

412 Forest Hill Fernvale Rd
Chainage: 9.77km
(Lake Clarendon Way intersection)
23 April 2018

CRASH SITE ASSESSMENT
Stage 1 Report

ROTCERID TIRI2ID
(SINWOD 211210)

DMS505/00158

Document control sheet

Contact for enquiries and proposed changes

If you have any questions regarding this document or if you have a suggestion for improvement, please contact:

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Version history

Version no.	Date	Changed by	Nature of amendment
0.1	11/5/2018	A Keen	Draft Report
0.2			Review
0.3			
1.0			Final Report for Endorsement

Document sign off

Report Prepared by:

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Position DISTRICT DIRECTOR
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Purpose of Report

The purpose of this report is to collect road-based information at an on the approaches to crash sites, to determine any road infrastructure factors which, if treated, could reduce the risk of serious crashes happening at the site in the future.

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1 Crash Details

Crash No.	20180741055	Date.	23 April 2018	Time.	8.00am
Location.	Intersection of Forest Hill Fernvale Rd and Lake Clarendon Way			Tdist.	9.77km
Police.		Rank.	Senior Constable	Station.	TWBA FCU
Road No.	412 Forest Hill Fernvale Rd	LGA.	Lockyer Valley Regional Council	Speed Zone.	100km/hr
Severity	Fatal			DCA Code	101
Victim Age / Gender	Not Relevant		driver of unit 2		
Unit Information	Unit 1 – Sedan Unit 2 - Sedan				

2 Police Report Information

Unit 2 was travelling South along Forest Hill Fernvale Road in the left hand lane. Unit 1 was travelling East along Lake Clarendon Road, approaching the intersection with Forest Hill Fernvale Road. Unit 1 entered the intersection apparently without braking, and the front left of Unit 1 impacted the front right of Unit 2. The impact caused both vehicles to exit the road. Unit 2 came to rest on its roof approximately 25 metres to the South East of the impact location. Unit 1 came to rest on its driver's side approximately 15 metres to the South East of the impact location.

3 Site Details: Site Inspection

A fatal crash site audit checklist was undertaken by TMR Roadworks Inspector Glen Chicken on 26 April 2018 at 3.45pm.

A copy of the completed fatal crash site audit checklist and photos are located in Attachments B and C of this report.

4 Crash History and Analysis

TMR's Webcrash system is typically up to date until:

- Fatal crashes 31 December 2017
- Hospital, Medical & Minor Injury 31 October 2017
- Property Damage Only 31 December 2010

Data from 1 July 2012 – 31 December 2014 has approximately 10-15% of the records incomplete and unavailable.

The date range for the data analysed was 31 October 2012 – present (Attachment F has a Chartview graph of all the crashes in the system from early 2010 to present).

There are 2 other similar crashes at the intersection within the time period assessed. Both these crashes involved vehicles travelling through the giveaway sign on Lake Clarendon Way and colliding with vehicles travelling in Forest Hill Fernvale Rd.

Crash Listing Report

Crash No.	Date	Day	Hour	DCA	Key Sev	Distr	R Sect	Cway	Tdist	Inter	Speed	Street 1	Street 2	Feature	Vehicle 1	Vehicle 2
20140826145	21-Jun-2014	Fri	12	506	S 4	3	412	1	9.800000	4754	90	Forest Hill - Fernvale Rd	Lake Clarendon Way	10	Car, Station	Car, Station
20180741055	23-Apr-2018	Sun	8	101	E 1	3	412	1	9.800000	4754	100	Forest Hill - Fernvale Rd	Lake Clarendon Way	10	Car, Station	Car, Station
20150385843	18-Mar-2015	Tue	8	202	S 2	3	412	1	9.800000	4754	100	Forest Hill - Fernvale Rd	Lake Clarendon Way	10	Car, Station	Car, Station
20160041899	07-Jan-2016	Wed	18	101	E 2	3	412	1	9.800000	4754	100	Forest Hill - Fernvale Rd	Lake Clarendon Way	10	Utility, Panel Van	Utility, Panel Van
20170645356	12-Apr-2017	Tue	14	102	E 3	3	412	1	9.800000	4754	100	Forest Hill - Fernvale Rd	Lake Clarendon Way	10	Car, Station	Utility, Panel Van

5 Attachments

- Attachment A – Site Layout
- Attachment B - Crash Site Checklist
- Attachment C – Crash Site Photographs
- Attachment D – Webcrash History Report
- Attachment E – Chartview Diagram Showing Crash Data
- Attachment F – Approved SRS Project

6 Report Writer's Statement

This Crash Site Assessment report was prepared using observations and relevant information available at the time. Every effort was made to ensure that all relevant safety issues were considered.

Report Writer

Name: Andrew Keen
Signature: Not Relevant
Date: 21/5/18.
Contact Details: Ph (07) 4639 0645; Mobile Not Relevant

7 Review

7.1 Site commentary

The crash occurred when a vehicle drove through a give way sign and failed to give way to traffic on the major road.

Signage

The intersection is controlled by a give way sign. The give way sign is appropriate at this location. Stop signs are used where there is restricted vision in either direction of the major or uncontrolled leg of the intersection (MUTCD Part 2 Cl. 2.5.4). There are no sight obstructions at this intersection.

On approach to the intersection there is a *cross roads* warning sign (sign W2-1) on Lake Clarendon Way. The sign is approximately 140m in advance of the intersection. The *cross roads* warning sign should not be used on any approach controlled by a give way sign (MUTCD Part 2 Cl 2.9). Advance warning for the give way sign should be provided with a *give way sign ahead* warning sign (sign W3-2).

To improve the conspicuity of the give way sign it could be enhanced with a fluorescent orange border or target board.

To further reinforce the give way sign it could be duplicated in the centre of the road. This would require a splitter island and likely also require associated pavement works to cater for the swept path of heavy vehicles. A reinforced concrete box culvert under Lake Clarendon Way would likely need extending to accommodate additional pavement works.

Vision to the Intersection

Lake Clarendon Way and Walhuben Rd form a cross road intersection with the Forest Hill Fernvale Rd. There is a short section of centre line and edge line marking less than 20m long on Lake Clarendon Way at the intersection. There are minimal other visual cues to indicate that an intersection is approaching. There is potential for a driver to "see through" the intersection if they miss the approach warning signage. An increase in visual cue to the intersection could be achieved by:

- Extension of the centre line and edge line marking on Lake Clarendon Way
- Provision of guide posts on either side of the road leading up to the intersection
- Retro Reflective Pavement Markers on the extended centre line and edge line if there is sufficient room.

Intersection layout

To remove the "see through" effect the intersection could be rearranged to a staggered "T" layout. There is insufficient room to provide this style intersection in the existing road reserve. Land resumptions would be required. There are also significant above ground electrical services running along both sides of Lake Clarendon Way that would likely require relocation.

Current proposed works

The site had been nominated as a safer road sooner project due to the previous crash history. A project was approved to upgrade the signage and line marking at the intersection. The works were in the design phase at the time of this most recent crash. The proposed works include basic signage and line marking upgrade as mentioned above. A copy of the works is included in Attachment F. The works are expected to be completed in the 2017/18 financial year.

7.2 Immediate Remedial Measures

Nil

7.3 Actions that Permanently Reduce Road Safety Risk

- Upgrade the signage, line marking and delineation at the intersection by implementing the approved Safer Roads Sooner project.
- Installation of a splitter island on Lake Clarendon Way to provide the ability for a give way sign to be duplicated in the median. This option would have a slightly better benefit than the signage and line marking mentioned above. The cost however will be significantly more due to the requirement of pavement and drainage works to accommodate the splitter island resulting in a lower BCR.
- A higher cost solution would be to install a staggered "T" intersection. This option will require land resumptions and likely require relocation of above ground electrical services.

8 Recommendation for Stage 2 Crash Site Assessment

There are no other safety improvements considered relevant to warrant a Stage 2 Crash Assessment.

Attachment A – Site Layout



Attachment B - Crash Site Checklist

Crash Site Investigation Checklist

Issue	Relevant (Y/N)	Information Captured
SITE DETAILS		
Road Information		
Site Location	N	LAKE CHARLTON RD GLENYS GROVE FOREST HILL FERNVALE RD
Local Council		
Crash Number		
Date & Time of Investigation		
General road and traffic conditions:		
Intersections	N	INCIDENT OCCURRED AT INTERSECTION
Bridges	NA	
Merge/diverge/weave arrangements	NA	
Adjacent speed zones		LAKE CHARLTON RD 100 KM FOREST HILL FERNVALE RD 100 KM
Vehicle composition	N	
Traffic control arrangements:		
Traffic signals (type, phasing, defects)	NA	
Roundabouts	NA	
Traffic signs (type, location, condition and visibility)		Give way 2MTS + INTERSECTION 1/2 KM
Linemarking	N	FAIR CONDITION
Chevron alignment markers	NA	
Guideposts	NA	
Road works	NA	
Geometry:		
Horizontal (straight, curve radius and direction etc.)		STRAIGHT
Vertical alignment (grade, crest, dip etc.)	NA	
Layout Sketch	N	

Crash Site Investigation Checklist

Issue	Relevant (Y/N)	Information Captured
Number of lanes including auxiliary/overtaking lanes	N	2 Lanes
Lane widths	N	4mtrs
Shoulder widths	N.	NA
Cross fall	N	2%
Superelevation slope and transition	N	NA
Grade	N	NA
Roadside characteristics/conditions:		
Clear zone information	N	Good
Cluttered/ uncluttered	N	Cheer
Urban/rural	N.	Rural
Commercial/residential	N	NA
Roadside hazards	N.	Good
Landscaping/vegetation	N	Good
Batters/embankments	N	1704
Roadside activity (driver distraction)	N	NA
Sight distance:		
Meet the required sight distance for the posted speed limit?	N.	NO POSTED SPEED LIMIT
Restricted by road geometry or physical obstructions?	N	NA
Sight obstructions, e.g. overgrown vegetation	N.	Good
Surface type, texture and condition:		
Type		
Sealed/unsealed	N	Sealed
Wet/dry	N	Dry
Surface defects	N	Good
Skid marks		
Pot holes	N.	NO
Ruts	N	NO
Loose gravel	N	yes

Crash Site Investigation Checklist

Issue	Relevant (Y/N)	Information Captured
Slippery	N	Loose Gravel
Fatty	N	NA
Polished	N	NA
Uneven	N	NA
Drainage issues	N	Good
Shoulder/edge drop off	N	Good
Shoulders sealed/unsealed	N	NA
Ponding	N	NA
Road furniture:		
Sign posts	N	Gateway
Power/light poles	N	3 mt from edge
Telstra / H.P.Gas Lines	N	NA
Guardrail (including end treatments)	N	NA
Medians	N	NA
Bridge railings	N	NA
Drainage:		
Culverts	N	NA ON WESTERN SIDE
Pipes	N	NA
Floodways	N	NA
Causeways	N	NA
Cross fall	N	NA
Flowpaths	N	NA
Width of the pavement being drained	N	NA
Parking conditions/restrictions:		
Associated signs and linemarking	N	Good
Public transport provision/facilities:		
Associated signs and linemarking	N	Good
Pedestrian and bicycle facilities:		
Crossing type	N	NA

Crash Site Investigation Checklist

Issue	Relevant (Y/N)	Information Captured
Kerb extensions	N	NA
Refuges	N	NA
Supervision	N	NA
Associated signs and linemarking	N	Good
Additional characteristics:		
Accesses	N	NA
Sidetracks/detours	N	NA
Stock crossings	N	NA
Wildlife activity	N	NA

Released under RTI - DTMR

Attachment C – Crash Site Photographs

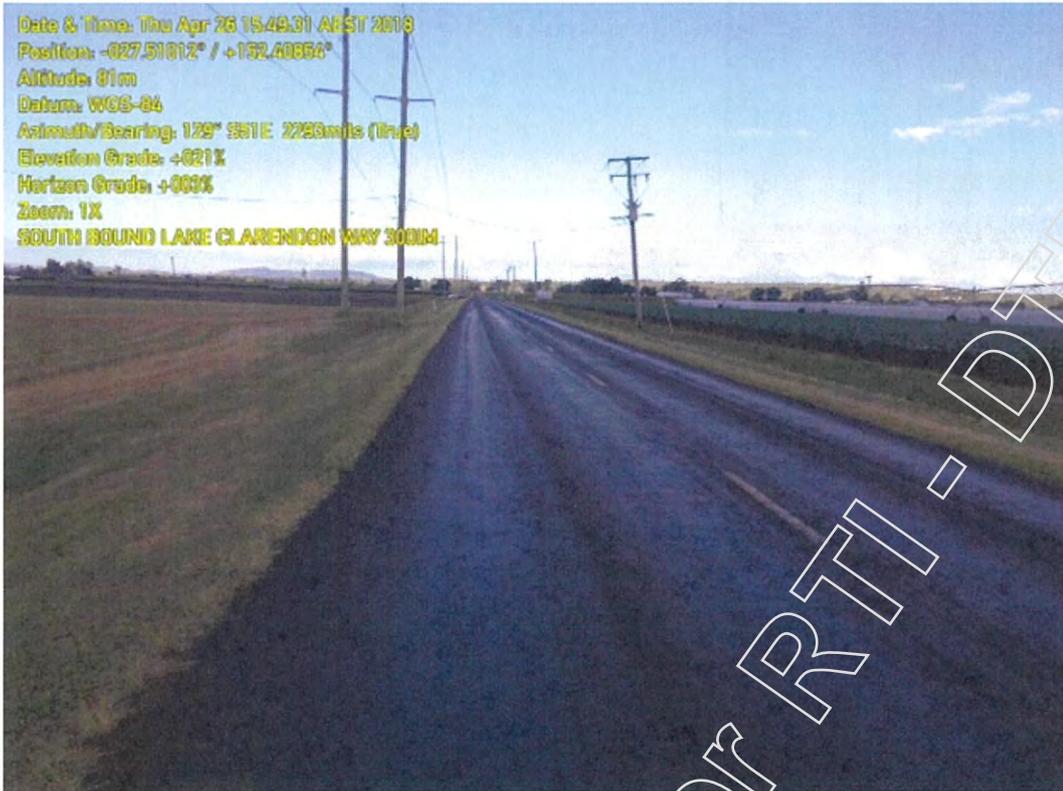


Photo 1: Approach for Unit 1, 300m from intersection

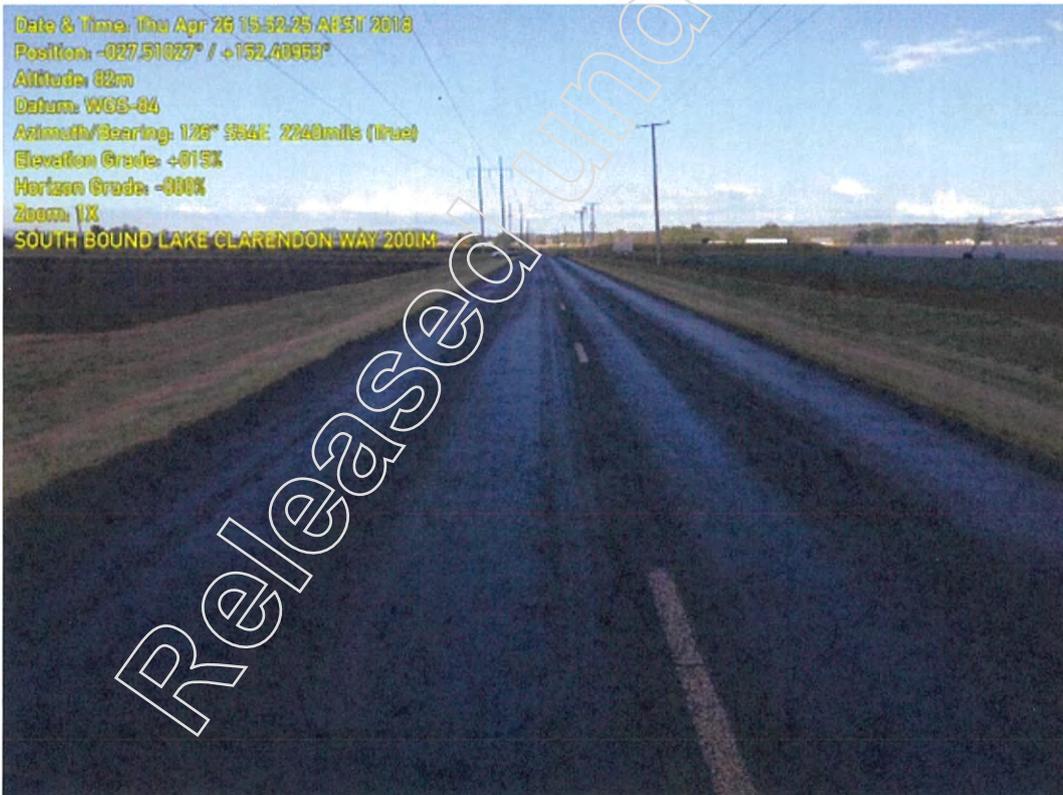


Photo 2: Approach for Unit 1, 200m from intersection



Photo 3: Approach for Unit 1, 100m from intersection

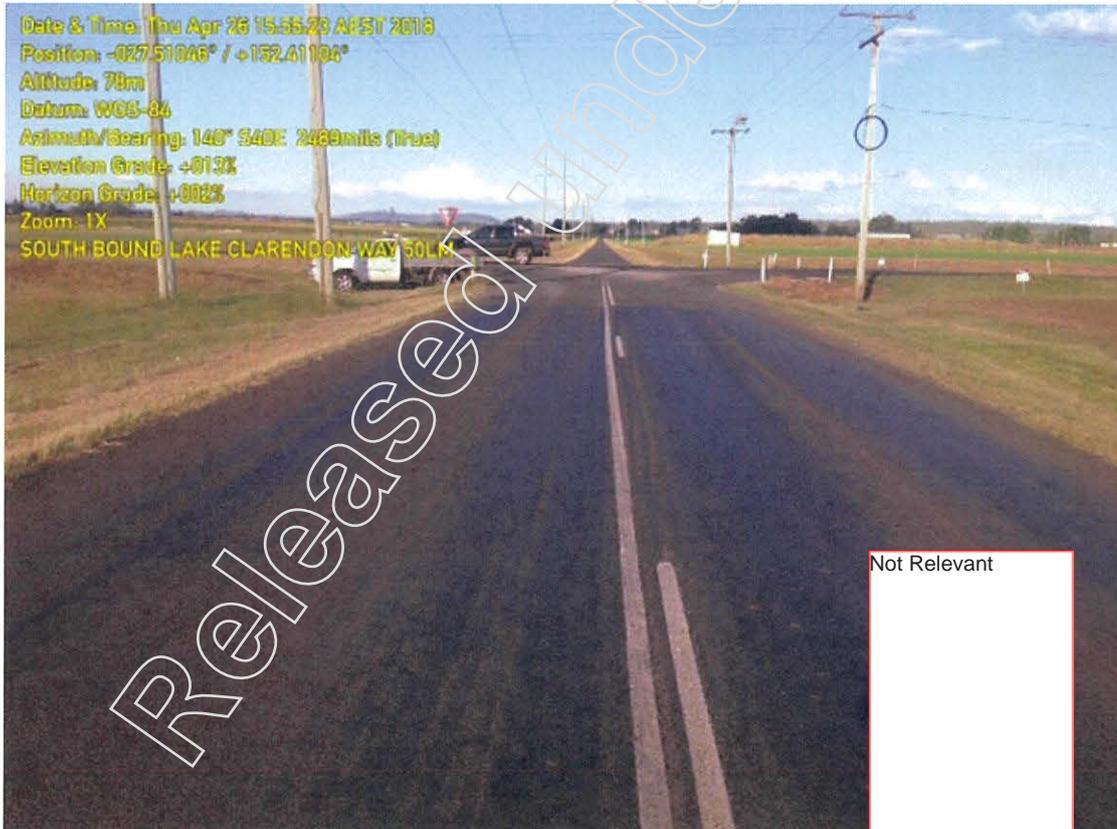


Photo 4: Approach for Unit 1, 50m from intersection

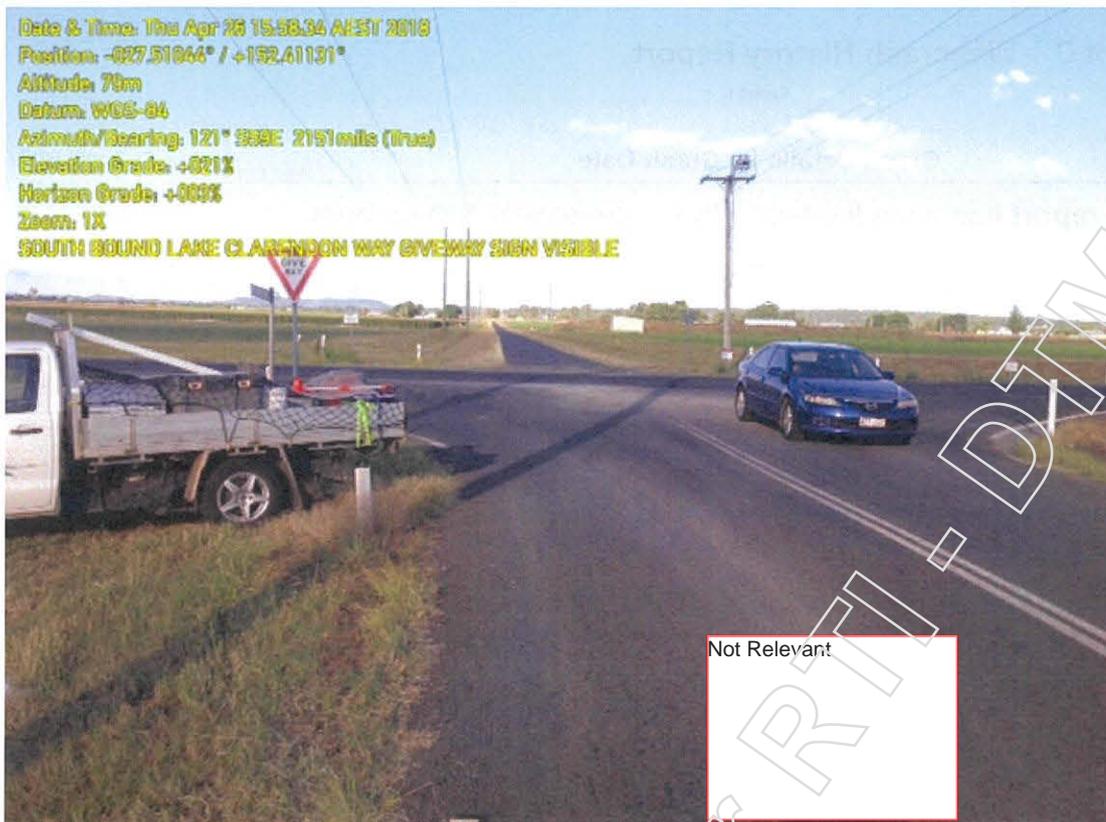


Photo 5: Giveaway sign at intersection



Photo 6: Approach for Unit 2, 100m from intersection

Attachment D – Webcrash History Report

Report 1

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Crash Details by Crash Date

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NOTE: This report has been limited to the maximum of 500 records.

Report Constraints	
Geographic Constraints	
MR Road Section: 412 - FOREST HILL - FERNSVALE ROAD	
Through Distance: 9.500km - 9.900km	
and	
Date and Time Constraints	
Continuous time: 2010 to 2018	
and	
Other Constraint Category: Crashes	
Other Constraint: Crash Severity	
Fatal or	
Hospitalisation or	
Medical Treatment or	
Minor Injuries or	
Property Damage	

Crash Number	20140826145 (1 of 5)	Latitude GDA94	-27.510592
Date and Time	Fri 21-Jun-2014 12pm	Longitude GDA94	152.411549
QT Region	Southern Region (Mr)	DCA Coding	Veh'S Overtaking: Overtake-Right Turn(506)
MR District	Southern District (Mr)	Crash Nature	Angle
LGA	Laidley Shire Council(75)	Speed Limit	90
SLA (Suburb)	Laidley (S)(4450)	Crash Severity	Minor Injury
Police Region	Southern	Roadway Feature	Cross-Intersection
Police District	Darling Downs(301)	Roadway Surface	Sealed - Dry
Police Division	Laidley(00148)	Horiz. Alignment	Straight
Road Authority	Main Roads	Vert. Alignment	Level
Road Section	412 - FOREST HILL - FERNSVALE ROAD	Traffic Control	No Traffic Control
Key Direction	S	Lighting Condition	Daylight
Street	Forest Hill - Fernvale Rd	Atmospheric Cond.	Clear
Intersecting St	Lake Clarendon Way		

Crash Description

Unit 1 [Ford Festiva XXX] has been driven South on Forest Hill Fernvale Rd and upon driving up towards Unit 2 travelling the same direction in front [Daewoo XXX] has gone to overtake Unit 2 as he believed it was pulling to left. Unit 2 was in fact indicating right to turn on a cross road and was subsequently side swiped by Unit 1 in an angle collision causing both Units to sustain damage and Unit 1 continue onwards, rolling and striking a power pole. Minor injury to Unit 1 driver. No Police tow. Nil RBT readings.

Unit Number	1 of 2	Licence State	QLD
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Overtake
Controller Age		Damage	Major - towed away
Controller Age Group		Unit Headed Direction	South
Licence Type			
Unit Number	2 of 2	Licence State	OS
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Make right turn
Controller Age		Damage	Moderate - towed away
Controller Age Group		Unit Headed Direction	South
Licence Type			

Contributing Circumstances

Unit 1 VIOLATION - IMPROPER OVERTAKING
Unit 2 NOT APPLICABLE

DTMR.azkeen.121354

Crash Details by Crash Date

Crash Number	20150385843 (2 of 5)	Latitude GDA94	-27.510592
Date and Time	Tue 18-Mar-2015 8am	Longitude GDA94	152.411549
QT Region	Southern Region (Mr)	DCA Coding	Veh'S Opposite Approach: Thru-Right(202)
MR District	Southern District (Mr)	Crash Nature	Angle
LGA	Laidley Shire Council(75)	Speed Limit	100
SLA (Suburb)	Laidley (S)(4450)	Crash Severity	Hospitalisation
Police Region	Southern	Roadway Feature	Cross-Intersection
Police District	Darling Downs(301)	Roadway Surface	Sealed - Wet
Police Division	Laidley(00148)	Horiz. Alignment	Straight
Road Authority	Main Roads	Vert. Alignment	Level
Road Section	412 - FOREST HILL - FERVALE ROAD	Traffic Control	No Traffic Control
Key Direction	S	Lighting Condition	Daylight
Street	Forest Hill - Fernvale Rd	Atmospheric Cond.	Raining
Intersecting St	Lake Clarendon Way		

Crash Description

At about 8:40 am on the 18 th day of March 2015 U1 Q reg xxx driven by xxx was travelling southbound on Forest Hill Fernvale Road in his company vehicle. At the same time U2 Q reg xxx was headed northbound on Forest Hill Fernvale Road. As the vehicles approached the intersection with Lake Clarendon Way U1 has slowed to about 50 km/h intending to turn right. At the same time U2 was intending to continue straight through the intersection maintaining a northerly direction. U1 has turned right in front of U2 failing to see him until too late resulting in contact with the front left bonnet of U1 with the front right bonnet of U2. The impact has spun U1 north which has then rolled off the road. U2 has cantered slightly left and rolled into a ditch. No injury to U1, U2

Not Relevant On arrival to the scene police observed both drivers out of the vehicles. Police noted it was raining at the time and the road was wet. The area is signed posted as 100 km/h. No skid marks observed. Likely cause was failing to give way.

Unit Number	1 of 2	Licence State	QLD
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Make right turn
Controller Age		Damage	Major - towed away
Controller AgeGroup		Unit Headed Direction	South
Licence Type			
Unit Number	2 of 2	Licence State	QLD
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Go straight ahead
Controller Age		Damage	Extensive; unrepairable
Controller AgeGroup		Unit Headed Direction	North
Licence Type			

Contributing Circumstances

- Unit 1 VIOLATION - FAIL TO GIVE WAY
- Unit 2 NOT APPLICABLE

Crash Details by Crash Date

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Crash Number	20160041899 (3 of 5)	Latitude GDA94	-27.510592
Date and Time	Wed 7-Jan-2016 6pm	Longitude GDA94	152.411549
QT Region	Southern Region (Mr)	DCA Coding	Veh S Adjacent Approach: Thru-Thru(101)
MR District	Southern District (Mr)	Crash Nature	Angle
LGA	Laidley Shire Council(75)	Speed Limit	100
SLA (Suburb)	Laidley (S)(4450)	Crash Severity	Hospitalisation
Police Region	Southern	Roadway Feature	Cross-Intersection
Police District	Darling Downs(301)	Roadway Surface	Sealed - Dry
Police Division	Laidley(00148)	Horiz. Alignment	Straight
Road Authority	Main Roads	Vert. Alignment	Level
Road Section	412 - FOREST HILL - FERNVALE ROAD	Traffic Control	Give Way
Key Direction	E	Lighting Condition	Daylight
Street	Forest Hill - Fernvale Rd	Atmospheric Cond.	Clear
Intersecting St	Lake Clarendon Way		

Crash Description

The crash site is a cross intersection with give way sign on Lake Clarendon Way requiring traffic upon Lake Clarendon Way to give way to Forest Hill Fernvale road. The crash site is a sealed country road, speed limit 100km. The crash involved two vehicles with single occupants. Unit 2 a white Mitsubishi Triton Utility (Qld XXX) was travelling South Bound on Forest Hill Fernvale Road. Unit 1 a white Toyota Hilux Utility (Qld XXX) was travelling East Bound on Lake Clarendon Way approaching the intersection with Forest Hill Fernvale Road. Unit 2 reported at scene that as he approached the intersection he briefly caught something out the corner of his eye to his right hand side before being impacted. Both vehicles have overturned and left the carriage way to the South East corner of the intersection coming to rest upon a grass area at the side of the road. Unit 2 sustained significant damage to the front driver corner. Unit 1 sustained extensive damage with the majority of the chassis and undercarriage being torn from the cabin of the vehicle. Unit 1 driver being transported to Princess Alexandra Hospital. Not Relevant

Not Relevant Requests for blood to be taken submitted by Sgt XXX at scene. Requirement for RBT given to U1 driver at 19:35 allegedly unable to provide due to Not Relevant Requirement for blood subsequently given by S/C XXX. 22:30 Reporting officer contacted by Dutton Park Police re CAD job for blood requirement; requesting information re requirements for blood. Advised RO that unlikely blood can be taken due to timeframe.

Unit Number	1 of 2	Licence State	QLD
Unit Type	Utility; Panel Van	Origin State	
Controller Gender	NR	Intended Action	Unknown/not stated
Controller Age		Damage	Extensive; unrepairable
Controller AgeGroup		Unit Headed Direction	East
Licence Type			
Unit Number	2 of 2	Licence State	QLD
Unit Type	Utility; Panel Van	Origin State	
Controller Gender	NR	Intended Action	Go straight ahead
Controller Age		Damage	Extensive; unrepairable
Controller AgeGroup		Unit Headed Direction	South
Licence Type			

Contributing Circumstances

Unit 1 VIOLATION - DISOBEY GIVE WAY SIGN
 Unit 1 VIOLATION - UNDUE CARE AND ATTENTION
 Unit 2 NOT APPLICABLE

Crash Details by Crash Date

Crash Number	20170645356 (4 of 5)	Latitude GDA94	-27.510592
Date and Time	Tue 12-Apr-2017 2pm	Longitude GDA94	152.411549
QT Region	Southern Region (Mr)	DCA Coding	Veh'S Adjacent Approach: Right-Thru(102)
MR District	Southern District (Mr)	Crash Nature	Angle
LGA	Laidley Shire Council(75)	Speed Limit	100
SLA (Suburb)	Laidley (S)(4450)	Crash Severity	Medical Treatment
Police Region	Southern	Roadway Feature	Cross-Intersection
Police District	Darling Downs(301)	Roadway Surface	Sealed - Dry
Police Division	Laidley(00148)	Horiz. Alignment	Straight
Road Authority	Main Roads	Vert. Alignment	Level
Road Section	412 - FOREST HILL - FERNVALE ROAD	Traffic Control	Give Way
Key Direction	E	Lighting Condition	Daylight
Street	Forest Hill - Fernvale Rd	Atmospheric Cond.	Clear
Intersecting St	Lake Clarendon Way		

Crash Description

Unit 1 xxxxxxxxxxxxxxxx Unit 2 xxxxxxxxxxxxxxxx Unit 1 was travelling on Lake Clarendon Way, preparing to turn right onto Forest Hill Fernvale rd toward Glenore Grove. Unit 2 was travelling along Forest Hill Fernvale toward Glenore Grove. Unit 1 has slowed down for the giveaway sign at the intersection, has had a look left and right but due to NR was unable to clear the intersection completely. Unit 1 has proceeded through the intersection. Unit 2 who was approaching the intersection has collided with the rear passengers door on unit 1. Both Vehicles have come to a stop and the driver of Unit 1 has gone to see if Unit 2 was injured and needed help. QAS was called and Unit 2 dvr was taken to Ipswich hospital before Police could interview. Police will call Unit 2 at a later date.

Unit Number	1 of 2	Licence State	QLD
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Make right turn
Controller Age		Damage	Moderate - drivable vehicle
Controller AgeGroup		Unit Headed Direction	East
Licence Type			
Unit Number	2 of 2	Licence State	QLD
Unit Type	Utility; Panel Van	Origin State	
Controller Gender	NR	Intended Action	Go straight ahead
Controller Age		Damage	Unknown
Controller AgeGroup		Unit Headed Direction	South
Licence Type			

Contributing Circumstances

- Unit 1 VIOLATION - DISOBEY GIVE WAY SIGN
- Unit 2 NOT APPLICABLE

Crash Details by Crash Date

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Crash Number	20180741055 (5 of 5)	Latitude GDA94	-27.510592
Date and Time	Sun 23-Apr-2018 8am	Longitude GDA94	152.411549
QT Region	Southern Region (Mr)	DCA Coding	Veh'S Adjacent Approach: Thru-Thru(101)
MR District	Southern District (Mr)	Crash Nature	Angle
LGA	Laidley Shire Council(75)	Speed Limit	100
SLA (Suburb)	Laidley (S)(4450)	Crash Severity	Fatal
Police Region	Southern	Roadway Feature	Cross-Intersection
Police District	Darling Downs(301)	Roadway Surface	Sealed - Dry
Police Division	Laidley(00148)	Horiz. Alignment	Straight
Road Authority	Main Roads	Vert. Alignment	Level
Road Section	412 - FOREST HILL - FERNSVALE ROAD	Traffic Control	Give Way
Key Direction	E	Lighting Condition	Daylight
Street	Forest Hill - Fernvale Rd	Atmospheric Cond.	Clear
Intersecting St	Lake Clarendon Way		

Crash Description

MVC REPORT Time:0805 hours Date- 23/04/2018 Place- Intersection Lake Clarendon Road and Forest Hill Fernvale Road, Glenore Grove GPS Location: Lat -27.5108, Long 152.4116 Summary: At about 0805 hours on the 23 rd day of April 2018 a two vehicle traffic crash occurred at the intersection of Lake Clarendon Road and Forest Hill Fernvale Road, Glenore Grove. The crash involved a red Ford focus hatch and a silver Ford falcon sedan. At the crash location Forest Hill Fernvale Road runs North to South, intersected by Lake Clarendon Road which runs East to West. Lake Clarendon road is controlled by a give way sign where it intersects Forest Hill Fernvale Road. Forest Hill Fernvale Road is zoned 100kph, and has one lane for each direction of travel. Both roads are sealed bitumen which is flat and level. It was daylight at the time of the crash, the weather was clear and the road was dry. The unit 2 vehicle was travelling South along Forest Hill Fernvale Road in the left hand lane. The unit 1 vehicle was travelling East along Lake Clarendon Road, approaching the intersection with Forest Hill Fernvale Road. The unit 1 vehicle entered the intersection apparently without braking, and the front left of the unit 1 vehicle impacted the front right of the unit 2 vehicle. The impact caused both vehicles to exit the road. The unit 2 vehicle came to rest on its roof approximately 25 metres to the South East of the impact location. The unit 1 vehicle came to rest on its driver's side approximately 15 metres to the South East of the impact location. The driver and the passenger airbags deployed in both vehicles. Units involved: Unit 1 Vehicle: Ford Focus 2003 Red,xxx Unit 2 Vehicle: Ford Falcon 2000 Silver, xxx Property damage: Nil Injuries: Unit 1 driver: Airifted to Princess Alexandra Hospital in serious but Stable condition Unit 2 driver: Deceased Unit 2 front passenger: Airifted to Toowoomba Base Hospital in serious but Stable condition Unit 2 rear right passenger: QAS transport to Ipswich hospital with contusions for observation. Unit 2 rear left passenger: QAS transport to Ipswich hospital with

Not Relevant

Unit 1 Driver version: xxx No version taken, Unit 2 Passenger version: xxx No version taken, Unit 2 Rear right passenger version: xxx No version taken, Unit 2 Rear left passenger version: xxx No version taken. Witness Version: xxx Taken by xxx- To be updated. Witness Version: xxx Taken by xxx- To be updated.

Unit Number	1 of 2	Licence State	N/A
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Go straight ahead
Controller Age		Damage	Extensive; unrepairable
Controller Age Group		Unit Headed Direction	East
Licence Type			
Unit Number	2 of 2	Licence State	QLD
Unit Type	Car; Station Wagon	Origin State	
Controller Gender	NR	Intended Action	Go straight ahead
Controller Age		Damage	Extensive; unrepairable
Controller Age Group		Unit Headed Direction	South
Licence Type			

Contributing Circumstances

Unit 1 VIOLATION - DISOBEY GIVE WAY SIGN
Unit 2 CONDITION - UNDER INFLUENCE OF LIQUOR/DRUG

DTMR.azkeen.121354

Attachment E - Chartview Diagram Showing Crash Data

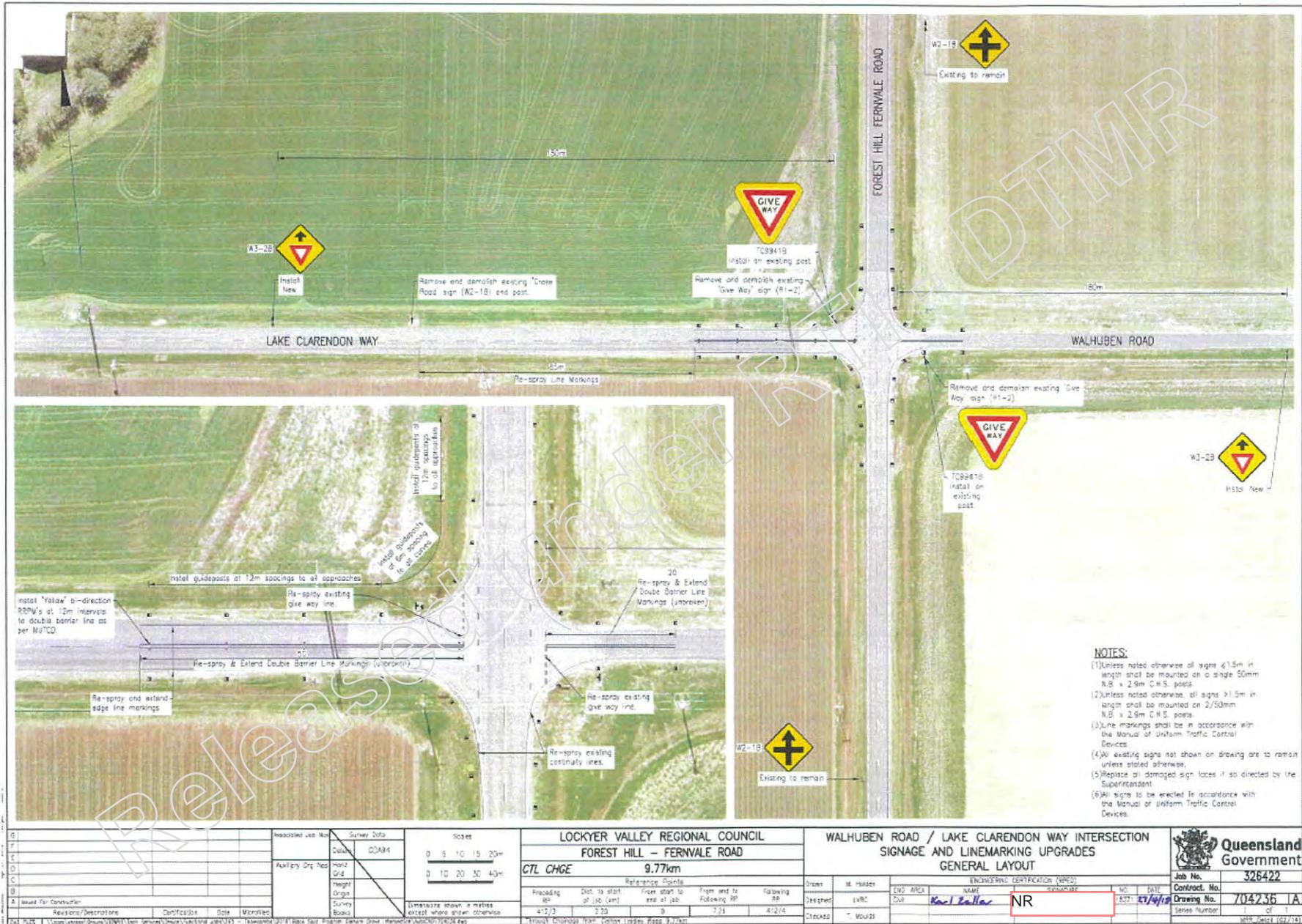


Queensland Government Road Section 412 - FOREST HILL - FERNVALE ROAD (38.9 km) from Roadlink refreshed on 10 May 2018 21:46



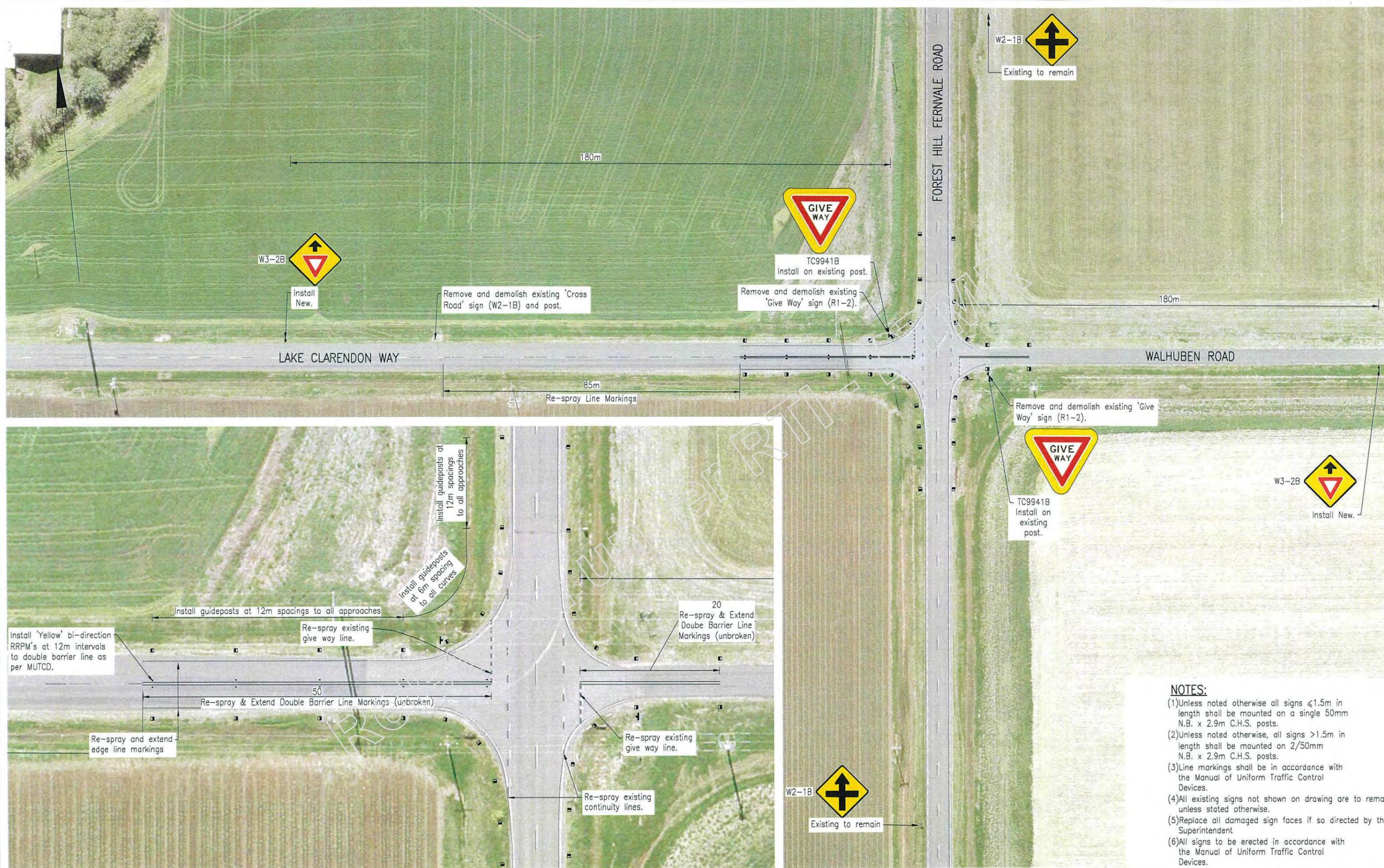
Scale : 147908 02:21 PM May 11, 2018 created with Armis ChartView Page 1 of 1

Attachment F – Approved SRS Project



- NOTES:**
- (1) Unless noted otherwise all signs $1.5m$ in length shall be mounted on a single 50mm N.B. x 2.9m C.H.S. post.
 - (2) Unless noted otherwise all signs >math>1.5m</math> in length shall be mounted on 2/50mm N.B. x 2.9m C.H.S. posts.
 - (3) Line markings shall be in accordance with the Manual of Uniform Traffic Control Devices.
 - (4) All existing signs not shown on drawing are to remain unless stated otherwise.
 - (5) Replace or damaged sign faces if so directed by the Superintendent.
 - (6) All signs to be erected in accordance with the Manual of Uniform Traffic Control Devices.

LOCKYER VALLEY REGIONAL COUNCIL FOREST HILL – FERNVALE ROAD WALHUBEN ROAD / LAKE CLARENDON WAY INTERSECTION SIGNAGE AND LINEMARKING UPGRADES GENERAL LAYOUT		Queensland Government Job No. 326422 Contract No. 704236 1A Drawing No. of 1 Series Number	
Proposed Job No. _____ Survey Data Datum: GDA84 Grid: 0 5 10 15 20m Height Origin: _____ Survey Epoch: _____ (Elevations shown in metres except where stated otherwise)		Reference Points Proceeding from start of job From and to following BP 412/3 2/20 3 7/3 4/2/4 Check: T. Woules	
Scales 0 5 10 15 20m 0 10 20 30 40m		ENGINEERING CERTIFICATION (MPC) NAME: Noel Walker NO: NR DATE: 27/4/12	

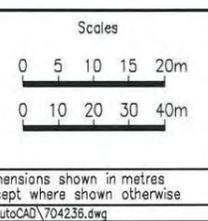


- NOTES:**
- (1) Unless noted otherwise all signs $\leq 1.5m$ in length shall be mounted on a single 50mm N.B. x 2.9m C.H.S. posts.
 - (2) Unless noted otherwise, all signs $> 1.5m$ in length shall be mounted on 2/50mm N.B. x 2.9m C.H.S. posts.
 - (3) Line markings shall be in accordance with the Manual of Uniform Traffic Control Devices.
 - (4) All existing signs not shown on drawing are to remain unless stated otherwise.
 - (5) Replace all damaged sign faces if so directed by the Superintendent.
 - (6) All signs to be erected in accordance with the Manual of Uniform Traffic Control Devices.

Last Modified: 27 Apr 2018 1:01pm XREFS: -

G				
F				
E				
D				
C				
B				
A	Issued For Construction			
	Revisions/Descriptions	Certification	Date	Microfiled

Associated Job Nos	Survey Data
	Date: GDA94
Auxiliary Drg Nos	Horiz. Grid
	Height Origin
	Survey Books



LOCKYER VALLEY REGIONAL COUNCIL				
FOREST HILL - FERNVALE ROAD				
CTL CHGE 9.77km				
Reference Points				
Preceding RP	Dist. to start of job (km)	From start to end of job	From end to Following RP	Following RP
412/3	2.20	0	7.26	412/4
Through Chainage from Gatton Laidley Road 9.77km				

WALHUBEN ROAD / LAKE CLARENDON WAY INTERSECTION				
SIGNAGE AND LINEMARKING UPGRADES				
GENERAL LAYOUT				
Drawn	M. Holden	ENGINEERING CERTIFICATION (RPEQ)		
Designed	LVRC	ENG. AREA	NAME	SIGNATURE
Checked	T. Moulds	Civil	Karl Zeller	Not Relevant
				NO. DATE
				18371 27/4/18

Queensland Government

Job No. 326422

Contract No. 704236

Drawing No. 1 of 1

Series Number 1 of 1

MRR_Detail (02/14)

From: Baldeep Sehmi
To: [Daniel C Noble](mailto:Daniel.C.Noble@tmr.qld.gov.au)
Subject: RE: Forest Hill - Fernvale Rd
Date: Friday, 8 June 2018 1:41:15 PM

Hi Daniel,

Linemarking and Signs are done. Guide posts and rrpms are pending. These should be complete in the next 2 weeks.

Regards,

Baldeep Sehmi (Sammy)
Manager Infrastructure Delivery

P 07 54684 972
M Not Relevant
E bsehmi@lvrc.qld.gov.au

Lockyer Valley Regional Council
26 Railway Street (PO Box 82) Gatton Qld 4343
1300 00 5872 (LVRC)
www.lockyervalley.qld.gov.au

From: Daniel C Noble [mailto:daniel.c.noble@tmr.qld.gov.au]
Sent: Friday, 8 June 2018 1:19 PM
To: Baldeep Sehmi
Subject: Forest Hill - Fernvale Rd

Hi Sammy

Just after an update on the signs and lines work at the Forest Hill-Fernvale Rd/Lake Clarendon Way intersection.

Cheers

Daniel Noble
Program Support Coordinator | Darling Downs District
Program Delivery And Operations | Department of Transport and Main Roads

Ground Floor | Warwick Main Roads Building | 306 Wood Street | Warwick Qld 4370
Locked Bag 1 | Warwick Qld 4370
P: (07) 46616388 | F: (07) 46516380
M Not Relevant
E: daniel.c.noble@tmr.qld.gov.au
W: www.tmr.qld.gov.au

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Released Under RTI - DTMR



Our ref 450/01850
Your ref
Enquiries Andrew Watson

Department of
Transport and Main Roads

6 July 2016

Mr Arash Rasti
Department of Transport and Main Roads
Transport House
GPO Box 213
Brisbane QLD 4001

**Black Spot and Safer Roads Sooner Program 2017/18
Lockyer Valley Regional Council Nomination on State-controlled Road
Foresthill Fernvale Road (State-controlled Road No. 412), Lake Clarendon Way and
Walhuben Road Intersection**

Dear Mr Rasti

The Department of Transport and Main Roads Darling Down District received a Safer Roads Sooner nomination from the Lockyer Valley Regional Council on 24 June 2016, for signage and line marking alterations to the subject intersection.

I wish to advise that this office has reviewed the proposal and is willing to provide endorsement/support for the nomination to proceed to the technical assessment committee. The endorsement provided is subject to the department reserving the right to (should the proposal be approved):

1. Make minor alterations to the proposal during detailed design should the nomination be approved (sign type and location, line marking type); and
2. Decide how the project will be delivered (including who by).

Should you have any questions regarding this letter, please do not hesitate to contact Andrew Watson on (07) 46390842.

Yours sincerely

Not
Relevant

for
Christopher Lunson
A/District Director (Darling Downs)

Program Delivery and Operations
Downs South West
Floor 1 Toowoomba - Phillip Street
1-5 Phillip Street (cnr Clopton Street) Toowoomba
Locked Bag 1 Warwick Qld 4350

Telephone +61 7 (07) 4639 0842
Facsimile +61 7 4639 0750
Website www.tmr.qld.gov.au
Email downsswr.office@tmr.qld.gov.au
ABN 39 407 690 291



Queensland
Government

Department of
Transport and Main Roads

File no: 450/01850

C/c Ms Xiau Pitts
Lockyer Valley Regional Council
PO Box 82
Gatton Qld 4343

For your information.

Not
R
elevant

Christopher Lunson
A/District Director (Darling Downs)

6 July 2016

Released under RTI - DTMR

Andrew P Holden

From: Xiau Pitts <XPitts@lvrc.qld.gov.au>
Sent: Tuesday, 28 June 2016 1:48 PM
To: Vanessa J Michael
Cc: Andrew W Watson; Seren McKenzie; Myles Fairbairn
Subject: RE: feedback - not sure if I sent you this one

Hi Vanessa,

This one was nominated to be a reactive application given that QPS advised that the three crashes were injury crashes at this intersection. The location of give way linemarking – can this be determined/confirmed at detailed design? The plans submitted in support of our nominations were all conceptual only, to be confirmed at detailed design should they be approved for funding.

Thank you,
Xiau

Xiau Pitts
Senior Civil Engineer

P 5468 4985
M Not Relevant
E xpitts@lvrc.qld.gov.au

Lockyer Valley Regional Council
26 Railway Street (PO Box 82) Gatton Qld 4343
1300 00 5872 (LVRC)
www.lockyervalley.qld.gov.au

From: Vanessa J Michael [<mailto:Vanessa.J.Michael@tnr.qld.gov.au>]
Sent: Tuesday, 28 June 2016 1:16 PM
To: Xiau Pitts
Cc: Andrew W Watson
Subject: feedback - not sure if I sent you this one

Hi Xiau

Not sure if I sent this one through yesterday:

>>>

Comments for Lake Clarendon Way – Walhuben- Forest H intersection:

- I would include existing crashes for all proactive nominations.
- Please ensure Give way line markings at side roads are not too far back.

>>>

Thanks

and

kind regards

Vanessa Michael
Program Support Officer | Darling Downs District
Program Delivery And Operations | Department of Transport and Main Roads

Ground Floor | Warwick Main Roads Building | 306 Wood Street | Warwick Qld 4370
Locked Bag 1 | Warwick Qld 4370
P: (07) 46616347 | F: (07) 46616380

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24/06/2016

Lockyer Valley Regional Council
Infrastructure Works and Services

Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road, Glenore Grove – Intersection

Project Proposal



Black Spot Programme

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Figure 1: Existing site layout – Intersection of Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road, Glenore Grove	3
---	---

Submission Support Documents

	Document	Notes
<input checked="" type="checkbox"/>	A completed Nomination Form (spreadsheet)	Required
<input checked="" type="checkbox"/>	A completed and signed RPEQ form	Required
<input checked="" type="checkbox"/>	Project Proposal / Scoping document (2 to 3 pages)	For nominations over \$500k (total estimated cost)
<input checked="" type="checkbox"/>	Locality Map	Recommended
<input type="checkbox"/>	Crash diagram	For reactive nominations based on crash history
<input type="checkbox"/>	Supporting crash statistics. (Webcrash, police data or other verified sources may be used). Ensure the crash data corresponds to the five years of data used in the BCR calculation.	For reactive nominations based on crash history
<input checked="" type="checkbox"/>	Cost Estimate Breakdown	Required
<input checked="" type="checkbox"/>	Concept layout plans, drawings and documents outlining the work being proposed	Detailed designs are not required. Aerial images with overlay sketches and annotations outlining the intentions of the proposed treatment(s) in relation to the crash types and locations are acceptable.
<input type="checkbox"/>	Site condition reports, Planning studies, investigation reports, etc.	Where applicable
<input checked="" type="checkbox"/>	Road Safety Audits (RSA)	For all proactive nominations
<input type="checkbox"/>	Completed Australian Government Nomination Form.	For all nominations received from a member of the public (including MPs/ Councillors)
<input checked="" type="checkbox"/>	Images, DVR clips, photographs, newspaper clippings, etc that highlight the deficiency.	Recommended
<input type="checkbox"/>	Any other supporting evidence including business cases, etc.	Where applicable

Introduction

This report is a proposal document for the improvements to the intersection of Walhuben Road, Lake Clarendon Way & Forest Hill-Fernvale Road, Glenore Grove. This proposal document has been prepared to support the Lockyer Valley Regional Council's funding application for the Australian Government's Black Spot road safety program for 2017-2018 financial year.

Project Name: Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road – Intersection

Current Conditions

Site Details

Walhuben Road is a rural access road that provides access to agricultural business to the east of the intersection. Lake Clarendon Way is a rural arterial road providing east-west connectivity in the local area. Forest Hill-Fernvale Road is a State-controlled rural arterial road that provides north-south connectivity in the north-east of the Lockyer Valley Region.



Figure 1: Existing site layout – Harm Drive & Lake Clarendon Road Intersection

Crash Data

Three crash incidents have been recorded at the intersection of Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road since June 2014. All three crash incidents were casualty crashes, therefore qualifying this project as a reactive nomination.

Road Safety Audit

As part of the application process a road safety audit was conducted by an audit team. The audit team was led by Myles Fairbairn who is a qualified Senior Road Safety Auditor as recognised by the Queensland Department of Transport and Main Roads.

The road safety audit report can be found in Attachment 1.

Proposal and Engineering Treatment

Design / Treatment

The proposed engineering design treatment for the intersection includes:

- refreshing of line marking;
- improvements to signage, including advance intersection warning signage;
- installation of guide posts and retroreflective pavement markers.

A proposed concept design can be seen in Appendix 2.

Cost

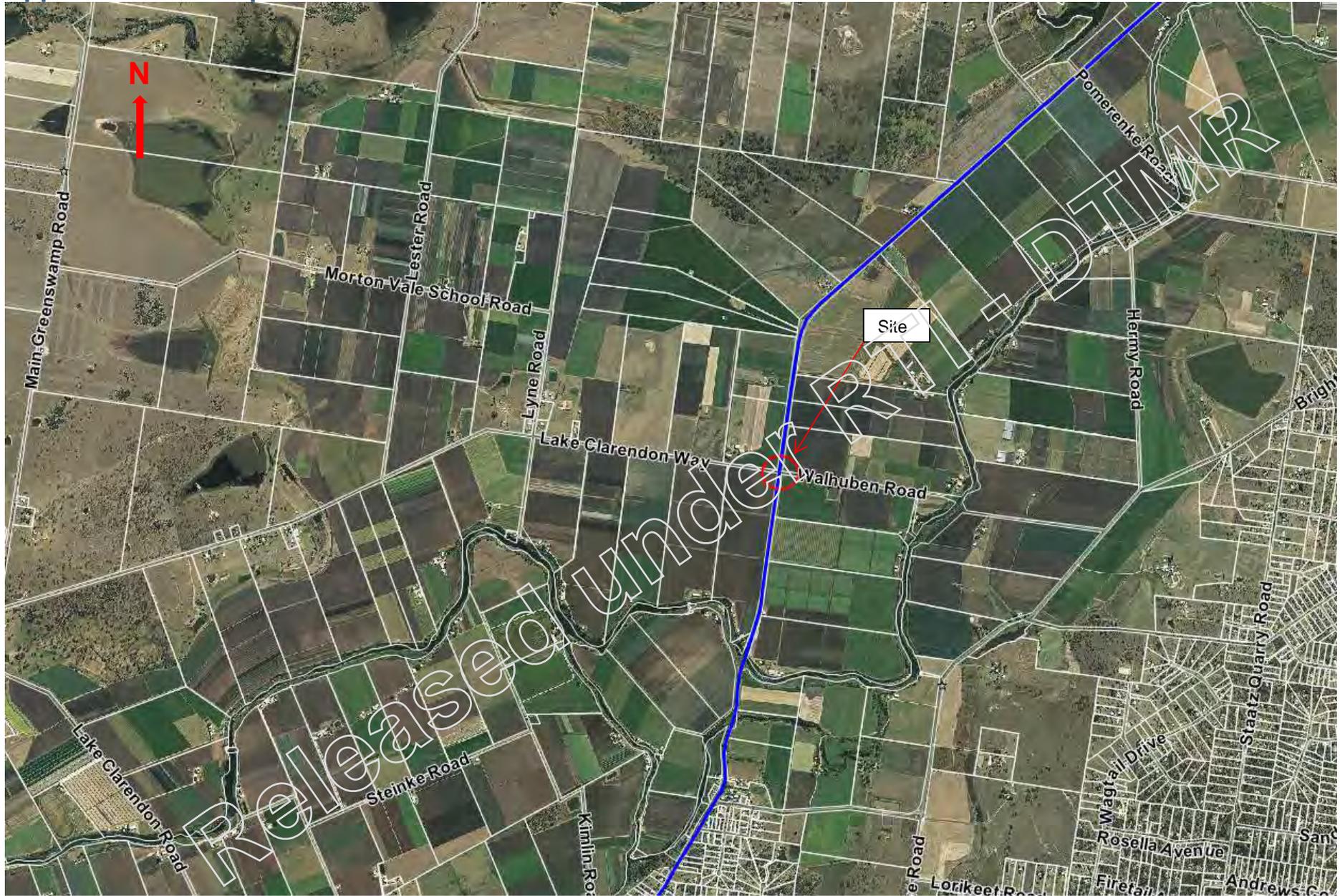
The estimated total cost of the project is \$35,200. A detailed cost breakdown is attached in Appendix 3.

The benefit cost ratio (BCR) for the project is 0. The BCR spreadsheet and results can be seen in Attachment 2.

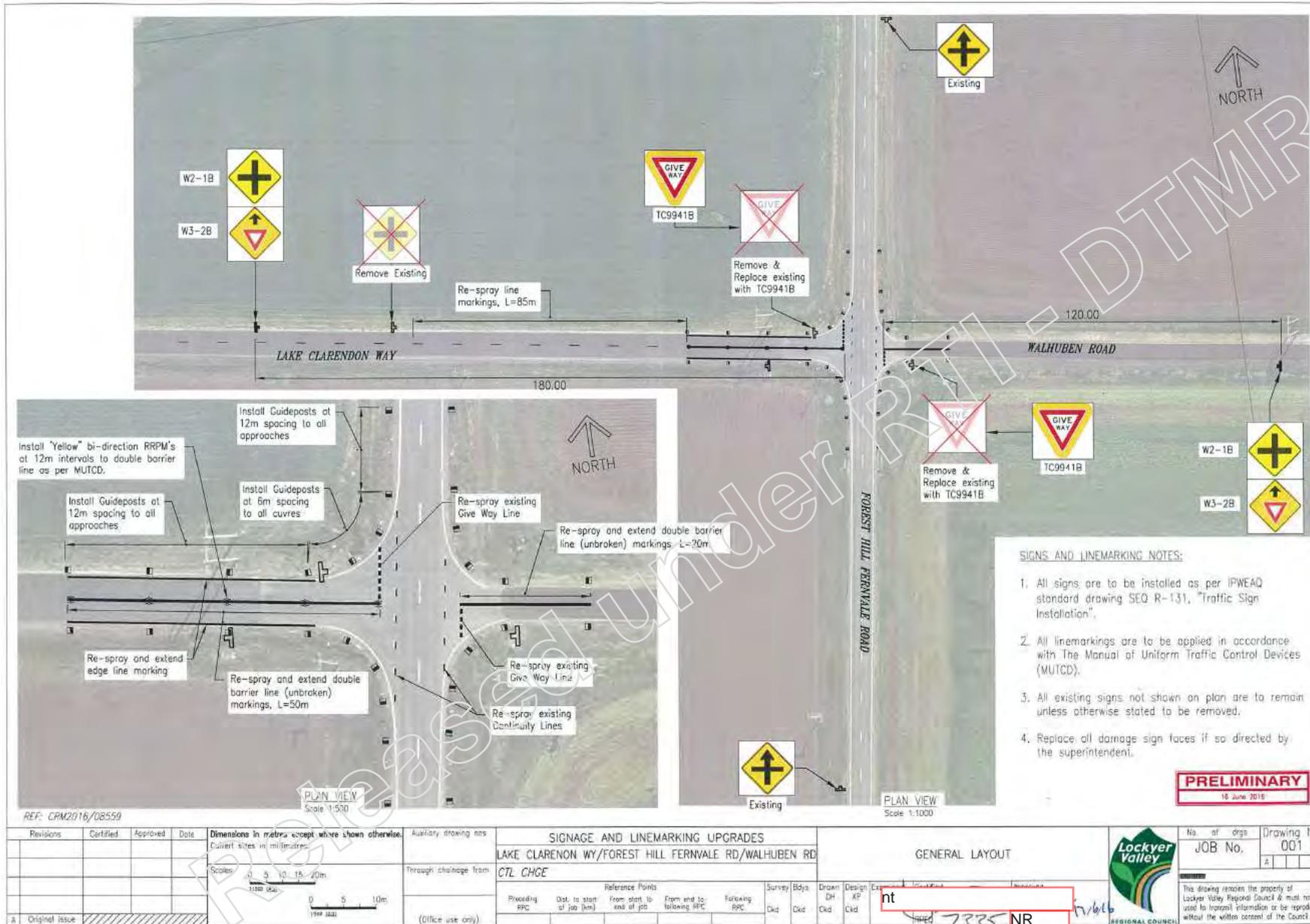
Conclusion

In conclusion, this Black Spot upgrade of the intersection of Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road will significantly improve the safety for motorists. If the project is successful for funding, Council will deliver the project within the required timeframes and to the relevant design and construction standards of delivery.

Appendix 1 Site Map



Appendix 2 Concept Design



Revisions				Dimensions in metres except where shown otherwise.				Auxiliary drawing nos				SIGNAGE AND LINEMARKING UPGRADES				GENERAL LAYOUT				No. of drgs		Drawing No.	
Certified				Scaled sites in millimetres				Through change from				LAKE CLARENDON WY/FOREST HILL FERVALE RD/WALHUBEN RD				JOB No.		001					
Approved				Scales: 0 5 10 15 20m				CTL CHGE				Phrasing		Reference Points		Survey		Drawn		Design		Checked	
Date				1:1000 (as)				From start to end of job				From and to following RPC		Dtd		Dtd		Dtd		Dtd		Dtd	
Original Issue				1:1000 (as)				(Office use only)				nt		7335 NR		7/6/19		nt		7/6/19		nt	

Appendix 3 Cost Estimate

Lockyer Valley Regional Council Engineering Services		Contract No: Job No :
Consultant : Client :		Date of Issue : 23/06/2016
ESTIMATE - CONCEPT ONLY WALHUBEN ROAD, LAKE CLARENDON WAY AND FOREST HILL-FERNVALE ROAD -- INTERSECTION (2017/2018 BLACK SPOT) SUMMARY SHEET		
DESCRIPTION	AMOUNT	
SECTION A : GENERAL WORKS Traffic Control Signs , Lines and Lighting Service Relocation Property Acquisition Landscaping	\$5,000 \$25,000 \$0 \$0 \$0	\$30,000
SECTION B : PRELIMINARY WORKS		\$0
SECTION C : BULK EARTHWORKS Earthworks and removal	\$0	\$0
SECTION D : ROADWORKS Pathways Pavement Pavement Seal	\$0 \$0 \$0	\$0
SUB-TOTAL:		\$30,000
Planning & Design Project Management		\$1,000 \$1,000
CONTINGENCIES 20%		\$3,200
TOTAL:		\$35,200

Appendix 4 Site Photos

The following images were taken on the day the Road Safety Audit was conducted for the intersection of Wahuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road.

Lake Clarendon Way, eastbound



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Walhuben Road, east bound



Walhuben, westbound



Released under RTI - DTMR



Forest Hill-Fernvale Road, southbound



Released under RTI - DTMR



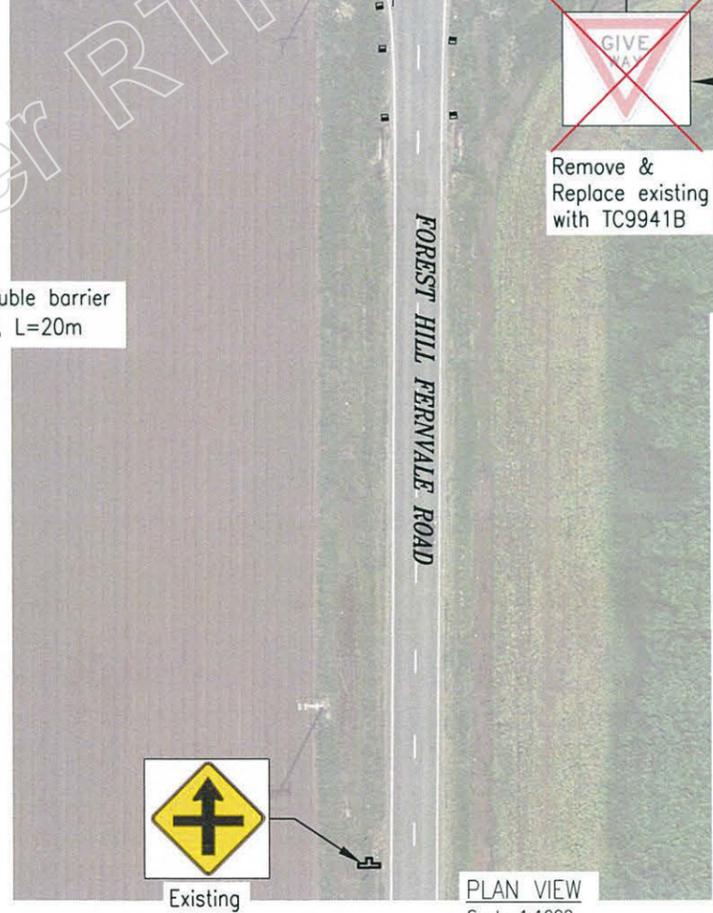
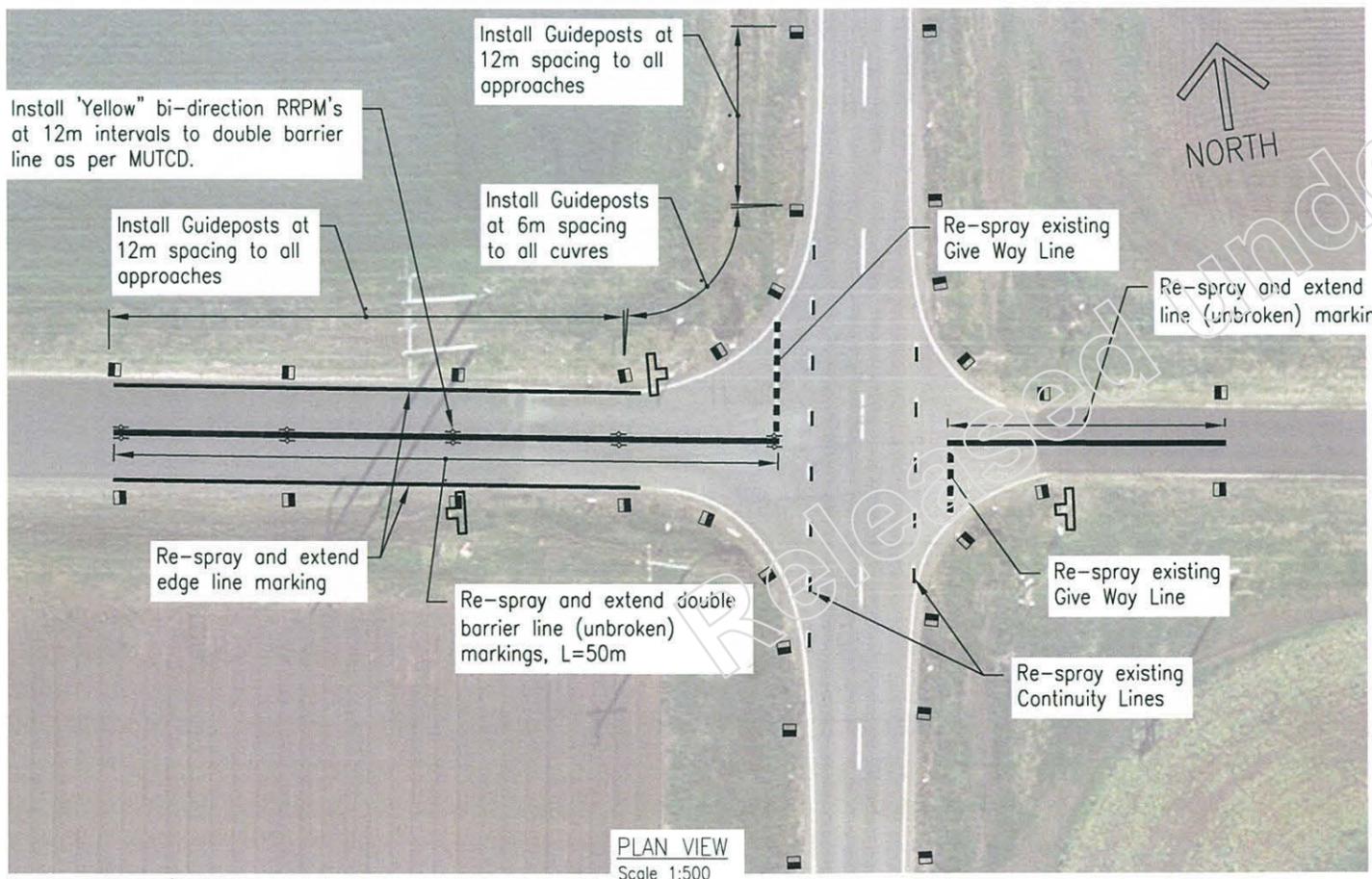
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Forest Hill-Fernvale Road, northbound





Released under RTI - DTMR



- SIGNS AND LINEMARKING NOTES:**
1. All signs are to be installed as per IPWEAQ standard drawing SEQ R-131, "Traffic Sign Installation".
 2. All linemarkings are to be applied in accordance with The Manual of Uniform Traffic Control Devices (MUTCD).
 3. All existing signs not shown on plan are to remain unless otherwise stated to be removed.
 4. Replace all damage sign faces if so directed by the superintendent.

PRELIMINARY
16 June 2016

REF: CRM2016/08559

Revisions	Certified	Approved	Date
A			Original issue

Dimensions in metres except where shown otherwise. Culvert sizes in millimetres.	Auxiliary drawing nos
Scales 0 5 10 15 20m 1:1000 (A3) 0 5 10m 1:500 (A3)	Through chainage from CTL CHGE (Office use only)

SIGNAGE AND LINEMARKING UPGRADES				
LAKE CLARENON WY/FORREST HILL FERVALE RD/WALHUBEN RD				
CTL CHGE				
Reference Points				
Preceding RPC	Dist. to start of job (km)	From start to end of job	From end to following RPC	Following RPC

Survey	Bdys	Drawn	Design	Exp
Ckd	Ckd	DH Ckd	XP Ckd	
				Not Relevant

No. of drgs
JOB No.

Drawing No.
001

Lockyer Valley REGIONAL COUNCIL

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RPEQ Endorsement

Endorsement of concept proposals by a Registered Professional Engineer Queensland (RPEQ). For Black Spot nominations.

Project Cost Estimate \$35,200

Reference Number
(e.g. 206-00011 – to be provided by TMR)

Project Location
Walhuben Road, Lake Clarendon Way and Forest Hill-Fernvale Road, Glenore Grove

Road Safety Risks Identified

- Intersection delineation and warning signs lacking.

Project Scope

- Improve signage and delineation on approaches to intersection.

I, Myles Fairbairn,

being a Registered Professional Engineer of Queensland,

registration number 7335 ,

confirm that I consider the proposed treatment to be appropriate to address the road safety risks for proactive proposals, and that the supporting benefit cost evaluation is sound.

Not Relevant

(Signed)

Date: 24 JUNE 2016

Site Details

✓ = indicates field entry required

Project Location Description	Walhuben Road/Lake Clarendon Way/Forest Hill-Fernvale Road - intersection
------------------------------	---

Site Type	Discrete Site - Intersection
Is this a high priority site within QRAM?	Not applicable for council nominations on the local road network
Is this a demonstrable high priority site (not using QRAM)?	Required to be 'Yes' for Safer Roads Sooner if 'No' has been selected for 'Is this a high priority site within QRAM'
If demonstrable high priority site - provide details	

Location Details <small>Note: separate multiple entries in a field by using ;</small>	
Local Government(s)	Lockyer Valley Regional Council
Postcode(s)	4343
Federal Electorate(s)	Wright
Suburb(s)/Town(s)/Locality(ies)	Gatton
State Electorate(s)	Lockyer

Rural or Urban?	Rural
-----------------	-------

Primary Road Details	
Declared Primary Road Name	Forest Hill-Fernvale Road
Local Road Name	
Network	State
Road Number or Local Government ID	412

Note: For intersections, the primary road is the highest order road at the intersection: National -> State -> Local

Speed Limit	100 km/h
Speed Category	High

Intersecting Road Details <small>Required for discrete site - intersection</small>	
Declared Road Name	
Local Road Name	Walhuben Road
Network	Local
Road Number or Local Government ID	

Additional Road Details 1 <small>Fill out only if required</small>	
Reason Associated	
Declared Road Name	
Local Road Name	Lake Clarendon Way
Network	Local
Road Number or Local Government ID	

Additional Road Details 2 <small>Fill out only if required</small>	
Reason Associated	
Declared Road Name	
Local Road Name	
Network	
Road Number or Local Government ID	

Additional Road Details 3 <small>Fill out only if required</small>	
Reason Associated	
Declared Road Name	
Local Road Name	
Network	
Road Number or Local Government ID	

Additional Road Details 4 <small>Fill out only if required</small>	
Reason Associated	
Declared Road Name	
Local Road Name	
Network	
Road Number or Local Government ID	

Road Sections	Road Number or ID	Start(s) km applicable for state-controlled roads - NN and OSCR	Geo Coordinate 1 Start of section		Geo Coordinate 2 End of section		Length(s) km (Manually Entered)	Length(s) km (Calculated)	AADT Result	AADT Date Undertaken	Additional Details
			Latitude	Longitude	Latitude	Longitude					
Section 1	412	9.76			9.76			0.02			
Section 2								0			
Section 3								0			
Section 4								0			
Section 5								0			
Section 6								0			
Section 7								0			
Section 8								0			
Section 9								0			
Section 10								0			
Total km								0.02			

Additional Supporting Details

✓ = indicates field entry required

Is this nomination reactive or proactive? Reactive All reactive nominations require a supporting BCR based on crash history

Is there a Road Safety Audit attached for this proposal? Yes Required for all proactive proposals to be eligible for the Black Spot Program

Is this proposal substantially rehabilitation or maintenance? No If 'Yes' proposal will not be eligible for either Black Spot or Safer Roads Sooner

Nature of Concern/Problem Diagnosis	✓ Poor intersection awareness	If appropriate, how would this proposal improve safety for the following specific Road User Groups?	
		Heavy Vehicles	
		Motorcyclists	
		Cyclists	
		Pedestrians	
Community Consultation (if applicable. To gauge potential impacts on delivery, provide details on community consultation undertaken - or - to be undertaken with relevant road users / local businesses / community)		Anticipated Traffic Growth Rate	<input checked="" type="checkbox"/> 2.00%
		Is the site identified among the top 10% of lengths within the state with a demonstrably higher crash rate?	<input type="checkbox"/>
		If selected as 'Yes', provide justification in the 'Additional Comments' field to the left	
Additional Comments		Has this location been nominated previously for funding from a Targeted Road Safety Program within the past five years?	<input checked="" type="checkbox"/>
		If 'Yes' provide details below	
TMR District Comments on Council Nominations			
TMR only to fill out. Note: • Required if on state-controlled road. • Indicate if TMR DD supports / not supports nomination - supply statement from TMR DD.			

Note: If required attachments as listed below are not provided, assessment of the proposal will not be undertaken.

Attachment Checklist List all supporting attachments		
RPEQ Sign Off	<input checked="" type="checkbox"/> Yes	Required for all nominations
Project Proposal / Scoping document - 2 or 3 pages in total	<input checked="" type="checkbox"/> Yes	Required for all nominations
Locality map	<input checked="" type="checkbox"/> Yes	Recommended
Crash diagram	<input checked="" type="checkbox"/> No	Required for all reactive proposals (based on crash history)
Cost Estimate Breakdown	<input checked="" type="checkbox"/> Yes	Required for all nominations
Supporting crash statistics	<input checked="" type="checkbox"/> No	Required for all reactive proposals (based on crash history)
Concept sketch	<input checked="" type="checkbox"/> Yes	Required for all nominations
Road Safety Audits (RSAs)	<input checked="" type="checkbox"/> Yes	Required for all proactive proposals under the Black Spot Program
Australian Government Black Spot Nomination Form	<input checked="" type="checkbox"/> N/A	Required if nominated by a member of the public (including MPs/Councillors) under the Black Spot Program
Planning studies & other safety investigation documents	<input checked="" type="checkbox"/> N/A	
Images, DVR clips, media, etc	<input checked="" type="checkbox"/> Yes	Recommended
Other supporting documentation provided	<input checked="" type="checkbox"/> N/A	

Crash Details

Crash Measurement Period	
Beginning	13/06/2011
End	24/06/2016
Period (Years)	5

Crash Data Please only include crashes within the length and limit of the nominated site and crash measurement period																						
DCA GROUPS >>																						
CRASH SEVERITY																					TOTAL	
Fatal																						0
Hospitalised																						0
Medical Treatment	3																					3
Minor Injury																						0
TOTAL	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

Released under RTI - DTMR

Proposed Treatments

✓ = indicates field entry required

TREATMENTS	Select Treatment from list	Capital Cost (\$)			Service Life (Years)
Treatment 1	3.28 Install New signing - Give Way sign at X intersection	\$35,200			10
Treatment 2	1.08 Install New Signing - Warning Signs				10
Treatment 3	2.02 Install Central line or Barrier Line Marking				3
Treatment 4	2.06 Install RRPM's on Centre Line Only (night time crashes only)				5
Treatment 5	5.24 Install guideposts with reflectors				5

CRASH SUMMARY	DCA GROUP																					Total
CRASH SEVERITY	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
Fatal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Casualty	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

TREATMENTS	CRASH REDUCTION FACTORS																				
Treatment 1	-20%	0%	-15%	0%	0%	0%	0%	0%	0%	0%	0%	-15%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Treatment 2	0%	-5%	0%	-5%	0%	0%	0%	0%	0%	0%	0%	0%	-5%	0%	0%	0%	0%	0%	0%	0%	0%
Treatment 3	0%	-10%	0%	0%	0%	0%	0%	0%	-35%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Treatment 4	0%	-5%	0%	0%	0%	0%	0%	0%	-5%	0%	0%	0%	0%	0%	-5%	-5%	0%	-15%	-15%	0%	0%
Treatment 5	0%	-15%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	-10%	-10%	-10%	-20%	-20%	0%	0%

Proposed Treatment (Detailed Description)	✓
--	---

Budget and Schedule Details

✓ = indicates field entry required

Proposal Contributions Ensure Total Proposal Contributions are equal to the total capital cost of all treatments listed on the Treatments tab	
SRS, Black Spot, RSMW or Other Targeted Road Safety Contribution ✓	\$35,200
Other State Funding Contribution	
Local Government Contribution	
	\$35,200

Each contribution (and subsequent total) should be rounded to nearest \$500.

✓ Proposal Contributions equal total capital costs for all treatments listed on the Treatments tab

Yearly Forecasts Note: The Black Spot Program requires all contributions to be forecast against 2017-18	Program Years			Totals
	Total Forecasts must match Total Contributions			
	2017-18	2018-19	2019-20	
Total Funding (all contributions) ✓	\$35,200			\$35,200

✓ Forecasts match contributions

Estimated Start and End Dates Note: Dates must align to forecast outlays		Start Date	End Date
Estimated pre-construction (planning & detailed design) start and end dates ✓		Jul-2017	Jun-2018
Estimated construction start and end dates ✓		Jul-2017	Jun-2018

Released under RTI-DTMR



REGIONAL COUNCIL

Existing Road Safety Audit

Intersection of Lake Clarendon Way/Walhuben Road and Forest Hill Fernvale Road



Client – Lockyer Valley Regional Council

Contact – Ms Xiau Pitts

Version 3

23/06/2016

DOCUMENT CONTROL SHEET

Version No.	Date	Prepared by	Document status	Changes from previous version
1	19 June	Mark de Hayr	Preliminary (for comment)	
2	21 June	Mark de Hayr	Draft	Minor Edits
3	23 June	Mark de Hayr	Final	Minor Edits – revised Traffic Counts

Version No.	Copy No.	Issue date	Issued to
1	1	19/06/2016	Ms Xiau Pitts
			Mr Myles Fairbairn
			Ms Seren McKenzie
2	2	21/06/2016	Ms Xiau Pitts
			Mr Myles Fairbairn
			Ms Seren McKenzie
3	3	23/06/2016	Ms Xiau Pitts
			Mr Myles Fairbairn
			Ms Seren McKenzie
4			

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FORCECOR
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 Eight Mile Plains
 QLD 4113

Approved for Issue:

Date:

Not Relevant

Mark de Hayr, Director

23/06/2016

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1. INTRODUCTION

1.1 Purpose of this document

This Road Safety Audit Report has been prepared to at the request of the Lockyer Valley Regional Council (LVRC). The report is based upon the guidelines as stated within the Austroads "Guide to Road Safety Part 6: Road Safety Audit".

1.2 Background

FORCECOR was appointed to carry out this investigation as a Stage 5 – Existing Road Audit. The purpose of the reports was review and assess road sections as a basis for the Australian Government's Blackspot Funding program.



Figure 1: Aerial photograph of the site – Sourced from Google Earth.

1.3 Audit Team

This Audit investigation was carried out by FORCECOR at the request of LVRC and was conducted by a team consisting of:

- Mark de Hayr, Senior Road Safety Auditor
- Myles Fairbairn, Senior Road Safety Auditor – LVRC
- Ms Seren McKenzie – LVRC Observer
- Ms Xiau Pitts – LVRC Observer

1.4 Entrance meeting and site visit

The LVRC audit team members performed a site visit and video commentary on the Monday 23rd May 2016.

1.5 Prioritisation of findings for remedial treatment

Issues identified during the safety audit are discussed in **Section 4**. A suggested importance for action by LVRC has been allocated to each of the recommendations (**see Section 6**) using the following ratings:

- **Priority A** (for immediate attention): Highest priority for action from a safety viewpoint. This list will also include items that are quick and easy to install and are expected to yield a high benefit-cost ratio.
- **Priority B** (important): Indicates that action is needed from a safety viewpoint. Quite often, the majority of recommendations will receive a priority rating of B.
- **Priority C** (routine/strategic): Action is desirable from a safety viewpoint.

2. Site Summary

The intersection of Lake Clarendon Way/Walhuben Road and Forest Hill Fernvale Road is noted as having a posted speed limit of 100kmph. Forest Hill is a State controlled Road. Lake Clarendon Way would be classed as being a Rural Distributor Road. Walhuben Road would be classed as a Lower Order Rural Road.

TMR has advised that the census data of Forest Hill Fernvale Road from 2013 200m south of Lake Clarendon Way concluded AADT 1,591 & 12.37% HV. Exactly the same in the 2012 census data. Data from Chart View: last AADT 1,347 in 2015 5 year growth rate is -2.7% & 14.19% HV.

Detailed Traffic Information provided from LVRC is provided in **Section 4.9**.

3. Site Photos



Figure 2 – Forest Hill Fernvale Road – Northbound



Figure 3 – Forest Hill Fernvale Road – Northbound Approach - Faded Intersection Warning Sign

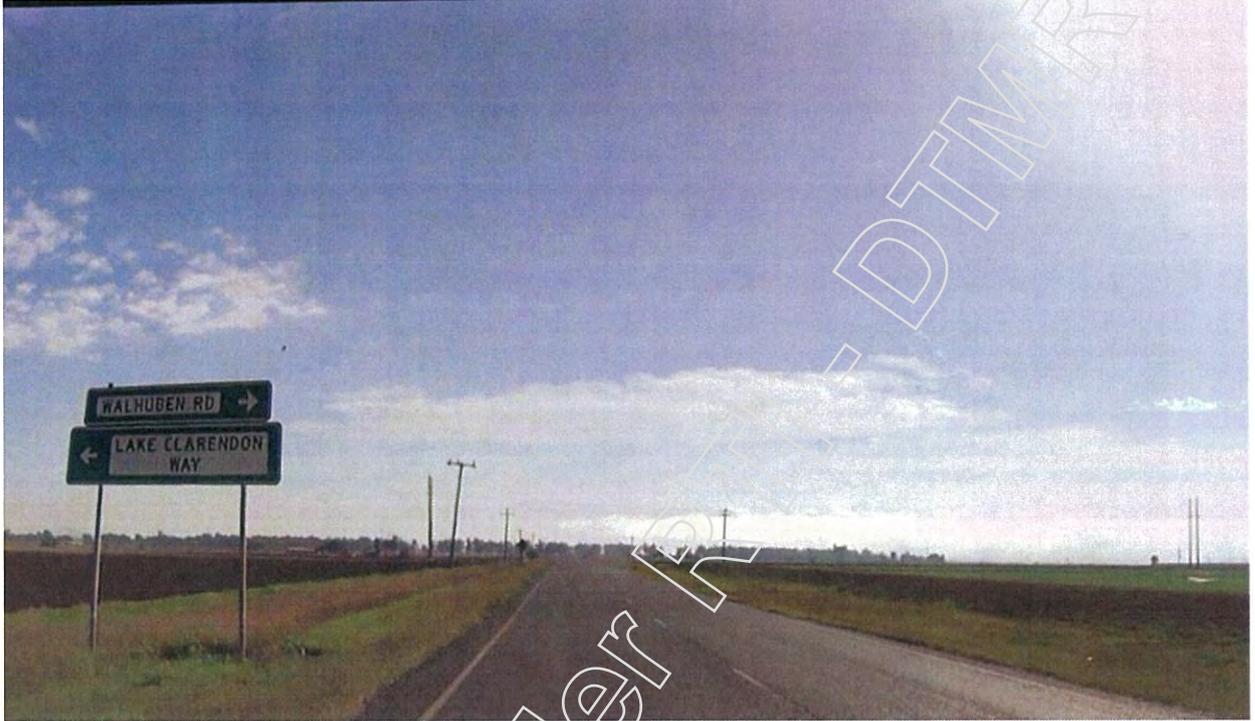


Figure 4 – Forest Hill Fernvale Road – Northbound Approach – Advanced Directional Signage



Figure 5 – Forest Hill Fernvale Road – Southbound Approach

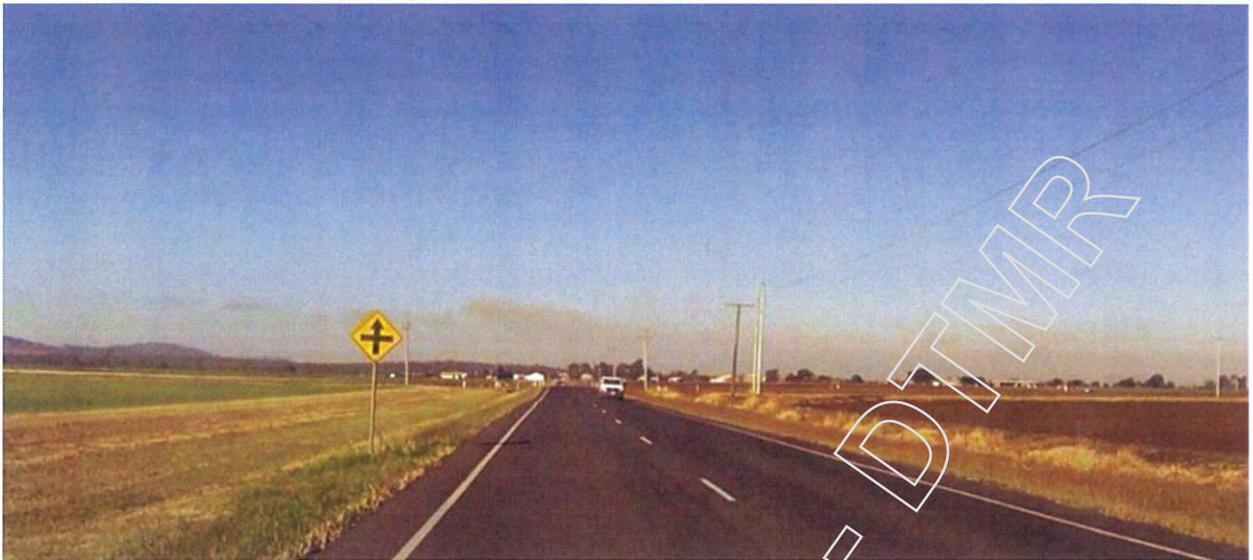


Figure 6 – Forest Hill Fernvale Road – Southbound Approach - Intersection Warning Sign

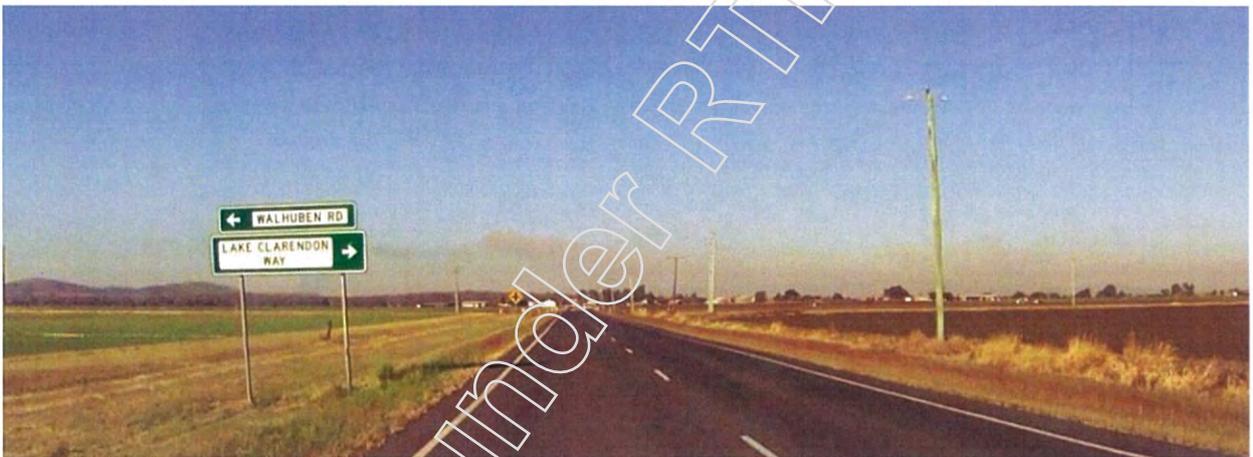


Figure 7 – Forest Hill Fernvale Road -- Southbound Approach - Faded Intersection Warning Sign

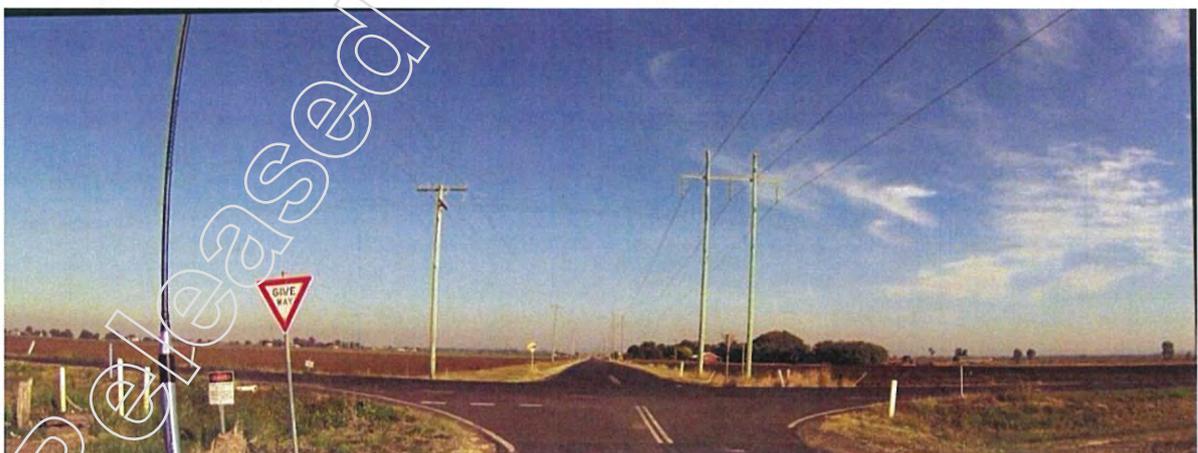


Figure 8 – Walhuben Road – Eastbound Approach

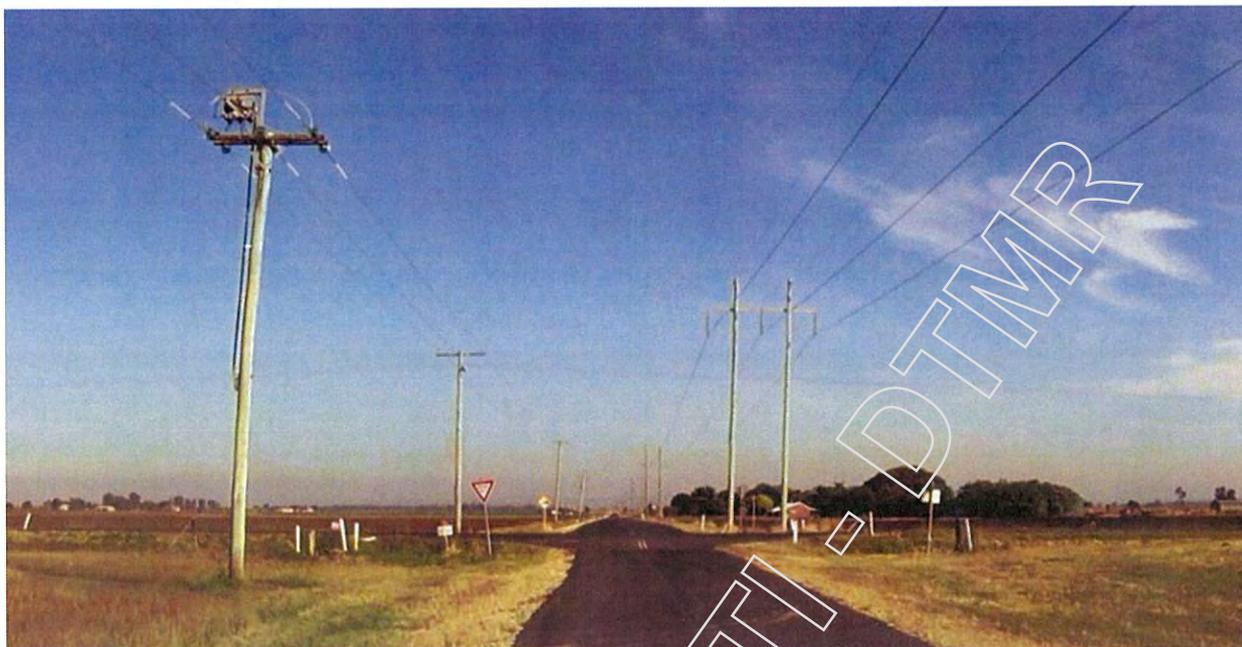


Figure 9 – Walhuben Road – Eastbound Approach



Figure 10 – Walhuben Road – Distant Eastbound Approach – No Advance Intersection Warning Signage



Figure 11 – Lake Clarendon Way – Westbound Approach



Figure 12 – Lake Clarendon Way – Westbound Approach – Faded Advance Intersection Warning Sign

4. DETAILS OF POTENTIAL PROBLEMS IDENTIFIED AT THE AUDIT SITE

4.1 Site inspection

The LVRC audit team members performed a site visit and video commentary on the Monday 23rd May 2016. During the site visit the weather was clear and sunny and the road conditions dry.

The inspection identified that there was estimated clear sight distance of approx. 200m in the main through portion of the intersection.

4.2 Road Pavement Surface

The Bitumen wearing surface was noted to be moderate to poor condition with moderate deformation, edge break and minor pavement failure.

4.3 Road Markings and Traffic Signs

The road marking on the main through portion of the intersection is in fair to moderate condition. The Signage on the primary road is in fair condition. The advanced warning signage on Lake Clarendon Way is not to current standard and should be reviewed. Walhuben Road has no advanced warning signage and should be reviewed.

4.4 Guardrail

There is no Guardrail requirements in the proximity of the intersection as identified by the audit team.

4.5 Street Lighting

There is no Street Lighting in the proximity of the intersection. Consideration to installing Street lighting in this location is suggested.

4.6 Drainage

Open Table drains run alongside all roads in the vicinity. No major drainage issues were observed.

4.7 Vegetation and other Environmental Matters

At the time of the inspection, no major vegetation concerns were apparent. Both roads have well established roadside vegetation within the clear zone area.

4.8 Roadway Geometry

The site is comprised of a Straight "X" intersection. The number of vehicles turning into and out of Lake Clarendon Way and Walhuben Road is not known to the audit team. Indicative evidence would suggest that Lake Clarendon would generate significantly more movements than Walhuben and have a potentially higher speed environment.

4.9 Traffic Information

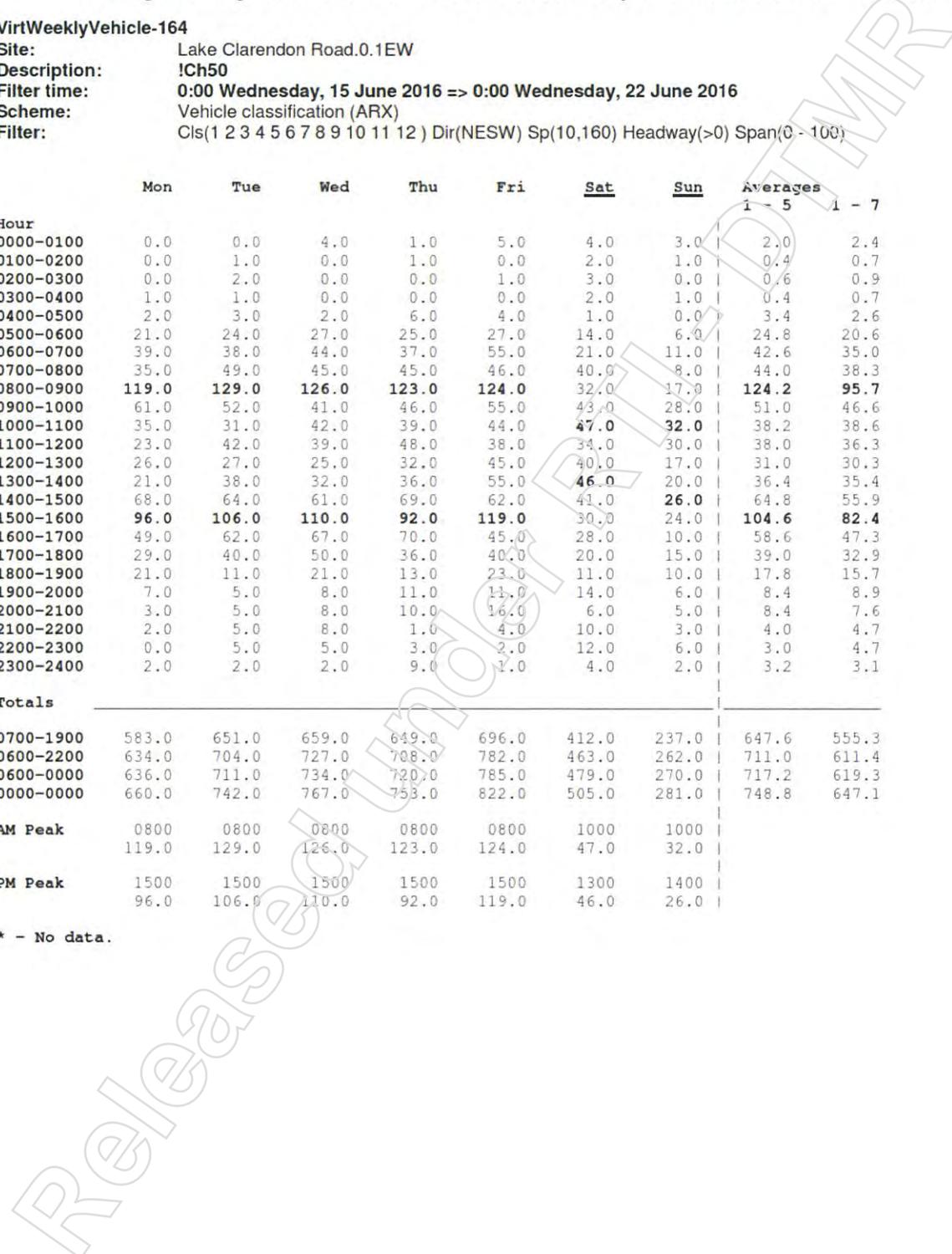
Council has provided traffic count data from June 2016 for the approach legs to the target intersection. Interpolation would suggest that there is approximately 650 VPD on average turning into and out of Lake Clarendon Way from Fernvale Forest Hill Road.

VirtWeeklyVehicle-164

Site: Lake Clarendon Road.0.1EW
 Description: !Ch50
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: CIs(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages	
								1 - 5	1 - 7
0000-0100	0.0	0.0	4.0	1.0	5.0	4.0	3.0	2.0	2.4
0100-0200	0.0	1.0	0.0	1.0	0.0	2.0	1.0	0.4	0.7
0200-0300	0.0	2.0	0.0	0.0	1.0	3.0	0.0	0.6	0.9
0300-0400	1.0	1.0	0.0	0.0	0.0	2.0	1.0	0.4	0.7
0400-0500	2.0	3.0	2.0	6.0	4.0	1.0	0.0	3.4	2.6
0500-0600	21.0	24.0	27.0	25.0	27.0	14.0	6.0	24.8	20.6
0600-0700	39.0	38.0	44.0	37.0	55.0	21.0	11.0	42.6	35.0
0700-0800	35.0	49.0	45.0	45.0	46.0	40.0	8.0	44.0	38.3
0800-0900	119.0	129.0	126.0	123.0	124.0	32.0	17.0	124.2	95.7
0900-1000	61.0	52.0	41.0	46.0	55.0	43.0	28.0	51.0	46.6
1000-1100	35.0	31.0	42.0	39.0	44.0	47.0	32.0	38.2	38.6
1100-1200	23.0	42.0	39.0	48.0	38.0	34.0	30.0	38.0	36.3
1200-1300	26.0	27.0	25.0	32.0	45.0	40.0	17.0	31.0	30.3
1300-1400	21.0	38.0	32.0	36.0	55.0	46.0	20.0	36.4	35.4
1400-1500	68.0	64.0	61.0	69.0	62.0	41.0	26.0	64.8	55.9
1500-1600	96.0	106.0	110.0	92.0	119.0	30.0	24.0	104.6	82.4
1600-1700	49.0	62.0	67.0	70.0	45.0	28.0	10.0	58.6	47.3
1700-1800	29.0	40.0	50.0	36.0	40.0	20.0	15.0	39.0	32.9
1800-1900	21.0	11.0	21.0	13.0	23.0	11.0	10.0	17.8	15.7
1900-2000	7.0	5.0	8.0	11.0	11.0	14.0	6.0	8.4	8.9
2000-2100	3.0	5.0	8.0	10.0	16.0	6.0	5.0	8.4	7.6
2100-2200	2.0	5.0	8.0	1.0	4.0	10.0	3.0	4.0	4.7
2200-2300	0.0	5.0	5.0	3.0	2.0	12.0	6.0	3.0	4.7
2300-2400	2.0	2.0	2.0	9.0	1.0	4.0	2.0	3.2	3.1
Totals									
0700-1900	583.0	651.0	659.0	649.0	696.0	412.0	237.0	647.6	555.3
0600-2200	634.0	704.0	727.0	708.0	782.0	463.0	262.0	711.0	611.4
0600-0000	636.0	711.0	734.0	720.0	785.0	479.0	270.0	717.2	619.3
0000-0000	660.0	742.0	767.0	753.0	822.0	505.0	281.0	748.8	647.1
AM Peak	0800	0800	0800	0800	0800	1000	1000		
	119.0	129.0	126.0	123.0	124.0	47.0	32.0		
PM Peak	1500	1500	1500	1500	1500	1300	1400		
	96.0	106.0	110.0	92.0	119.0	46.0	26.0		

* - No data.



Class Speed Matrix

ClassMatrix-163

Site: Lake Clarendon Road.0.1EW
 Description: ICh50
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: CIs(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Speed (km/h)	Class												Speed Totals	
	MC 1	SV 2	SVT 3	TB2 4	TB3 5	T4 6	ART3 7	ART4 8	ART5 9	ART6 10	BD 11	DRT 12		
10 - 20	2	143	.	6	3	2	.	.	1	.	.	.	157	3.5%
20 - 30	13	372	11	51	47	2	1	3	1	2	.	.	503	11.1%
30 - 40	13	1823	63	145	46	4	2	2	2	8	.	.	2108	46.5%
40 - 50	4	1485	23	92	3	.	.	1	.	1	.	.	1609	35.5%
50 - 60	1	135	1	7	.	.	.	.	.	.	.	.	144	3.2%
60 - 70	.	7	.	1	.	.	.	.	.	.	.	.	8	0.2%
70 - 80	.	1	.	.	.	.	.	.	.	.	.	.	1	0.0%
80 - 90	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
90 - 100	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
100 - 110	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
110 - 120	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	33 0.7%	3966 87.5%	98 2.2%	302 6.7%	99 2.2%	8 0.2%	3 0.1%	6 0.1%	4 0.1%	11 0.2%	0 0.0%	0 0.0%	4530	

Released under RTI-DTP

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-165

Site: Lake Clarendon Way.0.1SN
 Description: 140m North of Lake Clarendon Road
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: CIs(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	1 - 7
0000-0100	4.0	3.0	6.0	8.0	7.0	4.0	7.0	5.6	5.6
0100-0200	2.0	1.0	3.0	2.0	7.0	3.0	3.0	3.0	3.0
0200-0300	1.0	2.0	2.0	0.0	0.0	1.0	3.0	1.0	1.3
0300-0400	5.0	5.0	7.0	6.0	8.0	4.0	2.0	6.2	5.3
0400-0500	13.0	14.0	18.0	20.0	11.0	5.0	2.0	15.2	11.9
0500-0600	53.0	73.0	83.0	90.0	76.0	51.0	14.0	75.0	62.9
0600-0700	91.0	109.0	128.0	114.0	129.0	62.0	18.0	114.2	93.0
0700-0800	114.0	116.0	113.0	116.0	127.0	57.0	18.0	117.2	94.4
0800-0900	161.0	161.0	164.0	175.0	171.0	77.0	44.0	166.4	136.1
0900-1000	100.0	127.0	90.0	95.0	116.0	114.0	70.0	105.6	101.7
1000-1100	103.0	106.0	130.0	99.0	109.0	131.0	93.0	109.4	110.1
1100-1200	67.0	102.0	101.0	133.0	124.0	107.0	70.0	105.4	100.6
1200-1300	108.0	87.0	87.0	99.0	150.0	91.0	64.0	106.2	98.0
1300-1400	96.0	143.0	98.0	117.0	159.0	98.0	51.0	122.6	108.9
1400-1500	124.0	129.0	124.0	124.0	139.0	82.0	60.0	128.0	111.7
1500-1600	163.0	159.0	157.0	162.0	165.0	80.0	53.0	161.2	134.1
1600-1700	132.0	139.0	153.0	162.0	143.0	78.0	41.0	145.8	121.1
1700-1800	89.0	122.0	114.0	133.0	110.0	66.0	44.0	113.6	97.1
1800-1900	51.0	54.0	47.0	48.0	60.0	35.0	16.0	52.0	44.4
1900-2000	14.0	14.0	24.0	24.0	30.0	38.0	13.0	21.2	22.4
2000-2100	12.0	12.0	19.0	29.0	32.0	15.0	11.0	20.8	18.6
2100-2200	9.0	13.0	12.0	9.0	10.0	19.0	7.0	10.6	11.3
2200-2300	6.0	13.0	16.0	6.0	9.0	19.0	10.0	10.0	11.3
2300-2400	7.0	9.0	9.0	15.0	5.0	8.0	4.0	9.0	8.1
Totals									
0700-1900	1308.0	1445.0	1378.0	1463.0	1573.0	1018.0	624.0	1433.4	1258.4
0600-2200	1434.0	1593.0	1561.0	1639.0	1724.0	1152.0	673.0	1600.2	1403.7
0600-0000	1447.0	1615.0	1586.0	1660.0	1788.0	1179.0	687.0	1619.2	1423.1
0000-0000	1525.0	1713.0	1705.0	1786.0	1897.0	1247.0	718.0	1725.2	1513.0
AM Peak	0800	0800	0800	0800	0800	1000	1000		
	161.0	161.0	164.0	175.0	171.0	131.0	93.0		
PM Peak	1500	1500	1500	1600	1500	1300	1200		
	163.0	159.0	157.0	162.0	165.0	98.0	64.0		

* - No data.

Class Speed Matrix

ClassMatrix-166

Site: Lake Clarendon Way.0.1SN
 Description: 140m North of Lake Clarendon Road
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: CIs(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Speed (km/h)	Class												Speed Totals	
	MC	SV	SVT	TB2	TB3	T4	ART3	ART4	ART5	ART6	BD	DRT		
	1	2	3	4	5	6	7	8	9	10	11	12		
10 - 20	2	3	.	.	.	.	.	.	.	.	.	.	5	0.0%
20 - 30	2	22	1	1	3	1	.	.	1	1	.	.	32	0.3%
30 - 40	3	31	2	3	5	4	2	1	1	3	.	.	55	0.5%
40 - 50	1	178	16	41	21	9	1	5	5	17	2	.	288	2.7%
50 - 60	5	1272	48	89	69	33	4	10	2	22	6	.	1560	14.7%
60 - 70	8	3516	110	192	88	36	3	17	5	12	7	.	3994	37.7%
70 - 80	9	3169	60	191	33	7	3	.	2	8	3	.	3485	32.9%
80 - 90	9	917	9	56	14	2	1	.	.	2	.	.	1010	9.5%
90 - 100	3	133	1	13	.	.	.	.	.	1	.	.	151	1.4%
100 - 110	.	10	.	1	.	.	.	.	.	.	.	.	11	0.1%
110 - 120	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	42	9243	247	587	233	92	14	33	16	66	18	0	10591	
	0.4%	87.3%	2.3%	5.5%	2.2%	0.9%	0.1%	0.3%	0.2%	0.6%	0.2%	0.0%		

Weekly Vehicle Counts (Virtual Week)

VirtWeeklyVehicle-167

Site: Lake Clarendon Way.0.1SN
 Description: 160m South of Lake Clarendon Road
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Hour	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Averages 1 - 5	1 - 7
0000-0100	4.0	3.0	9.0	4.0	2.0	0.0	7.0	4.4	4.1
0100-0200	2.0	0.0	3.0	3.0	7.0	3.0	4.0	3.0	3.1
0200-0300	1.0	2.0	2.0	0.0	1.0	2.0	3.0	1.2	1.6
0300-0400	4.0	6.0	7.0	6.0	8.0	3.0	5.0	6.2	5.6
0400-0500	13.0	18.0	20.0	14.0	11.0	4.0	2.0	15.2	11.7
0500-0600	47.0	67.0	71.0	84.0	69.0	52.0	10.0	67.6	57.1
0600-0700	73.0	88.0	109.0	104.0	103.0	55.0	10.0	95.4	77.4
0700-0800	95.0	96.0	101.0	91.0	106.0	51.0	24.0	97.8	80.6
0800-0900	149.0	171.0	178.0	176.0	175.0	74.0	39.0	169.8	137.4
0900-1000	103.0	112.0	83.0	92.0	113.0	110.0	57.0	100.6	95.7
1000-1100	90.0	95.0	111.0	94.0	103.0	118.0	82.0	98.6	99.0
1100-1200	79.0	88.0	89.0	131.0	113.0	100.0	59.0	100.0	94.1
1200-1300	104.0	87.0	85.0	79.0	123.0	87.0	60.0	95.6	89.3
1300-1400	94.0	128.0	93.0	112.0	138.0	70.0	42.0	113.0	96.7
1400-1500	126.0	127.0	113.0	135.0	131.0	77.0	44.0	124.4	107.6
1500-1600	161.0	153.0	149.0	201.0	185.0	70.0	52.0	169.8	138.7
1600-1700	119.0	140.0	148.0	150.0	129.0	65.0	36.0	137.2	112.4
1700-1800	87.0	98.0	104.0	110.0	107.0	56.0	38.0	101.2	85.7
1800-1900	40.0	45.0	40.0	44.0	53.0	32.0	22.0	44.4	39.4
1900-2000	12.0	11.0	18.0	13.0	24.0	27.0	10.0	15.6	16.4
2000-2100	11.0	9.0	13.0	23.0	16.0	19.0	11.0	14.4	14.6
2100-2200	7.0	12.0	6.0	8.0	8.0	13.0	6.0	8.2	8.6
2200-2300	6.0	13.0	12.0	5.0	10.0	13.0	8.0	9.2	9.6
2300-2400	4.0	7.0	11.0	8.0	3.0	8.0	2.0	6.6	6.1
Totals									
0700-1900	1247.0	1340.0	1294.0	1415.0	1475.0	910.0	555.0	1354.4	1176.7
0600-2200	1350.0	1460.0	1440.0	1563.0	1627.0	1024.0	592.0	1488.0	1293.7
0600-0000	1360.0	1480.0	1463.0	1576.0	1640.0	1045.0	602.0	1503.8	1309.4
0000-0000	1431.0	1576.0	1575.0	1687.0	1738.0	1109.0	633.0	1601.4	1392.7
AM Peak	0800	0800	0800	0800	0800	1000	1000		
	149.0	171.0	178.0	176.0	175.0	118.0	82.0		
PM Peak	1500	1500	1500	1500	1500	1200	1200		
	161.0	153.0	149.0	201.0	185.0	87.0	60.0		

* - No data.

Class Speed Matrix

ClassMatrix-168

Site: Lake Clarendon Way.0.1SN
 Description: 160m South of Lake Clarendon Road
 Filter time: 0:00 Wednesday, 15 June 2016 => 0:00 Wednesday, 22 June 2016
 Scheme: Vehicle classification (ARX)
 Filter: Cls(1 2 3 4 5 6 7 8 9 10 11 12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100)

Speed (km/h)	Class												Speed Totals	
	MC 1	SV 2	SVT 3	TB2 4	TB3 5	T4 6	ART3 7	ART4 8	ART5 9	ART6 10	BD 11	DRT 12		
10 - 20	.	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
20 - 30	5	12	.	1	.	.	.	.	.	1	.	.	19	0.2%
30 - 40	.	23	1	8	.	2	.	.	.	3	.	.	43	0.4%
40 - 50	.	191	15	25	12	3	1	2	2	3	1	.	255	2.6%
50 - 60	2	1182	37	51	42	10	2	9	1	21	3	.	1360	14.0%
60 - 70	8	3125	95	122	56	27	6	7	5	25	3	.	3480	35.7%
70 - 80	13	3004	78	108	19	12	3	3	3	10	5	.	3258	33.4%
80 - 90	6	1025	12	30	12	3	.	1	.	.	.	.	1090	11.2%
90 - 100	1	204	4	8	1	.	.	.	.	.	.	.	218	2.2%
100 - 110	.	23	.	1	.	.	.	.	.	.	.	.	24	0.2%
110 - 120	.	1	.	.	.	.	.	.	.	.	.	.	1	0.0%
120 - 130	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
130 - 140	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
140 - 150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150 - 160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Class Totals	35	8792	242	354	148	57	12	22	12	63	12	0	9749	
	0.4%	90.2%	2.5%	3.6%	1.5%	0.6%	0.1%	0.2%	0.1%	0.6%	0.1%	0.0%		

4.10 Other issues

There is limited guideposts in the proximity to the intersection. Installing additional Guideposts to delineate the intersection is recommended.

Released under RTI - DTMR

5. CRASH HISTORY AND ANALYSIS

Walhuben/Lake Clarendon/Forest Hill Fernvale – there has been three recorded casualty crashes. TMR has advised that the DCA for these crashes are 202, 506 & 101. These crash codes are consistent with rural intersections. Advanced warning and visual queuing are the most effective solution in these instances.

Released under RTI - DTMR

6. RECOMMENDED REMEDIAL MEASURES

This Engineering Road Safety Audit Report has identified the following issues that may improve the road safety aspect in this location. The table below shows a summary of the recommendations for consideration provided in **Section 4**.

Ref.	Category description	Description of recommendations for consideration by Road Authority	Priority
1.	Road Pavement Surface	Wearing Surface is in moderate to poor condition. Widen Shoulders, install median kerb to denote road edge	B
2.	Road Markings and Traffic Signs	Refresh all delineation and install edge lines and addition guidepost in the vicinity. Review Movement Priorities.	A
3.	Guardrail	No action required	---
4.	Street Lighting	Review of Lighting Requirements is suggested	B
5.	Drainage	No action required	---
6.	Vegetation & Environment	Monitor Roadside vegetation	---
7.	Geometry	Intersection redesign is required to cater for crossing conflicts as depicted in Figure 12 & 13	B
8.	Traffic	Design Speed review required	B

The following diagram is a schematic representation of a possible rectification treatment and if considered feasible would require a detailed site survey and intersection design.



Figure 12 – Possible Treatment Option

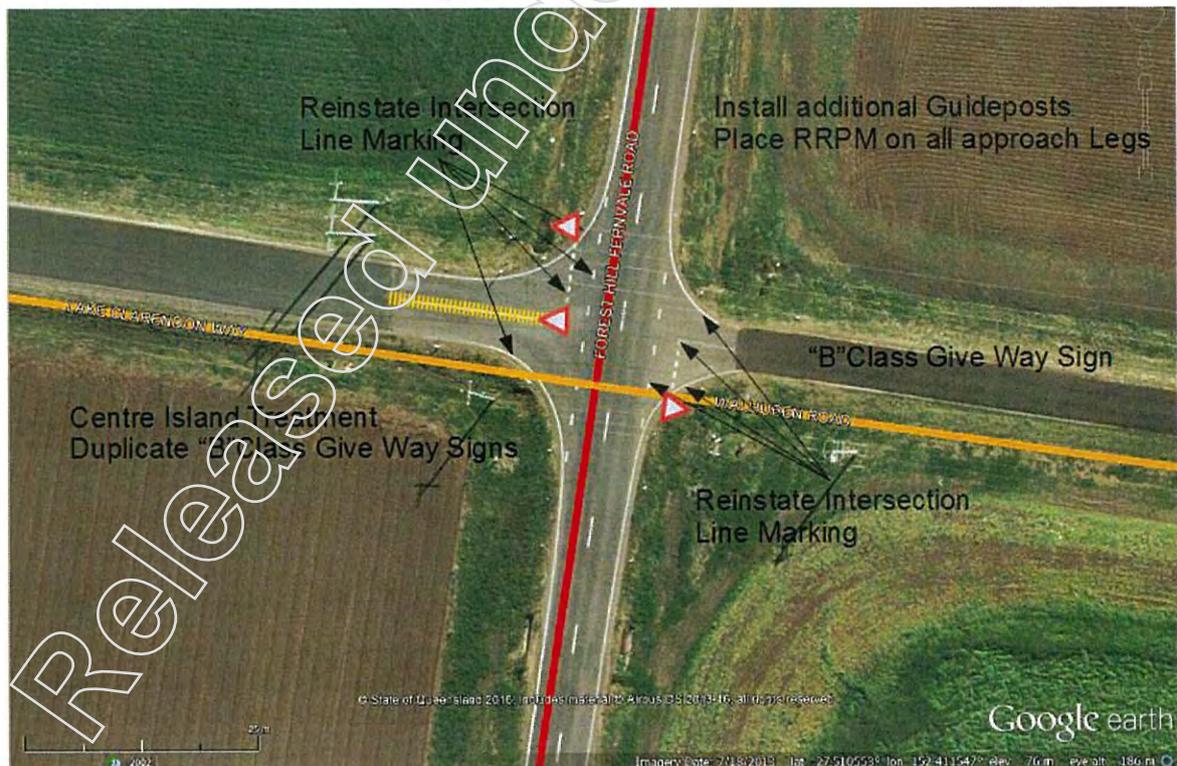


Figure 12a – Possible Treatment Option

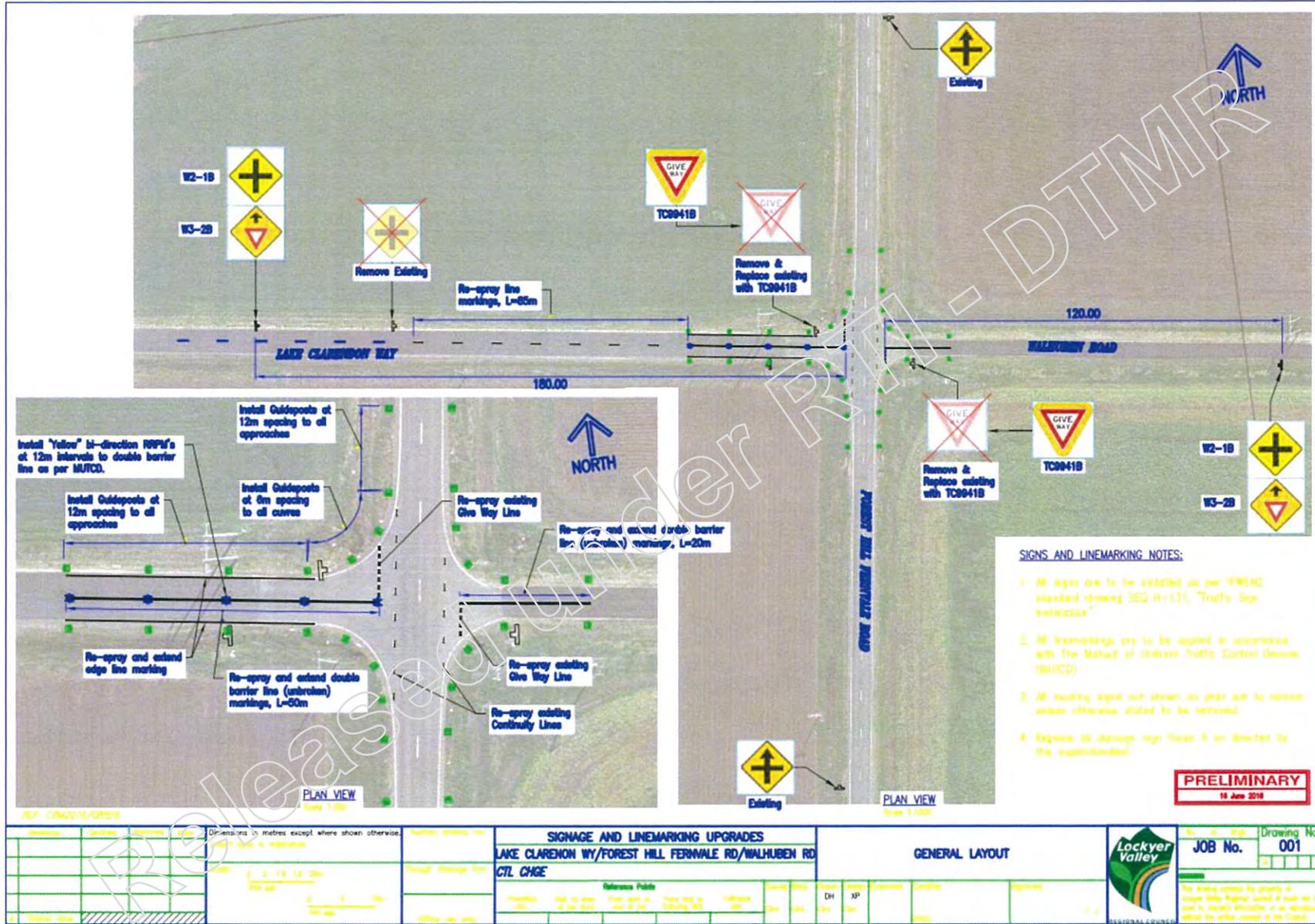


Figure 13 – Possible Treatment Option

7. INVESTIGATION TEAM STATEMENT

This Safety Audit investigation was carried out by the team as noted in **Section 1.3** using observations and information available to them. Every effort is being made to ensure that all relevant road safety issues are being considered in a timely and appropriate manner during the course of the investigation.

The recommended remedial measures provided in **Section 6** for council to consider are provided based upon the knowledge and experience of the team and the findings of this particular investigation. There may be factors not known by the crash investigation team which may preclude the implementation of some of the recommendations. It should be recognised by council that greater analysis, design work and costing may be required prior to implementing these recommendations.

Name: Mark de Hayr

Signature:

Position: Senior Road Auditor

Name: Myles Fairbairn

Signature:

Position: Senior Road Auditor

APPENDIX A – DEFINITIONS FOR CODING ACCIDENTS (DCA)

DEFINITIONS FOR CODING ACCIDENTS

NOTE:- 1 = Key vehicle direction.

ie: The direction in which the key vehicle was travelling as it approached the crash location.

	00	10	20	30	40	50	60	70	80	90
	PEDESTRIAN on foot or in toygram	INTERSECTION vehicles from adjacent approaches	VEHICLES from opposing directions	VEHICLES from one direction	MANOEUVRING	OVERTAKING	ON PATH	OFF PATH ON STRAIGHT	OFF PATH ON CURVE	PASSENGERS & MISCELLANEOUS
	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER	OTHER
1	000 NEAR SIDE	100 THRU THRU	200 HEAD ON	300 REAR END	400 LEAVING PARKING	500 HEAD ON	600 PARKED	700 OFF CARRIAGEWAY TO LEFT	800 OFF CARRIAGEWAY RIGHT BEND	900 FELL IN FROM VEHICLE
2	001 EMERGENCY	101 RIGHT THRU	201 THRU RIGHT	301 LEFT REAR	401 PARKING	501 OUT OF CONTROL	601 DOUBLE PARKED	701 OFF CARRIAGEWAY TO RIGHT	801 OFF CARRIAGEWAY LEFT BEND	
3	002 FAR SIDE	102 LEFT THRU	202 RIGHT LEFT	302 RIGHT REAR	402 PARKING VEHICLES ONLY	502 PULLING OUT	602	702 LEFT OFF CARRIAGEWAY INTO OBJECT	802 OFF RIGHT BEND INTO OBJECT	
4	003 FLIPPING WORKING LYING & STANDING ON CARRIAGEWAY	103 THRU RIGHT	203 RIGHT	303 U TURN	403 REVERSING IN TRAFFIC	503 CUTTING IN	603 LANE ZONE	703 RIGHT OFF CARRIAGEWAY INTO OBJECT	803 OFF LEFT BEND INTO OBJECT	903 HIT TRAIN
5	004 WALKING WITH TRAFFIC	104 RIGHT RIGHT	204 THRU LEFT	304 LANE SIDE SWIPE	404 REVERSING INTO PUBLIC OBJECT	504 PULLING OUT REAR END	604 HIT PERMANENT OBSTRUCTION	704 OUT OF CONTROL ON CARRIAGEWAY	804 OUT OF CONTROL ON CARRIAGEWAY	904 HIT ANIMAL OFF CARRIAGEWAY
6	005 FACING TRAFFIC	105 LEFT RIGHT	205 LEFT LEFT	305 LANE CHANGE RIGHT	405 LEAVING DRIVEWAY	505 OVERTAKING RIGHT TURN	605 HIT TEMPORARY OBSTRUCTION	705 LEFT TURN	805 LEFT TURN	905 PARKED VEHICLE RUN AWAY
7	006 DROPPED	106 THRU LEFT	206 U TURN	306 LANE CHANGE LEFT	406 FROM LOADING BAY	506	606 HIT TEMPORARY OBJECT ON CARRIAGEWAY	706 RIGHT TURN	806 RIGHT THRU	906 VEHICLE MOVEMENTS NOT KNOWN
8	007 ON FOOTWAY	107 RIGHT LEFT	207	307 RIGHT TURN SIDE SWIPE	407 FROM FOOTWAY	507	607 ACCIDENT OR BROKEN DOWN	707 MOUNTS TRAFFIC ISLAND	807 MOUNTS TRAFFIC ISLAND	907
9	008 STRUCK WHILE BOARDING OR ALIGHTING	108 LEFT LEFT	208	308 LEFT TURN SIDE SWIPE	408	508	608 ANIMAL	708	808	908
0							609 LOAD HIT VEHICLE			610