16. RING ROAD REVIEW

RR 10327

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INTRODUCTION

The purpose of this report is to respond to the 17 June 1999 request of the joint Fendalton/Waimairi and Shirley/Papanui Community Boards, *"That a report be prepared giving an indication of the timeframe for undertaking a complete review of the Ring Road and its associated intersections including Greers/Northcote/Sawyers Arms Roads and Greers/Harewood Roads intersections."*

The report also further addresses the City Plan submission of the Fendalton/Waimairi Community Board *"That the Council undertake an early review in consideration of alternative options to the use of the existing western leg of the Council's ring road system."*

This report focuses on the western section of the Ring Road from the Curletts Road/Blenheim Road intersection to the intersection of Main North Road and Northcote Road as shown in figure 1.

The section of the Ring Road from the Curletts Road/Blenheim Road intersection east to the intersection of Garlands Road/Opawa Road Expressway is State Highway controlled by Transit New Zealand.

The section of the Ring Road from just east of the Northcote New Brighton Expressway/Grimseys Road intersection southeast to the intersection of Dyers Road/Palinurus Road may also become State Highway controlled by Transit New Zealand subject to the outcome of the Christchurch Northern Roading Options Scoping and Main Studies.

This report looks at:

- The timing of a review of the western section of the Ring Road.
- How important the western section of the Ring Road is, and are there any alternatives.
- The trends in traffic growth along the western section of the Ring Road.
- The Greers Road/Northcote Road/Sawyers Arms Road intersection and the Greers Road/Harewood Road intersection.

TIMING OF A COMPLETE REVIEW OF THE WESTERN SECTION OF THE RING ROAD

A complete strategic review of the western section of the Ring Road will be undertaken as part of the Christchurch Metropolitan Transport Strategy (CMTS) component of the Regional Land Transport Strategy Review which is currently underway. The Strategy will indicate the amount of importance to be placed on providing additional roading supply to cater for traffic congestion and the level of importance to be placed on the Ring Road as an element of the road network.

Work on the Christchurch Metropolitan Transport Strategy (CMTS) is likely to begin in about 6 months time and will follow the broad strategic assessment of the transport network being undertaken as part of the Regional Land Transport Strategy.

A specific study aimed at identifying the issues, deficiencies and appropriate solutions in detail for the western section of the Ring Road for all transport modes would follow completion of the Christchurch Metropolitan Transport Strategy. The study would be likely to take around 6 to 12 months and cost in the order of $50,000 to $100,000 if undertaken by a transportation planning and traffic engineering consultancy.

It is recommended that:

- The information compiled in this report be used as a source of background information for the detailed study.

- That City Streets Unit programme budget and resources for a specific study of the western section of the Ring Road in the next financial year 2000/2001.

- The study have the objectives of identifying the issues, deficiencies and appropriate solutions in detail for the western section of the Ring Road for all transport modes. The study would include full public consultation and address such issues as:

    - Safety
    - Pedestrian facilities including signalised crossing and pedestrian islands
    - The need for flush medians
    - Cycle facilities including cycle lanes
    - Public transport facilities including bus priority and bus stops
    - On street parking
    - The need for and timing of any intersection widening
    - The need for, if any, and timing of any four laning of sections of the Ring Road

IMPORTANCE OF THE WESTERN SECTION OF THE RING ROAD – ARE THERE ANY ALTERNATIVES?

As early as 1964 the Master Transport Plan indicated the western section of the Ring Road to be a "major road" route (see figure 3). Note, however that only Northcote, Greers and Waimairi Roads made up the route at that time. Curletts Road, Peer Street and Grahams Road were not included.

There are no other routes across the western section of the city that easily connect the Ring Road from the Main North Road/Northcote Road intersection to the Ring Road at the Curletts Road/Blenheim Road intersection (see figure 1).

Orbital routes such as the Ring Road, are an essential part of a "spiders web" or "spokes and rim" road network, like that in Christchurch. Such transport networks are very efficient as indicated in figure 2.

A "living rooms and transport corridors" approach has been taken to road network planning in Christchurch. This approach requires transport corridors to cater for the vast majority of traffic as a trade off for the quality environment provided in the living rooms. The western section of the Ring Road is one such transport corridor as also indicated in figure 2.

TRENDS IN TRAFFIC GROWTH ALONG THE WESTERN SECTION OF THE RING ROAD

The western section of the Ring Road from the Curletts Road/Blenheim Road intersection to the Northcote Road/Main North Road intersection is comprised solely of two lane carriageway with some intersection widening.

As a generalisation, two lane roads can carry a maximum of 20,000 vehicles per day comfortably, and up to a maximum of about 27,500 vehicles per day (v.p.d) as on Riccarton and Papanui Roads with corresponding congestion (see figure 4).

The amount of congestion is dependent not only on the traffic flows but for how long they last (see figure 5). Peak flows in Christchurch last from 15 to 60 minutes depending on the location, day of the week and time of day.

The amount of intersection widening and adjoining landuse are also factors. Fendalton Road west of Glandovey Road carries almost as much traffic as Riccarton Road but with significantly less congestion.

Historic and projected trends of traffic growth along the western section of the Ring Road and Sawyers Arms and Harewood Roads indicate the following:

- Northcote Road is currently carrying 22,200 v.p.d and will exceed 27,500 v.p.d around the years 2012 – 2013 (see figure 6). Delays to right and left turning vehicles from side streets are high during peak traffic conditions.

- Sawyers Arms Road west of Greers Road is currently carrying 10,700 v.p.d and will not exceed 20,000 v.p.d within the planning period to 2021 (see figure 7).

- Greers Road south of Sawyers Arms Road is currently carrying 17,000 v.p.d and will exceed 20,000 v.p.d by 2006 – 2008, and will be just below typical Riccarton Road traffic flows of around 27,500 v.p.d by the end of the planning period (see figure 8).

- The dramatic growth in traffic flows on Northcote Road, Greers Road and Sawyers Arms Road since the opening of the Northcote/New Brighton Expressway has levelled off (see figures 6, 7 and 8).

- Greers Road south of Harewood Road is currently carrying 18,800 v.p.d and will exceed 20,000 v.p.d between 2003 and 2009 depending on the future traffic growth rate, but will not exceed 27,500 v.p.d within the planning period (see figure 9).

- Harewood Road north of Farrington Avenue is currently carrying 13,800 v.p.d and will not exceed the comfortable limit of 40,000 v.p.d for a four lane road within the planning period (see figure 10).

- Traffic flows on Harewood Road at the Main North Railway Line are almost static at about 13,000 v.p.d. (see figure 11).

- Grahams Road north of Wairakei Road is currently carrying 9,600 v.p.d and will not exceed 20,000 v.p.d within the planning period to 2021 (see figure 12).

- Grahams Road north of Memorial Avenue is currently carrying 12,800 v.p.d and may exceed 20,000 v.p.d anywhere between 2010 and 2021 depending on the future growth rate (see figure 13).

- Grahams Road south of Memorial Avenue is currently carrying 15,000 v.p.d and will exceed 20,000 v.p.d between 2011 and 2015 (see figure 14).

- Waimairi Road south of Grahams Road is currently carrying 9,400 v.p.d and will not exceed 20,000 v.p.d within the planning period to 2021 (see figure 15).

- Waimairi Road south of Greers Road is currently carrying 16,000 v.p.d and will exceed 20,000 v.p.d between 2006 and 2010 and may reach 27,500 v.p.d within the planning period to 2021 depending on the traffic growth rate (see figure 16).

- Waimairi Road north of Peer Street is currently carrying 17,600 v.p.d and will exceed 20,000 v.p.d between 2005 and 2007, but will not exceed 27,500 v.p.d within the planning period to 2021 (see figure 17).

- Peer Street south of Athol Terrace is currently carrying 13,200 v.p.d and will exceed 20,000 v.p.d sometime after 2011 depending on the traffic growth rate (see figure 18).

- Curletts Road north of Blenheim Road is currently carrying 20,500 v.p.d and will exceed 27,500 v.p.d between 2011 and 2016 (see figure 19).

The general conclusions that can be drawn from the above analyses are:

- That there will be considerable pressure from traffic growth to 4 lane Northcote Road and Curletts Road by around 2012. A designation exists in the City Plan for widening on Northcote Road.

- That there will be pressure from traffic growth to provide further intersection widening at existing traffic signals and the potential conversion of some priority intersections to signalised intersections along the remainder of the western section of the Ring Road within the planning period.

GREERS ROAD /NORTHCOTE ROAD/SAWYERS ARMS ROAD INTERSECTION

There have been two reported injury crashes at the Greers/Northcote/Sawyers Arms (west) intersection in the last five years, 1994-1998, as indicated in figure 20. There has been one fatal and one serious crash. Figure 20 also shows there have been 3 minor injuries at the Sawyers Arms (east) intersection. The combined intersections, east and west rank between 425th and 509th in terms of the total number of reported crashes per intersection from 1993 to 1997 as shown in figure 22. Further injury crashes would have to occur before these intersections gained priority for safety works over other more dangerous intersections.

The current level of traffic delays at the Greers/Northcote/Sawyers Arms (west) intersection do not justify any additional capacity works to be undertaken. The intersection has sufficient spare capacity to cater for at least seven years traffic growth as indicated in figure 25.

The construction of a single lane roundabout within the existing road reserve at the Greers/Northcote/Sawyers Arms Roads intersection cannot be justified as traffic delays would be 250% worse than current levels, and the roundabout would be at capacity within three years (see figure 25).

The installation of traffic signals within the existing road reserve at the Greers/Northcote/Sawyers Arms Roads intersection would be justified at some time after about 2003 when traffic delays would be less than the existing layout. Without any road widening the traffic signals would provide sufficient capacity through to about 2012.

It is recommended that the timing of the installation of traffic signals should be assessed as part of the specific study of the western section of the Ring Road as proposed above for the financial year 2000/2001. The exact timing will depend on the benefit/cost ratio for the project exceeding 4 to gain Transfund funding.

The design of the signals may need to include the realignment the eastern leg of Sawyers Arms Road to form a cross junction. The signalisation could also occur as part of a project to four lane Northcote Road.

GREERS ROAD/HAREWOOD ROAD INTERSECTION

There have been nine reported injury crashes at the Greers Road/Harewood Road intersection in the last five years, 1994-1998, as indicated in figure 21. There have been no fatals, five serious injuries, and 8 minor injuries.

The intersection is averaging 1.8 injury crashes per year which is just above the Christchurch average of 1.4.

The intersection ranks between 150th and 159th in terms of the total number of reported crashes per intersection from 1993 to 1997 as shown in figure 22.

Inspection of figure 21 shows that there are 3 crashes involving vehicles making right turns off Greers Road at the intersection.

Visual inspection of the intersection during peak traffic conditions showed that these movements were the only ones facing some delay.

The introduction of right turn arrows on Greers Road at the intersection would:

- Decrease the delays for right turning vehicles
- Reduce the accident rate for right turning vehicles by about one third
- Provide ease of turning for the Orbiter cross suburban bus from the southwest on Greers Road southeast into Harewood Road
- Encourage a proportion of heavy vehicles currently using Sawyers Arms Rd to use Harewood Road instead. See figures 23, 24 and 25.
- Increase the utilisation of Harewood Road which only carries 13,800 v.p.d on a four lane carriageway and is designated a major arterial road.

Figures 27, 28 and 29 show the right turn from the northeast on Greers Road to the northwest on Harewood Road to be the largest of all the left and right turns at the intersection for all time periods.

Figure 30 shows the upgrading to the intersection that was proposed in 1993. It is understood that this did not proceed because of funding constraints. Note that the design would no longer be considered adequate because cycle lanes are not included and nor is there sufficient space for them to be included. Some additional property would be required on the southwestern leg of Greers Road as the footpaths have already been narrowed as much as possible in this design.

Figure 31 shows the upgrading of the intersection as constructed from the 1994 publicity leaflet. The upgrading included only kerb and channel work on the southeast leg of Harewood Road.

Figure 32 shows that the existing intersection layout has about 10 years capacity. The figure also shows that the introduction of right turn arrows with the existing layout is not feasible as the intersection would immediately operate beyond capacity.

Construction of the 1993 proposal including right turn arrows and further widening to allow cycle lanes would operate only marginally better than the existing layout and would have almost 10 years capacity as well. It is not likely that a benefit/cost ratio of four could be achieved to gain Transfund funding. Only if the right turn arrows are not included does the layout provide a better alternative to the existing layout.

It is recommended that the upgrading of the intersection to a design similar to the 1993 proposal be assessed as part of the specific study of the western section of the Ring Road as proposed above for the financial year 2000/2001. The exact timing of the upgrade will depend on the benefit/cost ratio for the project exceeding 4 to gain Transfund funding.

For discussion