Document No: A423892

Report To: Council

Meeting Date: 26 March 2019

Subject: **Rural Roads Verge Maintenance – Yellow Bristle Grass**

Type: Information Only

Purpose of Report

1.1 The purpose of this business paper is to inform Council of best practice guidelines to reduce the spread of Yellow Bristle Grass.

Background

2.1 Yellow Bristle (*Setaria pumila*) is a serious weed (C4 weed grass) which aggressively competes with cultivated pasture species and can subsequently reduce farm productivity. If not well managed there is potential for Yellow Bristle Grass ('YBG') to infest all productive land throughout New Zealand.

2.2 YBG grows more vigorously at higher temperatures than ryegrass and becomes dominant through the summer months with distinctive, cylindrical seed heads with many yellow-tinged bristles. Seeds can be spread by roadside mowers and freshly chopped maize silage. Once established on the roadside it can quickly become established in farmland.

2.3 The presence of YBG in areas of road reserve has been raised by concerned ratepayers. YBG has been reported on Mangaotaki Road, Te Anga Road and Marokopa Road.

Commentary

3.1 WDC met with Chris Hale, Biosecurity Pest Plant Officer and Contractor to Waikato Regional Council. WDC's obligations with regards to this plant and management options were discussed.

3.2 Chris Hale advised as follows:

1. WDC is under no legal obligation to eradicate YBG from the local roads network.
2. YBG is not currently classified as a plant pest.
3. Many common chemical spray treatments for noxious weeds are ineffective and in fact spread and encourage YBG.

3.3 A set of Guidelines outlines the management options that can be used to minimise the risk of YBG spreading onto farms.

3.4 The Guidelines are **attached** for information purposes, however the key points as they apply to roadside vegetation control are as follows:

1. Avoid spreading yellow bristle grass along roadsides by better timing of roadside mowing and herbicide application around marker pegs.

    - Complete marker peg spraying in late January, follow up as late in autumn as possible – to avoid a spring spray.

2. Machinery wash down is recommended after leaving a known YBG zone. No seed, no plants.

3. Avoid spreading yellow bristle grass into paddocks adjacent to roadsides by not mowing up to the fence and not having runoff wash seed into the paddocks.

4. Have all roads with YBG infestations mowed prior to Christmas, and as close to the ground as possible.

5. Leave as much grass as possible adjacent to pasture boundaries, and mow as narrow verge as required for road visibility.

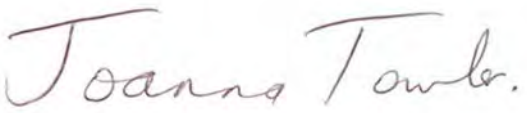
6. Avoid spring spraying at all costs. If spring spraying is unavoidable then use a grass specific chemical like Gallant.

3.5 WDC will monitor known problem areas and manage the associated local roads vegetation control program taking best practicable steps following set guidelines.

3.6 WDC will ensure that its Vegetation Control Sub-Contractor for the Mowing Program for Zones A, B, C, D, E, F and K is carried out in November and December. These Zones are identified on the **attached** District Map.

Suggested Resolution

The business paper on Yellow Bristle Grass best practice methods be received.



JOANNA TOWLER
MANAGER- LOCAL ROADS

20 March 2019

Attachments:
1 Roadside Mowing Zone Map Yellow Bristle Grass (A423893)
2 Guidelines for minimising the spread of yellow bristle grass (A424084)

Zones to mow in November and December to control Yellow Bristle Grass

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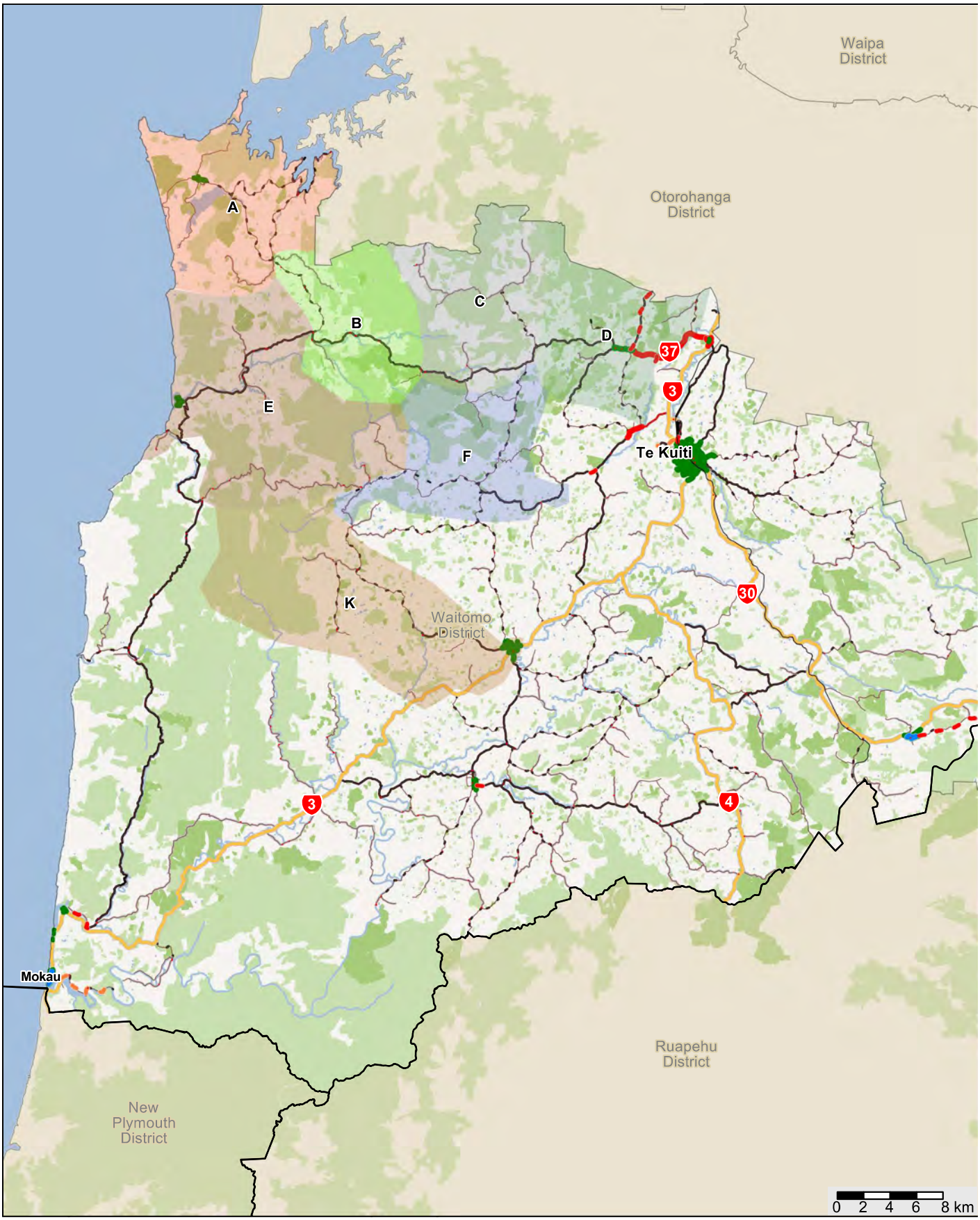

Scale: 1:400000

Original Sheet Size A4

Projection: NZGD2000 / New Zealand Transverse Mercator 2000
Bounds: 1737106.792841,5697346.26343501
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September 2016

Guidelines for minimising the spread of yellow bristle grass

Horizons has combined 3 short papers produced by AGR and supported by FAR and WRC to describe the current best practice approaches to manage yellow bristle grass across a number of scenarios. HRC have also added information recently to hand.

Guidelines for minimising the spread of yellow bristle grass by agricultural contractors
Guidelines for minimising the spread of yellow bristle grass by farmers
Guidelines for minimising the spread of yellow bristle grass by roadside vegetation control contractors

(Trevor James[1], Mike Parker[2] and Katherine Tozer[11]AgResearch, Ruakura Research Centre, Private Bag 3123, Hamilton 3240, New Zealand, [2]Foundation for Arable Research, 85 Duncan Road, RD3, Hamilton 3283, New Zealand)

ACTIVELY DOING NOTHING!

YBG appears to profit from typical actions used against other weeds. Spraying, cutting, even grubbing plants will give short relief and long term enhancement of plant numbers and hence site longevity. To open up an infestation is to encourage it. Doing nothing refers to standard control by direct intervention. What you'll find in this document are tactics to strangle YBG out of a place by promoting a better vegetation sward, better timing of management actions that do the work against YBGs requirements; so your knapsack or sprayer lies idle. Interestingly a recent genetic study has revealed the plant known as YBG is a hybrid species presenting hybrid vigour and atypical characteristics which enable fast growth and highly invasive potential. YBG is on the move, quickly. It is beatable and farming can continue if we address its strengths and manipulate its weaknesses.

KEY POINTS

Specific to road mangers:

1. Avoid spreading yellow bristle grass along roadsides by better timing of roadside mowing and herbicide application around marker pegs
2. Machinery wash down is recommended after leaving a known YBG zone. No seed, no plants.
3. Avoid spreading yellow bristle grass into paddocks adjacent to roadsides by not mowing up to the fence and not having runoff wash seed into the paddocks
4. Have all roads with YBG infestations mowed prior to Christmas, and as close to as possible.
5. Leave as much grass as possible adjacent to pasture boundaries, and mow as skinny as required for road visibility.
6. Marker peg spraying in late January, follow up as late in autumn as possible – to **avoid a spring spray**.
7. **Avoid spring spraying** at all costs. If spring spraying is unavoidable then use a grass specific chemical like Gallant.
8. Where there is narrow corridor, boom spray in lieu of mowing to leave a long grass buffer to the boundary. Boom spraying a narrow strip on the edge of the road and leaving the grass near the fence to grow long. This is a very good option, especially if the road side spraying is left as late as possible, say early autumn to get some low growing winter plants in place then spray them out as late as possible into summer.
9. Reducing large sprayed areas.
10. Boundary planting to create a barrier between farm and road edge, i.e. Flax hedgerow or other solid vegetation.

11. Depending on the ability and interest a strategy might be to spray with a grass herbicide to remove the taller growing grasses and establish a mat layer of lower growing weeds that don't require mowing!

Specific to croppers:

12. Ensure loads are well covered and remove loose debris from the outside of the vehicle.
13. Clean all equipment when leaving yellow bristle grass infested paddocks

Specific to farmers:

14. Inspect all incoming hay, if infested, limit where it is fed out and look out for yellow bristle grass plants next summer.
15. Clean all equipment when leaving yellow bristle grass infested paddocks

BACKGROUND

Yellow bristle grass (*Setaria pumila*) is a serious weed that reduces dairy farm profitability and could potentially infest all productive land throughout New Zealand. It is a summer growing annual grass with distinctive, cylindrical seed heads with many yellow-tinged bristles. It seeds can be spread by roadside mowers and freshly chopped maize silage. After becoming established on the roadside it can quickly move into farmland.

These guidelines offer roadside vegetation control contractors and farmers several management options that can be used to minimise the risk of yellow bristle grass spreading onto, through and from farms.

MANAGEMENT OPTIONS

There are two main areas to address; 1) to reduce the spread of yellow bristle grass along road corridors and 2) reduce the risk of it spreading onto adjacent farms and through farms if infested.

<u>Management options to reduce the spread of yellow bristle grass along the roadside (see appendix for examples on specific road types):</u>

Limit mowing over summer months when yellow bristle grass is seeding. If this is not an option then clean the mower when leaving an infested area

1. Time herbicide application around marker pegs for mid-summer and late-autumn (This should limit the germination of yellow bristle grass as there will be a thatch of winter weeds present during early summer and the mid-summer application will kill any that establish despite thatch).
2. Set mower to a higher cut level in early summer –a thick layer of vegetation will impede yellow bristle grass germination.
3. Try and reduce herbicide overspray when spraying around marker pegs to reduce the area of bare ground in which yellow bristle grass can establish.

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Management options to reduce the spread of yellow bristle grass onto neighbouring farms:

1. When mowing, leave a barrier of tall growing plants (grass) between the mown roadside area and the adjacent paddocks.
2. Avoid having roadside runoff spill onto adjacent pastures.
3. Roadside grazing of the 'longacre' should only take place outside YBG seeding. Therefore grazing from April through December will have a reduced risk of stock transferring seed.

Management options for on-farm spread prevention:

To reduce the risk of yellow bristle grass introduction onto the farm:

1. Require agricultural contractors to have cleaned their vehicles and equipment of plant, seed and soil debris before accessing your property
2. Ensure that all imported maize chopped for silage gets into the pit and that loose debris is not spread along the access way and into adjacent pasture
3. Regularly scout around the silage pits looking for yellow bristle grass (note that seed in the silage will be killed and is not a threat) during summer
4. Inspect all incoming hay unless you know the source is free of yellow bristle grass
5. Restrict the feed out of infested hay to areas where yellow bristle grass can be readily controlled (e.g. where glyphosate can be used)
6. Check that stock being brought in from outside the farm during summer have not grazed yellow bristle grass infested pasture.

To reduce the spread of yellow bristle grass within the farm:

7. Reduce yellow bristle grass seed production by spraying with fenoxaprop before seed heads emerge (generally early-December) or by topping pre or post grazing
8. Avoid moving stock from infested paddocks or roadside to clean paddocks
9. Clean agricultural equipment after use in yellow bristle grass infested paddocks
   Make silage rather than hay if yellow bristle grass is present.

Further information

http://www.dairynz.co.nz/feed/pasture/pests/yellow-bristle-grass/
http://agpest.co.nz/?pesttypes=yellow-bristle-grass
http://resistance.nzpps.org/index.php?p=herbicides/glyphosate

Appendix, Specific roadside situations

Figure 1 Yellow bristle grass in this situation can easily invade the paddocks directly through the fence. Better timing of both marker peg spraying and mowing will reduce this risk. Also consider vegetation barrier of long grass from fence to marker post or within paddock create sacrificial rank growth for 1m.

Figure 2 Yellow bristle grass in these situations is not a direct threat to adjacent paddocks but should be managed to reduce its spread further along the roadside.
Machinery should be cleaned after mowing an infestation like this, **and,** best practice would dictate that a sizeable length of rank growth should be left as a border to the end of this infestation if visibility specifications allow.

Specific scenarios

	• Vegetation management on the left (drain side) should be limited to the drain area by herbicide spraying, mowing or any combination of these • Refer to Management Options above for best timing of these operations • The area above the bank should be left unmown or mown only in late autumn/early winter • On the right the gravel berm should be kept weed free by grading or with herbicides or could be regularly mown to maintain a short sward • The area adjacent to the fence should not be mown.
	• This is possibly the most difficult scenario as options are limited • Other than hand weeding (weed eater) keeping the barrier free of yellow bristle grass requires good timing of herbicide applications. • Apply herbicide around the barrier in mid-summer and late-autumn • This will limit the germination of yellow bristle grass as there will be a thatch of winter weeds present during early summer and the mid-summer application will kill any that establish despite thatch.
	• On the left the berm is regularly mown to maintain a dense sward which will prevent the germination of yellow bristle grass • On the right the berm is not mown and the rampant growth of other plants will prevent the germination of yellow bristle grass • Both options are good, avoid irregular mowing which will open up the vegetation and allow yellow bristle grass to germinate • Note the absence of maker posts so no spraying is required.

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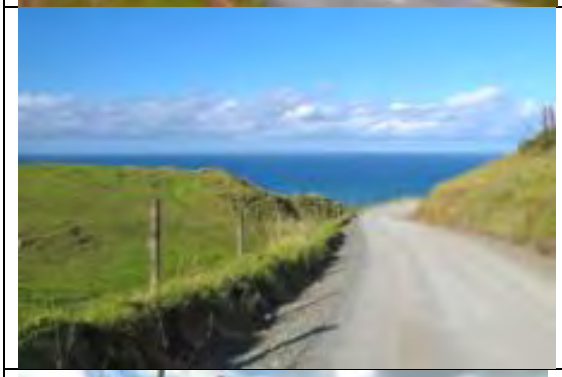
	• Similar to the case above but if mowing is required then limit this to a minimal width and leave a barrier of tall weeds adjacent to the fence to restrict movement of yellow bristle grass to the adjacent paddocks • Note in this case there are no hedges to restrict the spread or yellow bristle grass into these paddocks.
	• Spray herbicide or grade road edge to keep drain weed free • Mow vegetation on bankside only as required for visibility • Avoid spraying and, if possible, mowing adjacent to the fence.
	• On this narrow road, vegetation must be kept well back from the sides of the road • This can be achieved through grading, spraying or mowing • Note the Management Options for best timing of these operations • As shown in the photo, avoid mowing the tall plants adjacent to the fence lines.

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Prevention is the best if not only option.

The Waikato experience shows that within 5 years of a road verge being infested with YBG, up to 75% of the adjacent paddock may be YBG.

The objective is to stop the above scenario occurring. A yellow filter highlights YBG, seen in the right hand side of the photo around the marker posts and road edge, as well as dominating large parts of the adjacent paddock.

Good practice

If possible to maintain, a narrow mown strip will provide visibility while the thick vegetation will prevent spread of YBG into adjacent paddocks. This image is the best case scenario. An established site until the adjacent landowner took over managing the vegetation – to an agreed standard. The grass was sprayed then smothered. It is now non-existent.

Bad practice

Aggressively controlling YBG will only encourage its spread. A concerned cockie has used glyphosate to control roadside YBG. YBG is subsequently spreading into this cleared area and is since present throughout the adjacent paddock.

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Spraying the fence line to remove YBG has **accelerated** its spread into the maize.

This roadside is wide enough to have a rank grass barrier between the fence and the water table, while still allowing standard road management practice from the seal to the marker pegs.

The effort to be ‘tidy’ and control YBG in the first cut of maize has backfired. Controlling YBG in this first cut is important as trailed wagons and collecting trucks behind the maize chopper invariably end up with more trash able to fall onto roadsides when in transit. Control by prevention and smothering however is much preferred.

Two examples of managing roadsides with hedges

Figure 1 Well supressed roadside has contained the YBG to the watertable.

Figure 2 Hedge with sprayed 'tidy' strip has allowed YBG to invade under the hedge into adjacent paddock.

Acknowledgements

Dave Alker – HRC

Craig Davey- HRC

Chris Hale – Contractor to WRC

T James - AGR

Document No: A423763

Report To: **Council**

Meeting Date: 26 March 2019

Subject: **State Highway 30 – New Zealand Transport Agency Kopaki Bridge Replacement Project**

Type: Information Only

Purpose of Report

1.1 The purpose of this business paper is to update Council on the New Zealand Transport Agency's (NZTA) State Highway 30 Kopaki Bridge Replacement project.

Background

2.1 NZTA is planning a new bridge and slight re-alignment of the highway at the SH30 Bridge at Kopaki, 27 km south of Te Kuiti. The SH30 Mokau Bridge will also have work done on the deck structure while the Kopaki Bridge replacement is underway. Both these structures are NZTA assets.

2.2 **BRIDGE RESTRICTIONS**

2.3 NZTA issued their annual Bridge Posting Restrictions for Waikato and Bay of Plenty (A423590) on 19 October 2018. This included, for the Kopaki Bridge, a new posted speed limit of 10km/hr for all vehicles, and reducing the allowable freight loading to 80% of Class 1.

2.4 J. Swap Contractors Ltd raised a number of concerns with these restrictions with Waitomo District Council ('WDC') on 22 October 2018.

2.5 The key points made, as they apply to WDC, are as follows:

1. The weight restriction will force a significant increase of heavy trucks onto the Waitomo local road network.

2. All the fully loaded trucks to and from Te Kuiti to the likes of Tokoroa, Whakamaru, Taupo etc. will be forced onto the Waitomo local road network to avoid the bridge.

3. The alternative route via Kopaki Road isn't ideal, but also the maintenance of these roads will cause an extra burden upon WDC.

4. The Road Transport Association will be lobbying NZTA for a speedy resolution to this, and will support any similar moves by WDC.

2.6 At a meeting held between NZTA and WDC on 19 November 2018 the issues identified in 2.5 above were discussed. NZTA committed to fund the cost of extra maintenance or upgrades to Kopaki Road which may be required for it to be used as an alternate route.

2.7 **PROJECT BRIEFING**

2.8 NZTA also provided a project briefing at the 19 November 2018 meeting, including the reasoning behind some of the decisions made to date:

1. Regular bridge inspections by the NZTA Bridge Consultant have identified that a previous repair to Kopaki Bridge had not lasted as long as expected. NZTA has therefore decided to accelerate the program for the SH30 Kopaki Bridge Replacement.

2. A meeting was convened by NZTA (hosted by the WDC) on 10 December 2018 to explain the above approach to invited representatives from the road freight industry and WDC staff.

3. NZTA awarded a Capital Improvement Professional Services contract for a consultant to design and manage the construction of the new bridge. This contract was awarded on 19 December 2018 to Bloxam Burnett & Olliver Ltd (BBO) for $927,650 (A423741).

4. The Detailed Business Case phase of the SH30 Kopaki Bridge Replacement project is underway.

5. Construction is expected to begin by the end of 2019.

6. A bridge deck replacement is scheduled for another bridge on the same route, SH30 Mokau Bridge, between Kopaki and Te Kuiti. This will be done about the same time as the SH30 Kopaki Bridge.

7. BBO invited a representative from WDC to attend a "Safety in Design" meeting on 21 February 2019. This was attended by Johan Rossouw, Asset Manager – Local Roads.

Discussion

3.1 **IMPACT TO ROAD USERS**

3.2 The following impacts for road users can be expected as a result of the two projects (SH30 Kopaki Bridge Replacement and SH30 Mokau Bridge deck replacement):

1. There could be an extended period of time (more than one year) of Kopaki Road being used as a bypass for heavy freight; and

2. All road users will be required to use Kopaki Road as a detour for a period of up to two weeks during the SH30 Mokau Bridge deck replacement; and

3. All road users will be required to use Kopaki Road for an as yet undefined length of time while the SH30 Kopaki Bridge is being replaced.

3.3 **WDC AS ASSET OWNER OF KOPAKI RD**

3.4 A Safety Assessment was carried out to define the current condition of the route and identify any component assets that need to be upgraded.

3.5 The *Kopaki Bridge Detour Safety Assessment* (A423746) was forwarded to WDC on 7 March 2019 for comment.

3.6 The report recommends the Bypass Route between SH30 and SH4 be via Kopaki Road and Pukerimu Road.

3.7 This proposed route is much longer over local roads than it would be if only Kopaki Road was used. However there are potential hazard considerations along the section of Kopaki Road between the Pukerimu Road intersection and SH4 that have been considered. These considerations include a one-way bridge at Route Position (RP) 5.595 on Kopaki Road with barriers which are not compliant to the intended new temporary use as a bypass route. There is also a narrow section at RP6.47 on Kopaki Road due to an underslip. Because these two considerations would be very costly to repair, the report recommends the use of Pukerimu Road rather than this section of Kopaki Road.

3.8 The report states that the time duration this bypass will be required is not yet known, but from what was learned at the Safety in Design meeting for this project, the duration could be significant, possibly more than a year. For this reason, WDC has indicated its preference to have an appropriate upgrade implemented on the Kopaki Road route.

3.9 Also not evaluated or addressed in the report is the pavement strengths of the roads. This may be critical, especially in light of the long duration expected. This may be a reason to reconsider the Kopaki Road section between Pukerimu Road and SH4, because it is shorter and pavement repair costs may perhaps tip the balance on the choice? Further investigation should clarify this.

3.10 NZTA has been advised that WDC would prefer an appropriate upgrade to the Kopaki Road route and that WDC required that the pavement strengths of the roads in question be taken into consideration when making the decision as to which route should be used.

Suggested Resolution

The business paper on State Highway 30 – New Zealand Transport Agency Kopaki Bridge Replacement Project be received.

Joanna Towler

JOANNA TOWLER
MANAGER – LOCAL ROADS

12 March 2019

Attachment:
1 Meeting Notes – Waitomo DC – 20181119 Monday (A423578)
2 Bridge Posting Restrictions – Waikato / Bay of Plenty State Highway Network (A423590)
3 Awarded Contracts – SH30 Kopaki Bridge Replacement (A423741)
4 Kopaki Bridge Detour Safety Assessment (A423746)

Meeting Notes - Waitomo DC – 2018-11-19 Monday

NZTA: Brian Grey, Grant Tregigda

Waitomo DC: Joanna Towler, Johan Rossouw

- NZTA to provide a bulletin for Waitomo to put on their website re the bridge repairs and Class 1 Bypass. (Comms.)
- Alison to include a Project time line showing expected D&PD & Construction.
- NZTA will survey Kopaki Road to assess & record the "Before bypass" condition & do a video record. Waitomo will do the same. A joint list of current issues will be developed & agreed to baseline any excessive deterioration that becomes apparent following the bridge replacement due to bypassed HCVs.
- Safety assessment of signs for over 80% Class 1 HCVs to be bypassed onto Kopaki Road.
- Investigate possibility of a temporary level crossing or Bailey to permit Class 1 to be restored.
- Look into costs & time to upgrade SH4 Bridges as an HPMV option. (NB highly unlikely.)
- Option of lights and / or camera on Kopaki Bridge to improve 10kph compliance.
- Beca to advise how many Load Pictograms would be required for a special one-off sign to comprehensively cover the load & axle cases.

New SH30 Kopaki WIDTH.

- Width will be investigated on the basis of future traffic growth. All options are open until a detailed design is approved. (updated in consultation with the capital project manager)
- Specific cycle provision is unlikely, however wide 1.5m shoulders are probable which will meet the need for cyclists for the foreseeable future.
- Additional width for later centreline barrier retrofitting can be ruled out.

New SH30 Kopaki will have CAPABILITY

- It will be HPMV capable to align with current normal Bridge Manual design standards.
- Another bridge deck (SH30 Mokau Bridge) requires replacement for maintenance reasons. As a by-product, and for no additional cost this action will make it HPMV capable. These two improvements will make the full length of SH30 HPMV capable from Te Kuiti to Whakatane.

NZ TRANSPORT AGENCY
WAKA KOTAHI

19 October 2018

Attention: All Waikato & Bay of Plenty State Highway Overweight Vehicle, HPMV and Over Dimension Permit Holders

Bridge Posting Restrictions – Waikato / Bay of Plenty State Highway Network

NZ Transport Agency (NZTA) manages loadings on bridges with limited load capacity through bridge posting restrictions. NZTA has recently introduced two new bridge posting restrictions associated with the Waikato / Bay of Plenty State Highway network, including;

- State Highway 25, Waiwawa River Bridge (Coroglen, Coromandel)
- State Highway 30, Kopaki Rail Overbridge (Benneydale, King Country)

These restrictions have been formally advertised in accordance with *Regulation 11, Heavy Motor Vehicle Regulations 1974.* Signage is being installed at both sites during the month of October 2018.

A summary of current State Highway posting restrictions is included in the table below:

Region	State Highway	Bridge Name	Maximum mass on any 1 axle	Gross mass (maximum sum of axle mass)	Maximum speed limit	Comments
Waikato	25	Waiwawa River Bridge	N/A	N/A	10 km/hr	Temporary posting until strengthening completed.
Waikato	26	Flooks Stock Overbridge	N/A	44,000kg	10 km/hr	Farm access bridge crossing over SH26
Waikato	30	Kopaki Rail Overbridge	N/A	80% of Class 1	10 km/hr	
Bay of Plenty	35	Raukokore River Bridge	N/A	N/A	10 km/hr	
Bay of Plenty	36	Ngongotaha Stream Bridge	N/A	44,000kg	10 km/hr	
Bay of Plenty	Ngamuwahine Road	Ngamuwahine Bridge	N/A	25,000kg	10 km/hr	Local road bridge managed by NZTA

Authorised Issuing Officer

Joyceline Regan
Permit Issuing Officer (for) NZ Transport Agency

Awarded Contracts

Back to Awarded contracts

SH30 Kopaki Bridge Replacement

Number	NZTA 2018678
Estimated value	$960,000.00
Estimated cost range	Less than 5 million
Tender close date	11 December 2018
Successful tenderer	Bloxam Burnett & Olliver Ltd
Contract price	$927,650.00
Date awarded	19 December 2018
Number of tenders	2
Regional office	Hamilton
Region	Waikato & Bay of Plenty
Work type	M&V Traditional (PS)
Contract type	Capital Improvement PS
Status	Awarded
Evaluation method	PQM Simple

Kopaki Bridge Detour Safety Assessment

West Waikato South NOC

- Contract 2/14-004/601 West Waikato South

February 2019

NZ TRANSPORT AGENCY WAKA KOTAHI

BROADSPECTRUM Infinite Solutions

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Record of Amendment

REVISION	DESCRIPTION	PREPARED BY	APPROVED BY	DATE
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Table of Contents

1 Introduction

The aim of the following report is to evaluate the safety of the detour route proposed to be used during the construction period of the Kopaki bridge replacement project. Currently the Kopaki Rd/Pukerimu Rd/SH4/SH3/SH30 detour route is used as an emergency detour route and is detailed in the West Waikato South Emergency Preparedness Plan (EPP). Emergency detours are generally for short periods of time (less than six hours). The duration of the detour for the bridge works will depend on the specific design and methodology and is unknown at this stage.

2 Assessment

A site visit to SH4, Kopaki Rd, Pukerimu Rd and SH30 was undertaken on 7th December 2018 by the BRS Safety Engineer and Engineering Technician. An additional site visit was undertaken on 11th February 2019 with the BRS Safety Engineer and Rodney Dow (Otorohanga Transport Ltd) in a stock truck and trailer unit. The assessments focused mainly on Kopaki Rd and Pukerimu Rd. The rest of the detour route (SH4, SH3 and SH30 are state highways of sufficient enough standard as to not warrant further assessment.

The location plan below shows the layout of the area and areas of note that are discussed further in this document.

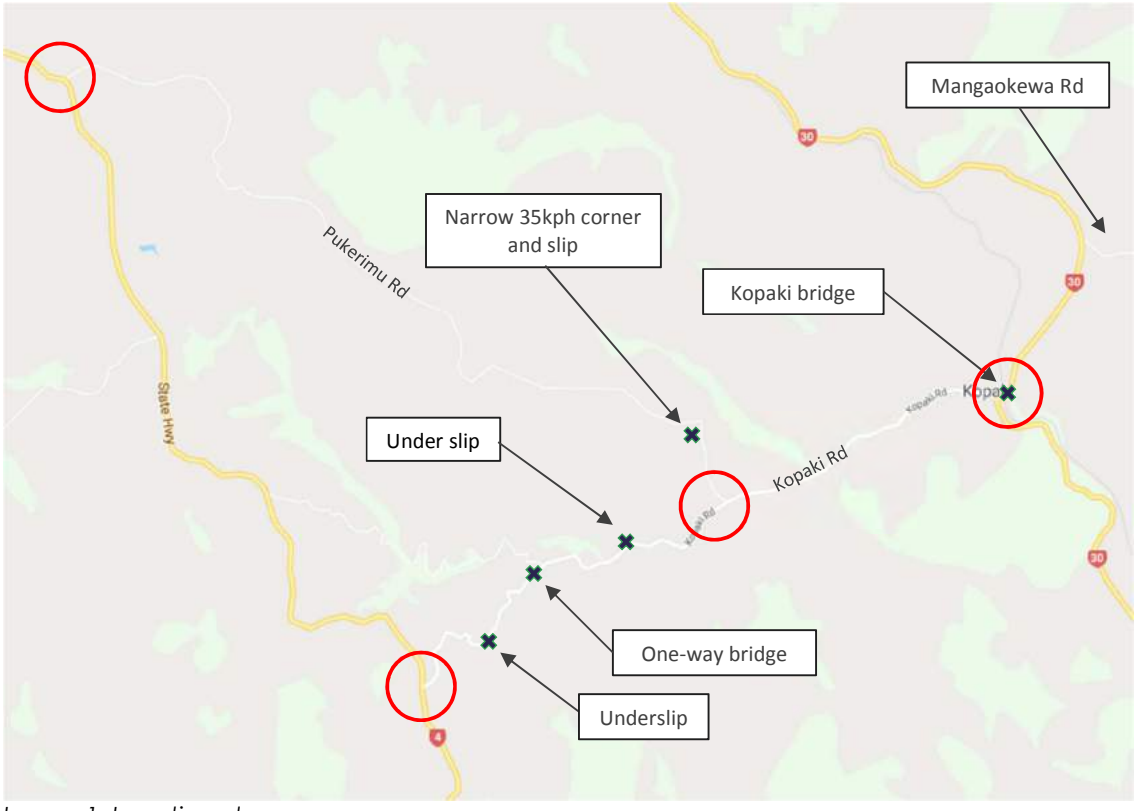


Image 1: Location plan

3 Crash History

The most up to date ten-year crash history (July 2008 – June 2018) was retrieved from CAS on 10th December 2018 for Kopaki Rd, Pukerimu Rd and the four major associated intersections. The intersections will be covered separately (see section 4).

Kopaki Rd:

There have been seven reported crashes on Kopaki Rd during the ten-year period. The crashes have resulted in one fatality, one serious injury and one minor injury.

The factors involved in the crashes is as follows:

- Condition of road: 4 dry, 1 wet, 2 icy
- Light conditions: 5 light, 2 dark
- Crash types: 4 loss of control on a corner, 1 head-on, 1 U-turn, 1 lost load
- Vehicle types: 6 cars, 1 motorbike, 1 van, 1 truck

The crashes were spread across Kopaki Rd with no crash clusters. The fatality and serious injury was the result of a tourist driving a car on the wrong side of the road and hitting a motorbike head-on.

Pukerimu Rd:

There were six reported crashes on Pukerimu Rd, resulting in one minor injury.

The factors involved in the crashes is as follows:

- Condition of road: 4 wet, 2 dry
- Light conditions: 5 light, 1 dark
- Crash types: 4 loss of control on a corner, 2 head-on
- Vehicle types: 5 cars, 2 trucks, 1 van

The crashes were spread across Pukerimu Rd with no crash clusters.

4 Intersections

Intersections within the detour have the potential to be hazardous. There are four intersections that have been considered as part of this assessment and they are outlined below.

4.1 SH30/KOPAKI RD

This is a T intersection on the outside of a 35kph posted curve. There have been two reported crashes at this location during the last ten years. Both were minor injury crashes that resulted from the vehicle exiting Kopaki Rd failing to give way and being impacted by a vehicle travelling along SH30. There is restricted visibility from Kopaki Rd to the left is restricted by the vertical curve over Kopaki bridge. There is also no intersection headway board present, which increases the probability of a vehicle failing to stop and running through the intersection. The alignment of this intersection is likely to be changed in conjunction with the construction of the new Kopaki bridge.

4.2 KOPAKI RD/PUKERIMU RD

This is a T intersection. There have been no reported crashes at this intersection in the last ten years. On the day of the site visit there were obvious wheel tracks from Kopaki (east) leading into Pukerimu. The line markings were faded and there was no intersection headway board. Visibility from Pukerimu Rd is limited to the left due to a vertical curve.

4.3 SH4/KOPAKI RD

This is a T intersection on a straight section of SH4. There have been two crashes in the vicinity of the intersection, however neither were intersection related. The crashes were loss of control crashes in which northbound, downhill vehicles have drifted of the road to the left and lost control in the gravel. One resulted in a minor injury. This is a high speed section of SH4 and visibility to the left, from Kopaki Rd, is slightly restricted by a horizontal curve. Clearing the vegetation on the inside of the curve would greatly improve visibility.

4.4 SH4/PUKERIMU RD

This intersection is located on the outside of a high-risk, out of context, 65kph posted curve. There have been seven crashes in the vicinity of the curve and all involved a northbound vehicle losing control on the curve in the wet. The crashes resulted in four minor injuries. Visibility through the curve on SH4 is considerably restricted by the bank on the inside of the curve. The visibility from Pukerimu Rd, in both directions, is excellent. As the detour would involve a left turn into Pukerimu Rd and a right turn out of Pukerimu Rd the visibility issues should not be a concern.

5 Areas of Concern

Kopaki Rd one-way bridge

The one-way bridge at RP 5.595, between Pukerimu Rd and SH4, requires eastbound vehicles to give way. There are steep drop-offs into the stream on both sides of the road in the vicinity of the bridge. The existing barrier is non-compliant due to the following:

- approach and opposing barriers are too short
- non-compliant end treatments

Narrowing of road width at RP 6.470

An underslip at RP 6.470 on Kopaki Rd has encroached into the westbound lane, and a short length of W-beam barrier is in place to protect road users from the drop-off. The barrier restricts the width of the road to 5.2m. The barrier is also non-compliant due to the following issues:

- Length of barrier is too short
- Non-compliant end treatments
- No hazard markers at narrowest point of barrier

The restricted road width requires one vehicle to give way to allow another vehicle to safely pass. Trucks heading downhill will typically stop to allow a truck heading uphill to pass. Visibility is restricted below the slip site due a bank on the inside of the curve.

Narrow seal width

The narrowest sections of road through the detour route are on Kopaki Rd, between Pukerimu Rd and SH4. The lane widths vary from 2.35 to 3.0 with the total seal width frequently around 5.4m. The majority of the road length has no edge lines and there are mixed horizontal and vertical curves with limited forward visibility.

The section of Kopaki Rd to the east of Pukerimu Rd is of a much better standard, with better visibility, and lane widths of 3.0 to 3.4m. The narrowest point is the pipe underpass with a seal width of 6.5m. Pukerimu Rd is also of a much better standard, with a typical seal width of 6.0m. There is a section of the road that narrows to 5.4m immediate prior to the 35kph curve at approximately RP 9.160.

Multiple roadside hazards on Kopaki Rd and Pukerimu Rd

Both Kopaki Rd and Pukerimu Rd have multiple roadside hazards close to the edge of seal. These include the following:

- Trees within 1.0m of the edge of seal
- Drop-off into a stream within 1.0m of the edge of seal
- Non-conforming end treatments on barriers
- Culverts/risers within 1.5m of the edge of seal






Long grass obscuring EMPs and roadside hazards

During the first site visit, many sections of both Kopaki Rd and Pukerimu Rd did not appear to have had roadside mowing for quite some time. The grass was long enough to completely obscure the EMPs. This is a significant safety concern as this would make it difficult to establish the location of the edge of seal when driving at night, particularly as there are no edge lines on most of the route. At the time of the second site visit this had been resolved.

Intermittent edge lines

For the majority of Pukerimu Rd and Kopaki Rd there are no edge lines except for on the inside of some curves.

Substandard curve advisory signage

There is very little in the way of curve advisory signage along both Kopaki Rd and Pukerimu Rd. The signs that do exist are non-compliant (do not meet MOTSAM standards) due to:

- Black and white (should be yellow reflective)
- Single chevron (should be a minimum of three chevrons on a curve)
- No curve pre-warning sign for chevron/chevron board

Underslip

There is an underslip/collapsing culvert at RP 4.500 on Kopaki Rd in which there is a steep drop-off on the inside of the curve very close to the edge of seal. This is indicated by the presence of white sight rail. If a vehicle should get too close to the edge, which is likely if a vehicle should appear from around the blind corner, the sight rail will not prevent the vehicle from going over the edge. It may also present a hazard in itself if the rails become detached from the posts and enter the vehicle.

Pipe overpass

The pipe overpass at the eastern end of Kopaki Rd has barrier in place to protect vehicles from the drop-off into the underpass. However, the barrier is too short to be shield the hazard completely and has non-compliant end treatments. The pipe itself, on the eastern side of the underpass, is left exposed in the berm and could easily be impacted by an errant vehicle.

Obstructions for high vehicles

In the photos below, it is clear that there are issues with the vertical clearance of trucks. The first is on Pukerimu Rd and simply requires the vegetation window to be well maintained. The second is of low hanging telephone wires that are low enough to contact the top of a high truck if it pulls over into the shoulder to allow another large vehicle to pass.

Icy road conditions in winter

There are “slippery when wet” signs along the section of Kopaki Rd between Pukerimu Rd and SH4. This area is prone to ice in winter and there have been two reported crashes related to icy conditions here over the last ten years.

Small radius curves with limited visibility

A hazard identified by both the Safety Engineer and Rodney Dow (truck driver) is the curve on Pukerimu Rd at RP 9.050. When travelling west (downhill) the seal width narrows up to 5.4m immediately prior to the 35kph curve, there is very poor forward visibility through the curve and a very narrow shoulder on the inside of the curve. A truck and trailer unit has to cross over the centreline travelling through the curve to enable the trailer to track through safely. There are several curves like this on Kopaki Rd and Pukerimu Rd, but this is the most hazardous one.

Slip Site

At approximately RP 8.860 on Pukerimu Rd there is an active slip site that is causing debris to create a safety issue on the road. In the photo below you can see the rocks that have come down sitting in the shoulder to the right of the road, and the fine material that is in the left lane. The fine material is likely to affect the skid resistance of the surfacing and proper drainage, the larger rocks are an obvious impact risk.

Steep sealed shoulders

Along some areas of Kopaki Rd, between SH4 and Pukerimu Rd, the sealed shoulders are very steep. This encourages vehicles to travel closer to the centreline and increases the risk of a head-on crash on such a narrow carriageway.

Mangaokewa Rd

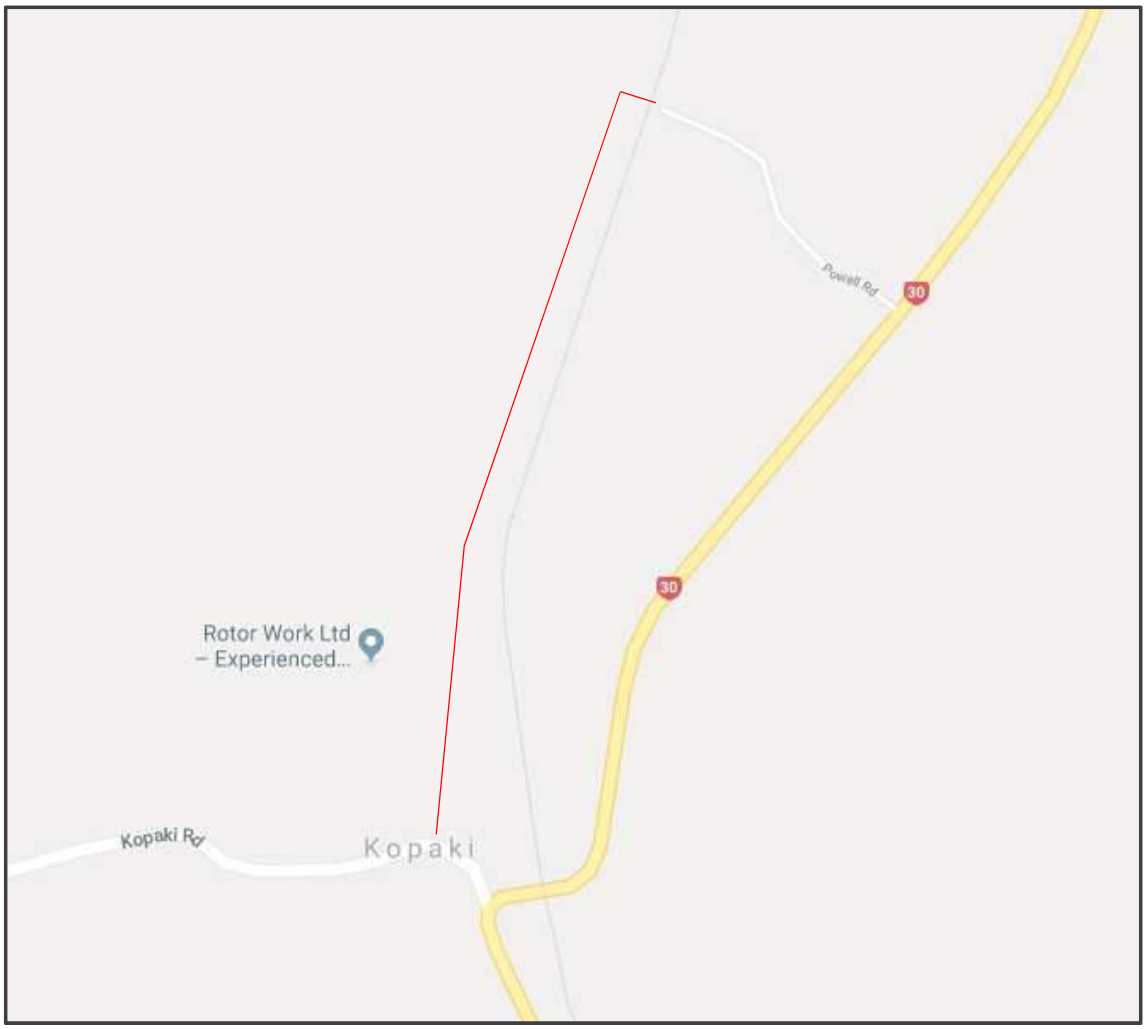
Mangaokewa Rd is a local road that starts from SH30, just north of Kopaki Rd, and rejoins SH30 approximately 9km east of Benneydale. This road is largely unsealed and has some very narrow, winding and steep sections. It is possible that it may be used as a detour route by locals in and around Benneydale, and possibly by tourists travelling between Te Kuiti and the Timber Trail. It is unsuitable for large volumes of traffic and drivers unfamiliar with driving on unsealed roads. It may be beneficial to install signs at each end warning drivers of the conditions of the road once Kopaki bridge is closed.

Powell Rd

It has been suggested that Powell Rd could be extended and connected up with Kopaki Rd to provide a detour route for the locals. This would present several issues:

- High cost of constructing temporary road
- Risk of increased traffic crossing a level crossing
- Difficulty in restricting detour route to local use only
- Possible land purchase/easement required

Based on the points above, this option is not valid.



6 Recommendations

It is recommended that the SH30, Kopaki Rd, Pukerimu Rd, SH4 route is used as the primary route during the construction of the new Kopaki bridge. This is the safest route using the existing infrastructure and avoids the most hazardous section of Kopaki Rd between Pukerimu Rd and SH4.

In order to improve the safety of the route for the increased volume of traffic, the following treatments are recommended:

Low Cost Options

- Increased frequency of roadside mowing/vegetation maintenance on Kopaki Rd and Pukerimu Rd.
- Installation of additional edge marker posts, particularly adjacent to roadside hazards.
- Mark edge lines along Kopaki Rd and Pukerimu Rd.
- Improved intersection signage/markings at the Kopaki Rd/Pukerimu Rd intersection.
- Install curve advisory signage along the route.
- Install warning signs at both intersections of Mangaokewa Rd/SH30 to encourage. use of official detour route/discourage use of Mangaokewa Rd as a detour route.

High Cost Options

- Sight benching on the inside of the 35kph curve at RP 9.050 on Pukerimu Rd. Also consider sight benching through the curves at RP 8.125, 8.320, and 8.650.
- Installation of barrier on true LHS along Pukerimu Rd from approximately RP 8.145 9.140 where shoulder width allows.
- Consider lengthening the pipeline barrier and installing compliant end terminals.
- Slip repair/improved containment measures for slip at RP 8.750 to 8.940 on Pukerimu Rd.
- Removal of trees close to seal edge, particularly on curves, along Pukerimu Rd.
- Installation of barrier in areas where there is sufficient shoulder width and the seal edge is close to the stream.

A temporary speed limit for the duration of the bridge works may also be considered if the safety of the route can not be improved to an acceptable standard, or as an additional safety measure.

** In areas where barrier is desirable, but not feasible, a minimum treatment is to install closely spaced EMPs adjacent to the roadside hazard and keep vegetation well maintained so that the hazard is visible.*

7 Summary and Conclusion

The aim of this report was to evaluate the safety of a potential detour route for use during the future construction of a new Kopaki bridge. The assessment shows that the most sensible detour route is SH30, Kopaki Rd, Pukerimu Rd, SH4.

There are both lower cost and higher cost treatment options that will improve the safety of this route to allow the higher volumes of traffic expected.

In conclusion, this route should be promoted as the primary detour route and all other routes should be discouraged, except in the case of locals who are familiar with the territory.

Document No: A423499

Report To: Council

Meeting Date: 26 March 2019

Subject: **Motion to Exclude the Public for the Consideration of Council Business**

Type: Decision Required

Purpose of Report

1.1 The purpose of this business paper is to enable the Council to consider whether or not the public should be excluded from the consideration of Council business.

Commentary

2.1 Section 48 of the Local Government Official Information and Meetings Act 1987 gives Council the right by resolution to exclude the public from the whole or any part of the proceedings of any meeting only on one or more of the grounds contained within that Section.

Suggested Resolutions

1 The public be excluded from the following part of the proceedings of this meeting.

2 Council agree the following staff, having relevant knowledge, remain in attendance to assist Council with its decision making: …

3 The general subject of each matter to be considered while the public is excluded, the reason for passing this resolution in relation to each matter, and the specific grounds under Section 48(1) of the Local Government Official Information and Meetings Act 1987 for the passing of this resolution are as follows:

General Subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Section 48(1) grounds for this resolution
1. Civil Defence Emergency Management – Appointment of Local Recovery Manager	7(2)(i) Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)	48(1)(d)
2. North King Country Indoor Sports and Recreation Centre – Game On Charitable Trust Grant Funding	7(2)(i) Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)	48(1)(d)

General Subject of each matter to be considered	Reason for passing this resolution in relation to each matter	Section 48(1) grounds for this resolution
3. Inframax Construction Ltd – Half Annual Report to 31 December 2018 and Draft Statement of Intent for Year Ending 30 June 2020	7(2)(i) Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)	48(1)(d)
4. Waikato Local Authority Shared Services Ltd – Statement of Intent for 2019/20	7(2)(i) Enable any local authority holding the information to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations)	48(1)(d)

This resolution is made in reliance on Section 48(1)(a) of the Local Government Official Information and Meetings Act 1987 and the particular interest or interests protected by Section 6 or Section 7 of that Act or Section 6, Section 7 or Section 9 of the Official Information Act 1982 as the case may require are listed above.

MICHELLE HIGGIE
EXECUTIVE ASSISTANT