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SUBJECT Awatarariki Fanhead - Turning Lane From SH2
(Workstream 6)

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Introduction

The Whakatāne District Council commissioned Opus International Consultants to investigate the intersection of SH2 and Kaokaoroa Street to determine if a right turn bay is warranted. This study is independently carried out under workstream 6 of the 9 workstreams of the Awatarariki project.

In 2015, the Whakatāne District Council has worked with six landowners, under the Consensus Development Group, to determine options for the safety of residents in the Awatarariki Fanhead. As part of this work, the residents have concerns that there is a high safety risk for right turning traffic travelling west and turning into Kaokaoroa Road.

This report aims to:

1. Determine if any treatment is warranted
2. If warranted, promote recommended treatment with NZ Transport Agency for inclusion on prioritisation system

Background

Prior to the 2005 Matatā Debris event, subdivision for residential use of the northern side of Arawa Street was carried out. This subdivision created 29 lots which were proposed to access SH2 at Kaokaoroa and McPherson Streets.

This subdivision had no condition relating to the construction of right turn bays at either Kaokaoroa or McPherson Street.



Data

The following table summarises the base data for this report and its source. The current number of peak right turners is an extrapolation of a traffic count at 5 – 6pm (1 right turner) with a modification based on the highly varied peak counts across the week from the Kaokaoroa St Count.

		SH 2	Kaokaoroa	Source
			St	
<i>Current</i>	Lots		29	WDC Aerial Map
	Dwellings		9	WDC Aerial Map
	AADT	4728	72	RAMM Database
	Peak	473	16	RAMM Database
	Peak Right Turners (Hour)		4	Physical Count Modified by Peak Count
	Product Of Flow	163		Calculation from High Risk Intersection Guide (1)
<i>Predicted (1)</i>	Lots		38	QuickMAP
	Dwellings		35	WDC Aerial Map
	AADT	4879	364	RAMM Database
	Peak	489	42	RAMM Database
	Peak hour Right Turners		10	NZTA PPM 2007 (2)
	Product Of Flow	296		Calculation from High Risk Intersection Guide (1)

Table 1: Background Data

Crash Warrant

The NZ Transport Agency's current main method for prioritising safety works is by the number of Death and Serious Injuries (DSIs) saved over 10 years per \$100M spent.

The current advice we have (October 2015) is that projects with over 140 DSI's saved / 10 years / \$100M spent will meet the warrant to be included on the priority list. In the 2015/16 financial year, projects with a DSI's saved / 10 years / \$100M spent of 325 or more were funded.

Historic Crashes

At this intersection, there has been one nil injury crash in the previous 10 years. This was in 2006 when a van was travelling towards Whakatāne (East) and lost control while turning on the corner. As there is no history of injury crashes at this intersection, the DSI Saved / 10 years / \$100M spent is nil and therefore does not meet the warrant for safety spend.

They also review the overall intersection risk level to give an indication of whether to investigate works. This intersection risk is a 5 tier system which is shown on the Transport Agency's SafetyNET tool. This intersection is ranked as "low risk" compared to other intersections as shown on figure 1 below. This means that the agency is unlikely to prioritise investigations on this intersection.

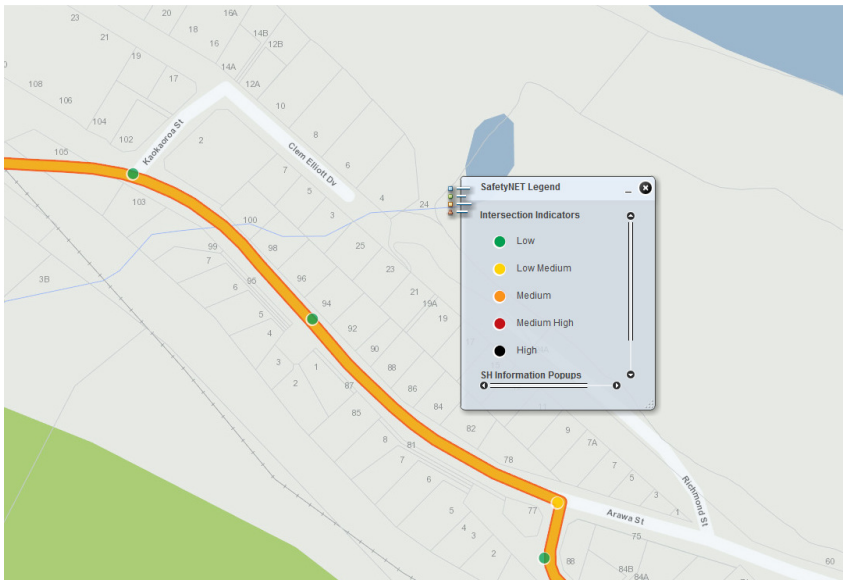


Figure 1: NZ Transport Agency Intersection Risk Indicator¹

Predicted Crashes

Using the NZ Transport Agency’s High Risk Intersection Guide (1) we are able to predict the number of injury crashes based on the type of intersection. Figure 2 below shows how the predicted injury crash number (dashed line) is related to the Product of Flow shown in the background data above.

Using these predicted crash numbers shows that installing a right turn bay would have minimal DSI saving / 10 years / \$100M (rounded to zero) and would therefore not warrant safety spend under the Agency's current policy.

	Injury Crashes Predicted (5yr)	DSI Equivalent (10 year)	DSI Saved / 10 years / \$100M
Current No. of Lots	1.06	0.3816	0
Full Development	1.38	0.497	0

Table 2: Crash Prediction Method to determine NZ Transport Agency Priority

¹ Abley Transport (2015) SafetyNET online tool - Intersection Risk Indicators. Retrieved 21 October 2015



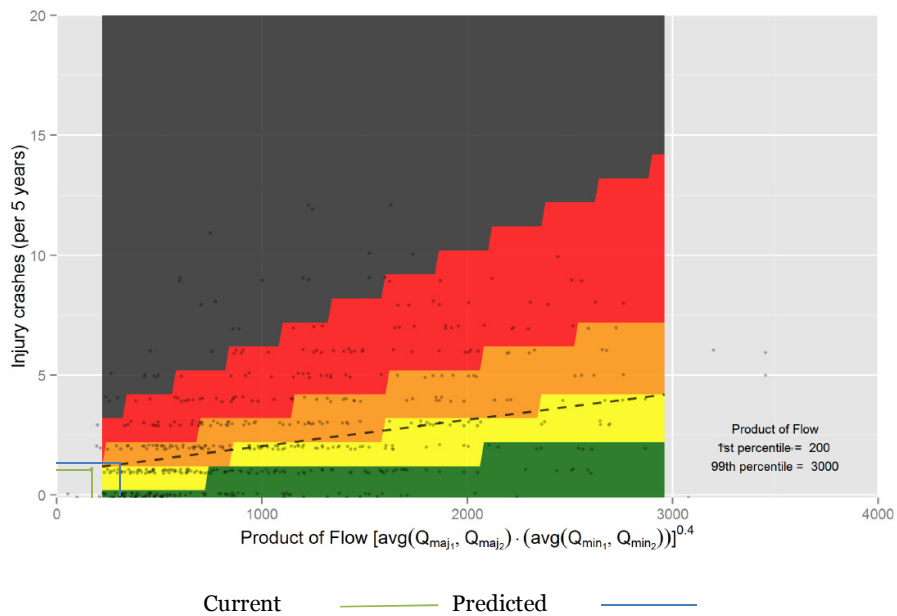


Figure 2: Predicted Injury Crash Number (1)

Traffic Volume Warrant

The intersection has been assessed using the warrants in the Austroads Intersection Guide and NZ Transport Agency Planning and Policy Manual. The Austroads Guide (3) determines whether right turn bays are warranted. The NZ Transport Agency Planning and Policy Manual is utilised to determine the amount of widening required if a right turn bay is not warranted.

Austroads warrant

As shown below, the current traffic generation at this intersection warrants widening only. However, if we use the predicted traffic volumes for a fully developed area then a short right turn bay is warranted.

Using this warrant, we are also able to estimate the number of dwellings that would warrant a right turn bay. We estimate that 23 (a further 14) dwellings would need to be constructed in order to warrant a right turn bay based on traffic volumes.



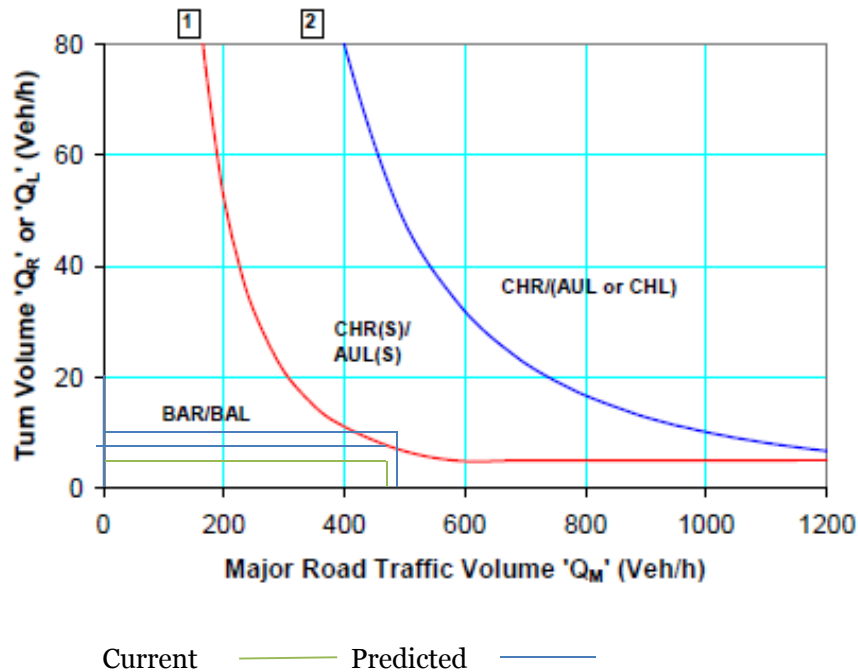


Figure 3: Austroads Right Turn Bay Warrant

Planning Manual Warrant

As shown above, the current number of dwellings only warrants a “BAR” widening for right turners. A diagram of this widening is shown in figure 4 below.

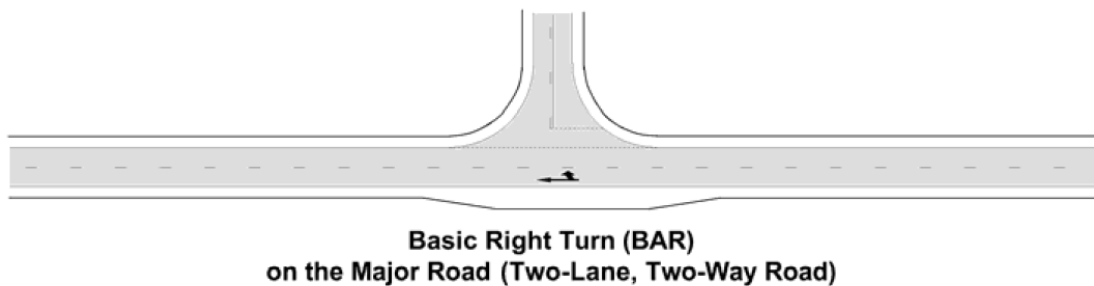


Figure 4: Austroads Basic Widening Schematic

The NZ Transport Agency Planning and Policy Manual (2) is utilised to determine the amount of basic right turn widening under the current number of dwellings. If we assume that more than one slow, heavy or long vehicle uses the access per week then Diagram E widening is warranted. A schematic of this widening is shown in Appendix A.



Summary

From the above, we are able to surmise:

1. Basic Right turn bay widening (Diagram E) is warranted based upon existing traffic numbers but the current crash risk and low probable crash reduction means that this treatment is unlikely to be a high priority for funding by the Transport Agency.
2. A short right turn bay is warranted based upon predicted traffic volumes if the subdivided lots were to have dwellings constructed on them. Again the low predicted crash reduction means this treatment is unlikely to be a high priority for funding by the Transport Agency.

Recommendation

- 1) Should less than 23 dwellings be proposed to access from Kaokaoroa Street then Diagram E widening (Appendix A) is warranted.
- 2) Should more than 23 dwellings be proposed to access from Kaokaoroa Street then a short right turn bay is warranted. This should be discussed with the NZ Transport Agency to determine if there is alternative funding mechanism for this project.



1 References

1. **NZ Transport Agency.** *High Risk Intersections Guide*. Wellington : NZ Transport Agency, 2012.
2. —. *Planning and Policy Manual 2007*. Wellington : NZ Transport Agency, 2007.
3. **Austroads.** *Guide to Road Design - Part 4A: Unsignalised and Signalised Intersections*. Sydney : Austroads, 2009.
4. **NZ Transport Agency.** *State Highway Traffic Volumes 2010 - 2014*. Wellington : NZ Transport Agency, 2014.



Appendix A – Diagram E Widening

Appendix 5B – Access standards and guidelines

Refer to Table App5B/4 for when this accessway type should be applied

