY AUDIT FINDINGS

GEEELONG-PORTARLINGTON ROAD / TIVOLI DRIVE INTERSECTION

The Geelong-Portarlington Road carries approximately 30,000 vehicles per day with less than 5% being commercial vehicles. It services high year round commuter traffic volumes, and seasonal peaks to the popular Bellarine Peninsula tourist destinations. It has a speed limit that has been reduced to 80km/h with this installation and Tivoli Drive has a 60km/h speed limit. The road alignments are straight and undulating with good approach sight distances.

Note: The traffic signals were switched on earlier on the day of the initial site inspection. Some cosmetic works were still in progress. Lighting at the intersection is by portable generators and flood lights as permanent lighting is not yet available. The temporary lighting was providing a fair to good level of illumination where needed.

3.1 During the site inspections the traffic signals seemed to be operating appropriately. The advance flashing warning sign on the north side, west approach, only had 1 aspect working. The east approach signs had different flash rates. This may indicate that one sign has a faulty flasher?

3.2 The proposed 'No U Turn' sign on Pedestal 10 has not yet been installed. This sign is important to stop traffic from trying to access the south side Property from the right side through traffic lane at the intersection.

3.3 There is a culvert outlet in the central median, west side, that has batters sloping up to 1to1 (45 deg.) close to the intersection without barrier shielding. The culvert could be extended to a point where the outlet is in a flatter and more driveable location.

On the south side, east approach, there is a culvert inlet that is close to the back of the kerb. It has a driveable endwall, however, it has a steep batter dropping to the invert (up to 60 deg.). It is difficult to shield this hazard with a barrier due to a driveway immediately east of it. The culvert inlet should have been set back further from the kerb and the depth of the inlet minimised.

3.4 For traffic heading east, after the intersection, there are a few power poles along the north side at approx. min 4.5m offset from the edge line. These poles are providing service to individual properties. These hazards should be reviewed and either removed, relocated, or shielded.

TIVOLI DRIVE

3.5 Tivoli Drive is a new connection that links northward to new residential subdivisions in Curlewis. It is expected to become a duplicated carriageway with future development, but this may be years away. It has duplicate carriageways at the Geelong-Portarlington Road signals, and currently narrows to a 7.5m wide carriageway for 2-way traffic with barrier kerbs defining its edges.

This new access road with traffic signals at the Geelong-Portarlington Road will significantly increase the traffic volume on Tivoli Road through the residential area. The 7.5m wide carriageway is sub-standard for a collector street if it is to cater for 2-way traffic, parking, and cyclists.

There is a bike lane provided at the exit from the Geelong-Portarlington Road, but this ends as the road narrows, and cyclists would then share a 3.75m wide lane with other traffic. The Cycling Aspects of Austroads Guides 2014 nominates a desirable minimum shared kerb side lane width of 4.2m in a 60km/h speed zone, with an acceptable minimum of 3.7m. If cyclists are to be given some on-road access and protection, then parking should be banned along the entire length of Tivoli Drive, where there is no off-road cycling facility.

If parking cannot be removed then appropriate off-road cyclist facility should be provided in both directions. If parking is to stay then it should be only allowed on the east side.

3.6 At approx 600m north the Geelong-Portarlington Road the Bellarine Rail Trail crosses Tivoli Drive. On demand Traffic Signals have been installed at this crossing but are not yet active. The speed limit is appropriately reduced to 50km/h at approx. 100m in advance of the Rail Trail crossing.

North of the Rail Trail, Tivoli Drive has a vertical curve cresting at approx. 60m north of the crossing point. Sight distance over the crest is poor. Queuing at the Rail Trail Traffic Signals will be partially hidden to south bound traffic coming over the crest, with a risk of tail end accidents. The high Mast Arm signal Outreach lantern, along with the 50km/h speed limit will help to reduce the crash risk (if the posted speed limit is obeyed).

Stanley Avenue intersects Tivoli Drive from the east at the crest of the hill (T-intersection). This intersection is partly hidden due to the crest and with the parking in Tivoli Drive north. Parking, if allowed, should be kept well clear of the intersection. The installation of intersection warning signs (W2-4) would help to identify the presence of this intersection.

3.7 North of Stanley Avenue there were significant numbers of parked vehicles on the 7.5m wide Tivoli Drive carriageway. This leaves a driveable width of approx. 5.2m for two way traffic. This is very restrictive for this collector street. The concern is further compromised with some parking being done on the west side of the carriageway. During the inspections a number of drivers refrained from squeezing past parked vehicles and they preferred to wait for oncoming traffic to clear.

More specific comments and recommendations are included in the table below.

4. CONCLUDING STATEMENT

The documents described in part 1.3 of this report have been examined with reference to the publications listed in Appendix 1. The audit has been carried out for the purpose of identifying any features that could be amended to improve safety at this location. The identified issues have been noted in this report.



____ 5 / 08 / 2020

Michael Stirrat - Senior Road Safety Auditor

APPENDIX 1

Documents Used During the Audit

1. Austroads – Guide to Road Safety Part 6: Road Safety Audit, 2009
2. Austroads – Guide to Road Design Part 3: Geometric Design
3. Austroads – Guide to Road Design Part 4A: Unsignalised and Signalised Intersections
4. VicRoads Supplement to the Austroads Guide Part 4

Table of Findings and Recommendations

Audit Findings	Recommendations	Priority	Project Manager - Accept or decline with comments
GEELONG-PORTARLINGTON ROAD / TIVOLI DRIVE TRAFFIC SIGNALS			
1. The advance flashing warning sign on the north side, west approach, only had 1 aspect working. The east approach signs had different flash rates.	Replace or reset the faulty west side signal aspect. Check the east side flasher units and replace or adjust if found to be faulty.	Note	
2. The proposed 'No U Turn' sign on Pedestal 10 has not yet been installed.	Install a No U Turn sign at Pedestal 10.	Note	
GEELONG-PORTARLINGTON ROAD / TIVOLI DRIVE INTERSECTION			
3. There is a culvert outlet in the central median, west side, that has batters sloping up to 1to1 (45 deg.) close to the intersection without barrier shielding.	Extend the culvert to a point where the outlet is in a flatter and more driveable location	Note	
4. On the south side, east approach, there is a culvert inlet that is close to the back of the kerb. It has a driveable endwall, however, it has a steep batter dropping to the invert (up to 60 deg.).	Either set back the culvert inlet further from the kerb and/or provide a type of drop inlet to minimise the batter slopes.	Note	
5. For traffic heading east, after the intersection, there are a few power poles along the north side at approx. 4.5m min offset from the edge line.	These poles are providing service to individual properties. Either remove, relocate, or shield these hazardous poles.	Note	
TIVOLI DRIVE			
6. The new access road and traffic signals at the Geelong-Portarlington Road will significantly increase the traffic volume on Tivoli Drive. The current 7.5m wide carriageway is sub-standard for this collector street.	Widen the carriageway to provide a minimum of 2x3m traffic lanes and a 2.4m parking lane. OR Ban parking along Tivoli Drive. OR fast track the proposed future installation of a duplicated carriageway.	Important	

7. Between the Geelong-Portarlington Road and the Rail Trail crossing (600m length) the formal bike lanes at the south end are terminated. There is no formal facility for cyclists to connect to and they will need to share with all traffic in a 3.75m wide kerb side lane.	3.75m is at the lower end of an acceptable width for a shared lane (desirable 4.2m). Consider providing an off road cycling facility.	Note	
8. North of the Rail Trail, Tivoli Drive has a vertical curve cresting at approx. 60m north of the crossing point. Sight distance over the crest is average to poor. Queuing at the Rail Trail Traffic Signals will be partially hidden over the crest with a risk of tail end accidents.	The high Mast Arm signal Outreach lantern, along with the 50km/h speed limit will help to reduce the crash risk. Consider adding a 'Prepare to Stop' panel to the existing Signals warning sign.	Note	
9. Stanley Avenue intersects Tivoli Drive at the crest of the hill (T-intersection to east) and is partly hidden due to the crest and with the parking in Tivoli Drive	Ban parking from close to the intersection. Install intersection warning signs (W2-4).	Note	
10. North of Stanley Avenue significant numbers of parked vehicles clutter the roadway and restrict the free flow of the increasing volume of collecting traffic.	Ideally ban parking along Tivoli Drive. At least restrict parking to the east side of Tivoli Drive. Provide an off-road cyclist option if parking is to remain. Proposed future widening /duplication of Tivoli Drive should be constructed as soon as possible.	Important	

ACTION BY: Responsible Officer:

Agency:

Signed:

Date:

Photographs



New signals looking east



Geelong-Portarlington Rd - Line of power service poles along edge of east side departure



Steep batters to culvert endwall -worst case is south side for west bound traffic.



Culvert on east approach with steep batter from back of kerb?



Temporary lighting around the intersection



Tivoli Drive approaching Geelong-Portarlington Road



Tivoli Drive looking northward where it narrows and bike lane disappears.



Rail Trail crossing – looking north to crest.



Looking south to Rail Trail Crossing from Stanley Avenue



North of Stanley Ave. – example of parking both sides.