

**9. RIGHT TURN PHASE AT CRANFORD STREET/MAIN NORTH ROAD**

RR 9950

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Corporate Plan Output: Traffic Signal Maintenance 9.5.37	

The purpose of this report is to inform the Board of the reason for the non-filtering of the right turn phase at the Cranford/Main North intersection.

**INTRODUCTION**

The Chairperson has expressed a wish for the current non-filtered right turn phase from Main North Road into Cranford Street to be altered to allow right turn filtering during the full green phase.

In February 1997 the phasing at this intersection was altered to remove the ability to filter right turn. This was achieved by always displaying a red arrow for right turning traffic for the whole of the Main North Road full green phase. Turning right is therefore only allowed when the green arrow is displayed. This alteration was supported by Transit New Zealand who are the Road Controlling Authority for this State Highway intersection.

The removal of the filter right turn was implemented because of the high number of right turn against crashes that were occurring, even though a right turn phase was provided. It was evident that the curvature of the two southbound lanes was making it difficult for some right turners to judge an acceptable gap in the oncoming traffic.

**CRASH HISTORY**

The crashes at this intersection are shown on the attachment and summarised in the following two tables:

<b>Total Crashes and Crash Rate per year ( ) for the period:</b>						
	<b>5 years before</b>			<b>2 years after</b>		
	<i>Right turn Crashes</i>	<i>Other Crashes</i>	<i>Total</i>	<i>Right turn Crashes</i>	<i>Other Crashes</i>	<i>Total</i>
Injury	6 (1.2)	7 (1.4)	13 (2.6)	Nil	1 (0.5)	1 (0.5)
Non-injury	8 (1.6)	6 (1.2)	14 (2.8)	Nil	4 (2.0)	4 (2.0)
Total	14 (2.8)	13 (2.6)	27 (5.4)	Nil	5 (2.5)	5 (2.5)

<b>Reduction in crash rate for:</b>			
	<i>RT Crashes</i>	<i>Other Crashes</i>	<i>Total</i>
Injury	1.2	0.9	2.1
Non-injury	1.6	-0.8	0.8
Total	2.8	0.1	2.9

Clearly, the removal of right turn filtering has had a marked reduction in the right turn against crash rate, down from 2.8 crashes/year to currently nil crashes/year.

## DELAYS AND QUEUE LENGTHS

A video recording of this intersection was carried out on Wednesday 28 April 1999 primarily looking at the right turn movement from Main North Road into Cranford Street. Unfortunately, a traffic signal contractor decided to do some work at the intersection on this day and the signals were switched off between 9:25 and 12:40. This is not the critical period of the day and it was therefore decided not to re-record the intersection. This video is available to Board Members if they wish to see how the intersection operates throughout the day.

Certain information relevant to the level of service to right turners has been summarised in the following table:

<b>Time Period</b>	<b>No. of Right Turners</b>	<b>Max Queue (cars)</b>	<b>No. of RTers taking more than one cycle to get through (no.x occurrence)</b>
7:30 – 8:00	61	5	1x2
8:00 – 9:00	176	11	5x2
9:00 – 9:25	78	15	-
13:00 – 14:00	195	9	1x1
14:00 – 15:00	274	10	1x1, 2x1
15:00 – 16:00	302	12	1x1
16:00 – 17:00	334	10	1x1, 5x2
17:00 – 17:35	191	9	-

The phasing at this intersection is different to any other in Christchurch. At certain times of the day (normally in the afternoon), the right turn phase is introduced twice each cycle. That is, the right turn phase will be introduced first, followed by the full Main North Road phase, followed again by the right turn phase and then the Cranford Street phase. In essence, the right turners get two “bites of the cherry” so to speak. The total amount of green time has remained the same, but it has been split into two parts. This repeat right turn is generally only introduced in the afternoon when the majority of traffic is heading north.

There are two main benefits of providing this repeat right turn phase. Firstly, it dramatically reduces the queue length, and secondly, it rewards the right turners for patiently waiting through the whole of the full green when perhaps there has not been much through traffic heading south.

The main disbenefit of this extra phase is that often not all the cars that arrive during the Main North Road full green phase will get through the repeat right turn. They therefore feel hard done by, but in fact are actually getting a better level of service than they would normally.

## CONCLUSION

Non-filtering the right turn phase at this intersection has significantly reduced the right turn against crashes. Since the change was made over two years ago, there have been no injury or non-injury crashes reported to the police.

Introducing a repeat right turn phase when the majority of traffic is northbound has also improved the level of service to right turners. The queue lengths for right turners peaked at 15 once, but is generally 5-10 vehicles. This is relatively low given the high volumes of right turning vehicles (334 vehicles between 4pm and 5pm). In general, no right turners wait more than one complete cycle to complete their turn, which cannot be said for a lot of other approaches to busy intersections.

There is therefore no proposal to make any further changes to the operation of this State Highway intersection.

**Recommendation:** That the information be received.

### **Chairperson's**

**Recommendation:** That the information be received and that the City Streets Unit arrange for the camera to be stationed at the intersection for a full Saturday with a report to come back to the 30 June meeting.