Delivering Safe Roads for the Bay of Plenty – Ipenz Conference March 2017

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ABSTRACT

The Safe Roads team has been established to deliver a programme of road and roadside safety improvements to the State Highway Network. Derived from the 2013-2015 Safer Journeys Action Plan, the Safe Roads and Roadsides programme is one of four components of the Safe System approach. This approach acknowledges that people made mistakes and aims to create a transport system that protects people from death and serious injury. The Safe Roads objective is to reduce deaths and serious injuries by 900 before 2026.

One of the first Safe Roads projects was the SH30 Te Teko to Awakeri project, west of Whakatane. The 10km corridor has a high crash rate, with 2 fatalities and 15 serious injuries in the past 10 years, mainly from loss of control crashes. The presence of severe roadside hazards along the route means that drivers running off the road have a high likelihood of suffering severe injury or death.

Various route-wide treatment options to address the risks on SH30 were developed. A predictive DSI economic assessment method, using KiwiRAP data, was undertaken to evaluate which combinations of treatments would result in maximum DSI savings on the route. Side barrier and wide centreline, to address the run-off-road and head-on risk, had the greatest predicted DSI savings (8.5 over 10 years), with a BCR of 5.3. After consultation with NZ Transport Agency it was agreed that additional shoulder widening on out-of-context curves, and a wide no-passing line would be added to the project to enhance safety further. The project was one of the first Safe Roads projects to be delivered going from scoping to construction in under 1 year.

INTRODUCTION

Safe Roads Programme

Safe Roads has been established to deliver a programme of road and roadside safety improvements to the State Highway Network. Made up of the NZ Transport Agency and consultancies Beca, Bloxam, Burnett & Olliver and Northern Civil Consulting, we will work with stakeholders to deliver safety improvements to New Zealand roads, helping to reduce deaths and serious injuries.

Derived from the 2013-2015 Safer Journeys Action Plan, the Safe Roads and Roadsides programme is one of four components of the Safe System approach. This approach acknowledges that people make mistakes and aims to create a transport system that protects people from death and serious injury. Safe Roads' objectives are to reduce deaths and serious injuries by 900 before 2026, and raise the KiwiRAP rating of rural state highways to above 3.5 star.

The national programme will see safety improvements made to over 90 high-risk rural state highways across the country, resulting in 400km of roads that are safer and more forgiving. In the past, NZTA spent around $60 million per year on minor safety improvements and capital safety works, so the Safe Roads programme investment of $600million over 6 years is a significant increase in investment.

In the past 2 years, the road toll has risen, with 320 people being killed in crashes in 2015. The highest proportions of deaths and serious injuries on all New Zealand roads are caused by head-on and run-off-road crashes, so safety treatments in the Safe Roads programme are targeted to reduce the severity and frequency of these crash types.

The corridors in the Safe Roads programme were initially identified from the Safer Journeys Roads and Roadsides National Programme Business Case (NPBC) published in 2014. The corridors are reviewed based on the most recent crash history, personal and collective risk ratings, and discussed with regional NZ Transport Agency staff, to determine if they should be progressed in the Safe Roads programme.

The Safe Roads programme currently has 55 projects underway nationwide, with a team of over 100 full time staff working on the programme throughout New Zealand.

Background – SH30 Te Teko to Awakeri project

One of the first Safe Roads projects to commence was the SH30 Te Teko to Awakeri project, located in the Eastern Bay of Plenty region. The 10km corridor begins west of Te Teko at the SH30/34 intersection and ends near Awakeri at the SH30/2 intersection as shown in Figure 1.

The SH30 corridor links Whakatane to the east with Rotorua to the west. The AADT is 5700, with 12% heavy vehicles. The route is classified as a 'primary collector' and is a high risk rural road based on the past 5 years' crash history. The corridor is characterised by long straights with a series of curves at the eastern end, with a number of property entrances and at-grade intersections. There are frequent unprotected road side hazards, including deep ditches, banks, trees, drop-offs, and power poles along the route.

The KiwiRAP star rating ranges between 3.1 and 3.3. The route has a personal risk of medium, and a collective risk of medium.

The road a high crash rate, with 2 fatalities and 15 serious injuries in the past 10 years, mainly from loss of control crashes. These crashes occurred on bends and straights, and

the presence of severe roadside hazards along the route means that drivers running off the road have a high likelihood of suffering severe injury or death. Within the last 5 years there have been 6 FSI, resulting in 1 death and 5 serious injuries.

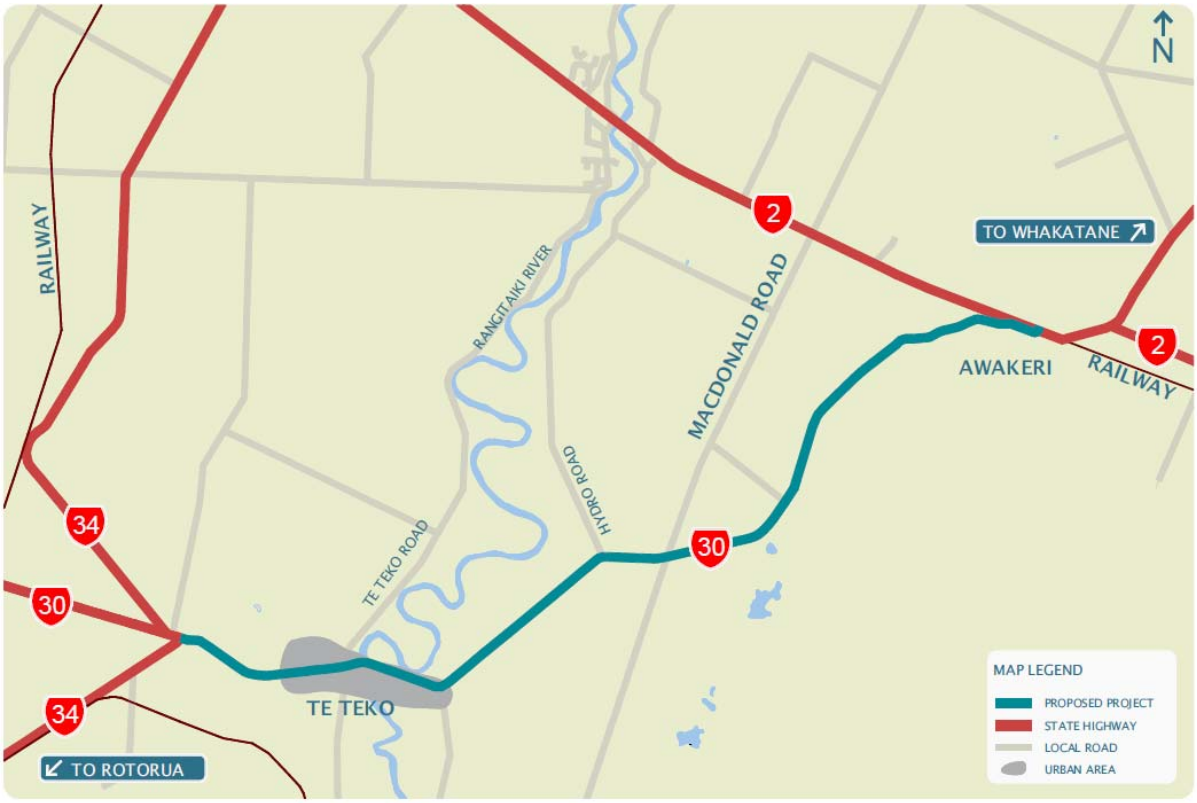

Figure 1 – Map showing SH30 Te Teko to Awakeri extent

RISK-BASED APPROACH

The Safe Roads team developed a Safety Toolkit, to support and guide practitioners involved in implementing the Safe Roads programme. The Toolkit has utilised international best practice in road safety to come up with a predictive DSI economic assessment method.

Various route-wide options to address the risks on SH30 were developed, using KiwiRAP data that showed where the run-off-road and head-on riskswere highest along the route.

All of the options considered were corridor-wide treatments, rather than the typical blackspot treatments at sites with high crash rates, which was used previously by NZ Transport Agency. This is a more proactive approach to road safety; rather than waiting for crashes to happen then installing a barrier on the particular corner, it looks at where the risks are over the entire route and prioritises treatments to the higher risk sections.

OPTIONS CONSIDERED

Five options were investigated, ranging from a full safe system treatment (median and side barriers targeting sections of highest risk) down to minor safety improvements (ATP only). When developing the options, it was assumed that the treatments could be retrofitted to the

existing corridor, based on the 10m cross-section in the Safety Toolkit, therefore no road widening was included in the option costs. The options considered are shown in Figure 2.

Using KiwiRAP data, the predictive DSI economic assessment method was undertaken to evaluate which combinations of treatments would result in maximum DSI savings on the route.

Option 1	Wide Centreline along whole length east of Te Teko (total 8.5km). Lane widths would have to be reduced to 3.25m and shoulder widths narrowed to 1.0m or less to accommodate this. Side barriers where there is a severe risk with hazard within 9m of edgeline (total 6km) Edgeline ATP on remainder of route
Option 2	Wide Centreline only where head-on risk highest (total 3km) Side barriers where there is a severe or moderate risk within 9m of edgeline (total 14km) Edgeline ATP on remainder of route
Option 3	Wide Centreline along whole route east of Te Teko (total 8.5km). Lane widths would have to be reduced to 3.25m and shoulder widths narrowed to 1.0m or less to accommodate this. ATPs on edgelines
Option 4	Median barrier west of Te Teko (on existing wide centreline) and in area of High Collective and Personal Risk (total 6km), Wide Centreline along remainder of route (total 3km). Lane widths would have to be reduced to 3.25m and shoulder widths narrowed to 1.0m or less to accommodate this. ATP edgelines along whole route
Option 5	Treat sections of highest Collective & Personal Risk with Wide Centreline - Awakeri end to Maunder Rd - (total 4.5km) Side Barriers where severe risk (total 3km) Edgeline ATPs on remainder of route.

Figure 2 – Options considered

Option 2, consisting of side barrier and wide centreline, to address the run-off-road and head-on risk, had the greatest predicted DSI savings of all the options, therefore was selected as the preferred option. Preliminary drawings were prepared, then modified based on discussions with NZ Transport Agency staff and a drive-over with key stakeholders which identified local constraints and issues. The modifications were:

- Sections of side barrier were altered to protect severe hazards, where practicable (some of which were not identified from the KiwiRAP data),
- Some barrier types were modified from wire rope barrier to W-section, due to the shorter lengths to accommodate entranceways.
- At the eastern end, the road width is insufficient for a wide centreline and there is limited sight distance around the curves, so a 200mm wide no-passing line (with ATP) was used
- ATP placed next to edge lines along the full length of the route to increase delineation (200mm wide edgeline used where ATP could not be applied due to proximity of houses)
- Shoulder widening on the outside of curves (where feasible) to provide additional recovery area.

Preferred option

The preferred option consists of :

- Wide centreline 3.1km
- Centreline ATP on full corridor
- Side barriers where there are moderate and severe risk areas, total 13km.
- Edgeline ATP on full corridor (or 200mm wide edgeline)
- Shoulder widening for out-of-context curves (total 900m).

By implementing the preferred option, the predicted number of DSIs saved will be 8.5. There will also be an increase in the KiwiRAP rating along the route from 3.2 to 3.8. The preferred option had an estimated cost of $3.0m and a BCR of 5.3. This equates to a cost per DSI saved of $0.44M which is consistent with Safe System treatments approved for other projects.

CONSULTATION

A communications and engagement plan was developed, detailing all of the known key stakeholders. The consultation approach used was identifying the key users of the route, and sending letters or phoning them to ask for feedback. A meeting was held with 10 landowners, to discuss their particular issues of barriers near their entranceways. The design was modified based on the feedback received.

Once construction commenced, additional stakeholders who the Safe Roads team had not consulted with gave us their feedback. An example was an agricultural contractor, who lives a few kilometres from the route but drives a large tractor on the route daily. The team were able to further modify the design while onsite, to accommodate the addiitonal feedback.

A lot of the feedback related to concerns about pulling over to let traffic pass, and how road users access their entranceways. Where barriers were installed, the road was widened to provide 2m between edgeline and barrier.

CONSTRUCTION

Construction commenced in September 2016 and is scheduled to be completed in February 2017. There were many minor changes to the design during construction, due to various factors such as the length of need of the barriers, services clashing with the locations of the barriers, and altering barrier lengths to ensure sightlines at driveways were adequate. In some cases, hazard removal was undertaken instead of installing barrier, as it was identified as a better solution while on site. The total project cost was $2.5m.

Figures 3 and 4 illustrate two sections where side barrier and wide centreline has been installed on SH30.

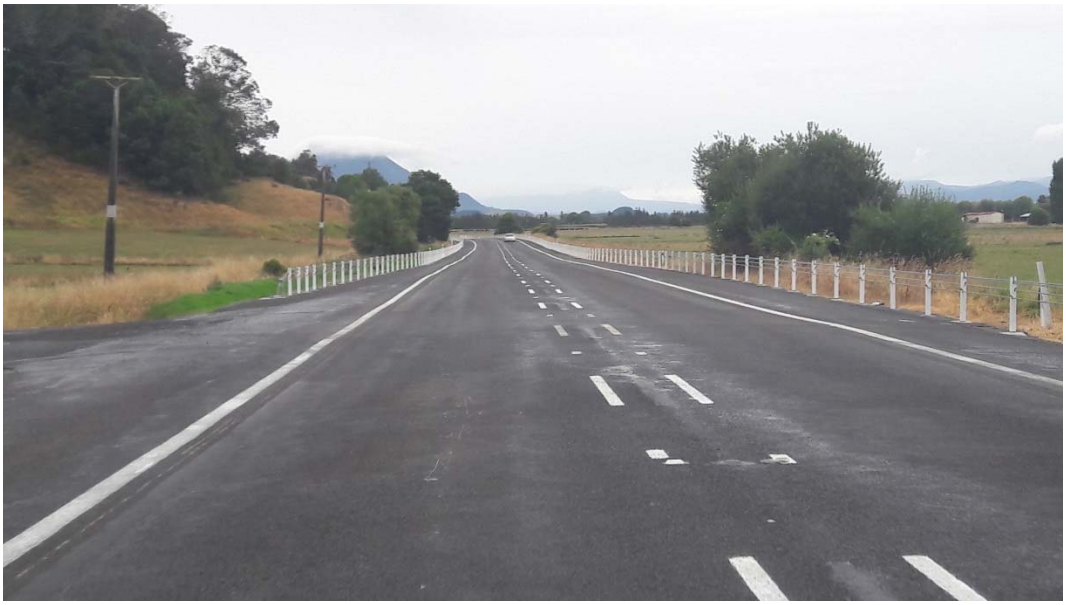

Figure 3 – Photo of side barrier and wide centreline installed on SH30

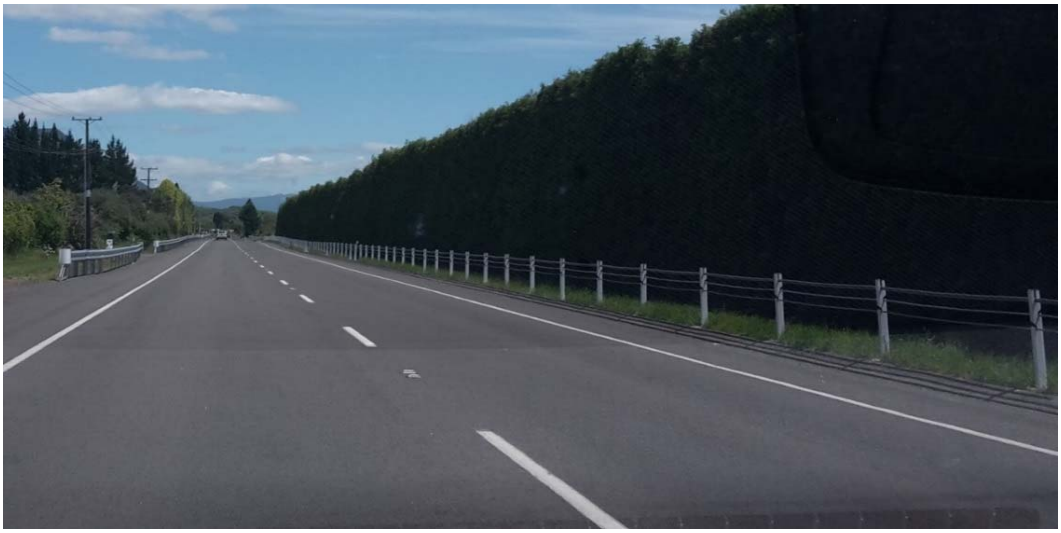

Figure 4 – Photo of side barrier installed on SH30 Te Teko to Awakeri

LESSONS LEARNT

As this was one of the first Safe Roads projects to start construction, there were many challenges faced by the team during design and construction phase, and lessons learnt captured through the process. Two of the key lessons learnt on stakeholder consultation were:

- The communication methods used to advise local residents and road users of the project were inadequate. Letters were sent to all residents on the route, but during construction many claimed to not have received them, or had not read them. The route is also used by many commuters, and the Safe Roads team had not consulted with them. VMS to advertise the project to through-traffic will be used in future projects.

- Some negative feedback was received because of a lack of understanding as to why this 10km route had been selected for safety treatments. Local Police, Council and landowners did not view the road as “high risk” and their view was that the money would be better spent elsewhere. Better education and more proactive communications about the Safe Roads programme is currently being rolled out which will assist with this.

CONCLUSION

In summary, the first Safe Roads project in the Bay of Plenty was a success, with many learnings that will be taken forward for future projects. The SH30 Te Teko to Awakeri project was one of the first NZ Transport Agency projects to be delivered going from scoping to construction in under one year.

REFERENCES

2013-2015 Safer Journeys Action Plan, viewed 8 February 2017, <http://www.saferjourneys.govt.nz/action-plans/2013-2015-action-plan/>

Safer Journeys Roads and Roadsides National Programme Business Case (NPBC) 2014, unpublished.