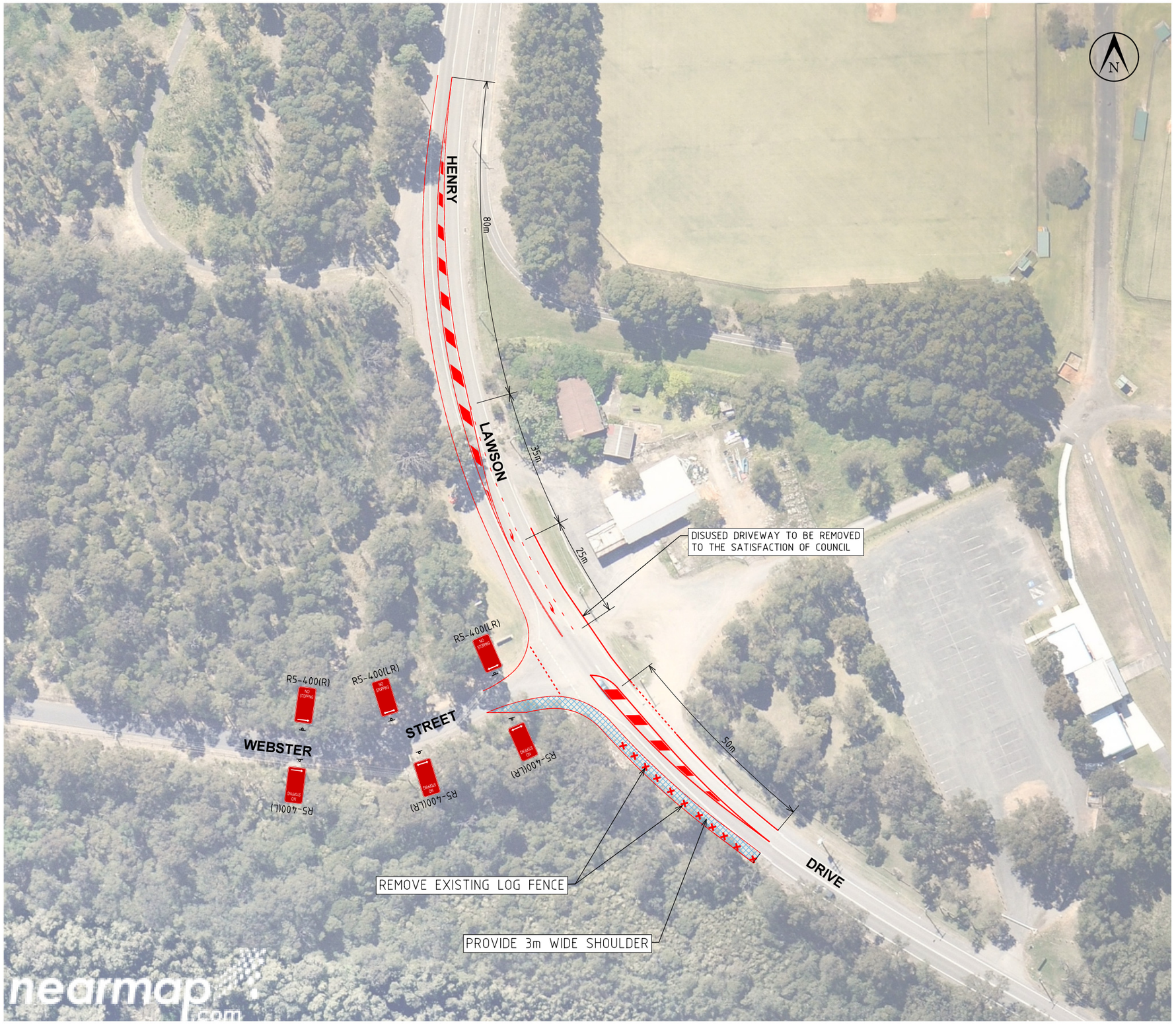


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RIGH TURN BAY TREATMENT
CONCEPT PLAN

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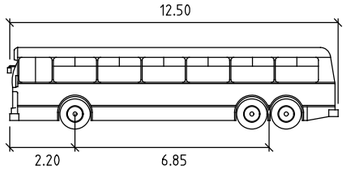
APPROVED: JAR
DRAWING NO. 14S1303000-01-01-P1
SHEET: 01 OF 01




| BUS | metres |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 36.6 |

## SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

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DEEPWATER MOTOR BOAT CLUB, MILPERRA
SWEPT PATH ASSESSMENT
12.5m BUS LEFT TURN IN AND RIGHT TURN IN

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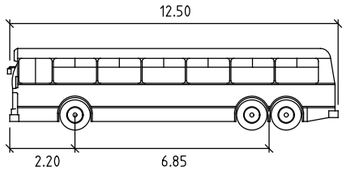
SHEET: 02 OF 01




BUS metres

| | |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
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SHEET: 03 OF 01

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# WEBSTER STREET AND HENRY LAWSON DRIVE, MILPERRA

# PRELIMINARY DESIGN ROAD SAFETY AUDIT

FOR

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Project No: P1790 Version No: 001 Issue date: 2 September 2014

# Document Control Sheet

## Issue History

| Report File Name | Prepared by | Reviewed by | Issued by | Date | Issued to |
|---|---|---|---|---|---|
| P1790.001 | S.Read | S.Brooke | S.Read | 2 / 9/ 2014 | Jason Rudd<br>GTA Consulting |

# CONTENTS



## Tables



## Figures

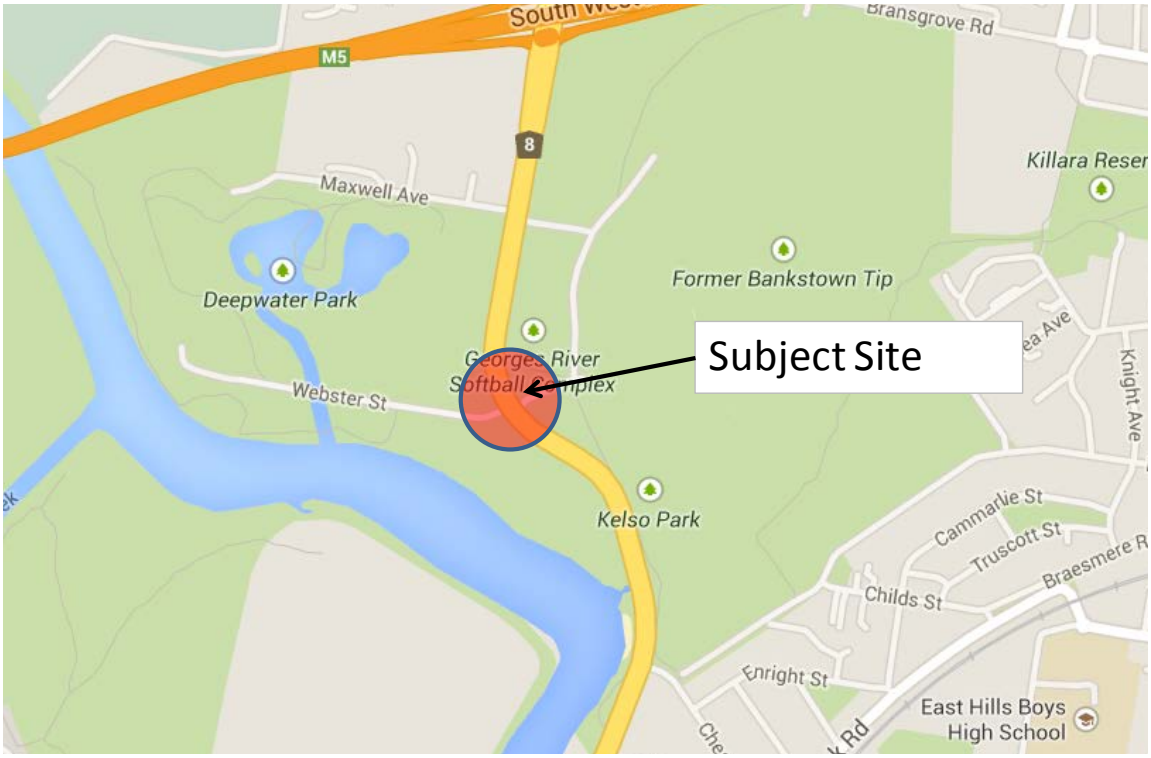


## Appendices

# 1. INTRODUCTION

## 1.1 BACKGROUND

Bitzios Consulting has been engaged by Doltone House to undertake a preliminary design road safety audit for the proposed intersection upgrade at Webster Street and Henry Lawson Drive, Milperra. The subject site is shown below in Figure 1.1.




*Source: Google Maps*

Figure 1.1: Locality Plan

Webster Street is a local street that provides access to the Deep Water Park and the Deep Water Motor Boat Club. The default speed limit for this street is 50km/h.

Henry Lawson Drive is a collector road with an annual average daily traffic volume (AADT) greater than 10,000 vehicles. The speed limit is 60 km/h.

The proposal is to widen Henry Lawson Drive to provide a right turn bay from the north.

## 1.2 SCOPE OF THE ASSESSMENT

The road safety audit was undertaken in accordance with the procedures set out in the Austroads – Road Safety Audit (2009) manual and the RMS Guide to Road Safety Practices Part 1. The audit involved undertaking a preliminary design road safety audit (as per the Austroads Road Safety Audit Checklist 2)).

# 2. ROAD SAFETY AUDIT PROCESS

## 2.1 DEFINITIONS

The Austroads Road Safety Manual (2009) guide defines a road safety audit as:

"a formal examination of a future road or traffic project or an existing road, in which an independent, qualified team reports on the project's crash potential and safety performance."

The essential elements of this definition are that it is:

- a formal process and not an informal check;
- an independent process;
- carried out by someone with appropriate experience and training; and
- restricted to road safety issues.

The objectives of a road safety audit are:

- to identify potential safety problems for road users and others affected by a road project; and
- to ensure that measures to eliminate or reduce the problems are considered fully.

The benefits of conducting road safety audits are that:

- the likelihood of crashes on the road network can be reduced; and
- the severity of crashes can be reduced.

The aim of a road safety audit is:

*"to identify any existing safety deficiencies of design, layout and road furniture which are not consistent with the road's function and use. There should be a consistency of standards such that the road users' perception of local conditions assists safe behaviour."*

## 2.2 METHODOLOGY

The road safety audit was undertaken in accordance with the requirements of the Austroads Road Safety Audit Manual. Items audited as part of the road safety audit included, but were not limited to:

- road alignment (horizontal and vertical);
- intersection geometry;
- intersection sight distances;
- signs and pavement markings;
- provision for special road users including pedestrians and cyclists and potential conflict points; and
- roadside objects and hazards.

## 2.3 AUDIT TEAM

The road safety audit was carried out by an audit team comprising:

- Stephen Read – Lead Auditor (level 3) (Bitzios Consulting); and
- Alan Finlay – Team Member (level 3) (Bitzios Consulting).

## 2.4 COMMENCEMENT MEETING

An informal commencement meeting was held via telephone between Stephen Read (Bitzios Consulting) and Jason Rudd (GTA Consulting) on 29 August 2014. During the meeting it was discussed that the purpose of the upgrade was part of the Deepwater Motor Boat Club renovations and that the types of vehicles that would be using the intersection may include the occasional tourist coach.

## 2.5 INFORMATION SOURCES

The road safety audit was based on plans provided by GTA Consulting including:

- Drawing Number: 14S1303000-01-01-P1 (dated 29.8.2014) sheets 1,2 and 3

## 2.6 SITE INSPECTION

A site inspection was undertaken on 1 September 2014 at 10am and was attended by Stephen Read and Alan Finlay. The weather at the time of the inspection was fine and the visibility was good.

In accordance with the Transport for NSW Guidelines a night time inspection was not considered necessary.

## 2.7 AUDIT HISTORY

The audit team has not been made aware of any previous audits.

## 2.8 AUDIT CLOSE OUT

The audit close out meeting was held via a telephone conversation (2 September 2014). Each of the issues identified were discussed. It was agreed that all of the issues raised could be addressed in the detailed design stage of the project.

## 2.9 RISK ASSESSMENT

The issues identified have been prioritised based on the Austroads risk assessment. The risk level is based on a combination of the likely frequency that a crash type will happen by the severity of the resulting crash. Table 2.1 below is from the Austroads Guide to Road Safety, Part 6.

Table 2.1: Risk Matrix

| | Frequent | Probable | Occasional | Improbable |
|---|---|---|---|---|
| Catastrophic | Intolerable | Intolerable | Intolerable | High |
| Serious | Intolerable | Intolerable | High | Medium |
| Minor | Intolerable | High | Medium | Low |
| Limited | High | Medium | Low | Low |

*Source: Austroads Guide to Road Safety part 6 Road Safety Audits*

# 3. DESIGN ROAD SAFETY AUDIT

This section summarises the safety issues identified during the audit of the design plans. The key audit findings are outlined below in Section 3.1 followed by a table of specific issues in Section 3.2

## 3.1 KEY AUDIT FINDINGS

The key findings of the audit related to objects in the clear zone including a mature tree, log fence and an existing culvert. Many of the issues raised relate to existing hazards and all issues can be addressed in the detail design of the intersection.

## 3.2 AUDIT FINDINGS

Table 3.1 details the key safety issues identified during the audit of the design drawings. The locations of the issues are indicated on Figure 3.1 below.

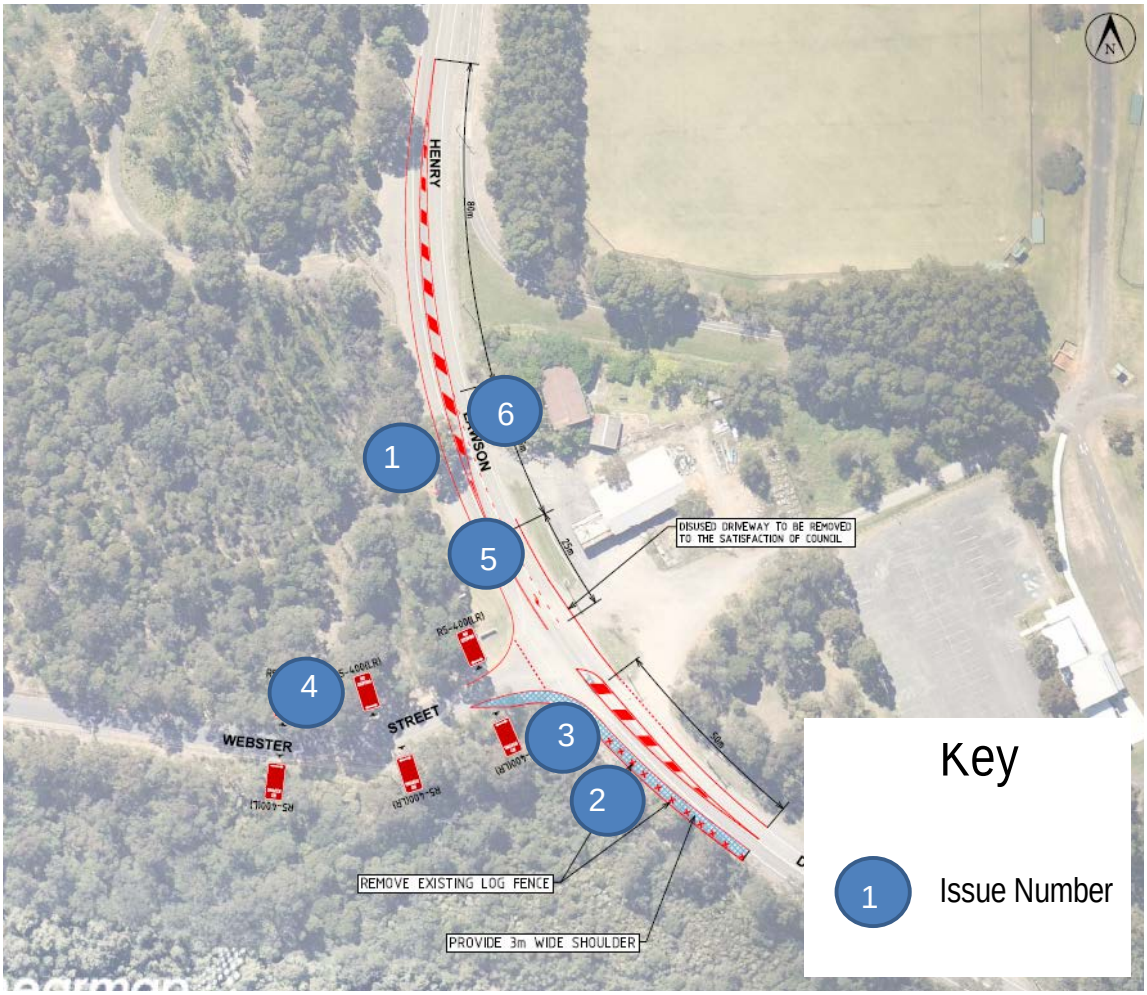


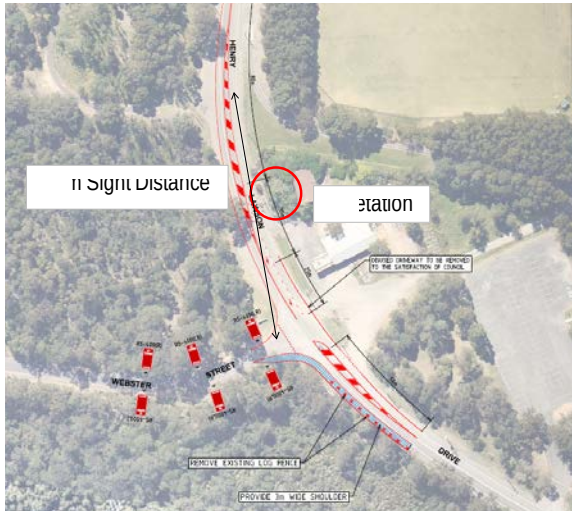

Figure 3.1: Location of Identified Issues

Table 3.1: Preliminary Design Stage Road Safety Audit Findings

| Item | Plan No. | Risk Priority | Issues | Site Illustration | Audit Response |
|---|---|---|---|---|---|
| 1 | 1 | High | The widening of the road will make the travel lane closer to a mature tree. It is estimated that it will be located some 3m from the nearest travel lane on the outside of a horizontal curve.<br>There is a risk that an errant vehicle could collide with the tree. |  <br>  | The location of the tree relative to the nearest travel lane shall be considered during detail design of the intersection.<br>Should the location of the tree be within the 3m zone then mitigation measures such as barrier controls or tree removal shall be considered. |
| 2 | 1 | Medium | There is a batter slope located on the outside of the bend on the eastern approach to the intersection. The slope will be unprotected and there is a risk that an errant vehicle may overturn. |  | Batter design and associated barrier protection shall be considered during detail design of the intersection. |

| Item | Plan No. | Risk Priority | Issues | Site Illustration | Audit Response |
|---|---|---|---|---|---|
| 3 | | High | The plan indicates that the log fence will be removed only part way to the intersection as indicated by the x's . The remaining log fence near the intersection is located on the outside of a horizontal curve and would be a hazard for errant vehicles that may collide head on into the fence. |   | It is recommended that the extent of the log fence removal be extended around the curve into Webster Street. |
| 4 | | Low | There is an unprotected drainage culvert located on the Webster Street approach to the intersection. An errant vehicle could strike the concrete structure. Further, there is poor delineation of the object with an unreflective white post that would be hard to see in low light conditions. |  | Guide posts and reflectors to be installed to delineate this object. It is noted that these works are required to address an existing situation and should be undertaken with or without approval of the Deepwater Motor Boat Club DA. |

| Item | Plan No. | Risk Priority | Issues | Site Illustration | Audit Response |
|---|---|---|---|---|---|
| 5 | | Medium | The exiting road has a super elevation on the curve. At this stage in the design it is unclear whether the super elevation will be maintained or a crown introduced in the road.<br>(i) If the super elevation is maintained for widened section then the road shoulder will slope away from the road reducing the chance of recovery or directing vehicles toward road side objects.<br>(ii) If not maintained then vehicles will have less grip while negotiating the turn. |  | Super elevation and in particular the associated issues identified in this audit shall be considered during detail design of the intersection. |

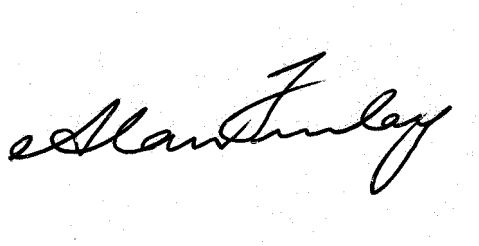
| Item | Plan No. | Risk Priority | Issues | Site Illustration | Audit Response |
|---|---|---|---|---|---|
| 6 | | High | Sight distance to the intersection is restricted by vegetation on inside of the curve. There is a potential for a vehicle on the main road to collide with a vehicle turning right from Webster street.<br><br>Austroads Guide to Road Design part 4A recommends a Safe Intersection Sight Distance of 123m. We estimate that from the existing hold line there is some 95m. From the future hold line sight distance will be 110m. Removing the vegetation would provide adequate sight distance. |  <br>  | It is recommended that the vegetation which is located within the road reserve be trimmed / removed such as to provide appropriate sight distances.<br>It is noted that these works are required to address an existing situation and should be undertaken with or without approval of the Deepwater Motor Boat Club DA. |

# 4. CONCLUDING STATEMENT

This audit was undertaken by a team of independent and qualified road safety auditors. This audit has recognised potential safety issues for road users and others.

It is the responsibility of the road owner / designer to determine how best to respond to the issues raised in this report.

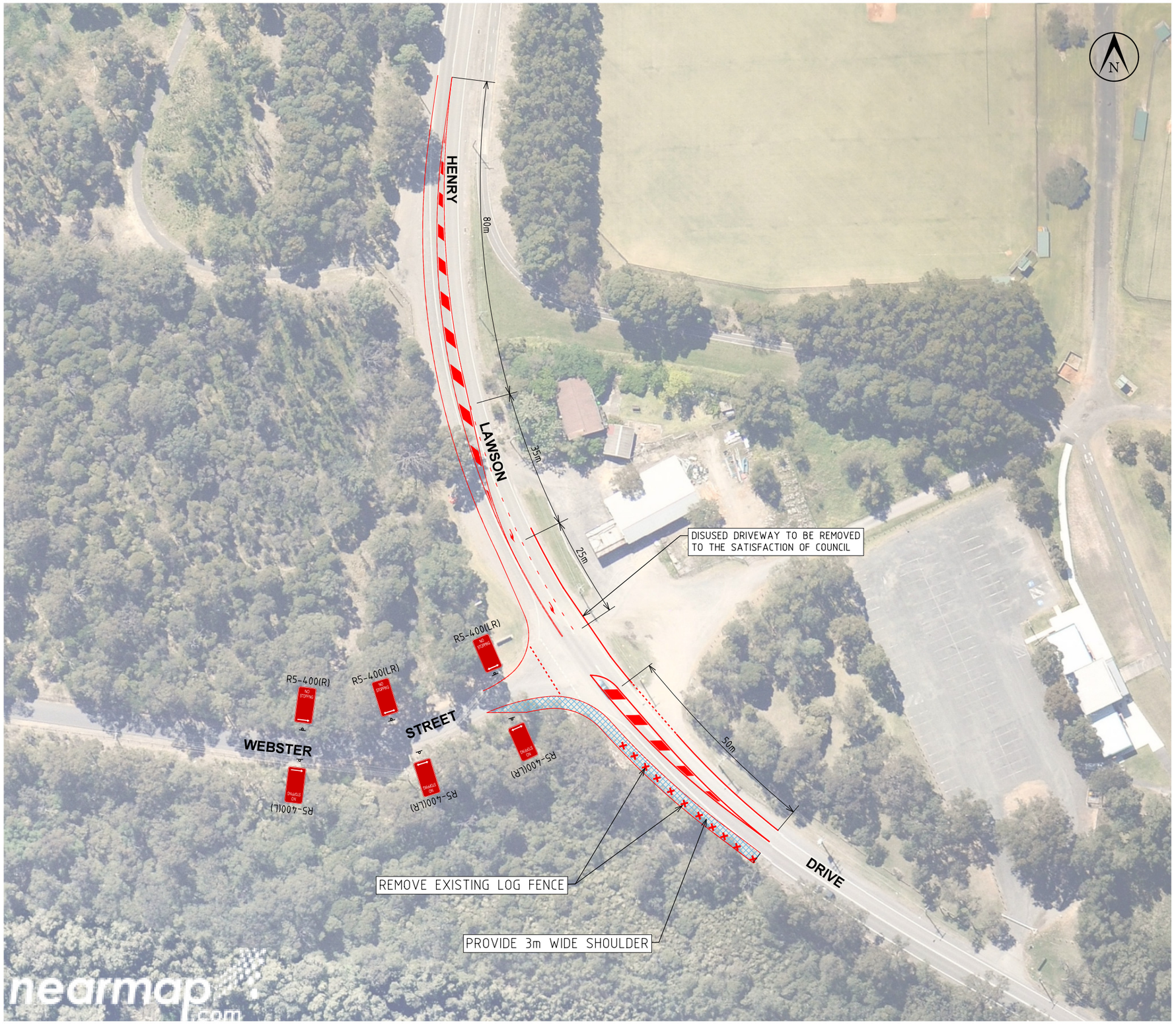
Stephen Read, Senior Road Safety Auditor Level 3 (lead auditor)



Alan Finlay, Senior Road Safety Auditor Level 2 (Team Member)

# APPENDIX A

# PLANS AUDITED

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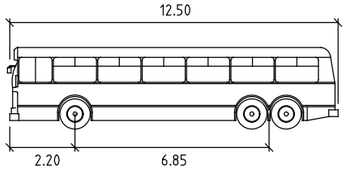


| BUS | metres |
|---|---|
| Width | : 2.50 |
| Track | : 2.50 |
| Lock to Lock Time | : 6.0 |
| Steering Angle | : 36.6 |

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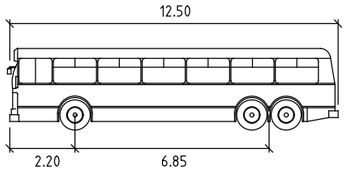


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