



RoadPro
CONSULTING

Road Safety Performance Review 'Kuranda Range' Kennedy Highway (Road no. 32A)

Prepared for Department of Transport and Main Roads (Far North District)

7 January 2016

Released under RTI - DTMR

© RoadPro Consulting.

This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by RoadPro Consulting, no other party may copy, reproduce, distribute, make use of, or rely on the contents of the report. No liability is accepted by RoadPro Consulting for any use of this report, other than for the purposes for which it was originally prepared and provided.

Document control

Version history

Version no	Date	Changed by	Nature of amendment
Draft V1	14.12.2015	Darren Shirley	Initial draft
Draft V2	23.12.2015	Darren Shirley	Update to recommendations
Draft V3	07.01.2016	Lisa Shirley	Review and editorial amendments

Contact for enquiries

Please direct any queries regarding the preparation of this document to:

Contact officer: Darren Shirley
Director/Principal Consultant
RoadPro Consulting

Job number: 1516-07

Email: darren@roadpro.net.au

Web: www.roadpro.net.au

Client sign-off

Prepared for:

Department of Transport and Main Roads (Far North District)

Project description:

Road safety performance review: Kennedy Highway (road no. 32A), Kuranda Range

Document sign-off:

The following officer acknowledges receipt of this document on behalf of Department of Transport and Main Roads (Far North District):

Name

Position

Signature

Date

Table of contents

1	Introduction	1
1.1	Abbreviations and acronyms.....	2
2	Project background.....	3
3	Objective.....	7
4	Methodology.....	8
5	Crash data analysis.....	9
5.1	Summary of crash data analysis.....	9
5.1.1	Frequency.....	9
5.1.2	Severity.....	9
5.1.3	Crash types.....	10
5.1.4	Contributing circumstances.....	10
5.1.5	Weather conditions.....	10
5.1.6	Vehicle types.....	11
5.1.7	Road users.....	11
5.1.8	Corridor road segments.....	11
5.2	Crash data analysis key findings.....	12
5.3	Crash zones.....	13
6	SIMS data analysis.....	15
6.1	Summary of SIMS data analysis.....	15
6.1.1	Total number of recorded incidents.....	15
6.1.2	Number of incidents per year (% of total number).....	15
6.1.3	Number of incidents per day of week (% of total number).....	15
6.1.4	Time of day.....	16
6.1.5	Duration (hrs) of incidents (% of total number of incidents).....	16
6.2	SIMS data analysis key findings.....	16
7	Crash countermeasures.....	17
8	Road safety review.....	20
8.1	Signage.....	21
8.2	Line and pavement markings.....	35
8.3	Delineation.....	40
8.4	Safety barriers.....	42
8.5	Roadside hazards.....	45
8.6	Alignment.....	50
8.7	Pedestrians and cyclists.....	52
8.8	Pavement and surface.....	58
8.9	Road lighting.....	64
9	Recommendations.....	66
Appendix A – Media articles.....		71
Appendix B – WebCrash output.....		76
Appendix C – BOM weather graph.....		114
Appendix D – SIMS data.....		116
Appendix E – Austroads’ references.....		125
Appendix F – Summary of safety review findings.....		130
Appendix G – Approved recommendations.....		155

1 Introduction

This report presents the findings of a road safety investigation along the section of Kennedy Highway (road no. 32A) that passes through mountainous terrain between the localities of Smithfield and Kuranda. The area is locally known as the Kuranda Range.

The subject section of road is approximately 14km in length, extending between the intersections with Captain Cook Highway (eastern end) and Rob Veivers Drive/Myoia Road (western end).

The investigation incorporates the following tasks:

- analysis of recorded crash data and identification of suitable high-benefit, low-cost countermeasures
- analysis of STREAMS Incident Management System (SIMS) crash-related data to identify trends and consistency with recorded crash data
- a detailed site inspection (road safety review) to identify existing and potential safety issues, and make recommendations regarding suitable high-benefit, low-cost treatments.

The Department of Transport and Main Roads (TMR) provided the following information:

- *Road Reference Book* (2015)
- WebCrash 2 reports (2007-2012)
- SIMS database output (2007-2012)
- DVR imagery.

1.1 Abbreviations and acronyms

Abbreviations and acronyms used in this report are listed below.

ANPR	Automatic number plate recognition
BCT	Breakaway Cable Terminals
BOM	Bureau of Meteorology
DVR	Digital Video Road
ITS	Intelligent Transport Systems
KRIP	Kuranda Range Improvement Project
LHS	Left-hand side
MUTCD	<i>Manual of Uniform Traffic Control Devices</i>
REGP	Road Edge Guide Posts
RHS	Right-hand side
RISC	Roadside Impact Severity Calculator
RPDM	<i>Road Planning and Design Manual</i>
RRPM	Raised Reflective Pavement Markers
SIMS	STREAMS incident management system
TMR	Department of Transport and Main Roads
VAS	Vehicle-activated signs
VMS	Variable Message Sign

2 Project background

The Kuranda Range section of the Kennedy Highway is a two-lane, two-way road with a relatively low geometric standard due to the steep mountainous terrain it passes over. The road is the principal access to the Atherton Tablelands and the towns of Mareeba and Atherton. Figures 1, 2 and 3 provide the location, extent, and an aerial view of the subject road segment.

Poor horizontal and vertical geometry and a narrow seal width contribute to frequent road crashes and subsequent lengthy road closures. TMR has advised the road segment operates at a 'Level of Service E' during peak traffic. Frequent closures due to crashes and weather conditions have created significant community interest and general dissatisfaction. Recent media articles are included in **Appendix A**.

TMR's options to upgrade or improve the geometric standard of the Kuranda Range section of the Kennedy Highway are limited. Constructability and costs issues associated with the steep and high mountainous terrain significantly constrain options to improve the geometric standard. Furthermore, as the road passes through the Wet Tropics of Queensland World Heritage Site, strict environmental controls further constrain major upgrade works. Due to these limitations, TMR has no current plans for major upgrade works along the range section of the highway.

While the required for any major upgrades limits options, TMR has committed to delivering a \$3 million project—the Kuranda Range Improvement Project (KRIP)—to improve the current operational performance on the range. An important element of the KRIP is to improve TMR's access to accurate, real-time information about incidents, therefore, providing timely incident response and the dissemination of improved traveller information to the public.

TMR is also considering a range of technology options to improve incident detections and response capabilities on the Kuranda Range. The aim is to reduce the time taken to communicate the presence of an incident on the Kuranda Range to both emergency responders and the community.

TMR has commissioned a number of concurrent investigation projects as part of the KRIP, including:

- a road safety performance review
- options report for closure/diversion route signage
- assessment of incident response performance
- options analysis for the provision of incident detection and verification technology.

SOURCE: GOOGLE MAPS

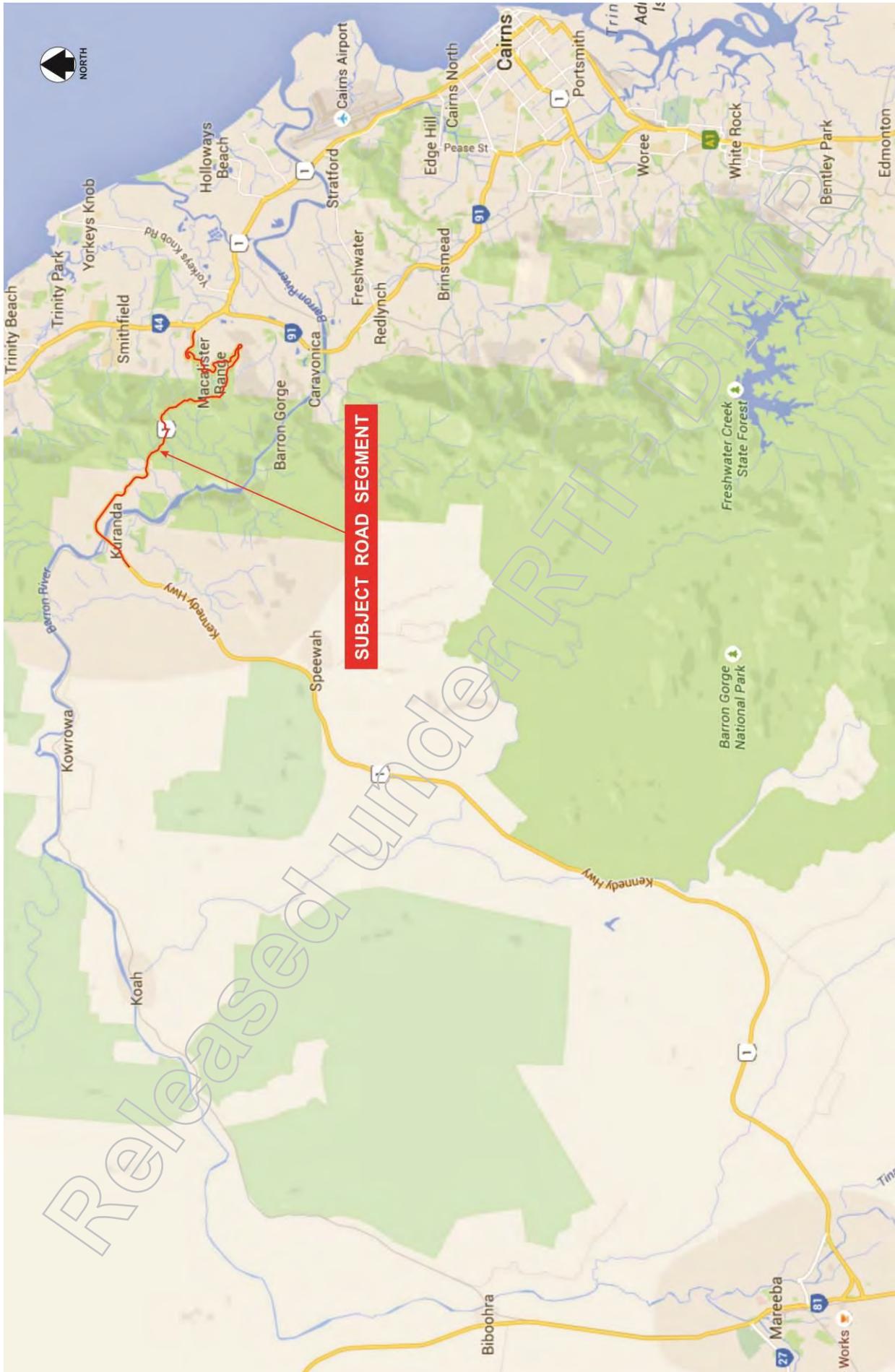


Figure 1: Location of subject site

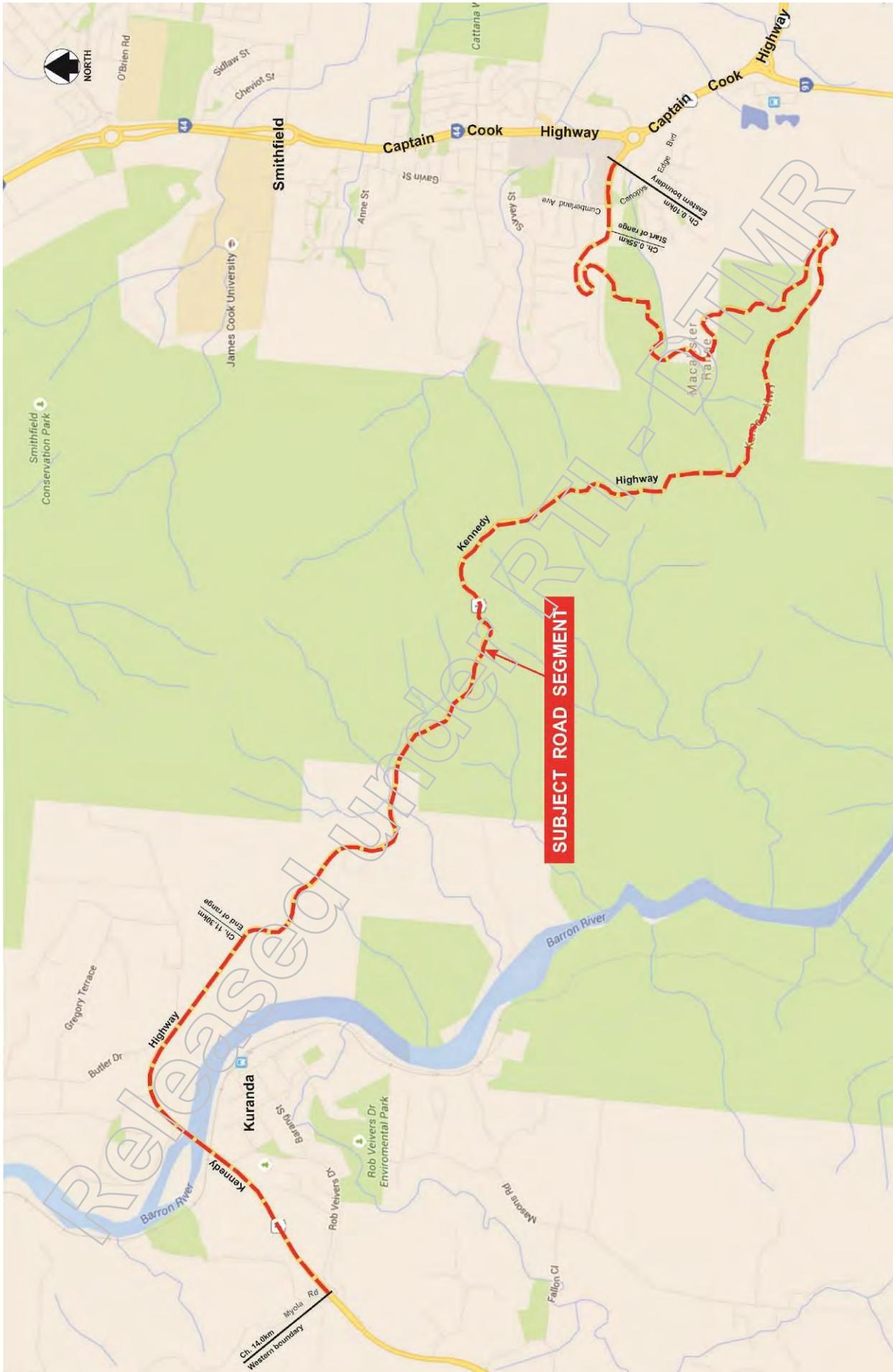


Figure 2: Extent of subject road segment

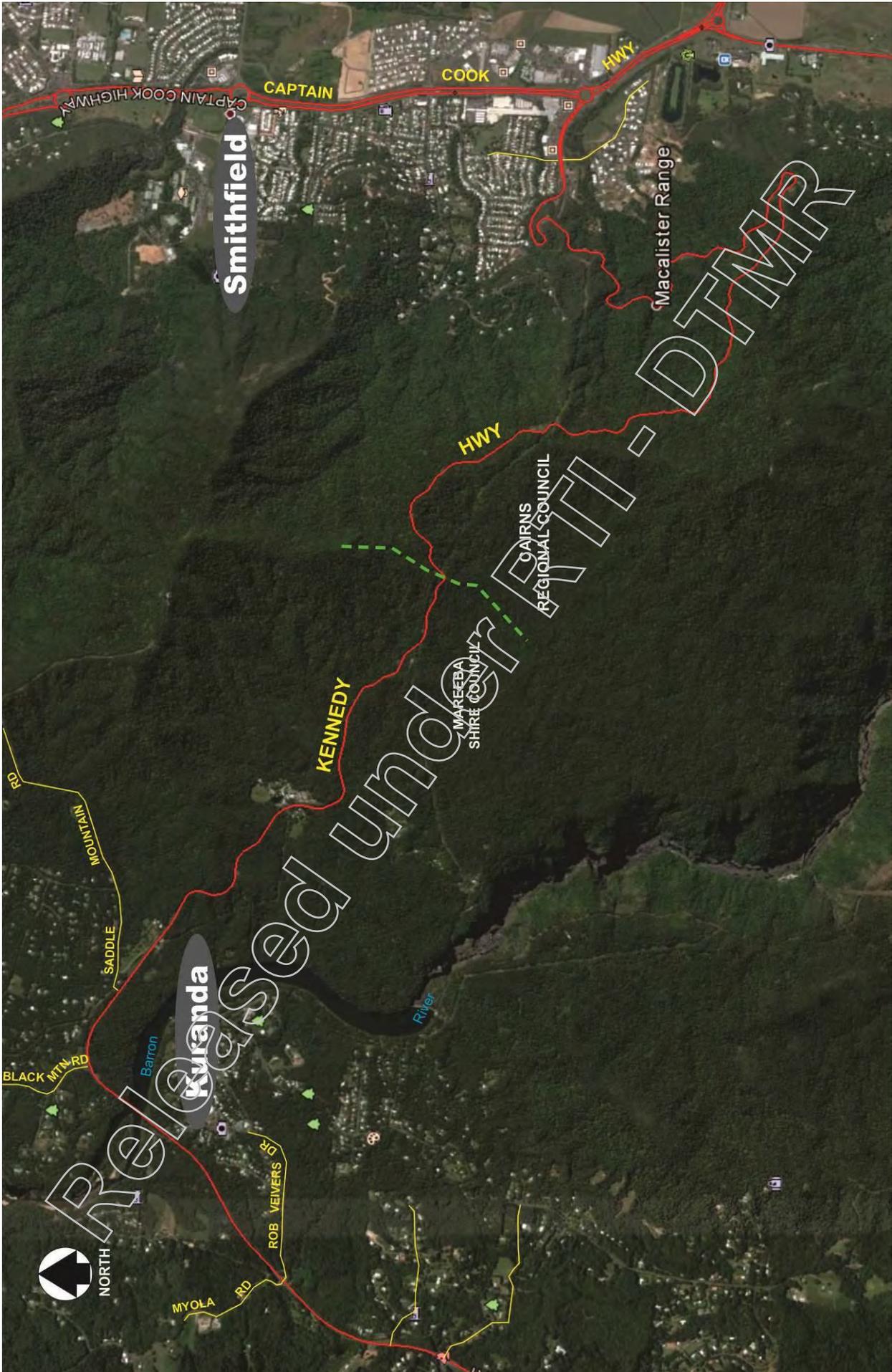


Figure 3: Aerial map

3 Objective

The objective of this road safety performance review is to:

- identify existing and potential safety issues through crash data analysis and site inspections
- determine and make recommendations about suitable high-benefit, low-cost engineering solutions to minimise the occurrence and injury severity of future crashes.

This project is consistent with TMR's strategic vision for road safety. *Safer Roads, Safer Queensland: Queensland's Road Safety Strategy 2015–21* sets four guiding principles for road safety in Queensland:

1. The true road toll is broader than fatalities
2. We need an ambitious vision with interim targets to inspire and motivate action
3. Safe System principles are the foundation for action
4. Road safety is everyone's issue and everyone's responsibility.

The strategy has led to development of *Safer Roads, Safer Queensland: Queensland's Road Safety Action Plan 2015-17*. The action plan identifies six key 'action areas' to improve road safety and build the basis for ongoing, sustainable change:

1. Education and engagement: Whole-of-life education helps everyone play their role in road safety.
2. Enforcement: Enforcement deters and detects, through highly visible or covert strategies, uses technology and is complemented by other efforts.
3. Technology: We harness the solutions that are already here or emerging.
4. Roads and roadsides: We invest in a protective road environment.
5. Research, data and innovation: We are positioned for sustainable improvement for the next road safety action plan, and beyond.
6. Governance and strategy: The right frameworks are in place to support effective road safety outcomes.

The action plan includes a financial commitment under 'Roads and roadsides' (action number 38):

Through the Targeted Road Safety Program, make available \$300 million over two years in infrastructure safety measures targeting high severity crash sites on state-controlled and local government roads, including through the Safer Roads Sooner and Safety Mass Action subprograms.

4 Methodology

The road safety performance review includes the following activities:

- detailed analysis of recorded crash data to identify trends including frequency, predominant crash types, and contributing circumstances
- identification of suitable high-benefit low-cost countermeasures to minimise the occurrence and/or severity of identified crash types and circumstances
- analysis of crash-related SIMS data to identify trends and consistency with recorded crash data
- detailed site inspections (road safety review) to identify existing and potential safety issues
- identification of suitable high-benefit low-cost treatments to minimise the risk and severity of crashes associated with safety issues observed during the site inspections.

These activities and their connectivity are illustrated in Figure 4.

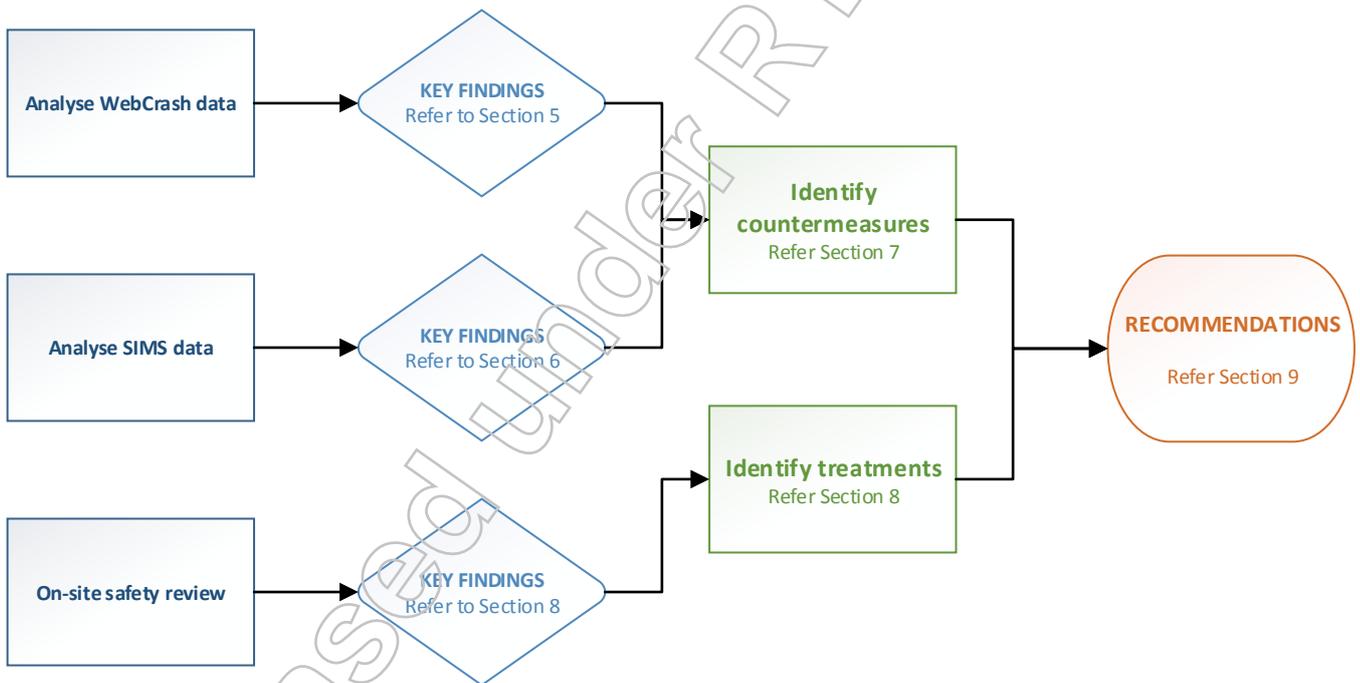


Figure 4: Safety performance review process

5 Crash data analysis

The crash data extracted from the WebCrash database identified general trends including the frequency, predominant crash types, and contributing circumstances.

In accordance with Austroads' guidelines (refer to *Guide to Road Safety Part 8: Treatment of Crash Locations*) for ensuring statistical reliability, data over a five-year period—between 1 July 2007 and 30 June 2012—was analysed. The end date coincided with the most recent crash data validated in WebCrash at the time of preparing this report.

The recording of 'Property Damage Only' (PDO) crashes in WebCrash ceased on the 31 December 2010. As the period of data analysed crossed over the PDO end date, the extracted data has been restricted to 'injury crashes' for the entire duration; encompassing only fatal, hospitalisation, medical treatment, and minor injury crashes.

A copy of tabulated crash data extracted from WebCrash is attached in **Appendix B**.

5.1 Summary of crash data analysis

5.1.1 Frequency

- 115 casualty crashes recorded, with an average of 23 crashes per year.
- Most incidents occurred on a Sunday (21) and the least on a Thursday (12).
- 80% of incidents occurred between 7am and 6pm, and 45% between 9am and 2pm.
- The highest number of incidents during the peak hours were:

Time of day	Crashes (quantity)
9am to 10am	12
11am to noon	11
10am to 11am	10
1pm to 2pm	10

5.1.2 Severity

- 3% fatal, 39% hospitalisation, 38% medical treatment, 20% minor injury.
- Of the three recorded fatal crashes, two were 'head-on' and the other a 'run-off road on curve'
- The number of casualty (non-fatal) crashes fluctuated over the five-year period.
- 60 (52%) of the 115 recorded incidents occurred when the road pavement was wet, 25 (42%) of those incidents resulted in injuries requiring hospitalisation.

5.1.3 Crash types

- 'Run-off road' (47%) and 'head-on' (30%) were the predominant crash types.
- 54 recorded 'run-off-road' crashes, with a spike of 19 recorded incidents between mid-2009 and mid-2010. 29 (54%) of these crashes occurred when the pavement was wet.
- 35 recorded 'head-on' crashes, with a spike of 12 recorded incidents mid-2010 to mid-2011. 23 (66%) of these crashes occurred when the pavement was wet.
- 21 (60%) of the 35 'head-on' crashes occurred on curved alignments with limited forward sight distance.
- 30 (55%) of the 54 'run-off-road' crashes occurred on curved alignments where there was greater (less restricted) forward sight distance.

5.1.4 Contributing circumstances

- 'Road – wet/slippery', 'Violation – cross double lines' and 'Violation – undue care and attention' were the most commonly attributed causes of crashes.
- There was a spike in the number of 'Road – wet/slippery' crashes during mid-2009 to mid-2010 and mid-2010 to mid-2011, with an increase of 12 and 13 per year respectively.
- 'Violation – cross double lines' and 'Violation – undue care and attention' were most commonly attributed to 'head-on' type crashes.
- 'Road – wet/slippery' most commonly attributed to 'head-on' and 'run-off-road' type crashes.
- Excessive speed was attributed to contributing to 12 of the recorded incidents.

5.1.5 Weather conditions

- Bureau of Meteorology (BOM) statistics indicate an average of 119 days of rain (>1mm) per year (refer to the graph attached in **Appendix C**).
- 60 (52%) of the 115 recorded incidents occurred when the road pavement was wet, that is, 52% of crashes occurred during 33% (119) of days per year.
- January to April have the highest number of wet days – average nearly 16 per month.
- July to October had the lowest number of wet days – average just over 5 per month.
- December to February had the higher number of crashes on wet roads: 9, 7 and 7 respectively.
- July to November had the lowest number of crashes on wet roads: 3, 4, 3, 3, and 3 respectively.
- 66% (23 out of 35) of 'head-on' and 54% (29 out of 54) of 'run-off road' crashes (predominant crash types) occurred on wet roads.
- 104 (90%) of the recorded crashes occurred on curved alignments - 28 (24%) occurred on wet pavement where there was limited forward sight distance through the curve, while 30 (26%) occurred on wet pavements where forward sight distance was less restricted through the curve

5.1.6 Vehicle types

- 182 vehicles were involved in the 115 recorded crashes: 113 (62%) cars, 35 (19%) utilities and 19 (10%) motorcycles
- Incidents involving motorcycles resulted in 2 fatalities, 11 hospitalisations, 4 medical treatments and 2 minor injuries.
- 21% (4 out of 19) of incidents involving motorcycles occurred on wet roads.

5.1.7 Road users

- 115 recorded crashes resulted in 160 injuries.
- 50:50 split of injuries between females and males.
- All three recorded fatal injuries were male.
- 50% of crashes involving males resulted in injuries requiring hospitalisation, whereas 39% involving women required in hospitalisation.
- 40-49 most vulnerable combined age group for men and women (40-49 for men only, 30-39 for women only).

5.1.8 Corridor road segments

Ranking against all roads managed by district.

Segment	Based on	Ranking
Top 25 15km road segments	'number' of crashes within each zone	5 th
Top 25 15km road segments	'social cost' of crashes within each zone (\$11,360,000)	5 th
Top 25 5km road segments	'number' of crashes with each zone (64 crashes within highest ranked zone)	7 th , 17 th and 18 th
Top 25 5km road segments	'social cost' of crashes with each zone (social cost of \$5,876,000 for 5th ranked zone)	5 th , 14 th and 23 rd
Top 25 500m road segments	'number' of crashes with each zone	10 th
Top 25 500m road segments	'social cost' of crashes with each zone (social cost of \$1,820,000 for 12th ranked zone)	12 th and 20 th

5.2 Crash data analysis key findings

Table 1: Key findings

Item no.	Category	Key finding
5.3.1	Frequency	High number of detected crashes per year, average 23.
5.3.2	Frequency	Most incidents typically occurred on a Sunday
5.3.3	Frequency	80% of incidents occurred between 7am and 6pm, and 45% between 9am and 2pm
5.3.4	Severity	The majority of crashes resulted in injuries requiring hospitalisation (3% fatal, 39% hospitalisation, 38% medical treatment, 20% minor injury)
5.3.5	Crash types	'Run-off road' (47%) and 'head-on' (30%) were the predominant crash types. 66% of 'head-on' and 54% of 'run-off road' crashes (predominant crash types) occurred on wet roads.
5.3.6	Contributing circumstances	'Violation – cross double lines' and 'Violation – undue care and attention' most commonly attributed to 'head-on' type crashes
5.3.7	Contributing circumstances	'Road –wet/slippery' most commonly attributed to 'head-on' and 'run-off road' type crashes
5.3.8	Contributing circumstances	Excessive speed attributed to 12 recorded incidents
5.3.9	Road surface	52% of incidents occurred when the road pavement was wet, 42% of those incidents resulted in injuries requiring hospitalisation
5.3.10	Road surface	52% of crashes occur on 33% of days per year (i.e. 119 wet days out of 365)
5.3.11	Road corridors	Considering both the total 'number of injury crashes' and total 'social cost', the overall road segment ranks high (5 th) compared to other 15km state-controlled road segments throughout the district. (15km length based on standard WebCrash report). Although the road segment has a high number of crashes, the AADT of approximately 8,500 VPD is significantly less than the 32,000–47,000 VPD on the road segments ranked 1 st to 4 th .
5.3.12	Crash zones	Majority of crashes occurred towards the eastern end of the subject road segment; about 50% of all crashes within the first 5km, and 70% of all crashes within the first 7km.

5.3 Crash zones

TMR’s WebCrash database makes provision for identifying and mapping clusters of crashes within a specified zone length along road corridors. The maps visually represent locations where numerous or closely-spaced zones may warrant further investigation, mass action, and/or initial focus, particularly where funding is limited.

Using a road segment length of 200m (adopted as an arbitrary length that may be treated/upgraded under a single road safety project), zones have been mapped along the subject section of Kennedy Highway. Figures 5 and 7 illustrate how the ‘number of crashes’ and ‘social cost’ of each 200m road length varies along the road in order of chainage. Figures 6 and 8 illustrate the rate of incremental increase in crash numbers and total social cost moving along the road in order of chainage. The data indicates approximately 70% of the overall number of crashes, and nearly 80% of the total social cost, can be attributed to the first half (7km) of the road (eastern end).

Refer to **Appendix B** for maps extracted from WebCrash.

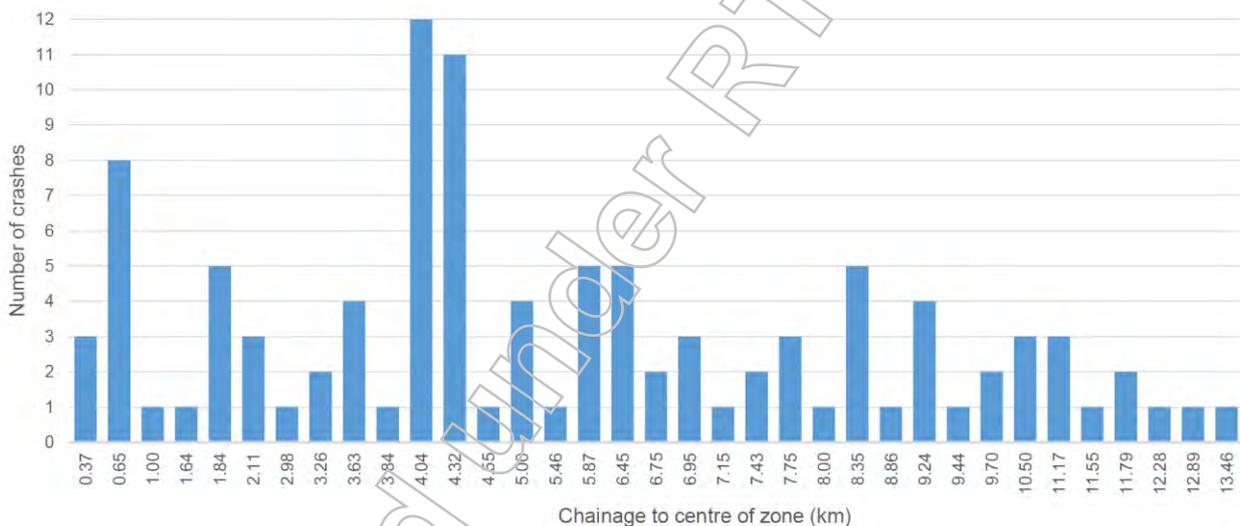


Figure 5: Number of crashes per 200m zone (in order of chainage)

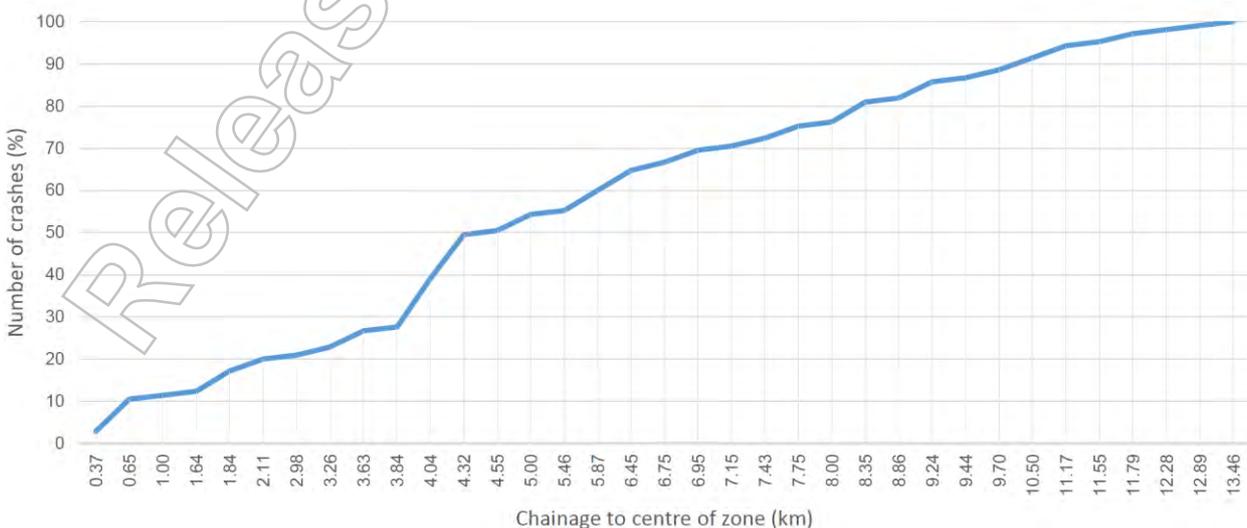


Figure 6: Incremental number of crashes (in order of chainage)

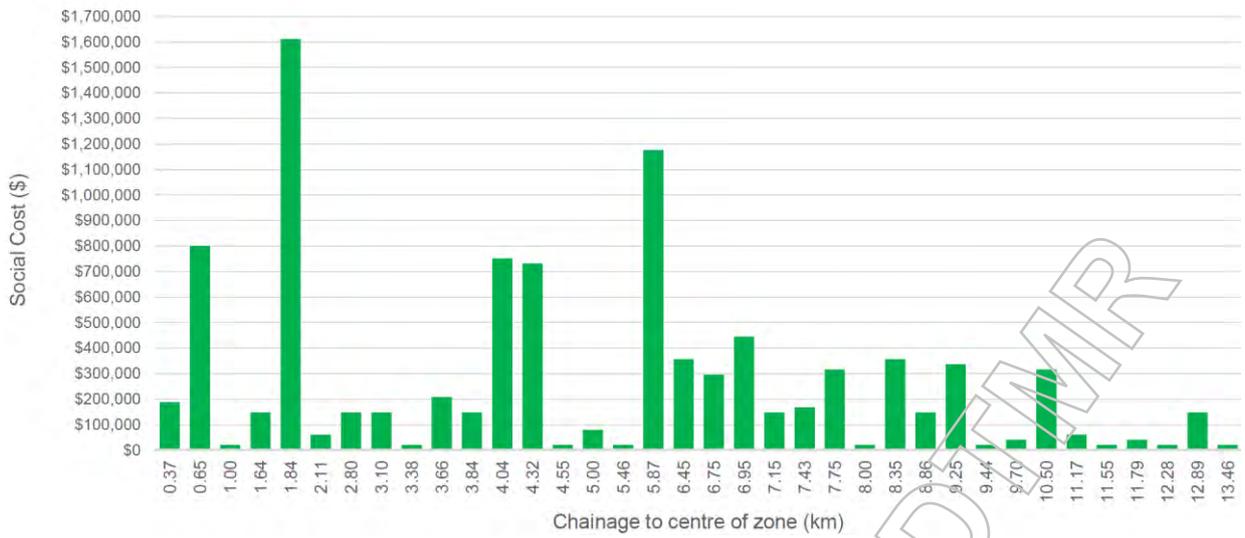


Figure 7: Social cost of crashes per 200m zone (in order of chainage)

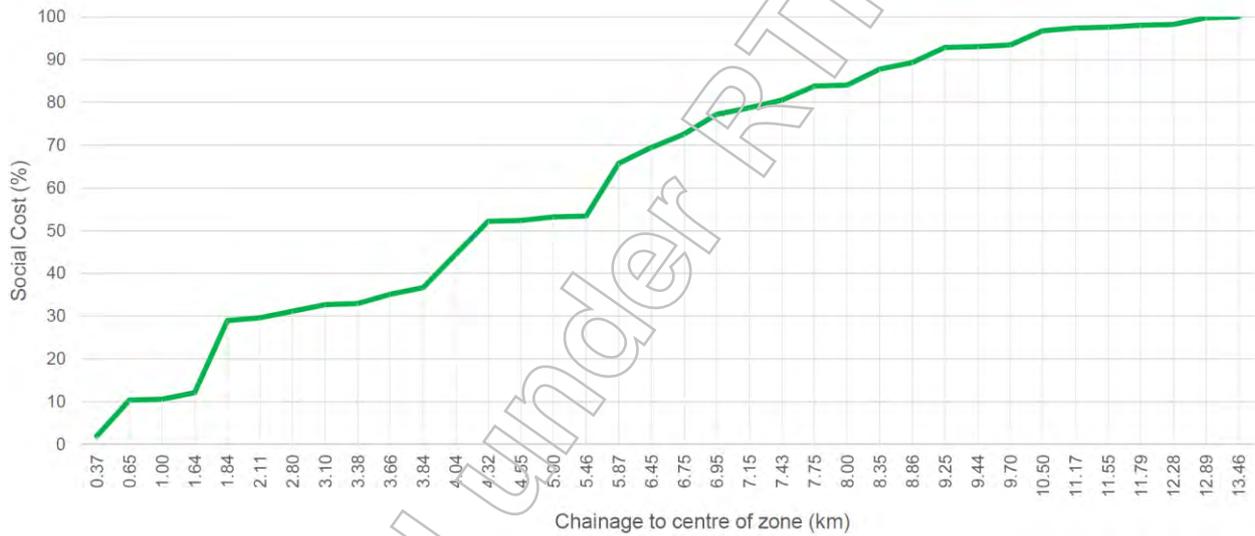


Figure 8: Incremental social cost (in order of chainage)

6 SIMS data analysis

Crash data has been extracted from TMR's STREAMS Incident Management System (SIMS) to identify general trends and assess the consistency of information with recorded crash data, where possible. TMR's traffic management centres use SIMS to manage road networks through detection, verification, logging and response to unplanned incidents such as crashes, planned events such as roadworks, and equipment faults.

Data extracted from SIMS has been restricted to incidents categorised in the system as 'Primary Crash'. The date range of data analysed extended over the five-year period between 1 July 2007 and 30 June 2012, to coincide with the date range used to analyse recorded crash data (as outlined in Section 5 of this report). A copy of tabulated data extracted from SIMS is attached in **Appendix D**.

It is important to highlight that the overall number of crash-related incidents recorded in SIMS is higher than that extracted from WebCrash, as it is not possible to exclude non-injury related incidents. Furthermore, as WebCrash is populated using information about incidents officially recorded by QPS, incidents detected for recording in SIMS—such as low impact, minor 'property damage only' crashes—may not be included. While TMR's traffic management centres endeavour to detect and record all incidents, it is more than likely undetected incidents occur.

6.1 Summary of SIMS data analysis

6.1.1 Total number of recorded incidents

- 224 incidents over five-year period

6.1.2 Number of incidents per year (% of total number)

- 2007/2008 – 32 (14%)
- 2008/2009 – 33 (15%)
- 2009/2010 – 46 (21%)
- 2010/2011 – 54 (24%)
- 2011/2012 – 59 (26%)

6.1.3 Number of incidents per day of week (% of total number)

- Monday – 33 (15%)
- Tuesday – 41 (18%)
- Wednesday – 35 (16%)
- Thursday – 34 (15%)
- Friday – 37 (16%)
- Saturday – 26 (12%)
- Sunday – 18 (8%)

6.1.4 Time of day

- 90% of incidents occurred between 7am and 6pm (31% between 8am and 11am, 23% between 3pm and 6pm)
- The highest number of incidents during the peak hours were:

Time of day	Crashes (quantity)
10am to 11am	27
8am to 9am	22
9am to 10am	21
5pm to 6pm	21

6.1.5 Duration (hrs) of incidents (% of total number of incidents)

- 00:01 to 00:59 – 86 (38%)
- 01:00 to 01:59 – 68 (30%)
- 02:00 to 02:59 – 20 (9%)
- 03:00 to 03:59 – 6 (3%)
- 05:00 to 05:59 – 2
- 06:00 to 06:59 – 1
- 07:00 to 07:59 – 1
- 09:00 to 09:59 – 2
- 10:00 to 10:59 – 1
- 16:00 to 16:59 – 1

6.2 SIMS data analysis key findings

Table 2: Key findings

Item No.	Category	Key finding
6.2.1	Frequency	High number of detected crashes per year, average 45. (Overall number of crashes increasing each year, however could be influenced by ongoing improvements to detection and recording techniques).
6.2.2	Day of week	Majority of detected incidents occur on a weekday, between 15% and 18% per day. (<i>WebCrash data indicates Sunday as peak</i>)
6.2.3	Time of day	90% of incidents occurred between 7am and 6pm. General peak hours between 8am and 11am. (<i>Relatively consistent with WebCrash data</i>).
6.2.4	Duration	62% of detected incidents have a duration of more than one hour, indicating the likelihood of significant congestion (where lanes are closed) and the potential for secondary crashes.

7 Crash countermeasures

Austrroads' *Guide to Road Safety Part 8: Treatment of Crash Locations* (2015) provides guidance on engineering countermeasure selection where the elements of the road and traffic environment that contribute to crashes and their severity are identified.

According to the guide, the aim of countermeasure development is to:

- select countermeasures which have been demonstrated to be effective in reducing the incidence and/or severity of target crash types
- check that adopted countermeasures do not have undesirable consequences, either in safety terms (for example, lead to an increase in the number or severity of another crash type, or crash migration) or in traffic efficiency or environmental terms
- be cost-effective, that is, maximise the benefits from the whole program of expenditure over a number of sites
- be efficient and produce benefits which outweigh the costs.

Table 4.5 and Table F2 from the Austrroads guide provide direction on the selection of suitable countermeasures and identify likely reductions in crashes following implementation. The tables have been used to assist with selecting suitable treatments to counteract the key findings outlined in Table 1 (refer Section 5.2) and Table 2 (refer Section 6.2).

Reference has also been made to Austrroads' *Technical Report - Road Safety Engineering Risk Assessment Part 6: Crash Reduction Factors*, with regards to considering the benefit of less traditional treatments such as ITS applications, in particular a Variable Message Sign (VMS). A copy of Austrroads reference material used when developing countermeasures is attached in **Appendix E**.

In addition to engineering treatments, consideration has also been given to enforcement and education countermeasures to counteract issues identified through the analysis of crash and SIMS data. Such action is supported under the *Safer Roads, Safer Queensland: Queensland's Road Safety Action Plan 2015-17*.

Table 3 outlines the range of enforcement, educational and engineering countermeasures that could be adopted to reduce the occurrence and severity of crashes.

Table 3: Countermeasures

Item no.	Category	Source of data	Description	Countermeasure
7.1.1	Frequency	Crash data SIMS data	Average of 23 recorded crashes per year. Average of 45 detected incidents per year.	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives.
7.1.2	Frequency	Crash data SIMS analysis	Majority of recorded crashes occurred on a Sunday. Majority of detected incidents occurred on a weekday, with between 15% and 18% per day.	Continue to monitor the occurrence of incidents and where trends in frequency are identified, investigate opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices.
7.1.3	Frequency	Crash data SIMS data	80% of incidents occurred between 7am and 6pm, and 45% between 9am and 2pm. 90% of incidents occurred between 7am and 6pm. General peak hours between 8am and 11am.	Consider opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices during peak times.
7.1.4	Duration	SIMS analysis	62% of detected incidents have a duration of one hour or more, indicating the likelihood of significant congestion (where lanes are closed) and the potential for secondary crashes.	Endeavour to minimise congestion by maximising opportunities to alert motorists via web-based reports, radio, social media and/or ITS devices (VMS).
7.1.5	Severity	Crash data	The majority of crashes resulted in injuries requiring hospitalisation (3% fatal, 39% hospitalisation, 38% medical treatment, 20% minor injury).	In accordance with the 'Safe System Approach' philosophy supported by TMR, consider opportunities to reduce the occurrence and severity outcome of crashes as part of future major infrastructure maintenance or upgrade projects.
7.1.6	Crash types	Crash data	'Run-off-road' (47%) and 'head-on' (30%) are the predominant crash types. 66% of 'dead-on' and 54% of 'run-off road' crashes (predominant crash types) occurred on wet roads.	'Run-off road' type crashes: <ul style="list-style-type: none"> maintain a high standard of delineation (i.e., linemarkings, REGPs, RRPMS and CAMs) review the application of alignment warning and advisory speed signing assess surface texture and skid resistance. 'Head-on' type crashes: <ul style="list-style-type: none"> maintain a high standard of centreline markings and supplementary RRPMS review the standard of existing overtaking facilities opportunities (i.e. visual cues, signing and linemarkings) investigate opportunities for constructing additional overtaking facilities.

Item no.	Category	Source of data	Description	Countermeasure
7.1.7	Contributing circumstances	Crash data	'Violation – cross double lines' and 'Violation – undue care and attention' most commonly attributed to 'head-on' type crashes.	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.
7.1.8	Contributing circumstances	Crash data	'Road – wet/slippery' most commonly attributed to 'head-on' and 'run-off road' type crashes.	Assess surface texture and skid resistance. Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.
7.1.9	Contributing circumstances	Crash data	Excessive speed attributed to 12 recorded incidents.	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.
7.1.10	Road surface	Crash data	52% of incidents occurred when the road pavement was wet, 42% of those incidents resulted in injuries requiring hospitalisation.	Continue to monitor pavement surface wear and texture with a view to maintaining a high standard of pavement condition.
7.1.11	Road surface	Crash data	52% of crashes occur on 33% of days per year (i.e. 119 wet days out of 365).	Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.
7.1.12	Road corridors	Crash data	Considering both the total 'number of injury crashes' and total 'social cost', the overall road segment ranks high (5 th) compared to other 15km state-controlled road segments throughout the district. (15km length based on standard WebCrash report). Although the road segment has a high number of crashes, the AADT of approximately 8,500 VPD is significantly less than the 32,000-47,000 VPD on the road segments ranked 1 st to 4 th .	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives. Investigate ongoing safety funding opportunities to address emerging crash trends and safety issues.
7.1.13	Crash zones	Crash data	Majority of crashes occur towards the eastern end of the subject road segment. About 50% of all crashes within the first 5km, and 70% of all crashes within the first 7km.	Where there is limited funding to implement mass action safety improvement projects, consider limiting works to locations where data identifies clusters of crashes.

8 Road safety review

A safety review has been conducted along the subject section of Kennedy Highway to identify existing and potential safety issues, and make recommendations regarding effective and cost-efficient engineering solutions. At the western end of the Kennedy Highway, the extent of road inspected extended slightly beyond the segment boundary in order to assess safety when entering and exiting the subject road section. The Kennedy Highway terminated at the eastern end where it intersected with the Captain Cook Highway. As safety issues associated with the intersection were not in scope, site inspections commenced on the western side of the intersection.

Day and night site inspections were carried out between Sunday 11 October and Thursday 15 October 2015. The inspections were conducted by an audit team comprising of:

Darren Shirley Senior Road Safety Auditor
Principal Consultant - RoadPro Consulting

Luke Kidd Senior Road Safety Auditor
Engineering Consultant - RoadPro Consulting

Parts of the road were inspected on foot and digital photographs taken to capture observations. Information gathered during the site inspection and other information supplied by TMR form the basis of the findings.

All issues identified during the safety review, along with suggested actions, are recorded in **Table 4**. These suggested actions are not intended to be the only possible actions, rather, they have been provided as a guide for remedial action. The responsibility for the selection and implementation of the recommendations rests with TMR, and Far North District should decide the appropriate actions for the identified issues and select the appropriate remedial measures.

Table 6: Summary of safety review findings is attached in **Appendix F** for the recording of comments and/or further actions in response to the suggested actions.

A suggested priority for remedial treatment has been allocated to each of the identified issues using the following ratings:

Priority A: Highest priority for action from a safety view point.

Priority B: Action needs to be taken from a safety view point.

Priority C: Action is desirable from a safety view point.

For ease of reference, the subject road segment is referenced to travel from east to west. The east direction is travelling towards Smithfield and the west direction is travelling towards Mareeba.

Table 4: Safety review findings

Item no.	Site inspection findings	Suggested action	Priority
8.1	Signage		
8.1.1	<p>The condition of road traffic signs was generally to a high standard throughout the audit site, with most signs performing well during both day and night inspections. However, several maintenance and installation issues were identified that affected a small number of signs, including:</p> <ul style="list-style-type: none"> • overhanging vegetation obscured vegetation • signs installed in close succession so that subsequent signs were partially obscured • sign faces coated in dirt or mould, which reduced effectiveness, particularly during the night inspection • damaged by vehicle strike • poor condition/faded due to age • signs missing and not replaced • superseded/outdated signs not upgraded to meet current signing practice • sign faces rotated 180 degrees on post. <p>To maximise traffic safety, it is essential road users are provided with clear, concise and consistent road traffic signing that is visible in all weather and lighting conditions. As important is the need to regularly inspect and maintain signs where required.</p>	<p>Recommendation 8.1.1.1: Arrange for vegetation trimming/removal to be undertaken at locations where traffic signs are obscured by foliage including warning signs on the steep range section and the road name sign at the Saddle Mountain Road intersection.</p> <p>Recommendation 8.1.1.2: Arrange the replacement of damaged, faded, and missing signs throughout the audit site. Ensure the content of all new signs complies with current design standards (such as MUTCD or TC sign designs).</p> <p>Recommendation 8.1.1.3: Arrange relocation of signs that are obscured by the close longitudinal placement of successive signs or where the spacing does not comply with the minimum separation requirements of Part 1/1.12.2 of the MUTCD.</p> <p>Recommendation 8.1.1.4: Arrange for cleaning of sign faces, particularly in heavily shaded areas, to maximise sign effectiveness and night time reflectorisation.</p>	<p>A</p> <p>A</p> <p>B</p> <p>B</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.1 Cont'd</p>	 <p>Photograph 1: KEEP LEFT sign facing wrong direction on nose of median island at the Kennedy Highway/Myola Road intersection.</p>  <p>Photograph 2: TURN LEFT AT ANY TIME WITH CARE sign in poor condition on the left-turn slip lane at the Kennedy Highway/Myola Road intersection.</p>	<p>Recommendation 8.1.1.5: Arrange for rotated signs to be realigned to face approaching traffic.</p> <p>Recommendation 8.1.1.6: Arrange for existing TURN LEFT AT ANY TIME WITH CARE (R2-16) signs to be replaced with GIVE WAY (R1-2B) signs, on the left-turn slip lanes at the Canopys Edge Boulevard and Rob Veivers Drive intersections (refer to MUTCD Part 14/6.1(d) for detail).</p>	<p>A</p> <p>C</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.1 Cont'd</p>	 <p>Photograph 3: Damaged KEEP LEFT sign on the nose of the median island at the Kennedy Highway/Rob Veivers Drive intersection.</p>  <p>Photograph 4: KEEP LEFT sign missing from the nose of the median island on the eastbound approach to the Kennedy Highway/Canopys Edge Boulevard intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.1 Cont'd</p>	 <p>Photograph 5: Example of closely spaced signs near the base of the range on the western side of the RoadTek Depot.</p>  <p>Photograph 6: Damaged Slippery / When Wet sign at chainage 8.77km LHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.1 Cont'd</p>	 <p>Photograph 7: Example of warning sign (LEFT LANE ENDS) obscured by overgrown vegetation at chainage 11.28km LHS.</p>  <p>Photograph 8: Example of dirty sign face (Reverse Curve above 30km/h Advisory Speed sign) that showed poor reflectivity during the night inspection (chainage 1.40km RHS).</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.1.2	<p>There was an inconsistent application of signs and linemarkings at overtaking lanes, climbing lanes, and slow vehicle turnouts throughout the audit site. Issues identified with these treatments include:</p> <ul style="list-style-type: none"> KEEP LEFT UNLESS OVERTAKING (R6-29) signs had been installed near the start of some auxiliary lanes immediately after SLOW VEHICLE LANE AHEAD (G9-10) signs. Although the diverge taper directed traffic into the left lane (typical of an overtaking lane), the auxiliary lane length was very short, hence it was unclear if the lane's purpose was as a climbing lane or overtaking lane. FORM 1 LANE (G9-15) signs were installed at the start of most merge tapers, indicating that 'zip-merge' arrangements were in effect. The zip-merge was considered appropriate for all climbing lanes, however its use at overtaking lanes was inconsistent with standard signing practices (refer MUTCD Part 2/4.7.2(b)). In addition, the FORM 1 LANE signs were often contradictory to the use of other devices including LEFT LANE ENDS (W4-9)/ MERGE RIGHT (W8-15) signs, continuity lines at the merge taper and/or merge pavement arrows, which indicated that "lane change" merge rules applied. A combination of continuity lines and lane lines had been used at most slow vehicle turnouts to separate the auxiliary lane from the adjacent through traffic lane. The use of lane lines was considered inappropriate as it could give the impression of a longer length of auxiliary lane than was actually present. The merge area at most slow vehicle turnouts was linemarked as a 'zip merge' and signed with a FORM 1 LANE (G9-15) sign. The sign often conflicted with the presence of merge pavement arrows on the road surface that are restricted for use with a lane change merge. In some cases no signs were placed at the merge and a full length continuity line had been marked along the turnout. 	<p>Recommendation 8.1.2.1: Confirm the purpose of auxiliary lanes within the audit site as either overtaking lanes or climbing lanes. Ensure that signs installed on approach to each treatment comply with the standard layouts shown in Part 2, Figures 4.21 and 4.22 of the MUTCD. Arrange for any contradictory or redundant signs to be removed. Also ensure that the diverge tapers are correctly linemarked to direct through traffic into the left (overtaking) or right (climbing) lanes. In situations where the merge is not clearly visible to approaching traffic in both lanes (e.g. the merge is located on a right curve), consider adopting a lane change merge treatment that incorporates a continuity line at the merge and associated 'merge' signage (i.e. LEFT LANE ENDS (W4-9)/ MERGE RIGHT (W8-15) and MERGE RIGHT (G9-73) signs). Refer to Part 2/4.7.2 of the MUTCD for further detail on both zip-merge and lane change merge treatments.</p> <p>Recommendation 8.1.2.2: Review the application of signs and linemarkings at slow vehicle turnouts throughout the audit site, with a view to providing a consistent treatment that conforms to the requirements of Part 2/4.8 and Figure 4.22 of the MUTCD. Consider removing existing FORM 1 LANE signs, merge pavement arrows and broken lane lines, and replace with a continuity line that extends along the full length of the slow vehicle turnout.</p>	<p>A</p> <p>A</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.2 Cont'd</p>	<p>As most auxiliary lanes throughout the audit site were very short, it is important motorists are given clear and consistent information on the purpose of each lane and the action required when merging.</p>  <p>Photograph 9: Example showing conflicting signage arrangements in the merge area of an overtaking lane (i.e. LEFT LANE ENDS / MERGE RIGHT sign vs FORM 1 LANE sign).</p>  <p>Photograph 10: Example showing conflicting signs and pavement markings in the merge area of an overtaking lane (i.e. FORM 1 LANE sign vs merge arrows and continuity line).</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.2 Cont'd</p>	 <p>Photograph 11: Example showing a combination of continuity line and broken lane line to separate the through traffic lane from the slow vehicle turnout lane.</p>  <p>Photograph 12: Examples showing an 'overtaking' sign at the start of an auxiliary lane was superseded by a SLOW VEHICLE LANE AHEAD sign.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.3</p>	<p>There were numerous alignment warning and curve advisory speed signs throughout the range section of the audit site. The values shown on some advisory speed signs were in 5km/h increments, which was inconsistent with current requirements for 10km/h speed value increments specified in Part 2/4.4.7.7 of the MUTCD.</p> <p>As most curve advisory speed signs appeared relatively new, it was unclear if the displayed speed values had been determined using current practice, or if older signs that showed 5km/h increments had simply been replaced. It is critical that posted advisory speeds be determined using accepted traffic engineering procedures.</p>  <p>Photograph 13: Example showing an advisory speed sign with its value in 5km/h increments.</p>	<p>Recommendation 8.1.3.1: Confirm the process used to determine advisory speed values on horizontal curves throughout the audit site. Where an accepted traffic engineering procedure has not been used, or records are not available, consider undertaking a mass review of advisory speeds using the process outlined in Appendix C, Part 2 of the MUTCD. Where discrepancies are identified, arrange for Advisory Speed (W8-2) signs to be replaced as necessary so that posted speed values are in 10km/h increments.</p> <p>Recommendation 8.1.3.2: Where a mass action review of advisory speed values is undertaken in accordance with Recommendation 8.1.3.1, also review the application of associated alignment warning signs to check the type (diagrammatic symbol) and location of the signs are consistent with advisory speed requirements. The appropriate combination of alignment warning and advisory speed signing is outlined in Part 2/4.4.6 of the MUTCD.</p>	<p>A</p> <p>A</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.4</p>	<p>A special warning sign that incorporated a Steep Climb (W5-13) sign was installed near the base of the range (immediately west of the RoadTek depot). However, there were no signs installed at the top of the range to warn eastbound motorists of the long steep descent, or the potential need for trucks and buses to use low gears.</p> <p>To assist heavy vehicle drivers to moderate speeds on approach to the steep downgrades, it is important that adequate advance warning is provided.</p>  <p>Photograph 14: Steep Climb sign incorporated into a special target board near the base of the Kuranda Range (immediately west of the RoadTek Depot).</p>	<p>Recommendation 8.1.4.1:</p> <p>In accordance with Part 2/4.9 of the MUTCD, investigate the need for additional steep grade signing throughout the Kuranda Range section of the Kennedy Highway. Where the need for additional signing is identified, ensure the application of signage complies with current MUTCD guidelines.</p>	<p>A</p>

Item no.	Site inspection findings	Suggested action	Priority
8.1.5	<p>Street name and direction signs at intersections throughout the audit site were inconsistently applied and of inconsistent standard. Identified issues included:</p> <ul style="list-style-type: none"> street name signs were not installed at some intersections, including Cumberland Avenue, Rob Veivers Drive and Myola Road street name signs were installed with a non-standard colour scheme (yellow background) at Warril Drive, Fallon Road, Black Mountain Road and Saddle Mountain Road single-sided street name signs were installed facing traffic from one direction only at the Warril Drive and Fallon Road intersection advance street name signs were not installed at the start of deceleration lanes to advise motorists of the street name to which the lane leads a street name sign was not readily visible at Green Hills Road due to small font size and the sign's location being offset too far from the intersection a proliferation of advance and supplementary advance direction signs were installed on approach to the intersection with Rob Veivers Drive and Myola Road intersection signs were installed with a non-standard colour scheme and information inconsistent with that shown on advance direction signs at the Rob Veivers Drive and Myola Road intersection. <p>Prominent direction signage is an essential element in effectively guiding motorists through the road network while maximising intersection safety for turning vehicles. Signs must be legible at a distance appropriate to the speed environment and should be placed sufficiently far in advance of intersections (e.g. at the start of deceleration lanes) to permit any necessary manoeuvres. This is particularly important on roads with a high volume of tourist traffic, as it enables road users to identify intersecting streets and destinations without having to take their attention off the road for an unnecessarily long period, or slow down to a point where they create a hazard.</p>	<p>Recommendation 8.1.5.1:</p> <p>Arrange for street name signs to be installed or upgraded at intersections throughout the audit site. Ensure the minimum treatment at all side-road intersections includes a street name sign with black legend on a white background (Part 5/2.6 of the MUTCD). This sign should be installed as close to the intersection as possible and be readily visible to traffic from both major road approaches (Part 5/2.9 of the MUTCD). Where the speed limit past the intersection is greater than 60km/h, the text height should be increased to 130mm minimum (Part 5/2.5 of the MUTCD). At intersections that have deceleration lanes but no advance direction signage, advance street name signs of the G2 or G3 type should also be installed at the start of the deceleration lane (Part 5/2.11 of the MUTCD).</p> <p>Recommendation 8.1.5.2:</p> <p>Arrange for advance and supplementary advance direction signs to be rationalised at the intersection of the Kennedy Highway, Rob Veivers Drive and Myola Road. Any desired tourist and service information should ideally be incorporated into the advance direction sign. Where there is an excessive amount of information to be signed, the service and tourist information should be shown on a single supplementary advance sign. Refer to Part 6/5.6.1 of the MUTCD for further detail on combining service signs with direction and tourist signs.</p>	<p>B</p> <p>C</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.5 Cont'd</p>	 <p>Photograph 15: Road name signs installed at the Fallon and Warril roads intersection used a non-standard colour scheme, with no sign for Warril Road facing westbound traffic.</p>  <p>Photograph 16: Eastbound view at the Green Hills Road intersection showing a street name sign (G5-1) with small font offset approximately 15m from the major leg.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.5 Cont'd</p>	 <p>Photograph 17: Intersection direction signs at the Rob Veivers Drive intersection used a non-standard colour scheme and was inconsistent with information shown on the advance signage. There were also no street name signs installed.</p>  <p>Photograph 18: Examples showing some of the advance direction, service and tourists signs installed on approach to the Rob Veivers Drive/Myola Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.1.5 Cont'd</p>	 <p>Photograph 19: Westbound view on approach to the Saddle Mountain Road intersection showing the absence of an advance road name sign near the deceleration lane taper.</p>  <p>Photograph 20: Westbound view on approach to the Green Hills Road intersection showing the absence of an advance road name sign near the deceleration lane taper.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.2 Line and pavement markings			
8.2.1	<p>Lines and pavement markings throughout the audit site were generally in very good condition, which provided a high standard of lane definition throughout both day and night inspections. However, there were several locations, primarily at intersections, where lines and pavement markings were worn/faded as a result of regular vehicle movements across the lines.</p> <p>Locations where deterioration was evident included:</p> <ul style="list-style-type: none"> • pavement arrows, continuity lines, and chevron splay markings at Canopys Edge Boulevard • pavement arrows at the Henry Ross Lookout • give way line, continuity line and edge lines (near kerb return) at Saddle Mountain Road intersection • give way line, continuity line, edge lines (near kerb return), median island outline, and diagonal pavement markings near turnout at Black Mountain Road, • edge lines, centre lines and median island splays between Rob Veivers Drive and Green Hills Road intersection • edge lines between Green Hills Road and Warril Drive intersection • island outlines, chevrons markings and diagonal markings at Warril Drive and Fallon Road intersection. <p>Line and pavement markings provide important regulatory control and guidance for motorists, hence it is essential they are regularly inspected and reapplied as required, particularly at intersections where there is an increased need for clear visual cues.</p> <p>Given the extent of substandard alignment and hazardous roadside environment throughout the audit site, maintaining a high standard of line and pavement markings is a crucial component to maximising safety for road users.</p>	<p>Recommendation 8.2.1.1: Arrange for worn and deteriorated lines and pavement markings to be remarked at the identified locations. Prioritise and schedule works accordingly with other planned maintenance.</p> <p>Recommendation 8.2.1.2: Check the department's current maintenance arrangement with a view to ensuring a high standard of line and pavement markings is maintained throughout the audit site through regular inspections and subsequent reapplication, as required.</p>	<p>C</p> <p>B</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.2.1 Cont'd</p>	 <p>Photograph 21: Example of worn give way line at the Black Mountain Road intersection.</p>  <p>Photograph 22: Example of worn edge line beside the kerb return at the Saddle Mountain Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.2.1 Cont'd</p>	 <p>Photograph 23: Example of worn outline markings and chevrons on the splayed island approach at Canopys Edge Boulevard.</p>  <p>Photograph 24: Example of worn edge lines between Rob Veivers Drive and the Green Hills Road intersection (photograph shows eastbound lane near end of median island).</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.2.2	<p>The configuration of the access at the western end of the Henry Ross Lookout was not clear. A small splitter island was positioned centrally at the access to separate vehicles that enter and exit the lookout parking area. A bidirectional hazard marker installed on the nose of the splitter island could be misconstrued as permitting traffic to enter the lookout around both sides of the island. There was an absence of linemarking and delineation around the splitter island and beside the entry lane to clarify the intended movement of traffic at the access. Furthermore, there were no signs installed on the opposing end of the island to prevent vehicles from exiting through the entry lane.</p> <p>Minor sign and pavement marking improvements could reduce any potential confusion or indecision at the access, and assist turning traffic to decelerate clear of the through lane at their earliest opportunity.</p>	<p>Recommendation 8.2.2.1:</p> <p>Consider undertaking the following works to clarify the permitted traffic movements at the Henry Ross Lookout's western access:</p> <ul style="list-style-type: none"> • install an edge line beside the entry lane • install outline markings with splayed ends around the median splitter island • install a left-turn arrow at the start of the entry lane and opposing straight arrows near the eastern end of the median splitter island • install a KEEP LEFT (R2-3A) sign on the eastern end of the median splitter island • install an additional NO ENTRY (R2-4B) sign behind the safety barrier, adjacent to the existing sign on the eastern end of the median splitter island, to face exiting traffic. <p>Refer to Figures 9 and 10 that show conceptual views of the suggested treatments.</p>	B

Item no.	Site inspection findings	Suggested action	Priority
<p>8.2.2 Cont'd</p>	<div data-bbox="257 209 1211 740"> </div> <p data-bbox="257 756 1211 810">Photograph 25: Eastbound view at the Henry Ross Lookout western access. The absence of linemarking/delineation at the entry could confuse unfamiliar motorists.</p> <div data-bbox="257 852 1211 1358"> </div> <p data-bbox="257 1374 1211 1453">Photograph 26: Westbound view at the Henry Ross Lookout western access. There was an absence of linemarking, delineation and signage to clearly define permitted movements.</p>	<div data-bbox="1238 209 1995 740"> </div> <p data-bbox="1238 756 1995 810">Figure 9: Concept view showing suggested line and pavement marking works to clarify entry movements at the western access.</p> <div data-bbox="1238 852 1995 1358"> </div> <p data-bbox="1238 1374 1995 1428">Figure 10: Concept view showing suggested line, pavement marking and signage works to clarify exist movements at the western access.</p>	

Item no.	Site inspection findings	Suggested action	Priority
8.3 Delineation			
8.3.1	<p>Raised Reflective Pavement Markers (RRPMs) were installed throughout the audit site to supplement edge, centre, and lane lines. Road Edge Guide Posts (REGPs) were also installed near the shoulder/formation edge on unkerbed road sections. The application and condition of RRPMs and REGPs were to a high standard, which provided good night time delineation in both directions. There were isolated locations where REGPs and RRPMs were damaged or missing, however, the small number of absences did not detract from delineation continuity during the night inspection.</p> <p>Given the extent of substandard alignment and hazardous roadside environment throughout the audit site, maintaining a high standard of delineation is a crucial component to maximising safety for road users.</p>  <p>Photograph 27: Example showing missing consecutive centre line RRPMs between Rob Veivers Drive and Green Hills Road.</p>	<p>Recommendation 8.3.1.1: Arrange for the replacement of damaged and missing RRPMs and REGPs throughout the audit site.</p> <p>Recommendation 8.3.1.2: Check the department's current maintenance arrangement with a view to ensuring a high standard of delineation is maintained throughout the audit site through regular inspections and replacement of devices, as required.</p>	<p>B</p> <p>B</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.3.1 Cont'd</p>	 <p>Photograph 28: Example showing missing centre line RRPMS immediately east of the Green Hills Road intersection.</p>  <p>Photograph 29: Example showing damaged REGPs on the range, east of Avondale Creek.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.4 Safety barriers			
8.4.1	<p>Safety barriers were installed at numerous locations throughout the audit site. In most cases they were offset between 0.5m and 1m from the traffic lanes and fitted with extruder or tension terminals on each end (e.g., ET 2000 Plus or X-350). The end terminals were typically flared away from the traffic lane; however, where the width was constrained they were installed tangentially.</p> <p>There were at least four locations where end terminals had been damaged as a result of vehicle strike. In most cases the damage was minimal, suggesting 'nuisance strikes' had occurred as a result of the close proximity to the traffic lane. As safety barriers are themselves a hazard within the clear zone, it is essential that post-crash repairs are undertaken so they remain functional in the event of future collisions.</p> <p>Post-crash assessment and repair of road safety barriers is detailed in Section 3.5, Part 1 of the Australian/New Zealand standard <i>Road Safety Barrier Systems</i> (AS/NZ 3845.1:2015).</p> 	<p>Recommendation 8.4.1.1: Arrange for all safety barrier terminals to be inspected and for any damaged components to be logged for repaired/replaced as necessary. As a minimum practice, conduct assessments in accordance with Section 3.5, Part 1: Road Safety Barrier Systems (AS/NZ 3845.1:2015).</p> <p>Recommendation 8.4.1.2: Arrange for uni-directional hazard stickers (D4-1-2-Q01) to be installed on end terminals where they are missing and for the replacement of existing stickers where they have been damaged. Also ensure that at least one dual-sided delineator is placed close to the end of each terminal head.</p>	<p>A</p> <p>A</p>

Photograph 30: Damaged X-350 end terminal at chainage 6.55km RHS.

Item no.	Site inspection findings	Suggested action	Priority
<p>8.4.1 Cont'd</p>	 <p>Photograph 31: Damaged ET2000 Plus end terminal at chainage 7.45km RHS.</p>  <p>Photograph 32: Damaged ET2000 Plus end terminal at chainage 7.96km LHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.4.2	<p>There were a significant number of successive delineators either missing or damaged on the section of guardrail that extended between the Barron River Bridge and Black Mountain Road (right side of carriageway). As the barrier is situated close to the traffic lanes, a high standard of delineation is required to alert motorists of the potential hazard during periods of poor light or adverse weather conditions.</p>  <p>Photograph 33: Eastbound view towards the Black Mountain Road intersection showing missing delineators on the W-Beam barrier face.</p>  <p>Photograph 34: Eastbound view towards Black Mountain Road intersection during the night inspection showing the absence of reflectorisation from guardrail delineators.</p>	<p>Recommendation 8.4.2.1: Arrange for new delineators to be placed on the section of W-Beam barrier that extends between Barron River Bridge and Black Mountain Road (right side of carriageway).</p>	A

Item no.	Site inspection findings	Suggested action	Priority
8.5 Roadside hazards			
8.5.1	<p>As a consequence of the mountainous terrain and the road's location within a heavily treed conservation park, the roadside contained a large number of high severity hazards. The types of hazards encountered and their proximity to the traffic lanes were generally consistent throughout the audit site, including:</p> <ul style="list-style-type: none"> steep and high fill embankments where the batter hinge point was situated between 1m to 2m from the traffic lane edge large trees within non-frangible trunks situated either beside the formation, on non-recoverable batter slopes, or near the toe of fill embankments steep-sided, high-cut batters, some with rough and jagged rock faces, where rocks or soil could become loose or subside onto the traffic lanes roadside drains with non-recoverable fore slopes and back slopes that could cause an errant vehicle to roll. <p>There were many areas where safety barriers had been installed to shield errant vehicles from the steep/tree-lined embankments. It was also evident that a significant amount of slope stabilisation work been undertaken to reduce the potential for rock falls and slides. However, there were still numerous locations where unshielded embankments, steep cuts, and large trees posed a potential hazard. The audit team identified two such sites where vehicles had recently left the road and come to rest near the base of a steep embankment (chainage 8.77km RHS and chainage 8.13km RHS). There was also evidence that a tree had recently fallen onto the road at chainage 7.86km RHS prior to being relocated beside the shoulder.</p>	<p>Recommendation 8.5.1.1: Where a mass action roadside hazard reduction program is supported within the audit site, conduct a detailed site inspection to log specific details for each roadside hazard. Use the prioritisation and treatment process outlined in Part 8.1 of the <i>Road Planning and Design Manual (RPDM)</i> to assist in identifying appropriate treatment options. Use an accepted risk assessment method, such as TMR's RISC software, to evaluate and rank potential treatment options. Establish a prioritised register of recommended treatments and consider a staged implementation as funding becomes available.</p> <p>Recommendation 8.5.1.2: Investigate options for incorporating roadside hazard reduction or shielding works as part of future corridor upgrade projects and/or major rehabilitation projects on the Kennedy Highway.</p> <p>Recommendation 8.5.1.3: Arrange an inspection of steep/high-cut slopes within the audit site to identify locations that may be prone to slides and areas where cut slopes are potentially unstable. Also identify locations where large rocks are situated in potentially hazardous locations. Arrange for the removal of debris at locations where existing slides have occurred and determine the need and relative priority for stabilisation and rock removal works in locations where there is a high risk of cut failures.</p>	<p>C</p> <p>C</p> <p>C</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.5.1 Cont'd</p>	<p>Assessing and prioritising treatment options throughout the audit site could be achieved using quantitative risk assessment techniques, such as TMR's Roadside Impact Severity Calculator (RISC) software. Although, given the significant number and extent of roadside hazards, in addition to the restrictions on removing vegetation from within the conservation park, the audit team acknowledges it may be difficult to justify costs associated with a mass action program to remove, relocate, or shield all roadside hazards.</p> <p>Where funding for higher cost hazard mitigation work is limited, maintaining a high standard of traffic lane delineation is generally considered to be the minimum treatment that should be provided. In this instance, the standard and condition of existing delineation throughout the audit was found to be very good.</p>  <p>Photograph 35: Example of steep-sided cutting with jagged rocks protruding at chainage 2.06km RHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.5.1 Cont'd</p>	 <p>Photograph 36: Example of high/steep-sided embankment situated within 1.5m of the traffic lane edge near chainage 3.0km LHS.</p>  <p>Photograph 37: Example of where a vehicle had recently travelled over a high, steep-sided embankment at chainage 8.75km LHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.5.1 Cont'd</p>	 <p>Photograph 38: Example of where a vehicle had recently travelled over a high, steep-sided embankment at chainage 8.18km RHS.</p>  <p>Photograph 39: Example of where a tree had recently fallen onto the road at chainage 7.86km RHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.5.1 Cont'd</p>	 <p>Photograph 40: Example of a location where a large tree was situated 2m from the traffic lane edge on the outside of a horizontal curve at chainage 7.49km RHS.</p>  <p>Photograph 41: Example of a steep-sided cut batter where there appeared to be a risk of loose rocks falling onto the road at chainage 7.47km LHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.6 Alignment			
8.6.1	<p>As a consequence of the mountainous terrain, the Kuranda Range features a predominantly winding alignment in combination with long steep grades. Although the alignment features sub-standard elements in some areas, the consistent radii and close spacing of successive horizontal curves largely constrain vehicle speeds.</p> <p>Sight distance was diminished in many areas as a result of the winding alignment, however the presence and severity of upcoming curves could be readily perceived. The high standard and good condition of alignment warning signs, in addition to the provision of high impact target board signs and vehicle-activated warning signs, clearly alerted motorists of the need to moderate speed.</p> <p>In spite of the existing speed reduction measures, there were numerous occasions throughout the day and night inspections where the audit team witnessed poor driver behaviour including aggressive driving, tailgating, high speeds, and excessive cornering speeds. It was evident that improving driver behaviour and minimising excessive speeds should be a primary focus in improving safety throughout the audit site. However it was acknowledged that the steep, winding alignment and narrow shoulder widths presents a challenge to the use of conventional police enforcement activities.</p>	<p>Recommendation 8.6.1.1:</p> <p>Investigate options to install one or more Intelligent Transport System (ITS) technologies that can identify and discourage poor driving behaviours (e.g., speeding, tailgating and excessive cornering speeds). Ideally a suite of measures could be adopted to compliment and build upon the several existing vehicle-activated signs.</p> <p>Measures to consider may include:</p> <ul style="list-style-type: none"> • Variable Message Signs (VMS) • Automatic Number Plate Recognition (ANPR) devices • Vehicle-activated signs (VAS) – warning and speed. 	A

Item no.	Site inspection findings	Suggested action	Priority
<p>8.6.1 Cont'd</p>	 <p>Photograph 42: VAS installed on approach to a series of closely spaced curves when travelling up the range at chainage 4.82km LHS.</p>  <p>Photograph 43: VAS installed on approach to a series of closely spaced curves when travelling down the range at chainage 4.69km RHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.7 Pedestrians and cyclists			
8.7.1	<p>To facilitate the movement of pedestrians and cyclists between the township of Kuranda and Black Mountain Road, a crossing of the Barron River was provided using the road shoulder on the northern side of the bridge. Path users were required to cross the Kennedy Highway near the western bridge abutment to link between the paths located on each side of the bridge. Safety issues identified with the pedestrians facilities around the Barron River Bridge are detailed below.</p> <ul style="list-style-type: none"> • Plastic bollards installed beside the edge line on the northern side of the bridge provided only limited physical separation between traffic and path users. There were no signs installed to warn of pedestrians or cyclists walking near to the traffic lane. • Pedestrians were required to cross Kennedy Highway near the western bridge abutment that was situated in a 'rural' environment that had an 80km/h posted speed limit. It appeared unlikely that motorists would expect to encounter pedestrians or cyclists crossing the road in this area. There was no signs or other devices installed to warn motorists or to encourage lower speeds. • An opening had been provided in the safety barrier located beside the southern roadside to enable pedestrians to cross the Kennedy Highway near the western bridge abutment. <ul style="list-style-type: none"> ○ Breakaway Cable Terminals (BCT) with buffered ends were attached to each end of the barrier openings, which is not compatible with crashes involving smaller vehicles and therefore should no longer be used (refer RPDM, Chapter 8/8.2.6.3). ○ The location of the opening also caused the length of barrier that was attached to the bridge parapet to be too short to allow an appropriate crash tested transition from the W-beam to the rigid bridge barrier (refer RPDM, Chapter 8/8.2.7.5). ○ Post spacing between the buffered end and the bridge parapet was also too large to prevent pocketing of the rail during a collision (refer RPDM, Chapter 8/8.2.7.6 and Standard Drawing 1475). 	<p>Recommendation 8.7.1.1: Arrange for Pedestrians warning signs (W6-1) to be installed on each approach to the Barron River Bridge. Ensure the signs on the western bridge approach are positioned an appropriate distance in advance of the point where pedestrians cross the road. Refer to Part 10 of the MUTCD for specific details on warning signs for pedestrians.</p> <p>Recommendation 8.7.1.2: Consider removing/closing one of the two crossing points on the southern side of the Kennedy Highway (near the western bridge abutment) and directing path users to a single preferred crossing location via appropriate signage and upgraded path connections, if required. It is suggested that the crossing closest to the bridge abutment be closed to remove the potential visibility obstruction caused by the safety barrier and to allow a compliant barrier connection to the bridge rail to be provided.</p> <p>Recommendation 8.7.1.3: Undertake a design review of the barrier installation on the southern side of the Kennedy Highway near the western abutment of Barron River Bridge. The review should identify non-conformances with the existing barriers and propose a solution to upgrade the system to meet current departmental and Australian standards. Where funding for new or upgraded barrier works is limited, consider nominating the project for funding under future capital works or safety programs (e.g. Safer Roads Sooner).</p>	<p>A</p> <p>B</p> <p>B</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.7.1 Cont'd</p>	<ul style="list-style-type: none"> • A separate short section of W-beam had been installed behind the barrier opening to prevent a vehicle that travels through the opening from travelling behind the bridge rail. The length of this barrier was significantly less than the minimum length shown on Standard Drawing 1474 and is therefore unlikely to be fully effective during a crash. The close proximity of the parallel barrier systems, combined with the presence of buffered end terminals on the system closest to the traffic lanes, also created a restriction to the path width to less than 1m. • The close proximity of the crossing to the western bridge abutment and the presence of W-beam barriers could obscure pedestrians from the view of motorists. • A concrete path and kerb ramp were provided on the southern side of Kennedy Highway adjacent to the cul-de-sac at Therwine Street, and provided an alternative facility to cross the Kennedy Highway, approximately 60m west of the Barron River bridge abutment. The presence of the two separate crossing facilities within close proximity created an additional conflict point for motorists to monitor.  <p>Photograph 44: Eastbound view at the western abutment of the Barron River Bridge showing the raised bollards that separate the traffic lane and pedestrian path.</p>	<p>Recommendation 8.7.1.4: Determine if a suitable treatment can be provided to physically separate cyclists/pedestrians from vehicular traffic crossing the Barron River Bridge.</p> <p>A suggested option would involve constructing barrier kerb across the northern side of the bridge such that it is parallel with, and at the same height, as the existing bridge kerb, with breaks provided for drainage and at deck expansion joints. The new kerb could be offset from the traffic lane at a similar offset to that used between the edge line and bridge kerb on the southern side of the bridge. Chequered steel lintels could be fixed between the two parallel kerbs to create a raised walkway above the existing shoulder. Pedestrian fencing or a suitable barrier system (if sufficient width is available) would need to be provided along the edge of the new kerb.</p> <p>Where an options analysis identifies one or more suitable treatments, develop a business case for the preferred solution and prioritise upgrade works accordingly.</p>	<p>C</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.7.1 Cont'd</p>	 <p>Photograph 45: Eastbound view at the western abutment of the Barron River Bridge showing the break in W-Beam barrier that allows path users to cross the road.</p>  <p>Photograph 46: View looking north at the western abutment of the Barron River Bridge showing the path leading to the crossing point.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.7.1 Cont'd</p>	 <p>Photograph 47: Eastbound view 60m west of the Barron River Bridge western abutment showing the alternative path that leads to a second informal road crossing.</p>  <p>Photograph 48: Westbound view from the eastern abutment of the Barron River Bridge showing the raised bollards that separate the traffic lane and pedestrian path.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.7.2</p>	<p>During the daytime inspection several cyclists were observed riding eastbound on the Kennedy Highway, near the base of the Kuranda Range. The audit team was advised at the pre-start meeting that an off-road mountain bike trail extends down the side of the range, starting near the Henry Ross Lookout and terminating at chainage 1.13km on the right-hand side. Cyclists re-enter the Kennedy Highway at this point and ride the remaining distance to the base of the range on the road. The road shoulder along this section varied in width between 0.5m to 1m and is typically constrained by the presence of safety barrier or kerb. This required cyclists to travel partially or fully within the eastbound traffic lane.</p> <p>Bicycle warning signs were installed near the top (11.17km RHS) and base of the range (0.67km LHS), which provided a general warning to motorists that they may encounter cyclists on the range. However the sign facing eastbound traffic (chainage 11.17km RHS) failed to highlight the area near the base of the range where potential for cyclist/vehicle conflict was greatest. There was also no specific warning or protection where cyclists re-enter the road unexpectedly at chainage 1.13km.</p>  <p>Photograph 49: Westbound view near chainage 1.13km showing the location where the mountain bike trail re-enters the Kennedy Highway.</p>	<p>Recommendation 8.7.2.1:</p> <p>Arrange for a SHARE THE ROAD warning sign (TC1878) and supplementary plate (TC1864) (as illustrated in Figure 10) to be installed near chainage 1.21km RHS, which is prior to the point where the mountain bike trail terminates and cyclists re-enter the Kennedy Highway.</p> <p>Also arrange for a ROAD AHEAD (W6-8) warning sign to be installed beside the mountain bike trail, prior to its junction with the Kennedy Highway at chainage 1.13km.</p>  <p>Figure 11: TC1878 and TC1864</p>	<p>A</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.7.2 Cont'd</p>	 <p>Photograph 50: Eastbound view near chainage 1.13km showing the location where the mountain bike trail re-enters the Kennedy Highway.</p>  <p>Photograph 51: Westbound view showing the Bicycles warning sign at chainage 0.67km LHS.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.8 Pavement and surface			
8.8.1	<p>The road surface displayed relatively few defects and was found to be in good condition throughout most of the audit site. It provided a smooth ride when travelled at the posted and advisory speed limits and appeared well textured when visually inspected. However there were several isolated locations where surface or underlying pavement issues were identified, including:</p> <ul style="list-style-type: none"> • loose gravel and dirt on the surface of the bicycle lane at Warril Drive intersection and on the left-turn slip lane from Myola Road onto the Kennedy Highway • aggregate stripping on the southern side of the Rob Veivers Drive intersection, near the median island nose • minor flushing on the northern side of the Rob Veivers Drive intersection near the median island nose • aggregate stripping and small potholes between the Black Mountain Road and Saddle Mountain Road intersections. • moderate to extensive crocodile cracking and potholes affecting an 800m section of road on the eastern side of the Saddle Mount Road intersection. • minor cracking at numerous locations on the range section between Canopys Edge Boulevard and the Rainforest Park access. 	<p>Recommendation 8.8.1.1: Arrange a maintenance inspection of the audit site to assess the identified pavement, surface and drainage issues, and determine an appropriate course of action to rectify. Ensure necessary rectification works are included on a prioritised program for future maintenance works. Monitor the rate of further deterioration to determine the need and timeframe for corrective action.</p>	B

Item no.	Site inspection findings	Suggested action	Priority
<p>8.8.1 Cont'd</p>	<p>There were also several locations where drains were completely or partially blocked with dirt and/or leaf matter, including:</p> <ul style="list-style-type: none"> • cross drains cut through the raised median island at the Warril Drive and Fallon Road intersection • strip drains and gully pits at the Myola Road and Black Mountain Road intersections. • the concrete table drain fronting the stockpile site at chainage 4.14km LHS. <p>One or a combination of the observed pavement/surface conditions can affect vehicle controllability, particularly in wet conditions. To improve safety, the audit team suggests action be taken to rectify the identified issues in accordance with standard maintenance intervention practices.</p>  <p>Photograph 52: Example of dirt and loose grit on the road surface within the eastbound bicycle lane at the Warril Drive/Fallon Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.8.1 Cont'd</p>	 <p>Photograph 53: Example of leaf matter blocking the drains cut through the median island at the Warril Drive/Fallon Road intersection.</p>  <p>Photograph 54: Example of gully pit and strip drain blocked with dirt at the Myola Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.8.1 Cont'd</p>	 <p>Photograph 55: Example of crocodile cracking on the range section at chainage 6.29km.</p>  <p>Photograph 56: Aggregate stripping on the eastbound lane near the end of the median island at chainage 14.28km.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.8.1 Cont'd</p>	 <p>Photograph 57: Aggregate stripping and cracking between the Black Mountain and Saddle Mountain roads intersection (eastbound lane).</p>  <p>Photograph 58: Flushing in the right-hand wheel path near the nose of the median island on the eastern side of the Myola Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
<p>8.8.1 Cont'd</p>	 <p>Photograph 59: Extensive crocodile cracking on the road section immediately east of the Saddle Mountain Road intersection.</p>  <p>Photograph 60: Longitudinal cracking on the road section immediately east of the Saddle Mountain Road intersection.</p>		

Item no.	Site inspection findings	Suggested action	Priority
8.9 Road lighting			
8.9.1	<p>The standard of lighting in place throughout the audit site consisted of 'Category V' lighting at all channelised intersections and flag lighting at the Green Hills Road intersection. The standard of lighting appeared sufficient to illuminate the location of each intersection and necessary visual information at the potential conflict points. However, there were two street lights situated opposite the Saddle Mountain Road intersection (near chainage 11.80km) that were not working during the night inspection.</p> <p>Lighting at the pedestrian crossing near the western abutment (abutment B) of the Barron River Bridge was also absent. This crossing was situated in a rural environment with an 80km/h posted speed limit, where the presence of pedestrians crossing the road would be unexpected. In conjunction with improved pedestrian crossing signage (see Item 6.7.2 for detail), lighting the crossing to a 'Category V' standard would assist motorists to detect the presence of pedestrians and anticipate their movements.</p> <p>As a non-safety related maintenance issue, it was also noted during the site inspection that street lights around the Rob Veivers Drive and Black Mountain Road intersections were operating during daylight hours.</p>	<p>Recommendation 8.9.1.1: Install supplementary lighting at the pedestrian crossing near the western abutment of Barron River Bridge. Where lighting is provided, ensure it is designed in accordance with Australian Standard <i>Supplementary Lighting at Pedestrian Crossings</i> (AS1158.4) and Chapter 17 of the RPDM. Where funding for new or upgraded lighting works is limited, consider nominating the project for funding under future capital works or safety programs (e.g. Safer Roads Sooner).</p> <p>Recommendation 8.9.1.2: Arrange for a maintenance inspection to be undertaken on street lighting between Saddle Mountain Road and Rob Veivers Drive intersections. Undertake necessary works to ensure existing street lights are functioning correctly.</p>	<p>C</p> <p>B</p>

Item no.	Site inspection findings	Suggested action	Priority
<p>8.9.1 Cont'd</p>	 <p>Photograph 61: Eastbound view on approach to the western abutment of the Barron River Bridge showing the absence of lighting at the location where pedestrians cross</p>  <p>Photograph 62: Westbound view at the Saddle Mountain Road intersection showing a Rate 3 street light that was not functioning (left side of image between the two guide posts).</p>		

9 Recommendations

The road safety performance review of the Kennedy Highway between Smithfield and Kuranda has identified a number of safety matters for consideration. These matters have been identified through the analysis of crash and SIMS data, and by conducting a detailed site inspection. The findings of the investigations are detailed in Sections 5 to 8 of this report.

Table 5: Recommendations consolidates all key findings and suggested actions. Priorities have been assigned to each recommendation to assist the department with prioritisation, particularly where funding and resourcing is limited. The recommendations are not intended to be the only possible actions, rather, they have been provided as a guide for consideration.

Where recommendations are supported, but the allocated \$3 million funding is exhausted, implementation is likely to occur under a purpose project or as part of existing projects or programs of work. The department is the appropriate authority to determine the best means of funding and delivering approved actions.

Table 7: Approved recommendations is attached in **Appendix G** for the recording of comments and/or further actions in response to the suggested actions.

Released under RTI - QTIAR

Table 5: Recommendations							
No.	Issue category	Data source	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority
1.	Frequency	Crash, SIMS	5.1.1 6.1.2	High number of crashes per year	Engineering	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives.	A
2.	Frequency	Crash, SIMS	5.1.1 6.1.3	Trends with the day of the week incidents occur	Engineering, Education	Continue to monitor the occurrence of incidents and where trends in frequency are identified, investigate opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices.	A
3.	Frequency	Crash, SIMS	5.1.1 6.1.4	High percentage of crashes occur during peak hours	Enforcement, Education	Consider opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices during peak times.	A
4.	Duration	SIMS	6.1.5	High percentage of incidents have a duration longer than one hour	Education	Endeavour to minimise congestion by maximising opportunities to alert motorists via web-based reports, radio, social media and/or ITS devices (VMS).	A
5.	Severity	Crash	5.1.2	Majority of crashes result in high severity injuries	Engineering	In accordance with the 'Safe System Approach' philosophy supported by TMR, consider opportunities to reduce the occurrence and severity outcome of crashes as part of future major infrastructure maintenance or upgrade projects.	B
6.	Crash types	Crash	5.1.3	'Run-off-road' and 'head-on' are the predominant crash types.	Engineering	Implement low-cost high-benefit engineering treatments to target a reduction in crash types, as outlined in Section 7.1.6. Ensure any proposed works are considered and implemented in conjunction with recommended treatments detailed under Sections 8.1.2, 8.1.3, 8.2.1 and 8.3.1.	A

Table 5: Recommendations							
No.	Issue category	Data source	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority
7.	Contributing circumstances	Crash	5.1.4	Driver violations	Enforcement, Education	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.	B
8.	Contributing circumstances	Crash	5.1.4	'Road – wet/slippery'	Engineering, Education	Assess surface texture and skid resistance. Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.	A
9.	Contributing circumstances	Crash	5.1.4	Excessive speed	Enforcement, Education	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.	A
10.	Road surface	Crash	5.1.5	High occurrence of incidents when the road pavement is wet	Engineering	Continue to monitor pavement surface wear and texture with a view to maintaining a high standard of pavement condition.	A
11.	Road surface	Crash	5.1.5	Lower number of wet days than dry, however, higher occurrence of incidents on wet days	Education	Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.	A
12.	Road corridors	Crash	5.1.8	The overall road segment ranked high compared to other similar state-controlled road segments throughout the district	Engineering	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives. Investigate ongoing safety funding opportunities to address emerging crash trends and safety issues.	A
13.	Crash zones	Crash	5.2	Majority of crashes occurred towards the eastern end of the road	Engineering	Where there is limited funding to implement mass action safety improvement projects, consider limiting works to locations where data identifies clusters of crashes.	A

Table 5: Recommendations

No.	Issue category	Data source	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority
14.	Signage	Site inspection	8.1.1	Maintenance of road traffic signs	Engineering	Action works to address identified maintenance issues as outlined under Section 8.1.1.	A
15.	Signage, Linemarking	Site inspection	8.1.2	Inconsistent signing and linemarking of overtaking lanes, climbing lanes and slow vehicle turnouts	Engineering	Undertake a mass action review and upgrade of signage and linemarkings as outlined under Section 8.1.2.	A
16.	Signage	Site inspection	8.1.3	Inconsistencies with the application of advisory speed signing	Engineering	Undertake a mass action review and upgrade (as required) of advisory speed and alignment warning signs as outlined under Section 8.1.3.	A
17.	Signage	Site inspection	8.1.4	Absence of steep grade signing to moderate vehicle speeds	Engineering	Investigate the need for additional steep grade signing as outlined under Section 8.1.4.	A
18.	Signage	Site inspection	8.1.5	Inconsistent application of guide signs	Engineering	Review and upgrading guide signing as outlined under Section 8.1.5.	B
19.	Line and pavement markings	Site inspection	8.2.1	Maintenance of line and pavement markings	Engineering	Re-apply markings as outlined under Section 8.2.1.	B
20.	Line and pavement markings	Site inspection	8.2.2	Upgrading of markings at the Henry Ross Lookout	Engineering	Upgrade markings and signage as outlined under Section 8.2.2.	B
21.	Delineation	Site inspection	8.3.1	Missing REGPs and RRPMS	Engineering	Replace missing REGPs and RRPMS as outlined under Section 8.3.1.	B
22.	Safety barriers	Site inspection	8.4.1	Damaged safety barrier end terminals	Engineering	Inspect and schedule repair/replace as outlined under Section 8.4.1.	A

Table 5: Recommendations

No.	Issue category	Data source	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority
23.	Safety barriers	Site inspection	8.4.2	Missing reflectors along W-beams	Engineering	Replace missing reflectors as outlined under Section 8.4.2.	A
24.	Roadside hazards	Site inspection	8.5.1	Significant number of roadside hazards	Engineering	Investigate viability of hazard reduction projects as part of a specific program or as an inclusion in major rehabilitation projects, as outlined under Section 8.5.1.	C
25.	Alignment	Site inspection	8.6.1	Poor driver behaviour	Engineering	Investigate installation of ITS applications to monitor and/or deter poor behaviour as outlined under Section 8.6.1.	A
26.	Pedestrian and cycling	Site inspection	8.7.1	Unsafe access for pedestrians and cyclists between Kuranda township and Black Mountain Road	Engineering	Improve pedestrian and cycling amenity as outlined under Section 8.7.1.	A
27.	Pedestrian and cycling	Site inspection	8.7.2	Limited signage to warning motorists about cycling activity	Engineering	Install additional signage as outlined under Section 8.7.2.	A
28.	Road pavement	Site inspection	8.8.1	Condition of road pavement	Engineering	Conduct an inspection to assess condition and identify appropriate action, as outlined under Section 8.8.1.	B
29.	Road lighting	Site inspection	8.8.1	Lack of lighting at pedestrian crossing, maintenance of other existing road lighting	Engineering	Inspect identified lighting issues and arrange necessary actions as outlined under Section 8.8.1.	B

Appendix A – Media articles

Released under RTI - DTMR

Range safety starts with us

David Anthony

OF the 92 reported accidents on the Kuranda Range Rd in the past two years, 95 per cent of them involved motorists local to the Cairns and Tablelands region.

Kuranda police station officer in charge Sgt Shane Mattes turned heads when he listed this startling statistic at a meeting in the town on Wednesday night last week.

The State Member for Barron River, Craig Crawford, was one of those at the Kuranda District Chamber of Commerce's public meeting who was taken aback and suggested complacency might be part of the problem.

"The motorists involved in crashes on the range are not people from overseas who don't know our road rules or are unfamiliar with the road they are us," he said.

Tablelands Acting Inspector Mark Stewart of Mareeba agreed complacency was a probable factor.

"Perhaps it is because local people are using the road more regularly," Insp Stewart said.

As a paramedic in his previous career, Mr Crawford was familiar with the road and the accidents that occurred on it.

Like most Far North Queenslanders, he knew the pain of road closures, slow-moving traffic and hold-ups.

"We need to look at a range of options to make the range safer, including greater law enforcement," Mr Crawford said.

Sgt Mattes supplied further

interesting traffic crash data to the meeting:

■ 38 per cent of accidents were due to driver error resulting in prosecution;

■ 58 per cent because of wet roads;

■ 50 per cent resulted in injuries and;

■ 46 per cent were single-vehicle accidents.

Most accidents occurred below the lookout in the Smithfield police division.

He said not all accidents could be ruled as driver error, but many were a combination of factors.

Sgt Mattes said he was aware the road could be slippery when wet.

"I have experienced sliding on the road while driving at 40km/h, so I drive to the conditions," he said.

Chamber president John Robinson said the public meeting was called after the "horror day", on Wednesday, July 22, when four accidents caused closures within a 12-hour period.

"The road is the lifeline between Cairns and the Tablelands and Cape York," he said. "Emotions were raw that day as was reflected in Facebook comments. But it's no good complaining about a problem without proposing solutions.

"I recognise the issue is too complex than to just blame the road surface."

To comment on this story:

editorial@tablelandnews.com.au

[facebook.com/tablelandsadvertiser](https://www.facebook.com/tablelandsadvertiser)

Police and TMR answer the tough questions

David Anthony

POLICE and Department of Transport and Main Roads (TMR) were in the hot seat when Kuranda residents had the chance to discuss the safety of the range crossing.

Residents expressed disappointment that police did not seem to follow up attempts to report offences on the range.

Other comments focused on the state of the road and the lack of warning about road closures.

Tablelands Acting Inspector Mark Stewart graciously

fielded pointed questions about police enforcement.

"We regularly receive reports of motorists doing the wrong thing and we do follow them up," Insp Stewart said.

One resident said he reported a car weaving across both sides of the road about halfway down the range.

"The person I spoke to seemed more concerned about getting my details rather than take details of the offender," he said.

"By the time we got to the bottom of the hill, he had gone. If police had acted when I

called, they might have been able to meet him."

Insp Stewart appreciated the feedback and said PoliceLink was a relatively new system.

Sgt Ian Lukin, Smithfield officer in charge, urged people to keep police informed.

"Don't feel you are wasting your time, we do follow up your reports," he said.

"We have a good strike rate in enforcing road safety on the range."

Residents wanted more action against trucks — or utilities and cars, for that matter —

that didn't properly seal diesel caps and allowed spillages to occur.

TMR's delivery of operations manager Jim Harding-Smith said the department's maintenance depot at the bottom of the range investigated and treated spillages with absorbent material when reported.

"After first rain, contaminants and dirt in the road get flushed out and makes the road slippery," Mr Harding-Smith said.

"Motorists on the range need to drive much slower in

those circumstances."

He said the department had spent \$40 million on the Kuranda Range Rd in the past three years, but had no plans for major upgrades.

Mr Harding-Smith took on board comments that more electronic signage be placed at either end of the range advising of road conditions or closures well before motorists actually started their journey on the range.

The department was looking at using closed-circuit television (CCTV) to show in real time what was happening on

the road.

When asked about the increased volume of traffic using the range road, Mr Harding-Smith said traffic in Cairns generally increased at a rate of three to four per cent a year.

To contact PoliceLink online, by mobile or landline visit <https://www.police.qld.gov.au/programs/polcelink/>

PoliceLink phone: 131 444.
For information on road closures and traffic conditions or to arrange for free text messages call TMR's number 13 19 40 or visit <http://131940.qld.gov.au/>

CRAE01201MA - V1

TMR assures best asphalt used on range

David Anthony

THE Kuranda Range road surface is made from the best high-performance asphalt available, according to the Department of Transport and Main Roads.

TMR manager of delivery

of operations Jim Harding-Smith of Cairns told the Kuranda meeting on Wednesday that skid-testing was carried out annually.

The volume of water applied to the road surface during testing was similar to a reasonably intense storm.

"The latest testing was in June and the results have so far not come in," he said.

Mr Harding-Smith said testing involved spraying water on the road to create a wet surface equivalent to what was experienced in wet conditions.

TMR advised a surface treatment at Caravonica and MacGregor Rd roundabouts on the Captain Cook Highway, had not conclusively improved safety and required more regular maintenance.

TMR had no plans to use this treatment at other loca-

tions. The present road surface was similar to the specification used in the early 2000s.

The mix design had not been changed by the suppliers.

While bitumen specifications had developed since then, the core properties remained the same.

Cairns garbage trucks create stink

Zoom Bookmark Share Print Listen Translate

GARBAGE trucks carting rubbish from Cairns to Mareeba leaked, crossed double lines and stunk.

Pictures: David Anthony



The Kuranda Range crossing was the hot topic of the Cairns District Chamber of Commerce's public meeting. From left: Cairns police officer in charge Sgt Shane Mayne, Tablelands Acting Inspector Mark Stewart, Cairns Regional Councillor Greg Fennell, chamber president John Robinson, Smithfield police station. OW: Sgt Ian Lukin.

This was according to Kuranda resident, Fr Chris Wright, one of several residents who spoke against the trucks they felt dominated the range.

Cairns Regional Councillor Greg Fennell, whose division included the section of the range road below the Henry Ross Lookout, said it was impossible for the tightly sealed units on the trucks to leak.

"Sorry, sir, I have seen it happen," Fr Wright said.

"Most of the people in Kuranda believe they are the source of all our problems."

Another resident complained about the speed of the trucks and called on Cr Fennell to tell them to slow down.

Cr Fennell said it was not up to council to manage speeding issues, a comment that attracted guffaws with one resident saying, "It should be in the contract".

A Cairns council officer agreed with the resident saying he would take up the matter with the contractor.

"Part of the contract is to adhere to traffic laws," he said.

"But we have not had one non-compliance issue since the contracts have been in place."



Tablelands Acting Inspector Mark Stewart addresses the public meeting about the Kuranda Range Rd at the Bottom Pub on Thursday night last week.

Picture: David Anthony

RAIL OPTION OVER RANGE

RAIL as the alternative to the Kuranda Range Rd was passionately expressed at a public meeting in Kuranda last week. A couple of residents at the Kuranda District Chamber of Commerce public meeting, held in the Bottom Pub, yelled to gain attention. "We have a railway line from Cairns to Mareeba," one woman said.

"Why are the people in power ignoring it? It may need upgrading, but let's do it." Another resident said rail would reduce the number of trucks using the road. The Member for Barron River, Craig Crawford, agreed, adding that the rail option would require trucks to meet at rail depots at either end of the range anyway.



Mareeba Shire Council chief executive officer Peter Franks, Mareeba Chamber of Commerce president Joe Moro and Mareeba Shire Councillor Karen Ewin.

Picture: David Anthony.

used on range

TMR advised a surface treatment at Caravonica and MacGregor Rd roundabouts on the Captain Cook Highway, had not conclusively improved safety and required more regular maintenance.

TMR had no plans to use this treatment at other loca-

tions. The present road surface was similar to the specification used in the early 2000s.

The mix design had not been changed by the suppliers.

While bitumen specifications had developed since then, the core properties remained the same.

Aquis may force big changes to road

THE game-changer in the future of the Kuranda Range Rd was the proposed development of the \$5.15 billion Aquis casino-hotel development at Yorkeys Knob.

The State Member for Barron River, Craig Crawford, said the range crossing would have to be redeveloped to accommodate increased transportation from the Atherton Tablelands to Cairns every day.

He said he felt sure Aquis would be a goer and that its effect on the region would be profound.

Mr Crawford said Redlynch area alone could expect some 250,000 gravel-truck movements during construction. After construction, its proponents hoped to attract 1 million visitors a year to the region, meaning more tourists using the range to access the Tablelands.

"Everybody staying at Aquis will want three meals a day and this means the Tablelands will play a major role as a supplier," Mr Crawford said.

He said the long-time proposal for a four-lane highway would have to be considered if Aquis went ahead. "I realise this is a contentious proposal as I have spoken to many local people who want a four-lane highway and many who don't," he said.

He said the lack of available money for any major infrastructure project was the only holdup. "The Department of Transport and Main Roads has the vision — what's missing is the funding," Mr Crawford said.

He was keen to discuss the Federal Government's White Paper for Northern Australia with the Federal Member for Leichhardt, Warren Entsch.

"The White Paper chose for highway funding to stop at Cairns, but not including the range," Mr Crawford said.

Range improvement

TRANSPORT | Andrea Falvo

A PROJECT that could potentially save lives and improve emergency response times on the Kuranda Range Road has been given the green light. Member for Barron River

Craig Crawford announced earlier this week that the Palaszczuk Government had made an investment of \$3 million to install four permanent Variable Message Signs (VMS) as well as Automatic Number Plate Recognition (ANPR)

systems to improve emergency response. Mr Crawford said the project was just the start of efforts to improve current operational performance on the range. "This project will dramatically improve ability to re-

spond to incidents on the Kuranda Range and provide accurate, timely advice to road users," Mr Crawford said. "We are looking into a standard ANPR system similar to technology used in tunnels in major cities."

Mr Crawford said the new technology would be used to measure traffic flow, traffic volumes and vehicle classification on the range, rather than enforcement action. Maree Shire Mayor Tom Gilmore said the funding an-

nouncement was a marvellous step towards hopefully getting a competent road to the coast. "What it really means is that government of all levels recognise the problem," he said. **CONTINUED ON PAGE 4**

Project aims to improve safety

CONTINUED FROM PAGE 1

"While there is a limitation on government capacity to pay for major upgrades of ranges like that, this \$3 million signifies that Queensland government knows that it's there," Councillor Gilmore said.

"It shows they are fully aware of the fact that it is a major bottle neck on the future development in the Tablelands region in particular, but also the Peninsula and southern Gulf regions.

"I see it as a marvellous step in the right direction and just hope that over time that recognition builds into a serious attempt to give us a competent road to the coast, which we don't currently have."

Mr Crawford said after a public meeting held in Kuranda on August 6, four temporary trailer-mounted VMS were set up at the top and bottom of the range.

He said the permanent signs will provide vital information for commuters, business owners, tourists and transport operators who feel the effects of range closures.

Appendix B – WebCrash output

Released under RTI - DTMR

Frequency

Count of Crashes by Financial Year and Month

Month	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
January	1	4	4	2	3	14
February	2	1	2	1	2	8
March	0	2	3	3	3	11
April	0	2	1	3	1	7
May	2	2	1	0	4	9
June	1	0	5	2	0	8
July	3	0	2	2	0	7
August	3	4	3	2	2	14
September	3	1	1	2	2	9
October	1	3	1	0	3	8
November	2	1	1	1	0	5
December	3	1	4	3	4	15
Totals	21	21	28	21	24	115

Count of Crashes by Day of Week and Hour of Day

Hour of Day	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total
Midnight - 1am	0	1	0	0	0	0	0	1
1am - 2am	0	0	0	0	0	1	0	1
2am - 3am	0	0	0	0	0	0	0	0
3am - 4am	0	0	0	0	0	0	1	1
4am - 5am	0	1	0	0	0	0	0	1
5am - 6am	0	1	0	0	1	0	0	2
6am - 7am	0	0	0	1	0	0	0	1
7am - 8am	1	1	3	1	1	0	0	7
8am - 9am	0	2	1	3	0	0	0	6
9am - 10am	3	1	1	0	1	1	5	12
10am - 11am	1	0	3	3	0	2	1	10
11am - 12 noon	2	2	2	0	2	3	0	11
12 noon - 1pm	2	1	0	2	1	0	3	9
1pm - 2pm	2	4	1	0	0	2	1	10
2pm - 3pm	2	0	2	1	0	0	0	5
3pm - 4pm	1	1	1	0	1	1	0	5
4pm - 5pm	1	1	1	2	1	1	1	8
5pm - 6pm	3	0	0	1	2	0	3	9
6pm - 7pm	1	1	0	0	0	1	0	3
7pm - 8pm	1	0	1	1	1	0	2	6
8pm - 9pm	0	0	0	0	0	1	0	1
9pm - 10pm	1	0	1	1	1	0	0	4
10pm - 11pm	0	0	0	0	0	0	0	0
11pm - Midnight	0	0	0	0	0	0	2	2
Totals	21	17	17	16	12	13	19	115

Count of Crashes by Financial Year and Crash Severity

Crash Severity	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Fatal	0	2	1	0	0	3
Hospitalisation	11	8	7	6	13	45
Medical Treatment	5	7	12	9	11	44
Minor Injury	5	4	8	6	0	23
Totals	21	21	28	21	24	115

Released under RTI - DTMR

Crash Types

Count of Crashes by Financial Year and DCA Group

DCA Group	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Head-on	7	3	6	12	7	35
Rear-end	1	2	3	1	3	10
Lane changes	2	0	0	0	1	3
Parallel lanes; turning	0	2	0	0	0	2
Vehicle leaving driveway	2	1	0	0	0	3
Hit animal	0	0	0	0	1	1
Off carriageway; on curve	1	2	1	1	3	8
Off carriageway; on curve; hit object	1	5	13	5	2	26
Out of control; on curve	5	4	5	0	6	20
Other	2	2	0	2	1	7
Totals	21	21	28	21	24	115

Count of Crashes by Crash Severity and DCA Group

DCA Group	Fatal	Hospitalisation	Medical Treatment	Minor Injury	Total
Head-on	2	17	11	5	35
Rear-end	0	1	8	1	10
Lane changes	0	2	1	0	3
Parallel lanes; turning	0	2	0	0	2
Vehicle leaving driveway	0	0	1	2	3
Hit animal	0	0	1	0	1
Off carriageway; on curve	0	4	2	2	8
Off carriageway; on curve; hit object	1	7	9	9	26
Out of control; on curve	0	10	8	2	20
Other	0	2	3	2	7
Totals	3	45	44	23	115

Count of Crashes by Horizontal Alignment and DCA Group

DCA Group	Straight	Curved-View obscured	Curved-View open	Total
Head-on	1	21	13	35
Rear-end	4	3	3	10
Lane changes	1	1	1	3
Parallel lanes; turning	1	1	0	2
Vehicle leaving driveway	2	0	1	3
Hit animal	1	0	0	1
Off carriageway; on curve	0	5	3	8
Off carriageway; on curve; hit object	0	10	16	26
Out of control; on curve	0	9	11	20
Other	1	4	2	7
Totals	11	54	50	115

Contributing Circumstances

Crash Circumstance Count by Financial Year and Contributing Circumstances

Contributing Circumstances	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
VIOLATION - FAIL TO GIVE WAY	1	0	0	0	0	1
VIOLATION - DISOBEY GIVE WAY SIGN	1	1	0	0	0	2
VIOLATION - DISOBEY TRAFFIC SIGN	0	0	1	0	0	1
VIOLATION - CROSS DOUBLE LINES	4	1	2	10	3	20
VIOLATION - UNDUE CARE AND ATTENTION	8	6	4	8	7	33
VIOLATION - FAIL TO KEEP LEFT	0	0	1	1	0	2
VIOLATION - FOLLOW TOO CLOSELY	1	2	2	0	1	6
VIOLATION - IMPROPER U-TURN	0	1	0	0	0	1
DRIVER - INEXPERIENCE/LACK OF EXPERTISE	3	1	1	1	0	6
DRIVER - MEDICAL CONDITION (HEART ATTACK; EPILEPSY ETC.)	0	0	1	0	0	1
DRIVER - AGE (LACK OF PERCEPTION; POWER OR CONCENTRATION)	2	1	2	0	0	5
DRIVER - TAKING AVOIDING ACTION TO MISS ANOTHER ROAD USER	0	0	1	0	1	2
DRIVER CONDITIONS - MISCELLANEOUS	2	1	3	1	3	10
EXCESSIVE SPEED FOR CIRCUMSTANCES	2	5	2	2	0	11
DRIVER - FATIGUE/FELL ASLEEP	0	0	0	0	1	1
VIOLATION - EXCEEDING SPEED LIMIT	0	0	0	0	1	1
CONDITION - UNDER INFLUENCE OF LIQUOR/DRUG	2	1	0	0	1	4
VIOLATION - OVER PRESCRIBED CONCENTRATION OF ALCOHOL	0	1	1	0	0	2
VEHICLE - BRAKES	1	0	0	0	0	1
VEHICLE - TYRES (I.E. LOW TREAD; PUNCTURE/BLOW OUT)	1	0	2	0	0	3
VEHICLE DEFECTS - MISCELLANEOUS	0	0	1	0	0	1
ANIMAL UNCONTROLLED - ON ROAD	0	0	1	0	1	2
VEHICLE ENTERING DRIVEWAY	0	1	0	0	0	1
MISCELLANEOUS	1	2	0	0	2	5
LIGHTING - HEADLIGHT GLARE	0	0	1	0	0	1
ATMOSPHERIC - HEAVY RAIN	1	0	0	2	1	4
ATMOSPHERIC CONDITIONS - MISCELLANEOUS	0	0	0	1	1	2
ROAD - WET/SLIPPERY	6	5	12	13	9	45
ROAD - TEMPORARY OBJECT ON CARRIAGEWAY	0	3	2	1	0	6
ROAD CONDITIONS - MISCELLANEOUS	0	0	0	0	1	1
NOT APPLICABLE	16	9	13	13	12	63
Totals	52	41	53	53	45	244

Crash Circumstance Count by Crash Severity and Contributing Circumstances

Contributing Circumstances	Fatal	Hospitalised	Medical Treatment	Minor Injury	Total
VIOLATION - FAIL TO GIVE WAY	0	0	1	0	1
VIOLATION - DISOBEY GIVE WAY SIGN	0	0	0	2	2
VIOLATION - DISOBEY TRAFFIC SIGN	0	1	0	0	1
VIOLATION - CROSS DOUBLE LINES	0	10	6	4	20
VIOLATION - UNDUE CARE AND ATTENTION	0	12	15	6	33
VIOLATION - FAIL TO KEEP LEFT	0	1	1	0	2
VIOLATION - FOLLOW TOO CLOSELY	0	1	5	0	6
VIOLATION - IMPROPER U-TURN	0	1	0	0	1
DRIVER - INEXPERIENCE/LACK OF EXPERTISE	0	1	2	3	6
DRIVER - MEDICAL CONDITION (HEART ATTACK; EPILEPSY ETC.)	1	0	0	0	1
DRIVER - AGE (LACK OF PERCEPTION; POWER OR CONCENTRATION)	1	1	1	2	5
DRIVER - TAKING AVOIDING ACTION TO MISS ANOTHER ROAD USER	0	1	1	0	2
DRIVER CONDITIONS - MISCELLANEOUS	1	4	3	2	10
EXCESSIVE SPEED FOR CIRCUMSTANCES	1	6	4	0	11
DRIVER - FATIGUE/FELL ASLEEP	0	1	0	0	1
VIOLATION - EXCEEDING SPEED LIMIT	0	1	0	0	1
CONDITION - UNDER INFLUENCE OF LIQUOR/DRUG	0	2	2	0	4
VIOLATION - OVER PRESCRIBED CONCENTRATION OF ALCOHOL	0	0	2	0	2
VEHICLE - BRAKES	0	1	0	0	1
VEHICLE - TYRES (I.E. LOW TREAD; PUNCTURE/BLOW OUT)	0	1	1	1	3
VEHICLE DEFECTS - MISCELLANEOUS	0	0	1	0	1
ANIMAL UNCONTROLLED - ON ROAD	0	0	1	1	2
VEHICLE ENTERING DRIVEWAY	0	1	0	0	1
MISCELLANEOUS	0	2	2	1	5
LIGHTING - HEADLIGHT GLARE	0	0	1	0	1
ATMOSPHERIC - HEAVY RAIN	0	3	1	0	4
ATMOSPHERIC CONDITIONS - MISCELLANEOUS	0	2	0	0	2
ROAD - WET/SLIPPERY	0	21	15	9	45
ROAD - TEMPORARY OBJECT ON CARRIAGEWAY	0	2	2	2	6
ROAD CONDITIONS - MISCELLANEOUS	0	0	1	0	1
NOT APPLICABLE	2	26	27	8	63
Totals	6	102	95	41	244

Crash Circumstance Count by DCA Group and Contributing Circumstances

Contributing Circumstances	Contributing Circumstances										Total
	Head-on	Rear-end	Lane changes	Parallel lanes; turning	Vehicle leaving driveway	Hit animal	Off carriageway; on curve	Off carriageway; on curve; hit object	Out of control; on curve	Other	
VIOLATION - FAIL TO GIVE WAY	0	0	0	0	1	0	0	0	0	0	1
VIOLATION - DISOBEY GIVE WAY SIGN	0	0	0	0	2	0	0	0	0	0	2
VIOLATION - DISOBEY TRAFFIC SIGN	1	0	0	0	0	0	0	0	0	0	1
VIOLATION - CROSS DOUBLE LINES	20	0	0	0	0	0	0	0	0	0	20
VIOLATION - UNDUE CARE AND ATTENTION	14	1	1	0	0	0	3	4	9	1	33
VIOLATION - FAIL TO KEEP LEFT	2	0	0	0	0	0	0	0	0	0	2
VIOLATION - FOLLOW TOO CLOSELY	0	6	0	0	0	0	0	0	0	0	6
VIOLATION - IMPROPER U-TURN	0	0	0	1	0	0	0	0	0	0	1
DRIVER - INEXPERIENCE/LACK OF EXPERTISE	2	0	1	0	0	0	0	1	2	0	6
DRIVER - MEDICAL CONDITION (HEART ATTACK; EPILEPSY ETC.)	1	0	0	0	0	0	0	0	0	0	1
DRIVER - AGE (LACK OF PERCEPTION; POWER OR CONCENTRATION)	2	0	0	0	0	0	1	1	1	0	5
DRIVER - TAKING AVOIDING ACTION TO MISS ANOTHER ROAD USER	1	0	0	0	0	0	0	1	0	0	2
DRIVER CONDITIONS - MISCELLANEOUS	0	2	2	0	0	0	1	4	1	0	10
EXCESSIVE SPEED FOR CIRCUMSTANCES	6	0	0	0	0	0	1	0	3	1	11
DRIVER - FATIGUE/FELL ASLEEP	0	0	0	0	0	0	1	0	0	0	1
VIOLATION - EXCEEDING SPEED LIMIT	0	0	0	0	0	0	0	0	1	0	1
CONDITION - UNDER INFLUENCE OF LIQUOR/DRUG	1	0	1	0	0	0	0	0	1	1	4
VIOLATION - OVER PRESCRIBED CONCENTRATION OF ALCOHOL	0	0	0	0	0	0	0	1	1	0	2
VEHICLE - BRAKES	1	0	0	0	0	0	0	0	0	0	1
VEHICLE - TYRES (I.E. LOW TREAD; PUNCTURE/BLOW OUT)	0	0	0	0	0	0	1	2	0	0	3
VEHICLE DEFECTS - MISCELLANEOUS	0	0	0	0	0	0	0	0	1	0	1
ANIMAL UNCONTROLLED - ON ROAD	0	0	0	0	0	1	0	1	0	0	2
VEHICLE ENTERING DRIVEWAY	0	0	0	1	0	0	0	0	0	0	1
MISCELLANEOUS	0	0	2	2	0	0	0	0	0	1	5
LIGHTING - HEADLIGHT GLARE	0	0	0	0	0	0	0	1	0	0	1
ATMOSPHERIC - HEAVY RAIN	1	0	0	0	0	0	1	0	1	1	4
ATMOSPHERIC CONDITIONS - MISCELLANEOUS	0	0	0	0	0	0	0	1	1	0	2
ROAD - WET/SLIPPERY	14	1	0	0	0	0	4	14	10	2	45
ROAD - TEMPORARY OBJECT ON CARRIAGEWAY	3	1	0	0	0	0	0	0	0	2	6
ROAD CONDITIONS - MISCELLANEOUS	0	1	0	0	0	0	0	0	0	0	1
NOT APPLICABLE	39	15	3	1	3	1	0	0	0	1	63
Totals	108	27	10	5	6	2	13	31	32	10	244

Crash Circumstance Count by Horizontal Alignment and Contributing Circumstances

Contributing Circumstances	Straight	Curved-View obscured	Curved-View open	Total
VIOLATION - FAIL TO GIVE WAY	0	0	1	1
VIOLATION - DISOBEY GIVE WAY SIGN	2	0	0	2
VIOLATION - DISOBEY TRAFFIC SIGN	0	0	1	1
VIOLATION - CROSS DOUBLE LINES	1	11	8	20
VIOLATION - UNDUE CARE AND ATTENTION	0	20	13	33
VIOLATION - FAIL TO KEEP LEFT	0	0	2	2
VIOLATION - FOLLOW TOO CLOSELY	4	1	1	6
VIOLATION - IMPROPER U-TURN	1	0	0	1
DRIVER - INEXPERIENCE/LACK OF EXPERTISE	0	3	3	6
DRIVER - MEDICAL CONDITION (HEART ATTACK; EPILEPSY ETC.)	0	1	0	1
DRIVER - AGE (LACK OF PERCEPTION; POWER OR CONCENTRATION)	0	3	2	5
DRIVER - TAKING AVOIDING ACTION TO MISS ANOTHER ROAD USER	0	1	1	2
DRIVER CONDITIONS - MISCELLANEOUS	1	6	3	10
EXCESSIVE SPEED FOR CIRCUMSTANCES	0	7	4	11
DRIVER - FATIGUE/FELL ASLEEP	0	1	0	1
VIOLATION - EXCEEDING SPEED LIMIT	0	0	1	1
CONDITION - UNDER INFLUENCE OF LIQUOR/DRUG	0	1	3	4
VIOLATION - OVER PRESCRIBED CONCENTRATION OF ALCOHOL	0	0	2	2
VEHICLE - BRAKES	0	1	0	1
VEHICLE - TYRES (I.E. LOW TREAD; PUNCTURE/BLOW OUT)	0	1	2	3
VEHICLE DEFECTS - MISCELLANEOUS	0	1	0	1
ANIMAL UNCONTROLLED - ON ROAD	1	1	0	2
VEHICLE ENTERING DRIVEWAY	0	1	0	1
MISCELLANEOUS	3	2	0	5
LIGHTING - HEADLIGHT GLARE	0	0	1	1
ATMOSPHERIC - HEAVY RAIN	0	2	2	4
ATMOSPHERIC CONDITIONS - MISCELLANEOUS	0	2	0	2
ROAD - WET/SLIPPERY	0	20	25	45
ROAD - TEMPORARY OBJECT ON CARRIAGEWAY	0	3	3	6
ROAD CONDITIONS - MISCELLANEOUS	0	1	0	1
NOT APPLICABLE	16	27	20	63
Totals	29	117	98	244

Released under RTI - DTMR

Road Surface

Count of Crashes by Crash Severity and Roadway Surface

Roadway Surface	Fatal	Hospitalisation	Medical Treatment	Minor Injury	Total
Sealed - Dry	3	20	24	8	55
Sealed - Wet	0	25	20	15	60
Totals	3	45	44	23	115

Count of Crashes by Horizontal Alignment and Roadway Surface

Roadway Surface	Straight	Curved-View obscured	Curved-View open	Total
Sealed - Dry	9	26	20	55
Sealed - Wet	2	28	30	60
Totals	11	54	50	115

Count of Crashes by Roadway Surface and DCA Group

DCA Group	Sealed - Dry	Sealed - Wet	Total
Head-on	12	23	35
Rear-end	8	2	10
Lane changes	3	0	3
Parallel lanes; turning	1	1	2
Vehicle leaving driveway	3	0	3
Hit animal	1	0	1
Off carriageway; on curve	3	5	8
Off carriageway; on curve; hit object	11	15	26
Out of control; on curve	11	9	20
Other	2	5	7
Totals	55	60	115

Count of Crashes by Month and Roadway Surface

Roadway Surface	January	February	March	April	May	June	July	August	September	October	November	December	Total
Sealed - Dry	7	1	5	3	3	3	4	10	6	5	2	6	55
Sealed - Wet	7	7	6	4	6	5	3	4	3	3	3	9	60
Totals	14	8	11	7	9	8	7	14	9	8	5	15	115

Vehicle Types

Count of Units involved by Financial Year and Unit Type

Unit Type	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	Total
Car; Station Wagon	21	17	28	25	22	113
Utility; Panel Van	5	8	6	7	9	35
Truck	1	0	0	1	1	3
Articulated Vehicle	4	0	3	0	1	8
Omnibus	0	1	0	0	1	2
Motorcycle	6	6	4	1	2	19
Moped	1	0	0	0	0	1
Animal - other	0	0	0	0	1	1
Totals	38	32	41	34	37	182

Count of Units involved by Crash Severity and Unit Type

Unit Type	Fatal	Hospitalisation	Medical Treatment	Minor Injury	Total
Car; Station Wagon	1	42	49	21	113
Utility; Panel Van	0	11	16	8	35
Truck	0	2	1	0	3
Articulated Vehicle	1	5	2	0	8
Omnibus	1	1	0	0	2
Motorcycle	2	11	4	2	19
Moped	0	1	0	0	1
Animal - other	0	0	1	0	1
Totals	5	73	73	31	182

Count of Units involved by Roadway Surface and Unit Type

Unit Type	Sealed - Dry	Sealed - Wet	Total
Car; Station Wagon	53	60	113
Utility; Panel Van	16	19	35
Truck	1	2	3
Articulated Vehicle	6	2	8
Omnibus	2	0	2
Motorcycle	15	4	19
Moped	1	0	1
Animal - other	1	0	1
Totals	95	87	182

Road Users

Count of Casualties by Crash Severity, Gender and Casualty Age Group

Gender	Casualty Age Group	Fatal	Hospitalisation	Medical Treatment	Minor Injury	Total
Male						
	0-4	0	2	0	0	2
	17-20	0	1	6	1	8
	21-24	1	3	2	1	7
	25-29	0	4	4	0	8
	30-39	0	7	2	1	10
	40-49	0	10	6	2	18
	50-59	0	7	2	4	13
	60-69	1	3	2	1	7
	70-79	0	2	1	2	5
	80 and over	1	1	0	0	2
	SubTotals	3	40	25	12	80
Female						
	0-4	0	3	0	1	4
	5-11	0	0	0	1	1
	12-16	0	1	1	0	2
	17-20	0	1	5	3	9
	21-24	0	0	2	0	2
	25-29	0	2	2	2	6
	30-39	0	8	7	3	18
	40-49	0	7	6	0	13
	50-59	0	3	7	3	13
	60-69	0	3	3	1	7
	70-79	0	2	1	0	3
	80 and over	0	1	0	0	1
	Unknown	0	0	1	0	1
	SubTotals	0	31	35	14	80
Totals		3	71	60	26	160

Count of Casualties by Road User Type, Gender and Casualty Age Group

Gender	Casualty Age Group	Driver	Passenger	Motorcycle Rider	Motorcycle Pillion	Other Controller	Total
Male							
	0-4	0	2	0	0	0	2
	17-20	7	1	0	0	0	8
	21-24	6	0	1	0	0	7
	25-29	5	2	1	0	0	8
	30-39	7	1	2	0	0	10
	40-49	10	1	7	0	0	18
	50-59	7	1	5	0	0	13
	60-69	6	0	1	0	0	7
	70-79	5	0	0	0	0	5
	80 and over	1	0	1	0	0	2
	SubTotals	54	8	18	0	0	80
Female							
	0-4	0	4	0	0	0	4
	5-11	0	1	0	0	0	1
	12-16	0	2	0	0	0	2
	17-20	6	3	0	0	0	9
	21-24	2	0	0	0	0	2
	25-29	3	2	0	0	1	6
	30-39	12	4	1	1	0	18
	40-49	10	2	0	1	0	13
	50-59	8	5	0	0	0	13
	60-69	6	1	0	0	0	7
	70-79	1	1	0	1	0	3
	80 and over	0	1	0	0	0	1
	Unknown	0	1	0	0	0	1
	SubTotals	48	27	1	3	1	80
Totals		102	35	19	3	1	160

Count of Casualties by DCA Group, Gender and Casualty Age Group

Gender	Casualty Age Group	Head-on	Rear-end	Lane changes	Parallel lanes; turning	Vehicle leaving driveway	Hit animal	Off c'way; on curve	Off c'way; on curve; hit object	Out of control; on curve	Other	Total
Male												
	0-4	2	0	0	0	0	0	0	0	0	0	2
	17-20	1	0	0	0	0	0	0	3	4	0	8
	21-24	3	1	1	0	0	0	1	1	0	0	7
	25-29	3	0	0	0	0	0	0	2	3	0	8
	30-39	7	2	0	0	0	0	0	0	1	0	10
	40-49	6	1	3	1	0	1	1	0	4	1	18
	50-59	7	1	0	0	0	0	1	2	1	1	13
	60-69	2	0	0	0	0	0	1	4	0	0	7
	70-79	0	1	0	0	0	0	2	1	1	0	5
	80 and over	1	0	0	0	0	0	0	0	1	0	2
	SubTotals	32	6	4	1	0	1	6	13	15	2	80
Female												
	0-4	3	0	0	0	0	0	0	1	0	0	4
	5-11	0	0	0	0	1	0	0	0	0	0	1
	12-16	1	1	0	0	0	0	0	0	0	0	2
	17-20	0	1	0	0	0	0	0	5	3	0	9
	21-24	0	0	0	0	0	0	0	1	1	0	2
	25-29	1	0	0	0	0	0	1	3	1	0	6
	30-39	9	2	0	0	0	0	1	2	2	2	18
	40-49	6	0	0	2	0	0	0	3	1	1	13
	50-59	5	1	1	0	1	0	0	3	0	2	13
	60-69	5	0	0	1	1	0	0	0	0	0	7
	70-79	0	0	0	0	0	0	0	1	2	0	3
	80 and over	0	0	0	0	0	0	0	1	0	0	1
	Unknown	0	1	0	0	0	0	0	0	0	0	1
	SubTotals	30	6	1	3	3	0	2	20	10	5	80
Totals		62	12	5	4	3	1	8	33	25	7	160

Corridor Crash Zones

(Note: the following tables are a comparison of all state roads managed by Far North District)

Top 25 15km segment lengths based on 'number of crashes'

Zone Ranking	Map Number	Crashes Count	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	269	-16.863342	145.730775	20A	20A - Cairns - Mossman	7.765
2	2	203	-16.938200	145.746893	809	809 - Mulgrave Road	2.608
3	3	203	-16.896659	145.709594	647	647 - Cairns Western Arterial Road	7.158
4	4	201	-16.985298	145.742165	10P	10P - Innisfail - Cairns	77.940
5	5	127	-16.834179	145.670543	32A	32A - Cairns - Mareeba	7.430
6	4	74	-16.756666	145.662545	20A	20A - Cairns - Mossman	23.604
7	6	64	-16.911509	145.756395	649	649 - Anderson Street	1.920
8	1	60	-17.149310	145.710956	642	642 - Gillies Range Road	11.849
9	1	55	-16.572423	145.509748	20A	20A - Cairns - Mossman	53.345
10	1	53	-17.501364	145.993221	10P	10P - Innisfail - Cairns	6.895
11	7	47	-16.923779	145.768206	810	810 - Port Connection Road	1.790
12	1	46	-17.205472	145.476878	32B	32B - Mareeba - Ravenshoe	24.140
13	3	44	-17.101327	145.790918	10P	10P - Innisfail - Cairns	62.675
14	1	43	-16.994466	145.393823	664	664 - Mareeba - Dimbulah Road	6.403
15	2	38	-17.265120	145.532779	642	642 - Gillies Range Road	49.238
16	2	34	-16.994770	145.466747	32A	32A - Cairns - Mareeba	43.930
17	2	32	-17.400424	145.909065	10P	10P - Innisfail - Cairns	22.510
18	3	31	-17.547487	146.032218	10N	10N - Ingham - Innisfail	140.082
19	2	28	-16.478326	145.404655	20A	20A - Cairns - Mossman	68.961
20	4	27	-17.217482	145.672790	642	642 - Gillies Range Road	30.470
21	1	24	-17.728562	146.036777	10N	10N - Ingham - Innisfail	122.272
22	4	22	-17.571192	146.020346	627	627 - Innisfail - Japoon Road	3.993
23	8	22	-16.877451	145.573604	32A	32A - Cairns - Mareeba	22.795
24	9	21	-16.883858	145.746035	6472	6472 - Stratford Connection Road	1.243
25	1	21	-17.475253	145.581507	641	641 - Millaa Millaa - Malanda Road	7.723

Top 25 15km segment lengths based on 'social cost'

Zone Ranking	Map Number	Crashes Count	Social Cost	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	195	\$19,676,000	-17.000020	145.743529	10P	10P - Innisfail - Cairns	76.515
2	2	269	\$17,592,000	-16.863342	145.730775	20A	20A - Cairns - Mossman	7.765
3	3	203	\$14,840,000	-16.896659	145.709594	647	647 - Cairns Western Arterial Road	7.158
4	4	203	\$13,840,000	-16.938200	145.746893	809	809 - Mulgrave Road	2.608
5	5	125	\$11,360,000	-16.832307	145.663790	32A	32A - Cairns - Mareeba	8.000
6	1	72	\$7,228,000	-16.749514	145.662414	20A	20A - Cairns - Mossman	24.385
7	2	38	\$5,524,000	-16.606851	145.527692	20A	20A - Cairns - Mossman	42.351
8	1	46	\$5,428,000	-17.205472	145.476878	32B	32B - Mareeba - Ravenshoe	24.140
9	1	45	\$4,920,000	-16.536056	145.468067	20A	20A - Cairns - Mossman	59.749
10	2	60	\$4,708,000	-17.149310	145.710956	642	642 - Gillies Range Road	11.849
11	1	53	\$4,644,000	-17.501364	145.993221	10P	10P - Innisfail - Cairns	6.895
12	2	21	\$4,288,000	-16.963297	145.537636	32A	32A - Cairns - Mareeba	33.684
13	6	64	\$3,988,000	-16.911509	145.756395	649	649 - Anderson Street	1.920
14	2	38	\$3,576,000	-17.265120	145.532779	642	642 - Gillies Range Road	49.238
15	2	32	\$3,560,000	-17.400424	145.909065	10P	10P - Innisfail - Cairns	22.510
16	1	25	\$3,292,000	-17.707461	146.050872	10N	10N - Ingham - Innisfail	127.172
17	1	43	\$3,036,000	-16.994466	145.393823	664	664 - Mareeba - Dimbulah Road	6.403
18	3	22	\$2,848,000	-17.571192	146.020346	627	627 - Innisfail - Japoon Road	3.993
19	1	11	\$2,808,000	-17.522737	145.541634	6404	6404 - East Evelyn Road	5.029
20	4	28	\$2,788,000	-17.561252	146.036282	10N	10N - Ingham - Innisfail	142.638
21	3	34	\$2,728,000	-17.121220	145.816528	10P	10P - Innisfail - Cairns	58.950
22	2	21	\$2,572,000	-17.475253	145.581507	641	641 - Millaa Millaa - Malanda Road	7.723
23	7	47	\$2,476,000	-16.923779	145.768206	810	810 - Port Connection Road	1.790
24	3	25	\$2,420,000	-17.014013	145.425353	32A	32A - Cairns - Mareeba	48.915
25	4	11	\$2,372,000	-16.921090	145.418219	34A	34A - Mareeba - Mount Molloy	7.123

Top 25 5km segment lengths based on 'number of crashes'

Zone Ranking	Map Number	Crashes Count	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	180	-16.935460	145.753978	809	809 - Mulgrave Road	3.382
2	2	132	-16.919710	145.740343	647	647 - Cairns Western Arterial Road	2.393
3	3	128	-16.902486	145.757165	20A	20A - Cairns - Mossman	2.430
4	3	111	-16.986088	145.742248	10P	10P - Innisfail - Cairns	78.100
5	1	105	-16.831540	145.693045	20A	20A - Cairns - Mossman	13.860
6	4	64	-16.911509	145.756395	649	649 - Anderson Street	1.920
7	2	64	-16.845913	145.673402	32A	32A - Cairns - Mareeba	5.956
8	5	57	-16.856696	145.725791	20A	20A - Cairns - Mossman	8.560
9	6	49	-16.891235	145.702055	647	647 - Cairns Western Arterial Road	8.120
10	5	47	-16.923779	145.768206	810	810 - Port Connection Road	1.790
11	6	43	-16.946119	145.759793	10P	10P - Innisfail - Cairns	83.375
12	3	43	-16.792689	145.678344	20A	20A - Cairns - Mossman	18.976
13	1	43	-17.036236	145.755724	10P	10P - Innisfail - Cairns	72.110
14	7	41	-17.519944	146.010749	10P	10P - Innisfail - Cairns	2.390
15	1	37	-16.997283	145.422933	664	664 - Mareeba - Dimbulah Road	1.850
16	1	33	-17.141462	145.749975	642	642 - Gillies Range Road	6.210
17	4	32	-16.837727	145.686439	32A	32A - Cairns - Mareeba	0.790
18	5	26	-16.816207	145.634464	32A	32A - Cairns - Mareeba	12.886
19	2	25	-16.541458	145.470927	20A	20A - Cairns - Mossman	59.060
20	1	23	-17.268619	145.475816	32B	32B - Mareeba - Ravenshoe	31.520
21	3	20	-17.081638	145.775427	10P	10P - Innisfail - Cairns	66.250
22	8	20	-16.847829	145.696960	647	647 - Cairns Western Arterial Road	14.015
23	3	19	-17.257772	145.485851	642	642 - Gillies Range Road	54.358
24	2	19	-17.004580	145.450832	32A	32A - Cairns - Mareeba	45.980
25	3	18	-17.159820	145.699690	642	642 - Gillies Range Road	16.815

Top 25 5km segment lengths based on 'social cost'

Zone Ranking	Map Number	Crashes Count	Social Cost	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	180	\$12,356,000	-16.935460	145.753978	809	809 - Mulgrave Road	3.382
2	2	111	\$11,568,000	-16.986088	145.742248	10P	10P - Innisfail - Cairns	78.100
3	2	128	\$8,576,000	-16.902486	145.757165	20A	20A - Cairns - Mossman	2.430
4	3	127	\$8,428,000	-16.914334	145.728016	647	647 - Cairns Western Arterial Road	3.776
5	1	62	\$5,876,000	-16.845651	145.673371	32A	32A - Cairns - Mareeba	4.112
6	2	99	\$5,872,000	-16.821265	145.692731	20A	20A - Cairns - Mossman	15.244
7	4	67	\$5,360,000	-16.849572	145.713282	20A	20A - Cairns - Mossman	9.477
8	1	35	\$4,824,000	-17.038844	145.759009	10P	10P - Innisfail - Cairns	71.730
9	5	38	\$3,988,000	-16.881679	145.691891	647	647 - Cairns Western Arterial Road	9.511
10	4	64	\$3,968,000	-16.911509	145.756395	649	649 - Anderson Street	1.920
11	6	41	\$3,636,000	-17.519944	146.010749	10P	10P - Innisfail - Cairns	2.390
12	5	43	\$3,164,000	-16.946119	145.759793	10P	10P - Innisfail - Cairns	83.375
13	1	33	\$2,888,000	-17.141462	145.749975	642	642 - Gillies Range Road	6.210
14	3	34	\$2,856,000	-16.827010	145.654157	32A	32A - Cairns - Mareeba	9.200
15	1	15	\$2,836,000	-16.701402	145.618303	20A	20A - Cairns - Mossman	33.600
16	1	37	\$2,660,000	-16.997283	145.422933	664	664 - Mareeba - Dimbulah Road	1.850
17	6	18	\$2,640,000	-17.692610	146.045787	10N	10N - Ingham - Innisfail	127.017
18	7	47	\$2,476,000	-16.923779	145.768206	810	810 - Port Connection Road	1.790
19	2	13	\$2,412,000	-17.182759	145.456904	32B	32B - Mareeba - Ravenshoe	20.427
20	3	25	\$2,292,000	-16.541458	145.470927	20A	20A - Cairns - Mossman	59.060
21	3	18	\$2,204,000	-16.607186	145.528540	20A	20A - Cairns - Mossman	48.380
22	5	13	\$2,156,000	-17.348532	145.922546	10P	10P - Innisfail - Cairns	28.480
23	2	22	\$2,104,000	-16.833257	145.620071	32A	32A - Cairns - Mareeba	15.321
24	8	8	\$2,056,000	-17.561411	146.027186	627	627 - Innisfail - Japoon Road	2.682
25	4	14	\$1,996,000	-16.646288	145.565323	20A	20A - Cairns - Mossman	42.015

Top 25 500m segment lengths based on 'number of crashes'

Zone Ranking	Map Number	Crashes Count	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	45	-16.920888	145.740285	647	647 - Cairns Western Arterial Road	2.151
2	2	39	-16.839859	145.693013	20A	20A - Cairns - Mossman	12.968
3	1	32	-16.915256	145.766389	20A	20A - Cairns - Mossman	0.734
4	3	31	-16.965515	145.746705	10P	10P - Innisfail - Cairns	80.275
5	4	31	-16.913797	145.722000	647	647 - Cairns Western Arterial Road	4.331
6	1	31	-16.921992	145.768526	809	809 - Mulgrave Road	5.640
7	1	28	-16.936482	145.751551	809	809 - Mulgrave Road	3.150
8	1	24	-16.899110	145.755407	20A	20A - Cairns - Mossman	2.870
9	3	24	-17.003116	145.744123	10P	10P - Innisfail - Cairns	76.195
10	2	24	-16.850819	145.686400	32A	32A - Cairns - Mareeba	4.227
11	1	23	-16.940692	145.742094	809	809 - Mulgrave Road	2.060
12	1	22	-16.928999	145.758651	809	809 - Mulgrave Road	4.340
13	4	20	-16.951975	145.744707	809	809 - Mulgrave Road	0.242
14	5	20	-16.925605	145.770606	810	810 - Port Connection Road	1.430
15	6	19	-16.799788	145.687089	20A	20A - Cairns - Mossman	17.727
16	3	19	-16.976300	145.744092	10P	10P - Innisfail - Cairns	79.210
17	2	19	-16.820642	145.693094	20A	20A - Cairns - Mossman	15.158
18	4	19	-16.943887	145.738311	809	809 - Mulgrave Road	1.475
19	7	18	-16.904019	145.709115	647	647 - Cairns Western Arterial Road	6.285
20	5	18	-16.904134	145.757927	20A	20A - Cairns - Mossman	2.260
21	4	17	-16.926225	145.741830	647	647 - Cairns Western Arterial Road	1.500
22	1	17	-16.908398	145.761049	20A	20A - Cairns - Mossman	1.708
23	8	17	-16.994755	145.422638	664	664 - Mareeba - Dimbulah Road	2.080
24	4	17	-16.916612	145.743829	649	649 - Anderson Street	0.410
25	4	16	-16.938200	145.746893	809	809 - Mulgrave Road	2.608

Top 25 500m segment lengths based on 'social cost'

Zone Ranking	Map Number	Crashes Count	Social Cost	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	24	\$3,016,000	-17.003116	145.744123	10P	10P - Innisfail - Cairns	76.195
2	2	45	\$2,692,000	-16.920888	145.740285	647	647 - Cairns Western Arterial Road	2.151
3	2	32	\$2,432,000	-16.915256	145.766389	20A	20A - Cairns - Mossman	0.734
4	1	31	\$2,284,000	-16.965515	145.746705	10P	10P - Innisfail - Cairns	80.275
5	2	28	\$2,276,000	-16.936482	145.751551	809	809 - Mulgrave Road	3.150
6	2	30	\$2,136,000	-16.921717	145.769293	809	809 - Mulgrave Road	5.710
7	1	16	\$2,036,000	-16.985298	145.742165	10P	10P - Innisfail - Cairns	77.940
8	1	18	\$1,948,000	-16.958229	145.746828	10P	10P - Innisfail - Cairns	79.000
9	3	31	\$1,900,000	-16.913797	145.722000	647	647 - Cairns Western Arterial Road	4.331
10	2	22	\$1,848,000	-16.928999	145.758651	809	809 - Mulgrave Road	4.340
11	4	19	\$1,840,000	-16.799788	145.687089	20A	20A - Cairns - Mossman	17.727
12	4	9	\$1,820,000	-16.840878	145.682499	32A	32A - Cairns - Mareeba	1.879
13	5	16	\$1,780,000	-16.865099	145.732398	20A	20A - Cairns - Mossman	7.490
14	4	39	\$1,676,000	-16.839859	145.693013	20A	20A - Cairns - Mossman	12.968
15	6	6	\$1,632,000	-17.346629	145.924365	10P	10P - Innisfail - Cairns	28.820
16	7	4	\$1,592,000	-17.511997	145.585705	640A	640A - East Evelyn Road	10.558
17	8	11	\$1,552,000	-17.139950	145.739389	642	642 - Gillies Range Road	7.550
18	3	18	\$1,512,000	-16.905362	145.710249	647	647 - Cairns Western Arterial Road	6.190
19	2	24	\$1,504,000	-16.899110	145.755407	20A	20A - Cairns - Mossman	2.870
20	9	24	\$1,504,000	-16.850819	145.686400	32A	32A - Cairns - Mareeba	4.227
21	2	23	\$1,484,000	-16.940692	145.742094	809	809 - Mulgrave Road	2.060
22	10	7	\$1,472,000	-17.039590	145.760428	10P	10P - Innisfail - Cairns	71.570
23	3	17	\$1,364,000	-16.926225	145.741830	647	647 - Cairns Western Arterial Road	1.500
24	11	17	\$1,364,000	-16.994755	145.422638	664	664 - Mareeba - Dimbulah Road	2.080
25	12	5	\$1,304,000	-16.712357	145.634522	20A	20A - Cairns - Mossman	31.329

Crash Clusters – based on number of crashes

Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

Report Constraints

Geographic Constraints
MR Road Section: 32A - CAIRNS - MAREEBA
Through Distance: 0.100km - 14.000km
and

Date and Time Constraints
Continuous time: 01-Jul-2007 to 30-Jun-2012
and

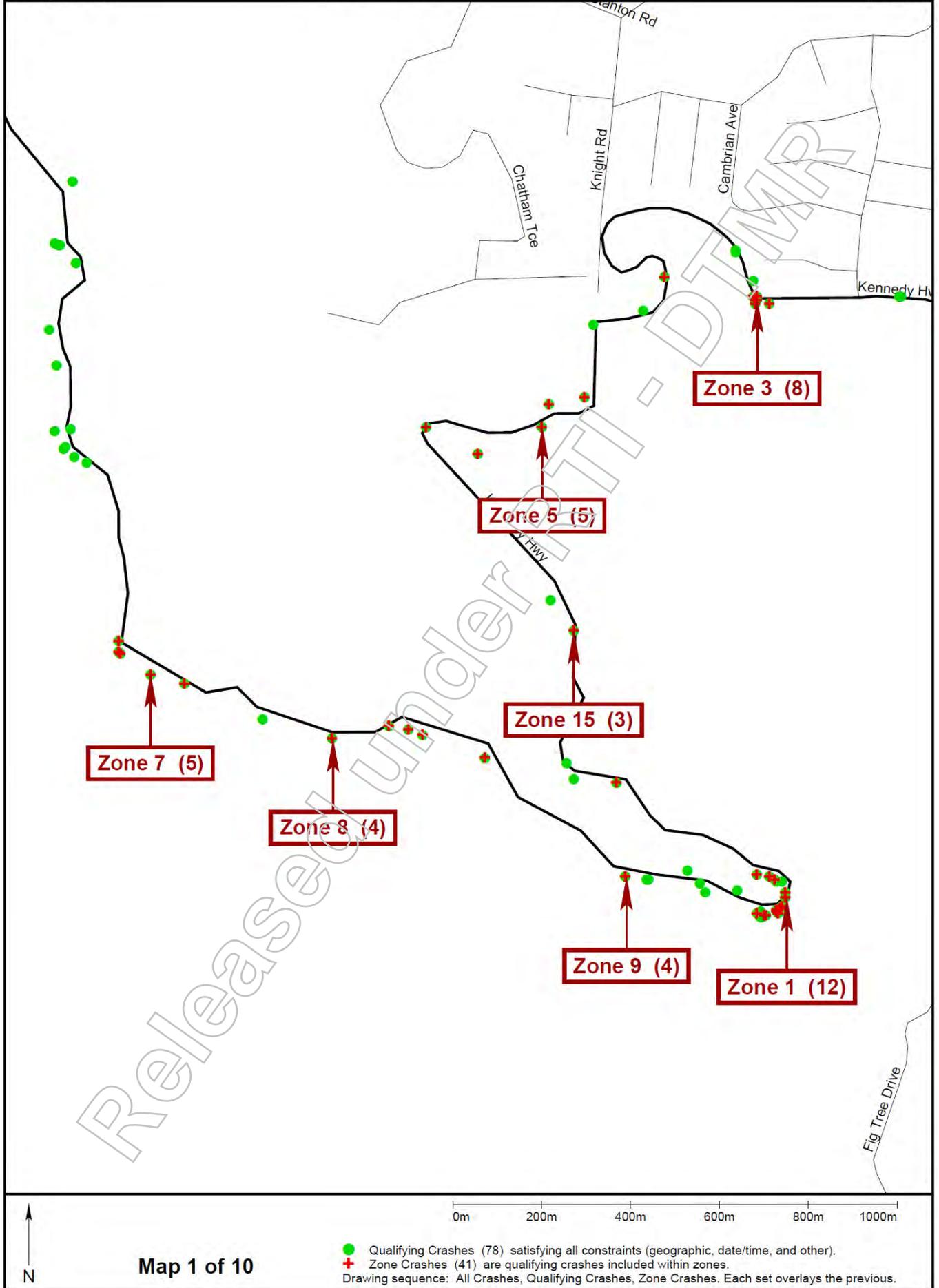
Other Constraint Category: Crashes
Other Constraint: Crash Severity
Fatal or
Hospitalisation or
Medical Treatment or
Minor Injuries

Corridor Crash Zones Summary

Zone Ranking	Map Number	Crashes Count	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	12	-16.850992	145.687432	32A	32A - Cairns - Mareeba	4.042
2	2	11	-16.851373	145.686903	32A	32A - Cairns - Mareeba	4.319
3	1	8	-16.838744	145.686890	32A	32A - Cairns - Mareeba	0.650
4	3	5	-16.841298	145.672374	32A	32A - Cairns - Mareeba	6.446
5	1	5	-16.841321	145.682335	32A	32A - Cairns - Mareeba	1.840
6	3	5	-16.831636	145.664827	32A	32A - Cairns - Mareeba	8.346
7	1	5	-16.846327	145.674029	32A	32A - Cairns - Mareeba	5.866
8	1	4	-16.847672	145.677872	32A	32A - Cairns - Mareeba	5.000
9	1	4	-16.850537	145.684049	32A	32A - Cairns - Mareeba	3.626
10	4	4	-16.826940	145.652152	32A	32A - Cairns - Mareeba	9.241
11	2	3	-16.838850	145.690636	32A	32A - Cairns - Mareeba	0.370
12	3	3	-16.837528	145.672163	32A	32A - Cairns - Mareeba	6.946
13	4	3	-16.814988	145.640356	32A	32A - Cairns - Mareeba	11.170
14	5	3	-16.830596	145.667196	32A	32A - Cairns - Mareeba	7.746
15	1	3	-16.845500	145.682973	32A	32A - Cairns - Mareeba	2.106
16	4	3	-16.822502	145.649328	32A	32A - Cairns - Mareeba	10.500
17	6	2	-16.814650	145.640424	32A	32A - Cairns - Mareeba	11.790
18	6	2	-16.823612	145.651025	32A	32A - Cairns - Mareeba	9.700
19	3	2	-16.834179	145.670543	32A	32A - Cairns - Mareeba	7.430
20	5	2	-16.832318	145.664021	32A	32A - Cairns - Mareeba	6.746
21	2	2	-16.837775	145.686455	32A	32A - Cairns - Mareeba	3.261
22	5	1	-16.841687	145.672227	32A	32A - Cairns - Mareeba	4.550
23	7	1	-16.832307	145.663790	32A	32A - Cairns - Mareeba	8.000
24	8	1	-16.813504	145.637914	32A	32A - Cairns - Mareeba	11.550
25	9	1	-16.851370	145.686928	32A	32A - Cairns - Mareeba	3.840
26	8	1	-16.816207	145.634464	32A	32A - Cairns - Mareeba	12.886
27	7	1	-16.826293	145.657742	32A	32A - Cairns - Mareeba	9.441
28	2	1	-16.839232	145.683436	32A	32A - Cairns - Mareeba	1.640
29	3	1	-16.829859	145.658748	32A	32A - Cairns - Mareeba	8.860
30	2	1	-16.844861	145.682484	32A	32A - Cairns - Mareeba	2.980
31	8	1	-16.820339	145.629428	32A	32A - Cairns - Mareeba	13.456
32	9	1	-16.838970	145.684502	32A	32A - Cairns - Mareeba	1.000
33	5	1	-16.836245	145.672456	32A	32A - Cairns - Mareeba	7.146
34	5	1	-16.847273	145.676409	32A	32A - Cairns - Mareeba	5.459
35	10	1	-16.816917	145.633470	32A	32A - Cairns - Mareeba	12.282

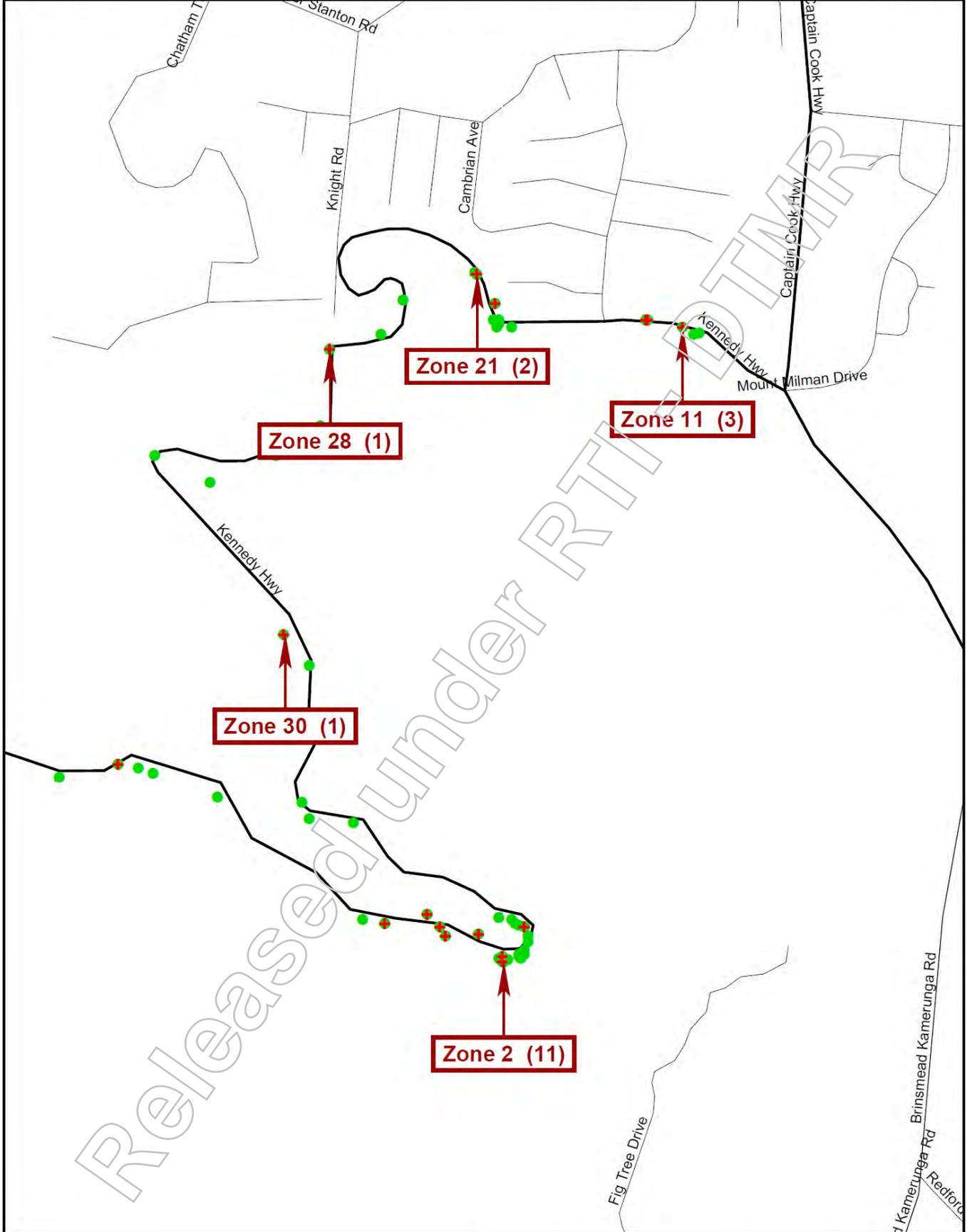
Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



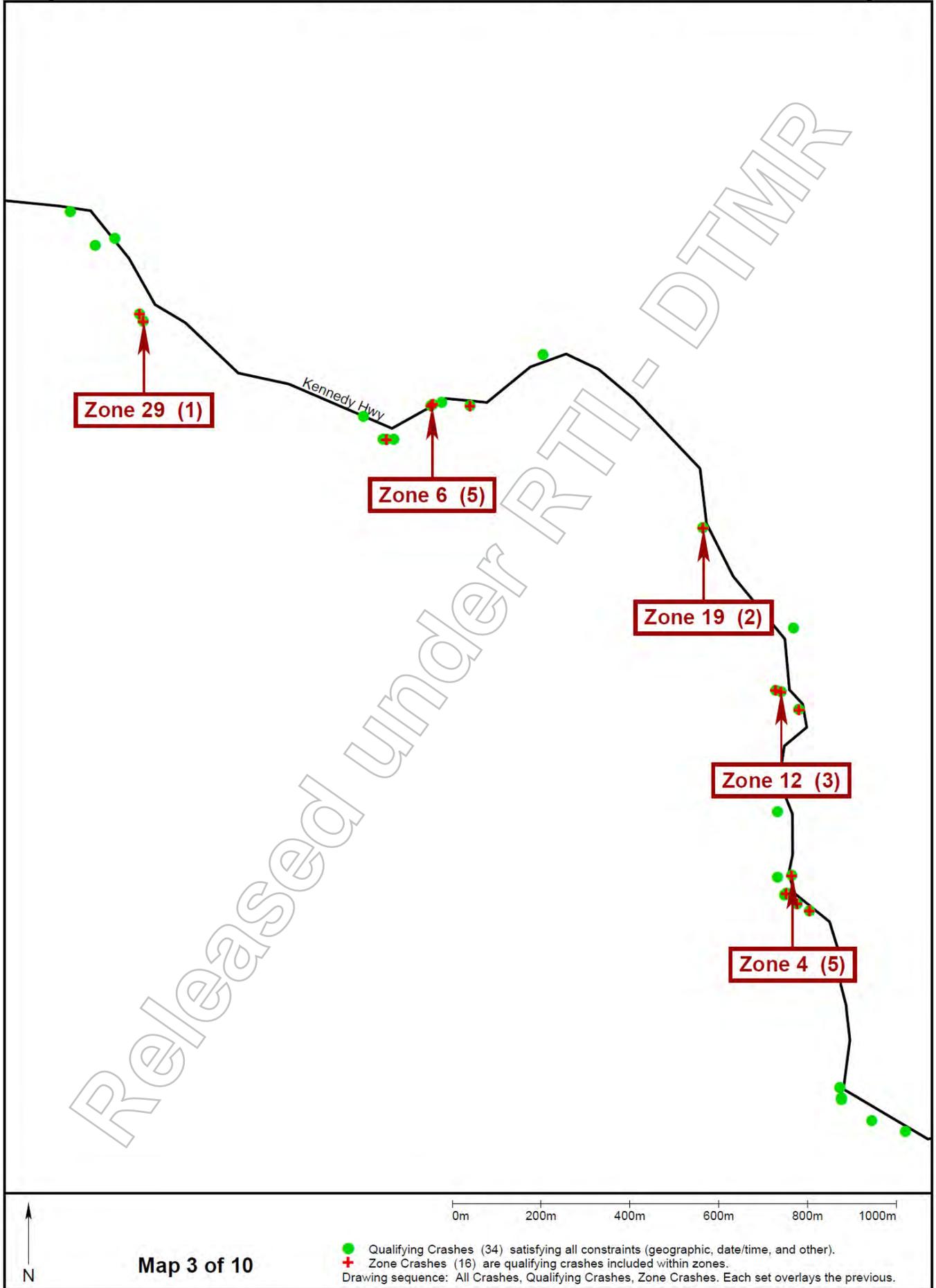
Map 2 of 10

- Qualifying Crashes (62) satisfying all constraints (geographic, date/time, and other).
 - + Zone Crashes (18) are qualifying crashes included within zones.
- Drawing sequence: All Crashes, Qualifying Crashes, Zone Crashes. Each set overlays the previous.

Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

PDF Page 10 of 18

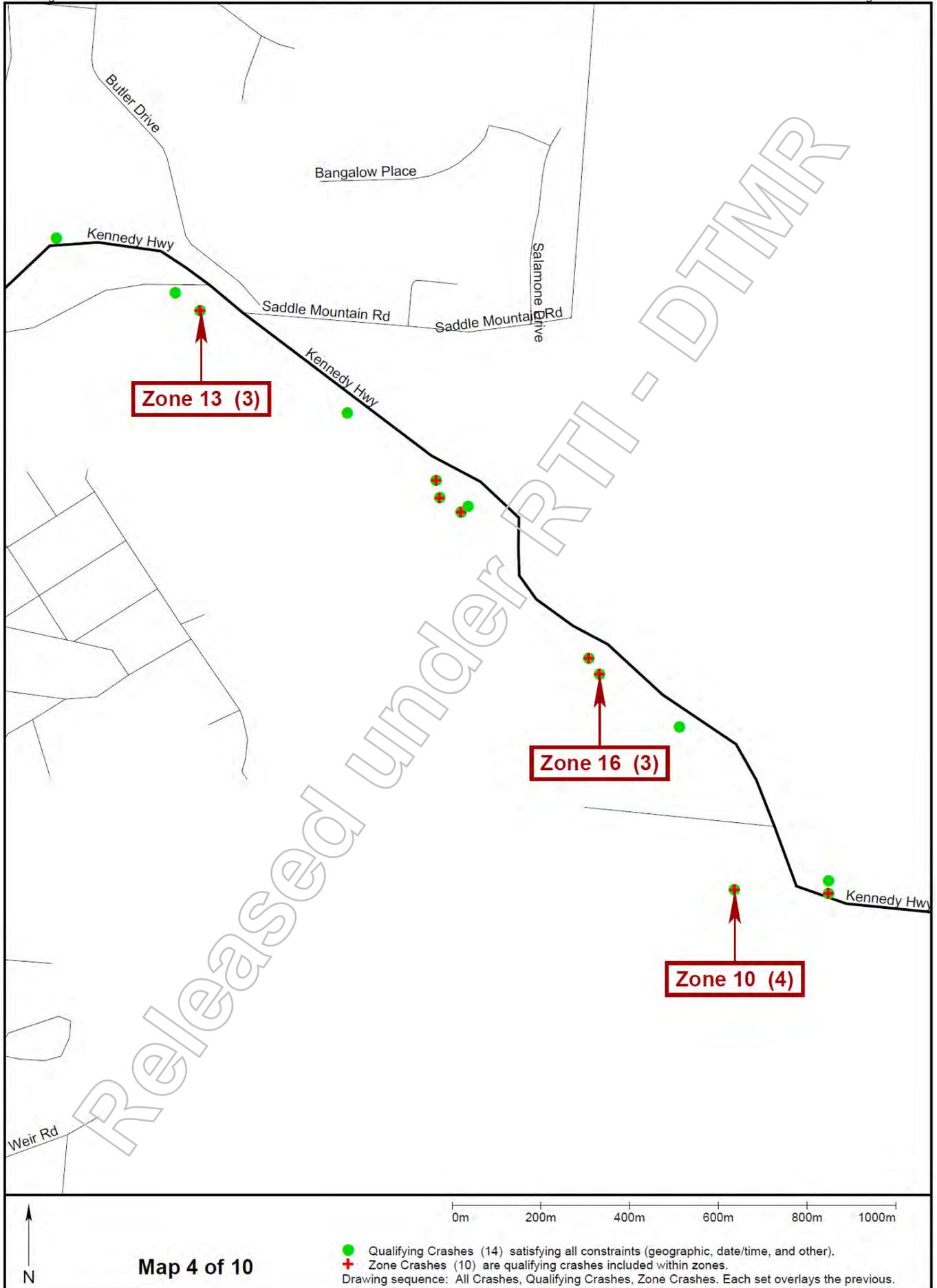
Page 8 of 16



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

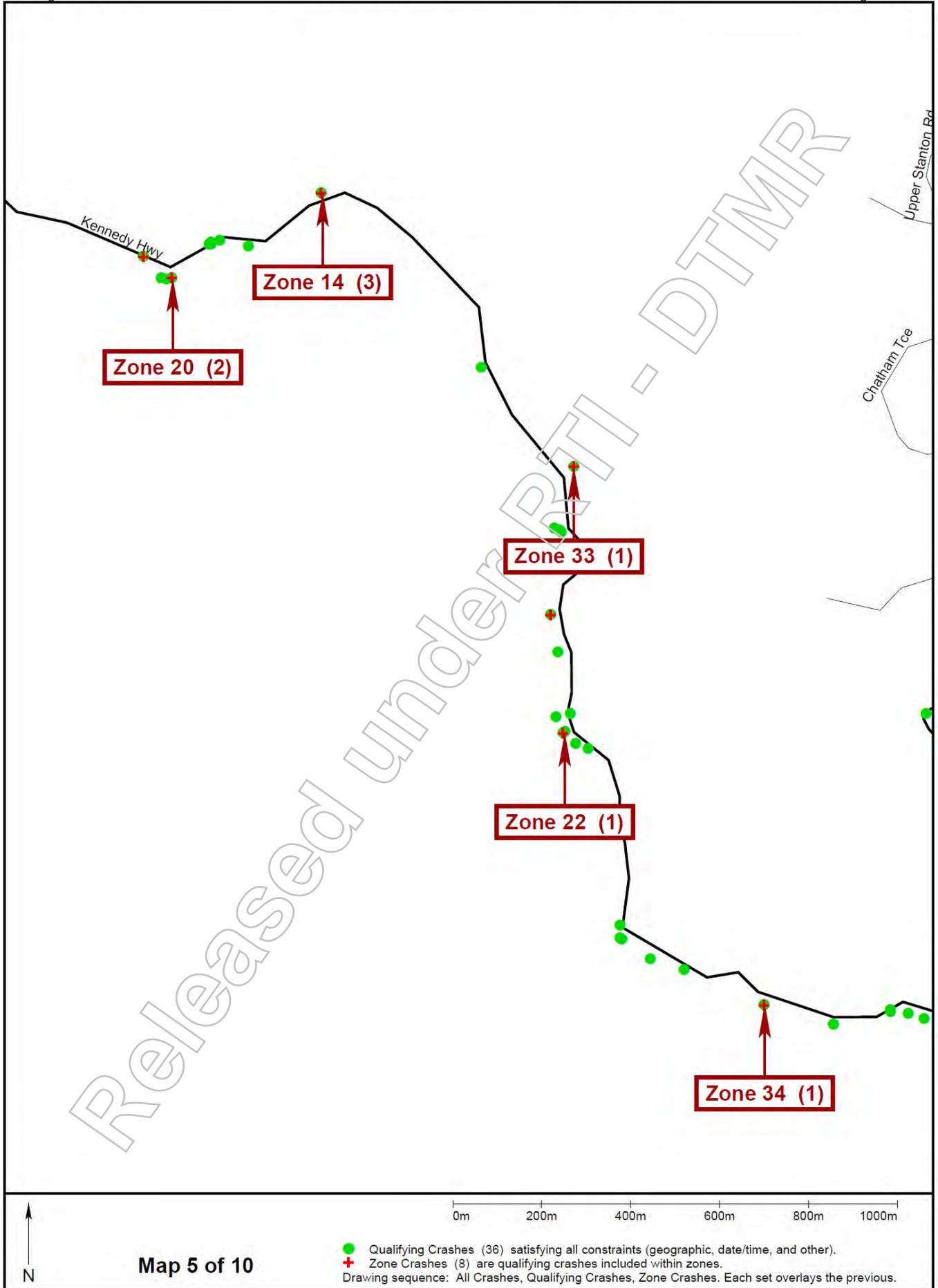
PDF Page 11 of 18

Page 9 of 16



Corridor Crash Zones using Road Section-based Analysis

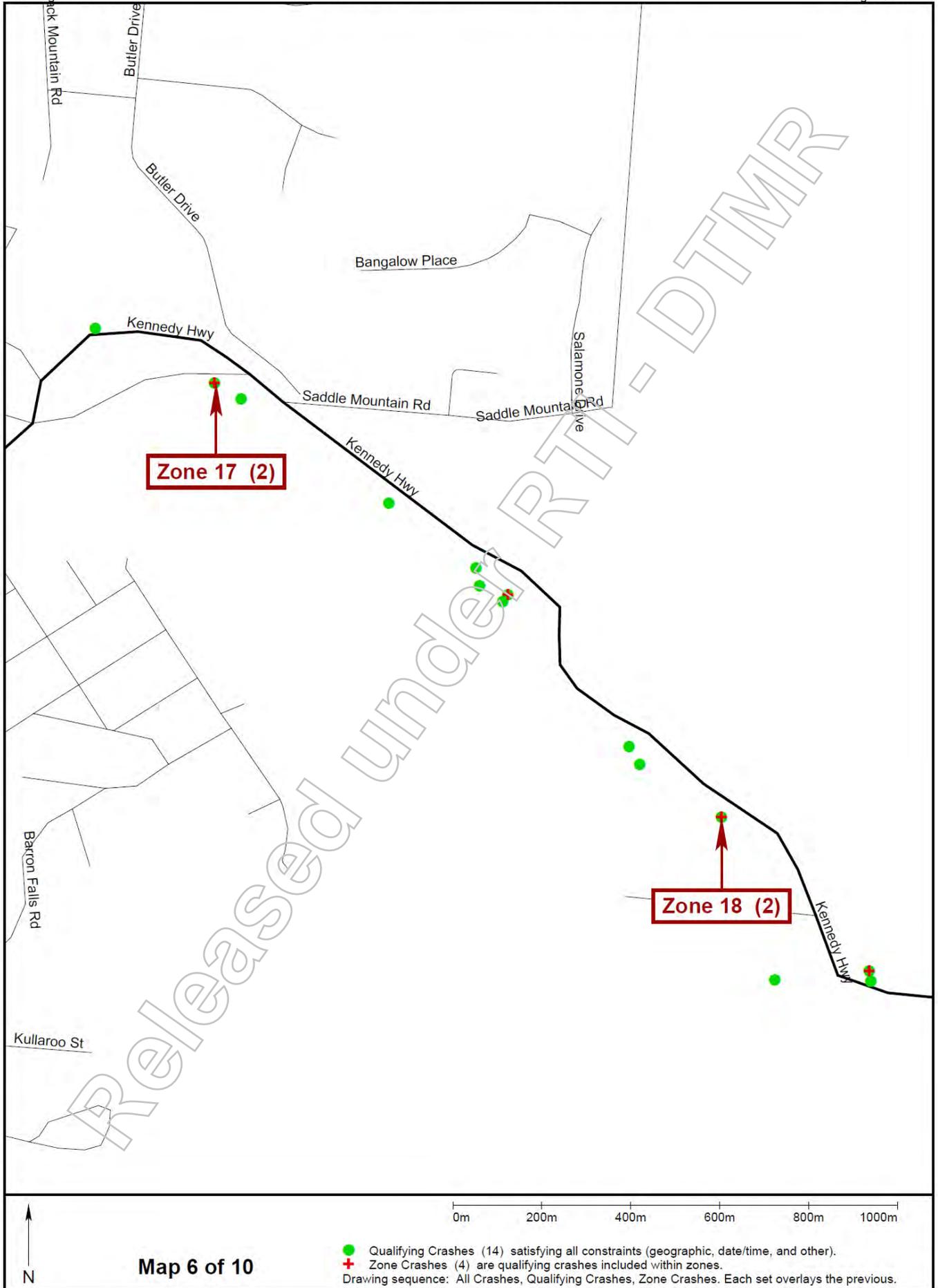
Zone Length 200m Top 100 Zones



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

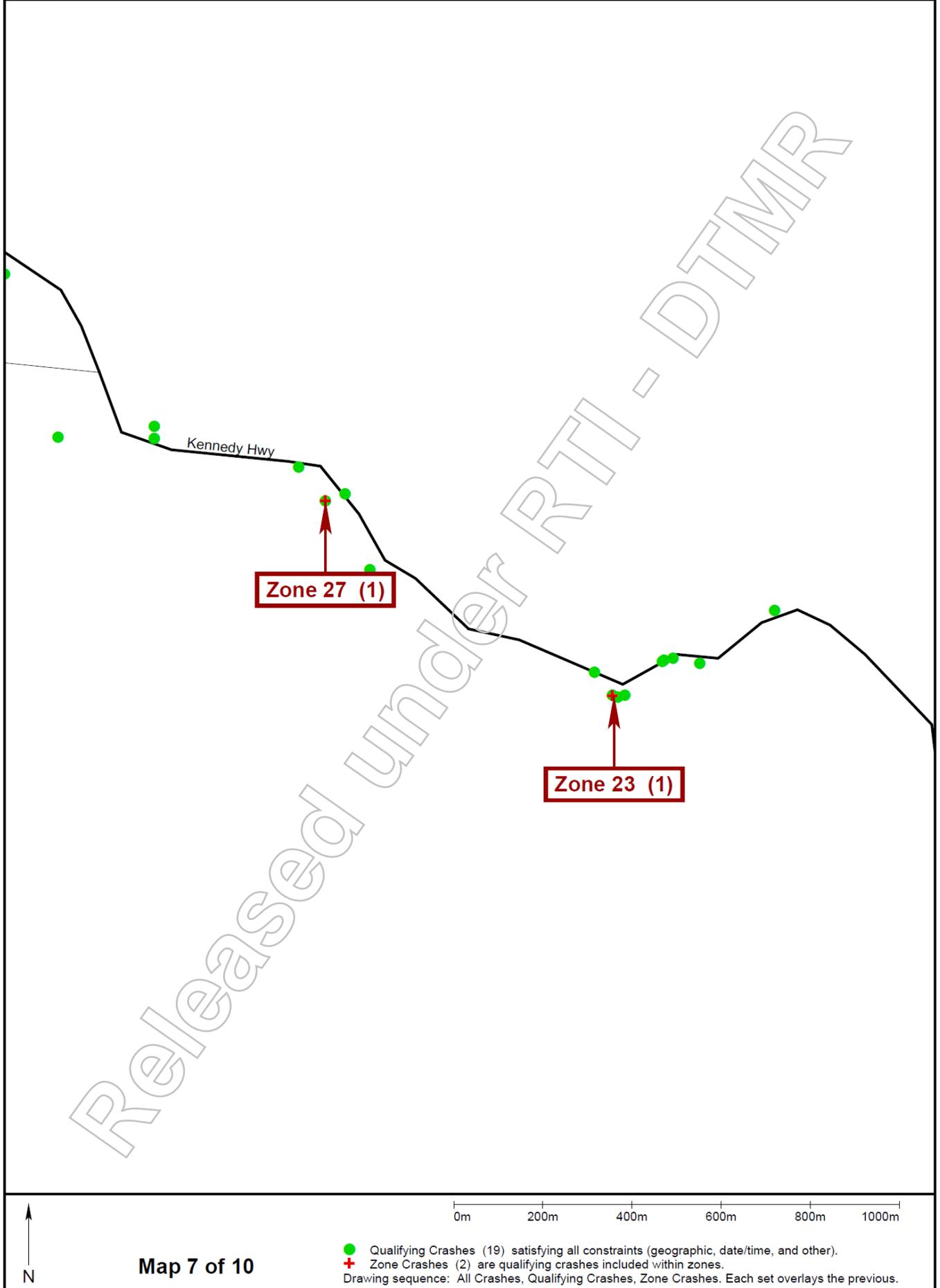
PDF Page 13 of 18

Page 11 of 16



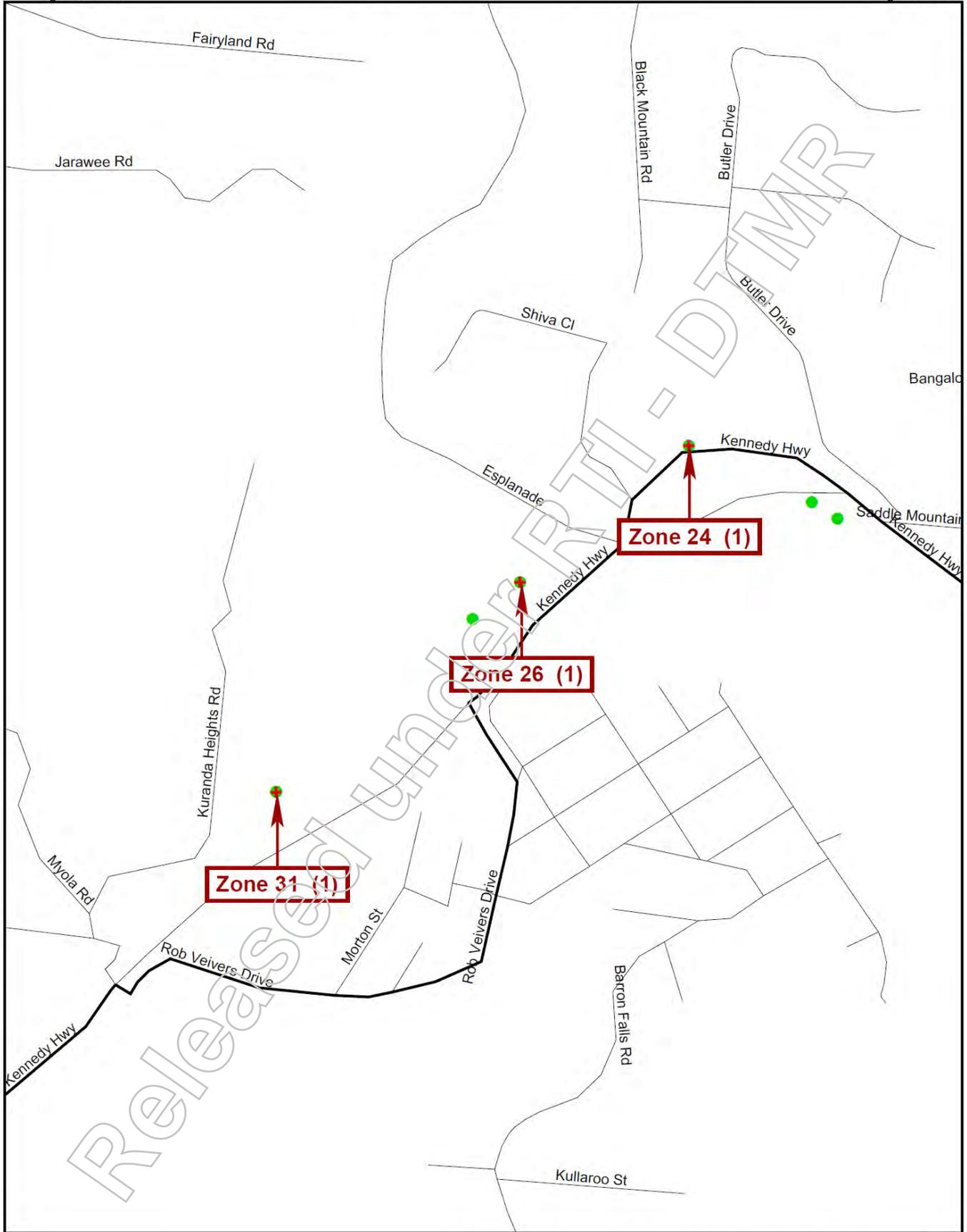
Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Released under RTI - DTPMR

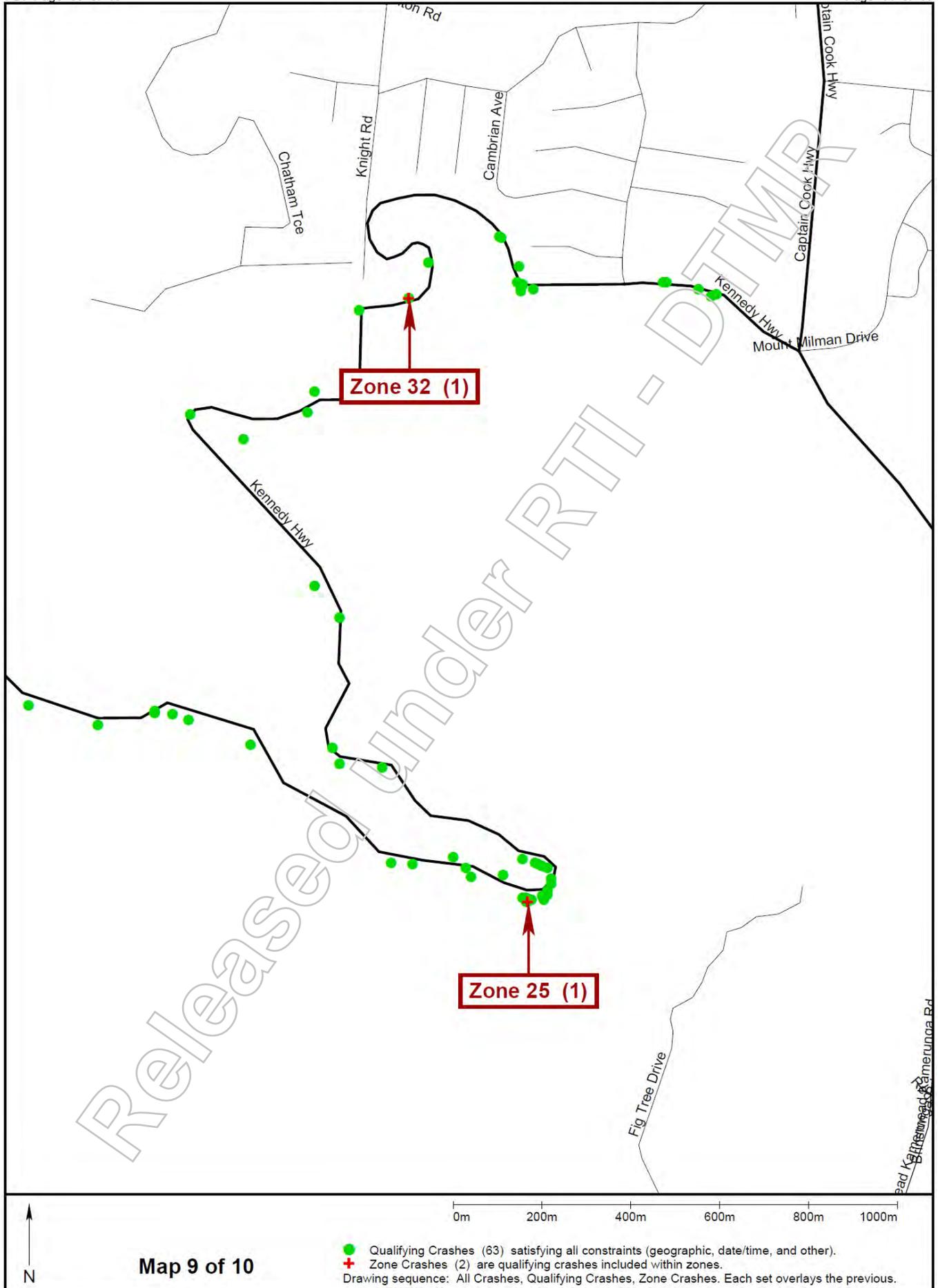


Map 8 of 10

- Qualifying Crashes (6) satisfying all constraints (geographic, date/time, and other).
 - + Zone Crashes (3) are qualifying crashes included within zones.
- Drawing sequence: All Crashes, Qualifying Crashes, Zone Crashes. Each set overlays the previous.

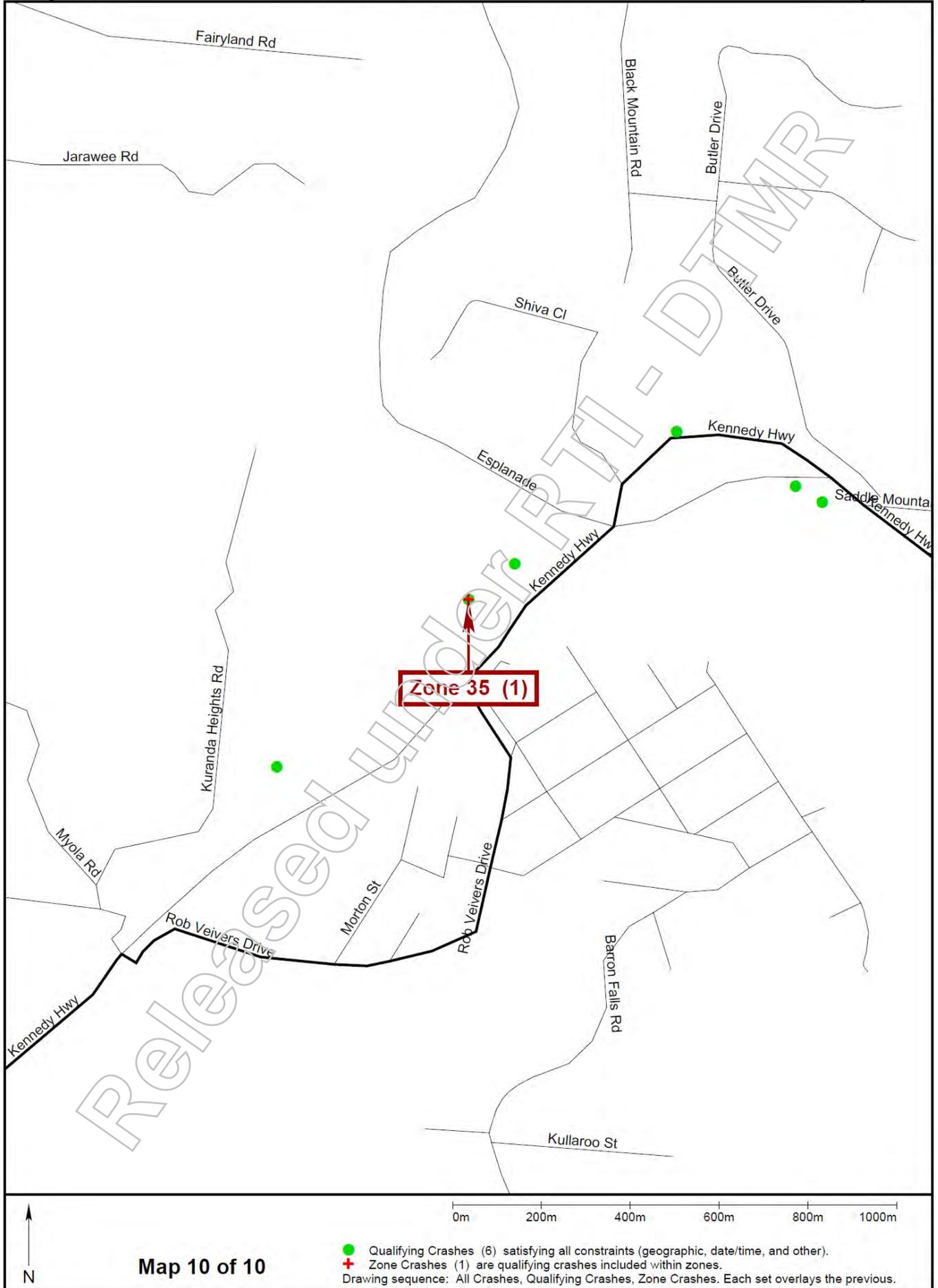
Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Crash Clusters – based on social cost

Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

Report Constraints

Geographic Constraints
MR Road Section: 32A - CAIRNS - MAREEBA
Through Distance: 0.100km - 14.000km

and

Date and Time Constraints
Continuous time: 01-Jul-2007 to 30-Jun-2012

and

Other Constraint Category: Crashes
Other Constraint: Crash Severity
Fatal or
Hospitalisation or
Medical Treatment or
Minor Injuries

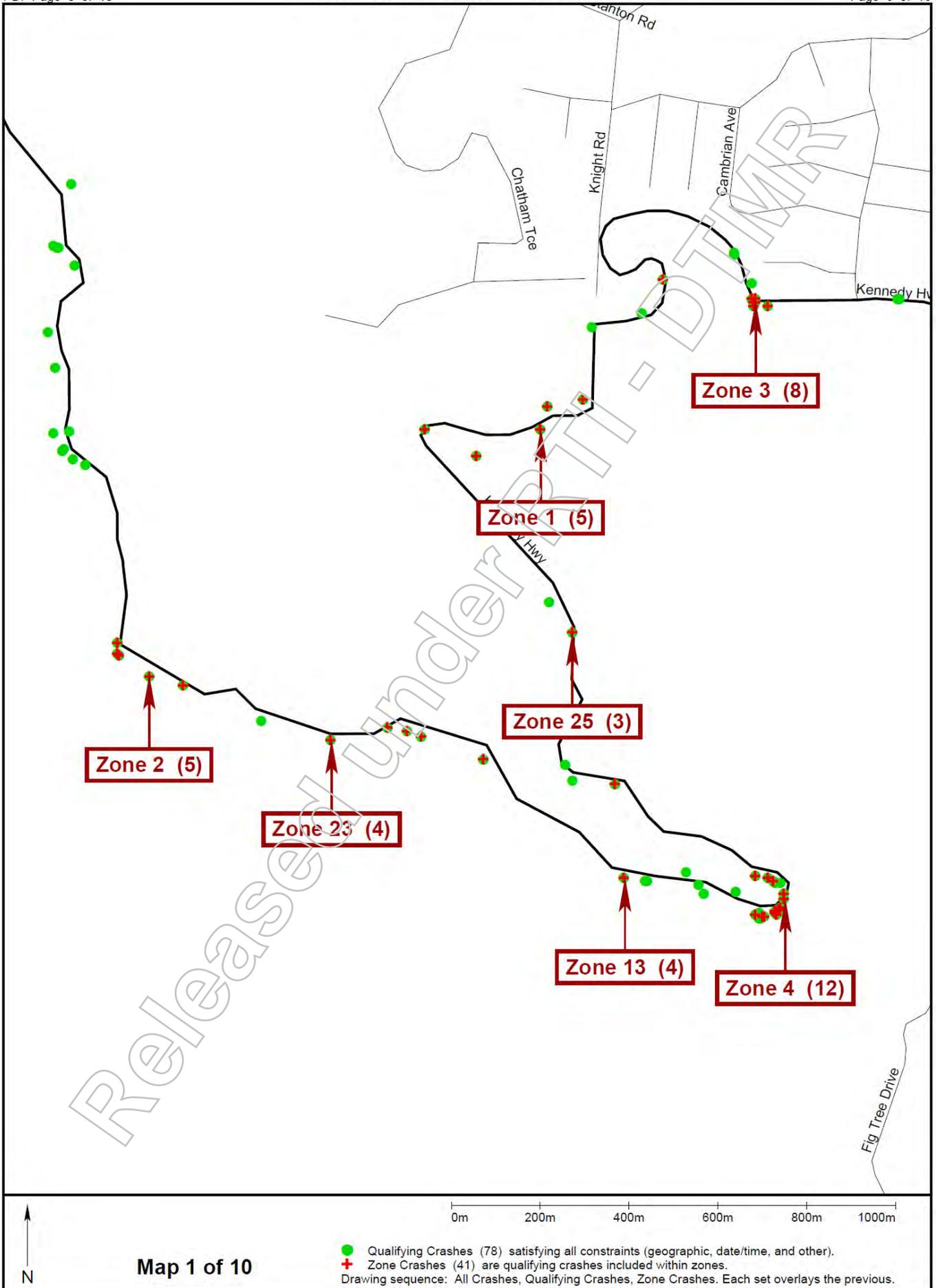
Corridor Crash Zones Summary

Zone Ranking	Map Number	Crashes Count	Social Cost	Latitude GDA94	Longitude GDA94	Road Section Id	Road Section Name	Through Distance kms
1	1	5	\$1,612,000	-16.841321	145.682335	32A	32A - Cairns - Mareeba	1.840
2	1	5	\$1,176,000	-16.846327	145.674029	32A	32A - Cairns - Mareeba	5.866
3	1	8	\$800,000	-16.838744	145.686890	32A	32A - Cairns - Mareeba	0.650
4	1	12	\$752,000	-16.850992	145.687432	32A	32A - Cairns - Mareeba	4.042
5	2	11	\$732,000	-16.851373	145.686903	32A	32A - Cairns - Mareeba	4.319
6	3	3	\$444,000	-16.837528	145.672163	32A	32A - Cairns - Mareeba	6.946
7	3	5	\$356,000	-16.841298	145.672374	32A	32A - Cairns - Mareeba	6.446
8	3	5	\$356,000	-16.831636	145.664827	32A	32A - Cairns - Mareeba	8.346
9	4	4	\$336,000	-16.826940	145.652152	32A	32A - Cairns - Mareeba	9.241
10	5	3	\$316,000	-16.830596	145.667196	32A	32A - Cairns - Mareeba	7.746
11	4	3	\$316,000	-16.822502	145.649328	32A	32A - Cairns - Mareeba	10.500
12	5	2	\$296,000	-16.832318	145.664021	32A	32A - Cairns - Mareeba	6.746
13	1	4	\$208,000	-16.850537	145.684049	32A	32A - Cairns - Mareeba	3.626
14	2	3	\$188,000	-16.838850	145.690636	32A	32A - Cairns - Mareeba	0.370
15	3	2	\$168,000	-16.834179	145.670543	32A	32A - Cairns - Mareeba	7.430
16	6	1	\$148,000	-16.851370	145.686928	32A	32A - Cairns - Mareeba	3.840
17	7	1	\$148,000	-16.816207	145.634464	32A	32A - Cairns - Mareeba	12.886
18	8	1	\$148,000	-16.850635	145.687237	32A	32A - Cairns - Mareeba	3.100
19	2	1	\$148,000	-16.839232	145.683436	32A	32A - Cairns - Mareeba	1.640
20	3	1	\$148,000	-16.829859	145.658748	32A	32A - Cairns - Mareeba	8.860
21	5	1	\$148,000	-16.836245	145.672456	32A	32A - Cairns - Mareeba	7.146
22	2	1	\$148,000	-16.848191	145.682823	32A	32A - Cairns - Mareeba	2.800
23	1	4	\$80,000	-16.847672	145.677872	32A	32A - Cairns - Mareeba	5.000
24	4	3	\$60,000	-16.814908	145.640956	32A	32A - Cairns - Mareeba	11.170
25	1	3	\$60,000	-16.843500	145.682973	32A	32A - Cairns - Mareeba	2.106
26	7	2	\$40,000	-16.814650	145.640424	32A	32A - Cairns - Mareeba	11.790
27	9	2	\$40,000	-16.823612	145.651025	32A	32A - Cairns - Mareeba	9.700
28	5	1	\$20,000	-16.841687	145.672227	32A	32A - Cairns - Mareeba	4.550
29	9	1	\$20,000	-16.832307	145.663790	32A	32A - Cairns - Mareeba	8.000
30	10	1	\$20,000	-16.813504	145.637914	32A	32A - Cairns - Mareeba	11.550
31	9	1	\$20,000	-16.828293	145.657742	32A	32A - Cairns - Mareeba	9.441
32	6	1	\$20,000	-16.848511	145.682971	32A	32A - Cairns - Mareeba	3.380
33	7	1	\$20,000	-16.820339	145.629428	32A	32A - Cairns - Mareeba	13.456
34	6	1	\$20,000	-16.838970	145.684502	32A	32A - Cairns - Mareeba	1.000
35	5	1	\$20,000	-16.847273	145.676409	32A	32A - Cairns - Mareeba	5.459
36	10	1	\$20,000	-16.816917	145.633470	32A	32A - Cairns - Mareeba	12.282

Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

PDF Page 8 of 18

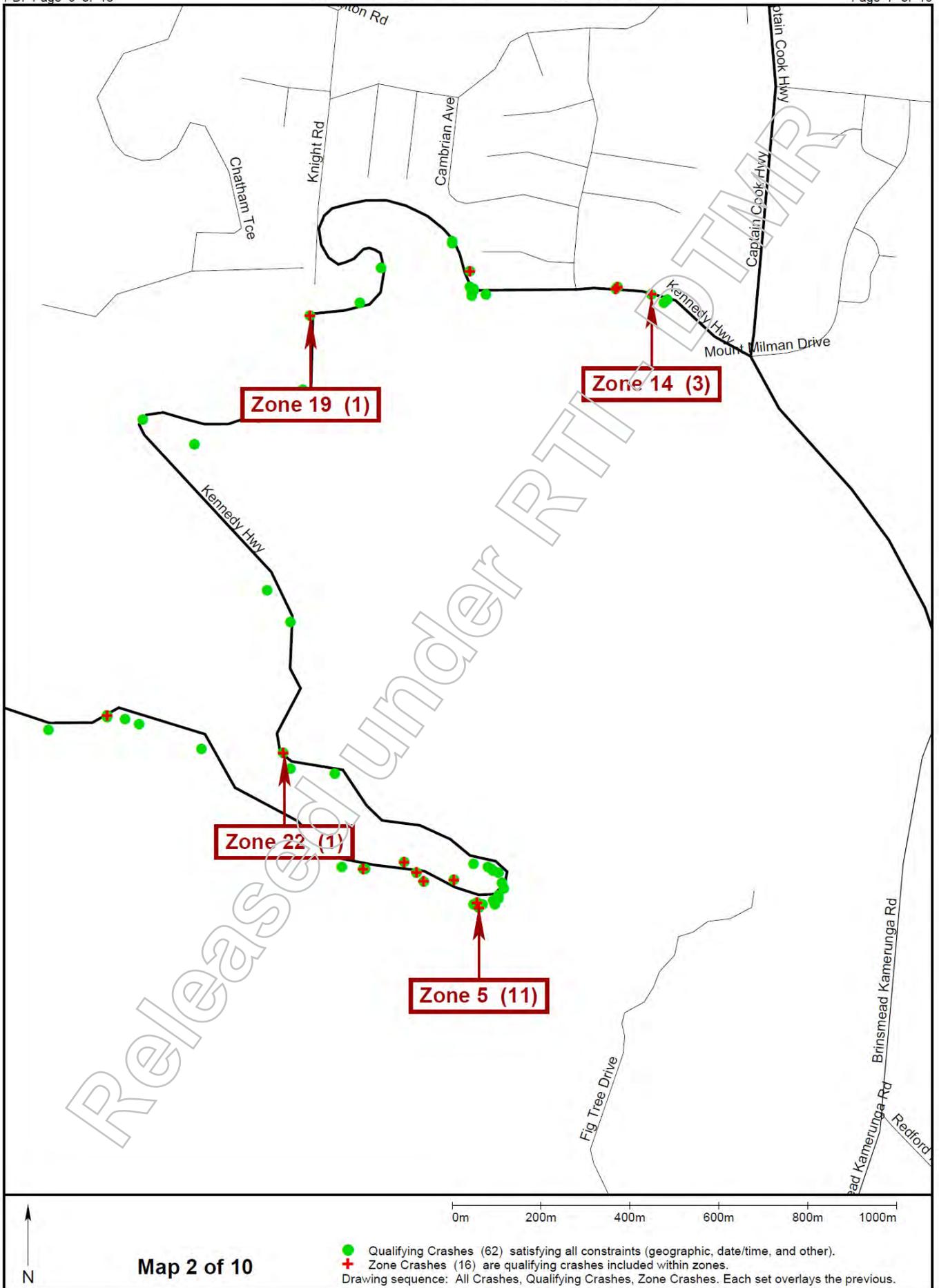
Page 6 of 16



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

PDF Page 9 of 18

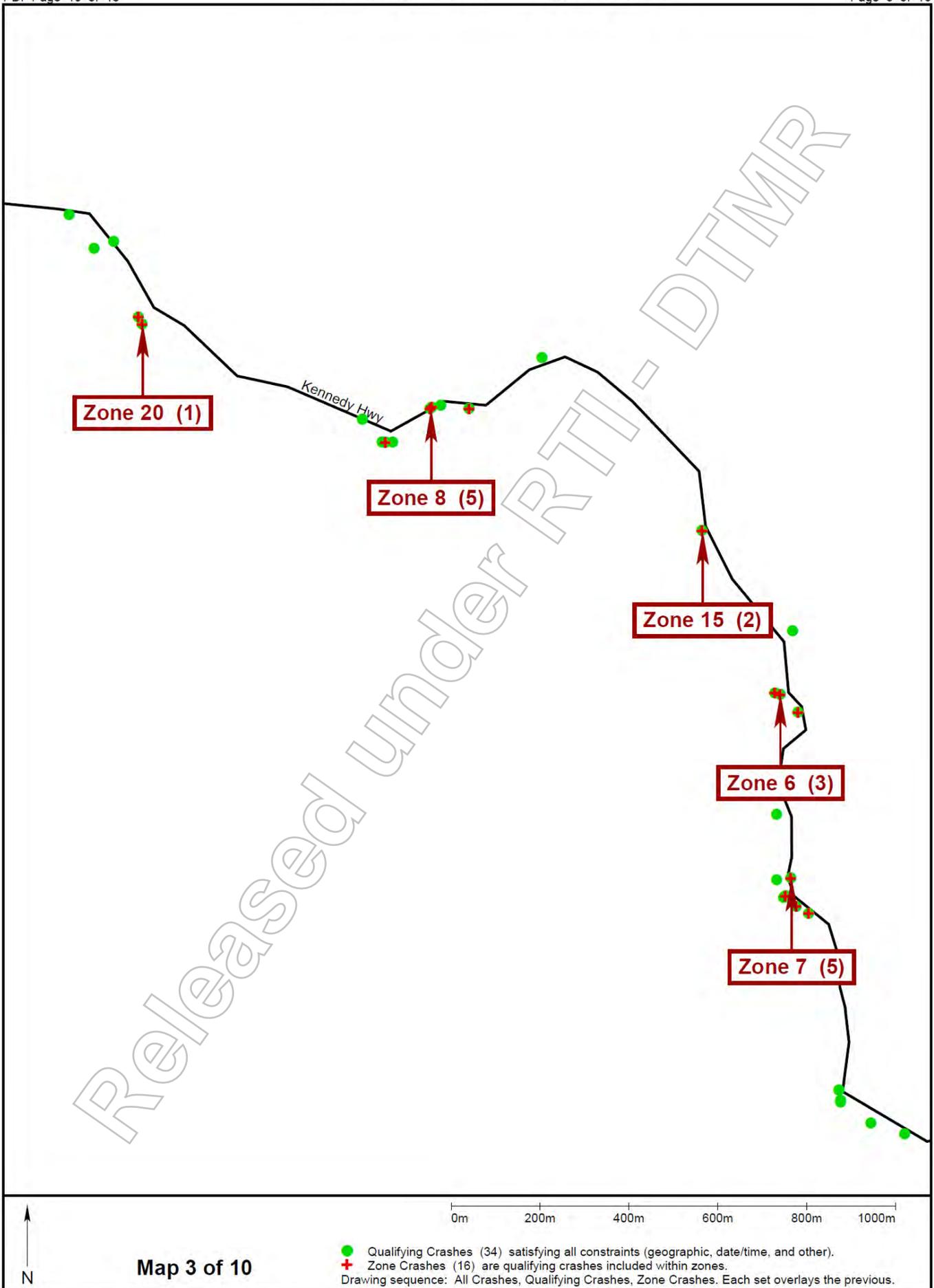
Page 7 of 16



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

PDF Page 10 of 18

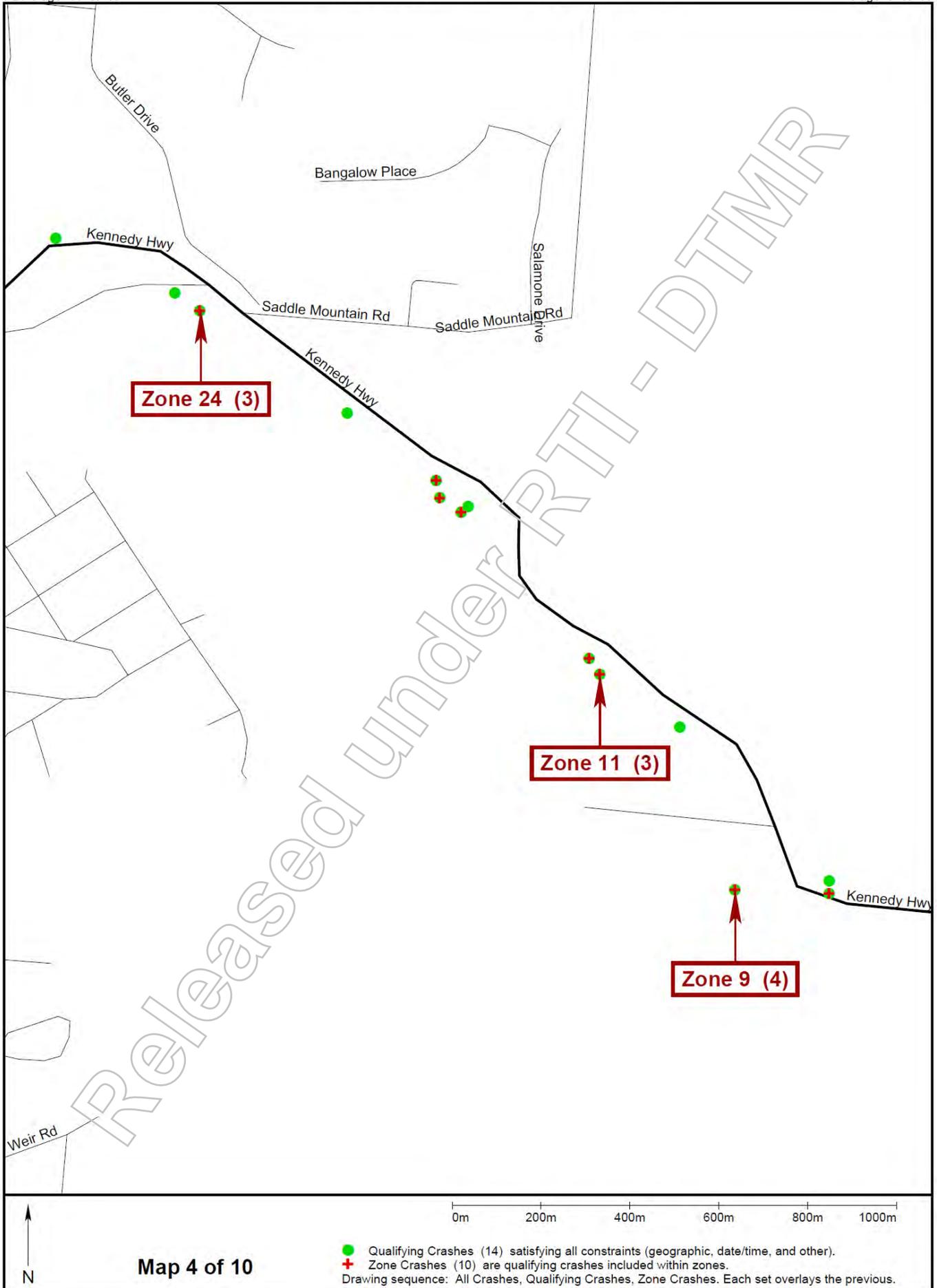
Page 8 of 16



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

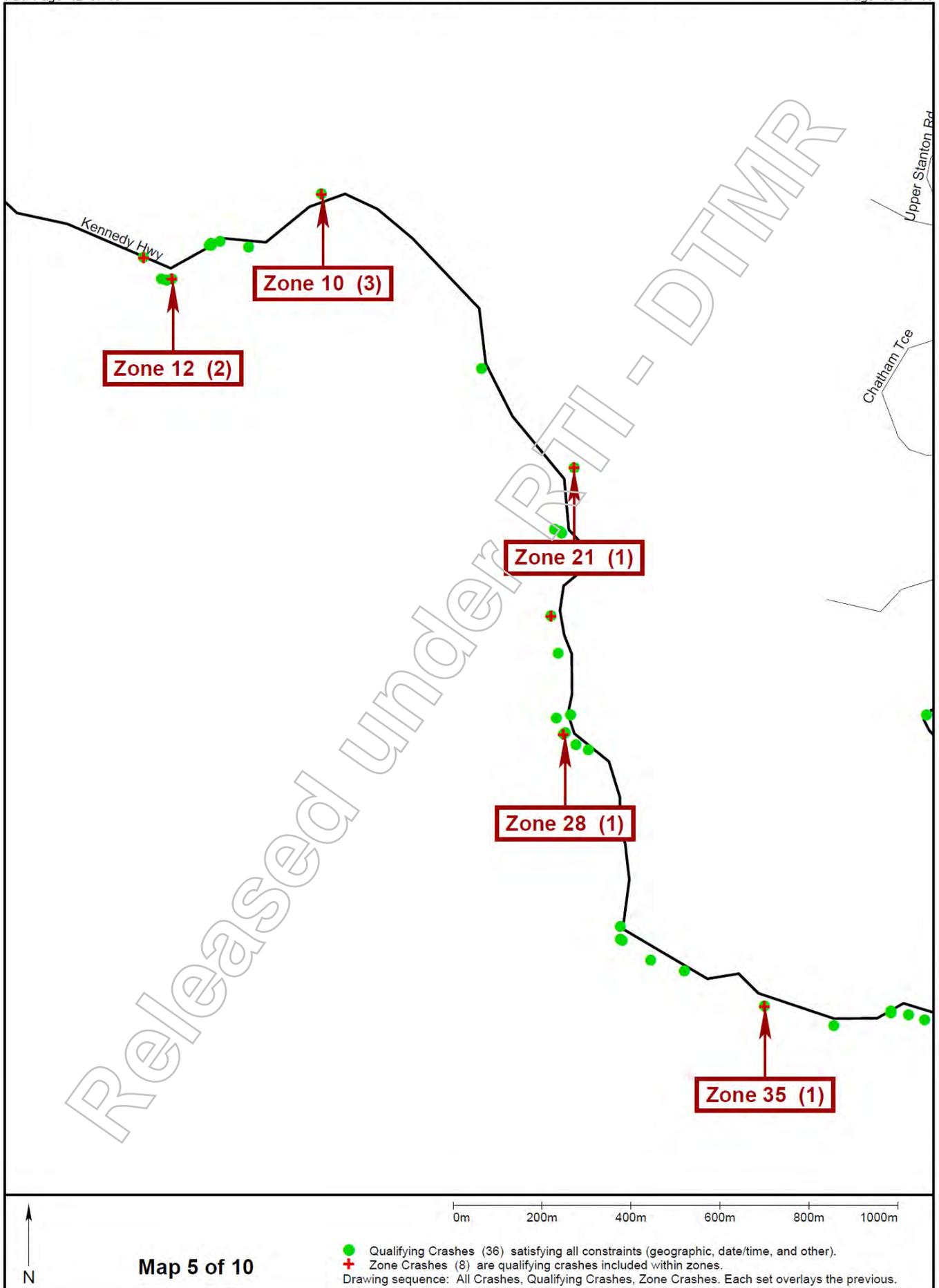
PDF Page 11 of 18

Page 9 of 16



Corridor Crash Zones using Road Section-based Analysis

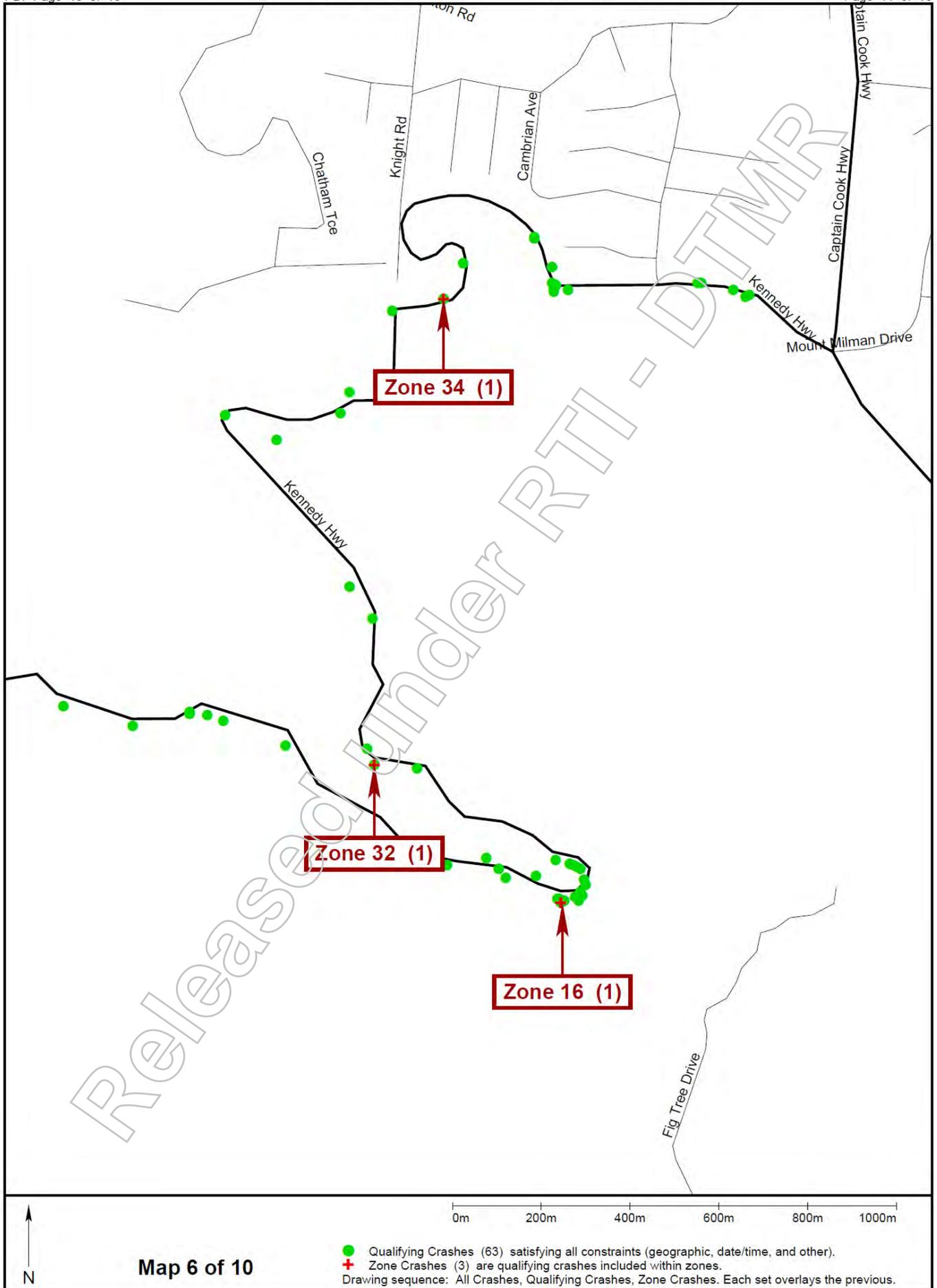
Zone Length 200m Top 100 Zones



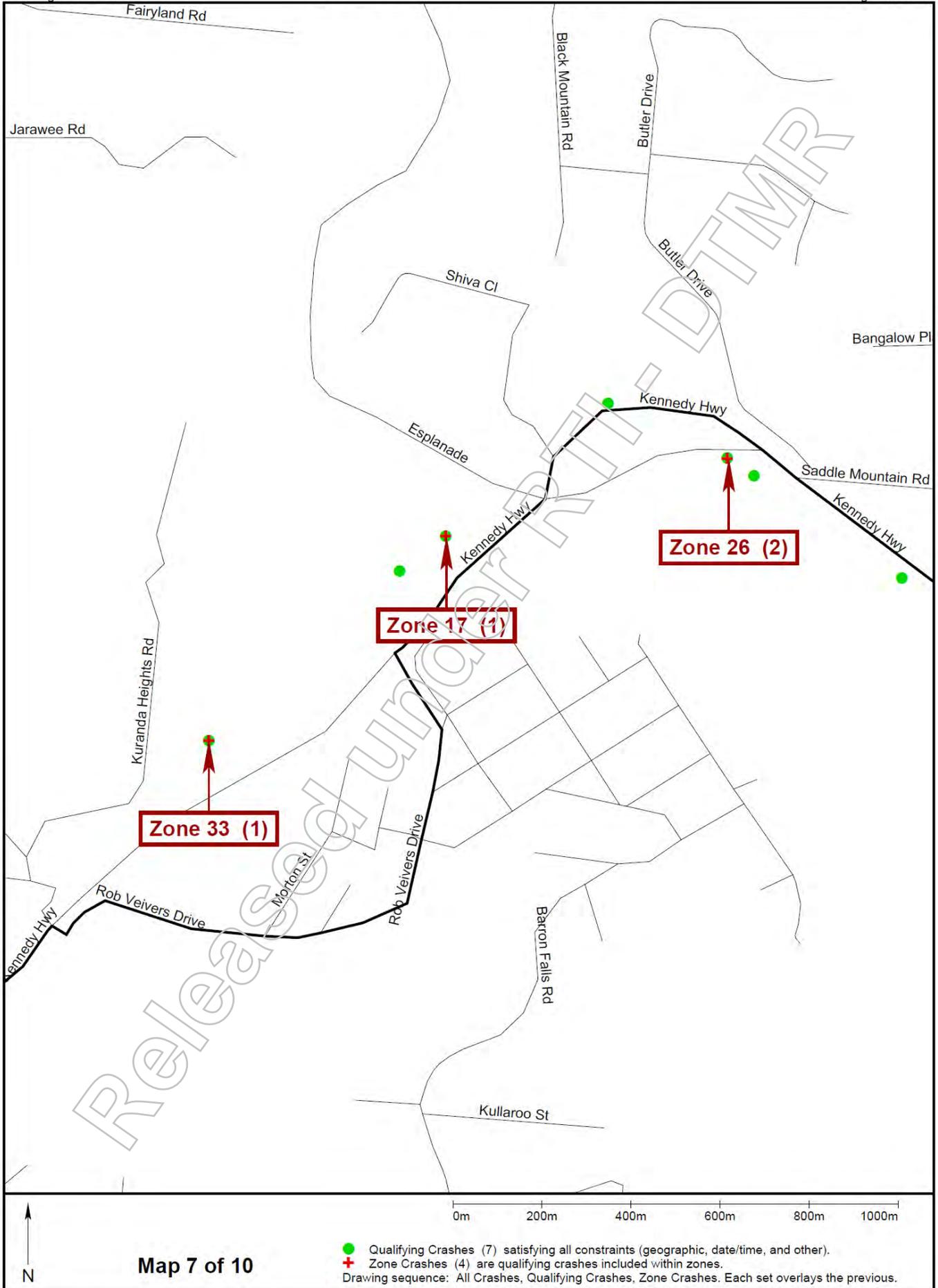
Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

PDF Page 13 of 18

Page 11 of 16



Corridor Crash Zones using Road Section-based Analysis Zone Length 200m Top 100 Zones

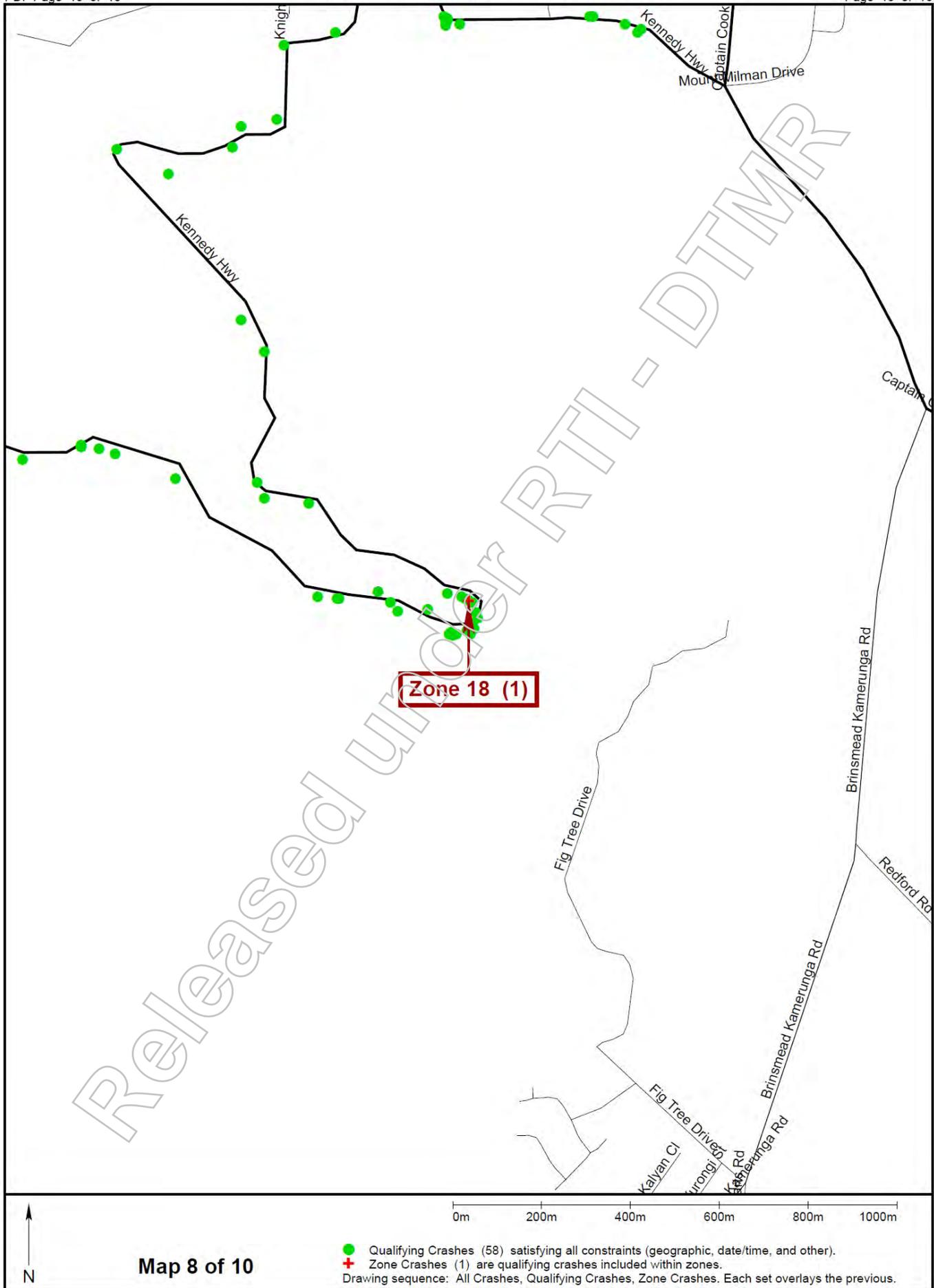


Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones

PDF Page 15 of 18

Page 13 of 16

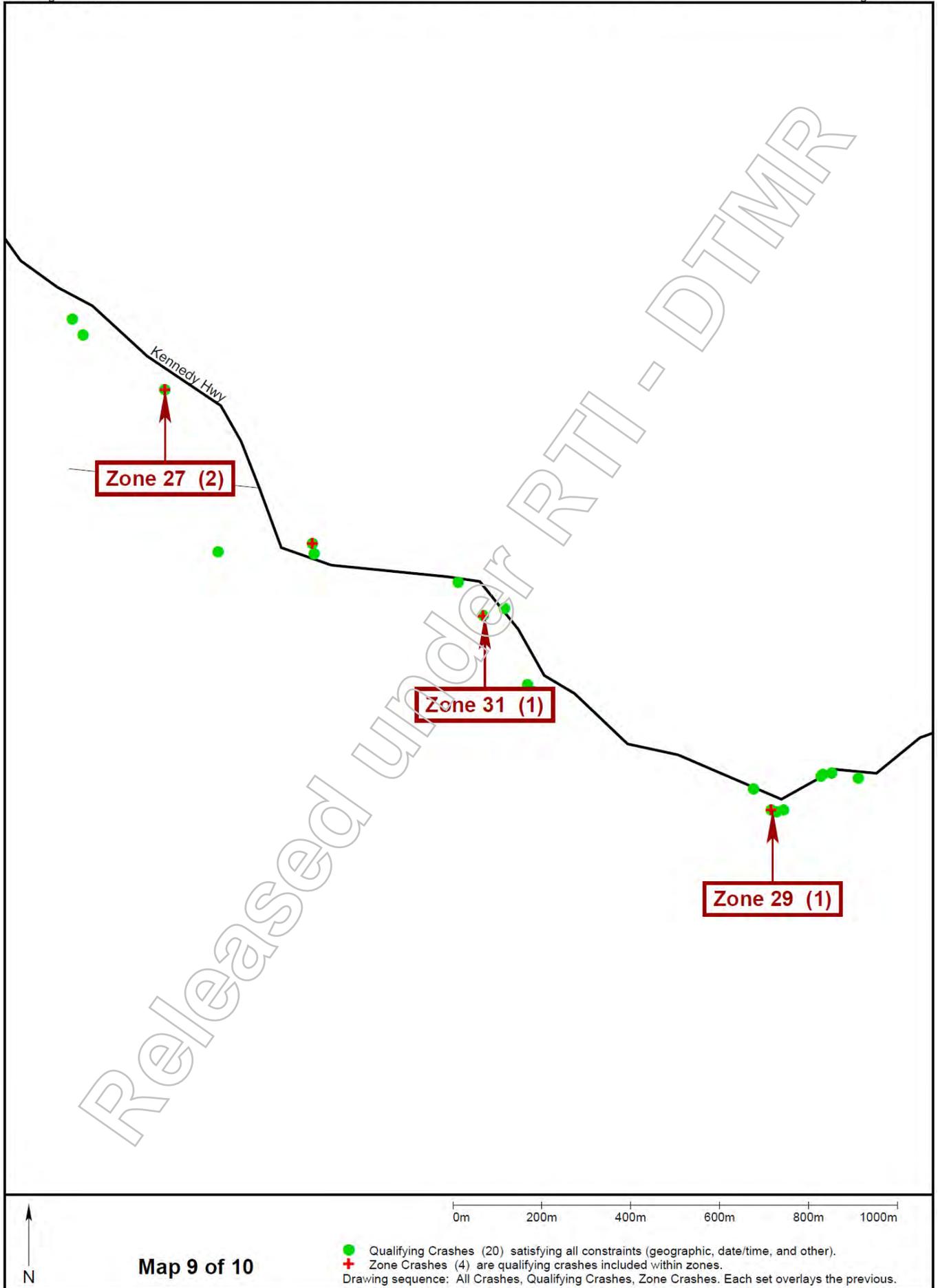


Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones

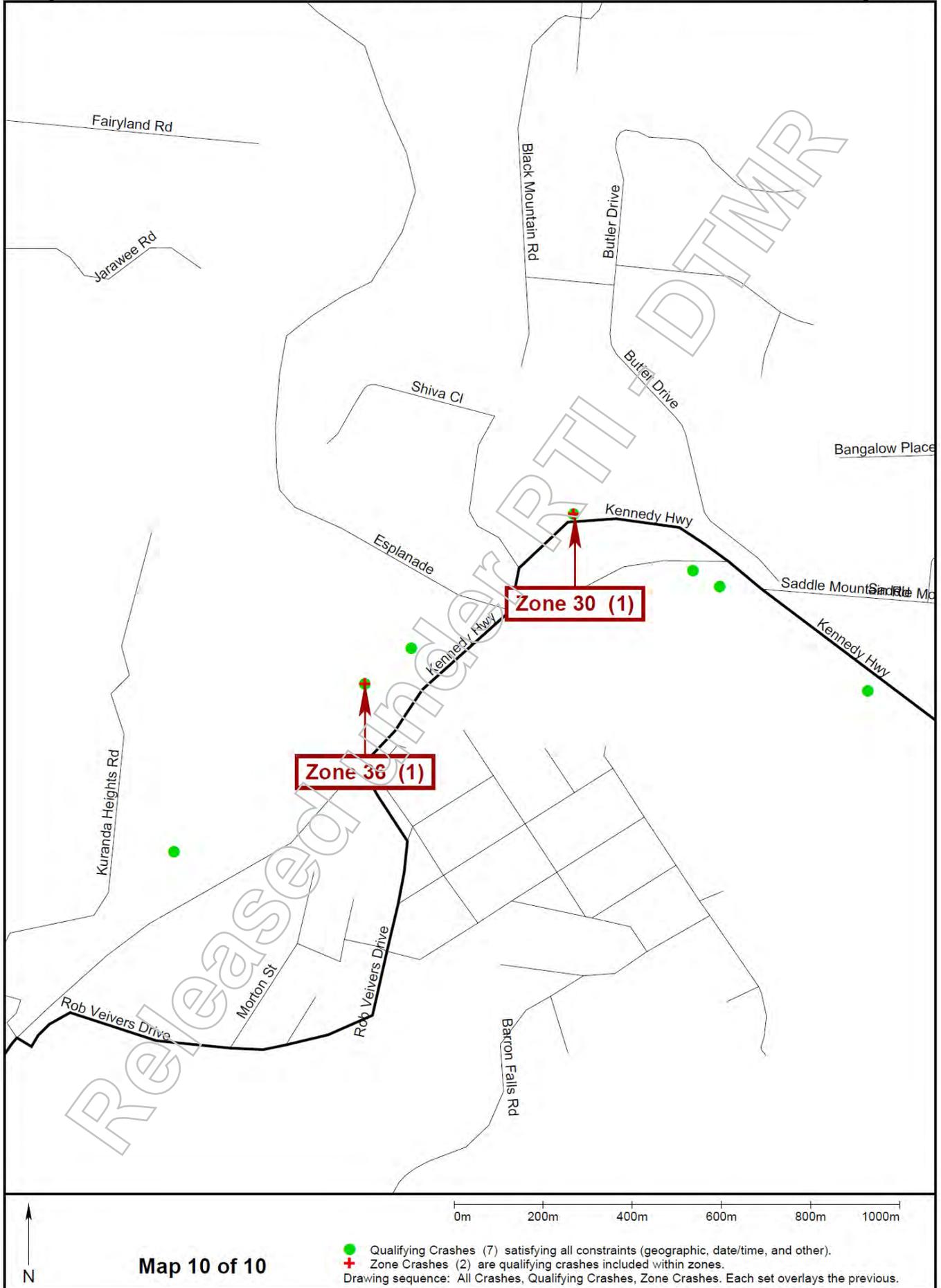
PDF Page 16 of 18

Page 14 of 16



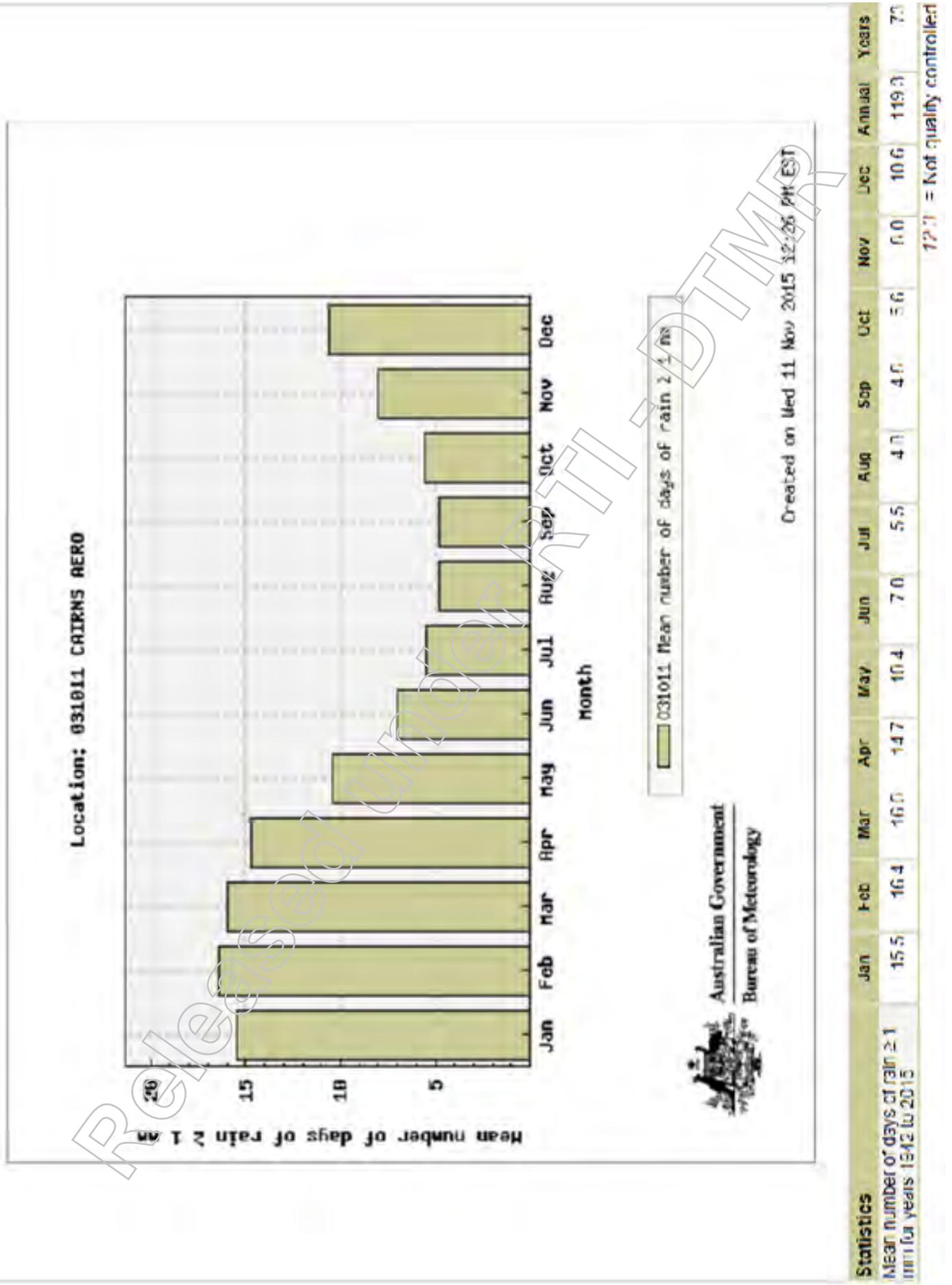
Corridor Crash Zones using Road Section-based Analysis

Zone Length 200m Top 100 Zones



Appendix C – BOM weather graph

Released under RTI - DTMR



Appendix D – SIMS data

Released under RTI - DTMR

Database search constraint: Classification 'Primary Crash' only

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
1	07CNS0000271	There has been a single vehicle accident on the Kuranda Range Road. Police have closed the road to all traffic from 11.45am for approximately 1 - 3 hours.	"Kennedy Highway 32D, Mt Garnet-The Lynd - CLIFTON BEACH"	CLIFTON BEACH	6/02/2007	12:06:00			
2	07CNS0001101	There has been a truck rollover on the Kuranda Range just south of Streets Creek near Rainforest Station. Emergency crews are in attendance and EPA have been advised due to the truck spilling sewage mud partly on the road and down the embankment. Traffic control are in attendance. Road may have to be shut at 4:00pm so a crane can lift and remove the truck.	"Kennedy Highway 32D, Mt Garnet-The Lynd"		2/07/2007	13:54:00	2/07/2007	19:40:00	05:46:00
3	07CNS0001201	Minor traffic accident on the Kuranda Range about 2kms from the bottom. Single vehicle slid into a wall. Police closed range for about 5 minutes so a tow truck could remove the car.	Kuranda Range "Kennedy Highway 32D, Mt Garnet-The Lynd"		17/07/2007	07:43:00			
4	07CNS0001261	2 vehicle traffic accident on the Kuranda Range approximately 4km up the range. Both lanes are open under the direction of traffic controllers. Third lane (overtaking lane) is blocked.	"Kennedy Highway 32D, Mt Garnet-The Lynd"		31/07/2007	08:46:00	31/07/2007	09:17:00	00:31:00
5	07CNS0001431	2 vehicle traffic accident on the Kuranda Range approximately 8kms from the bottom of the range. All emergency crews are in attendance. Boral has a VMS on the bottom of the range so RoadTek changed message on it and RoadTek are conducting traffic control at the bottom of the range to stop traffic and Boral are stopping traffic at the top of the range.	Kuranda Range "Kennedy Highway 32D, Mt Garnet-The Lynd"		22/08/2007	09:58:00	22/08/2007	10:52:00	00:54:00
6	07CNS0001581	Vehicle accident on the Kuranda Range between the old lookout and the bottom of the range. Unsure of any further details. Waiting for Roadtek to give me a call back.	Approximately 3km from the bottom of the range "Kennedy Highway 32D, Mt Garnet-The Lynd"		11/09/2007	08:05:00	11/09/2007	09:03:00	00:58:00
7	07CNS0001601	Kuranda Range near hairpin bend, near lookout. Fuel truck rolled, blocking road. Police & traffic attending.	On the range near lookout and Hairpin bend. "Kennedy Highway 32D, Mt Garnet-The Lynd - KURANDA"	KURANDA	17/09/2007	13:01:00	17/09/2007	21:00:00	07:59:00
8	07CNS0001691	Kuranda Range - Vehicle Accident. Range closed due to semi rolling over. Entrapments. Bottom lookout culvit 35.	Culvit 35 "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	26/09/2007	17:31:00			
9	07CNS0001721	4wd rollover on the Kuranda Range on the 3rd bend from the bottom. Traffic is open to one lane only under the direction of traffic controllers. Expected to be reopened to two lanes by 9:00am	"Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	2/10/2007	07:57:00	2/10/2007	08:16:00	00:19:00
10	07CNS0001731	Car has veered off the range just below the lookout due to slippery conditions. Road is open until they need to retrieve the vehicle	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	3/10/2007	14:32:00	3/10/2007	15:02:00	00:30:00
11	07CNS0001911	Kennedy HWY, Grove Creek. Accident causing Road Closure.	Neal Grove Creek "Kennedy Highway, Kuranda to Mareeba - SPEEWAH"	SPEEWAH	19/10/2007	18:48:00	19/10/2007	19:41:00	00:53:00
12	07CNS0002031	Kuranda Range. Vehicle Crash - 2 vehicles below Rainforest Station. Approx 3/4 way up range.	Approx 3/3 way up below Rainforest Station. 2 Cars, no injuries. Above lookout. "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	31/10/2007	13:55:00			
13	07CNS0002261	Kuranda Range 2 car accident.	Bottom hairpin bend. "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	16/11/2007	11:45:00			
14	07CNS0002281	Kuranda Range. Accident approx 200m below Henry Ross lookout.	Approx 200m sth Henry Ross Lookout. 6.5 kms up range. "Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	19/11/2007	17:03:00			
15	07CNS0002471	There has been a traffic accident on the Kennedy Highway between the Barron River Bridge and the traffic lights at Kuranda. This section of road is currently closed until 4:30pm. Traffic delays are expected.	Between the Barron River Bridge and traffic lights at Kuranda "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	21/12/2007	14:43:00	21/12/2007	16:16:00	01:33:00
16	08CNS0000331	Traffic incident - mini bus gone sideways on the Kuranda Range in ditch on opposite side.	"Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	25/01/2008	15:41:00	25/01/2008	15:52:00	00:11:00
17	08CNS0000521	Kuranda Range - 2 car pile up roughly 2km from the bottom - require assistance with traffic control	"Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	2/02/2008	02:51:00			
18	08CNS0001171	Kuranda Range Road - motorcycle accident	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	24/02/2008	21:06:00			
19	08CNS0001161	Kuranda Range Road - multiple vehicle collision - top of range	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	25/02/2008	21:03:00			
20	08CNS0001141	A man was unscathed after driving off the side of the Kuranda Range road at high speed last night and plunging some distance down the mountain. An ambulance spokesman said another motorist reported the accident after seeing the man drive off the roadside, just north of the Henry Ross lookout, about 7:30pm. By the time the ambulance arrived, the man had managed to climb back up to the road and declined to be transported.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	29/02/2008	10:19:00			

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
21	08CNS0001181	As at 1:20pm Friday 29th February 2008, there has been an accident on the Kuranda Range Road just north of the Henry Ross Lookout. Traffic has been reduced to one lane under the direction of traffic controllers. Minor traffic delays are expected. Please proceed through this area with caution.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	29/02/2008	13:26:00	29/02/2008	14:30:00	01:04:00
22	08CNS0001261	Brian heard that a car has gone over the Kuranda Range Road. He will find out more details and will let us know. Ambulance are in attendance.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	4/03/2008	10:33:00	4/03/2008	11:02:00	00:29:00
23	08CNS0001571	Noticed a car off the side of the Kuranda Range Road at the last overtaking lanes near the wild raspberry bushes. Unsure if anyone is in the car.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	6/03/2008	11:53:00			
24	08CNS0001621	Kuranda Range - multiple vehicle accident at the bottom of Kuranda Range @ 2.30pm as reported in Cairns Post	"Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	7/03/2008	16:06:00			
25	08CNS0002751	Kuranda Range Road - accident - single vehicle rollover at hair pin turn. no injuries. it had occurred about 20 minutes before being notified by MOP.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	2/05/2008	14:15:00			
26	08CNS0002861	2 car TA on the Kuranda Range just after the hairpin corner before the overtaking lane. On the Cairns side.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	10/05/2008	19:21:00	10/05/2008	19:29:00	00:08:00
27	08CNS0003041	Single vehicle accident of the Kennedy Highway at Smithfield.	"Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	16/05/2008	09:23:00			
28	08CNS0003541	Kennedy Highway - Kuranda Range - 2 vehicle traffic accident @ Henry Ross Lookout.	Henry Ross Lookout "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	29/05/2008	10:41:00			
29	08CNS0004251	Kennedy Highway - KURANDA RANGE ROAD - 32A - Police have stopped traffic due to earlier accident	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	19/06/2008	12:20:00			
30	08CNS0004221	Kennedy Highway - KURANDA RANGE - Motorcyclist fell off bike. Rang police and it had been sorted with no disruptions to traffic	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	20/06/2008	10:20:00	20/06/2008	10:38:00	00:18:00
31	08CNS0004421	Kuranda Range Road - Kennedy Highway 32A - reported of hearing about a vehicle accident at the top of the range	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	25/06/2008	17:48:00			
32	08CNS0004581	single vehicle accident Kuranda range (top) near Myola Rd	near Myola Rd "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	28/06/2008	22:02:00	28/06/2008	22:53:00	00:51:00
33	08CNS0004781	2 veh t/a- Kennedy hwy, Kuranda Range- hairpin bend south of largest overtaking lane.	on Hairpin bend south of the largest overtaking lane known as the horseshoe "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	3/07/2008	17:59:00	3/07/2008	20:21:00	02:22:00
34	08CNS0006681	32A Kennedy Hwy / Kuranda Range - VEHICLE OVERTURNED - Ute has flipped in the vicinity of the 'switchback' hair pin turn on range. no threat to traffic.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	18/08/2008	08:05:00			
35	08CNS0006821	32A Kennedy Hwy Top of Kuranda Range - SINGLE VEHICLE ACCIDENT - Ute gone over top of Kuranda Range. Aprx position 3 bends past Rainforestation heading down range. QAS in attendance.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	22/08/2008	17:23:00	22/08/2008	20:28:00	03:05:00
36	08CNS0006981	32A Kennedy Highway @ Barron River Bridge - 2 TRUCK T/A - no reported delays to traffic on initial reports	"Kennedy Highway, Kuranda to Mareeba - MAREEBA"	MAREEBA	28/08/2008	10:48:00			
37	08CNS0007371	32A Kennedy Hwy Kuranda Range - TRAFFIC ACCIDENT - 2 vehicle t/a, 5km from the bottom of the range.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	10/09/2008	16:52:00	10/09/2008	17:16:00	00:24:00
38	08CNS0008021	32A Kennedy Hwy Kuranda Range - TRAFFIC ACCIDENT - 2Vehicle 4WD and Semi.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	25/09/2008	12:04:00			
39	08CNS0008301	32A Kennedy Hwy Kuranda Range - TRAFFIC ACCIDENT - Single vehicle roll over on Kuranda side of Rainforestation turnoff. QAS and QFS en route.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	3/10/2008	10:32:00			
40	08CNS0008601	32A Kennedy Hwy Kuranda Range - TRAFFIC ACCIDENT - Motor Cycle RC. Motorist has already reported to QPS. North of the passing lanes	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	12/10/2008	13:07:00			
41	08CNS0008661	32A Kuranda Range - CAR ROLL OVER - at top of range heading downhill after the 1st/2nd major bend of range. RoadTek witnessed and are in attendance	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	13/10/2008	12:46:00			
42	08CNS0009241	32A Kennedy Hwy Kuranda Range - TRAFFIC INCIDENT - Near Rainforestation	32A - KURANDA RANGE - TRAFFIC INCIDENT - 4k's below the Rainforest Station "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	31/10/2008	09:50:00			
43	08CNS0009461	Single vehicle roll over - Kuranda Range just below the Lookout. Large oil spill which requires assistance from Roadtek.	just below the Lookout "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	7/11/2008	21:12:00	7/11/2008	22:09:00	00:57:00
44	08CNS0010041	32A Kennedy Hwy / Kuranda Range - TRAFFIC ACCIDENT - tree fell onto car	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	27/11/2008	14:31:00			
45	08CNS0010081	32A Kennedy Highway on Kuranda Range - TRAFFIC ACCIDENT - between semi and toyota landcruiser in vicinity of Water Point. Up bound lane is blocked. members of vehicle trying to do traffic control.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	28/11/2008	10:22:00	28/11/2008	11:32:00	01:10:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
46	08CNS0010651	32A Kennedy Hwy - TRAFFIC ACCIDENT - Near Barron River Bridge. Single vehicle. Car run off Rd. No entrapment. QFS enroute.	"Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	18/12/2008	08:49:00			
47	08CNS0010661	32A Kennedy Hwy Mareeba - TRAFFIC ACCIDENT - Near Anzac Ave Ch.46.902. Car off Rd. RACQ towing req'd. No disruption to traffic. QPS on site.	"Kennedy Highway, Kuranda to Mareeba - MAREEBA"	MAREEBA	18/12/2008	08:58:00			
48	08CNS0010771	Single car crash - Kuranda Range Kennedy Hwy before Bennetts Lookout.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	27/12/2008	08:45:00	27/12/2008	09:47:00	01:02:00
49	08CNS0010801	Car with a trailer, Tyre has blown on the trailer, its stuck on the right side of the cliff on the Kuranda Range, its not driveable. Car is going up the range northbound heading twds Kuranda - QPS job 623	Heading away from Cairns "Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	28/12/2008	11:54:00	28/12/2008	13:03:00	01:09:00
50	08CNS0010861	Multiple vehicle crash on the Kennedy Highway east at the Kuranda Range at the Water Point	At the Water Point "Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	31/12/2008	15:54:00	31/12/2008	17:09:00	01:15:00
51	08CNS0010901	Crash - Kuranda Range 100mts south of Henry Ross lookout. Kuranda Range closed in both directions for 1hr.	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	31/12/2008	17:43:00	31/12/2008	18:51:00	01:08:00
52	09CNS0000941	32A Kennedy Hwy Speewah - TRAFFIC ACCIDENT - aprx 500m Mareeba side of Speewah turnoff	aprx 500m Mareeba side of Speewah turnoff "Kennedy Highway, Kuranda to Mareeba - SPEEWAH"	SPEEWAH	19/01/2009	16:28:00	19/01/2009	18:12:00	01:44:00
53	09CNS0001141	Kennedy Hwy Kuranda Range couple of klms from the Smithfield end-motorcycle crash -fatal-Police Job 372	Smithfield end "Kennedy Highway, Kuranda to Mareeba"		26/01/2009	06:36:00	26/01/2009	09:20:00	02:44:00
54	09CNS0001871	32A Kennedy Hwy Kuranda Range - TRAFFIC ACCIDENT - Between Henry Ross Lookout and Top of Range in eastbound lane. QFS on scene. QPS en route	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	4/02/2009	16:16:00			
55	09CNS0002331	MVC- Kuranda range westbound 300m after the lookout	300m after the lookout outbound "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	14/02/2009	10:21:00	14/02/2009	11:16:00	00:55:00
56	09CNS0002921	32A Kuranda Range - TRAFFIC ACCIDENT - 1st or 2nd overtaking lane from bottom of range. Motorbike vs Bus. Police enroute. Possible fatality.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	2/03/2009	13:56:00			
57	09CNS0003121	32A Kennedy Hwy on Kuranda Range - TRAFFIC ACCIDENT - single vehicle rollover towards bottom of range	towards bottom of the range "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	6/03/2009	11:18:00			
58	09CNS0003301	32A Kennedy Hwy on Kuranda Range - VEHICLE ACCIDENT - car has gone over the edge at the top near Rainforestation	top of range near Rainforstation "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	10/03/2009	16:23:00	10/03/2009	17:07:00	00:44:00
59	09CNS0004251	32A Kennedy Hwy on Kuranda Range - TRAFFIC ACCIDENT - single vehicle lost control on range just above avondale creek.	Avondale Creek - no disruption to traffic "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	8/04/2009	14:41:00			
60	09CNS0004371	Crash on Kuranda Range - range closed and requesting signage.	lookout "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	11/04/2009	15:27:00	11/04/2009	16:05:00	00:38:00
61	09CNS0004381	32A Kuranda Range, Kennedy Highway heading downhill, there is a car on its side approximately 200m after the Lookout. The vehicle is down an embankment about 10m off the road.	200m after the Lookout "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	12/04/2009	14:20:00	12/04/2009	14:53:00	00:33:00
62	09CNS0004411	32A Kennedy Hwy , Mareeba- TRAFFIC ACCIDENT - 2 vehicle MVA	Lions Rest Area Ch47.111 - one lane blocked - three vehicles involved "Kennedy Highway, Kuranda to Mareeba - MAREEBA"	MAREEBA	14/04/2009	10:37:00			
63	09CNS0004841	1 veh crash- Kuranda Range 2 kms west of the lookout- one lane blocked.	Kuranda Range- 2K's west of Lookout "Gillies Range - GADGARRA"	GADGARRA	2/05/2009	17:02:00	2/05/2009	18:50:00	01:48:00
64	09CNS0005641	32A Kennedy Hwy - TRAFFIC INCIDENT - Single car accident on Kuranda Range into a tree roadtek en route. One lane open and traffic control will be in place	just south of Avondale creek - Kuranda Range "Kuranda Range, Kennedy Highway 32A - SMITHFIELD"	SMITHFIELD	27/05/2009	07:37:00	27/05/2009	09:00:00	01:23:00
65	09CNS0006331	32A Kennedy Hwy - 2 VEHICLE ACCIDENT - Kuranda Range - Henry Ross Lookout	Henry Ross Lookout "Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	19/06/2009	17:10:00			
66	09CNS0006681	32A - Kuranda Range - SINGLE VEHICLE ACCIDENT - vehicle hanging over edge - minor injuries	Kuranda Range "Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	4/07/2009	10:00:00	4/07/2009	12:00:00	02:00:00
67	09CNS0006701	32A - Motorcycle ACCIDENT - Srhoj Rd, Emerald Creek near Mareeba - fatality - pillion was hit by oncoming vehicle when the motorbike she was on swerved to avoid hitting a 4wd	Srhoj Rd, Emerald Creek near Mareeba "Kennedy Highway, Kuranda to Mareeba - MAREEBA"	MAREEBA	5/07/2009	16:00:00	5/07/2009	16:10:00	00:10:00
68	09CNS0007301	32A Kennedy Hwy - ACCIDENT - single vehicle - Spena Rd & hwy	"Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	21/07/2009	13:00:00	21/07/2009	14:00:00	01:00:00
69	09CNS0007481	32A Kuranda Range - single vehicle ACCIDENT approx 3km from bottom of range - one lane closed	3 kms from bottom of range "Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	28/07/2009	15:50:00	28/07/2009	16:54:00	01:04:00
70	09CNS0009261	32A Kennedy Highway - SINGLE MVA - at second hairpin turn of Kuranda Range	32A Kennedy Highway - at second hairpin turn of Kuranda Range "Kennedy Highway, Kuranda to Mareeba - KURANDA"	KURANDA	4/09/2009	10:21:00	4/09/2009	10:43:00	00:22:00
71	09CNS0009751	32A - Kennedy Hwy/Kuranda Range near lookout - ACCIDENT - single vehicle - QAS not required	Near lookout "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	16/09/2009	10:15:00	16/09/2009	11:45:00	01:30:00
72	09CNS0009761	32A - Kennedy Hwy/Kuranda Range - ACCIDENT - 2 vehicle near Streets Ck	Streets Ck "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	16/09/2009	11:14:00	16/09/2009	13:16:00	02:02:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
73	09CNS000984	32A - Kennedy Hwy @ Myola Rd Int - ACCIDENT	Kuranda/Myola Rd intersection "Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	21/09/2009	13:45:00	21/09/2009	14:30:00	00:45:00
74	09CNS001001	32A - Kuranda Range - TRAFFIC ACCIDENT - Range is closed major delays expected	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	25/09/2009	11:41:00			
75	09CNS001107	32A Kennedy Hwy (Kuranda Range) - CRASH - 2 vehicle mva - traffic reduced to one lane. minor delays	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	19/10/2009	08:09:00	19/10/2009	10:21:00	02:12:00
76	09CNS001108	32A Kennedy Hwy (Kuranda Range @ Bottom of Range) - CRASH - called in via fire rescue. diesel left on road	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	19/10/2009	08:57:00			
77	09CNS001109	32A Kennedy Hwy (Kuranda Range @ Switchback) - CRASH - vehicle left hanging over edge.	"Kuranda Range, Kennedy Highway 32A - MACALISTER RANGE"	MACALISTER RANGE	19/10/2009	08:57:00	19/10/2009	10:20:00	01:23:00
78	09CNS001134	32A - Kennedy Hwy CRASH - signal vehicle near Rainforest Station - off road	"Kuranda Range, Kennedy Highway 32A - KURANDA"	KURANDA	21/10/2009	17:00:00	21/10/2009	17:41:00	00:41:00
79	09CNS001166	Crash on Kuranda Range near Streets Creek. Requested traffic control		KURANDA	1/11/2009	11:01:00	1/11/2009	11:53:00	00:52:00
80	09CNS001188	32A-CRASH kuranda range ,single vehicle bottom of range	32A-CRASH kuranda range ,single vehicle bottom of range	SMITHFIELD	6/11/2009	09:51:00	6/11/2009	10:10:00	00:19:00
81	09CNS001216	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle MVA @ bottom of range		MACALISTER RANGE	11/11/2009	13:16:00	11/11/2009	13:17:00	00:01:00
82	09CNS001253	32A-Kuranda range-CRASH X 2 @ henry ross lookout, no injuries, no traffic delays, And 300mtr's south of lookout, no injuries, no traffic delays	32A-Kuranda range-CRASH X 2 @ henry ross lookout, no injuries, no traffic delays, And 300mtr's south of lookout, no injuries, no traffic delays	MACALISTER RANGE	17/11/2009	10:24:00	17/11/2009	12:24:00	02:00:00
83	09CNS001336	32A-Kuranda range CRASH 2vehicle mva, 3 kms up,near 3rd overtaking lane, nil injuries		SMITHFIELD	3/12/2009	09:27:00	3/12/2009	10:39:00	01:12:00
84	09CNS001354	32A-Kennedy hwy CRASH Kuranda Range 2vehicle near the Henry Ross Lookout-due to Truck Breakdown		MACALISTER RANGE	9/12/2009	14:18:00	9/12/2009	16:14:00	01:56:00
85	09CNS001365	32A Kennedy hwy CRASH truck over the side Kennedy Hwy Kuranda Range below the lookout requested 20 bags of kitty litre by RTEK Police QAS and QFRS at scene QPS job 162	just below the lookout	KURANDA	11/12/2009	02:15:00	11/12/2009	11:22:00	09:07:00
86	09CNS001402	32A Kuranda Range CRASH over range, single vehicle, minor injuries..south of Henry Ross Lookout		MACALISTER RANGE	31/12/2009	17:18:00	31/12/2009	18:32:00	01:14:00
87	10CNS000004	2 vehicle crash on Kuranda Range- 2kms from Bottom of Range- fuel spillage on roadway.	Kennedy Highway Kuranda	KURANDA	3/01/2010	09:38:00	3/01/2010	10:45:00	01:07:00
88	10CNS000069	32A Kennedy hwy CRASH Windy Hollow rd, nth of Kuranda ch 18.156, Car on road, took posts out.		MACALISTER RANGE	15/01/2010	14:50:00	15/01/2010	14:52:00	00:02:00
89	10CNS000074	32A Kuranda Range - CRASH - 2 vehicle MVA. "Traffic came to a standstill on the Kuranda Range last night after a two car crash on the road. no one was hurt in the crash, which happened about 8pm in the east bound land of the range. the cars were towed away, with police direction traffic for a short time after the crash		MACALISTER RANGE	17/01/2010	20:00:00	17/01/2010	21:25:00	01:25:00
90	10CNS000072	32A Kennedy Hwy CRASH semi- trailer Kuranda Range 2km up the range		MACALISTER RANGE	18/01/2010	13:41:00	18/01/2010	20:25:00	06:44:00
91	10CNS000091	32A Kuranda Range CRASH, single vehicle HAZARD rocks on range, 2kms up from smithfield, c		SMITHFIELD	22/01/2010	11:41:00	22/01/2010	17:17:00	05:36:00
92	10CNS000255	32A Kuranda Range CRASH top of range, car over edge, no injuries, or hazard		MACALISTER RANGE	23/02/2010	12:05:00	23/02/2010	12:16:00	00:11:00
93	10CNS000300	32A Kuranda Range CRASH 5 CARS, Barron river bridge		KURANDA	9/03/2010	10:47:00	9/03/2010	13:27:00	02:40:00
94	10CNS000309	32A Kennedy Hwy - TRAFFIC ACCIDENT - Top of Kuranda Range at traffic lights. possibly 3 vehicles, blocking part lane westbound to Mareeba		KURANDA	11/03/2010	09:05:00	11/03/2010	10:15:00	01:10:00
95	10CNS000322	32A Kennedy Hwy, Kuranda Range - CRASH single vehicle & trailer. blocking one lane		MACALISTER RANGE	15/03/2010	07:17:00	15/03/2010	09:28:00	02:11:00
96	10CNS000332	32A Kuranda Range CRASH one lane blocked near streets ck, Eastbound		MACALISTER RANGE	18/03/2010	11:53:00	18/03/2010	14:08:00	02:15:00
97	10CNS000340	32A Kennedy Hwy CRASH rollover bottom of Kuranda range-injuries		SMITHFIELD	22/03/2010	10:45:00	22/03/2010	10:46:00	00:01:00
98	10CNS000347	32A Kuranda Range, just south of Lookout - CRASH		MACALISTER RANGE	23/03/2010	08:26:00	23/03/2010	10:24:00	01:58:00
99	10CNS000362	32A Kennedy hwy, CRASH single vehicle rollover		MACALISTER RANGE	26/03/2010	09:36:00	26/03/2010	09:37:00	00:01:00
100	10CNS000368	32A Kennedy Hwy CRASH near streets ck. into guard rail		MACALISTER RANGE	26/03/2010	13:47:00	26/03/2010	14:50:00	01:03:00
101	10CNS000370	32A Kennedy Hwy CRASH single vehicle		MACALISTER RANGE	26/03/2010	17:41:00	26/03/2010	17:59:00	00:18:00
102	10CNS000406	32A Kennedy Hwy CRASH no injuries, not effecting traffic		MACALISTER RANGE	1/04/2010	14:55:00	1/04/2010	15:44:00	00:49:00
103	10CNS000462	32A Kuranda Range CRASH single vehicle		KURANDA	16/04/2010	16:35:00	16/04/2010	16:37:00	00:02:00
104	10CNS000500	3 car Crash Kennedy Hwy before the Henry Ross Lookout , Kuranda bound. NB job no. 732 and mareeba no. 303341. minor delays.	before the lookout NB	KURANDA	24/04/2010	09:35:00	24/04/2010	10:45:00	01:10:00
105	10CNS000508	32A Kuranda Range CRASH Motorcyclist 4kms from top		MACALISTER RANGE	28/04/2010	17:09:00	28/04/2010	17:46:00	00:37:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
106	10CNS0005951	32A Kuranda Range - CAR OVER THE EDGE - first corner from the bottom		MACALISTER RANGE	3/06/2010	12:25:00	3/06/2010	13:01:00	00:36:00
107	10CNS0006261	Car off the side of the Kuranda Range 10km east of Kuranda heading towards Cairns.	Kuranda Range 10km east of Kuranda heading towards Cairns.	KURANDA	15/06/2010	19:48:00	15/06/2010	20:30:00	00:42:00
108	10CNS0006591	32A Kennedy Hwy, Kuranda Range below lookout - CRASH - single motorcycle accident. bike is off road. no disruption to traffic.		MACALISTER RANGE	23/06/2010	07:23:00	23/06/2010	08:34:00	01:11:00
109	10CNS0006601	32A Kennedy Hwy, Kuranda Range @ 2nd turnout lane - CRASH - single vehicle. ute has lost control and is partially blocking lane.		MACALISTER RANGE	23/06/2010	07:45:00	23/06/2010	08:34:00	00:49:00
110	10CNS0006631	32A Kennedy Hwy CRASH 1/2 way up 2 vehicles, not serious, not effecting traffic.		MACALISTER RANGE	23/06/2010	16:29:00	23/06/2010	16:56:00	00:27:00
111	10CNS0006731	Crash, Car V Car 1 lane partially blocked on the Kennedy on the lower end of the Kuranda range outbound toward Kuranda. QPS job 712		SMITHFIELD	26/06/2010	10:41:00	26/06/2010	12:24:00	01:43:00
112	10CNS0007181	32A Kuranda Range CRASH Car Vs motorhome major overtaking lane.		MACALISTER RANGE	8/07/2010	12:13:00	8/07/2010	12:44:00	00:31:00
113	10CNS0007661	32A Kuranda Range - CRASH - Single veh rollover - top of Kuranda Range near Rainforest Station, Kuranda.		KURANDA	24/07/2010	13:25:00	24/07/2010	16:40:00	03:15:00
114	10CNS0008331	32A Kuranda Range @ Switchback - CRASH - two vehicle T/A. unknown impact on traffic at this time.		MACALISTER RANGE	10/08/2010	08:22:00	10/08/2010	09:29:00	01:07:00
115	10CNS0008361	32A Kennedy Hwy CRASH car spun out, wet weather- nil injuries @ hairpin. roadtek stopping traffic to move car		MACALISTER RANGE	10/08/2010	10:27:00	10/08/2010	11:28:00	01:01:00
116	10CNS0008751	32A Kennedy hwy CRASH single vehicle, east of lookout-nil injuries ..car is in dangerous position		MACALISTER RANGE	16/08/2010	16:45:00	16/08/2010	17:39:00	00:54:00
117	10CNS0009121	32A Kennedy hwy CRASH near 1st hairpin. approx 2kms up from S'field..		MACALISTER RANGE	26/08/2010	17:32:00	26/08/2010	18:38:00	01:06:00
118	10CNS0010181	Crash with and oil spill -Kennedy Hwy at the bottom of the Kuranda Range - SMITHFIELD. 2nd Crash 200m from the Lookout which resulted in the Range being closed.	Kuranda Range	SMITHFIELD	19/09/2010	15:24:00	19/09/2010	17:24:00	02:00:00
119	10CNS0011311	32A Kennedy Hwy - CRASH - Single Vehicle 4WD 1 lane blocked - approx 4-5km from bottom (triple passing lanes)		MACALISTER RANGE	14/10/2010	09:00:00	14/10/2010	09:40:00	00:40:00
120	10CNS0011751	32A Kennedy Hwy @ Switchback - CRASH - 2 vehicle MVA. both vehicles off road but still causing minor delays.		MACALISTER RANGE	21/10/2010	16:29:00	21/10/2010	17:53:00	01:24:00
121	10CNS0012801	32A Kennedy Hwy / Switchback - CRASH - Single Vehicle		MACALISTER RANGE	16/11/2010	15:16:00	16/11/2010	16:04:00	00:48:00
122	10CNS0013131	32A Kennedy Hwy / Hairpin Kuranda Range - STATIONERY VEHICLE, lost control, done 180 and has lost a tyre.		MACALISTER RANGE	22/11/2010	12:59:00	22/11/2010	13:39:00	00:40:00
123	10CNS0014251	reports of crash Kuranda Range / Kennedy hwy near avondale creek - called qps - car rolled over onto its roof. police now have a contro flow in place. probably 2km from Smithfield.	2km west of Smithfield	SMITHFIELD	4/12/2010	21:04:00	4/12/2010	21:32:00	00:28:00
124	10CNS0015091	32A Kennedy Hwy / Kuranda Range - CRASH - Truck Vs Car Vs 4WD		MACALISTER RANGE	14/12/2010	09:14:00	14/12/2010	11:25:00	02:11:00
125	10CNS0015471	32A Kennedy hwy CRASH east of Lookout single vehicle		MACALISTER RANGE	21/12/2010	14:25:00	21/12/2010	14:49:00	00:24:00
126	10CNS0015481	32A Kennedy Hwy / Kuranda Range approx. 3km from bottom - CRASH - single vehicle, no delays		KURANDA	21/12/2010	15:35:00	21/12/2010	17:13:00	01:38:00
127	10CNS0015711	32A Kennedy Highway CRASH 10 mins up		MACALISTER RANGE	23/12/2010	11:51:00	23/12/2010	12:27:00	00:36:00
128	10CNS0016121	32A Kennedy hwy / Kuranda Range - CRASH - Van Vs motorcycle		MACALISTER RANGE	28/12/2010	11:53:00	28/12/2010	13:16:00	01:23:00
129	11CNS0000071	32A Kennedy Hwy CRASH 2 vehicles, 500metres downside of Lookout		MACALISTER RANGE	4/01/2011	11:28:00	4/01/2011	11:29:00	00:01:00
130	11CNS0000481	32A Kennedy Hwy / near top Kuranda Range - CRASH - single vehicle, in drain, traffic control req'd		KURANDA	15/01/2011	07:39:00	15/01/2011	09:45:00	02:06:00
131	11CNS0000561	32A Kennedy Hwy / Kuranda Range Lookout - CRASH - 3 vehicle, truck vs car vs car		MACALISTER RANGE	18/01/2011	16:52:00	18/01/2011	18:31:00	01:39:00
132	11CNS0000711	32A Kennedy Hwy / Water Point - CRASH - 3 vehicle, blocking OB lane		MACALISTER RANGE	19/01/2011	17:31:00	19/01/2011	19:09:00	01:38:00
133	11CNS0000981	Advising Crash Kennedy Hwy approx 5 km south of lookout same spot as accidents earlier in week request re road surface (diesel spill??) One person transported unknown injuries. No QPS# supplied		SMITHFIELD	22/01/2011	10:32:00	22/01/2011	12:18:00	01:46:00
134	11CNS0001191	32A Kennedy Hwy / Myoia Rd - CRASH - 3 vehicle, rear ender, O/B Traffic Blocked, lights on Flash		KURANDA	25/01/2011	11:33:00	25/01/2011	14:22:00	02:49:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
135	11CNS0001261	32A Kuranda Range CRASH A 30-year-old Kewarra Beach man was charged with drink driving (UIL) after the car he was allegedly driving crashed on the Kuranda Range section of the Kennedy Highway early on Wednesday morning. Police were called to the crash scene at about 1.30am after the vehicle left the road and crashed into a ditch. The man was arrested after allegedly returning a breath alcohol reading of .163 per cent and is due to appear in the Cairns Magistrates Court on February 11.		MACALISTER RANGE	26/01/2011	01:30:00	27/01/2011	12:14:00	10:44:00
136	11CNS0002921	32A Kennedy Hwy/Kuranda Range CRASH single vehicle rollover, QPS attended & roadtek		MACALISTER RANGE	26/02/2011	08:56:00			
137	11CNS0002971	32A Kennedy hwy/Kuranda Range CRASH below the lookout, suspended by a tree		MACALISTER RANGE	25/02/2011	11:00:00	25/02/2011	12:01:00	01:01:00
138	11CNS0003431	32A Kennedy Hwy on Kuranda Range - CRASH - SINGLE VEHICLE.		MACALISTER RANGE	26/02/2011	10:00:00	26/02/2011	10:28:00	00:28:00
139	11CNS0003441	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle.		MACALISTER RANGE	26/02/2011	10:00:00	26/02/2011	10:45:00	00:45:00
140	11CNS0003451	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle lost control.		MACALISTER RANGE	26/02/2011	12:40:00	26/02/2011	13:31:00	00:51:00
141	11CNS0003461	32A Kennedy Hwy @ Kuranda Range CRASH - multiple vehicle. one sliding into path of another		MACALISTER RANGE	26/02/2011	13:00:00	26/02/2011	14:00:00	01:00:00
142	11CNS0003471	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle.		MACALISTER RANGE	26/02/2011	13:20:00	26/02/2011	14:33:00	01:13:00
143	11CNS0003481	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle.		MACALISTER RANGE	26/02/2011	15:07:00	26/02/2011	16:34:00	01:27:00
144	11CNS0003511	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle		MACALISTER RANGE	27/02/2011	07:00:00	27/02/2011	08:00:00	01:00:00
145	11CNS0003521	32A Kennedy Hwy @ Kuranda Range - CRASH -		MACALISTER RANGE	27/02/2011	08:50:00	27/02/2011	09:05:00	00:15:00
146	11CNS0003531	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle lost control		MACALISTER RANGE	27/02/2011	09:30:00	27/02/2011	10:40:00	01:10:00
147	11CNS0003541	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle lost control on road		MACALISTER RANGE	27/02/2011	14:20:00	27/02/2011	15:20:00	01:00:00
148	11CNS0003551	32A Kennedy Hwy @ Kuranda Range - CRASH - single vehicle off road		MACALISTER RANGE	27/02/2011	16:35:00	27/02/2011	17:42:00	01:07:00
149	11CNS0003131	32A Kennedy Hwy, Kuranda Range - CRASH - single vehicle over the edge, 300-400m south of lookout.		MACALISTER RANGE	28/02/2011	07:22:00	28/02/2011	09:00:00	01:38:00
150	11CNS0003261	32A Kennedy Hwy / Kuranda Range Lookout - CRASH - single vehicle, downhill lane blocked		MACALISTER RANGE	1/03/2011	09:00:00	1/03/2011	09:43:00	00:43:00
151	11CNS0003331	32A Kuranda Range CRASH single vehicle stuck on railing @ switchback		SMITHFIELD	1/03/2011	14:01:00	1/03/2011	14:44:00	00:43:00
152	11CNS0003731	32A Kennedy Hwy on Kuranda Range - CRASH - Crash Bus V Car, fuel on the road Kennedy Highway up the range westbound half way up from Smithfield, Macalister Range. QPS job 1252. QAS in attendance, contra flow in place. RoadTek and QPS attended. No advice regarding injuries.		MACALISTER RANGE	5/03/2011	16:12:00	5/03/2011	17:03:00	00:51:00
153	11CNS0004011	32A Kennedy Hwy CRASH Car Vs Bus downhill near Avondale ck		MACALISTER RANGE	8/03/2011	10:40:00	8/03/2011	13:29:00	02:49:00
154	11CNS0005411	32A Kennedy Hwy / Rainforestation - CRASH - single vehicle		MACALISTER RANGE	1/04/2011	15:03:00	1/04/2011	16:23:00	01:20:00
155	11CNS0005421	32A Kennedy Hwy / Bottom of Range - CRASH - single vehicle, one lane blocked.		MACALISTER RANGE	1/04/2011	17:01:00	1/04/2011	17:44:00	00:43:00
156	11CNS0005521	32A Kennedy Hwy / Water Point - CRASH - 3 vehicle		MACALISTER RANGE	4/04/2011	13:30:00	4/04/2011	14:17:00	00:47:00
157	11CNS0005651	32A Kennedy Hwy CRASH car over range		MACALISTER RANGE	5/04/2011	15:05:00	6/04/2011	07:30:00	16:25:00
158	11CNS0005671	SVC Kennedy Highway 1/2 way up, all off the road - oil on the road. No impact on traffic.		SMITHFIELD	6/04/2011	00:40:00	6/04/2011	00:50:00	00:10:00
159	11CNS0006421	32A Kennedy Hwy / Kuranda Range near bottom - CRASH		MACALISTER RANGE	18/04/2011	13:45:00	18/04/2011	14:47:00	01:02:00
160	11CNS0006511	32A CRASH 2 cars, blocking range. approx 2.5kms from bottom.	2.5Kms up from bottom	MACALISTER RANGE	20/04/2011	08:03:00	20/04/2011	09:23:00	01:20:00
161	11CNS0008241	32A Kennedy Hwy / Kuranda Range Lookout - CRASH		MACALISTER RANGE	17/05/2011	13:44:00	17/05/2011	14:25:00	00:41:00
162	11CNS0008411	32A CRASH between Bottom of range - lookout / 1 car obstructing traffic	Between Lookout - bottom of range	MACALISTER RANGE	19/05/2011	07:43:00	19/05/2011	09:13:00	01:30:00
163	11CNS0010561	32A Kennedy Hwy/Kuranda Range CRASH single vehicle, down lane near Avondale Ck	Kuranda Range	MACALISTER RANGE	15/06/2011	08:05:00	15/06/2011	08:55:00	00:50:00
164	11CNS0011551	32A - CRASH - 2 vehicle, rd closed for 10 min to retrieve vehicle	3.5km from bottom of range	MACALISTER RANGE	28/06/2011	08:51:00	28/06/2011	10:39:00	01:48:00
165	11CNS0011871	32A CRASH single vehicle near lookout, blocking both directions for approx. 5 min. then opened to one lane, no congestion.	Near Lookout	MACALISTER RANGE	30/06/2011	12:30:00	30/06/2011	13:45:00	01:15:00
166	11CNS0013491	32A CRASH top of range, off road, no delays, no injuries	Top of Kuranda Range	MACALISTER RANGE	25/07/2011	13:40:00	25/07/2011	15:04:00	01:24:00
167	11CNS0013671	32A CRASH single vehicle 2kms from bottom	Kuranda Range	MACALISTER RANGE	27/07/2011	15:01:00	27/07/2011	15:49:00	00:48:00
168	11CNS0014211	32A CRASH/CAR OFF RANGE, near top of range	Kuranda Range	MACALISTER RANGE	4/08/2011	07:55:00	4/08/2011	08:43:00	00:48:00
169	11CNS0014351	32A CRASH Kuranda Range - Multiple Vehicle incident on the Kennedy Highway approx. 1km east of the Baron River. Police and emergency crews are on site. Delays are expected. Mareeba Police requested traffic control.		KURANDA	5/08/2011	16:58:00	5/08/2011	18:28:00	01:30:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
170	11CNS001583I	32A CRASH - single vehicle, blocking one lane, not called to TMC.	Henry Ross Lookout	MACALISTER RANGE	29/08/2011	09:00:00	29/08/2011	09:46:00	00:46:00
171	11CNS001731I	32A CRASH sedan vs mini bus, minor injuries		MACALISTER RANGE	19/09/2011	10:17:00	19/09/2011	10:18:00	00:01:00
172	11FN 001851I	32A Kuranda Range CRASH 2 vehicle t/a, apparently one vehicle sticking its butt onto the road	Kuranda Range 'few turns from the bottom'	MACALISTER RANGE	6/10/2011	14:17:00	6/10/2011	15:16:00	00:59:00
173	11FN 001914I	QPS Report THE Kennedy Hwy Kuranda Range Rd closed at the top in both directions to all traffic due to 2 vehicle head on crash with a roll over - QPS job number 671		SMITHFIELD	15/10/2011	10:21:00	15/10/2011	10:48:00	00:27:00
174	11FN 001917I	Single vehicle crash IB on the Kennedy Highway at the bottom at Kuranda Range LL blocked, Kuranda. 1 person injured, unknown details of injuries of if transported. Unknown delays. QPS#1498	Bottom of the range	KURANDA	15/10/2011	19:10:00	15/10/2011	20:07:00	00:57:00
175	11FN 001928I	32A - CRASH - 2 vehicle, near water point	Water Point	MACALISTER RANGE	18/10/2011	08:50:00	18/10/2011	10:43:00	01:53:00
176	11FN 001932I	32A - CRASH - Kuranda Range Switchback	Switchback	MACALISTER RANGE	18/10/2011	09:30:00	18/10/2011	10:47:00	01:17:00
177	11FN 001936I	32A CRASH Kuranda Range, below the lookout at the start of overtaking lanes	Kuranda Range	MACALISTER RANGE	18/10/2011	15:07:00	18/10/2011	17:26:00	02:19:00
178	11FN 001950I	32A CRASH 3kms from bottom, single vehicle into wall	3kms from bottom	MACALISTER RANGE	19/10/2011	14:23:00	19/10/2011	14:34:00	00:11:00
179	11FN 001955I	32A CRASH bottom of range, single vehicle, nil injuries	Bottom of range	SMITHFIELD	19/10/2011	16:37:00	19/10/2011	16:50:00	00:13:00
180	11FN 002013I	32A CRASH Crash on Kennedy Highway inbound towards Smithfield. QPS crew on site. No further information re RoadTek assistance etc. QPS did not advise further information as to what type of crash it was or injuries etc. Short delays. Unknown QPS job #	inbound towards Smithfield.	SMITHFIELD	25/10/2011	21:36:00	25/10/2011	22:23:00	00:47:00
181	11FN 002096I	20A/32A CRASH start of 32A westbound, Car vs cyclist	Intersection CCH/Kennedy Hwy	SMITHFIELD	9/11/2011	14:06:00	9/11/2011	14:31:00	00:25:00
182	11FN 002149I	Kennedy Hwy Kuranda Range - 2 vehicle crash + oil spill -QPS, QFRS and QAS on scene	Kennedy Hwy Kuranda Range	MACALISTER RANGE	20/11/2011	13:29:00	20/11/2011	14:27:00	00:58:00
183	11FN 002179I	32A - Kuranda Range 1 car CRASH - driven off side. Cleared	Kuranda Range	MACALISTER RANGE	24/11/2011	11:52:00	24/11/2011	13:02:00	01:10:00
184	11FN 002184I	32A - 2 VEHICLE CRASH Kennedy Highway, 4km up from the bottom of the Kuranda Range.	Kennedy Highway, 4km up from the bottom of the Kuranda Range.	KURANDA	24/11/2011	17:29:00	25/11/2011	03:13:00	09:44:00
185	11FN 002186I	32A Kennedy Hwy CRASH - KURANDA RANGE - car in culvert - on switchback	car off road near switchback - approx 3km up from Smithfield	KURANDA	25/11/2011	07:31:00	25/11/2011	09:15:00	01:44:00
186	11FN 002211I	32A - 2 CAR CRASH KENNEDY HIGHWAY, Kuranda near the hairpin.	KENNEDY HIGHWAY, Kuranda	KURANDA	30/11/2011	09:31:00	30/11/2011	10:50:00	01:19:00
187	11FN 002216I	32A Kennedy Highway, bottom of the Kuranda Range, near Smithfield - Single vehicle roll-over blocking the WB lane	Kuranda Range	MACALISTER RANGE	1/12/2011	06:12:00	1/12/2011	07:06:00	00:54:00
188	11FN 002301I	32A - KENNEDY HWY - Int. Kuranda & Warri Drive - CRASH	Int Kennedy Hwy & Warri Drive	KURANDA	15/12/2011	06:48:00	15/12/2011	10:20:00	03:32:00
189	11FN 002322I	32A Kennedy Hwy - between rainforest station and top of the range. 2 x vehicle crash		KURANDA	17/12/2011	06:19:00	17/12/2011	08:29:00	02:10:00
190	11FN 002324I	32A Kuranda Range, 5kms Kuranda Range. 3 x car crash.		KURANDA	18/12/2011	09:19:00	18/12/2011	10:24:00	01:05:00
191	11FN 002349I	32A - Kuranda Range - CRASH - rear end collision		MACALISTER RANGE	22/12/2011	17:25:00	22/12/2011	17:42:00	00:17:00
192	11FN 002361I	32A Kennedy Hwy - Kuranda Range - 4 km from bottom of range - crash	99A Kennedy Hwy - Kuranda Range	MACALISTER RANGE	27/12/2011	14:48:00	27/12/2011	16:38:00	01:50:00
193	11FN 002370I	32A - Single vehicle crash, Kennedy Highway, Kuranda Range hairpin bend	Kennedy Highway, Kuranda Range hairpin bend	KURANDA	29/12/2011	08:34:00	29/12/2011	09:39:00	01:05:00
194	11FN 002371I	32A CRASH multiple vehicle, 3kms from bottom	Kuranda Range	MACALISTER RANGE	29/12/2011	10:30:00	29/12/2011	11:37:00	01:07:00
195	12FN 000067I	32A Kennedy Highway Kuranda - Crash 2km east of rainforest station Single Vehicle x2 Injuries QPS, QFRS, QAS and RoadTek on scene	32A Kennedy Highway Kuranda Range	KURANDA	14/01/2012	10:25:00	14/01/2012	12:46:00	02:21:00
196	12FN 000109I	32A Kuranda Range CRASH 2 buses near Avondale Ck in job site (Culvert 23)	Near Avondale Ck	MACALISTER RANGE	23/01/2012	12:40:00	23/01/2012	13:33:00	00:53:00
197	12FN 000134I	32A Kuranda Range CRASH near Waterpoint below Lookout	Near Waterpoint	MACALISTER RANGE	25/01/2012	17:24:00	25/01/2012	19:23:00	01:59:00
198	12FN 000264I	32A Kuranda Hwy - CRASH - single vehicle crash near Rainforest Station			16/02/2012	20:00:00	16/02/2012	21:00:00	01:00:00
199	12FN 000270I	32A CRASH - below Switchback, single vehicle rollover.	just below SWITCHBACK	MACALISTER RANGE	20/02/2012	08:36:00	20/02/2012	11:30:00	02:54:00
200	12FN 000285I	20A - Capt Cook Hwy & Smithfield roundabout - CRASH - vehicle vs truck - one lane closed	smithfield roundabout	SMITHFIELD	21/02/2012	17:09:00	21/02/2012	18:03:00	00:54:00
201	12FN 000307I	Crash - Car and Truck	Kennedy Highway	MACALISTER RANGE	25/02/2012	09:48:00	25/02/2012	11:27:00	01:39:00
202	12FN 000314I	32A - Kuranda Range @ Switchback - CRASH - car vs bus, downhill, road reduced to one lane.	Switchback (hairpin turn on range)	MACALISTER RANGE	27/02/2012	09:43:00	27/02/2012	11:19:00	01:36:00
203	12FN 000318I	32A - Kuranda Range - Single vehicle CRASH	Kuranda Range	KURANDA	27/02/2012	12:18:00	27/02/2012	12:59:00	00:41:00
204	12FN 000320I	32A - Kuranda Range - CRASH - single vehicle -	near switchback	MACALISTER RANGE	27/02/2012	15:52:00	27/02/2012	16:23:00	00:31:00
205	12FN 000328I	32A - CRASH - car down embankment near rainforestation - Heading down the range.	1km from rainforestation	KURANDA	28/02/2012	14:45:00	28/02/2012	15:21:00	00:36:00
206	12FN 000339I	32A - Kuranda Range - CRASH - Bus vs vehicle	in passing lane halfway up the range	MACALISTER RANGE	29/02/2012	16:17:00	29/02/2012	16:48:00	00:31:00

SIMS Data - 1/7/2017 to 30/6/2012

Item No.	Identifier	Details	Location Details	Suburb	Start / Detected Time (Date)	Start / Detected Time (Time)	End Time (Date)	End Time (Time)	Length of Closure
207	12FN 000353I	Kuranda Range between the lookout and rainforest station. Car has slid off road and is in dangerous position. Has organised own tow but QPS requesting traffic control.	Rainforestation	KURANDA	2/03/2012	05:54:00	2/03/2012	08:28:00	02:34:00
208	12FN 000394I	32A Kennedy Hwy - Two vehicle crasg - fuel on road - 2 bends past Avondale Creek	Kennedy Highway - 2 bends past Avondale Creek	MACALISTER RANGE	11/03/2012	08:40:00	11/03/2012	12:39:00	03:50:00
209	12FN 000401I	32A - Kuranda Range, at the switchback - Multiple vehicle crash (2 Cars)	32A - Kuranda Range, at the lookout	KURANDA	12/03/2012	14:28:00	12/03/2012	15:26:00	00:58:00
210	12FN 000415I	32A - Kuranda Range, Bottom of the Range - Multiple vehicle crash (2 Cars)	32A - Kuranda Range, Bottom of the Range	MACALISTER RANGE	13/03/2012	13:47:00	13/03/2012	14:55:00	01:08:00
211	12FN 000420I	32A - Top of Kuranda Range - Tree Fallen on car - Kennedy Highway is blocked in both directions	Top of Kuranda Range	KURANDA	13/03/2012	17:08:00	13/03/2012	20:51:00	03:43:00
212	12FN 000672I	32B Kennedy Hwy & Black Mountain Road - Single vehicle crash into street light	Kennedy Hwy & Black Mountain Rd		15/04/2012	21:09:00	15/04/2012	21:52:00	00:43:00
213	12FN 000733I	32B - CRASH - car vs motorbike	near Humpy fruit stall - Tolga		27/04/2012	12:32:00	27/04/2012	16:09:00	03:37:00
214	12FN 000740I	32A - CRASH - single vehicle	on the switchback	MACALISTER RANGE	30/04/2012	10:20:00	30/04/2012	10:22:00	00:02:00
215	12FN 000755I	32A - CRASH	near Avondale Creek		2/05/2012	15:56:00	2/05/2012	16:52:00	00:56:00
216	12FN 000818I	32A - CRASH - Single vehicle roll over 1km from bottom of range	1 km from bottom of range		17/05/2012	15:23:00	17/05/2012	17:56:00	02:33:00
217	12FN 000842I	32A - CRASH	Avondale Creek		21/05/2012	09:59:00	21/05/2012	10:52:00	00:53:00
218	12FN 000853I	32A - CRASH	6.946 - 6.946 - Kuranda Range - Culvert # 61 near lookout		21/05/2012	12:20:00	21/05/2012	13:52:00	01:32:00
219	12FN 000867I	32A - CRASH KURANDA RANGE	(Kuranda Range) On the downside below the lookout at the blind bend		23/05/2012	10:15:00	23/05/2012	11:12:00	00:57:00
220	12FN 000881I	32A - CRASH 2kms up from bottom	2kms up		24/05/2012	17:34:00	24/05/2012	19:06:00	01:32:00
221	12FN 000895I	32A - CRASH/STATIONARY VEHICLE 3kms from the bottom	Kuranda Range (3Kms from bottom)		25/05/2012	09:28:00	25/05/2012	10:07:00	00:39:00
222	12FN 000935I	32A - CRASH TWO VEHICLE (KURANDA RANGE)	Kuranda Range (near Avondale Ck)		1/06/2012	08:40:00	1/06/2012	09:12:00	00:32:00
223	12FN 001099I	20A - CRASH	1/2 way up Kuranda Range	MACALISTER RANGE	26/06/2012	08:07:00	26/06/2012	09:14:00	01:07:00
224	12FN 001109I	32A - CRASH	at Water Point	MACALISTER RANGE	27/06/2012	07:31:00	27/06/2012	08:06:00	00:35:00

Released under

Appendix E – Austroads' references

Released under RTI - DTMR

Table 4.5: Countermeasures for non-intersection collisions

<p>Side-swipe crashes</p> <ul style="list-style-type: none"> • Check the visibility of lane lines in daylight and at night. • In a rural area provide or check adequacy of centre and edgelines and, where relevant, lane line delineation. Supplement with retroreflective pavement markers (RRPMs). • Consider provision of wider lanes. • If at an isolated curve, consider adequacy of alignment design and superelevation. Aim to remove need for drivers to reduce speed at curves. 		<ul style="list-style-type: none"> • On the approach to an intersection, consider improving direction signing including overhead lane use signs where relevant. Also consider adequacy or provision of auxiliary lanes for turning traffic. • If at a lane drop, check that warning signs and pavement markings are to standard. • Check the speed limit is appropriate.
<p>Head-on crashes</p> <ul style="list-style-type: none"> • In a rural area check adequacy of centreline marking and consider supplementing this with RRPMs. If on a curve, check delineation of the curve as well. • If at locations where visibility is restricted, consider barrier lining. • If at a location of local widening (e.g. at an intersection), check that it does not look like an overtaking lane. Consider altering right turn lane markings. • Where justified, consider separation of opposing flows by means of a painted median with or without rumble strips or by means of a raised median where economically justifiable. 		<ul style="list-style-type: none"> • Consider increasing the number of overtaking opportunities by duplication or overtaking lanes. • If occurring on a divided roadway, consider improving delineation, widening of the median, provision of a median barrier or, if due to wrong way manoeuvres at intersections, check design, signs and lighting at intersections. • Consider removing or relocating that may encourage drivers to drive further to the centre of the road. This include poles, trees, and barriers in close proximity to the roadside. • Check the speed limit is appropriate.
<p>Rear-end crashes</p> <ul style="list-style-type: none"> • On busy roads, check forward visibility. • On freeways, take action to provide stable flow, including added lanes on uphill grades, balancing numbers of lanes, adequate merge and diverge capacity, shifting traffic from the left lane prior to heavy on-flow, variable speed limits or ramp metering. 		<ul style="list-style-type: none"> • Provide auxiliary lanes for access to driveways and bus stops. • Check the speed limit is appropriate.
<p>Run-off-road type crashes</p> <ul style="list-style-type: none"> • Consider improved delineation, including post-mounted delineators, RRPMs, edgelines, tactile edgelines and chevron alignment markers. • Consider a delineation package to treat all curves on rural high speed roads. The amount of delineation would match the risk level of the curve (difficulty). The higher risk, the more intense the delineation. • If at an isolated curve, consider adequacy of alignment design and superelevation. Aim to remove need for drivers to reduce speed at curves. • Widen the lanes or seal the shoulders. • If at critical curves, consider warning signs and advisory curve speed signing. 		<ul style="list-style-type: none"> • Widen the edgeline on curves. • If in urban areas with a high night-time crash involvement, consider street lighting. • If there is a high incidence of wet weather crashes, check surface texture, skid resistance and pavement drainage. • Check the speed limit is appropriate. • If a conflict point, such as an intersection, is placed towards the base of a long, steep gradient, consider removing or signalling conflict.
<p>Hit fixed object crashes</p> <ul style="list-style-type: none"> • As well as providing the run-off-road crash treatments listed above: • Remove or relocate objects to less vulnerable positions. • Consider relocation or use of frangible lighting poles or sign posts. <p>Note: removing a tree or object does not prevent the vehicle from being out-of-control, but this measure will be expected to reduce the crash severity outcome of this type of crash.</p>		<ul style="list-style-type: none"> • If an object cannot be relocated or made frangible, consider provision of guardrail, crash barriers or a crash cushion. • If an object is an island, illuminate or delineate it; provide linemarking beside and past it.

Table F 2: Crash Modification Factors of Various Countermeasures for Non-intersection Crashes

Treatment type	Description and DCA code						
	Head-on 201	Opposing turns 202–206	Rear end 301–304	Lane change 305–307	Vehicle hits pedestrian 001–003	Hit parked/ parking vehicle 601, 401, 402	
Median on existing carriageway	0.1				0.5		
Pedestrian refuge					0.55		
Pedestrian (zebra) crossing					0.6		
Kerb blisters	0.9				0.9	0.5	
Pedestrian overpass					0.15		
Pedestrian signals					0.3		
Pedestrian crossing lighting					0.4		
Improved route lighting					0.7		
Clearway, parking bans			0.8		0.7	0.5	
Indented right turn island		0.7	0.6				
Painted turn lanes		0.8	0.8				
Roadside hazards – remove	Note 1						
Roadside hazards – guard fence							
Wire rope safety barrier – roadside							
Wire rope safety barrier – median	0.05						
High skid resistance surfacing			0.6				
Seal shoulders	0.6						
Advisory speed signs on curves	0.7						
Delineation							
Edgelines							
Audio-tactile edgelines							
Reconstruct superelevation on curve	0.5						
Climbing/overtaking lanes	0.7 Note 2			1.1			
Signs (railway level crossing)							
Flashing lights (railway level crossing)							
Barriers or gates (railway level crossing)							
Bridge or overpass (railway level crossing)							
Frangible posts, poles							
Cost per casualty crash (\$'000)	Metro	373	180	89	135	234	174
	Rural	660	303	208	339	410	297
<p><i>Note 1: For this treatment removing the objects which were hit after the vehicle left the carriageway is to reduce crashes that relate to hitting objects (i.e. crash types 703–704, 803–804) but the reduction in these crashes will be matched by an increase in crash types 701–702 and 801–802, as vehicles will continue to leave the carriageway but now will not be hitting objects (all else being equal). The net benefit will be a reduction in crash severity.</i></p> <p><i>Note 2: For this treatment crash type 501 (head-on, overtaking) is also relevant (use DCA 201 cost).</i></p>							

Treatment type	Description and DCA code							
	On straight			On curve			Hit train 903	
	Off road 701–702	Off road, hit object 703, 704	Loss of control, on road 705	Off road 801, 802	Off road, hit object 803, 804	Loss of control on road 805		
Median on existing carriageway								
Pedestrian refuge								
Pedestrian (zebra) crossing								
Kerb blisters								
Pedestrian overpass								
Pedestrian signals								
Pedestrian crossing lighting								
Improved route lighting								
Clearway, parking bans								
Indented right turn island								
Painted turn lanes								
Roadside hazards- remove	1.8	0.2		1.8	0.2			
Roadside hazards – guard fence	0.7	0.7	1.3	0.7	0.7	1.3		
Wire rope safety barrier – roadside	0.15	0.1		0.15	0.1			
Wire rope safety barrier – median								
High skid resistance surfacing	0.9	0.9	0.9	0.9	0.0	0.9		
Seal shoulders	0.6	0.6	0.6	0.6	0.6	0.6		
Advisory speed signs on curves				0.7	0.7	0.7		
Delineation	0.85	0.85	0.85	0.85	0.85	0.85		
Edgelines	0.7	0.7		0.7	0.7			
Audio-tactile edgelines								
Reconstruct superelevation on curve				0.5	0.5	0.5		
Climbing/overtaking lanes								
Signs (railway level crossing)							0.85	
Flashing lights (railway level crossing)							0.5	
Barriers or gates (railway level crossing)							0.2	
Bridge or overpass (railway level crossing)							0.0	
Frangible posts, poles		Note 3			Note 3			
Cost per casualty crash (\$'000)	Metro	133	272	140	210	323	149	628
	Rural	261	452	293	404	503	268	928
<p><i>Note 3: For this treatment, the number of off-road-hit-object crashes is not expected to change. However, the severity outcome of these crashes will be reduced.</i></p>								

Austrroads Technical Report - Road Safety Engineering Risk Assessment Part 6: Crash Reduction Factors

Issue	Environment type	% Reduction	Confidence
	Close bi-directional crossover	53%	Medium
Midblock turning provisions	All environments	34%	Medium
No overtaking markings	All	35%	Low
Overtaking lanes	All environments	23%	Medium
	Tack-on lane	5%	Low
	New alignment and passing lane	54%	Low
Parking ban	All	20%	Low
Parking – convert angle to parallel	All	40%	Low
Pavement markings – centreline	All environments	30%	Low
Pavement markings – edgeline	All environments	20%	Low
Pavement markings – words and symbols	All environments	unknown	n.a.
Pavement markings – painted speed limits	All environments	0%	Low
Pedestrian crossings	No reliable reductions determined for this issue	unknown	n.a.
Pedestrian treatment – rest on red	All	50%	Low
Railway crossing treatments	From nothing to signage	25%	Low
	From signage to lights and bells	50%	Low
	From lights and bells to barriers	45%	Low
	From signage to barriers	67%	Low
	Improve sight distance	44%	Low
Road surfacing	Resurfacing to improve skid resistance - urban	35%	High
Roundabouts	Install roundabout – rural	70%	High
	Install roundabout – urban	55%	Medium
	Install roundabout – all environments	70%	High
Safety barriers	Install guardrail – all environments	40%	High
Sight distance improvements	Rural environments and intersections – based on an improvement in sight distance	30%	Medium
Signs – advisory	Advisory speed signs – all environments	25%	Low
	Curve warning signs – all environments	25%	Low
	Chevron warning signs – all environments	30%	Low
	Bridge warning signs – all environments	30%	Low
	Guidance signs – all environments	15%	Low
	Variable message signs – all environments	20%	Medium
	Vehicle activated signs – all environments	34%	Medium
Signs – regulatory (intersection)	Install <i>stop sign</i> at T-intersection	20%	Medium
	Install <i>stop sign</i> at X-intersection	35%	Medium
	Install <i>give way sign</i> – all intersections	15%	Low
Signs – regulatory (midblock)	All environments	25%	Low
Speed cameras	Mobile overt	40%	Medium
	Mobile covert – urban	20%*	Low
	Mobile covert – rural	20%*	Medium
	Fixed overt – urban	30%	Medium
	Fixed overt – rural	30%	Low
Speed – change in speed limit and change in speed	<i>Decreases in speed limit</i>		
	From no previous restriction to any speed limit 100 to 80 km/h	20% 15%	Medium

Appendix F – Summary of safety review findings

Released under RTI - DTMR

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.1	<p>The condition of road traffic signs was generally to a high standard throughout the audit site, with most signs performing well during both day and night inspections. However, several maintenance and installation issues were identified that affected a small number of signs, including:</p> <ul style="list-style-type: none"> overhanging vegetation obscured vegetation signs installed in close succession so that subsequent signs were partially obscured sign faces coated in dirt or mould, which reduced effectiveness, particularly during the night inspection damaged by vehicle strike poor condition/faded due to age signs missing and not replaced superseded/outdated signs not upgraded to meet current signing practice sign faces rotated 180 degrees on post. <p>To maximise traffic safety, it is essential road users are provided with clear, concise and consistent road traffic signing that is visible in all weather and lighting conditions. As important is the need to regularly inspect and maintain signs where required.</p>	<p>Recommendation 8.1.1.1: Arrange for vegetation trimming/removal to be undertaken at locations where traffic signs are obscured by foliage including warning signs on the steep range section and the road name sign at the Saddle Mountain Road intersection.</p> <p>Recommendation 8.1.1.2: Arrange the replacement of damaged, faded, and missing signs throughout the audit site. Ensure the content of all new signs complies with current design standards (such as MUTCD or TC sign designs).</p> <p>Recommendation 8.1.1.3: Arrange relocation of signs that are obscured by the close longitudinal placement of successive signs or where the spacing does not comply with the minimum separation requirements of Part 1/1.12.2 of the MUTCD.</p>	<p>A</p> <p>A</p> <p>B</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.1 Cont'd		<p>Recommendation 8.1.1.4: Arrange for cleaning of sign faces, particularly in heavily shaded areas, to maximise sign effectiveness and night time reflectorisation.</p> <p>Recommendation 8.1.1.5: Arrange for rotated signs to be realigned to face approaching traffic.</p> <p>Recommendation 8.1.1.6: Arrange for existing TURN LEFT AT ANY TIME WITH CARE (R2-16) signs to be replaced with GIVE WAY (R1-2B) signs, on the left-turn slip lanes at the Canopys Edge Boulevard and Rob Veivers Drive intersections (refer to MUTCD Part 14/6.1(d) for detail).</p>	<p>B</p> <p>A</p> <p>C</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.2	<p>There was an inconsistent application of signs and linemarkings at overtaking lanes, climbing lanes, and slow vehicle turnouts throughout the audit site. Issues identified with these treatments include:</p> <ul style="list-style-type: none"> KEEP LEFT UNLESS OVERTAKING (R6-29) signs had been installed near the start of some auxiliary lanes immediately after SLOW VEHICLE LANE AHEAD (G9-10) signs. Although the diverge taper directed traffic into the left lane (typical of an overtaking lane), the auxiliary lane length was very short, hence it was unclear if the lane's purpose was as a climbing lane or overtaking lane. FORM 1 LANE (G9-15) signs were installed at the start of most merge tapers, indicating that 'zip-merge' arrangements were in effect. The zip-merge was considered appropriate for all climbing lanes, however its use at overtaking lanes was inconsistent with standard signing practices (refer MUTCD Part 2/4.7.2(b)). In addition, the FORM 1 LANE signs were often contradictory to the use of other devices including LEFT LANE ENDS (W4-9)/ MERGE RIGHT (W8-15) signs, continuity lines at the merge taper and/or merge pavement arrows, which indicated that "lane change" merge rules applied. 	<p>Recommendation 8.1.2.1:</p> <p>Confirm the purpose of auxiliary lanes within the audit site as either overtaking lanes or climbing lanes. Ensure that signs installed on approach to each treatment comply with the standard layouts shown in Part 2, Figures 4.21 and 4.22 of the MUTCD. Arrange for any contradictory or redundant signs to be removed. Also ensure that the diverge tapers are correctly linemarked to direct through traffic into the left (overtaking) or right (climbing) lanes. In situations where the merge is not clearly visible to approaching traffic in both lanes (e.g. the merge is located on a right curve), consider adopting a lane change merge treatment that incorporates a continuity line at the merge and associated 'merge' signage (i.e. LEFT LANE ENDS (W4-9)/ MERGE RIGHT (W8-15) and MERGE RIGHT (G9-73) signs). Refer to Part 2/4.7.2 of the MUTCD for further detail on both zip-merge and lane change merge treatments.</p>	A		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.2 Cont'd	<ul style="list-style-type: none"> A combination of continuity lines and lane lines had been used at most slow vehicle turnouts to separate the auxiliary lane from the adjacent through traffic lane. The use of lane lines was considered inappropriate as it could give the impression of a longer length of auxiliary lane than was actually present. The merge area at most slow vehicle turnouts was linemarked as a 'zip merge' and signed with a FORM 1 LANE (G9-15) sign. The sign often conflicted with the presence of merge pavement arrows on the road surface that are restricted for use with a lane change merge. In some cases no signs were placed at the merge and a full length continuity line had been marked along the turnout. <p>As most auxiliary lanes throughout the audit site were very short, it is important motorists are given clear and consistent information on the purpose of each lane and the action required when merging.</p>	<p>Recommendation 8.1.2.2:</p> <p>Review the application of signs and linemarkings at slow vehicle turnouts throughout the audit site, with a view to providing a consistent treatment that conforms to the requirements of Part 2/4.8 and Figure 4.22 of the MUTCD. Consider removing existing FORM 1 LANE signs, merge pavement arrows and broken lane lines, and replace with a continuity line that extends along the full length of the slow vehicle turnout.</p>	A		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.3	<p>There were numerous alignment warning and curve advisory speed signs throughout the range section of the audit site. The values shown on some advisory speed signs were in 5km/h increments, which was inconsistent with current requirements for 10km/h speed value increments specified in Part 2/4.4.7.7 of the MUTCD.</p> <p>As most curve advisory speed signs appeared relatively new, it was unclear if the displayed speed values had been determined using current practice, or if older signs that showed 5km/h increments had simply been replaced. It is critical that posted advisory speeds be determined using accepted traffic engineering procedures.</p>	<p>Recommendation 8.1.3.1: Confirm the process used to determine advisory speed values on horizontal curves throughout the audit site. Where an accepted traffic engineering procedure has not been used, or records are not available, consider undertaking a mass review of advisory speeds using the process outlined in Appendix C, Part 2 of the MUTCD. Where discrepancies are identified, arrange for Advisory Speed (W8-2) signs to be replaced as necessary so that posted speed values are in 10km/h increments.</p> <p>Recommendation 8.1.3.2: Where a mass action review of advisory speed values is undertaken in accordance with Recommendation 8.1.3.1, also review the application of associated alignment warning signs to check the type (diagrammatic symbol) and location of the signs are consistent with advisory speed requirements. The appropriate combination of alignment warning and advisory speed signing is outlined in Part 2/4.4.6 of the MUTCD.</p>	<p>A</p> <p>A</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.4	<p>A special warning sign that incorporated a Steep Climb (W5-13) sign was installed near the base of the range (immediately west of the RoadTek depot). However, there were no signs installed at the top of the range to warn eastbound motorists of the long steep descent, or the potential need for trucks and buses to use low gears.</p> <p>To assist heavy vehicle drivers to moderate speeds on approach to the steep downgrades, it is important that adequate advance warning is provided.</p>	<p>Recommendation 8.1.4.1: In accordance with Part 2/4.9 of the MUTCD, investigate the need for additional steep grade signing throughout the Kuranda Range section of the Kennedy Highway. Where the need for additional signing is identified, ensure the application of signage complies with current MUTCD guidelines.</p>	A		

Released under RTI - DTMR

Table 6: Summary of audit findings

Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.5	<p>Street name and direction signs at intersections throughout the audit site were inconsistently applied and of inconsistent standard. Identified issues included:</p> <ul style="list-style-type: none"> street name signs were not installed at some intersections, including Cumberland Avenue, Rob Veivers Drive and Myola Road street name signs were installed with a non-standard colour scheme (yellow background) at Warril Drive, Fallon Road, Black Mountain Road and Saddle Mountain Road single-sided street name signs were installed facing traffic from one direction only at the Warril Drive and Fallon Road intersection advance street name signs were not installed at the start of deceleration lanes to advise motorists of the street name to which the lane leads a street name sign was not readily visible at Green Hills Road due to small font size and the sign's location being offset too far from the intersection a proliferation of advance and supplementary advance direction signs were installed on approach to the intersection with Rob Veivers Drive and Myola Road intersection signs were installed with a non-standard colour scheme and information inconsistent with that shown on advance direction signs at the Rob Veivers Drive and Myola Road intersection. 	<p>Recommendation 8.1.5.1: Arrange for street name signs to be installed or upgraded at intersections throughout the audit site. Ensure the minimum treatment at all side-road intersections includes a street name sign with black legend on a white background (Part 5/2.6 of the MUTCD). This sign should be installed as close to the intersection as possible and be readily visible to traffic from both major road approaches (Part 5/2.9 of the MUTCD). Where the speed limit past the intersection is greater than 60km/h, the text height should be increased to 130mm minimum (Part 5/2.5 of the MUTCD). At intersections that have deceleration lanes but no advance direction signage, advance street name signs of the G2 or G3 type should also be installed at the start of the deceleration lane (Part 5/2.11 of the MUTCD).</p>	B		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.1.5 Cont'd	<p>Prominent direction signage is an essential element in effectively guiding motorists through the road network while maximising intersection safety for turning vehicles. Signs must be legible at a distance appropriate to the speed environment and should be placed sufficiently far in advance of intersections (e.g. at the start of deceleration lanes) to permit any necessary manoeuvres. This is particularly important on roads with a high volume of tourist traffic, as it enables road users to identify intersecting streets and destinations without having to take their attention off the road for an unnecessarily long period, or slow down to a point where they create a hazard.</p>	<p>Recommendation 8.1.5.2: Arrange for advance and supplementary advance direction signs to be rationalised at the intersection of the Kennedy Highway, Rob Veivers Drive and Myola Road. Any desired tourist and service information should ideally be incorporated into the advance direction sign. Where there is an excessive amount of information to be signed, the service and tourist information should be shown on a single supplementary advance sign. Refer to Part 6/5.6.1 of the MUTCD for further detail on combining service signs with direction and tourist signs.</p>	C		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.2.1	<p>Lines and pavement markings throughout the audit site were generally in very good condition, which provided a high standard of lane definition throughout both day and night inspections. However, there were several locations, primarily at intersections, where lines and pavement markings were worn/faded as a result of regular vehicle movements across the lines.</p> <p>Locations where deterioration was evident included:</p> <ul style="list-style-type: none"> pavement arrows, continuity lines, and chevron splay markings at Canopys Edge Boulevard pavement arrows at the Henry Ross Lookout give way line, continuity line and edge lines (near kerb return) at Saddle Mountain Road intersection give way line, continuity line, edge lines (near kerb return), median island outline, and diagonal pavement markings near turnout at Black Mountain Road, edge lines, centre lines and median island splays between Rob Veivers Drive and Green Hillis Road intersection edge lines between Green Hills Road and Warril Drive intersection island outlines, chevrons markings and diagonal markings at Warril Drive and Fallon Road intersection. 	<p>Recommendation 8.2.1.1: Arrange for worn and deteriorated lines and pavement markings to be remarked at the identified locations. Prioritise and schedule works accordingly with other planned maintenance.</p> <p>Recommendation 8.2.1.2: Check the department's current maintenance arrangement with a view to ensuring a high standard of line and pavement markings is maintained throughout the audit site through regular inspections and subsequent reapplication, as required.</p>	<p>C</p> <p>B</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.2.1 Cont'd	<p>Line and pavement markings provide important regulatory control and guidance for motorists, hence it is essential they are regularly inspected and reapplied as required, particularly at intersections where there is an increased need for clear visual cues.</p> <p>Given the extent of substandard alignment and hazardous roadside environment throughout the audit site, maintaining a high standard of line and pavement markings is a crucial component to maximising safety for road users.</p>				

Released under RTI - DTMR

Table 6: Summary of audit findings

Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.2.2	<p>The configuration of the access at the western end of the Henry Ross Lookout was not clear. A small splitter island was positioned centrally at the access to separate vehicles that enter and exit the lookout parking area. A bidirectional hazard marker installed on the nose of the splitter island could be misconstrued as permitting traffic to enter the lookout around both sides of the island. There was an absence of linemarking and delineation around the splitter island and beside the entry lane to clarify the intended movement of traffic at the access. Furthermore, there were no signs installed on the opposing end of the island to prevent vehicles from exiting through the entry lane.</p> <p>Minor sign and pavement marking improvements could reduce any potential confusion or indecision at the access, and assist turning traffic to decelerate clear of the through lane at their earliest opportunity.</p>	<p>Recommendation 8.2.2.1: Consider undertaking the following works to clarify the permitted traffic movements at the Henry Ross Lookout's western access:</p> <ul style="list-style-type: none"> • install an edge line beside the entry lane • install outline markings with splayed ends around the median splitter island • install a left-turn arrow at the start of the entry lane and opposing straight arrows near the eastern end of the median splitter island • install a KEEP LEFT (R2-3A) sign on the eastern end of the median splitter island • install an additional NO ENTRY (R2-4B) sign behind the safety barrier, adjacent to the existing sign on the eastern end of the median splitter island, to face exiting traffic. 	B		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.3.1	<p>Raised Reflective Pavement Markers (RRPMs) were installed throughout the audit site to supplement edge, centre, and lane lines. Road Edge Guide Posts (REGPs) were also installed near the shoulder/formation edge on unkerbed road sections. The application and condition of RRPMs and REGPs were to a high standard, which provided good night time delineation in both directions. There were isolated locations where REGPs and RRPMs were damaged or missing, however, the small number of absences did not detract from delineation continuity during the night inspection.</p> <p>Given the extent of substandard alignment and hazardous roadside environment throughout the audit site, maintaining a high standard of delineation is a crucial component to maximising safety for road users.</p>	<p>Recommendation 8.3.1.1: Arrange for the replacement of damaged and missing RRPMs and REGPs throughout the audit site.</p> <p>Recommendation 8.3.1.2: Check the department's current maintenance arrangement with a view to ensuring a high standard of delineation is maintained throughout the audit site through regular inspections and replacement of devices, as required.</p>	<p>B</p> <p>B</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.4.1	<p>Safety barriers were installed at numerous locations throughout the audit site. In most cases they were offset between 0.5m and 1m from the traffic lanes and fitted with extruder or tension terminals on each end (e.g., ET 2000 Plus or X-350). The end terminals were typically flared away from the traffic lane; however, where the width was constrained they were installed tangentially.</p> <p>There were at least four locations where end terminals had been damaged as a result of vehicle strike. In most cases the damage was minimal, suggesting 'nuisance strikes' had occurred as a result of the close proximity to the traffic lane. As safety barriers are themselves a hazard within the clear zone, it is essential that post-crash repairs are undertaken so they remain functional in the event of future collisions.</p> <p>Post-crash assessment and repair of road safety barriers is detailed in Section 3.5, Part 1 of the Australian/New Zealand standard <i>Road Safety Barrier Systems</i> (AS/NZ 3845.1:2015).</p>	<p>Recommendation 8.4.1.1: Arrange for all safety barrier terminals to be inspected and for any damaged components to be logged for repaired/replaced as necessary. As a minimum practice, conduct assessments in accordance with Section 3.5, Part 1: Road Safety Barrier Systems (AS/NZ 3845.1:2015).</p> <p>Recommendation 8.4.1.2: Arrange for uni-directional hazard stickers (D4-1-2-Q01) to be installed on end terminals where they are missing and for the replacement of existing stickers where they have been damaged. Also ensure that at least one dual-sided delineator is placed close to the end of each terminal head.</p>	<p>A</p> <p>A</p>		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.4.2	There were a significant number of successive delineators either missing or damaged on the section of guardrail that extended between the Barron River Bridge and Black Mountain Road (right side of carriageway). As the barrier is situated close to the traffic lanes, a high standard of delineation is required to alert motorists of the potential hazard during periods of poor light or adverse weather conditions.	Recommendation 8.4.2.1: Arrange for new delineators to be placed on the section of W-Beam barrier that extends between Barron River Bridge and Black Mountain Road (right side of carriageway).	A		

Released under RTI - DTMR

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.5.1 Cont'd	<p>The audit team identified two such sites where vehicles had recently left the road and come to rest near the base of a steep embankment (chainage 8.77km RHS and chainage 8.18km RHS). There was also evidence that a tree had recently fallen onto the road at chainage 7.86km RHS prior to being relocated beside the shoulder.</p> <p>Assessing and prioritising treatment options throughout the audit site could be achieved using quantitative risk assessment techniques, such as TMR's Roadside Impact Severity Calculator (RISC) software. Although, given the significant number and extent of roadside hazards, in addition to the restrictions on removing vegetation from within the conservation park, the audit team acknowledges it may be difficult to justify costs associated with a mass action program to remove, relocate, or shield all roadside hazards.</p> <p>Where funding for higher cost hazard mitigation work is limited, maintaining a high standard of traffic lane delineation is generally considered to be the minimum treatment that should be provided. In this instance, the standard and condition of existing delineation throughout the audit was found to be very good.</p>	<p>Recommendation 8.5.1.3:</p> <p>Arrange an inspection of steep/high-cut slopes within the audit site to identify locations that may be prone to slides and areas where cut slopes are potentially unstable. Also identify locations where large rocks are situated in potentially hazardous locations. Arrange for the removal of debris at locations where existing slides have occurred and determine the need and relative priority for stabilisation and rock removal works in locations where there is a high risk of cut failures.</p>	C		

Table 6: Summary of audit findings

Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.6.1	<p>As a consequence of the mountainous terrain, the Kuranda Range features a predominantly winding alignment in combination with long steep grades. Although the alignment features sub-standard elements in some areas, the consistent radii and close spacing of successive horizontal curves largely constrain vehicle speeds.</p> <p>Sight distance was diminished in many areas as a result of the winding alignment, however the presence and severity of upcoming curves could be readily perceived. The high standard and good condition of alignment warning signs, in addition to the provision of high impact target board signs and vehicle- activated warning signs, clearly alerted motorists of the need to moderate speed.</p> <p>In spite of the existing speed reduction measures, there were numerous occasions throughout the day and night inspections where the audit team witnessed poor driver behaviour including aggressive driving, tailgating, high speeds, and excessive cornering speeds. It was evident that improving driver behaviour and minimising excessive speeds should be a primary focus in improving safety throughout the audit site. However it was acknowledged that the steep, winding alignment and narrow shoulder widths presents a challenge to the use of conventional police enforcement activities.</p>	<p>Recommendation 8.6.1.1: Investigate options to install one or more Intelligent Transport System (ITS) technologies that can identify and discourage poor driving behaviours (e.g., speeding, tailgating and excessive cornering speeds). Ideally a suite of measures could be adopted to compliment and build upon the several existing vehicle-activated signs.</p> <p>Measures to consider may include:</p> <ul style="list-style-type: none"> • Variable Message Signs (VMS) • Automatic Number Plate Recognition (ANPR) devices • Vehicle-activated signs (VAS) – warning and speed. 	A		

Table 6: Summary of audit findings

Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.7.1	<p>To facilitate the movement of pedestrians and cyclists between the township of Kuranda and Black Mountain Road, a crossing of the Barron River was provided using the road shoulder on the northern side of the bridge. Path users were required to cross the Kennedy Highway near the western bridge abutment to link between the paths located on each side of the bridge. Safety issues identified with the pedestrians facilities around the Barron River Bridge are detailed below.</p> <ul style="list-style-type: none"> Plastic bollards installed beside the edge line on the northern side of the bridge provided only limited physical separation between traffic and path users. There were no signs installed to warn of pedestrians or cyclists walking near to the traffic lane. Pedestrians were required to cross Kennedy Highway near the western bridge abutment that was situated in a 'rural' environment that had an 80km/h posted speed limit. It appeared unlikely that motorists would expect to encounter pedestrians or cyclists crossing the road in this area. There was no signs or other devices installed to warn motorists or to encourage lower speeds. An opening had been provided in the safety barrier located beside the southern roadside to enable pedestrians to cross the Kennedy Highway near the western bridge abutment. presence of the two separate crossing facilities within close proximity created an additional conflict point for motorists to monitor. 	<p>Recommendation 8.7.1.1: Arrange for Pedestrians warning signs (W6-1) to be installed on each approach to the Barron River Bridge. Ensure the signs on the western bridge approach are positioned an appropriate distance in advance of the point where pedestrians cross the road. Refer to Part 10 of the MUTCD for specific details on warning signs for pedestrians.</p> <p>Recommendation 8.7.1.2: Consider removing/closing one of the two crossing points on the southern side of the Kennedy Highway (near the western bridge abutment) and directing path users to a single preferred crossing location via appropriate signage and upgraded path connections, if required. It is suggested that the crossing closest to the bridge abutment be closed to remove the potential visibility obstruction caused by the safety barrier and to allow a compliant barrier connection to the bridge rail to be provided.</p>	<p>A</p> <p>B</p>		

Table 6: Summary of audit findings

Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.7.1 Cont'd	<ul style="list-style-type: none"> ○ Breakaway Cable Terminals (BCT) with buffered ends were attached to each end of the barrier openings, which is not compatible with crashes involving smaller vehicles and therefore should no longer be used (refer RPDM, Chapter 8/8.2.6.3). ○ The location of the opening also caused the length of barrier that was attached to the bridge parapet to be too short to allow an appropriate crash tested transition from the W-beam to the rigid bridge barrier (refer RPDM, Chapter 8/8.2.7.5). ○ Post spacing between the buffered end and the bridge parapet was also too large to prevent pocketing of the rail during a collision (refer RPDM, Chapter 8/8.2.7.6 and Standard Drawing 1475). ● A separate short section of W-beam had been installed behind the barrier opening to prevent a vehicle that travels through the opening from travelling behind the bridge rail. The length of this barrier was significantly less than the minimum length shown on Standard Drawing 1474 and is therefore unlikely to be fully effective during a crash. The close proximity of the parallel barrier systems, combined with the presence of buffered end terminals on the system closest to the traffic lanes, also created a restriction to the path width to less than 1m. ● The close proximity of the crossing to the western bridge abutment and the presence of W-beam barriers could obscure pedestrians from the view of motorists. 	<p>Recommendation 8.7.1.3: Undertake a design review of the barrier installation on the southern side of the Kennedy Highway near the western abutment of Barron River Bridge. The review should identify non-conformances with the existing barriers and propose a solution to upgrade the system to meet current departmental and Australian standards. Where funding for new or upgraded barrier works is limited, consider nominating the project for funding under future capital works or safety programs (e.g. Safer Roads Sooner).</p>	B		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.7.1 Cont'd	A concrete path and kerb ramp were provided on the southern side of Kennedy Highway adjacent to the cul-de-sac at Therwine Street, and provided an alternative facility to cross the Kennedy Highway, approximately 60m west of the Barron River bridge abutment. The	<p>Recommendation 8.7.1.4: Determine if a suitable treatment can be provided to physically separate cyclists/pedestrians from vehicular traffic crossing the Barron River Bridge.</p> <p>A suggested option would involve constructing barrier kerb across the northern side of the bridge such that it is parallel with, and at the same height, as the existing bridge kerb, with breaks provided for drainage and at deck expansion joints. The new kerb could be offset from the traffic lane at a similar offset to that used between the edge line and bridge kerb on the southern side of the bridge. Chequered steel lintels could be fixed between the two parallel kerbs to create a raised walkway above the existing shoulder. Pedestrian fencing or a suitable barrier system (if sufficient width is available) would need to be provided along the edge of the new kerb.</p> <p>Where an options analysis identifies one or more suitable treatments, develop a business case for the preferred solution and prioritise upgrade works accordingly.</p>	C		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.7.2	<p>During the daytime inspection several cyclists were observed riding eastbound on the Kennedy Highway, near the base of the Kuranda Range. The audit team was advised at the pre-start meeting that an off-road mountain bike trail extends down the side of the range, starting near the Henry Ross Lookout and terminating at chainage 1.13km on the right-hand side. Cyclists re-enter the Kennedy Highway at this point and ride the remaining distance to the base of the range on the road. The road shoulder along this section varied in width between 0.5m to 1m and is typically constrained by the presence of safety barrier or kerb. This required cyclists to travel partially or fully within the eastbound traffic lane.</p> <p>Bicycle warning signs were installed near the top (11.17km RHS) and base of the range (0.67km LHS), which provided a general warning to motorists that they may encounter cyclists on the range. However the sign facing eastbound traffic (chainage 11.17km RHS) failed to highlight the area near the base of the range where potential for cyclist/vehicle conflict was greatest. There was also no specific warning or protection where cyclists re-enter the road unexpectedly at chainage 1.13km.</p>	<p>Recommendation 8.7.2.1: Arrange for a SHARE THE ROAD warning sign (TC1878) and supplementary plate (TC1864) (as illustrated in Figure 10) to be installed near chainage 1.21km RHS, which is prior to the point where the mountain bike trail terminates and cyclists re-enter the Kennedy Highway.</p> <p>Also arrange for a ROAD AHEAD (W6-8) warning sign to be installed beside the mountain bike trail, prior to its junction with the Kennedy Highway at chainage 1.13km.</p>	A		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.8.1	<p>The road surface displayed relatively few defects and was found to be in good condition throughout most of the audit site. It provided a smooth ride when travelled at the posted and advisory speed limits and appeared well textured when visually inspected. However there were several isolated locations where surface or underlying pavement issues were identified, including:</p> <ul style="list-style-type: none"> • loose gravel and dirt on the surface of the bicycle lane at Warril Drive intersection and on the left-turn slip lane from Myola Road onto the Kennedy Highway • aggregate stripping on the southern side of the Rob Veivers Drive intersection, near the median island nose • minor flushing on the northern side of the Rob Veivers Drive intersection near the median island nose • aggregate stripping and small potholes between the Black Mountain Road and Saddle Mountain Road intersections. • moderate to extensive crocodile cracking and potholes affecting an 800m section of road on the eastern side of the Saddle Mount Road intersection. • minor cracking at numerous locations on the range section between Canopys Edge Boulevard and the Rainforest Park access. 	<p>Recommendation 8.8.1.1: Arrange a maintenance inspection of the audit site to assess the identified pavement, surface and drainage issues, and determine an appropriate course of action to rectify. Ensure necessary rectification works are included on a prioritised program for future maintenance works. Monitor the rate of further deterioration to determine the need and timeframe for corrective action.</p>	B		

Table 6: Summary of audit findings					
Item no.	Audit findings	Suggested action	Action priority	Agreed action / comments	Action officer
8.8.1 Cont'd	<p>There were also several locations where drains were completely or partially blocked with dirt and/or leaf matter, including:</p> <ul style="list-style-type: none"> • cross drains cut through the raised median island at the Warril Drive and Fallon Road intersection • strip drains and gully pits at the Myola Road and Black Mountain Road intersections. • the concrete table drain fronting the stockpile site at chainage 4.14km LHS. <p>One or a combination of the observed pavement/surface conditions can affect vehicle controllability, particularly in wet conditions. To improve safety, the audit team suggests action be taken to rectify the identified issues in accordance with standard maintenance intervention practices.</p>				

Released under RTI - DTMR

Appendix G – Approved recommendations

Released under RTI - DTMR

Table 7: Approved recommendations							
No.	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority	Agreed action / comments	Action Officer
1.	5.1.1 6.1.2	High number of crashes per year	Engineering	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives.	A		
2.	5.1.1 6.1.3	Trends with the day of the week incidents occur	Engineering, Education	Continue to monitor the occurrence of incidents and where trends in frequency are identified, investigate opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices.	A		
3.	5.1.1 6.1.4	High percentage of crashes occur during peak hours	Enforcement, Education	Consider opportunities for targeted enforcement and/or education via social media and ITS devices (VMS) to encourage safer driving practices during peak times.	A		
4.	6.1.5	High percentage of incidents have a duration longer than one hour	Education	Endeavour to minimise congestion by maximising opportunities to alert motorists via web-based reports, radio, social media and/or ITS devices (VMS).	A		
5.	5.1.2	Majority of crashes result in high severity injuries	Engineering	In accordance with the 'Safe System Approach' philosophy supported by TMR, consider opportunities to reduce the occurrence and severity outcome of crashes as part of future major infrastructure maintenance or upgrade projects.	B		

Table 7: Approved recommendations

No.	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority	Agreed action / comments	Action Officer
6.	5.1.3	'Run-off-road' and 'head-on' are the predominant crash types.	Engineering	Implement low-cost high-benefit engineering treatments to target a reduction in crash types, as outlined in Section 7.1.6. Ensure any proposed works are considered and implemented in conjunction with recommended treatments detailed under Sections 8.1.2, 8.1.3, 8.2.1 and 8.3.1.	A		
7.	5.1.4	Driver violations	Enforcement, Education	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.	B		
8.	5.1.4	'Road – wet/slippery'	Engineering, Education	Assess surface texture and skid resistance. Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.	A		
9.	5.1.4	Excessive speed	Enforcement, Education	Identify opportunities for enforcement and/or education to improve driver awareness and encourage safer driving practices.	A		
10.	5.1.5	High occurrence of incidents when the road pavement is wet	Engineering	Continue to monitor pavement surface wear and texture with a view to maintaining a high standard of pavement condition.	A		

Table 7: Approved recommendations

No.	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority	Agreed action / comments	Action Officer
11.	5.1.5	Lower number of wet days then dry, however, higher occurrence of incidents on wet days	Education	Consider opportunities for targeted education via social media and ITS devices (VMS) to encourage safer driving practices on wet days and during the wet season.	A		
12.	5.1.8	The overall road segment ranked high compared to other similar state-controlled road segments throughout the district	Engineering	Continue to monitor the frequency, severity, and type of crashes to review and assess implemented road safety projects and initiatives. Investigate ongoing safety funding opportunities to address emerging crash trends and safety issues.	A		
13.	5.2	Majority of crashes occurred towards the eastern end of the road	Engineering	Where there is limited funding to implement mass action safety improvement projects, consider limiting works to locations where data identifies clusters of crashes.	A		
14.	8.1.1	Maintenance of road traffic signs	Engineering	Action works to address identified maintenance issues as outlined under Section 8.1.1.	A		
15.	8.1.2	Inconsistent signing and linemarking of overtaking lanes, climbing lanes and slow vehicle turnouts	Engineering	Undertake a mass action review and upgrade of signage and linemarkings as outlined under Section 8.1.2.	A		

Table 7: Approved recommendations							
No.	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority	Agreed action / comments	Action Officer
16.	8.1.3	Inconsistencies with the application of advisory speed signing	Engineering	Undertake a mass action review and upgrade (as required) of advisory speed and alignment warning signs as outlined under Section 8.1.3.	A		
17.	8.1.4	Absence of steep grade signing to moderate vehicle speeds	Engineering	Investigate the need for additional steep grade signing as outlined under Section 8.1.4.	A		
18.	8.1.5	Inconsistent application of guide signs	Engineering	Review and upgrading guide signing as outlined under Section 8.1.5.	B		
19.	8.2.1	Maintenance of line and pavement markings	Engineering	Re-apply markings as outlined under Section 8.2.1.	B		
20.	8.2.2	Upgrading of markings at the Henry Ross Lookout	Engineering	Upgrade markings and signage as outlined under Section 8.2.2.	B		
21.	8.3.1	Missing REGPs and RRPMS	Engineering	Replace missing REGPs and RRPMS as outlined under Section 8.3.1.	B		
22.	8.4.1	Damaged safety barrier end terminals	Engineering	Inspect and schedule repair/replace as outlined under Section 8.4.1.	A		
23.	8.4.2	Missing reflectors along W-beams	Engineering	Replace missing reflectors as outlined under Section 8.4.2.	A		

Table 7: Approved recommendations							
No.	Report reference	Brief description of issue	Countermeasure category	Recommended action	Priority	Agreed action / comments	Action Officer
24.	8.5.1	Significant number of roadside hazards	Engineering	Investigate viability of hazard reduction projects as part of a specific program or as an inclusion in major rehabilitation projects, as outlined under Section 8.5.1.	C		
25.	8.6.1	Poor driver behaviour	Engineering	Investigate installation of ITS applications to monitor and/or deter poor behaviour as outlined under Section 8.6.1.	A		
26.	8.7.1	Unsafe access for pedestrians and cyclists between Kuranda township and Black Mountain Road	Engineering	Improve pedestrian and cycling amenity as outlined under Section 8.7.1.	A		
27.	8.7.2	Limited signage to warning motorists about cycling activity	Engineering	Install additional signage as outlined under Section 8.7.2.	A		
28.	8.8.1	Condition of road pavement	Engineering	Conduct an inspection to assess condition and identify appropriate action, as outlined under Section 8.8.1.	B		
29.	8.8.1	Lack of lighting at pedestrian crossing, maintenance of other existing road lighting	Engineering	Inspect identified lighting issues and arrange necessary actions as outlined under Section 8.8.1.	B		