Policy and Strategy Occasional Paper
Waimakariri River Bridge Average Daily Traffic Counts 2016

SUMMARY

November 2016
Total light and heavy average daily counts
- north & south bound -

17.5% 15.8%

Monthly Average Daily Traffic Movements in Five Years (2012 - 2016)

Old Bridge
9,750

Motorway Bridges
49,500

59,250
Vehicle Traffic Movements Per Day

PEAK HOURS

2015 2016

9,750 + 49,500 = 59,250

Vehicle Traffic Movements Per Day
1. INTRODUCTION

This occasional paper updates the information provided in Occasional Paper #9, “Traffic patterns on arterial routes and commuter travel options” published in 2014.

This paper reviews the average daily traffic (ADT) movements across the State Highway 1, Waimakariri River Bridge, identifying the change in travel patterns since 2013. Commuter travel options have not been considered on this occasion.
2. Northern Motorway traffic patterns

Congestion on the northern motorway is one of the major concerns for commuters living in the Waimakariri District and traveling to Christchurch for their work. A lot of data is available relating to traffic patterns and the following figures provide an overview of the fluctuation of traffic volumes by month over the last five years.

**Figure 1 – Southbound traffic**

![Monthly Average Daily Traffic (MADT) Southbound on Waimakariri Bridge (SH1S)](image)

**Figure 2 – Northbound traffic**

![Monthly Average Daily Traffic (MADT) Northbound on Waimakariri Bridge (SH1N)](image)

Figure 1 and 2 show that the monthly fluctuations demonstrated in the first three years (2012, 2013, 2014) have become less prominent in recent (2015, 2016) years. In particular in 2016 the variation is...
Between June 2012 and June 2016 there has been a 17.5% increase in the population of the Waimakariri District.

At the 2013 Census 41.5% (10,725 people) of Waimakariri’s usually resident labour force worked in Christchurch.

In 2016 there are estimated to be 36,300 people in the Waimakariri District aged between 15 and 64 years (labour force age group). If 41.5% of these people are working in Christchurch this means that (potentially) there are just over 15,000 people traveling from the District to Christchurch for work each day.

Figure 3 sets out the total average daily traffic movements across the Waimakariri River Bridges (north and south-bound) on SH1 for light and heavy vehicles for November 2014 – 2016. This month has been chosen for consistency with the previous paper and because November is most often the month with the highest average daily motor vehicle counts for each of these years.

**Figure 3 – Total light and heavy vehicle average daily counts**

![Graph showing average daily counts for North- and South-bound traffic](image)

Figure 3 shows that there was an increase of 1,759 (3.7%) in the number of total traffic movements between the City and the Waimakariri District in the months of November 2014 and November 2016. For light vehicles there was an increase of 1,637 (3.7%), and for heavy vehicles there was an increase of 122 (3.8%).
3. The morning traffic peak on the Northern Motorway

The following graphs show the change in travel times between 5.00 am and 10.00 am, in October/November 2015 and 2016. In 2016 the number of vehicles travelling between 7.00 and 8.00 am have increased with the ‘peak one hour’ in 2015 becoming the ‘peak two hours’ in 2016. By October/November 2016 there is consistently around 12,000 southbound vehicle movements a day between 5.00 and 10.00 am (excluding weekends, Saturday and Sunday, and the public holidays of Labour Weekend Monday and Show Weekend Friday).

The pattern of vehicle movements seen between 0700 – 0800 in the graph below (figure 4) also suggests the possibility of an unstable flow pattern. Bill Rice (Senior Transport Engineer) suggests that as the flow on the road approaches capacity, the speed reduces, and it only takes a small incident or small increase in traffic demand to result in a major reduction in speed. Because the road is at, or near, capacity any reduction in speed results in a reduction in the number of vehicles that can get through in a given time period.

Figure 4 – 2015 vehicle movements

![2015 vehicle movements across the Waimakariri Bridge (SH1) by hour](image1)

Figure 5 – 2016 vehicle movements

![2016 vehicle movements across the Waimakariri Bridge (SH1) by hour](image2)

These graphs show that in 2015 peak vehicle movements are between 6.00 and 7.00 am; whereas by October 2016 the peak had increased to two hours, between 6.00 and 8.00 am. In 2016 there are not a
lot more vehicles traveling between 6.00 and 7.00 am, but there are more vehicles traveling between 7.00 and 8.00 am compared with 2015.

Anecdotal evidence suggests that traffic flow was improved in 2016 compared with 2015, this is supported by the lower level of variability in traffic volumes described above.

It is possible that the increased volume in the 0700 – 0800 period in 2016 could be attributed to much better flow characteristics allowing more vehicles to get through in the hour. This improvement in flow could (in part) be due to measures NZTA has put in place (including the variable speed limit).

The following figures (6 and 7) show the change in vehicle movement patterns for October and early November 2015 and 2016 respectively from 5.00 am to 10.00 am.

**Figure 6 – 2015 peak hour traffic counts**

![Average traffic counts motorway bridge (southbound) October/November 2015](chart)

**Figure 7 – 2016 peak hour traffic counts**

![Average traffic counts motorway bridge (southbound) October/November 2016](chart)

Figure 7 (2016) shows the change in travel patterns with an overall increase in the number of vehicles as well as the increased number of vehicle movements between 7.00 and 8.00 am. Note: the week including Labour weekend has been excluded from these figures.
4. **Old Main North Road Bridge**

The Old Main North Road Bridge over the Waimakariri River provides an alternative to the Northern Motorway Bridges and carries significant traffic volumes. Traffic counts are available for this bridge but they are not as comprehensive as those available for the Northern Motorway Bridges. Counts for 2013 – 2016 are set out in figure 8. Note: high river flows (flooding) may necessitate this bridge being closed to traffic.

**Figure 8: Average daily traffic counts Old Main North Road Bridge**

![Traffic movements](chart)

Figure 8 shows the increase in the total number of vehicle movements per day in September 2013 has been sustained going forward to April 2016. This represents 19 – 20% vehicle movements in addition to the average number using the SH1 motorway bridges of approximately 49,500 in late 2016.
5. Variable Speed Initiative

To improve the travel times from the Waimakariri District into Christchurch City a ‘speed’ initiative was introduced by the New Zealand Transport Agency (NZTA) in February 2016. This initiative involved setting up speed restrictions along SH1 from just south of Ohoka Road. This introduced variable speed restrictions at peak hours depending on the amount of traffic. It was intended to slow the traffic along SH1 to minimise the traffic halting and providing a more consistent travel time between the District and the City.

The monitoring of this initiative is complicated by the road works impacting the northern access to Christchurch with the Western Bypass and more recently the Northern Corridor project.

**The Christchurch Northern Corridor**

*The Christchurch Northern Corridor will be built to the east of Belfast, between the Waimakariri River and Cranford Street, providing relief for North Canterbury commuters and freight transporters travelling into Christchurch. Construction of this new motorway started in November 2016.*

**Western Belfast Bypass**

*This project is part of the Christchurch Western Corridor identified by the Government as part of the roads of national significance programme. The Western Belfast Bypass will provide a new route from the Northern Motorway (SH1) for about five kilometres south to Johns Road (SH1) near The Groynes entrance.*

Source: New Zealand Transport Agency (https://www.nzta.govt.nz)