RANGIORA TRANSPORT STUDY

A COMMUNITY PROJECT - PLANNING FOR THE FUTURE

WAIMAKARIRI DISTRICT COUNCIL

CONSULTATION REPORT
for Waimakariri District Council
Report

Rangiora Transport Study

Prepared for
Waimakariri District Council

By
Beca Carter Hollings & Ferner Ltd

May 2001
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Appendix A – Rangiora Transport Study Proposal
Executive Summary

Unprecedented Growth
Over the last fifteen years, Rangiora has experienced unprecedented population growth. The current population of approximately 11,200 is predicted to grow to 15,000 by 2016. This growth has impacted on the roading infrastructure. In order to ensure population growth does not adversely affect residents the Council has undertaken this Urban Transport Study.

Council and Community Issues
A key element of the Council’s future planning is community and stakeholder involvement as these are not just issues for the Council. A key stakeholder group, the Rangiora Advisory Group, was consulted during the preparation of this report. The community will have opportunity to make submissions on this report.

Rangiora Transport Study
This study identified transportation improvement options within the Rangiora Urban area and surrounding rural area that may be required over the next 20 years. It considers both internal transport concerns and also the transport linkages between the town and rural areas and other urban centres. The study looks at the entire land transport network and includes cycling, pedestrian, parking and public transport initiatives.

Other complementary studies
This study complements the Waimakariri District Transport Study (DTS), which is being prepared in parallel. The DTS concentrates on the rural roading network, including State Highways 1 & 71. An urban transport study for Kaiapoi was undertaken in 1998.

Study Outcome and Stages
The main outcome of the transport study will be a list of improvements that are required, or are likely to be required, to the land transport network over the next 20 years. Actual improvements depend on the pace and location of growth within the town and the adjoining rural area.

Deficiency and Issue Identification and Option Development
Some of the key issues/deficiencies identified through this project were:

- Increased congestion (or lower level-of-service) on the Rangiora north-to-south strategic route (Ashley/Ivory/Percival/Southbrook);
- Adverse effects (noise, vibration and emissions) caused by heavy vehicles travelling through the town, particularly on the northern section of West Belt and on the main north-south route.
- Impact of household growth to the east and west of the town and integrating new roads into the current roading network.
Safety concerns around the Dudley Park access and within the carpark particularly on Saturdays, when there is high parking demand due to netball activities.

Safety at level railway crossings and on the rural-urban fringe, i.e. at the 50kph speed limit signs.

Cycle safety and the need to provide both on-road and off-road cycle lanes to encourage cycling within the town.

More direct and attractive bus services to encourage higher public transport patronage.

Option Assessment

A series of options were developed to address these issues and deficiencies. The benefits of each option have been discussed and listed (Refer to Table 1). Most of the larger roading projects have been analysed in the DTS, and Benefit-Cost ratios are available in the DTS reports.

Ranking of Projects

Table 1 shows the Top 10 short and medium term land transport improvement projects that are recommended for the town, along with timeframes over which such projects should be investigated and constructed.

Where to from Here?

All options are at the consultation stage and no firm decision has been made as to whether they will proceed or not. Further investigation may result in the deletion or addition of options and/or changes in the ranking of projects. Following completion of the consultation process a final report, with recommendations, will be prepared and presented to the Council.

Once recommendations are confirmed, and funding criteria met, a scheme assessment study will be carried out to refine and develop the improvement options.

Where a new roading corridor is required, an Assessment of Environmental Effects (AEE) report would be prepared to apply for roading designations. The designation process is subject to the full statutory planning process that gives stakeholders and landowners full participatory rights, including lodging of submissions and a right to be heard at any hearing conducted by Council or the Environment Court.
Table 1 – Rangiora Land Transport Improvements (Top 10 projects)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Option</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Timeframe</th>
</tr>
</thead>
</table>
| 1    | Interim Improvements to main north to south strategic route: Traffic signals at Ashley/High/Ivory and Southbrook/South Belt Intersections | - Would break traffic up into platoons that would create gaps for vehicles entering the main route downstream of the traffic signals.  
- Would address some of the severance problems caused by increased traffic volumes, by creating two ‘safe’ crossing places for Pedestrians and cyclists. | - Increased delays for through traffic  
- Increase in vehicle emissions | 1 - 2 years |
| 2    | Eastern Arterial, with links to the town and modifications to the current main north to south link OR East Belt and Blackett Street Extensions, which have additional disadvantages to the Eastern Arterial (eg. environmental and safety impacts on existing East Belt housing) and less advantages (eg. can not easily be 4-laned) | - New route could be 4-laned in the future.  
- All intersections would have a standard layout  
- New route could have a cycle-lane  
- Reduces severance effects on current route  
- Moves heavy vehicles away from residential streets  
- Reduces traffic volumes through Red Lion Corner  
- Multiple railway crossing places would be used rather than concentrating traffic at Lineside Road railway crossing  
- Addresses the majority of pedestrian and cycle safety concerns on current route. School children travelling to high school would no longer have to cross main route. | - Eastern Arterial would result in severance and the loss of rural land and some dwellings  
- Blackett Street extension would impact on rail operations and significantly increase traffic volumes on Keir Street, which would have an impact on noise and emission levels and safety  
- Would require additional railway crossing(s)  
- Queen Street extension would have an adverse effect on surrounding housing in terms of noise, vehicle emissions and safety | 1 - 5 years |
| 3    | Collector route network in eastern and western growth areas           | - The establishment of several north-south and east-west collector routes, joining at appropriate locations with current routes will ensure that new subdivisions are integrated into the current roading network. | - None identified, if new routes are constructed as part of subdivisions. | 1 – 15 years |
| 4    | Township cycle plan: including on-road and off-road cycle lanes and intersection treatments. The details to be investigated in a more focused study. | - Lower risk of cycle crashes.  
- Make cycling more attractive. | - Minimal impact, unless road widening is required to accommodate cycle lanes. In this case may impact on road frontage of several houses. | 1 – 5 years |
<table>
<thead>
<tr>
<th>Rank</th>
<th>Option</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Direct (Ecan) bus route from Rangiora to Christchurch along Linseside</td>
<td>- Would make bus travel more attractive by reducing journey times.</td>
<td>- None identified</td>
<td>1–3 years</td>
</tr>
<tr>
<td></td>
<td>Road and motorway. Peak hour express routes.</td>
<td>- Would create a better alternative to private vehicle travel.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Upgrade and install new bus shelters and timetable and route data</td>
<td>- Would improve the image of bus travel and the ease of use.</td>
<td>- None identified</td>
<td>1–3 years</td>
</tr>
<tr>
<td></td>
<td>(even real time information screens). Use of more modern bus fleet to</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>service route.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Commercial Area (CBD) ring Road and associated improvements</td>
<td>- Would provide alternatives routes for traffic wanting to travel around</td>
<td>- Would increase traffic volumes on Queen Street with possible increase in environmental impacts,</td>
<td>1 – 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the CBD/Shopping Area and also to the southern carparking area behind the</td>
<td>eg. traffic noise, vehicle emissions.</td>
<td>years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>shops.</td>
<td>- Would provide better link to new eastern arterial, rather than the current Kippenberger Avenue</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>and High Street link.</td>
<td>and High Street link.</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Dudley Park Carpark improvements (including access improvements and</td>
<td>- Reduce number of conflicting movements at carpark entrance and hence</td>
<td>- A road through park would create a barrier for pedestrians walking through the park.</td>
<td>1 – 2</td>
</tr>
<tr>
<td></td>
<td>sealing and formalisation of carpark)</td>
<td>improve safety.</td>
<td>- Separation between entry and exit points, resulting in some vehicles being diverted a</td>
<td>years</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Relocate pick-up and drop-of activities into specific off-road parking</td>
<td>significant distance from desired path. There are benefits in retaining entry and exit onto</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>area</td>
<td>Church Street. Other higher cost options could be considered.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Create footpath area around netball courts and from courts to Church</td>
<td>- Impacts on stormwater plans and park activities.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Street</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Formal parking layout will control vehicle movements and reduce risk of</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>pedestrian/vehicle crashes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>White Street Traffic Calming modifications- remove speed humps, and</td>
<td>- White Street should be more attractive for through traffic, and street</td>
<td>- travel speeds may increase if new measures (road narrowing) not effective. Needs to be</td>
<td>1–2 years</td>
</tr>
<tr>
<td></td>
<td>narrow gateways to compensate</td>
<td>is therefore more likely to function as a collector route</td>
<td>monitored.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Ashley Bridge widening</td>
<td>- Lower risk of head-on and cyclist sideswipe crashes</td>
<td>- may be better to wait and construct a new bridge.</td>
<td>5 – 10</td>
</tr>
</tbody>
</table>
1 INTRODUCTION
1 Introduction

1.1 Background and Study Area

The Waimakariri District Council commissioned Beca Carter Hollings & Ferner Ltd to undertake the Rangiora Transport Study in February 2001. The Rangiora Transport Study is the second township transport study to be prepared for the Waimakariri District; with a study of Kaiapoi having been completed in July 1998.

A District Transport Study (DTS) of the eastern section of the District (from Rangiora and Swannanoa to the Coast) is also being prepared in parallel to the Rangiora Transport Study. This district wide study generally considers the rural land transport network, including access into and out of Kaiapoi and Rangiora. The study includes SH 1 & 71 and for completeness the smaller urban centres, such as Woodend, which are not covered by separate township studies.

Given the strong population growth in and around Rangiora it is timely that a study of the town’s land transport system (including roading, rail and the different modes of transport, being cars, buses, trucks, trains, cyclists and pedestrians) is being undertaken. There is evidence, during peak periods, of the impact that several years of strong growth is having on the efficiency and safety of the current roading network, particular along the ‘north-to-south’ strategic route (Ashley/Ivory/Northbrook/Southbrook).

Transport modelling indicates that if this growth continues, as expected, that the town’s road network will come under significant pressures over the next 20 years.

The area being considered in this study is shown in Figure 1.1. This area includes abutting rural land that over the next 20 years may be subdivided and integrated into the Rangiora urban area.

1.2 Study Aim and Objectives

The Aim of the study is:

To identify short, medium and long-term land transport improvements for the Rangiora Roading Network that address:

- Road safety deficiencies/issues;
- Network efficiency deficiencies/issues; and
- Environmental and social effects of land transport, over the next 20 years (2001 to 2021).

The Study Objectives are:

- To identify key transport deficiencies/issues in Rangiora in 2001 and through to 2021.
- To develop improvement options for addressing the key transport issues.
To identify the preferred options and when such options are required (short, medium or long term).

To produce a report that contains a plan of possible roading and other land transport improvements for the next 20 years.

1.3 Project Control Group and Key Stakeholders

The Project Management Group, or Project Control Group (PCG) members are shown in Table 1.1. The role of the PCG is to:

- Develop the job brief and scope;
- Establish and approve job procedures;
- Review and approve work progress;
- Monitor overall job progress;
- Establish who should be consulted, and when, and lines of communication.

<table>
<thead>
<tr>
<th>PCG Member</th>
<th>Organisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Andrew Robinson</td>
<td>Waimakariri District Council</td>
</tr>
<tr>
<td>George Jasonsmith</td>
<td>Waimakariri District Council</td>
</tr>
<tr>
<td>Shane Turner</td>
<td>Beca Carter Hollings &amp; Ferner Ltd</td>
</tr>
</tbody>
</table>

The second group, of key stakeholders, consists of the Rangiora Advisory Group (RAG), and representatives from ‘Our Town Rangiora’ and the Ashley/Eyre Advisory Group. A presentation to this group was undertaken on 14 March 2001, to receive preliminary feedback on issue identification and option development.

The high school and New Life school were also contacted to identify the travel characteristics of school students and identify likely safety hazards in the vicinity of schools.

Environment Canterbury and bus operators were approached for information on public transport patronage and service quality. Tranzrail were contacted regarding the impacts of some options on their operations.

1.4 Report Structure

The report has been broken down into four sections (excluding Introduction). Section 2.0 provides base-line information on the characteristics of the current road network, including: the road hierarchy; traffic volumes (broken down by mode where data is available); historical traffic growth; and crash data; and facilities provided for pedestrians, cyclists and buses.
Section 3.0 details the deficiencies and issues raised by council officers, the stakeholder group, by schools and identified by the consultant (Beca Carter Hollings & Ferner Ltd). In terms of the latter, deficiencies have been identified through intersection modelling (to identify high delay movements) and through analysis of the data presented in Section 2.0. For example, crash clusters (grouping of crashes) were identified in the crash data.

Section 4.0 details the options that have been developed and identified to address the deficiencies and issues raised in Section 3.0.

The final section, Section 5.0, details the analysis of the options and recommends which options, in rank order, should be pursued. This section contains rough-order investigation and construction costs, and where possible rough order Benefit-Cost Ratios (BCRs).
2
TRANSPORT NETWORK CHARACTERISTICS
2 Transport Network Characteristics

2.1 Introduction

The Rangiora Land Transport Network has three Transport Systems, the road network, the rail network (or corridor) and the network of formal and informal pedestrian footpaths and crossing points. Currently Rangiora does not have the fourth type of transport system, an off-road cycle network, although there is the potential for such a network to be developed.

This report focuses primarily on the roading network (including public and private carparks), as this network is more likely to come under pressure during the next 20 years and carries the majority of person-trips. However, a study of this type would not be complete without discussion on improvements to these other transport systems, and hence such discussion occurs where relevant.

There are a number of transport modes (or types) operating on the Rangiora Land Transport Network; including private motor-vehicles and light commercial vehicles (cars, vans, utes, station-wagons, motor-cycles), heavy commercial vehicles (trucks), buses and coaches, cyclists, pedestrians and trains.

Given the dominance of the private motor-vehicle in and around and to and from a rural servicing and satellite town such as Rangiora, much of the discussion in this report centres around the movement of private motor-vehicles and to a lesser extent commercial vehicles (particularly larger vehicles).

While the dominance of this mode is not expected to change significantly over the next 20 years, particularly for longer trips (such as from Rangiora to Christchurch) the role of other modes (in particular public transport) in providing mobility to the transport disadvantaged (i.e. those without a car) and also as an alternative to the private motor-vehicle needs to be acknowledged. Hence the report also covers these other important modes of travel.

2.2 Road Hierarchy

The Rangiora Road Hierarchy (refer to Figure 2.1) has evolved over the last 20 years, as the town has grown. Unlike the roading network in larger town and cities, such as Christchurch, there is very little difference in layout between roads classified as local, collector, arterial and strategic routes. The majority of roads in the town, except for local streets that have been constructed during the last 10 years, are approximately the same width, and differ only in there priority at intersections and extra signage and markings.

There are currently no purpose-built arterial/strategic routes in the town, with limited access provision and additional seal width, and the town is approaching a size where such routes need to be considered. The main north-south route also has a number of geometric deficiencies that make it less than ideal as a strategic route.
2.3 Road Network Efficiency

2.3.1 Route Traffic Volumes (2001)

Figure 2.2 is a flow map of the Rangiora Strategic, Arterial and Collector Roading network, showing the relative differences in traffic volume between the difference routes. Table 2.1 shows the flows estimated on key routes. The flow data for the map and table were extracted from the Council’s RAMM database and it is estimates that the margin of error is around plus or minus 20%. Not all of the counts were collected in the base year (2000) and some have been estimated from counts collected in previous years.

<table>
<thead>
<tr>
<th>Route</th>
<th>Start</th>
<th>Finish</th>
<th>Average Daily Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashley Street</td>
<td>Coldstream Road</td>
<td>High Street</td>
<td>8000</td>
</tr>
<tr>
<td>Ivory Street</td>
<td>High Street</td>
<td>Northbrook Road</td>
<td>8000</td>
</tr>
<tr>
<td>Southbrook Road</td>
<td>Johns Road</td>
<td>Todd Road</td>
<td>13,500</td>
</tr>
<tr>
<td>High Street</td>
<td>West Belt</td>
<td>King Street</td>
<td>5000</td>
</tr>
<tr>
<td>High Street</td>
<td>King Street</td>
<td>Ashley Street</td>
<td>5000</td>
</tr>
<tr>
<td>Blackett Street</td>
<td>King Street</td>
<td>Ashley Street</td>
<td>2500</td>
</tr>
<tr>
<td>King Street</td>
<td>High Street</td>
<td>Johns Road</td>
<td>3000</td>
</tr>
<tr>
<td>King Street</td>
<td>Johns Road</td>
<td>South Belt</td>
<td>1400</td>
</tr>
<tr>
<td>Johns Road</td>
<td>King Street</td>
<td>Percival Street</td>
<td>2200</td>
</tr>
<tr>
<td>Kingsbury Avenue</td>
<td>King Street</td>
<td>Ashley Street</td>
<td>3000</td>
</tr>
</tbody>
</table>

As expected the traffic volume on the main north-south strategic route (Ashley Street/Ivory Street/Northbrook Road/Percival Street/Southbrook Road/Lineside Road) dominates, particularly at the southern end of the town. At several points there are quite high side-road volumes, and the results in the next chapter show the delays being faced by some of this side-road traffic entering the main route during the morning peak period are substantial, particularly in the future.

The traffic volume along High Street is in the order of 5,000 vehicles per day, even through the main shopping area. It is unclear how much of this traffic travels straight through, rather than parks in or around the CBD. The traffic volumes on the Blackett Street Bypass does however indicate that a large number of motorists are choosing to go around the town, which is the desired result, particularly during shopping hours. Further reinforcement of the bypass route for through traffic is desirable. This is covered in latter sections, as is the development of a ring road around the town.

The traffic volumes on King Street, Johns Road and the eastern end of Kingsbury Avenue, indicate that these are significant collector routes.
2.3.2 Intersection Traffic Volumes

Figure 2.2 also shows turning traffic counts (24 hours) at the major intersections within Rangiora. These counts were estimated using turning volumes counts collected in the morning peak (7am to 9am), inter-peak (12pm to 2pm) and afternoon peak (4pm to 6pm). The peak hour counts were also used to calculate traffic delays during peak periods (see latter section for results).

Table 2.2 shows the critical turning movements (all right turns) during the morning peak. The traffic delays to these right-turning movements are presented in the next chapter.

<table>
<thead>
<tr>
<th>Movement</th>
<th>Typical RT Flow</th>
<th>Typical Main Road Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT from Kingsbury into Ashley</td>
<td>110</td>
<td>600</td>
</tr>
<tr>
<td>RT from Blackett into Ashley</td>
<td>90</td>
<td>650</td>
</tr>
<tr>
<td>RT from Johns into Southbrook</td>
<td>230</td>
<td>1050</td>
</tr>
<tr>
<td>RT from South Belt into Southbrook</td>
<td>200</td>
<td>1100</td>
</tr>
</tbody>
</table>

Table 2.2 shows that not only is there more traffic turning right onto the main north-south route at the last two intersections (in the order of double), this traffic has to find gaps in a much higher main road flow.

2.3.3 Traffic and Population Growth

There is limited historical traffic count data on routes within Rangiora and hence it is difficult to estimate what the historical growth rate has been over the last 10 years. The only site where reliable data is available over a number of consecutive years is at the Transit count station on Lineside Road (SH 71). Figure 2.3 shows the traffic counts that were collected over an 8 years period (up to 1998) and a linear regression line showing the growth in traffic. Based on these historical traffic counts, traffic is expected to grow at 5% from Year 2000.
Table 2.3 shows population forecast data for Rangiora. Traffic growth is often in the order of twice the population growth, due to an increase in vehicle ownership per household and increase in kilometers travelled per person. Hence, while population growth in Rangiora over the last five years has only been 2%, traffic growth has been 5%. It is expected based on the population forecast in Table 2.3 that traffic growth will continue at 4 to 5% over the next 15 to 20 years.

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>10,200</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>11,200</td>
<td>2%</td>
</tr>
<tr>
<td>2016</td>
<td>15,000</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Directions for Residential Growth 1997 to 2016 & Council Planners

### 2.4 Accident History

Figure 2.4 shows the number and location of injury crashes that have occurred in the last complete five-year period (Jan 1996 to Dec 2000). There were 2 fatal, 15 serious, 55 minor and 131 non-injury crashes over this period. The location of non-injury (or property-damage-only) crashes are shown in Appendix A.

The crash record shows that there were 7 crashes involving pedestrians and 8 crashes involving cyclists (3 non-injury and 5 injury). Six crashes involved a train (3 at the Boys Street crossing and one at the Dunlop, Marsh and Wales Street crossings) and 3 injury crashes involved a heavy commercial vehicle. Refer to Appendix A for the full crash printout.
The dominant injury crash types in the study area are crossing (both vehicles travelling straight ahead), or ‘HA’ crashes. 25% of all crashes were ‘HA’. ‘HA’ crashes often occur where drivers fail to give-way at stop or give-way controlled cross-roads. This is by far the highest crash type at such intersections, and given the high number of such intersections in Rangiora, it is no surprise that this is the major crash type. The next highest crash types (right turning crashes) made up less than 8% of all crashes.

A number of crashes (27 injury crashes) occurred along the main north-south strategic route. The injury crash rates, with and without intersection crashes, along this route, from River Road to the railway line (excluding crashes at the crossing), a distance of 5km, are 37 and 21 crashes per 100 million-vehicle kilometres respectively. The typical crash rate for an urban arterial route is 21 crashes per 100 million-vehicle kilometres, excluding major intersections.

### 2.5 Heavy Vehicle Movements

Table 2.4 shows the major heavy-vehicle turning volumes that were observed at the intersection count sites. As expected there is a high number of trucks using the main north-south strategic route and also a lesser number using Oxford Street, the northern section of West Belt and River Road when heading north from the west. There are also a high number of heavy vehicle movements around the Southbrook Industrial area, and particular at the Southbrook/Flaxton/Lineside Intersection.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Movements</th>
<th>Daily Volumes (both ways)</th>
<th>% Total Traffic</th>
</tr>
</thead>
<tbody>
<tr>
<td>West Belt/High/Oxford</td>
<td>Left turn into West Belt and vice versa</td>
<td>120</td>
<td>13%</td>
</tr>
<tr>
<td>Ashley/High/Ivory</td>
<td>Ashley St to High St to Ivory St and vice versa</td>
<td>200</td>
<td>4%</td>
</tr>
<tr>
<td>Flaxton/Lineside</td>
<td>Right turn into Flaxton Road and vice versa</td>
<td>240</td>
<td>7%</td>
</tr>
<tr>
<td>Flaxton/Lineside</td>
<td>Straight through from Southbrook Rd into Lineside Rd and vice versa</td>
<td>300</td>
<td>6%</td>
</tr>
</tbody>
</table>

### 2.6 Cycle Volumes and Facilities

#### 2.6.1 School Cycle Routes

Local schools (High School and New Life) have reported that only a relatively small proportion of pupils cycle to school (less than 10%). The majority of pupils either walk or are dropped off by parents. The low proportion of cycle trips, when compared with other
‘flat’ urban areas, such as Christchurch, is believed to be related to the size and location of Rangiora. The size of the urban area is such that it is relatively easy to walk from home to school within 15 to 20 minutes. Walking is generally considered a safer mode for school children, both in terms of road safety and security, were children can walk in groups.

In terms of location, the schools, and particularly the high school, services an extensive rural community, where distances and road safety concerns (e.g. high speed limit roads) are not conclusive to cycling. In such circumstances buses are the primary mode of travel.

Table 2.5 shows the major cycle movement observed during the intersection traffic count surveys. The highest flows where during the period 8am to 9am, and were generally school-aged children.

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Movement</th>
<th>Volume (hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kingsbury/Ashley</td>
<td>Right Turn into Ashley</td>
<td>20-30 cyclists</td>
</tr>
<tr>
<td>Blackett/King</td>
<td>Eastbound on Blackett</td>
<td>20-30 cyclists</td>
</tr>
<tr>
<td>King/Johns</td>
<td>Northbound on King</td>
<td>10-20 cyclists</td>
</tr>
<tr>
<td>Southbrook/Torlesse</td>
<td>Left Turn into Torlesse</td>
<td>10-20 cyclists</td>
</tr>
<tr>
<td>King/Johns</td>
<td>Eastbound on Johns</td>
<td>0-10 cyclists</td>
</tr>
</tbody>
</table>

Based on discussions with the high school, the majority of cyclists observed at the first three intersections, are likely to be high school children travelling to the school cycle racks in Wales Street. Based on the counts observed and discussions with the high school it appears that the preferred northbound/southbound and eastbound/westbound routes to the high school are King Street, Ashley Street (between Blackett Street and Kingsbury Avenue), Blackett Street, Kingsbury Avenue and Wales Street. The spine of the network does appear to be King Street. The collection of additional data, perhaps through a travel-to-school survey at the high school, would confirm these routes.

In terms of primary schools the left-turn movement into Torlesse Street, from Southbrook Road, shows that there is at least 10-20 pupils travelling to the Southbrook School. While no counts were collected, the New Life school has advised that there are school-aged cyclists turning left into Denchs Road.

The Council has installed cycle lanes on both sides of East Belt from Kippenberger Avenue to the High School. The school has indicated that the cycle volumes on East Belt are relatively low (anecdotal evidence) as most pupils access the Wales Street Bike Racks from Ashley Street. Hence these cycle lanes are not highly utilised. This highlights the need to establish an overall cycle plan for the town, which considers current cycle routes (see Chapter 3.0), before installing such facilities.

If the Rangiora Urban area grows to the west, it is expected that the number of high school cyclists will grow as the distances and travel times become too long for walking. Growth to the immediate east is not expected to increase cycle trips as this area is only a short walk...
to the high school. Under either growth scenario, cycling to primary schools is likely to stay static or decrease further as new primary schools are built in new development areas and increased traffic volumes make cycling more hazardous to young children.

2.6.2 Commuter Cycle Routes

Very limited information is available on commuter trips both to destinations within the Rangiora Urban area and to other employment locations, and in particular the Christchurch urban area.

The count data collected at intersections within Rangiora, shows low cycle volumes (0 to 10 cyclists per hour) prior to 8am. Between 8am and 9am it is difficult to separate school cyclists from commuters (i.e. adults), but given the destination of commuters, to the Rangiora shopping area and to Christchurch, the volumes appear to be low. In Table 2.5 the last count, eastbound on King is likely to be predominately commuters. It is possible that commuter cycle volumes to the Rangiora shopping area might increase if proposed eastern and western development goes ahead, as distances and travel times will be higher.

2.7 Pedestrian Facilities

2.7.1 Pedestrian Facilities in CBD (or shopping area)

The Rangiora CBD contains the majority of Rangiora’s retail shops, and this generates reasonably high pedestrian flows, particularly along the footpaths on High Street (Ashley Street through to King Street) and at the High Street crossing points.

About 10 years ago traffic calming devices were installed along High Street, to slow down traffic and improve visibility for pedestrians and motorists alike. The major emphasis of the improvements has been to change the appearance of the route from a through route to that which more closely represents a carpark/pedestrian precinct. This change in route function is not only driven by safety concerns, but also from an economic perspective, as the shopping area has to be attractive and safe in order to compete with the Christchurch suburban shopping malls.

The low number of injury accidents along this stretch of road over the last five years indicates that the traffic calming improvements have been effective. Anecdotal observations suggest that travel speeds are low and that kerb-extensions and the raised pedestrian crossing platforms have improved the visibility between pedestrians and motorists.

The promotion of the Blackett Street Bypass as an alternative west-to-east through route also seems to have been reasonably effective, given the number of vehicles using the bypass.

In general the footpath widths on High Streets seem to be reasonable, and cater for the two-way movement of pedestrians. No congestion points were identified in our
observations in the CBD. Hence, footpath widening for capacity reasons does not appear to be warranted at this stage, although this should be monitored as the town grows. Footpath widening, at the expense of carparking, for on-street dining, should be encouraged, as it can be an effective traffic-calming feature.

2.7.2 Pedestrian Facilities around Schools and Parks

The Council have installed a number of pedestrian facilities around schools and parks, particularly the former, and the demand for further facilities is evident. Examples of such facilities, include:

- Southbrook Road ‘Kea’ crossing,
- Pedestrian refuge outside Rangiora Borough School,
- Pedestrian platforms on East Belt, outside High School, and
- White Street Traffic Calming.

Chapter 3.0 discusses locations where new facilities could be considered, to improve pedestrian safety. In particular, a major area of interest is Church Street outside Dudley Park, and within the Dudley Park off-road carpark.

2.8 Parking Facilities

The majority of the parking demand is concentrated within the CBD, and is catered for by kerbside parking and at-grade off-road parking areas. The majority of kerbside carparking is parallel parking, except along High Street, where angle parking has been provided, primarily for traffic calming reasons.

The at-grade off-street parking is in close proximity to the High Street shops and there are several connecting malls and streets running from the carparks to High Street. Access to the carparks is primarily from High Street, Blackett Street and Queen Street, and several north-south roads and several minor lanes. Easy circulation between the carparks is an important feature of this type of shopping precinct and generally does occur in Rangiora.

Generally adequate medium to long-term parking is provided for schools and parks. However, around several of the schools (e.g. New Life and Southbrook) there is an issue with short-term parking, and pick-up and drop-off activities.

There is also a high parking demand particularly on Saturdays, at Dudley Park, particularly along Church Street and also within the Dudley Park off-road carpark on Saturdays.
2.9 Bus Routes and Facilities

2.9.1 Commuter Bus Routes (to Christchurch)

The ‘Rangiora’ bus service, operated by Red Bus, travels to Rangiora from Christchurch via Kaiapoi and Woodend (55 minutes service). The service terminates in Rangiora, where it follows a loop around the town, taking in Kippenberger Avenue, Ivory Street, Percival Street, South Belt, Bush Street, Charles Street, Green Street, White Street, Kingsbury Avenue, Good Street and Ashley Street. The weekday bus service is a fully commercial bus service, i.e. it does not attract an Environment Canterbury Subsidy. This is one of only two un-subsidised services in the Greater Christchurch Area. The weekend service is partially subsidised.

In addition to the Red Bus service there is a private (weekday) express bus service that runs between Rangiora and Christchurch and also to Amberley via Woodend. This service is operated by ‘Yaubus’ and again patronage data is not readily available.

The typical proportion of journey to work trips by bus from Rangiora and Kaiapoi was recorded in the 1996 census. The census data indicates that the proportion of bus trips is between 0 and 1.5% of total journey to work trips. This compares with figures of 2 to 3% in the Rodney District, which contains a number of satellite towns to the north of Auckland. Hence there is the potential to at least double the proportion of bus trips to Rangiora, to capture a higher mode share for public transport. Possible initiatives are discussed in a latter section.

The size of Rangiora means that there is little demand for a local bus service in Rangiora, other than the current loop traversed by the Rangiora to Christchurch service. It is unlikely that demand will reach a level were a local bus service is warranted over the next 20 years, even if eastern and western growth areas go ahead.

2.9.2 School Bus Routes

The number of pupils travelling to school by bus, both high school and primary, is high in Rangiora, and in the order of 50% of total journey to school trips. This equates to approximately 500 to 600 of the high school pupils; approximately 15 buses. The schools, and particularly the high school, service a large, and reasonably dense, rural area, which takes in most of the Waimakariri District and parts of the Hurunui District. The high school has 11 main school bus routes and a number of smaller routes serviced by mini-buses and vans. The number of services to each of the primary schools is lower and in the order of 4 to 5 buses.

All schools contacted have a temporary bus stop area, which operates in the mornings and afternoons. No concerns were raised with respect to the operation of the bus stops.
2.10 Rail Services

The location of the rail-line through the town, and the close proximity of the majority of residents to the railway station provides opportunities to provide a peak period passenger rail service to Christchurch (and vice-versa) long term. Indeed many new towns and cities overseas are being built around such transport ‘nodes’. While there is a great opportunity at the Rangiora end of the line for a service, the main problem is the Christchurch end, where there is no centrally located railway station.

While a service to northern Christchurch (to say Papanui), and a transfer to the Christchurch bus network is an option, it is unlikely the operating costs of such a service could compete with a direct bus route.

Long term it is possible Christchurch City will invest in a central railway station for light or heavy rail, and at such a time a passenger service to Rangiora and other northern towns will become attractive. Given that there are long term prospects for passenger services to Christchurch it is recommended that the future development of Rangiora retains or enhances links between the railway station and main shopping area.
3
ISSUE & DEFICIENCY IDENTIFICATION
3  Issue and Deficiency Identification

This section details the deficiencies and issues raised by council officers, the stakeholder group, by schools and identified during drive-overs of the Rangiora Road network. Deficiencies have been identified through intersection modelling (to identify high delay movements) and through analysis of the data presented in Section 2.0, such as crash data.

Detailed analysis of all road elements, such as individual intersections and short sections of roading, is not possible in a network study of this type. The study generally concentrates on major issues and deficiencies.

3.1  Efficiency Issues/Deficiencies

3.1.1  Route Level-of-Service

A Level-of-Service deficiency analysis focuses attention on the capacity of links (or routes) in a study area. Links that carry low traffic volumes generally provide a good level-of-service to road users, and require little attention with respect to capacity improvements.

Routes that carry high volumes, have significant vehicle bunching, low vehicle speeds or queuing, during peak periods or all-day, provide a poor level-of-service to road users. Such routes generally warrant attention with respect to capacity improvements.

The “Level of Service” concept, which is derived from the Highway Capacity Manual (HCM), and is in common use throughout the world, can be more specifically defined as a six level system (A to F), that can be defined as follows:

Level of service A represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and manoeuvre within the traffic stream is extremely high. The general level of comfort and convenience provided to the motorist, passenger or pedestrian is excellent.

Level of Service B is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select speeds is relatively unaffected, but there is a slight decline in the freedom to manoeuvre in the traffic stream from LOS A. The level of comfort and convenience provided is somewhat less than at LOS A, because the presence of others in the traffic stream begins to affect individual behaviour.

Level of Service C is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by the interaction with others in the traffic stream. The selection of speed is now affected by the presence of others, and manoeuvring within the traffic stream requires substantial vigilance on the part of the user. The general level of comfort and convenience declines noticeably at this level.

Level of Service D represents high density, but stable flow. Speed and freedom to manoeuvre are severely restricted, and the driver or pedestrian experiences a generally poor level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.
Level of Service E represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Freedom to manoeuvre within the traffic stream is extremely difficult, and is usually achieved by forcing another vehicle to “give way”. Comfort and convenience levels are extremely poor, and driver frustration generally high. Operations at this level are usually unstable, because small increases in flow or minor perturbations within the traffic stream will cause breakdowns.

Level of Service F is used to describe forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form. Operations within the queue are characterised by stop-and-go waves, and they are extremely unstable.

It is necessary to determine what a reasonable level-of-service (LOS) is for elements within the roading system. It is our opinion that LOS “D” is the lowest level of service that should be accepted and rates should not be allowed to deteriorate to the next level, LOS “E”. This is backed up by the HCM:

In reality LOS “E” is rarely attained. Perturbations in traffic flow as level E is approached cause a rapid transition to level F

The same type of assessment has also been applied to intersection performance.

The level-of-service of a particular route, or section of a route, can be calculated from its volume, cross-section, vehicle classification (particularly proportion of heavy vehicles) and directional split (vehicles travelling in each direction). Typically the level-of-service is derived for different periods of the day, as often a route will have a poor level of service during peak periods, but not during other periods of the day.

Table 3.1 shows the routes that will obtain an inadequate level-of-service over the next 20 years. These routes were identified using a transportation model, as part of the District Transport Study, and manual calculations.

Table 3.1 - Level-of-Service on Key Routes in Rangiora (Uninterrupted flow)

<table>
<thead>
<tr>
<th>Route</th>
<th>LOS in 2001 Morning Peak</th>
<th>LOS in 2001 Afternoon Peak</th>
<th>LOS in 2021 Morning Peak</th>
<th>LOS in 2021 Afternoon Peak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lineside Road (urban)</td>
<td>C</td>
<td>D</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Southbrook Road</td>
<td>B</td>
<td>D</td>
<td>F</td>
<td>F</td>
</tr>
<tr>
<td>Percival Street **</td>
<td>A</td>
<td>B</td>
<td>D</td>
<td>F</td>
</tr>
<tr>
<td>Northbrook Road *</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>D</td>
</tr>
<tr>
<td>Ivory Road</td>
<td>A</td>
<td>A</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>Ashley Street</td>
<td>A</td>
<td>A</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

* South Victoria, ** West of Ivory

Table 3.1 shows that the main north-south route (Ashley/Ivory/Percival/Southbrook), particularly the southern section already has poor level-of-service during peak periods and that this will deteriorate further over the next 20 years, if current rates of traffic growth are
maintained. It is likely that peak spreading will delay the onset of the poor levels-of-service.

It is evident that the town is getting to a size that a new north-south route needs to be considered, and ideally such a route should be ‘purpose-built’ so that it is capable of carrying high volumes of traffic, including provision for 4-laning.

The level-of-service on all other routes within the town are within acceptable levels for the next 20 years. However, there is the potential for western growth to impact on the level-of service along West Belt and on Townsend Road and traffic volumes on this corridor need to be closely monitored.

3.1.2 Intersection Level-of-Service

The Level-of-Service criterion for intersections is based on movement or intersection delays (definitions are available in the Austroads Guides to Traffic Engineering Practice). The higher the delay generally the lower the Level of service. For priority intersections (stop and give-way controlled) LOS is calculated for each movement. At traffic signals the LOS is calculated from the overall intersection delay per vehicle.

Table 3.2 and 3.3 show the delay and LOS of critical movements (generally right turns) on the main north-south route intersections and other critical intersection respectively. The delay and LOS has been shown only for the worst daily hour (generally morning or afternoon peak).

It should be noted that the results are obtained from traffic intersection models (in this case a software package called SIDRA), and have been calculated to identify deficiencies, rather than as an accurate value of a movement delay. Validation of the delays, through observation and data collection would be required prior to final agreement on delays, and this is outside the scope of this study.

**Table 3.2 - Delay and LOS at Main North-South Route Intersections**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Movement</th>
<th>2001 Delay</th>
<th>2001 LOS</th>
<th>2021 Delay</th>
<th>2021 LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ashley/Kingsbury</td>
<td>RT out of Ashley (AM)</td>
<td>26 sec</td>
<td>D</td>
<td>&gt; 2 mins</td>
<td>F</td>
</tr>
<tr>
<td>Ashley/Blackett/Edward</td>
<td>RT out of Blackett (PM)</td>
<td>47 sec</td>
<td>E</td>
<td>60 sec</td>
<td>F</td>
</tr>
<tr>
<td>Ashley/High/Ivory</td>
<td>RT &amp; TH from High (AM)</td>
<td>49 sec</td>
<td>E</td>
<td>58 sec</td>
<td>F</td>
</tr>
<tr>
<td>Percival/Johns</td>
<td>RT out of John (AM)</td>
<td>&gt;2 mins</td>
<td>F</td>
<td>&gt; 2 mins</td>
<td>F</td>
</tr>
<tr>
<td>Southbrook/South Belt</td>
<td>RT out of South Belt (AM)</td>
<td>&gt;2 mins</td>
<td>F</td>
<td>&gt; 2 mins</td>
<td>F</td>
</tr>
<tr>
<td>Southbrook/Todd</td>
<td>RT out of Todd (PM)</td>
<td>&gt;2 mins</td>
<td>F</td>
<td>&gt; 2 mins</td>
<td>F</td>
</tr>
<tr>
<td>Lineside/Flaxton</td>
<td>RT out of Flaxton (AM)</td>
<td>66 sec</td>
<td>F</td>
<td>&gt; 2 mins</td>
<td>F</td>
</tr>
</tbody>
</table>

Note: AM is morning peak and PM is afternoon peak

Table 3.2 shows that the critical movements from intersections on the main north-south route are right turn from the side-road to the south. The problem is generally worse in the
morning peak period, when right turn flows from the sideroads are the highest. In the evening the major turning movement is left turn into the sideroads; and there is minimal delay. The results shown confirm the concerns raised by Council staff and stakeholders on the difficult faced by many commuters accessing the main north-south route, particularly by those living in Rangiora South.

Anecdotal observations suggest that some residents in Rangiora South are choosing to travel via Townsend Road, Fernside Road, Flaxton Road and Skewbridge Road to avoid these delays.

### Table 3.3 - Delays and LOS at lower volume intersections

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Movements</th>
<th>2001 Delay</th>
<th>2001 LOS</th>
<th>2021 Delay</th>
<th>2021 LOS</th>
</tr>
</thead>
<tbody>
<tr>
<td>King/Johns</td>
<td>All</td>
<td>&lt;12sec</td>
<td>A &amp; B</td>
<td>&lt;14sec</td>
<td>A &amp; B</td>
</tr>
<tr>
<td>High/King</td>
<td>All</td>
<td>&lt;12sec</td>
<td>A &amp; B</td>
<td>&lt;30sec</td>
<td>B &amp; C</td>
</tr>
<tr>
<td>West Belt/High</td>
<td>All</td>
<td>&lt;11sec</td>
<td>A &amp; B</td>
<td>&lt;18sec</td>
<td>B &amp; C</td>
</tr>
<tr>
<td>Blackett/King</td>
<td>All</td>
<td>&lt;12sec</td>
<td>A &amp; B</td>
<td>&lt;16sec</td>
<td>A &amp; B</td>
</tr>
</tbody>
</table>

Table 3.3 shows that the LOS in 2001 at the four intersections modelled is either ‘A’ or ‘B’. Both the King/Johns and Blackett/King intersections will continue to have an excellent LOS over the next 20 years (assume 5% growth per annum for each movement). For some movements the LOS at the High/King and West Belt/High intersection will deteriorate to LOS ‘C’. Proposed network improvements (see latter) on West Belt and elsewhere may have dramatic effects on traffic volumes, and may require capacity improvements at some intersections.

#### 3.1.3 Traffic Volume Expectation

During the district transport study a number of routes were identified that are currently or are in the future likely to carry traffic volumes above what might be expected for their classification in the road hierarchy. In terms of Rangiora the routes were, Southbrook Road, Flaxton Road and Fernside Road. In terms of Southbrook Road, which has the highest road classification, as a strategic route, the main problems are the low travel speeds (40 to 50 kph) and high number of accesses (with associated safety problem). Ideally a purpose-built limited access route should carry such high traffic volumes.

While not identified in the district transport study analysis, Council staff raised concerns that Church Street is acting as a collector route, even though it is classified in the road hierarchy as a local road. It is classified as a local road because of its relatively narrow width opposite Dudley Park, and because of activities around the park entrance, particularly the movement in an out of angle carparking.

It is speculated that traffic may be using Church Street rather than White Street, the closest collector route, because of the speed humps that have been installed in that street. Speed humps are not normally placed in collector streets, particularly if by doing so through traffic might be diverted onto local roads. While the speed humps serve to slow traffic in
the vicinity of the White Street angle parking, there are other ways to slow traffic which are not as severe as speed humps, such as road narrowing, to form gateways. The speed humps should be removed and the road narrowed further.

Community severance is a major concern particularly in a town of the size of Rangiora. As traffic volumes on the main north-south route continue to grow it will become more difficult for residents to cross the route. This is already a major problem during peak periods, and particularly to residents on the eastern side of the route, that work in the main shopping area.

There are two main solutions to this problem, the movement of traffic elsewhere, to routes further east and west, or by providing signalised crossing or over-bridges. The problem with the latter is that several crossing places would need to be provided and these have implications in terms of additional delay to through traffic and costs. A better solution is to divert through traffic to a route further east.

3.1.4 Route, Intersection Layout and Access Location Implications

At high traffic volumes, as occurs on the main north-south route, the layout of intersections and the general route geometry becomes more critical, as deficiencies can create geometric delays, which can lead to bottle-necking (or stop-start queuing), earlier than on straight and well laid-out routes. Poor intersection layout, such as staggered T-junctions (e.g. Red Lion corner) tend to introduce higher intersection delays when traffic signals are installed.

The main north-south route has a number of such deficiencies, which introduce both additional geometric and queuing delay to vehicles travelling along the route and turning into it from sideroads. The main deficiencies along the main route are:

- Layout of the Ashley/Blackett/Edward intersection (five-arms);
- Staggered T-junction at Ashley/High/Ivory (Red Lion corner);
- Reverse priority at Ivory/Northbrook (change stop sign to Ivory Street);
- Close proximity of Johns/Percival and Percival/Victoria Intersection;
- Alignment of Southbrook Road through Intersection with South Belt,
- Layout of the Lineside/Southbrook/Todd/Flaxton/Station intersection; and
- Lineside Road Level railway crossing;
- High number of residential accesses.

As peak hour traffic volumes continue to increase the impacts of all these deficiencies on travel time and safety will become more pronounced and the need for an alternative routes will increase. While interim measures, such as the installation of traffic signals at key intersections and minor geometric improvements may address some concerns, it will be costly and disruptive to address the major deficiencies.
The Dudley Park southern access can be a problem area during certain periods and particularly on Saturdays, when there is a lot of activity centred on the netball courts. The access is wide and not well defined. Turning movements into and out of the entrance-way can conflict with movements in and out of angle and parallel carparks. Within the carpark the surface is gravel, and hence there are no paint markings or definition of pedestrian crossing points or standing areas. There is also not designated drop-off/pick-up area. The lack of access and carpark definition has efficiency and more importantly safety implications.

3.2 Safety Deficiencies and Issues (Motor-Vehicles)

3.2.1 Crash Clusters

Crash cluster, that is locations where three or more injury crashes within 50 metres, were observed at the following locations:

- Blackett/King Intersection (3 crashes prior to roundabout being installed);
- Ashley/High/Ivory Intersection (3 crashes, 1 serious);
- Johns/Percival/Victoria Intersections (3 crashes, 1 serious);
- South Belt/Southbrook Intersection (6 crashes, 1 serious);
- Boys Road/South Belt Railway Crossing (3 crashes, 1 fatal);
- Lineside Railway Crossing (5 crashes).
The Blackett Street/King Street intersection has recently been converted to a roundabout and this is expected to address some of the safety concerns. This site needs to be monitored, and if crash occurrence continues to be a problem, improvement options need to be developed.

The next four sites are on the main north-south route and highlight the need for a purpose-built strategic route, which does not have the geometric layout faults of the current route. As traffic volumes continue to increase, crash occurrence is also likely to increase, and perhaps at a faster rate, as driver frustration levels rise due to side-road delays and the geometric layout deficiencies play a greater part in crash occurrence.

The crash rate along this route, that is the number of crash per 100 million vehicle-kilometres, is a common measure used to assess the safety of a route. The crash rate is often compared with national data to determine whether the crash rate on a route is above or below the national average.

The crash rates for the main north-south route, between River Road and the Lineside Railway Crossing (excluding crashes at the crossing) are given in Section 2.4. The currently crash rate, excluding intersections, is 21 per 100 million vehicle kms, which is on a par with the national rates for this type of route. With intersection crashes the rate is higher, at 37 per 100 million vehicle kms. The crash problems are at the intersections.

### 3.2.2 Railway Crossing Safety and Urban/Rural Speed Limit Changes

The crash cluster analysis above shows that there are safety concerns at the Lineside Road and South Belt railway crossings. At the former the problem is the high approach speeds from the south, often in excess of 100 kph, and the low approach curves, with posted speed limits of 35kph. Given the traffic volumes on Lineside Road, in excess of 10,000 vehicles per day, and which is likely to almost double in the next 20 years, a grade separation of the railway crossing may be warranted, even if some of the traffic is diverted to a new route.

Photo 2 - Lineside Road Railway Crossing.
At the South Belt crossing there are two factors; the high approach speeds from the east and the height of the railway crossing. Speed management prior to the railway crossing is crucial at this location, and some form of threshold treatment is warranted.

There are a number of routes, particularly to the east and west, which have approach speeds into the urban area of at least 100kph. On several route the only form of speed management is a 50kph sign, the start of kerb and channel and a higher frequency of accesses and housing.

Even with this limited speed management, the crash record does not indicate that there is a safety hazard on most rural approaches, other than the location discussed above and on Oxford Road. To the north, the Ashley River Bridge slows down traffic, as does the railway crossing on Lineside Road to the south. To the west, on Oxford Road, a township ‘gateway’ or threshold treatment was installed in 1998/1999, in response to the number of crashes that have occurred on that approach.

3.3 Heavy Vehicles through Routing

There were two primary heavy vehicle routes identified during the intersection surveys, the north west route, utilising West Belt and River Road, and the north to south route, using the main north-south strategic route.

Concerns have been raised by ‘West Belt residents’ regarding the use of West Belt, north of High Street, by heavy vehicles. There is the potential in this area for heavy vehicles to conflict with pedestrians and also the impacts of noise and vibration, particularly during the night. Ideally heavy vehicle movements could be moved further west, but the current rural roads to the west are not wide enough and the route is longer than using West Belt.

Photo 3 – Ashley/High/Ivory Intersection (Red Lion corner)
In terms of the north-south movement of heavy vehicles, the current route used, being classified as a strategic route in the road hierarchy, is the correct route for such vehicles. However, even more than other motorists, heavy vehicles are affected by the poor geometry and intersection layout of this route, and an alternative ‘purpose built’ route to the east would advantage heavy vehicle operators and local residents alike. There would also be benefits in terms of pedestrian and cyclist safety if heavy vehicles were moved away from Red Lion corner.

3.4 Cycle Routes and Facilities

The absence of cycle facilities, including on-road cycle lanes, off-road tracks and intersection treatments is a deficiency of the Rangiora land transport system. As noted in the introduction the provision and promotion of a cycle network is important, and can be used to guide cyclists away from hazard sections of the roading network, such as Red Lion corner. The major users of a Rangiora cycle network are likely to be school children travelling to and from schools and to lesser extent adults travelling to employment areas with the town.

Use of the local cycle network and a wider regional network for commuter cycling to other town and Christchurch is likely to be restricted due to: the travel distances involved, the high speed limits on rural routes and the fitness levels required to make such trips. However, even if numbers are relatively small, rural roading improvements should cater for such road users where possible, as this does offer an alternative to the private motor-car.

The first step in providing a safe cycle network is to specify which roads are going to form the basic cycle network. The next Chapter makes recommendations on such a network.

3.5 Pedestrian Facilities

No major deficiencies were identified within the Rangiora shopping area. Footpath widths and crossing locations appear to be adequate for the foot traffic using this area. While not within the shopping area proper the Red Lion corner intersection is crossed by many residents walking to the shops and walking to and from the recently opened Warehouse. This intersection is particularly hazardous to pedestrians, due to the uncertain and often erratic behaviour drivers, particularly unfamiliar drivers, negotiating the intersection and also visibility problems.

A number of concerns have been raised regarding pedestrian safety around parks and schools. When assessing the demand for pedestrian facilities around parks and schools one needs to be conscious that the high pedestrian volumes are often concentrated into a relatively short period of time and that during large periods of the week there is little activity.

Where possible any improvements should only operate when pedestrian volumes are high. While this is often practical in the vicinity of schools where pupils and teachers can
set up temporary pedestrian crossing points, e.g. Kea Crossings, this is not generally possible in the vicinity of parks. The use of refuge island islands and kerb extensions at such locations is preferred over formal crossing as experience suggests that motorists are less likely to stop at low volume pedestrian crossing.

One area that appears to warrant the installation of refuge islands and kerb extensions is Church Street, between the Rangiora Borough School and Dudley Park. Such a facility would cater for the Rangiora Borough school children who regularly cross over to the Dudley Park sports grounds.

There has also been concerns raise by the New Life School regarding children crossing Denchs Street. There is currently no kerb and channel on the southern side of Denchs Street and cars park right up on the verge, sometimes effectively blocking the southern footpath. This forces children to cross at the Denchs/Southbrook intersection, where there is potential conflict between turning vehicles and pedestrians. At such a location it would be better to encourage children away from the ‘main road’ to a controlled pedestrian crossing point further along Denchs Street. A pedestrian path on the southern side of Denchs Street, kerb and channel and kerb extension should be considered.

3.6 Bus Routes and Facilities

Environment Canterbury has identified that there is the potential to improve bus services to the north of Christchurch, and particularly to Rangiora and the general Waimakariri District. The current bus service is not particularly direct and is not an attractive alternative to private motor-vehicle travel.

A more direct bus route, along Lineside Road and the motorway would be more attractive to commuters, particularly express services. However, assessing the viability of such a route is beyond the scope of a general transport study like this. We would recommend that council discuss this matter further with Environmental Canterbury, who can assist in specialised studies of this type.

Environment Canterbury undertake a survey of bus users annually, and ask them to rate the quality of their bus services. One of the questions they ask bus-users is how they rate the number and quality of bus shelters provided on particular routes. In terms of the Rangiora bus route bus patrons were not particularly happy with the number and quality of bus shelters.

3.7 Parking Facilities

A high proportion of carparking is located within and around the Rangiora shopping area.

As with most shopping areas the extent of kerbside carparking is of concern to residents living in close proximity to the commercial area, as they want to retain use of parking along there road frontages for visitors. To address such concerns the council needs to ensure that sufficient off-road carparking is being provided for new developments, that
the carparking needs to have direct and secure pedestrian connections to shopping areas and that good linkage are provided to the surrounding road network. Both the district plan parking provisions and council review staff have a key role in ensuring adequate carparking is provided, and that carparking is integrated with the existing shopping and carparking areas.

There are concerns that High Street, between King Street and Ashley Street, is still carrying too many through vehicles. While Blackett Street does provide a bypass to the north there is a need to provide a similar route to the south of the shopping area. Queen Street is ideally placed to serve this function, and to form part of a ring road around the shopping area.

To improve circulation of vehicles along Queen Street the stop controls at the Percival and Victoria need to be reversed and ideally a roundabout should be constructed at the King/Queen intersection. The promotion of a ring route, including Blackett Street, King Street, Queen Street, Ashley Street and Ivory Street should assist in removing through vehicles from High Street, so that it can function more like a carpark and pedestrian precinct.

As mentioned previously, the Dudley Park carpark is informal, unmarked and there is no provision for drop-off and pick-up areas. Options to address this issue are discussed in the next chapter.
4
OPTION DEVELOPMENT
4 **Option Development**

4.1 **Strategic/Arterial Routes: North to South**

4.1.1 **Purpose Built Eastern Arterial**

A large number of deficiencies and issues discussed in the previous chapter occur on the current main north-south route through Rangiora, and its associated intersections. The current route is fast approaching its ‘use-by date’ and needs to be replaced with a ‘purpose-built’ limited access, high capacity, route. There are opportunities to create such a route to the east of the town, on land that currently has limited development. However, this opportunity will be ‘short-lived’ as there are plans for residential subdivisions to the east, which may restrict the options that are available in the future.

In the District Transport Study one such route was investigated, utilising East Belt. The proposed route would involve an extension of East Belt, to the south, to link with Lineside Road east of the current railway crossing. This option would also involve the extension of Blackett Street to the east, across the railway line and along Keir Street to East Belt. An economic analysis of the option suggests that this route could be constructed over the next five years. The benefits of the proposed route are such that it is likely to attract a Transfund funding subsidy, which would reduce the funding required from the council and hence ratepayers.

While the East Belt extension is likely to be the lowest cost option for a new eastern strategic route, there are a number of features of the route that make it less than ideal. The most significant feature is that between Northbrook Road and Keir Street there are a high density of existing property accesses, which does not fit with the desire to limit access from such a route and for future four-laning. While the number of accesses could be limited along the extension, there would still be a section, which while straight, would have similar characteristics to Ivory Street.

There is also an issue with traffic on East Belt travelling further north than the Blackett Street extension, perhaps using Wales Street and Coldstream Road to access the northern part of Rangiora, travelling past/through the high school. Increasing the traffic flows through this section of East Belt is not desirable, given the high number of pedestrian crossing movements by school students. The location of the school would also effectively prohibit possible extension of the new route to the north, with a new Ashley River crossing. Such an extension would increase flows outside the high school to in excess of 7,000 vehicles per day, which is not acceptable.

A preferred option is to construct a totally new eastern route (Eastern Arterial) further to the east. To minimise the costs of such a route it may be possible to require construction of sections of the route as part of new subdivision roading. Such a route would also involve several east to west link roads across to the town, including a Blackett Street extension.
Figure 4.1 shows one possible alignment for the Eastern Arterial. A more detailed study is required to confirm the preferred route.

A new Eastern Arterial Route should include service roads for residential property access and kerbside parking. Photo 4.1 shows an example of a service road, on Blenheim Road in Christchurch. The service road and berm need not be constructed until the adjoining lane is subdivided.

Photo 4 - Service Road Example: Blenheim Road, Christchurch

It is recommended that the urban section of the route (north of Northbrook Road initially) be constructed with one traffic and one cycle lane in each direction initially, with stop, give-way and roundabout intersection controls, were applicable. A solid median should also be provided. To allow for future growth it is recommended that provision be made for 4-laning and signalised intersections. This could be achieved by installing an extra wide berm between the service roads and the arterial route.

The rural section of the route, between Lineside Road and Northbrook Road and north of Coldstream Road should have a standard rural road cross-section, of 3.5m wide lanes and 1.5m wide shoulders, with no median and kerb and channel. The difference in cross-section and road design will send signals to drivers that they are moving into a different speed environment. As development spreads it may be necessary to extend the ‘urban’ cross-section further south. To allow for expansion the road designation should be at least 43m wide.
At the southern end of the route a intersection with Lineside Road and possibly a new Southern Link Road (see latter section) would be required. Ideally this intersection would involve grade separation of the turning movements and of the railway crossing (a mini interchange). However initially the intersection should be a roundabout as shown in Figure 4.2 (a concept sketch). Careful design will be required to insure that the high approach speeds on the Eastern Arterial and Lineside Road, which is likely to be 4-laned, are managed.

Figure 4.1 shows a possible extension of the Eastern Arterial across the Ashley River, connecting with Upper Sefton Road just east of Ashley. This extension, combined with improvements at the Harleston Road railway crossing and the widening of Harleston Road would create an excellent northern access to the State Highway network. While the economic justification for a Eastern Arterial extension may be some years away we believe that this is the best long term access route to the north, and should be protected with a route designation.

4.1.2 Interim Improvements on main north-south route

To alleviate problems on the current strategic route, while the recommended eastern route is being investigated it is recommended that a couple of interim measures be undertaken.

The Ashley/High/Ivory (Red Lion Corner) intersection is a problem area and there are currently two options on the table to address concerns; installation of traffic signals and realignment of the northern end of Ivory Street to line up with Ashley Street, which would require relocation of the War Memorial. Given that the measure is an interim one, it seems better to install traffic signals until the new route is opened rather than realign Ivory Street.

The installation of traffic signals would have additional benefits over a realignment, including breaking the current continuous stream of traffic, during peak periods, up into ‘platoons’. This would create gaps in the traffic flow that would allow side-road traffic south of this location to enter the main route. It would also create a safe pedestrian crossing place and improve safety for cyclists, which would address severance problems.

It is also recommended that another set of traffic signals be installed at the southern end of the route, probably at the South Belt/Southbrook intersection. This would reduce side-road traffic delays and break-up traffic heading north during the afternoon peak period. It would also create a pedestrian crossing facility for school children travelling to the Southbrook and New Life Schools. The current ‘Kea’ crossing could then be removed. It is expected that it would also reduce the number of vehicles turning right from Johns Road (and other roads), which is a high-risk movement due to the close proximity of the Percival/Victoria intersection.
4.1.3 Western Arterial Route (and Southern Link Road)

As Rangiora starts to grow towards the west the volume of vehicles travelling west to east across a number of collector routes, such as South Belt, Johns Road, High Street and Kingsbury Street will continue to grow. This will not only increase volumes on these routes and at intersections, but will also increase the number of vehicles wanting to turn right onto either the current north-south route or the new Eastern Arterial.

An alternative is that the north-south traffic be funnelled down a western arterial route, which connects across to Lineside Road, via a Southern Link road. The Southern Link Road would then need to connect with the Lineside Road and the Eastern Arterial Road in such a way that delays to such traffic are minimised. The intersection layout in Figure 4.3 would achieve such a result.

A Western Arterial route would follow West Belt south until Johns, then traverse a new extension of Townsend Road, utilised a ‘sealed’ and widened Townsend Road, swing onto widened Fernside Road and then traverse a new Southern Link Road from approximately the intersection of Fernside and Todd to Lineside Road.

The alignment of the Townsend extension is fixed as it needs to connect with West Belt to the north and Townsend Road to the south. The alignment of the southern link road is not fixed and should be designed to minimise effects on industrial zoned land. Indeed the new road would provide an excellent access route into the current and proposed Rangiora Industrial Area.

The Western Arterial would have various cross-sections. The Southern Link Road would have kerb and channel and a total seal width of at least 12m, which includes two 3.5m lanes and two 2.5m wide parking shoulders, that are wide enough to accommodate large vehicles. Through the rural section of the route, from Todd through to Johns Road, the seal width should be 9m, with 3.5m wide lanes and 1m wide shoulders. The designation through this section should allow for widening to 11 or 12m at a latter date, as the town expands. Through West Belt itself a minimum seal width of 11m, with kerb and channel, should be provided, which allows for 3.5m wide lanes and 2m wide parking shoulders.

The project would involve the redesign of the Fernside/Townsend intersection to give priority to the Western Arterial.

The southern link route would allow the closure of the Fernside/Lineside Road intersection, or at least its restriction to left-in and left-out, which is required if Lineside Road is to be converted into a four-laned median divided expressway.

4.1.4 Function of Current North to South Strategic Route

Once an Eastern Arterial route is opened the current route should be downgraded, to discourage its use as a through route. Recommended changes include:
1. A roundabout should be installed at the Blackett/Ashley intersection, so that priority is given to traffic heading east on Blackett, rather than south on Ashley in the morning peak, and vice-versa in the afternoon peak.

2. Priority at the Ashley/High/Ivory intersection should revert back to priority on High Street. If required the township traffic calming could be extended east to improve pedestrian linkages and safety, particularly now that the Warehouse has gone in.

3. If a Queen Street link is constructed through to the Eastern Arterial (see latter for details) then priority at the Ivory/Queen intersection should be to Queen Street.

4. Priority at the Ivory/Northbrook intersection should revert to Northbrook Road.

5. Northbrook/Victoria Street should be realigned so that it intersects with Percival Street further north, and that Percival Street should have priority.

6. The Lineside Road arm of the Lineside/Flaxton/Todd/Station intersection should be closed. This of course will depend on the timing of the Southern Link Road and an interim intersection design may be required. The north-south through route should be Southbrook onto Flaxton Road. The Todd and Ellis arms should be combined into one that intersects the main route at 90 degrees, or thereabouts. The Station Road arm should be widened and made into a two-way link, as Station Road and Marsh will be a main link across to the Eastern Arterial. The new intersection should be a roundabout.

7. The Flaxton/Southern Link Road intersection should be a roundabout, so that priority in the morning peak is to the western arterial traffic.

4.2 Strategic/Collector Routes: West to East

4.2.1 Commercial Area (CBD) Ring Road

The effectiveness of the new Eastern Arterial will be dependant on the location of the east to west connecting routes and the ease at which traffic will be able to get onto the new route (refer to Figure 4.1). The two key connecting routes will be Blackett Street Extension and also a link across from Queen Street. Both these routes will be main connectors into and out of the shopping area.

The Blackett Street Extension would be relatively straight-forward to construct, given the current layout of Blackett Street and Keir Street. The major issue for this option is the location of the railway siding. A link across to Queen Street would be disruptive to adjoining residential areas and would require the purchase of several houses.

Short term such a link to Queen Street may not be required, with the Blackett Street Extension and Northbrook Road links providing the necessary access to the shopping area. However in the medium to long term a link across to Queen Street, effectively completing a ring route around the shopping area would be desirable. Such a ring road would encourage traffic off High Street.
To encourage use of such a ring road, which would include parts of King Street, East Belt, Blackett Street and Queen Street, improvements to Queen Street would be required. This would include roundabouts at the intersection of Queen and King and also East Belt and priority at each of the stop and give-way controlled intersections between these two points.

Such a route would help connect the light commercial retail that has already spread to the east of the current shopping area to the existing retail area. It would also provide excellent external links into the various carparks around the back of the central shopping strip.

### 4.2.2 Other Links to Eastern Arterial

Other links would be provided to the Eastern Arterial along Station/Marsh Road, South Belt/Boys Road, Northbrook Road Wales Street Extension and Coldstream Road. Other than the Wales Street Extension, such connections would be relatively easy to construct as the roads currently exists and all that would be necessary is some localised road widening.

The Wales Street Extension is not so straightforward and would require modifications to the high school grounds and buildings and also substantial widening of the western section of Wales Street. The impact of such a link needs to be closely examined as part of a more detailed investigation of the Eastern Arterial. There may be other options available for such a link, further north.

We would recommend that the function of Kippenberger Avenue be downgraded if the Eastern Arterial is pursued, so that traffic would be diverted away from High street and the Ashley/High/Ivory intersection. At the eastern end of Kippenberger Avenue it is recommended that Rangiora-Woodend Road be extended further to the north-west and connect up with a further extension of Blackett Street. This would then encourage vehicles travelling along this route onto the Blackett Street Bypass, rather than directing them towards High Street. Any new intersections along Kippenberger Road, as part of new subdivisions, should give priority to north-south routes, so that through traffic can not be guaranteed a through run along Kippenberger Avenue.

### 4.2.3 Heavy Vehicles Bypasses: Eastern & Rangiora North-West Arterial

The construction of the Eastern Arterial would significantly reduce the volume of heavy vehicle travelling north to south on roads such as Ashley Street and Ivory Street, which are effectively only standard width residential streets. The layout of these residential streets does not provide an adequate ‘buffer’ between houses and the heavy vehicles, in terms of noise and vibration effects. Such effects are likely to worsen as traffic volumes grow. The new arterial route has a much wider ‘buffer’ area between traffic and houses, with a wide berm area and a service road, and hence the environmental affects of heavy vehicles on adjoining properties is likely to be minor, even at high traffic volumes.

The safety and environmental effects of heavy vehicles on the northern section of West Belt has also been identified. Heavy vehicles travelling from the west to the Cones Road
Ashley Bridge either have to travel through the town and onto Ashley Street or use West Belt. Most drivers appear to choose the former, which has a lower impact on the residential area, but is not a satisfactory option long term, particularly if new subdivisions occur to the west of West Belt.

Alternative rural roads further west, such as Lehmans Road, are both too narrow for large commercial vehicles and less direct than the West Belt route. With the development of residential subdivisions to the north-west there is an opportunity to construct a north-west arterial route that serves as a heavy vehicle bypass (refer to Figure 4.1). Such a route would need to have limited access, and frontage housing would need to be well set-back from the roadway. Such a route could eventually connect with Oxford Road, but even a northern link across to Lehmans Road and the widening of Lehmans Road would provide a suitable bypass route. Such a route should be sign-posted as a heavy vehicle bypass.

If the eastern arterial extension to the north goes ahead then an extension of River Road to the east, to connect with the new arterial, would be desirable. We recommend that a designation for such a route be put in place.

### 4.3 Collector Route Upgrades

#### 4.3.1 White Street Traffic Management Changes

It is recommended that the speed bumps in White Street, outside the Dudley Park angle parking, be removed in favour of more severe road narrowing and additional planting, as speed bumps are not considered a suitable traffic calming feature on a collector route. There are anecdotal observations that suggest that the speed bumps are pushing traffic away from White Street onto Church Street, which is not desirable, given the narrowness of sections of Church Street and the higher number of school age pedestrian crossing the road to Dudley Park.

The preferred treatment, as identified above, is to narrow the road to form a gateway effect at the current speed bump locations. This will slow drivers down but not cause the discomfort of travelling over a speed bump. Added to this the presence of parked and manoeuvring vehicles during busy periods, and extra planting, as part of the narrowing and gateway effect, should send clear signals to motorists to slow down and be cautious. When the car parking area is quiet, which is the majority of the time, drivers will be able to negotiate the area at a reasonable speed.

Road narrower below that currently provided need not impact on cyclists, if a slip lane, approximately 1m wide, between the kerb extension and the footpath, is provided, which is just wide enough for a cyclist to slip through.

#### 4.3.2 Collector Routes for Eastern and Western Development Areas

It is important that the roading provided for any new residential or industrial subdivisions ties in with the current urban roading network, and does not rely on a single access to the
current road network. Such an arrangement can create capacity problems in the long term, particularly for larger subdivisions, and can also be restrictive for residents travelling in certain directions.

An example, of this type of situation is the Wigram industrial area, which only has a single main access off Curletts Road. There is considerable congestion at the access intersection during peak periods, so much so that an alternative access has been suggested. Such restrictions also results in unnecessary travel on the surrounding road as vehicles may have to take an indirect route to get to where they are going.

Figure 4.1 shows a proposed network of collector routes to the east and west of the town. The routes shown need not be straight, but needs to be continuous.

For example, to the west of the town a new collector route half-way between Lehmans Road and West Belt has been shown. This route need not be straight, but should extend from the new ‘northern arterial’ right through to Fernside Road, so that it does fulfil its function as a distributor of traffic from local roads to the arterial and strategic roading network.

There are a number of local road network layouts that could tie in with the collector networks shown. Routes within a particular ‘square’ of collector routes should connect at a number of locations, rather than at a single point. There should be a combination of cul-de-sacs, crescents and through routes. Rather than restrict subdivision design it is recommended that the council work with individual developers to produce suitable local roading networks within the specified framework of collector, arterial and strategic roading networks.

### 4.4 Dudley Park Improvements

Figure 4.3 shows a possible layout for the Dudley Park off-road carpark and access. Its features a one-way entry, new one-way exit, a pick-up and drop-off area, pedestrian only areas, pedestrian crossing places and formal carpark layout.

An entry only access has been recommended because of the narrow width of Church Street at the access point, visibility problems to the south and the added complexity of nearby parallel and angle parking and pedestrians walking from carparks up the access. The creation of a new exit point onto White Street also links the off-road carpark with additional parking on White Street for occasions when the off-street carpark is full.
The pick-up and drop-off area has been located so that children playing netball at the courts can exit a vehicle and travel to the courts within crossing a road, access or carpark. If children do need to access the northern part of Dudley Park raised pedestrian crossing places has been provided at each end of the drop-off area.

The two major disadvantages of the proposed plan are; 1) the creation of the exit access route separates the larger northern section of the park from the smaller southern section and 2) that the exit is quite a distance from the entrance. The first problem has been mitigated by the provision of several formal pedestrian crossing points and a narrow access width, to slow down vehicles. The latter can not be easily mitigated, without the purchase of several houses, which would raise improvement costs substantially.

4.5 Cycling Initiatives

Rangiora currently does not have a cycle plan, and the preparation of such a plan is recommended. Figure 4.4 shows a possible cycle network for the town. The main cycle routes are King Street, Kingsbury Street, Wales Street, Blackett Street, Johns Road, to King Street, South Belt and Southbrook Road, between South Belt and Denchs Road.

As Rangiora grows to the east a cycle route either up the railway line (from South Belt to Wales Street) or along the new Eastern Arterial (allowance for such a route has been made in the proposed cross-section) should be added to the cycle network. At the same time a route from the Johns Road/King Street intersection to the railway line should be investigated.

Once consensus has been reached on the routes to include in the cycle network, plans should be prepared for cycle lanes and intersection treatments on the network. Priority should be given to the high-risk intersections and to the higher volume cycle routes. A more extensive cycle count to that undertaken in this study should be undertaken. Promotion of the route should be undertaken, particularly through the schools.

4.6 Pedestrian Facilities Improvements

No substantial pedestrian facility upgrades are proposed.

The installation of traffic signals at Red Lion Corner and the South Belt/Southbrook Road Intersection would make crossing the main north-south route safer for pedestrians at these locations. The construction of an Eastern Arterial would lower volumes on the current main north-south link, which would make it easier and safer for pedestrians to cross this route during peak periods.

The proposed Dudley Park carpark improvement would improve pedestrian safety in the carpark and at the current access.
4.7 Car Parking Requirements

The Dudley Park carpark improvements would formalise this carpark and could potential lead to better utilisation of the White Street carparking area.

The proposed Eastern Arterial would reduce traffic volumes on Ashley Street, south of Blackett Street, which would address safety and efficiency concerns at the New World carpark access.

The proposed ring road around the shopping area is expected to reduce traffic volumes on High Street, which would reduce the potential for collisions between manoeuvring vehicles and through traffic. The ring road would also improve access to carparking behind the main shopping area, particularly from the south.

4.8 Public Transport Initiatives

There is potential to improve public transport services between Rangiora and Christchurch, and in doing so to provide an attractive alternative to the motor-car.

It is recommended that the Council approach Environment Canterbury regarding the setting up of a ‘non-commercial’ direct bus service from Rangiora to the Christchurch CBD, with peak period ‘express’ buses. We would also recommend that the council request that modern buses, such as those used for the Orbiter Route and inter-city loop, be used on the new service, as this will appeal to some potential bus-users.

It is recommended that an audit of the current bus-stops and shelters be undertaken, and that a programme of improvements to the bus stops, including new seating, shelters and timetable displays be prepared and implemented. Future, improvements might also include the provision of ‘real-time information’ displays, like those that have recently been installed in Christchurch, at the bus exchange.

A passenger rail service is not considered viable at this time, but may be an option in the long term.
5
OPTION EVALUATION & RECOMMENDATIONS
5 Option Evaluation & Recommendation

5.1 Construction Costs

Costs have been prepared for all the significant capital works projects and for several of the smaller improvement projects. These are ‘rough order costs’ and should be treated as such. We recommend that a more detailed analysis of costs and benefits be undertaken for each project prior to applying for Transfund subsidies or allocating council funding. The costs estimates are summarised in Table 5.1.

<table>
<thead>
<tr>
<th>Option</th>
<th>Construction Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. East Belt and Blackett Street Extensions</td>
<td>$3,700,000</td>
</tr>
<tr>
<td>2. Eastern Arterial (excluding service roads*, connecting roads and Lineside Road Roundabout)</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>3. Eastern Arterial Connection Roads</td>
<td></td>
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<tr>
<td>Coldstream Road Upgrade</td>
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<tr>
<td>Wales Street Extension and Widening</td>
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<tr>
<td>Blackett Street Extension &amp; Roundabout</td>
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<td>Queen Street Extension &amp; Roundabout</td>
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<tr>
<td>Northbrook Road Upgrade</td>
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<tr>
<td>South Belt Widening</td>
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<td>Station Road/Marsh Road Widening, Lineside Road closure and Todd/Southbrook Intersection Upgrade</td>
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<td>4. Blackett Road Extension from Eastern Arterial to Rangiora-Woodend Road (1.5km)</td>
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<td>5. Ashley/High/Ivory Traffic Signals</td>
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<td>6. South Belt/Southbrook Traffic Signals</td>
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<td>7. Eastern Arterial/Southern Link Road Roundabout</td>
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<td>8. Southern Link Road and Western Arterial</td>
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<td>Southern Link Road (1.2km)</td>
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<td>Fernside Road and Townsend Road Widening and Upgrade (1.6km)</td>
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<td>West Belt Upgrade</td>
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<td>9. Northern Arterial (West Belt to Merton – 2.9km)</td>
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<td>10. Widening of Ashley River Bridge plus approach upgrades</td>
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<td><strong>TOTAL ##</strong></td>
<td><strong>$23,600,000</strong></td>
</tr>
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</table>

* It has been assumed that the service roads and berm would be constructed and financed by developers. We have priced a 2-lane route with kerb and channel.

## Beca have assumed that Eastern Arterial rather than East Belt extension would proceed, as these options are mutually exclusive. The total does not include the cost of the East Belt extension.
5.2 Option Benefits & Recommendations

The benefits of the improvement option are discussed in detail in the preceding Chapter. The options we recommend be carried through to more detailed analysis, along with a summary of their benefits, are shown in Table 5.2. Where appropriate a benefit-cost ratio has been shown. We have ranked the projects in the order we believe they should be investigated and/or implemented.

It is recommended that each of the options detailed in Table 5.2 be carried forward to more detailed analysis at the beginning of the timeframes specified. For example, projects that have a specified timeframe of 5 to 10 years should be the subject of a more detailed study, such as a scheme assessment, in five years time. The remaining time period is our estimate of the time it will take for the project to be investigated, designed, proceed through the RMA process and constructed.

The rankings provided are indicative only. The ranking of a number of the new roading projects is highly dependant on the rate and location of growth, particularly options that will be partially or fully constructed as part of new subdivisions. A number of the options have been evaluated, using a transportation model, in the District Transport Study (DTS). The ranking specified takes into account the analysis undertaken in the DTS.

Further analysis of the new roading options specified, using the transportation model, is recommended, to refine the timeframes and ranking. This would involve refinements to the transport model, within the town, to improve the model predictions.

As the town grows, there will be a need to regularly update the transportation model and revisit the analysis of improvement options. This is particularly relevant for the Southern Link Road and Western Arterial route as it won’t be required until substantial growth to the west occurs. If growth to the west occurs at a faster rate than expected then the construction of this route will need to be brought forward.


Table 5.2 - Improvement Option Benefits and Ranking

<table>
<thead>
<tr>
<th>Rank</th>
<th>Option</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Interim Improvements to main north to south strategic route:</td>
<td>- Would break traffic up into platoons that would create gaps for vehicles entering the main route downstream of the traffic signals. - Would address some of the severance problems caused by increased traffic volumes, by creating two ‘safe’ crossing places for Pedestrians and cyclists.</td>
<td>- Increased delays for through traffic - Increase in vehicle emissions</td>
<td>1 - 2 years</td>
</tr>
<tr>
<td></td>
<td>Traffic signals at Ashley/High/Ivory and Southbrook/South Belt</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Intersections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Eastern Arterial, with links to the town and modifications to the</td>
<td>- New route could be 4-laned in the future. - All intersections would have a standard layout - New route could have a cycle-lane - Reduced severance effects on current route - Moves heavy vehicles away from residential streets - Reduces traffic volumes through Red Lion Corner - Multiple railway crossing places would be used rather than concentrating traffic at Lineside Road railway crossing - Addresses the majority of pedestrian and cycle safety concerns on current route. School children travelling to high school would no longer have to cross main route.</td>
<td>- Eastern Arterial would result in severance and the loss of rural land and some dwellings - Blackett Street extension would impact on rail operations and significantly increase traffic volumes on Keir Street, which would have an impact on noise and emission levels and safety - Would require additional railway crossing(s) - Queen Street extension would have an adverse effect on surrounding housing in terms of noise, vehicle emissions and safety</td>
<td>1 - 5 years</td>
</tr>
<tr>
<td></td>
<td>current main north to south link (# refer to footnote on East Belt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Extension)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Collector route network in eastern and western growth areas</td>
<td>- The establishment of several north-south and east-west collector routes, joining at appropriate locations with current routes will ensure that new subdivisions are integrated into the current roading network.</td>
<td>- None identified, if new routes are constructed as part of subdivisions.</td>
<td>1 – 15 years</td>
</tr>
<tr>
<td>4</td>
<td>Township cycle plan: including on-road and off-road cycle lanes and</td>
<td>- Lower risk of cycle crashes. - Make cycling more attractive.</td>
<td>- Minimal impact, unless road widening is required to accommodate cycle lanes. In this case may impact on road frontage of several houses.</td>
<td>1 – 5 years</td>
</tr>
<tr>
<td></td>
<td>intersection treatments. The details to be investigated in a more</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>focused study.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Rank</td>
<td>Option</td>
<td>Advantages</td>
<td>Disadvantages</td>
<td>Timeframe</td>
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</tbody>
</table>
| 5    | Direct (Ecan) bus route from Rangiora to Christchurch along Linesside Road and motorway. Peak hour express routes. | - Would make bus travel more attractive by reducing journey times.  
- Would create a better alternative to private vehicle travel.                                                                                                           | - None identified                                                                                                                                                                                                                                                  | 1–3 years  |
| 6    | Upgrade bus shelters and install new shelters and bus timetable and route data (even real time information screens). Use of more modern bus fleet to service route. | - Would improve the image of bus travel and the ease of use.  

| 7    | Commercial Area (CBD) ring Road and associated improvements | - Would provide alternatives routes for traffic wanting to travel around the CBD/Shopping Area and also to the southern carparking area behind the shops.  
- Would provide better link to new eastern arterial, rather than the current Kippenberger Avenue and High Street link. | - Would increase traffic volumes on Queen Street with possible increase in environmental impacts, eg. traffic noise, vehicle emissions.  
- Would increase traffic volumes travelling past Rangiora Borough School                                                                                                    | 1–10 years |
| 8    | Dudley Park Carpark improvements (including access improvements and sealing and formalisation of carpark) | - Reduce number of conflicting movements at carpark entrance and hence improve safety.  
- Relocate pick-up and drop-off activities into specific off-road parking area  
- Create footpath area around netball courts and from courts to Church Street  
- Formal parking layout will control vehicle movements and reduce risk of pedestrian/vehicle crashes. | - A road through park would create a barrier for pedestrians walking through the park.  
- Separation between entry and exit points, resulting in some vehicles being diverted a significant distance from desired path. There are benefits in retaining entry and exit onto Church Street. Other higher cost options could be considered.  
- Impacts on stormwater plans in the park.                                                                                       | 1–2 years  |
<p>| 9    | White Street Traffic Calming modifications- remove speed humps, and narrow gateways to compensate | - White Street should be more attractive for through traffic, and street is therefore more likely to function as a collector route                                                                 | - travel speeds may increase if new measures (road narrowing) not effective. Needs to be monitored.                                                                                                                        | 1–2 years  |</p>
<table>
<thead>
<tr>
<th>Rank</th>
<th>Option</th>
<th>Advantages</th>
<th>Disadvantages</th>
<th>Timeframe</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Ashley Bridge widening</td>
<td>- Lower risk of head-on and cyclist sideswipe crashes</td>
<td>- may be better to wait and construct a new bridge. Crash occurrence needs to be monitored.</td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>11</td>
<td>Blackett St extension to Rangiora-Woodend Road and downgrading of the current classification of Kippenberger Avenue to a local or collector route</td>
<td>- Traffic travelling to and from Woodend would be diverted onto the Blackett Street Bypass, rather than onto High Street and through Red Lion Corner, as currently occurs. - Reduces traffic through Red Lion Corner, which will address some of the safety concerns.</td>
<td>- May impact on light commercial development along Kippenberger Avenue, by removing passing trade.</td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>12</td>
<td>Millton Road extension (as part of subdivision roading)</td>
<td>- Creates a more direct route from the Ashley River Bridge and Woodend, via Rangiora-Woodend Road. - Reduces the proportion of vehicles that would otherwise have to travel through the new eastern arterial and Blackett Street intersection.</td>
<td></td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>13</td>
<td>Western Arterial and Southern Link Road</td>
<td>- Creates a new arterial route servicing western and southern area of Rangiora. - Would reduce the number of vehicles travelling west to east to the current or proposed main north-south route. - Would improve accessibility to the proposed Industrial subdivisions in Rangiora South - Would cater for traffic generated by proposed western residential subdivisions. - Would enable the Flaxton Rd/Lineside Rd intersection to be closed, so that this section of Lineside Road could be median divided.</td>
<td>- Would increase traffic volumes along West Belt, particularly south of the intersection of West Belt with High Street. - Would cut across a number of properties in Southbrook, a number of which are zoned industrial. - Widening and extension of Townsend road would effect adjoining properties.</td>
<td>5 – 10 years</td>
</tr>
<tr>
<td>14</td>
<td>Rangiora North-West Arterial – Heavy Vehicle Bypass.</td>
<td>- Stage 1 would produce an attractive alternative route for heavy vehicles travelling from the west to the Ashley River Bridge. This would reduce the proportion of heavy vehicles travelling into the town and particularly using the northern section of West Belt. - Extension of the route further west, will make the route even more attractive as a heavy vehicle bypass.</td>
<td>None identified, if constructed as part of subdivisions.</td>
<td>5 – 15 years</td>
</tr>
<tr>
<td>Rank</td>
<td>Option</td>
<td>Advantages</td>
<td>Disadvantages</td>
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<td>------</td>
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</tr>
<tr>
<td>15</td>
<td>Lehmans Road to River Road, along with seal widening along Lehmans Road to create a heavy vehicle bypass route.</td>
<td>- Long term this extension could form part of a high capacity through route linking Rangiora with SH 1 at the Lineside Rd/Smith St interchange and the Harleston Road intersection. Would require upgrades to Upper Sefton Road and Harleston Road. &lt;br&gt;- Would remove the ‘dog-leg’ that exists in the current route, being Coldstream Road, Ashley Road, Cones Street and Upper Sefton Road.</td>
<td>- May impact on residential properties in Ashley, depending on alignment. &lt;br&gt;- Some severance of properties</td>
<td>20 years +</td>
</tr>
<tr>
<td>16</td>
<td>Rangiora Southern Arterial, with new bridge at the end of Bradleys Road.</td>
<td>- Would provide a more direct link between Ohoka and Mandeville and Rangiora.</td>
<td>- Increase in traffic volumes on Bradleys Road and Easterbrook Road. &lt;br&gt;- Impacts on rural land.</td>
<td>20 years +</td>
</tr>
</tbody>
</table>

# Until a more detailed investigation is undertaken it is unclear whether the eastern arterial or the east belt extension would be the preferred route. We have assumed that the Eastern Arterial would be selected, as the East Belt extension has at least two deficiencies, being the; high density of local accesses over parts of the proposed route and the possibility that additional traffic would travel past the high school.
5.3 Where to from here

Following the consultation stage, in which stakeholders and members of the public will have the opportunity to comment on this report, the options recommended, will be revisited. Depending on the results of this investigation some options may be deleted, new options may be added, or changes may be made to the ranking of projects. Following completion of the consultation process a final report, with recommendations, will be prepared and presented to the Council.

Once recommendations are confirmed, and funding criteria met, a scheme assessment study will be carried out to refine and develop the improvement options.

Where a new roading corridor is required, an Assessment of Environmental Effects (AEE) report would be prepared to apply for roading designations. The designation process is subject to the full statutory planning process that gives stakeholders and landowners full participatory rights, including lodging of submissions and a right to be heard at any hearing conducted by Council or the Environment Court.

Report Prepared By: Shane Turner  Signed ................................................

Report Reviewed By: Stephen Hewett  Signed ................................................
Appendix A: Rangiora Transport Study Proposal
Study Brief

Rangiora Transportation Study

Prepared for
Waimakariri District Council

By
Beca Carter Hollings & Ferner Ltd

December 2000
1 Introduction

The Waimakariri District Council has requested a brief and proposal from Beca Carter Hollings and Ferner Ltd to prepare a Transportation Study for Rangiora township.

The study area is identified on the drawing enclosed in Appendix A.

2 Objectives

The objectives of the study are:

1. To identify key transportation issues in Rangiora, by:
   - Reviewing existing traffic flow data, road inventory data and accident data.
   - Conducting an Issues and Options Workshop with the Rangiora Advisory Group.

2. To develop options for addressing each of the key transportation issues.

3. To develop a range of preferred options through benefit-cost analysis of higher cost options and priority ranking of lower cost options (<$50,000).

4. To produce a report outlining the issues and preferred options.

3 Study Outputs

The outputs of the Study will include:

- A brief presentation package for the Issues and Options Workshop.
- A bullet point list of Key Issues following the Issues Workshop.
- A draft report and, following consultation, a final report outlining the issues and recommended options.
- One schematic (A1) plan showing the recommended strategy.

4 Methodology

4.1 Issues Identification

4.1.1 Existing Information

Existing traffic flow data will be extracted from Council databases, as appropriate. We are aware that there are recent link counts for a number of routes. We would also extract link count data from the CTS Model (1996 and 2021).
Intersection counts have also been collected at several strategic intersections during the District Transport Study. Additional intersection counts and also counts of other transport modes (e.g. cycling and walking) may need to be collected, depending on the issues raised (this would incur additional costs and be at the discretion of the Council).

The counts available will be used to assess the level of service on major routes and intersections within the study area both now (2000), and in 20 years time (2020). Only key intersections will be examined, using the Sidra intersection software. Any deficiencies will be presented at the Issues Workshop.

Accident data will be extracted from the LTSA’s CAS databases. This data will be plotted on collision diagrams and accident clusters and common factors contributing to accidents will be identified. Trends in accident occurrence will be discussed.

The Council has supplied the following list of issues that need to be considered as part of the study:

- Improvements to Ashley/High/Ivory Intersection.
- Integration and servicing of the Eastern Growth Area.
- Confirmation of the road hierarchy.
- Any designations that may be required and the likely time-frame.
- Eastern bypass at the edge of Eastern development area.
- Alteration of priorities on Queen St/Albert St intersection.
- Access to CBD parking.
- Blackett St extension across the railway line.
- Extension of East Belt to the south.
- Identification of any missing links.
- Intersections Upgrade at Percival, Victoria, Johns with South Belt.
- White Street traffic management.
- Dudley Park access, including Church Street.
- High St parking.
- Cycle routes to schools and CBD.
- Roundabout upgrades.
- Integration of the western growth.

During this stage our traffic engineer will drive all routes in the area and identify any deficiencies that are apparent and also confirm issues already raised by Council. We do not intend to identify any deficiencies or evaluate any options using the CTS Model. Reference, however, will be made to the traffic volume data and deficiency plots prepared as part of the District Transport Study.

A list of issues and deficiencies will be prepared for the Issues Workshop.
4.1.2 Issues and Option Workshop

The preliminary issues and deficiencies identified from the review of existing data will be presented to a workshop involving WDC officers and the Rangiora Advisory Group. The presentation will be followed by a brainstorming session intended to produce further issues for consideration. We would also record any options raised.

Workshop participants will have the opportunity to identify their areas of particular concern, discuss issues and deficiencies raised by the consultant (Beca), and other stakeholders, and to prioritise issues as having high, medium or low importance.

The workshop would be held on a weeknight from 7 pm to 9 pm. The first half an hour being for the presentation.

4.1.3 Interim Issues Report

Following the Issues Workshop, a list of the key issues (prioritised) will be produced and submitted to WDC.

4.2 Option Development and Report Preparation

A series of options will be developed to address the issues that have been raised during the preceding process.

Options will be classified into maintenance, minor safety or capital works. For the latter class, options will be ranked using benefit/cost analysis.

A Draft Final Report detailing the issues identified and the preferred options, including BCR values for capital works, will then be produced. The report will be submitted to the client for review. The report will be amended to incorporate WDC’s comments and will then be issued for public submissions.

We have assumed that WDC would arrange printing and distribution of the report (from originals provided by Beca). Beca would process public submissions and make any (text) changes that are necessary to the report. No additional BCR analysis would be undertaken.

The Final Report will then be produced.

We have not allowed for public presentation of the draft or final reports.

5 Proposed Outcomes

5.1 Programme

1. Study brief (this document)
2. Issue and Options Workshop (to discuss and develop issues for consideration)
3. List of key issues (prioritised)
4. Draft report
5. Public consultation (submission period)
6. Final Report

6 Management Meetings and Information Required From Client

6.1 PCG Meetings

We have allowed for three one-hour monthly PCG meetings (proposal dates given below).

The proposed PCG Team is:

1. Andrew Robinson
2. George Jasonsmith
3. Shane Turner
4. Bruce Thompson
5. Richard Johnstone

PCG Meeting Dates:
1. February 8
2. March 8
3. April 19

Progress (letter) reports will be submitted at least three working days prior to each PCG meeting. Meeting minutes (email) will be issued within ten working days following the meeting.

6.2 Information from Client (WDC)

We have assumed that the WDC will provide the following information:

- Traffic Counts
- Previous studies and engineer reports on transport concerns
- Board reports and submissions relates to transport matters
Rangiora Advisory Group contact details.
Other information that is requested during the study