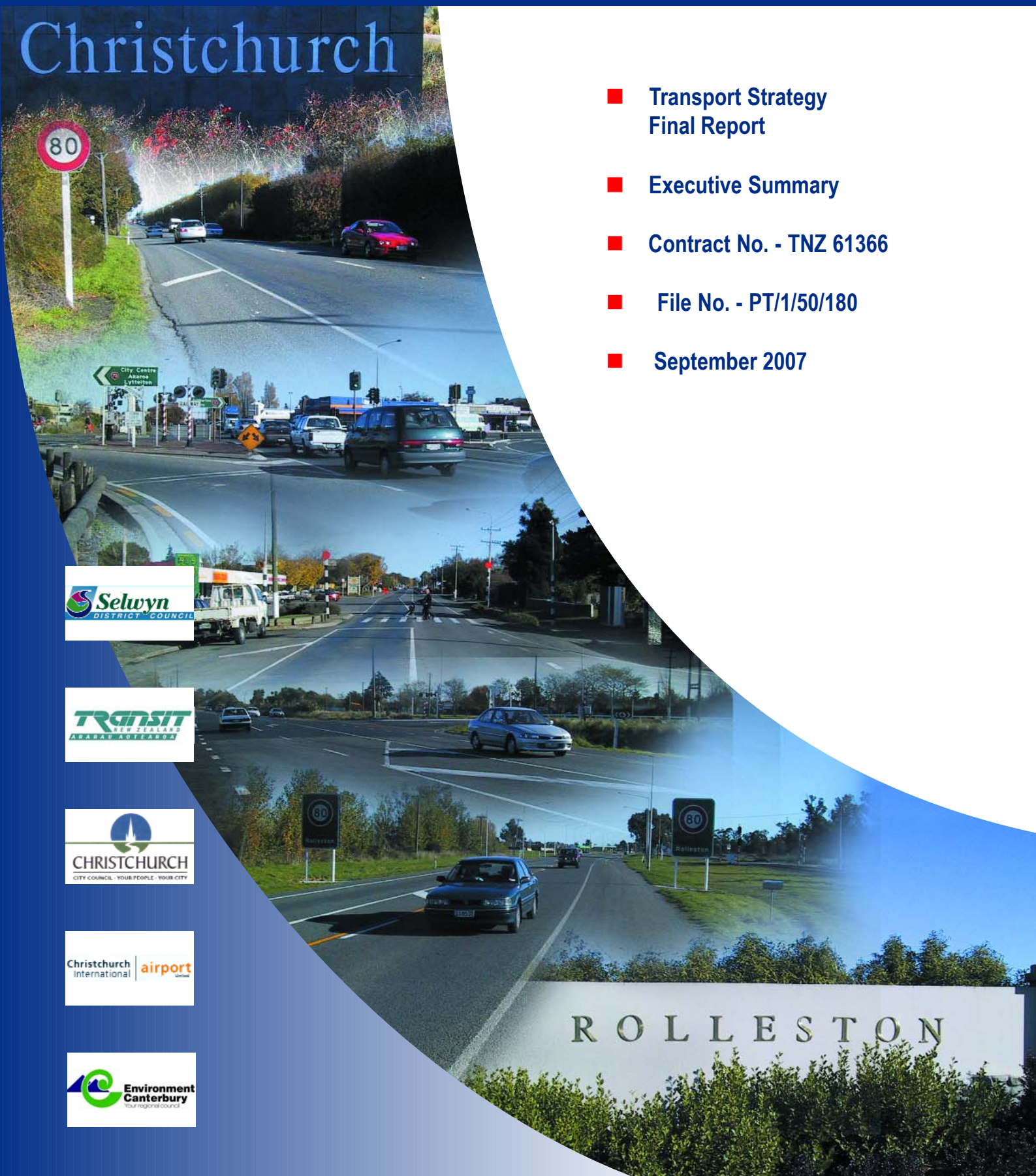
CHRISTCHURCH, ROLLESTON AND ENVIRONS TRANSPORTATION STUDY



- Transport Strategy
  Final Report
- Executive Summary
- Contract No. - TNZ 61366
- File No. - PT/1/50/180
- September 2007

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Transit New Zealand

Christchurch City Council

Christchurch International airport

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Transit NZ Contract 61366
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Christchurch, Rolleston and Environs Transportation Study

Transport Strategy
Final Report
Executive Summary

September 2007
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1	5/06/07	Initial Draft	LZ	MDF/RJC	MDF	GKW
2	14/08/07	Revised Draft	LZ	MDF/RJC	MDF	GKW
3	28/09/07	Final Report	TLM	MDF/RJC		

1. Introduction

1.1 Introduction

The Christchurch, Rolleston & Environs Transportation Study (CRETS) began in early 2002. The study has been undertaken by Connell Wagner (the Consultant), on behalf of the Study Partners, comprising (in no particular order):

- Transit New Zealand – Road Controlling Authority for State Highways,
- Selwyn District Council – Road Controlling Authority for roads in Selwyn District excluding State Highways,
- Christchurch City Council – Road Controlling Authority for roads in Christchurch City excluding State Highways,
- Environment Canterbury – Responsible for Public Transport and managing the Regional Land Transport Strategy,
- Christchurch International Airport Ltd – Responsible for Airport Operations and most roads on the Airport Campus.

Other interested groups in this study have been identified as but not limited to (in no particular order):

- Land Transport New Zealand (previously Land Transport Safety Authority and Transfund New Zealand),
- New Zealand Police,
- Road Transport Forum,
- Automobile Association,
- Public Transport Operators,
- Cycling Advocate Networks / Spokes,
- Ngai Tahu.

In the Terms of Reference for the study, the Objective is:

> *'The study of transportation requirements in the Christchurch to Rolleston broad area is seen as a key component in the planning for the development of the roading network to the west and south of Christchurch for the ensuing 25 year period.*
>
> *The key output of the study is the identification, justification and reporting of a strategy that details the most appropriate stages for the progression of improvement projects that will achieve an ideal roading network to satisfy projected demands."*

This study focuses on identifying shortcomings in the strategic transport network to the southwest and south of Christchurch and developing and assessing various options to find a strategy to counter the shortcomings identified. The area includes the Selwyn towns of Rolleston, Lincoln, Springston, West Melton, Tai Tapu, Templeton and Prebbleton; the south western suburbs of Christchurch generally including Hornby, Sockburn, Wigram and Halswell; and the Christchurch International Airport. The study area within the context of greater Christchurch has been included as Figure 1.

With the introduction of the NZ Transport Strategy 2002 and the Land Transport Management Act (LTMA) in 2003, the study now takes into account the relevant sections of the LTMA which requires solutions to contribute to an integrated, safe, responsive and sustainable land transport system. As a result, the study not only considers improvements to the roading network, but also includes other transport mode opportunities, including passenger services (both road and rail) and cycling and walking

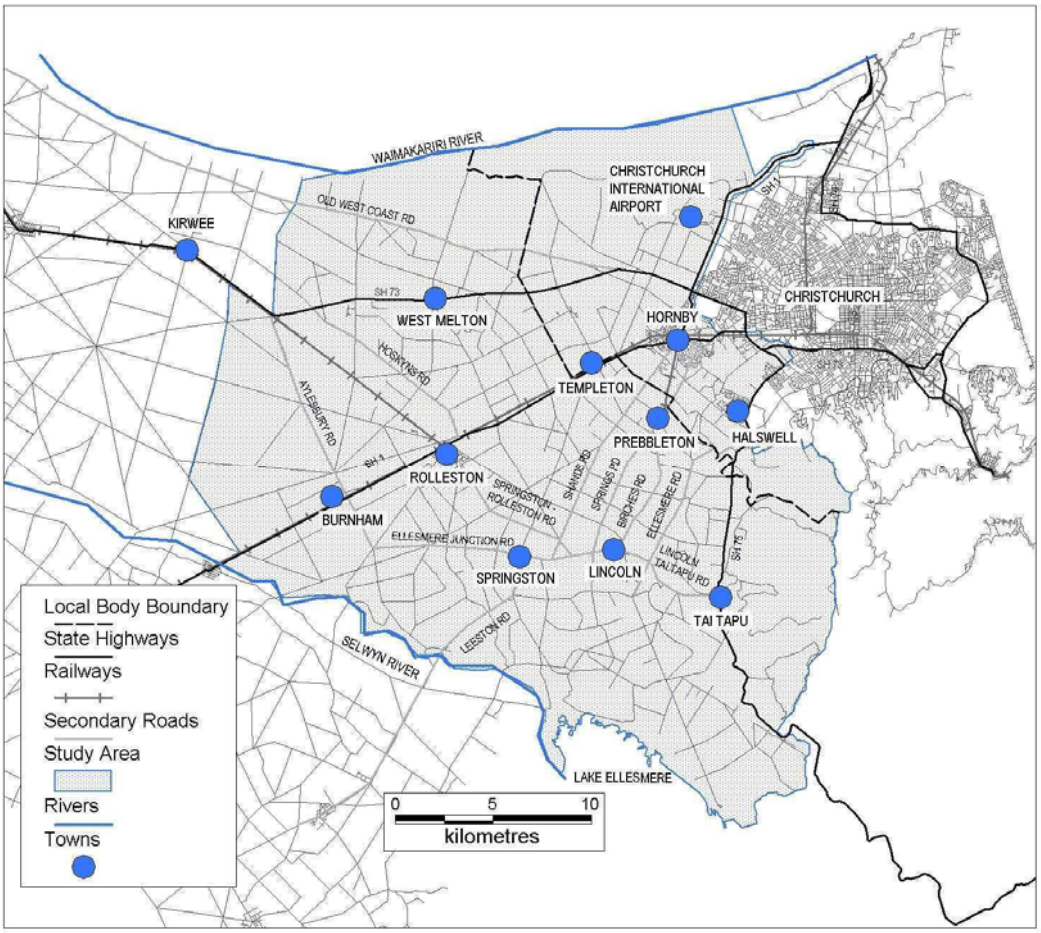

Figure 1
Study Area

1.2 Study Process

The study process has been set up in ten consecutive steps, including:

1. Identification, Review of, and Consultation on Issues,
2. Review of Data,
3. Data Collection,
4. Traffic Model Preparation,
5. Deficiency Analysis,
6. Identification of Project Options and Potential Strategies,
7. Analysis and Assessment of Project Options and Potential Strategies,
8. Detailed Analysis and Assessment to form a Draft (Consultation) Transport Strategy,
9. Public Consultation on the Draft Transport Strategy,
10. Final Report.

Each step of the study process contributes to the inferred objectives for the study as follows:

1. <u>Identification, Review of, and Consultation on Issues</u>
   A comprehensive list of initial, mainly technical Study Partner issues were provided in the Scope for Services for assessment by the study. These issues were used to provide structure to ensuing analysis and have been discussed, assessed and revised throughout the study as new information has become available.

Initial consultation with the stakeholders and public was carried out to identify issues of concern to the community. Some of the community issues were in line with the initial issues raised in the Scope of Services, however, additional issues were raised by the community and added to the issues to be considered in this study. The initial consultation data has been collated and reported on in the Stage 1 Consultation Report – July 2002, Revision 1.

2&3 Review of Data and Data Collection

A review of the available data indicated the need for additional data. The data required consisted of traffic count data (both links and intersection turning movements) and travel speed surveys for use in validating the CRETS traffic models. The additional traffic count and speed survey data was collated and reported in the Traffic Data Report – March 2003, Revision 0.

4. Traffic Model Preparation

The Christchurch Transportation Study (CTS) base year traffic models were updated from 1996 to 2001 census data as part of the CRETS study. The models have been extended and refined to a level of detail, especially in the study area, to meet the purposes of this study. This involved increasing the detail in the modelled zone structure and roading network. Other improvements made to the models include modifying the travel pattern methodology for Burnham Military Camp, Lincoln University and the trips from outside the study area. Detail of the formation of the 2001 CRETS models is included in the Model Validation Report – April 2005, Revision 12.

The Christchurch International Airport is a unique traffic generator in terms of traffic generation, timing and directionality of trips. For these reasons and given the potential changes in land use patterns, a project model (modified version of the CRETS models) and a sub model for the Airport were developed. Detail of the Airport project and submodel models development is included in the Christchurch International Airport Model Validation and Identification of Potential Problem Areas Report – August 2005 – Version 2.

5. Deficiency Analysis

The 2021 CTS model has been extended and refined the same way as the 2001 CTS models to form the 2021 CRETS models. The 2021 land uses for the CRETS models are based on medium growth projections from Statistics New Zealand which has been used to predict the 2021 vehicle travel demand. A Do Minimum Network was formed using the currently planned improvements in the ten year plans from each of the Road Controlling Authorities (RCA). By applying the 2021 traffic demand to the 2011 Do Minimum Network, areas of the network that are likely to be under pressure in 2021 were identified. Details of the formation of the 2021 CRETS models, the Do Minimum Network and the areas of the network that are likely to be under pressure in 2021, are included in the Identification of Potential Problem Areas Report – April 2005, Revision 10.

As specific models have been developed for the Christchurch International Airport, the process used to identify areas of the network that are likely to be under pressure in 2021 for the CRETS models, has been applied to the Airport models. Details of the formation of the 2021 Airport project and submodel models, the Airport Do Minimum Network and the areas of the road network that are likely to be under pressure in 2021, are included in the Christchurch International Airport Model Validation and Identification of Potential Problem Areas Report – August 2005 – Version 2.

6. Identification of Project Options and Potential Strategies

This step of the study process involved bringing together, summarising and grouping the issues to be considered in this study and identifying options that may potentially address the issues. The issues were grouped as general issues applying to the whole of the study area and specific issues applying to specific locations or routes in the study area. Using these issues, Project Options were identified to potentially address the issues. Detail of this step of the study is included in the Issues and Options Identification Report – April 2005, Revision 9.

7. Analysis and Assessment of Project Option and Potential Strategies

This step of the study process looked in detail at the way in which some 47 different roading improvement proposals would address the issues identified earlier in the study. The viable project options were then grouped into packages of options and the way in which packages of improvements would work together, or not, were analysed. A set of proposals was prepared, which, subject to changes as a result of consultation, forms the basis of the consultants' recommendations to the study partners. Detail of this step of the study is included in the Options Analysis Report – December 2005, Revision 4.

8. Detailed Analysis and Assessment of Consultation Project Options to form a Draft Transport Strategy
   The Draft Transport Strategy took the initial packages of options identified in the Options Analysis Report and subjected them to a more detailed analysis, including intersection analysis, link travel time analysis, staging analysis and risk analysis. The Draft Transport Strategy, including the Executive Summary, formed the basis of the 2006 public consultation documents.

9. Public Consultation
   Public consultation on the Draft Transport Strategy was undertaken between 29 September 2006 and 17 November 2006. The public consultation process and outcomes are reported on in the report titled *'Consultation Report 2007, Christchurch, Rolleston and Environs Transportation Study'*.

10. Final Report
    This final report titled *'Christchurch, Rolleston and Environs Transportation Study, Transport Strategy Final Report, September 2007'* sets out the Transport Strategy prepared following, and taking into account feedback from stakeholders and public consultation. During the course of the study the Greater Christchurch Urban Development Strategy (UDS) has been developed. Final sensitivity testing of this transport strategy included traffic forecasts using the latest UDS land use projections and higher levels of public transport usage.

    Each of the reports mentioned above are available from the Project Managers of the Study Partners mentioned in Section 1.1.

2. Study Aim and Key Transport Issues

The Christchurch Rolleston and Environs Transportation Study focuses on identifying the future transportation needs to the southwest and south of Christchurch. The study area includes:

- The towns of Rolleston, Lincoln, Springston, West Melton, Tai Tapu, Templeton and Prebbleton,
- Christchurch south-western suburbs of Hornby, Wigram and Halswell,
- The Christchurch International Airport.

The Christchurch to Rolleston area is seen as a key component in the planning for the development of Canterbury's transport system and roading network to the southwest and south of Christchurch. The aim of the study is to produce a Transport Strategy that is robust and flexible to accommodate a number of future urban growth possibilities in the study area. For example, where existing towns like Rolleston and Lincoln are expected to grow significantly, the study looks at how to meet the transportation needs resulting from this growth and the connectivity between Christchurch City. This Transport Strategy is a vision for the future transport needs of the study area to around the year 2021. It also considers in detail a range of public passenger transport and cycle opportunities within the area and how these contribute to an integrated, safe, responsive and sustainable land transport system in the future as required by the Land Transport Management Act 2003.

Consultants, Connell Wagner have conducted the study on behalf of Transit New Zealand (Transit), Selwyn District Council (SDC), Christchurch City Council (CCC), Environment Canterbury (ECan), and Christchurch International Airport Limited (CIAL).

Public consultation, technical analysis and consideration of social and environmental impacts have been major inputs in developing the Transport Strategy.

The key transport issues addressed in the study area are identified as:

- Land use development in Rolleston, Lincoln, Prebbleton, south-west Christchurch, and around Christchurch International Airport,
- Increasing traffic flows from beyond and within the study area,
- Road network capacity constraints especially through Sockburn and along parts of the State Highway network,
- Road safety concerns and access issues onto arterial roads, particularly at Christchurch International Airport and Rolleston,
- Social and environmental issues through townships on busy arterial roads, especially Templeton, Lincoln and Prebbleton,
- The lack of clear roading hierarchy, including supporting district planning controls,
- Accessibility for cyclists and pedestrians,
- Consideration of public transport options.

A number of options and alternatives were developed and tested in order to arrive at the Transport Strategy that best addresses these issues.

3. Transport Strategy Development /Road Network Hierarchy

The Christchurch Rolleston and Environs Transportation Study proposes a Transport Strategy to address the transportation issues of the southwest and south Christchurch area up to around the year 2021. This was based on medium growth projections from Statistics New Zealand which has been used to predict the 2021 vehicle travel demand. The strategy reinforces the use of main roads and the redirection of traffic onto alternative routes and transport modes, both new and existing, to minimise the effects of traffic through the townships of Templeton, Lincoln and Prebbleton. The suggested improvements will provide improved travel time reliability along key corridors to provide an integrated, safe, responsive and sustainable land transport system.

A rail corridor predominantly used for freight is in place within the study area between Rolleston, Templeton, Hornby and Christchurch Central. The use of rail for freight should be encouraged in the future, predominantly for key industrial generators such as those at the Rolleston Industrial Park. However, due to the low population living close to the rail and that the rail has one inflexible route, rail is not a viable commuter option in the foreseeable future.

It has therefore been concluded that bus based public transport will be more cost effective in the short to medium term. As travel demand for public transport increases, other modes could be explored in the near future, such as larger buses or bus rapid transit.

With the promotion of bus passenger transport, park and ride facilities are promoted for Rolleston and Lincoln. The main public transport corridors for Selwyn are set out in Figure 2.

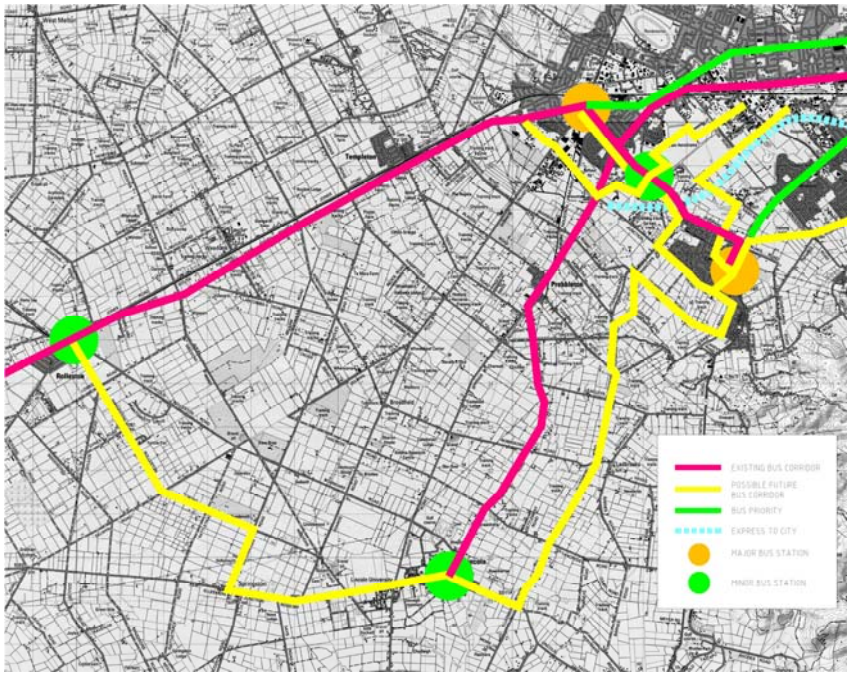

Figure 2
Main Public Transport Corridors for Selwyn

Roads can be classified based upon their function. The main road network is made up of roads that are expected to move large volumes of traffic (trucks, cars, buses and cycles). Figure 3 below classifies the main roads in the study area.

Key

- Red: (national arterial). These roads are major through roads for traffic moving long distances (ie south to north or north to south) or to a port or airport, and are normally state highways. Direct property and side road access to arterial roads is limited to ensure that 'mobility' is maintained.
- Dark blue: (regional arterial). These are roads that traffic is encouraged to use to get to key destinations not served by the national arterials. Direct property access will also be restricted, but generally to a lesser extent than for national arterials.
- Light blue: (district arterial). These roads are used by traffic to get to and around parts of the district or city. Some feed into the city and some make connections between national, regional and district arterials.
- Green: (collector/distributor). These 'collect' traffic from local roads and 'distribute' them to arterial roads. Collector roads provide a mix of local access and limited through traffic function.
- Local roads and streets (not highlighted on the diagram) provide access to individual properties, businesses and community facilities.

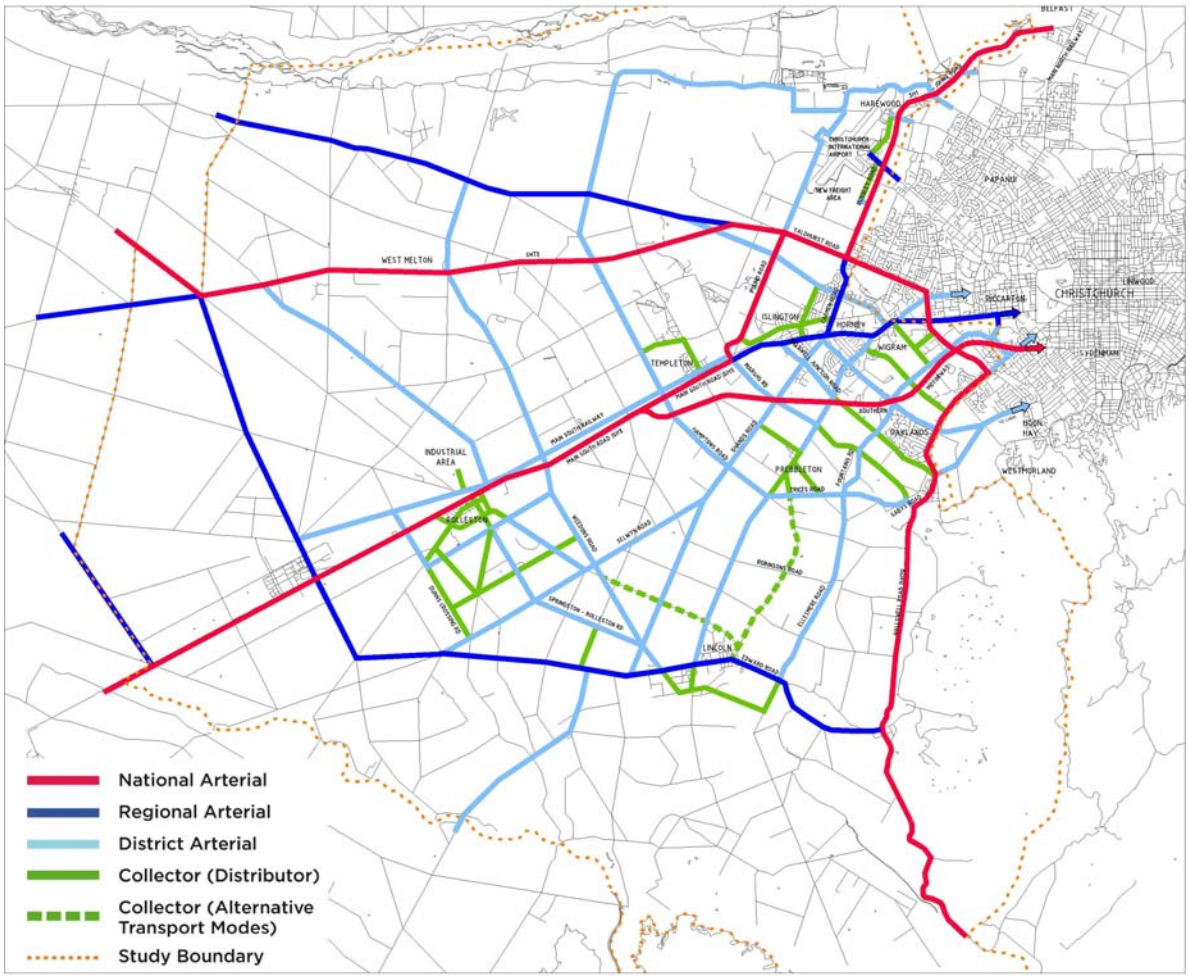

Figure 3.
Transport Strategy Road Network Hierarchy

4. Transport Strategy Major Projects

In support of the future main road network identified, a number of major projects have been proposed. An assessment of the likely timing of these projects has been undertaken to identify those required in the short, medium and long term. These are summarised in the figure and text below with further intersection details shown in the appendices.

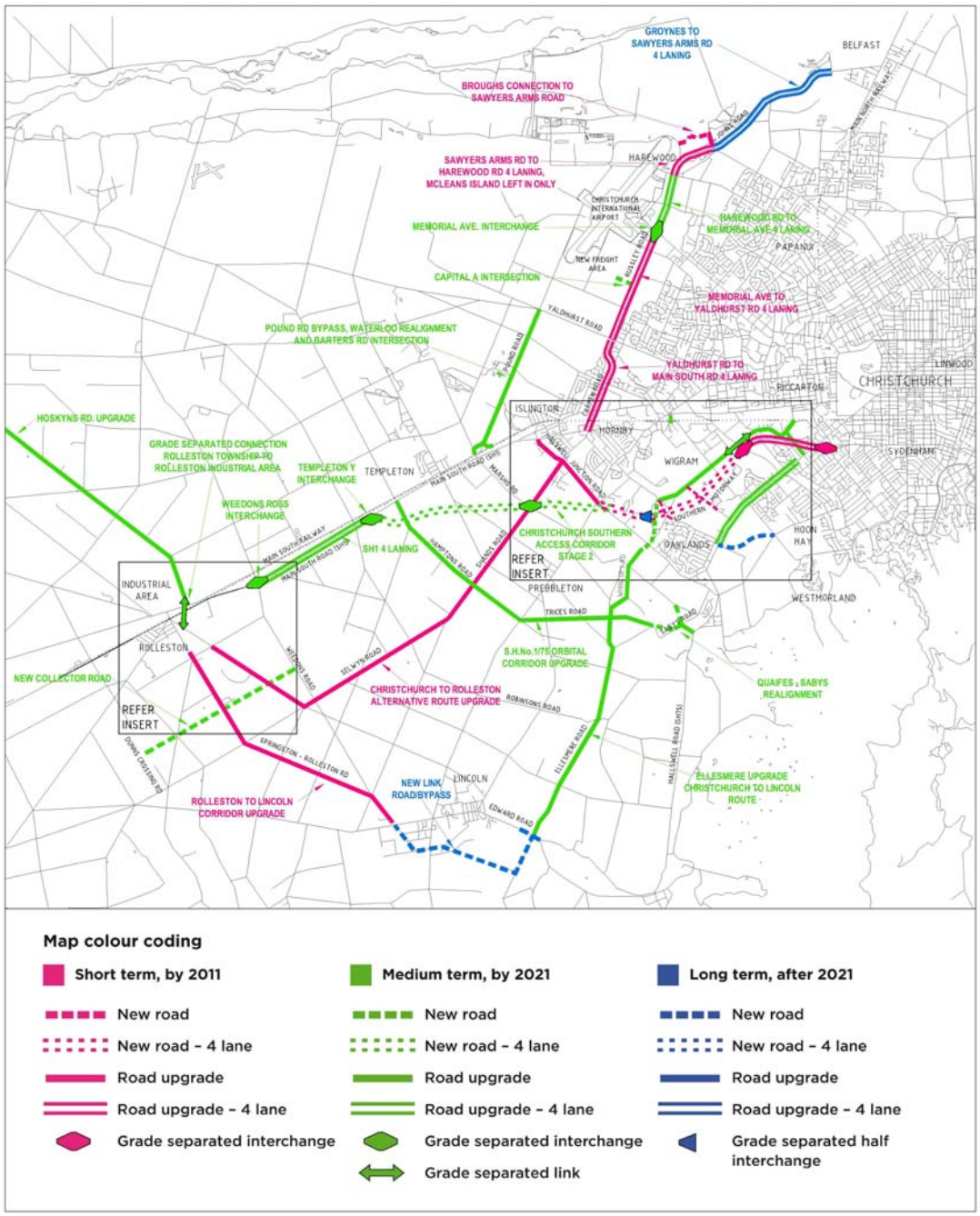

Figure 4.
Transport Strategy Staging and Timing Diagram

Christchurch Southern Access Corridor (Stage I) – Christchurch Southern Motorway, Barrington to Halswell Junction / Main South

This has been assumed as a Do Minimum work for the area. Duplication of the existing Christchurch Southern Motorway between Barrington Street and Curletts Road. Four lane extension of the Southern Motorway west of Curletts Road to Halswell Junction Road / Springs Road roundabout and upgrading of Halswell Junction Road north to

Main South Road. Local road overbridges at Nash Road and a realigned Awatea / Dunbars Road. Major interchanges at Barrington Street and Curletts Road. Other supporting arterial network improvements (see south west Christchurch map).

Christchurch Southern Access Corridor (Stage II)

Four lane extension of the Christchurch Southern Motorway south west from Halswell Junction Road / Springs Road intersection to connect to State Highway 1 about 2km south of Templeton, including intersection upgrades and closures. Major interchange at Marshs / Shands Roads intersection with no access at Springs / Halswell Junction Roads intersection. Possible south facing ramps around Awatea / Dunbars Road in the longer term.

Belfast to Hornby Corridor

Four-laning (with median) of Johns Road, Russley Road, Masham Road and Carmen Road from the vicinity of Groynes Drive to the Main South Railway Line (at Hornby) including intersection upgrades, closures and access restrictions. Development of a state highway bypass of Hornby via Yaldhurst Road and Pound Road to rejoin Main South Road at an upgraded Barters Road intersection, with associated realignment of Waterloo Road.

Hornby to Burnham Corridor and Templeton Township

Traffic through Templeton is reduced by a diversion to the proposed Christchurch Southern Access Corridor works. Main South Road (State Highway 1) through Templeton remains a state highway route and has no changes proposed except for new traffic signals at Barters Road. This facilitates right turns into Templeton and provides for safe pedestrian crossing of State Highway 1. Four-laning (with median) of State Highway 1 from approximately 2km south of Templeton to a grade separated interchange at Weedons/Weedons Ross Road as the main access point into Rolleston (via Levi and Lowes Road) and the industrial area (via Jones Road). Retention of the existing passing lanes south of Weedons Ross/ Weedons Road and Hoskyns Road and a new service lane south of Hoskyns Road for access to the BP Service Station and Tennyson Street / Brookside Road. Replacement of the Rolleston Drive North and Hoskyns Road traffic signals at State Highway 1 at a time when they can not accommodate the required capacity with a separated grade access across State Highway 1 between the Hoskyns Road / Jones Road intersection and Rolleston Drive North including a proposed extension of Byron Street between Tennyson St and Rolleston Dr. This would then influence the timing of the interchange at Weedons/Weedons Ross Road. Development of a secondary local roading alternative route to State Highway 1 via Shands Road, Selwyn Road, and Lincoln-Rolleston Road, incorporating road upgrades and intersection priority changes.

Lincoln, Prebbleton and Tai Tapu to Christchurch Corridors

The aim is to reduce future traffic growth on Springs Road through Prebbleton Township. This includes

1. The promotion of a route between Lincoln and Christchurch that uses:
   - Improvements to Ellesmere Road, Longstaffs and Whincops Road to Halswell Junction Road to create a district arterial route
   - An upgrade and modification of Wigram Road between Halswell Junction Road and Dunbars / Awatea Road (then extended to Blenheim Road via Wigram Road, Magdala Place, Birmingham Drive and Matipo Street; see south-west Christchurch map).
2. Improvements to Hamptons Road, Trices Road and Candys Road to provide an orbital route between Templeton (SH1), Prebbleton and Halswell (SH75) and onto southern Christchurch via Sparks/Frankleigh/Milton Roads. Birchs Road is to be reconfigured to provide a public transport route and off-road cycleway (Part of Christchurch to Little River Rail Trail constructed in 2006). No significant improvement between Tai Tapu and Halswell, but four-laning of Halswell Road (SH75) and Lincoln Road from Dunbars Road to Wrights Road, to strengthen its use as a passenger transport corridor, (see south west Christchurch map).
3. Removing access to the Southern Motorway at Halswell Junction/Springs Roads when the Southern Motorway is extended to State Highway 1 south of Templeton and providing a full interchange at Shands/Marshs Roads intersection which will attract traffic to use Shands Road in preference to Springs Road to access the central city and beyond.

Rolleston to Lincoln Corridor

Upgrading of Springston-Rolleston Road including intersection priority changes to provide a district arterial roading connection between Rolleston and Lincoln. Upgrading of Weedons Road and Weedons Ross Road (from State Highway 73 at West Melton and beyond to the Old West Coast Road) to provide an north/south arterial connection to the proposed interchange on State Highway 1. Lincoln Rolleston Road and Boundary Road promoted as a cycle route from Rolleston to Lincoln, connecting with cycling facilities on Birchs Road.

Rolleston

Promotion of inner ring road (Rolleston Drive) and outer ring road (Weedons Road, Levi Road, Lowes Road, Dunns Crossing Road, Walkers Road, Two Chain Road, Jones Road and Weedons Ross Road) with associated road and intersection upgrades. Main access to Rolleston via a new Weedons/Weedons Ross Road interchange on State Highway 1. Upgrading of Hoskyns Road from Jones Road to State Highway 73, for access from the west to both Rolleston industrial area and Rolleston Township. Provision for a new collector road (would only come about through new subdivisional development that would occur to the south of Rolleston if additional land was rezoned) and at Rolleston Drive South between Brookside Road and State Highway 1 (currently under construction). Byron Street extended to connect Tennyson Street and Rolleston Drive north. Upgrading of Springston Rolleston Road and Lincoln Rolleston Road as part of arterial roading provisions connecting to Lincoln and south of Christchurch respectively. Retention of the existing passing lanes along State Highway 1 south of Weedons/ Weedons Ross Road and provision of a new service lane south of Hoskyns Road for access to the BP Service Station and Tennyson Street / Brookside Road.

Linking of Rolleston Township and the industrial area by replacing the Rolleston Drive North and Hoskyns Road traffic signals at State Highway 1, with a grade separated access across State Highway 1 between the Hoskyns Road / Jones Road intersection and Rolleston Drive North including the proposed extension of Byron Street.

Restricted access of local roads and streets to State Highway 1 at various locations (closures or left in/out).

Realignment of Two Chain / Jones Road at Railway Road and construction of rail crossing control.

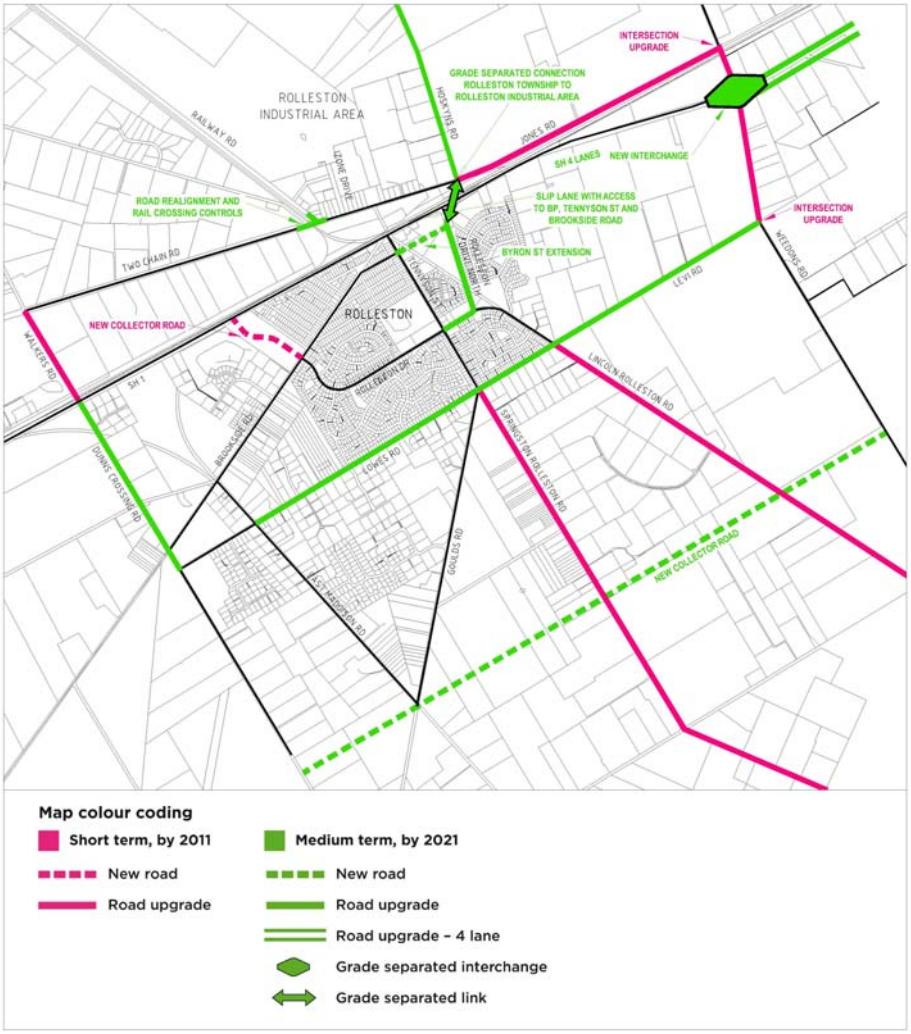

Figure 5
Rolleston Township

Christchurch International Airport

- The main entrance to the airport would be via a grade separated interchange at the intersection of Russley Road and Memorial Ave. This would require Wairakei Road and Avonhead Road to be closed or revert to left in/left out,
- Harewood and Sawyers Arms Roads provide arterial access to the state highway,
- McLeans Island Road from State Highway 1 would be left-in traffic only from the south and Broughs Road would be upgraded and extended to provide a new link between McLeans Island Road and Sawyers Arms Road for all other traffic,
- A proposed airport freight area south of Memorial Avenue would be served by the interchange and a new road (called Capital A Road).

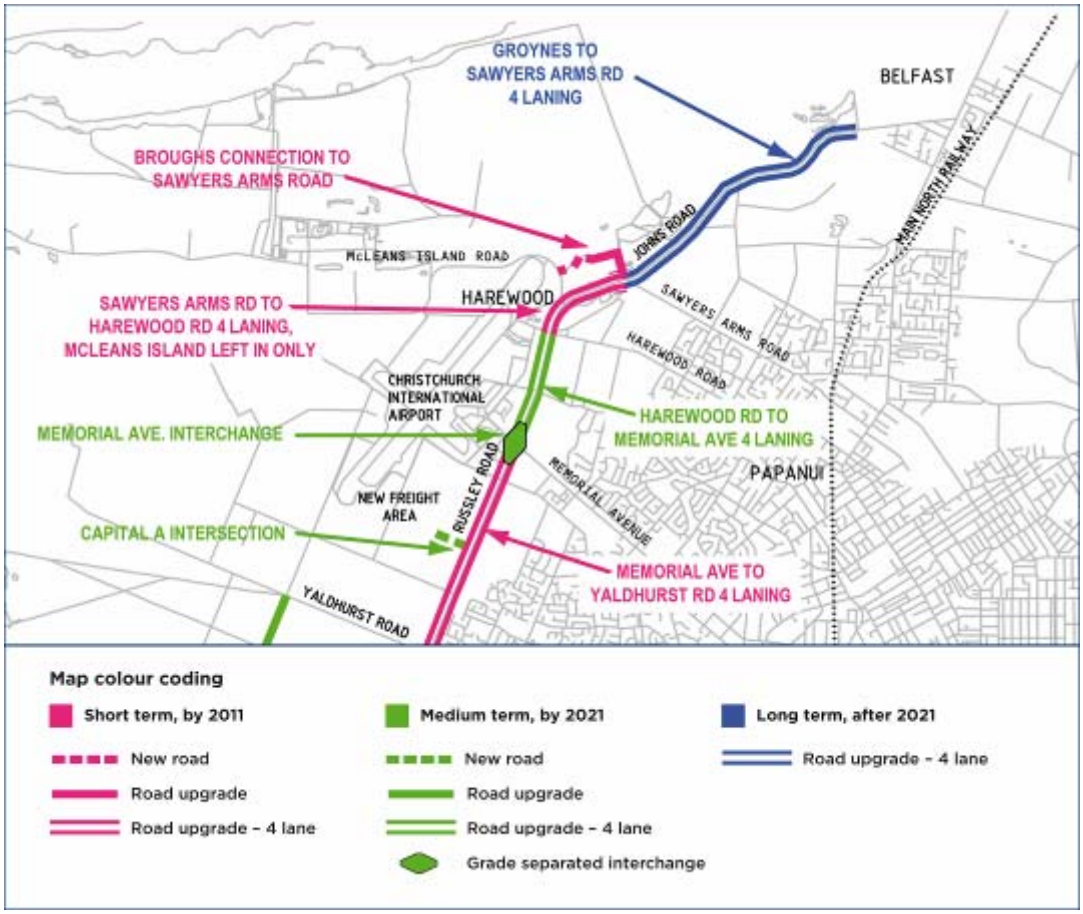

Figure 6
Christchurch International Airport

South West Christchurch

The Christchurch Southern Motorway scheme has been revised to exclude access at Awatea / Dunbars and Nash Road. Analysis shows that when these accesses are provided the motorway becomes overloaded east of Curletts Road and upstream on Brougham Street. By restricting local access the motorway can fulfil its strategic function into the future, while local travel demand is facilitated through the urban arterial network, public transport, walking or cycling.

A summary of the proposed land transport system for southwest Christchurch is shown below.

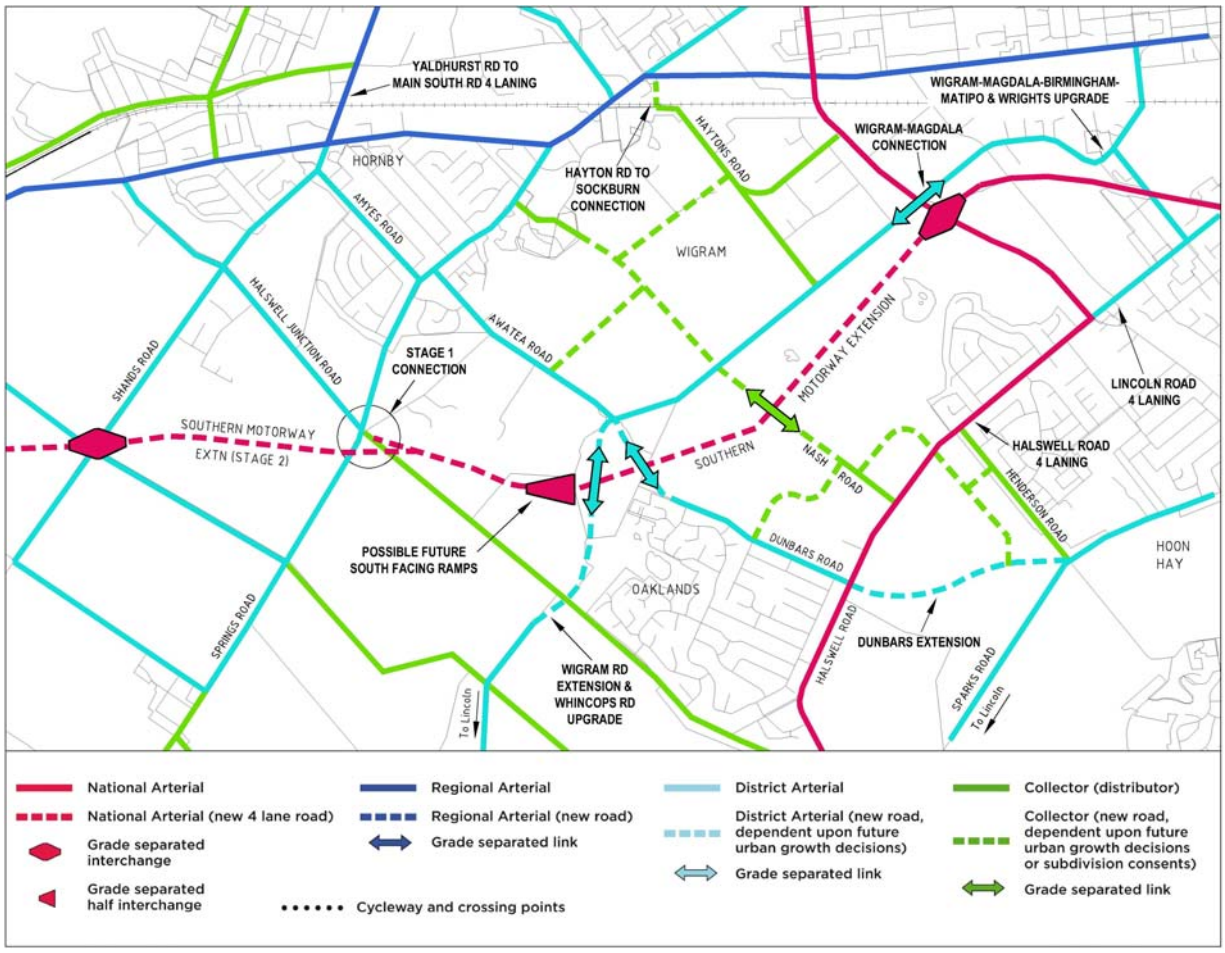

Figure 7.
Christchurch Southern Motorway Duplication and Extension (Stage 1)

Christchurch Southern Motorway Duplication and Extension (Stage I)
(already planned):

- Duplication of the existing Christchurch Southern Motorway (Barrington Street to Curletts Road),
- Four lane extension of the motorway to Halswell Junction Road,
- Improvements along Halswell Junction Road till it rejoins Main South Road at new traffic signals,
- Major interchanges at Barrington Street and Curletts Road,
- An upgraded roundabout at Springs Road / Halswell Junction Road,
- Intersection improvements at Halswell Junction Road / Shands Road,
- Motorway underpasses at Awatea / Dunbars and Nash Road (Aidanfield Drive) to connect with Wigram Road,
- Various walk / cycle crossing points and a cycleway along the corridor.

Christchurch Southern Motorway Extension Stage 2 (medium term):

- Four lane extension of the motorway beyond Springs Road / Halswell Junction Road to south of Templeton,
- Major interchange at Shands / Marshs Roads,
- Removal of motorway access at Halswell Junction Road / Springs Road,
- Possible south facing ramps in the vicinity of Awatea / Dunbars Roads in the long term.

Orbital Arterial Roads

- Amyes Road - Awatea Road - Dunbars Road upgrade (medium term),
- Extension of Dunbars Road south-eastwards to the Sparks / Hendersons intersection (long term, dependent upon future growth decisions).

Radial Arterial Roads

- Springs Road, improvements to intersections (short term),

- Shands Road, road and intersection upgrades as part of the development of a secondary local roading alternative route to State Highway 1 including Selwyn Road, and Lincoln-Rolleston Road as part of the Hornby to Burnham corridor package of works. (short term). Full interchange planned at Shands/Marshs Roads for access to Southern Motorway Extension.

- Upgrade of existing parts of Wigram Road (medium term),
- Wigram Road extension north-eastwards for Lincoln, Halswell and Wigram development traffic (medium term) via:
  - grade separated link (over Curletts Road) to Magdala Place,
  - upgrade Magdala Place, Birmingham Drive and Matipo Street (to link with Blenheim Road) and Wrights Road (to link with Lincoln Road).
- Wigram Road extension south-westwards for Lincoln and Halswell development traffic (medium term), via:
  - new roundabout with Awatea Road,
  - grade separated link (over new Southern motorway) realignment of Wigram Road to Whincops Road and the route to Lincoln via Whincops, Longstaffs and Ellesmere Road.
- Halswell Road (SH75),(medium term) upgrade to four lanes with public transport priority between Dunbars Road and Curletts Road, including:
  - traffic signals at Dunbars Road (already planned) and new Aidanfield North connection,
  - give way and stop controlled intersections at other side road intersections with u-turn facilities where intersection movements are restricted.
- Lincoln Road, (medium term) upgrade to four lanes with public transport priority between Curletts Road and Wrights Road including:
  - give way and stop controlled intersections at other side road intersections with u-turn facilities where intersection movements are restricted.

Other features (medium to long term, dependent upon future urban growth decisions)

- New link paralleling Hendersons Road connecting to the proposed traffic signals at the Aidanfield north connection with Halswell Road,
- Radial and orbital collector roads within the proposed Wigram development area,
- Hayton Extension across the railway line to connect with Alloy Place at the Sockburn roundabout.

Note: The possible staging and timing of the Transport Strategy Projects is based on a more strategic technical analysis only. It is up to the partner agencies to further investigate at project level feasibility and establish funding and identify timelines for the completion of the projects.

The overall cost of the improvements proposed in the Transport Strategy is estimated to be in the order of $230 million dollars. This does not include the cost of the planned Christchurch Southern Motorway duplication and extension project (Stage 1).

5. Transport Strategy – Outcomes – *Including Traffic, Social, Environmental, Economic and Transportation Effectiveness*

Land Use Activity

Traffic forecasting has been modelled based upon future levels of landuse activity.

The land use data used in the traffic modelling has been obtained from Census information held by Statistics New Zealand and growth projections carried out by Statistics New Zealand. The base year for the traffic model must be the same as a census year; hence the base year for the model is 2001 that was the only data available at the outset of the study. The future year for the traffic model is 2021 which at the time of this study is the last year that Statistics New Zealand have sufficiently detailed land use projection data. The medium growth projections were used as the basis for 2021 population. The study partners, given their knowledge of the study area and development patterns, have allocated the land use for 2021 as supplied by Statistics New Zealand. The 2021 adopted land use has been used for the bulk of this study. However, it is recognised, that there are other potential land use growth scenarios. For this reason sensitivity testing has been carried out using the Urban Development Strategy (UDS) landuse growth forecasts. The sensitivity testing is discussed and reported in Section 25 of the main report.

For reporting purposes, the land use data for various zones has been aggregated to the approximate extents of the Selwyn Townships, Christchurch City Suburbs, the remainder of the CTS modelled area and the model expansion area. Table 1 shows the 2001 land use data as obtained from Statistics New Zealand, the projected 2021 medium growth scenario landuse data and the associated growth.

Area	2001 CRETS		2021 CRETS		Growth 2001 to 2021	
	HH	Jobs	HH	Jobs	HH	Jobs
Rolleston	959	260	5296	2107	452%	710%
Lincoln	665	1492	1750	1571	163%	5%
Prebbleton	503	397	2000	468	298%	18%
Templeton	710	843	833	903	17%	7%
West Melton	554	215	758	263	37%	2%
Hornby	4782	5820	4654	6521	-3%	12%
Avonhead	4448	722	4283	756	-4%	5%
Wigram	264	506	3388	1635	1183%	223%
Halswell	4568	984	8743	1439	91%	46%
CTS Area Total	138332	119548	170796	129280	23%	8%
Area of Expansion	989	485	1404	562	42%	16%
Total	139321	120033	172200	129842	24%	8%

Table 1

Growth in Households and Employment

Traffic Volumes

It has been found from modelling of the major works that if the Transport Strategy was to be implemented, it would result in changes to the traffic volumes on various links. Figure 8 shows the predicted changes in traffic volumes compared to the revised Do Minimum Network for a 24 hour period in 2021 and Figure 9 shows the predicted absolute traffic volumes for a 24 hour period in 2021. Table 2 contains the 24 hour period 2021 traffic volumes for a number of significant links.

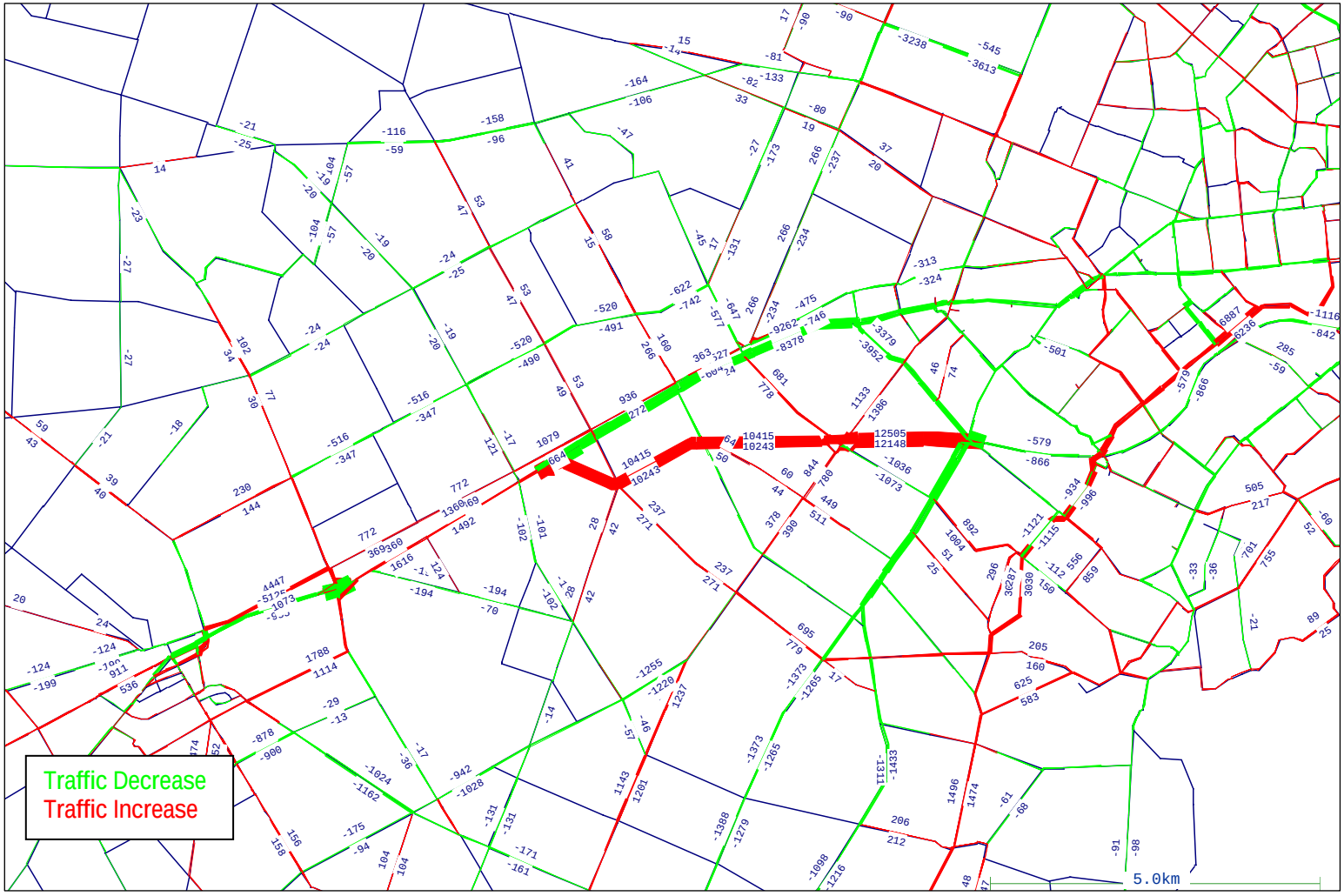

Figure 8

Transport Strategy Major Works – 24 Hour 2021 Traffic Volume Change Plot (Compared to Do Minimum Network)

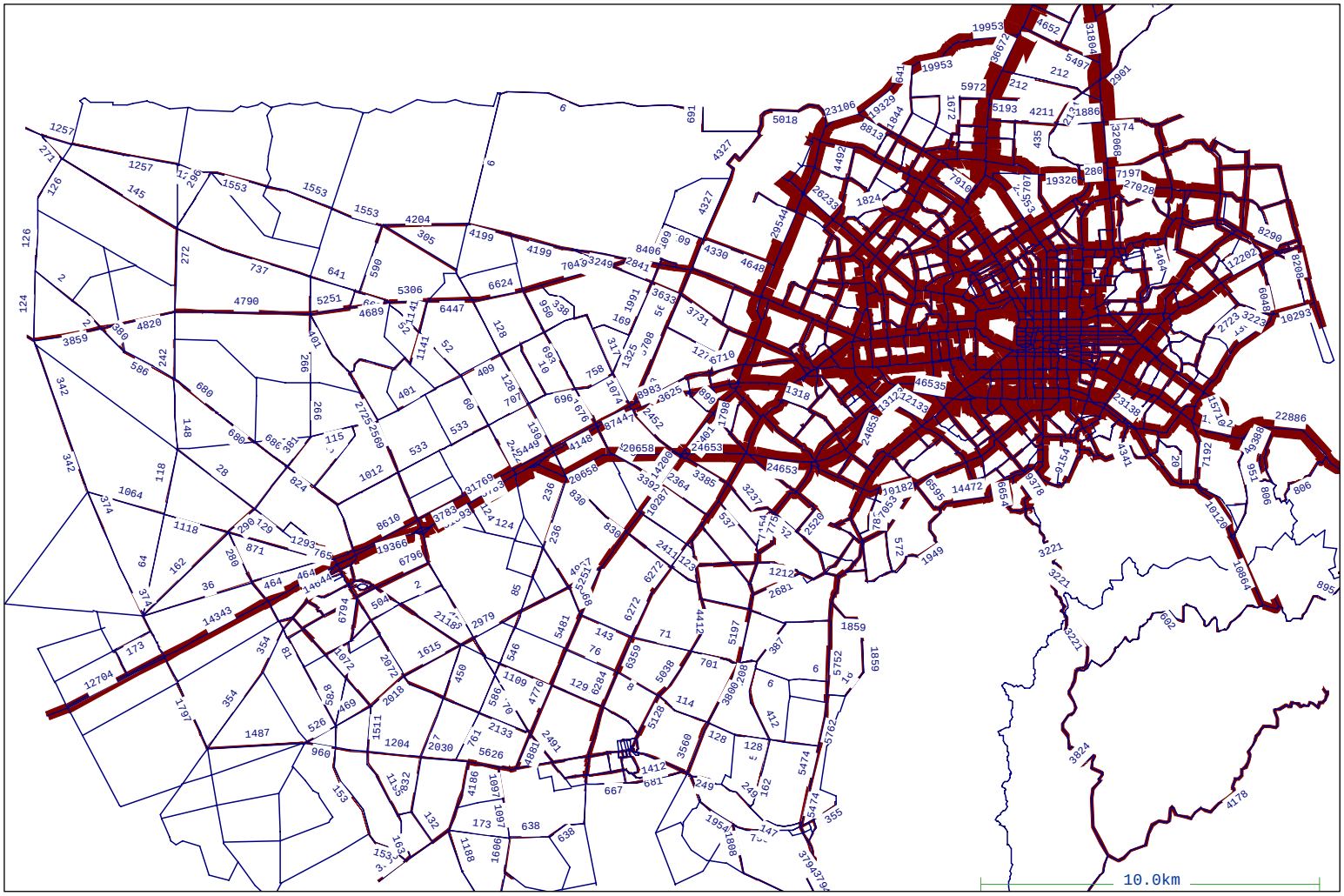

Figure 9

Transport Strategy Major Works –24 Hour 2021 Traffic Volume Plot

ROUTE	DESCRIPTION	24 hour volumes Validation Network 2001	Do Min Network 2021	Growth Val to Do Min	Package of Options TS 2021	Growth Val to Pckge TS
SH1 - Hornby to Rolleston	SH1 Sth Carmen	16400	19200	17%	11000	-33%
	SH1 Sth HJR	15500	26600	72%	9000	-42%
	SH1 Sth Barters	15800	27300	73%	11400	-28%
	SH1 Sth Kirks	16300	29800	83%	12100	-26%
	SH1 Sth Dawsons	15700	29200	86%	11100	-29%
	SH1 Sth Curraghs	15300	28900	89%	31800	108%
	SH1 Sth Weedons	14700	25400	73%	19400	32%
Springs - Trents to Main South	Springs Sth Main South	18000	22400	24%	21100	17%
	Springs Sth Amyes	14600	16200	11%	15100	3%
	Springs Sth HJR	10300	27300	165%	10500	2%
	Springs Sth Marshs	10500	23200	121%	11300	8%
	Springs Sth Birchs	9200	21400	133%	10300	12%
	Springs Sth Toswilll	6500	15900	145%	6500	0%
	Springs Sth Hamptons	4500	8900	98%	6300	40%
Shands - Halswell Junction to Main South	Sth Main South	21100	26200	24%	27000	28%
	Sth Amyes	11400	11000	-4%	13700	20%
	Sth Seymour	12500	12100	-3%	14200	14%
Lincoln Connection	Birmingham Sth Vulcan	5700	6500	14%	14500	154%
	Wigram Sth Haytons	3500	8800	151%	16700	377%
	Dunbars to Halswell Junction			NA	12300	NA
	Halswell Junction to Marshs			NA	11000	NA
	Whincops Sth Quaifes	200	500	150%	7200	3500%
	Ellesmere Sth Leadleys	2800	2200	-21%	5200	86%
	Lincoln Southern Collector			NA	1400	NA
SH1 - Main South to Main North	Johns Wst Main North	12100	19800	64%	20000	65%
	Johns Wst Gardiners	11300	18700	65%	19300	71%
	Johns Wst of Sawyers Arms	17100	27300	60%	23100	35%
	Russley Sth Harewood	16500	21700	32%	20600	25%
	Russley Sth Wairakei	16900	22100	31%	22300	32%
	Russley Sth Memorial	22200	30800	39%	30300	36%
	Russley Sth Ryans	18000	23700	32%	26600	48%
	Masham Sth Yaldhurst	16100	23600	47%	23800	48%
	Carmen Sth Buchannans	16900	25400	50%	24900	47%
	Carmen Sth Waterloo	17100	23800	39%	24000	40%
CSM - Nash to Jerrold	Barrington Wst Selwyn	27300	43800	60%	42500	56%
	CSM Wst Barrington	24000	48500	102%	46500	94%
	CSM Wst Curletts		26100	NA	24700	NA
	CSM Wst Nash		26100	NA	24700	NA
	CSM Wst Awatea/Dunbars		26100	NA	24700	NA
	CSM Wst Springs			NA	24700	NA
	CSM Wst Shands			NA	20700	NA
Main South/Blenhiem - Springs to Curletts	Blenhiem Wst Curletts	40200	35500	-12%	31500	-22%
	Main South Wst Epsom	50200	54400	8%	52200	4%
	Main South Wst Lowther	43300	48000	11%	39200	-9%
	Main South Est Springs	44500	48700	9%	40400	-9%
Curletts - Blenhiem to Lincoln/Halswell	Curletts Sth Blenhiem	35500	37400	5%	33300	-6%
	Curletts Sth Parkhouse	35400	35100	-1%	35000	-1%
	Curletts Sth CSME	12000	11900	-1%	12100	1%
Amyes - Shands to Springs	Amyes Sth Shands	7700	16900	119%	14600	90%
	Amyes Nth Springs	10600	20500	93%	17900	69%
	Awatea Sth Springs	2600	18300	604%	15500	496%
	Awatea Nth Wigram	2400	10700	346%	9000	275%
	Dunbars Sth Wigram	5100	12000	135%	13000	155%
	Dunbars Nth Halswell	4700	9800	109%	9700	106%
Halswell Junction - Main Sth to Springs	HJR Nth Shands	1800	8200	356%	900	-50%
	HJR Nth Springs	7200	16900	135%	8300	15%
Halswell - Nicholls to Lincoln	Lincoln Sth Wrights	24400	30500	25%	27800	14%
	Halswell Sth Curletts	23500	27200	16%	24600	5%
	Halswell Sth Hendersons	18000	26100	45%	22400	24%
	Halswell Sth Aidenfield	18000	22100	23%	18600	3%
	Halswell Sth Dunbars	13600	17500	29%	14800	9%
Rolleston Drive	Rolleston Sth SH1	2400	5900	146%	9700	304%
	Rolleston Sth Tennyson	100	2300	2200%	2400	2300%

Table 2

Transport Strategy Major Works – Traffic Volumes

The data in Figure 8, Figure 9, and Table 2 indicates that the two most significant effects of the Transport Strategy are the shift of traffic from State Highway 1 north of the Christchurch Southern Motorway connection (Stage II) south of Templeton to the Southern Motorway Extension and the shift of traffic from Springs Road to the Lincoln to Christchurch connection utilising Ellesmere Road. These effects are both related to the construction of new roads and/or connections. The 24 hour period effects in 2021 of the Transport Strategy on the major works corridors and growth areas compared to the revised 2021 Do Minimum Network include:

- Hornby to Burnham Corridor – The extension of the Christchurch Southern Motorway to Main South Road(State Highway 1) from the intersection of Springs Road and Halswell Junction Road results in the traffic volumes on Main South Road through Templeton, Hornby and Sockburn decreasing to near the 2001 traffic volumes. The traffic volume on State Highway 1 between the Southern Motorway Extension and Weedons Road increase. The traffic volumes on State Highway 1 between Weedons Road and Rolleston Drive North decrease whilst the traffic volumes between Rolleston Drive North and Rolleston Drive South increase slightly. The traffic volumes on the parallel routes of Shands/Selwyn Roads decrease while the traffic volumes on Jones Road south of Weedons Road increase,
- Christchurch Southern Access Corridor – The extension of the Christchurch Southern Motorway (Stage I) to Main South Road (State Highway 1) from the intersection of Springs Road and Halswell Junction Road, results in the traffic volumes on Halswell Junction Road decreasing. The traffic volumes on the Southern Motorway east of the intersection of Springs Road and Halswell Junction Road (Stage I) decrease, due to traffic from Prebbleton and Lincoln not being able to access the motorway (access to the Christchurch Southern Motorway (Stage II) would be available via Shands Road). The traffic volumes on other routes such as Halswell Road, Springs Road (north of Halswell Junction Road), Main South Road and Blenheim Road all decrease. The traffic volumes on Main South Road and Blenheim Road generally decrease by 10% or more compared to 2001 volumes,
- Belfast to Hornby Corridor (Western Corridor) – Refer to the CIA works details below,
- Christchurch to Lincoln Corridor incorporating Prebbleton – The upgrade of Wigram Road to connect with the intersection of Halswell Junction Road and Whincops Road, and upgrade of roads to the south (Ellesmere Road Route) results in the traffic volumes on Springs Road through Prebbleton decreasing to near 2001 traffic volumes,
- South Western Connection Corridor – Upgrade of Hamptons Road and Trices Road along with extension of Trices Road to the intersection of Sabys Road and Candys Road increases traffic along the route whilst reducing traffic volumes on adjacent parallel routes. However, the changes are minor.

The 24 hour period effects 2021 of the Transport Strategy on the minor works corridors and remaining growth areas include:

- Russley to Aylesbury Corridor – As a result of the major works, the traffic volumes on State Highway 73 decrease slightly, however, the change is minor. There is a slight increase in traffic travelling across to State Highway 1 and then using the State Highway 1 or the Christchurch Southern Motorway to access Christchurch,
- Christchurch to Tai Tapu Corridor – As a result of the major works the traffic volumes on State Highway 75 decrease slightly, however, the change is minor,
- Rolleston to Lincoln Corridor – As a result of the works the traffic volumes on the Rolleston Springston Road and Weedons Road route increase slightly and there is a small decrease in traffic volumes on the Lincoln Rolleston Road and Boundary Road route,
- Christchurch Outer Suburbs – As a result of the major works, specifically the extension of the Christchurch Southern Motorway to State Highway 1, and the new Christchurch to Lincoln Connection, the traffic volumes on most other roads in the outer suburbs decrease slightly. The connection of Haytons Road to the Sockburn Roundabout results in an increase in the traffic volumes on Haytons Road and other roads providing access to the Haytons Road extension. There is a decrease in the traffic volumes on Treffers Road due to the limiting of movements at its intersection with Wigram Road,
- Rolleston – As a result of the major works, specifically the upgrade of State Highway 1 including the provision of the proposed interchange at Weedons/Weedons Ross Road the traffic volumes on Lowes Road, Levi Road, Jones Road, Weedons/Weedons Ross Road, Rolleston Drive North of the Byron Street Extension, Rolleston Drive South of Brookside Road and Byron Street increase. Most other roads have minor changes in traffic volume,
- Lincoln – As a result of the major works, specifically the construction of a new bypass/collector road to the south of Lincoln and the promotion of the new Christchurch to Lincoln connection (Ellesmere Road Route) the traffic volumes on most main roads in Lincoln decrease, however this is likely to be offset with the connection of new

subdivision roads and streets connecting to existing main streets and to the new bypass/collector road south of Lincoln as part of new development.

- Springston – The traffic volumes in and around Springston do not significantly change.

Social and Environmental Effects

Existing/potential land uses: The Transport Strategy affects existing roading corridors and also involves the creation of new roads. The existing roading corridors adjoin a range of different land uses from servicing townships and schools, university and research institutions, quarrying, industrial and service activities, the Christchurch International Airport, residential and rural residential activities, recreation activities, and rural farming activities. The new roads and connections outlined in the Transport Strategy principally affect rural and rural-residential land uses. The designation and acquisition of significant amounts of rural land will be necessary for these new roads. Some residential land will be required near Halswell and Lincoln. Recent rural-residential developments, such as the Claremont Subdivision near the intersection of State Highway 1 and Dawsons/Waterholes Road will require any new roads adjoining them to be aligned and constructed in a manner that minimises any adverse effects as much as practicable.

Designations: Designations will be required for new roads, road widening, and to upgrade intersections where new alignments will fall outside current road reserve boundaries. There is an existing Christchurch City Council designation for the realignment of part of Wigram Road and designations for the widening of State Highway 1. Important new major designations will be required to establish new roads for:

- Widening for a service lane for Whincops Road between Halswell Junction Road and Quaifes Road
- Creation of the Wigram Road to Magdala Place link
- Southern Motorway extension from Halswell Junction Road to State Highway 1
- A link between Trices Road and Candys Road
- The Lincoln southern bypass/collector
- Realignment of Pound Road at Barters/Waterloo Road
- State Highway 1 / Weedons/Weedons Ross Road Interchange
- Byron Street Extension
- Hoskyns Road and Rolleston Drive connection and other Rolleston intersections
- Bend and intersection realignments along upgrade routes in rural areas

Property access severance: This will be an issue principally affecting State Highway 1 and Halswell / Lincoln Roads with the construction of a four-lane median divided road. Existing properties will join the highway in one direction and cross movement will be limited to the main intersections. For safety reasons, the LAR status will be extended so as to cover State Highway 1 from Dawsons/Waterholes Road to Rolleston and also the new section of the Southern Motorway extension. Changes to roading hierarchies may seek to consolidate access onto key arterial routes and avoid the creation of new access where possible. These changes will have to be introduced into the respective Study Partners District Plan provisions.

Landscape characteristics/quality: The study area is flat terrain consisting predominantly of grassed open farmland, rural-residential allotments, scattered buildings, some shelterbelts and trees and Christchurch. The Transport Strategy involves widening existing roads, establishing new roads, and constructing new structures like grade separated interchanges and roundabouts that will create local adverse visual effects. The Transport Strategy will also require the removal or relocation of existing landscape features such as trees and vegetation, fencing, lighting and power poles, as well as introducing them.

Mitigation of effects on landscape: To ensure that the roading will be integrated into the existing environment, those sections of State Highways and local authority roading will be suitably landscaped where appropriate, as will the intersections that are proposed to be closed. Design and landscaping will assist in mitigating some of the adverse effects arising from the establishment of the new roads.

Geological/geotechnical considerations: There is the possibility of the presence of filled pits in the area between the Halswell Junction Road/Springs Road intersection and the Marshs Road/Shands Road intersection. This would require further detailed investigation. New roads, widening, and changes at intersections will require detailed geotechnical investigations during the design phase of roading improvements. This is particularly important when establishing new structures such as those at grade separated interchanges.

Drainage: The parts of the study area where drainage is a particularly important consideration include new roads or roading improvements that pass over or are near to the tributaries of the Halswell River and near to the Halswell River itself. Compliance with Environment Canterbury's Natural Resources Regional Plan to treat and dispose of stormwater will form a significant part of larger scale drainage and stormwater requirements.

Noise: There will be temporary noise effects during the construction phase. New roads will introduce vehicle noise from high-volume traffic flows to some presently quiet areas, most notably in the case of the Southern Motorway extension. Other roading improvements will facilitate higher traffic volumes with a consequent rise in traffic-generated noise or increased noise levels at the notional boundaries of existing dwellings by bringing vehicle paths closer to existing dwellings. An increase in traffic-generated noise is to be expected, given existing roading designations, the purpose of which is to cater for growing traffic volumes. Increases in traffic-generated noise levels on the new portions of road can be mitigated in areas of higher density residential use through the employment of buffers or barriers.

Maori, archaeological, cultural and heritage sites: Halswell River and its tributaries, such as Knights Stream and the surrounding area, are well known as significant sites/areas to Ngai Tahu. Therefore, it is recommended that further consultation with the relevant parties be undertaken at a more appropriate time such as at the scheme assessment stage. There are no other known sites of Maori, cultural, historical or archaeological significance affected by the Transport Strategy.

Social severance and property severance: The Transport Strategy seeks to minimise social severance within settlements by ensuring existing links are maintained while new roads bypass settlements. At some intersections it is proposed that road links be closed to provide priority to key strategic and arterial routes e.g. at Rolleston. New roads will lead to the separation of land that is currently in the same ownership or otherwise provide a barrier between neighbours. This is particularly the case for rural and rural-residential properties to be separated by the Southern Motorway extension. There will be considerable adverse social effects for the affected owners and occupiers. There will be realignments at some intersections and Trents Road will be closed where the proposed Southern Motorway extension crosses it.

Public transport/cycle: The more efficient highway and roading network will enable public transportation to operate more efficiently. There will also be opportunities to provide for separate cycle lanes, improvements to the shoulders of existing carriageways, or separate off road cycleways to establish cycling routes between townships and also to Christchurch city.

Transport Strategy Economic Assessment

The economic assessment has been carried out using the procedures contained in the Land Transport New Zealand Economic Evaluation Manual. It is, however, acknowledged that the procedures have been adapted from the detailed project analysis procedures for use in this area wide study. It has been found that the benefits of any options considered are generally marginally more than the calculated values. Appendix B of the Christchurch, Rolleston and Environs Transportation Study Transport Strategy contains the estimated benefits, costs and benefit cost ratio for the Transport Strategy. The costs, summarised below in Table 3, are discounted costs for the major projects that amount to around $185M undiscounted. Other road improvement works add around $50M to the total construction costs. There are benefits for these works but they have not been represented in the approach used for this analysis. These projects will require specific analysis as they are developed further outside of this study.

Project Options	Transport Strategy	Do Minimum	Net Cost/Benefits
Costs	$165,000,000		$165,000,000
Benefits	*$7,208,000,000	*$7,410,000,000	$202,000,000
Tangible Benefit/Cost Ratio			1.2

Table 3

Benefits, cost and benefit/cost ratio for Transport Strategy

* These costs are net present value network operation costs, from which the benefits are calculated from the difference of the two.

Economic Efficiency

- The benefit stream for this option increases approximately $17.7 million per annum from approximately $12.5 million in 2001 to $30.2 million in 2021.
- The benefit cost ratio for the Transport Strategy is 1.2.
- The First Year Rate of Return is 10%.

VKT and VMT

- The 2021 24-hour total Vehicle Kilometres Travelled on this package of work within the study area is 3,413,274 kilometres.
- The 2021 24-hour total Vehicle Kilometres Travelled on this the revised Do Minimum Network within the study area is 3,400,902 which is less than the VKT for this package of options.
- The 2021 24-hour total Vehicle Minutes of Travel on this package of work including intersection delays within the study area is 3,819,040 minutes.
- The 2021 24-hour total Vehicle Minutes Travelled on this, the Do Minimum Network within the study area is 3,969,843 which is greater than the VMT for this package of options.

As the benefit stream is increasing with time this option is sustainable in that it will continue to provide economic benefits into the future.

Transport Strategy Transportation Effectiveness

The Transport Strategy has been developed following the Study Partners Discussions. The analysis for 2021 shows that the Transport Strategy addresses the issues raised, resulting in the following:

Hornby to Burnham Corridor

- Decreased traffic volumes on State Highway 1 between Hornby and Curraghs Road from a predicted 27,300 (South of Barters) to 11,400 vehicles per day. Currently 15,800 vehicles per day,
- Reduced traffic volumes through townships of Templeton and Islington,
- Reduced traffic at Hornby Intersection on the Main South Road Link by approximately 8,200 vehicles per day through the intersection on Main South Road,
- Increased traffic volumes carried on the State Highway 1 4-lane median divided highway between Dawsons Road and Weedons Ross Road by approximately 2,900 vehicles per day with an estimated volume of 31,800 vehicles per day,
- Increased traffic on Jones Road near Rolleston. For example, south of Weedons Ross Road volumes increase from approximately 3,100 vehicles per day to 8,600 vehicles per day,
- Increased safety as a result of lower traffic volumes on State Highway 1 in northern section and median divided four lane and intersection improvement on the southern section,
- Safer cross movements of State Highway 1 with a full diamond interchange at Weedons Ross Road/Weedons Road,
- Provides capacity (including through managed access) on links and at intersections, with reduced delay to through traffic meaning increased mobility,

- Access to industrial areas to the north of Rolleston is improved with the State Highway 1/Weedons Road interchange providing access via Weedons Ross Road and Jones Road, while access to the residential areas south of State Highway 1 from the interchange is provided by an outer ring road utilising Weedons Road, Levi Road and Lowes Road,
- Safety is improved with the closing of Elizabeth Street intersection with State Highway 1 and providing a service lane to provide left-in/left-out only access to the BP Service Station, Tennyson Street / Brookside Road,
- Access between Rolleston Township and the Industrial Park is improved with the connection of Rolleston Drive North to Jones/Hoskyns Road grade separated over State Highway 1,
- Access to Rolleston from the south is provided via Dunns Crossing Road and Rolleston Road South until such time that the increase in traffic on State Highway 1 requiring the ban of right turns at Rolleston Drive South and the conversion of the intersection to left turn in/out only.

Christchurch Southern Access Corridor

- Provides a key access corridor from the south, to Christchurch and Port of Lyttelton. Traffic volumes range from 20,700 vehicles per day (State Highway 1 to Shands), 24,700 vehicles per day (Shands to Curletts), and 46,500 (Curletts to Barrington),
- Relieves traffic volumes on the Hornby to Burnham corridor north of Curraghs Road as noted above,
- Decreases traffic on Main South Road through Sockburn from a predicted 54,400 vehicles per day (west of roundabout) to 52,200 vehicles per day (50,200 in 2001) and from a predicted 35,500 on Blenheim Road (east of the roundabout) to 31,500 (40,200 in 2001),
- Provides capacity on the existing links and at intersections,
- Decreases traffic on Halswell Junction Road by approximately 8,600 vehicles per day to 8,300 vehicles per day west of Springs Road,
- Route only has two intermediate access points providing the corridor with a high degree of mobility.

Belfast to Hornby Corridor (Western Corridor) (also refer to CIAL work)

- Provides 4-lane median divided to cater for the increased traffic volumes in the order of 30% to 2021. Examples being south of Memorial Avenue predicted traffic 30,300 vehicles per day, south of Sawyers Arms Road 23,100 vehicles per day and south of Yaldhurst Road 23,800 vehicles per day,
- Rationalises intersections for mobility and safety.

Christchurch to Lincoln Corridor incorporating Prebbleton

- Decreases traffic on Springs Road through Prebbleton by 11,200 vehicles per day from 18,900 to 7,700 vehicles per day (currently 7,600), improving safety and severance issues,
- Decreases traffic on Springs Road north of Prebbleton (north of Marshs Road) by 16,800 from 27,300 to 10,500 vehicles per day (currently 10,400),
- Increases traffic on Wigram, Whincops, Longstaffs and Ellesmere Roads due to the new connection to Christchurch via Wigram Road etc to Blenheim Road. Whincops Road increases from 500 to 7,200 vehicles per day, and Ellesmere 2,200 to 5,200 south of Leadleys Road,
- Improved orbital access to both Prebbleton and Lincoln via new connections to Christchurch via Wigram Road and Blenheim Road and the Halswell area via Trices and Sabys Road and beyond to Christchurch via Sparks/Frankleigh/Milton..

South Western Orbital Corridor – State Highway 1 to State Highway 75

- Increased traffic on the route by 500 vehicles per day with an actual volume of 1,000 vehicles per day on Hamptons Road between Waterholes and Shands Road,
- Increased traffic on the route by 500 vehicles per day between Ellesmere Road and State Highway 75,
- Provides an alternative route as a south-western bypass of Christchurch near Halswell between State Highway 1 and State Highway 75 through the upgrade of existing and construction of a section of new road,
- Mobility improved through rationalising of property access.

Rolleston

- Access to the north (industrial) and south (residential) of Rolleston improved with the State Highway 1/Weedons Ross Road/Weedons Road interchange as above for the Hornby to Burham Corridor,
- Access to Rolleston from the south is provided via Dunns Crossing Road and Rolleston Road South until such time that the increase in traffic on State Highway 1 requires the ban of right turns at Rolleston Road South and the conversion of the intersection to left turn in/out only,
- Access to the Rolleston Industrial Park provided via Jones Road/Weedons Ross Road/State Highway 1 to the north, Two Chain Road/Walkers Road/State Highway 1 to the south and to Rolleston Township via Rolleston Drive North extension to Jones Road/Hoskyns Road,
- Safety is improved with the closing of the Elizabeth Street intersection with State Highway 1, providing new service lane to provide left in/left out access to the BP Service Station, Tennyson Street and Brookside Road,
- Inner and outer ring roads, Rolleston Drive and Weedons Road/Levi Road/Lowes Road/Dunns Crossing Road respectively, upgraded to allow for the increase in traffic and to improve access to all areas of Rolleston,
- Cycling promoted by widening existing main roads and streets to include cycle lanes where appropriate, in particular on the inner and outer ring roads,
- Provision for future 'Park and Ride' facility utilising buses between Rolleston and Christchurch.
- Collector road to cater for any future residential subdivisions to the south of Rolleston.

Lincoln

- Southern bypass/collector road reduces traffic volumes on existing east west route through Lincoln by approximately 700 vehicles per day with an actual volume of 700 vehicles per day, however this may increase based on the development of a local area network and connectivity to serve future residential growth in the area.
- Diverts heavy traffic to bypass, in particular agricultural vehicles and stock trucks away from the town centre,
- Provides alternative part of main orbital route connecting Burnham (State Highway 1) and Tai Tapu (State Highway 75) that does not rely on the use of the main street through Lincoln Township,
- Reduces noise and improves the amenity of the existing town centre,
- Provision for future 'Park and Ride' facility, utilising buses between Lincoln and Christchurch
- Southern bypass/collector road can also act as a local collector road for future subdivisions to the south as identified in a recent Lincoln Structure Plan process undertaken by Selwyn District Council,

Christchurch International Airport

- Access to the airport provided via three key access points, being Memorial Avenue as the main access to the passenger terminal areas and freight area south of the terminal, Harewood Road for access to both the passenger terminal area from the north and access to the commercial and industrial areas to the north of the passenger terminal area, and Capital A road to the southern freight area,
- Provides an acceptable level of service at all intersections and links,
- Separation of freight vehicles from passenger vehicles by new Capital A road access off State Highway 1.

Hornby Bypass

- Bypass (north) of Hornby provided by upgrades to Yaldhurst and Pound Road that would carry approximately 5,700 vehicles per day and a reduction of approximately 1,000 vehicles per day on Carmen Road

Halswell Road – Curletts Road to Dunbars Road

- Corridor to be strengthened by four laning and median dividing for a passenger transport and cycling route.

Overall effectiveness of the Transport Strategy to address the issues is high.

6. Sensitivity Testing Using UDS Land Use

Introduction

During the course of this study, the Greater Christchurch Urban Development Strategy (UDS) has been prepared by Environment Canterbury, Christchurch City Council, Waimakariri District Council, Selwyn District Council and Transit New Zealand. The UDS proposes an agreed growth strategy for the Greater Christchurch area to address the pressures being placed on the Greater Christchurch area's expansion to around 500,000 population at the year 2041. It aims to integrate land use development with transport and other social, environmental and infrastructural planning and is a step towards a more collaborative means of planning for the future. The UDS is not just about transport but takes a holistic approach to urban planning including land use, community identity, natural environment and economic factors. Statutory support is being given to the UDS through Proposed Plan Change No.1 to the Regional Policy Statement, which in turn from a transportation perspective will be underpinned in the 2008 Regional Land Transport Strategy.

The Christchurch, Rolleston and Environs Transportation Study (CRETS) is a Transportation study based on projected landuse and growth within the CRETS study area of south west Christchurch. CRETS commenced in 2002 before the UDS process started and at that time the CRETS landuse projection to 2021 was based on a medium growth forecast established from the 2001 Census. The recommended Transport Strategy was therefore oginally devised to address the resultant level of travel demands based on this growth scenario and land use patterns generally provided for in the Christchurch and Selwyn District Plans.

The Study Partners have agreed to investigate the alignment of the recommended Transport Strategy with the agreed UDS landuse growth forecasts by performing a sensitivity test on the recommended Transport Strategy using the 2026 UDS landuse forecasts

The agreed UDS landuse has adopted a Medium High forecast, based around the latest 2006 Census. This results in higher household and employment numbers than those assumed in CRETS for 2021. The same transportation modelling assumptions have been used to derive the resultant travel demands and traffic flow forecasts.

CRETS vs UDS Landuse and Travel Demand

A comparison of the CRETS landuse against the UDS landuse is shown in Table 4 below. It should be noted that for CRETS there are landuses for 2001 and 2021, and UDS 2001 (CRETS equivalent) and 2026.

AREA	2001 CRETS		2021 CRETS		2026 UDS		2021 CRETS to 2026 UDS	
	HH	Jobs	HH	Jobs	HH	Jobs	HH	Jobs
Rolleston	959	260	5296	2107	7112	6117	1816	2939
Lincoln	665	1492	1750	1571	3411	4062	1661	1954
Prebbleton	503	397	2000	468	1614	92	-386	-556
Templeton	710	843	833	903	2037	1727	1204	600
West Melton	554	215	758	263	1260	209	502	-189
Hornby	4782	5820	4654	6521	5617	15986	963	7971
Avonhead	4448	722	4283	756	5027	2107	744	635
Wigram	264	506	3388	1635	2970	8766	-418	6914
Halswell	4568	984	8743	1439	9640	2391	897	84
Model Total [1]	139321	120033	172200	129842	216210	231600	44010	101758

Table 4

CRETS vs UDS Landuse

Note [1] – This is not the sum of the areas outlined above rather the total for the whole model including the areas.

- CRETS 2001 to CRETS 2021 has a 24% growth in Households and a 8% growth in Jobs. This is a 1.2% growth per year for Households and a 0.4% growth per year for Jobs over the 20 years.
- CRETS 2001 to UDS 2026 has a 55% growth in Households and a 93% growth in Jobs. This is a 2.2% growth per year for Households and a 3.7% growth per year for Jobs over the 25 years.

Forecast Travel Demand

The resultant travel demand forecast for the UDS landuse is shown in the table below.

Trip Purposes in the 24-Hour period (Modelled)

Trip Purpose	Total Trips 2001	Total Trips 2021	*Increase 2001 to 2021*	*Increase 2001 to 2021*	Total Trips UDS 2026	*Increase 2021 to 2026*	*Increase 2021 to 2026*	*Increase 2001 to 2026*	*Increase 2001 to 2026*
Home Based Work	157179	187979	*30800*	*19.60%*	209785	*21806*	*11.60%*	*52606*	*33.47%*
Home Based Shopping	156214	197049	*40835*	*26.14%*	230755	*33706*	*17.11%*	*74541*	*47.72%*
Home-Based Social/Rec	125774	157883	*32109*	*25.53%*	184111	*26228*	*16.61%*	*58337*	*46.38%*
Home Based Other	283769	335691	*51922*	*18.30%*	393318	*57627*	*17.17%*	*109549*	*38.60%*
Non Home Based	290572	350196	*59624*	*20.52%*	403367	*53171*	*15.18%*	*112795*	*38.82%*
Light Goods	98914	154600	*55686*	*56.30%*	232076	*77476*	*50.11%*	*133162*	*134.62%*
Heavy Goods	51482	59071	*7589*	*14.74%*	86574	*27503*	*46.56%*	*35092*	*68.16%*
External	32268	51596	*19328*	*59.90%*	58229	*6633*	*12.86%*	*25961*	*80.45%*
Total	1196172	1494065	*297893*	*24.90%*	1798215	*304150*	*20.36%*	*602043*	*50.33%*

Overall 24-Hour Trip Rates

Horizon	2021	2026
Trip Matrix Total at end of CRETS model procedure[1]	1501533	1803352
Total Households in model	172200	216210
Overall 24-hour trips per household	8.72	8.34

Table 5

Travel demand forecast for UDS landuse.

[1] Adjustment for Lincoln University trips.

Traffic Volumes on Transport Strategy with UDS 2026 Landuse (UDS 2026)

It has been found from modelling the Transport Strategy, that if the UDS 2026 landuse was to be implemented, it would result in changes to the traffic volumes on various links. Table 7 contains the 24 hour period for 2026 traffic volumes for a number of significant links for the UDS landuse.

		24 hour volumes							
ROUTE	DESCRIPTION	Validation Network 2001	Do Min Network 2021	Growth Val to Do Min	Package of Options TS 2021	Growth Val to Pckge TS 2021	Package of Options UDS 2026	Growth Val to Pckge UDS 2026	Growth TS 2021 to UDS 2026
SH1 - Hornby to Rolleston	SH1 Sth Carmen	16400	19200	17%	11000	-33%	13100	-20%	19%
	SH1 Sth HJR	15500	26600	72%	9000	-42%	12500	-19%	39%
	SH1 Sth Barters	15800	27300	73%	11400	-28%	14800	-6%	30%
	SH1 Sth Kirks	16300	29800	83%	12100	-26%	14500	-11%	20%
	SH1 Sth Dawsons	15700	29200	86%	11100	-29%	13100	-17%	18%
	SH1 Sth Curraghs	15300	28900	89%	31800	108%	39300	157%	24%
	SH1 Sth Weedons	14700	25400	73%	19400	32%	21500	46%	11%
Springs - Trents to Main South	Springs Sth Main South	18000	22400	24%	21100	17%	30900	72%	46%
	Springs Sth Amyes	14600	16200	11%	15100	3%	20000	37%	32%
	Springs Sth HJR	10300	27300	165%	10500	2%	14900	45%	42%
	Springs Sth Marshs	10500	23200	121%	11300	8%	13800	31%	22%
	Springs Sth Birchs	9200	21400	133%	10300	12%	12700	38%	23%
	Springs Sth Toswilll	6500	15900	145%	6500	0%	9200	42%	42%
	Springs Sth Hamptons	4500	8900	98%	6300	40%	7600	69%	21%
Shands - Halswell Junction to Main South	Sth Main South	21100	26200	24%	27000	28%	35600	69%	32%
	Sth Aymes	11400	11000	-4%	13700	20%	15900	39%	16%
	Sth Seymour	12500	12100	-3%	14200	14%	17100	37%	20%
Lincoln Connection	Birmingham Sth Vulcan	5700	6500	14%	14500	154%	18400	223%	27%
	Wigram Sth Haytons	3500	8800	151%	16700	377%	21900	526%	31%
	Dunbars to Halswell Junction			NA	12300	NA	15900	NA	29%
	Halswell Junction to Marshs			NA	11000	NA	13500	NA	23%
	Whincops Sth Quaifes	200	500	150%	7200	3500%	10200	5000%	42%
	Ellesmere Sth Leadleys	2800	2200	-21%	5200	86%	7800	179%	50%
	Lincoln Southern Collector			NA	1400	NA	1900	NA	36%
SH1 - Main South to Main North	Johns Wst Main North	12100	19800	64%	20000	65%	29000	140%	45%
	Johns Wst Gardiners	11300	18700	65%	19300	71%	28000	148%	45%
	Johns Wst of Sawyers Arms	17100	27300	60%	23100	35%	30700	80%	33%
	Russley Sth Harewood	16500	21700	32%	20600	25%	28600	73%	39%
	Russley Sth Wairakei	16900	22100	31%	22300	32%	30200	79%	35%
	Russley Sth Memorial	22200	30800	39%	30300	36%	39500	78%	30%
	Russley Sth Ryans	18000	23700	32%	26600	48%	34400	91%	29%
	Masham Sth Yaldhurst	16100	23600	47%	23800	48%	30600	90%	29%
	Carmen Sth Buchannans	16900	25400	50%	24900	47%	32800	94%	32%
	Carmen Sth Waterloo	17100	23800	39%	24000	40%	31200	82%	30%
CSM - Nash to Jerrold	Barrington Wst Selwyn	27300	43800	60%	42500	56%	51500	89%	21%
	CSM Wst Barrington	24000	48500	102%	46500	94%	58800	145%	26%
	CSM Wst Curletts		26100	NA	24700	NA	31500	NA	28%
	CSM Wst Nash		26100	NA	24700	NA	31500	NA	28%
	CSM Wst Awatea/Dunbars		26100	NA	24700	NA	31500	NA	28%
	CSM Wst Springs			NA	24700	NA	31500	NA	28%
	CSM Wst Shands			NA	20700	NA	26200	NA	27%
Main South/Blenhiem - Springs to Curletts	Blenhiem Wst Curletts	40200	35500	-12%	31500	-22%	40500	1%	29%
	Main South Wst Epsom	50200	54400	8%	52200	4%	67800	35%	30%
	Main South Wst Lowther	43300	48000	11%	39200	-9%	52400	21%	34%
	Main South Est Springs	44500	48700	9%	40400	-9%	55000	24%	36%
Curletts - Blenhiem to Lincoln/Halswell	Curletts Sth Blenhiem	35500	37400	5%	33300	-6%	37900	7%	14%
	Curletts Sth Parkhouse	35400	35100	-1%	35000	-1%	41100	16%	17%
	Curletts Sth CSME	12000	11900	-1%	12100	1%	12100	1%	0%
Aymes - Shands to Springs	Aymes Sth Shands	7700	16900	119%	14600	90%	20500	166%	40%
	Aymes Nth Springs	10600	20500	93%	17900	69%	23700	124%	32%
	Awatea Sth Springs	2600	18300	604%	15500	496%	22900	781%	48%
	Awatea Nth Wigram	2400	10700	346%	9000	275%	12400	417%	38%
	Dunbars Sth Wigram	5100	12000	135%	13000	155%	16100	216%	24%
	Dunbars Nth Halswell	4700	9800	109%	9700	106%	13200	181%	36%
Halswell Junction - Main Sth to Springs	HJR Nth Shands	1800	8200	356%	900	-50%	2200	22%	144%
	HJR Nth Springs	7200	16900	135%	8300	15%	18600	158%	124%
Halswell - Nicholls to Lincoln	Lincoln Sth Wrights	24400	30500	25%	27800	14%	29200	20%	5%
	Halswell Sth Curletts	23500	27200	16%	24600	5%	25200	7%	2%
	Halswell Sth Hendersons	18000	26100	45%	22400	24%	23000	28%	3%
	Halswell Sth Aidenfield	18000	22100	23%	18600	3%	22700	26%	22%
	Halswell Sth Dunbars	13600	17500	29%	14800	9%	16700	23%	13%
Rolleston Drive	Rolleston Sth SH1	2400	5900	146%	9700	304%	12400	417%	28%
	Rolleston Sth Tennyson	100	2300	2200%	2400	2300%	4200	4100%	75%

Table 6

Transport Strategy (CRETS 2021) and UDS 2026 – Traffic Volumes

A comparison has been made between traffic volumes for the Transport Strategy in 2021 and UDS in 2026. The comparison shows a significant increase in traffic across the network on most corridors. The 24 hour period effects in 2026, of the UDS 2026 landuse sensitivity test on the major works corridors and growth areas include:

- Christchurch Southern Access Corridor – Significant increase in traffic volume over the entire length, including through Sockburn and along the Southern Motorway,
- Belfast to Hornby Corridor – Significant increase in traffic volume over the entire length,
- Russley to Aylesbury Corridor – Small increase in traffic volume over the entire length,
- Hornby to Burnham Corridor – Significant increase in traffic volume between Hornby and Weedons Ross Road and a small increase between Weedons Ross Road and Burnham,
- Christchurch to Lincoln Corridor including Prebbleton – Moderate increases on Ellesmere and Birchs Road with small increases on Springs Road south of Halswell Junction Road, with larger increases north of Halswell Junction Road,
- Christchurch to Tai Tapu Corridor – Very small increase in traffic volume between Hendersons and Wrights Road,
- Dunbars and Hendersons Road – Moderate increase in traffic volume south of Dunbars Road,
- Christchurch Outer Suburbs and Western Orbital Corridor – both very small increases and decreases in traffic volumes along route, basically no significant change,
- Rolleston to Lincoln Corridor – No significant change in traffic volume along this corridor.

A sample of the main changes in traffic flows are shown in the following table.

Location	CRETS 2021	UDS 2026	Difference
Brougham Wst Selwyn	42,500	51,500	9,000
CSM West of Barrington	46,500	58,800	12,300
CSM West Awatea/Dunbars	24,700	31,500	6,800
CSM Wst Shands	20,700	26,200	5,500
Main South Road Sockburn	52,200	67,800	15,600
Johns Wst of Main North	20,000	29,000	9,000
Russley Sth Harewood	20,600	28,600	8,000
Russley Sth Memorial	30,300	39,500	9,200
Carmen Sth Buchanans	24,900	32,800	7,900
SH1 Sth Halswell Junction Rd	9,000	12,500	3,500
SH1 Sth Dawsons	11,100	13,100	2,000
SH1 Sth Curraghs	31,800	39,300	7,500
SH1 Sth Weedons	19,400	21,500	2,100
Springs Sth Main South	21,100	30,900	9,800
Springs Sth Halswell Junction Rd	10,500	14,900	4,400
Springs Sth Birchs	10,300	12,700	2,400
Birmingham Sth Vulcan	14,500	18,400	3,900
Wigram Sth Haytons	16,700	21,900	5,200
Whincops Sth Quaifes	7,200	10,200	3,000
Ellesmere Sth Leadleys	5,200	7,800	2,600
Lincoln Sth Wrights	27,800	29,200	1,400
Halswell Sth Aidenfield	18,600	22,700	4,100

Table 7

Comparison of 24 hour traffic volumes generated by CRETS 2021 and UDS 2026

A comparison has been made between traffic volumes for the Transport Strategy in 2021 and the UDS in 2026 for the area around the Christchurch International Airport. The major effects include:

- A significant increase in traffic volume on Johns Road/Russley Road and Sawyers Arm Road East of State Highway 1,
- A moderate increase in traffic on Pound Road/McLeans Island Road,
- A moderate increase in traffic on Memorial Avenue east of State Highway 1.

A sample of the main changes in traffic flows around the Christchurch International Airport area include:

Location	CRETS 2021	UDS 2026	Difference
Johns Road west of Gardiners Road	17,900	26,900	9,000
Russley Road south of Harewood Road	25,700	36,900	11,200
Russley Road south of Memorial Avenue	28,900	38,100	9,200
Memorial Avenue west of Russley Road	29,300	31,000	1,700
Memorial Avenue east of Russley Road	26,200	30,100	3,900
Pound Road south of McLeans Island Road	4,000	6,200	2,200

Table 8

Comparison of traffic volumes generated by CRETS 2021 and UDS 2026

Conclusion

As a result of the increase in vehicle trips for UDS 2026, the effectiveness of the CRETS Transport Strategy, when the UDS 2026 landuse is applied to it, is reduced. While the Transport Strategy addresses the issues that resulted from the assumed 2021 (CRETS) landuse, the more recent and higher UDS landuse projections indicate that the proposed Transport Strategy may be more relevant for the year 2016, than 2021. However, the underlying concepts of the CRETS Transport Strategy are equally applicable to the UDS 2026 including Road Hierarchy and the package of works including major, minor and CIA. If the higher vehicle trips eventuate for UDS 2026, the timing of some work for the CRETS Transport Strategy will require bringing forward, while some new works may need to be added.

It is important to note that the traffic forecast assumptions are based upon people travelling in the future as they do today. That is, people drive reasonably long distances to work, and there is only modest use of public transport and other modes. Both the UDS transport response to landuse growth and the Regional Land Transport Strategy encourage greater use of alternative modes of transport, better landuse/transport integration and travel demand management. Similarly the CRETS transport strategy identifies the need for strategic road improvements, but equally identifies the importance of public transport and other modes of travel. If there is a greater use of alternative modes than the private motor car, then the forecast travel demands may occur later than estimated. If not, then there may need to be further infrastructure improvements required.

Monitoring of actual population and traffic growth and further investigations will be necessary through ongoing UDS processes to confirm the transport requirements beyond the Transport Strategy recommended through this Christchurch Rolleston and Environs Transportation Study.

7. Test of Higher Passenger Transport Usage

The greatest potential to influence travel demand lies through landuse planning, the provision of public transport, cycle opportunities (identified within CRETS) and wider policy measures such as travel demand management, and longer term potentially road pricing (suggested in the RLTS).

As a sensitivity check, a test on passenger transport utilising the Urban Development Strategy (UDS) 2026 landuse, and an assumption that 10% of the future trips would be undertaken by passenger transport (on top of the 3% already incorporated into the CRETS study). The test is therefore based on the 2026 UDS landuse and includes approximately 13% of all trips being undertaken by public transport.

It has been found from modelling, that if the UDS 2026 landuse was to be implemented with 10% less trips (assumption that these trips transfer to public transport – or other travel demand reduction methods), it would result in changes to the traffic volumes on various links. Figure 10 shows the predicted changes in traffic volumes compared to the UDS 2026 landuse for a 24 hour period. Table contains the 24 hour period for 2026 traffic volumes for a number of significant links for the 90% UDS landuse.

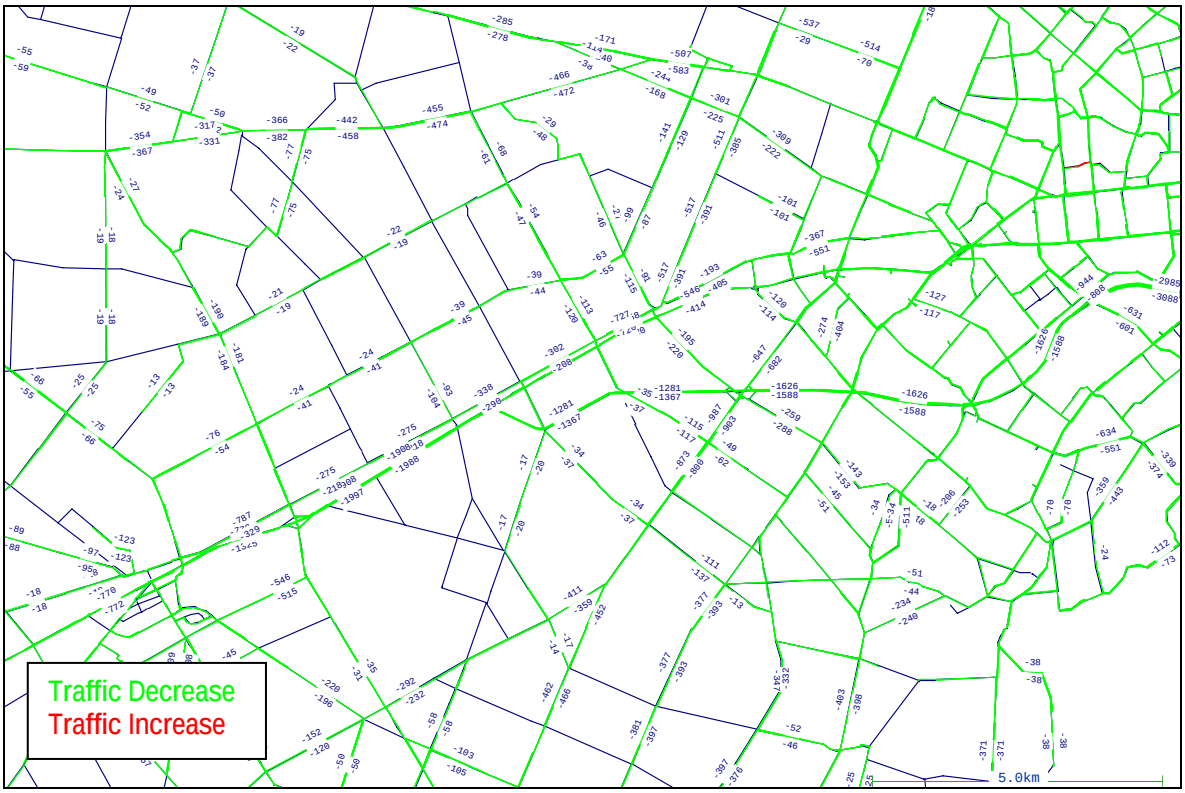

Figure 10

Transport Strategy with 90% of UDS 2026 Landuse – 24 Hour Traffic Volume Change Plot (Compared to 100% UDS 2026 Landuse)

ROUTE	DESCRIPTION	24 hour volumes					
		Validation Network 2001	Do Min Network 2021	Package of Options TS 2021	Package of Options UDS 2026	Package of Options 90% UDS 2026	Differnce UDS 2026 to 90% of UDS 2026
SH1- Hornby to Rolleston	SH1 Sth Carmen	16400	19200	11000	13100	12100	-1000
	SH1 Sth HJR	15500	26600	9000	12500	11500	-1000
	SH1 Sth Barters	15800	27300	11400	14800	13500	-1300
	SH1 Sth Kirks	16300	29800	12100	14500	13100	-1400
	SH1 Sth Dawsons	15700	29200	11100	13100	11800	-1300
	SH1 Sth Curraghs	15300	28900	31800	39300	35500	-3800
	SH1 Sth Weedons	14700	25400	19400	21500	19400	-2100
Springs - Trents to Main South	Springs Sth Main South	18000	22400	21100	30900	28000	-2900
	Springs Sth Amyes	14600	16200	15100	20000	18200	-1800
	Springs Sth HJR	10300	27300	10500	14900	13400	-1500
	Springs Sth Marshs	10500	23200	11300	13800	12500	-1300
	Springs Sth Birchs	9200	21400	10300	12700	11500	-1200
	Springs Sth Toswilll	6500	15900	6500	9200	8300	-900
	Springs Sth Hamptons	4500	8900	6300	7600	6900	-700
Shands - Halswell Junction to Main South	Sth Main South	21100	26200	27000	35600	32000	-3600
	Sth Amyes	11400	11000	13700	15900	14500	-1400
	Sth Seymour	12500	12100	14200	17100	15500	-1600
Lincoln Connection	Birmingham Sth Vulcan	5700	6500	14500	18400	16600	-1800
	Wigram Sth Haytons	3500	8800	16700	21900	19800	-2100
	Dunbars to Halswell Junction			12300	15900	14300	-1600
	Halswell Junction to Marshs			11000	13500	12200	-1300
	Whincops Sth Quaifes	200	500	7200	10200	9200	-1000
	Ellesmere Sth Leadleys	2800	2200	5200	7800	7000	-800
	Lincoln Southern Collector			1400	1900	1700	-200
SH1 - Main South to Main North	Johns Wst Main North	12100	19800	20000	29000	25900	-3100
	Johns Wst Gardiners	11300	18700	19300	28000	25100	-2900
	Johns Wst of Sawyers Arms	17100	27300	23100	30700	27600	-3100
	Russley Sth Harewood	16500	21700	20600	28600	25700	-2900
	Russley Sth Wairakei	16900	22100	22300	30200	27000	-3200
	Russley Sth Memorial	22200	30800	30300	39500	35600	-3900
	Russley Sth Ryans	18000	23700	26600	34400	31000	-3400
	Masham Sth Yaldhurst	16100	23600	23800	30600	27600	-3000
	Carmen Sth Buchannans	16900	25400	24900	32800	29600	-3200
	Carmen Sth Waterloo	17100	23800	24000	31200	28200	-3000
CSM - Nash to Jerrold	Barrington Wst Selwyn	27300	43800	42500	51500	46000	-5500
	CSM Wst Barrington	24000	48500	46500	58800	52700	-6100
	CSM Wst Curletts		26100	24700	31500	28300	-3200
	CSM Wst Nash		26100	24700	31500	28300	-3200
	CSM Wst Awatea/Dunbars		26100	24700	31500	28300	-3200
	CSM Wst Springs			24700	31500	28300	-3200
	CSM Wst Shands			20700	26200	23600	-2600
Main South/Blenhiem - Springs to Curletts	Blenhiem Wst Curletts	40200	35500	31500	40500	36700	-3800
	Main South Wst Epsom	50200	54400	52200	67800	61300	-6500
	Main South Wst Lowther	43300	48000	39200	52400	47400	-5000
	Main South Est Springs	44500	48700	40400	55000	49800	-5200
Curletts - Blenhiem to Lincoln/Halswell	Curletts Sth Blenhiem	35500	37400	33300	37900	34300	-3600
	Curletts Sth Parkhouse	35400	35100	35000	41100	37000	-4100
	Curletts Sth CSME	12000	11900	12100	12100	10800	-1300
Amyes - Shands to Springs	Amyes Sth Shands	7700	16900	14600	20500	18300	-2200
	Amyes Nth Springs	10600	20500	17900	23700	21600	-2100
	Awatea Sth Springs	2600	18300	15500	22900	20700	-2200
	Awatea Nth Wigram	2400	10700	9000	12400	11100	-1300
	Dunbars Sth Wigram	5100	12000	13000	16100	14400	-1700
	Dunbars Nth Halswell	4700	9800	9700	13200	11900	-1300
Halswell Junction - Main Sth to Springs	HJR Nth Shands	1800	8200	900	2200	2000	-200
	HJR Nth Springs	7200	16900	8300	18600	16600	-2000
Halswell - Nicholls to Lincoln	Lincoln Sth Wrights	24400	30500	27800	29200	26200	-3000
	Halswell Sth Curletts	23500	27200	24600	25200	22700	-2500
	Halswell Sth Hendersons	18000	26100	22400	23000	20700	-2300
	Halswell Sth Aidenfield	18000	22100	18600	22700	20300	-2400
	Halswell Sth Dunbars	13600	17500	14800	16700	15100	-1600
Rolleston Drive	Rolleston Sth SH1	2400	5900	9700	12400	11200	-1200
	Rolleston Sth Tennyson	100	2300	2400	4200	3800	-400

Table 9

Transport Strategy with 90% of UDS 2026 Landuse Major Works – Traffic Volumes

Conclusion

The shift of 10% of all trips to public transport as set out in this section shows a reduction of traffic of up to 4,000 vpd on key arterial roads. The resultant traffic flows through Sockburn are still higher than the CRETS forecasts. To provide a sustainable transport network, a greater than 10% use of passenger transport and alternative modes such as cycling will be required.

8. Summary/Conclusion

The Christchurch, Rolleston and Environs Transportation Study (CRETS) is a study of the transportation requirements in the Christchurch to Rolleston broad area for the period to 2021. The study takes into account the NZ Transport Strategy 2002 and the Land Transport Management Act (LTMA) 2003. The study not only considers improvements to the road network but also includes other transport mode opportunities, including passenger services and cycling.

The study area includes the Selwyn towns of Rolleston, Lincoln, Springston, West Melton, Tai Tapu, Templeton and Prebbleton; the south western suburbs of Christchurch generally including Hornby, Sockburn, Wigram and Halswell; and the Christchurch International Airport. Although outside the study area, access to the Port of Lyttleton, in particular from the south has been taken into account.

The aim of the study is to produce a Transport Strategy that is robust and flexible to accommodate a number of future urban growth possibilities in the study area, while contributing to an integrated safe, responsible and sustainable land transport system in the future.

Key aspects of the Transport Strategy can be summarised as:

- Utilising the Main South and Midland Rail lines for the movement of freight, especially coal from the West Coast
- Protecting the rail corridor from Rolleston through Hornby to Christchurch Central as a long term possibility for commuter rail.
- Developing a road hierarchy to ensure that the road network is developed where appropriate for mobility and access, and to assist the Study Partners in the protection of the road corridors.
- Distribution of traffic across the network whereby better utilising the existing road network.
- Future proofing transport corridors in particular State Highway 1, Southern Motorway (including its extension from Halswell Junction Road to the South of Templeton) and the Christchurch/Lincoln connection via Wigram, Whincops and Ellesmere Roads.
- Planning of key bus corridors in the Selwyn area including Park and Ride Facilities and key corridors including Birchs Road and Lincoln/Halswell Road.
- Improving the Western Corridor by four laning of Johns/Russley/Carmen/Masham Roads (SH1) to provide improved access to the airport and industries and commerce on the Western fringe of Christchurch, as well as to strengthen the North/South function of this route and promoting Yaldhurst Road/Pound Road as a bypass of Hornby.
- Improving access to Christchurch International Airport via three key points, including provision for the separation of heavy/freight from passenger traffic as much as possible.
- Planning for increased traffic between Christchurch and Rolleston and traffic from the south to Christchurch City and the Port of Lyttelton via an extension of the Christchurch Southern Motorway and the four laning of State Highway 1 from the extended motorway connection with State Highway 1, to Weedons Ross Road on the Northern edge of Rolleston.
- Improving access to the township of Rolleston and the Rolleston Industrial Area via three key points including one to the north, one to the south and Tennyson Street, as well as a grade separated connection between Rolleston Township and Rolleston Industrial Area.

- Improved connection between Rolleston and Lincoln including a passenger transport route via Boundary Road.

- Planning for increased traffic between Christchurch and Lincoln and the Halswell area via a series of arterial roads including an improved route utilising Matipo Street, Birmingham Drive, Magdalan Place, Wigram Road, Whincops Road, Longstaffs Road and Ellesmere Road to Lincoln, and Ellesmere Road via Sabys/Candys State Highway 75 to Sparks Road/Frankleigh Street/Milton Street to the Halswell area.

- Provision of an improved orbital arterial from Hornby to Halswell and beyond via Amyes Road, Awatea and Dunbars Road with an extension to Sparks Road/Hendersons Road.

- Promotion and development of a South Western orbital corridor between State Highway 1 and State Highway 75 utilising Hamptons Road, Trices Road, Sabys Road and Candys Road with a new link between Trices Road and Sabys Road.

- Upgrading of Hoskyns Road to provide better access to Rolleston from the West, including State Highway 73.

- Planning for an alternative route to State Highway 1 between Christchurch and Rolleston via Shands and Selwyn Roads.

- Intersection improvements on various routes to improve mobility, safety and access.

- Reduction of future traffic through existing townships including Templeton and Prebbleton.

- Provision for cycling into individual works by providing wide shoulders and cycle lanes where appropriate, as well as dedicated alternative mode corridors including Birchs Road between Lincoln and Prebbleton, and Boundary Road between Lincoln and Rolleston.

The Transport Strategy has shown to be effective in providing for the transport needs within the Study Area up to 2021, utilising where possible the existing transport corridors, for both freight, private and public passenger transport, and cycling. A limited number of new transport corridors will be required, which have been chosen through extensive analysis to maximise the transport efficiency, while minimising both environment and social effects.

The Transport Strategy has deliberately built into it, the ability to cater for alternative transport modes in the future. In particular future bus passenger transport will have the necessary transport corridors in place and appropriate road cross sections have been included for cyclists and in some cases off road cycle lanes are included.

APPENDICES