

## 11. TRAFFIC & TRANSPORT

### Overview

The Project is consistent with the Requiring Authority objectives and will have significant positive traffic effects (i.e. benefits) at a local, regional and national level, in that:

- travel times on the Southern Corridor between Rolleston and Brougham Street are expected to be significantly lower with the Project, with travel time savings of up to 12 minutes predicted by 2041 (journey time down from 30 minutes without the Project);
- the reliability of these travel times is expected to improve, as the improved level of service on Main South Road and CSM provided by the Project, and the design providing predominantly grade separated intersections, will reduce the likelihood of unexpected delays;
- it will be significantly safer than the current route (with a predicted 40% reduction in fatal and serious injury crashes), as well as providing more capacity;
- it provides additional road capacity between Christchurch and the Port of Lyttelton to the south and west, and reduces travel times along the corridor by improving the linkage from Rolleston through to Brougham Street, and then on to the Port of Lyttelton. The rerouting of traffic onto this Project is expected to reduce traffic volumes through Templeton and Hornby by over 17,000 vehicles per day, with over 2,000 fewer trucks travelling through Templeton daily; and
- the expected rerouting of some heavy vehicles from Main South Road through Templeton and Hornby onto CSM removes this through traffic from Main South Road and moves them onto a high class motorway facility. The improved level of service provided on Main South Road is also expected to lead to a decrease in traffic on Jones Road, the primary passenger transport route between Christchurch and Rolleston. This will significantly contribute to promotion of the Jones Road route for passenger transport.

There are some localised adverse effects relating to restrictions in access to properties, primarily along the MSRFL section, which will be mitigated by the provision of alternative rear access routes on both sides of Main South Road.

A construction traffic management plan, supported by individual site specific temporary traffic management plans, will manage as far as is reasonably practicable the adverse effects on the road network.

### 11.1. Introduction

This chapter presents the key findings of the assessment of traffic and transport effects undertaken for the Project. The chapter draws on the information contained in Technical Report 2 and covers the key traffic and transport effects for both the operation (Section 11.7) and construction (Section 11.9) of the Project.

This assessment is primarily informed by traffic modelling, which is described briefly in Section 11.6. Of note, the effects of the Canterbury earthquakes have not been explicitly taken into account in the modelling assessment. At the time the modelling was undertaken, there was

insufficient information to assess their likely long-term effects on population and land-use projections.

The NZTA and UDS partners have recently undertaken a programme of works to understand how the earthquakes have affected where people live, work and travel in the Greater Christchurch area. The outcome from this work is that in the short term, household and employment numbers are likely to lag behind pre-earthquake growth scenarios. However, by 2026 growth projections are expected to be almost the same as predicted before the earthquakes, with similar trends continuing through to 2041.

In the Christchurch southwest area, the updated growth scenario suggests a slightly faster rate of development than projected before the earthquakes (5% higher). Although no quantitative modelling analysis has been carried out, this is considered to further support the Project as this higher rate of growth will increase the demand for travel within the area served by the Project.

### **11.2. Wider transport planning**

As identified in Section 7.4.1 above, the Project was included in the final CRETS strategy as part of a wider package of transportation improvements in the Christchurch to Rolleston area. This strategy was developed to accommodate future population and employment growth to the southwest and south of Christchurch and has since been integrated into other key growth management documents, including the UDS and SWAP.

The Project is therefore a key individual component of a joint overall transport network solution. Primarily, the Project will complete the Christchurch RoNS Southern Corridor and provide the national strategic function of connecting the wider Canterbury and South Island areas to the Christchurch City Centre and Lyttelton Port.

To complement the Project, a number of other local road improvements are currently intended, as identified in CRETS and UDS partner local roading programmes, to service current and future demand from growth in the area. Whilst separate from the Project, these local road improvements will complement the strategic function of the Project by catering for local trips, while maintaining efficient access and connectivity to the arterial network.

Current examples include the upgrade of adjoining local roads and intersections to cater for traffic using the Project interchanges planned near Prebbleton and Rolleston, and the promotion of a route between Lincoln and Christchurch using Ellesmere Road, connecting to Magdala Place via Wigram Road, to reduce future traffic demand from Lincoln on Springs Road through Prebbleton. The upgrade of Selwyn Road and Lincoln Rolleston Road, in conjunction with Shands Road, has created a new district arterial that will connect to the proposed Project interchange on Shands Road to cater for traffic growth from expanding Rolleston southern residential areas.

The NZTA will continue to work with the UDS partners to develop local projects supporting the efficient and safe function of the wider network relating to the Project. In this regard, a short study on wider network operations is currently underway. This study is considering post-

earthquake land use changes and the overall Project configuration, specifically the inclusion of motorway access ramps at Halswell Junction Road and the extent of the effects on the adjoining local network, such as Springs Road and Halswell Junction Road. The desired outcome of this study is to agree amongst the UDS partners the “best for network” solution taking these aspects into account. The study will also help inform other local road upgrades required in the wider study area that may be needed. This may include those already identified in CRETS and other local transport programmes. Projects outside the scope of this Project would be developed by the NZTA and the relevant council through a coordinated planning and funding approach to deliver these. Should the study identify new projects that would enhance the outcomes to be delivered by this Project, the NZTA will work with the relevant council to agree their planning, funding and delivery of such projects.

### 11.3. Traffic and transport issues and objectives

The Requiring Authority has specific objectives for the Project which are directly relevant to the traffic and transport assessment. These include catering for future growth and traffic demand whilst improving travel times, road safety and access for people and freight in southwest Christchurch. The following sections describe the key issues with the existing network in this regard. The Requiring Authority objectives for the Project are listed in full in Chapter 2 of this AEE.

#### 11.3.1. Travel demand

The route currently experiences congestion and predicted growth in the southwest area will place further demand on this corridor. The completion of CSM1 in 2013 will bring about significant relief on the existing motorway and the Blenheim Road/ Curletts Road corridor. However, the completion of CSM1 will also lead to a large increase in traffic on Halswell Junction Road and congestion issues will remain on Main South Road from Halswell Junction Road through to Rolleston.

Table 16 below presents the baseline 2006 traffic flows, together with the forecast “Without Project” traffic flows in 2016 and 2026 at selected locations along Main South Road and Halswell Junction Road. A percentage change is shown to compare the traffic growth from the Baseline 2006 traffic flows to the future 2016 year and from 2016 to the 2026 year.

**Table 16: Baseline “Without Project” Daily Traffic Volumes on SH1 and Halswell Junction Road**

Location	2006	2016	2006-2016 Change	2026	2016-2026 Change
HJR: West of Springs Rd	15,750	29,750	89%	34,250	15%
MSR: South of HJR	20,000	30,250	51%	35,750	18%
MSR: South of Trents Rd	18,500	25,250	36%	30,750	22%
MSR: South of Weedons Rd	17,750	24,750	39%	30,500	23%

HJR = Halswell Junction Road, MSR = Main South Road

There is significant growth predicted to occur between 2006 and 2016, in particular on Halswell Junction Road as a result of the direct connection to CSM1. Increases from 15 – 23% are predicted to occur between 2016 and 2026, indicating the continued growth in demographic and economic factors. For example, in Rolleston over the 10 year period between 2016 and 2026, it is projected that there will be a 40% increase in households and employment.

### **11.3.2. Travel time and congestion**

The high travel demand results in congestion and increased travel times during weekday peak periods. For example, in 2026 it is expected that a southbound journey from Brougham Street to Rolleston will take 43% longer in the weekday PM peak when compared to the uncongested Inter-peak. By 2041, it is predicted this journey will be 59% longer.

Travel time variability is also known to increase as a result of traffic congestion. This leads to uncertainty of travel times along the route. The planning of journeys can become increasingly difficult resulting in additional costs for travellers and businesses.

### **11.3.3. Safety**

Between 2006 and 2010, there were 197 reported crashes on Main South Road (Park Lane to Halswell Junction Road) and on Halswell Junction Road (Main South Road to Springs Road). This included one fatal and 14 serious injury crashes. The reported number of high severity crashes has not changed significantly over the five year reporting period.

Of the 197 crashes, 57% occurred on the peri-urban  $\leq 70$  km/h sections of Main South Road and Halswell Junction Road. The remaining 43% occurred on the rural 100 km/h sections of Main South Road. Well over a half of crashes (57%) occurred at intersections or property accessways.

The Project will address rising traffic demands by the provision of an upgraded section of Main South Road and provision of an alternative route designed to modern safety standards. Without the Project, existing crash rates are likely to increase with an increase in traffic over time.

## **11.4. Traffic and transport policy framework**

This Project is part of the RoNS programme and fits within a number national legislative and strategic documents including:

- Land Transport Management Act 2003;
- Government Policy Statement on Land Transport Funding 2012/13–2021/22;
- National Infrastructure Plan 2011; and
- Connecting New Zealand 2011.

The national strategic significance and priority of the Project has been incorporated by the regional council and relevant district authorities in regional and local strategic planning documents, including:

- Canterbury Regional Land Transport Strategy 2012–2042;
- Canterbury Regional Policy Statement 1998 (RPS) and Proposed RPS 2011;
- Greater Christchurch Urban Development Strategy and Action Plan (2007);
- Draft Christchurch Transport Plan 2012-2042; and
- South-West Christchurch Area Plan 2009.

Further discussion on these strategies is provided in Chapters 6 and 28 of this AEE.

## 11.5. The existing transportation and traffic environment

### 11.5.1. Strategic context

SH1 is an integral part of the strategic road network in the Canterbury region being the primary north-south arterial and providing key linkages to the city, Port and Airport. The route in the Project area serves an important role for inter-regional and longer distance travel, especially freight travelling to the Port. It also connects to some of the major warehousing and industrial areas in the Christchurch region including Rolleston Izone, Hornby and Woolston. The route therefore has an important function in supporting the local, regional and national economy in the distribution and delivery of goods and services.

The Port is identified as a key freight destination in the South Island for international exporting and domestic coastal shipping. In 2011, the Port handled an import value of \$2.9 billion (cost insurance freight value) and export value of \$5.1 billion (free on-board value)<sup>68</sup>. This represented approximately 60% of the total value of regional imports and exports and 8% of total national imports and exports.

Freight volumes through the Port have grown steadily over the last decade, and this growth is expected to continue over the next decade, especially with container operations no longer being handled by the Port of Timaru. Containers are primarily transported by road, and the number of containers through the Port is projected to double by 2022.

### 11.5.2. Network description

A description of the existing transport network, in terms of the existing State highway, local road, freight, public transport, walking and cycling networks is outlined in Chapter 3 of this AEE.

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<sup>68</sup> Statistics New Zealand overseas cargo statistics

## 11.6. Methodology for assessing effects

### 11.6.1. Traffic models

This assessment has been informed by the use of transportation models, which have been used to provide forecasts of travel demands, road conditions, level of service (LoS) and operational performance of the road network. This has been based on a hierarchical approach involving the following:

- Regional multi-modal modelling using the Christchurch Transport Model (CTM);
- Regional traffic modelling using the CSM2 Project Model (CPM);
- Detailed operational modelling of interchanges using VISSIM; and
- Detailed operational modelling of intersections using SIDRA.

The models have been developed for a historic base year of 2006 and future years of 2016, 2026 and 2041, using demographic forecasts consistent with the UDS growth strategy. The modelled outputs are representative for weekday morning (AM) peak, inter-peak and evening (PM) peak periods. The regional models have been subject to rigorous processes of calibration, validation and peer review to ensure that modelling forecasts are reliable.

As noted previously in Section 11.1, the growth forecasts do not take account of the changes brought about by the recent Canterbury earthquakes. However, post-earthquake growth scenarios indicate a slightly faster rate of development occurring in the Christchurch southwest area, with the long term total level of development in 2041 expected to remain relatively unchanged. This is considered to further support the need for the Project, although no quantitative modelling analysis has been undertaken.

### 11.6.2. Modelling methodology

The effects assessment on the transport network has been based around the following two typical scenarios:

- Baseline “Without Project” scenario: this represents a realistic future scenario of the road network in the modelled area, but without the Project in place; and
- “With Project” scenario: this is the same as the Baseline network, except that it includes the CSM2 and MSRFL elements of the Project.

### 11.6.3. Effects based assessment methods

The two scenarios described above have been assessed across a range of criteria which measure the performance of the transportation network. The traffic and transport models have been used to provide quantitative forecasts to assist in this process. The criteria assessed are:

- traffic impacts analysis (traffic volumes, level of service and travel times);
  - intersection performance (level of service);
  - heavy vehicles (traffic volumes);
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- passenger transport services (opportunities and impacts);
- pedestrians and cycling (opportunities and impacts);
- safety (changes in frequency, severity and location of crashes); and
- access to property.

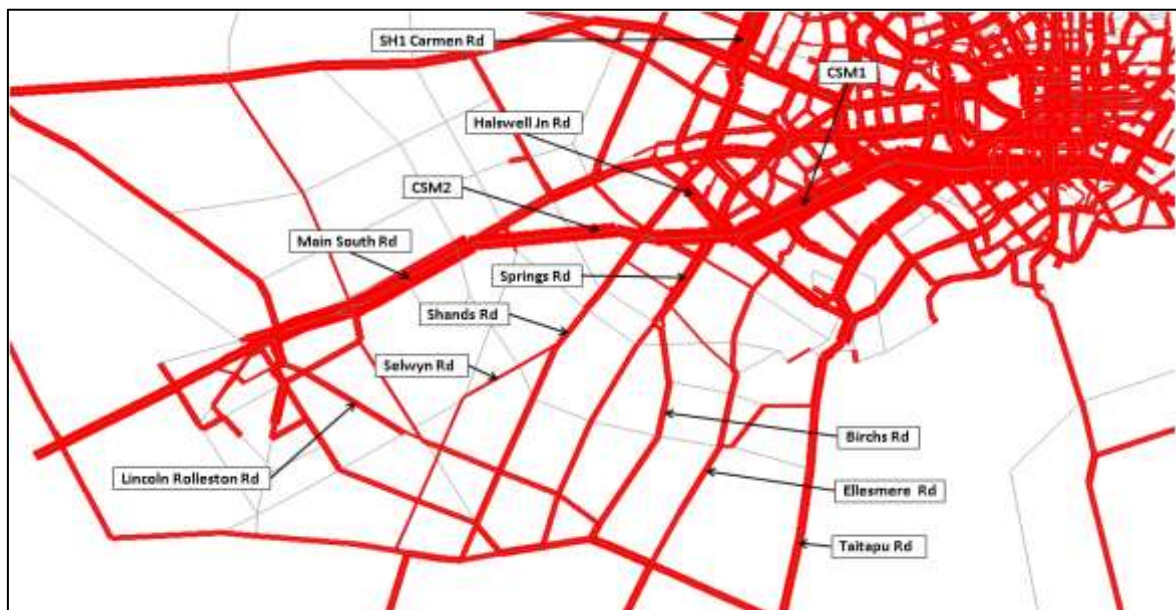
### 11.7. Assessment of effects

Detailed effects on the transport network are outlined in the following sections.

#### 11.7.1. Effects on traffic volumes

Figure 45 depicts graphically the all day traffic volumes forecast for 2041 for the “With Project” road network. The red lines indicate the relative volume of traffic on each link, with thicker bars representing more vehicles than thinner bars i.e. the “wider” the road link, the more important it is for the movement of people and goods.

Figure 45: CSM2 & MSRFL network average daily traffic volumes – 2041



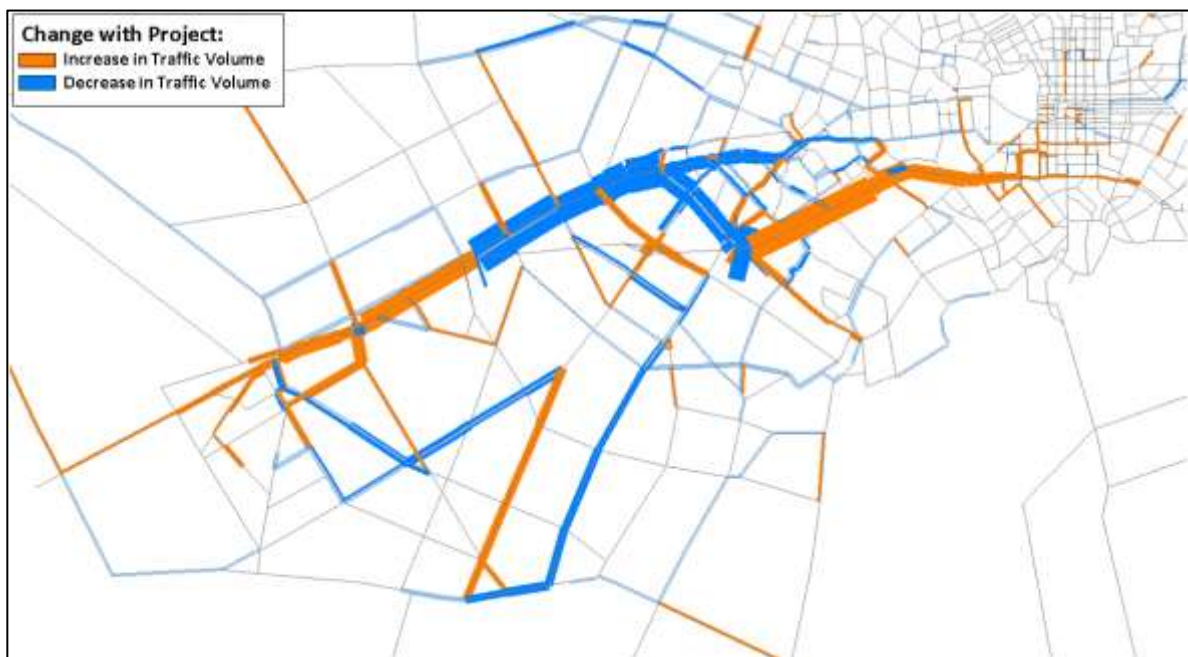
From Figure 45, it can be seen that the main routes for trips to and from the south west area of Christchurch and the southern side of central Christchurch city will be:

- Along the route of the RoNS Southern Corridor (comprising CSM1, CSM2 and MSRFL);
- Main South Road corridor from the CSM2/ Main South Road interchange through to SH1 Carmen Road in Hornby;
- Springs Road, Shands Road and Birchs Road on the Lincoln/Prebbleton corridor;
- Ellesmere Road; and
- Tai Tapu Road.

Figure 46 presents the larger differences in all day traffic volumes expected in 2041 with the Project completed. The orange lines show where traffic is predicted to increase compared to the Baseline “Without Project” scenario. The blue lines indicate where traffic is expected to decrease. The width of lines denotes the level of volume change.

For clarity, traffic volumes on the CSM2 motorway links are not shown, as they would overwhelm the relative differences on other links within the network given the Baseline network does not include these links.

Figure 46: Traffic Difference Plot – 2041 ADT (Project vs. Baseline)



Completion of the Project is expected to have the following effects on the route choices within the south western area of Christchurch:

- CSM2 between Halswell Junction Road and Main South Road will be used in preference to the Baseline routing of Halswell Junction Road and Main South Road;
- the largest reduction in traffic volumes is on the bypassed section Main South Road (between the CSM2 interchange and Halswell Junction Road) and on Halswell Junction Road (between Main South Road and Springs Road);
- there will be a reduction in traffic volumes on Main South Road through Hornby between Halswell Junction Road and Carmen Road;
- south of the CSM2/ Main South Road interchange, the upgraded Main South Road will be used instead of the parallel alternative routes (Selwyn Road, Jones Road and Maddisons Road) as level of service improves and travel times decrease on Main South Road;
- the new interchange on Shands Road will draw traffic from the parallel Springs Road routing, enabling access to the motorway without having to travel through the Prebbleton urban area or the Halswell Junction Road/ Springs Road roundabout;



- the new interchange at Weedons will attract more traffic on Weedons Road, Weedons Ross Road and Levi Road for access into Rolleston;
- more traffic will use Marshs Road between Main South Road and Springs Road to access the new interchange on Shands Road; and
- minor decreases in traffic volumes on Hamptons Road, Trents Road and Blakes Road across Prebbleton.

The key State highway and local road sections where notable changes in traffic volumes are experienced are outlined in Table 17 and Table 18 below. The locations where significant changes (in percentage terms) will be felt are highlighted with green indicating a significant reduction predicted, and red indicating a significant increase predicted.

**Table 17: State highway traffic volume changes**

State highway section	2041 Baseline	2041 Project	% Change
Brougham St: West of Selwyn St	51,500	54,500	6%
CSM1: Between Barrington St & Curletts I/C	49,250	55,750	13%
CSM1: Between Curletts I/C & HJR	40,750	54,750	34%
CSM2: Between HJR & Shands I/C	N/A	32,750	N/A
CSM2: Between Shands I/C & MSR	N/A	27,000	N/A
HJR: Between Springs Rd & MSR	37,750	28,000	-26%
MSR: South of SH1 Carmen Rd	25,500	21,000	-18%
MSR: South of HJR	40,500	23,250	-43%
MSR: South of Marshs/ Barters Rd	37,750	24,000	-36%
MSR: South of Trents/ Kirk Rd	19,000	35,750	-47%
MSR: Between CSM2 & Weedons I/C	36,750	45,750	24%
MSR: Between Weedons I/C & Park Ln	35,250	40,750	16%
MSR: Between Hoskyns Rd & Rolleston Dr	42,000	43,500	4%

HJR = Halswell Junction Road, MSR = Main South Road

At the northern end of the Christchurch Southern Corridor, the traffic modelling indicates that there will be capacity issues on Brougham Street for both the Baseline and “With Project” scenarios. The NZTA is intending to progress a full corridor study from the City end of CSM1 to the Port of Lyttelton to investigate options for maintaining the efficient operation of this strategic

corridor. Pending the results of this corridor study, the NZTA will continue its normal policy of making incremental operational improvements.

At the southern end of the Project in Rolleston, the end of the four-laning at Park Lane merges traffic back into a single lane in the southbound direction. With the additional traffic drawn to the widened Main South Road and CSM2 from Rolleston, the level of service through this merge is expected to be worse than for the Baseline case, with slightly increased travel times. Although the NZTA does not currently have any specific projects on its 10 year programme to improve this section of the State highway network, it has a strategy for improvements as outlined in the CRETS reports and will continue to monitor the performance of this part of the network. When this monitoring identifies the need for improvements, the adopted CRETS strategy improvements will be developed and implemented to resolve safety or congestion issues. These improvements involve the removal of the traffic signals on the Main South Road intersections with Hoskyns Road and Rolleston Drive, and provision of a grade separated connection between Rolleston and Jones Road.

Improvements to the alternative routes bypassing this section of Main South Road to both the western and eastern sides of Rolleston are being delivered as part of the Project. These are via Weedons interchange to Jones Road and Levi Road.

**Table 18: Local road traffic volume changes**

Local road section	2041 Baseline	2041 Project	% Change
Springs Rd: North of Halswell Junction Rd	24,250	28,250	16%
Springs Rd: North side of Prebbleton	20,000	18,750	-6%
Springs Rd: Through Prebbleton	17,750	16,250	-8%
Springs Rd: South side of Prebbleton	5,000	2,500	-50%
Springs Rd: South of Robinsons Rd	5,500	3,250	-41%
Shands Rd: North of Halswell Junction Rd	19,500	18,750	-4%
Shands Rd: North side of Prebbleton	14,250	15,500	9%
Shands Rd: South side of Prebbleton	12,000	11,750	-2%
Shands Rd: South of Robinsons Rd	4,750	7,250	53%
Jones Rd: South of Templeton	4,000	2,500	-38%
Selwyn Rd: South of Shands Rd	9,000	6,500	-28%
Marshs Rd: West of Springs Rd	5,500	6,750	23%

Local road section	2041 Baseline	2041 Project	% Change
Marshs Rd: West of Shands Rd	2,000	4,000	100%
Weedons Ross Rd: West of Jones Rd	1,000	1,750	75%
Levi Rd: South of Weedons Rd	3,500	7,000	100%
Hamptons Rd: West of Shands Rd	1,750	1,250	-29%
Trents Rd: East of Main South Rd	2,000	1,000	-50%
Blakes Rd: East of Shands Rd	5,500	3,000	-45%

In summary, the modelling indicates that there will be significant changes in patterns of traffic demands throughout the area served by the Project. Many of the changes are positive, with traffic transferring onto the higher standard Project alignment. The change in traffic volumes on the road also gives an indication of the potential for safety benefits i.e. the number of crashes predicted due to vehicle exposure. Traffic safety is assessed further below in Section 11.7.7.

In terms of local roads, the main changes to traffic flows are summarised as follows:

- many local roads are predicted to experience a decrease in traffic volumes. In particular, Springs Road between Prebbleton and Lincoln, Jones Road between Weedons and Templeton, the Lincoln Rolleston Road – Selwyn Road route to Shands Road and the Hamptons/Trents/Blakes Road connections across Prebbleton;
- traffic volumes on Marshs Road are expected to increase as a result of the Shands Road interchange, with flows on the section between Main South Road and Shands Road predicted to more than double. While significant in percentage terms, the largest increase of 2,250 vehicles per day is not expected to alter the nature of the road environment. The proposed signals at the Marshs / Shands Road intersection will also improve traffic management through this area;
- traffic volumes on Weedons Road, Weedons Ross Road and Levi Road are expected to increase by around 75 – 100% as a result of the Weedons interchange and the alternative access they provide to and from Rolleston. Again, while significant in percentage terms, the increase in traffic volumes is not expected to significantly impact on the operation of these roads;
- traffic volumes are expected to increase by around 50% on Shands Road between Lincoln and Prebbleton. This is a result of traffic transferring from Springs Road to Shands Road to access the motorway via the Shands road interchange. This supports the CRETS strategy to reduce traffic demand on Springs Road through Prebbleton and progressive upgrades are expected to take place on adjoining local roads to cater for traffic using this interchange;
- other local road improvements have been identified through CRETS and UDS partner local roading programmes to service current and future demand from growth to the south and southwest of Christchurch. Current examples include the upgrade of local roads adjoining the Project near Prebbleton and Rolleston and the promotion of a

secondary route between Lincoln and Christchurch using Ellesmere Road connecting to Magdala Place via Wigram Road to further reduce traffic demand from Lincoln on Springs Road. The NZTA will continue to work with the UDS partners to develop complementary local road projects. Such projects, however, would be separate improvement packages and do not form part of this Project.

#### 11.7.2. Effects on road travel times

The travel times on three routes within the area affected by the Project have been assessed. The routes include:

- RoNS Southern Corridor Route: Covers SH73/ SH76/ SH1 from Brougham Street to Rolleston;
- Lincoln/Prebbleton Corridor: Springs Road from Ellesmere Junction Road in Lincoln to Main South Road in Hornby; and
- Main South Road Corridor: Covers Main South Road and Blenheim Road from the CSM2 interchange on Main South Road to Deans Avenue at Hagley Park.

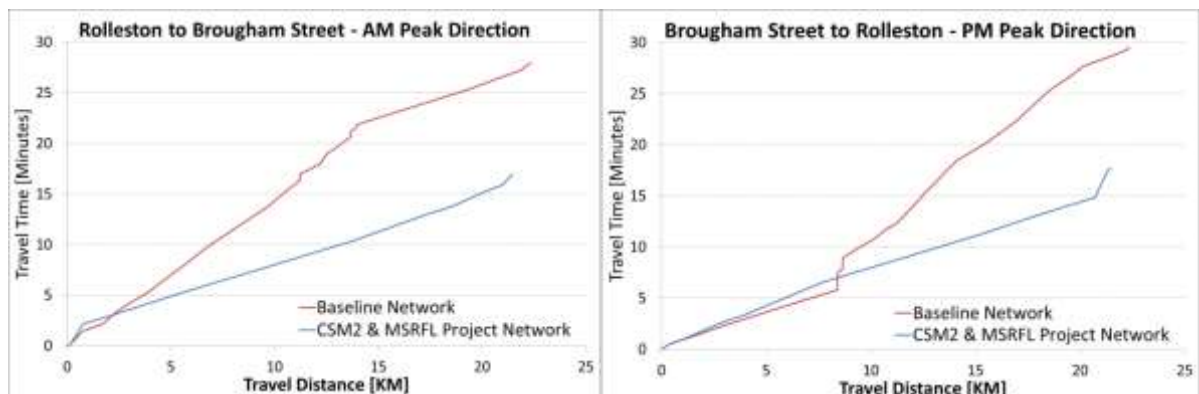
The most significant travel time effects are on the Southern Corridor route and the results comparing the Baseline and “With Project” scenarios are summarised below. There are also moderate positive effects on both the Lincoln/ Prebbleton and Main South Road corridors and these are reported in Technical Report 2.

##### *RoNS Southern Corridor route*

Travel times have been assessed for the Southern Corridor journey between the Main South Road / Rolleston Drive intersection in Rolleston and the Brougham Street / Selwyn Street intersection in Christchurch City. The Baseline routing utilises CSM1, Halswell Junction Road and Main South Road, whilst the Project travels via CSM2 and MSRFL.

Figure 47 presents time versus distance plots for the peak direction for the AM and PM peak hours, comparing the travel times on the Baseline route in 2041 against those with the Project in place. It is noted that for the Baseline scenario, travel distances on the route are marginally longer (0.9 km), so the completion of the Project will result in both journey time savings and a shorter travel distance.

Figure 47: Time vs distance plots of travel times between Rolleston and Brougham Street – 2041



The assessment indicates that the completion of the Project will produce significant travel time savings on the Southern Corridor route:

- savings of nine minutes (35%) citybound in the AM peak hour and 10 minutes (40%) Rolleston bound in the PM peak hour are expected in 2026, rising steadily to 11 minutes (40%) and 12 minutes (40%) respectively by 2041; and
- slightly lower savings of approximately five minutes (25%) are expected in the non-peak directions, as well as during the inter-peak period.

Although not quantified in these travel time figures, it is likely there will also be significant benefits in terms of the consistency of travel times for users of the Project. Travel time variability is known to increase as traffic levels become more congested, as is expected on the existing SH1 corridor. Therefore the significant increase in capacity provided as part of the Project, and the ability to avoid passing through a number of at-grade intersections, is expected to improve journey time reliability. This leads to travellers having more certainty regarding their expected arrival times at their destination, especially important for freight movements. This is consistent with the Requiring Authority objective to provide more predictable travel times and connections between the first stage of the Christchurch Southern Motorway and Rolleston for people and freight.

### 11.7.3. Effects on intersection performance

#### *Existing intersections*

The Project will result in significant reductions in volumes of through traffic along the bypassed sections of Main South Road and Halswell Junction Road, which will lead to an improvement in the performance of all intersections along this corridor. An example includes the priority controlled Main South Road/ Kirk Road/ Trens Road intersection in Templeton, where traffic volumes on Main South Road will reduce by approximately 15,000 vehicles per day in 2026 making it substantially easier for movements to and from the side roads. At the Halswell Junction Road/ Shands Road signals, the operation of the intersection will improve with the Project in place.

Specific intersection assessments have been undertaken at the following locations:

- Main South Road/ Rolleston Drive signals;
- Main South Road/ Hoskyns Road signals;
- Main South Road/ Kirk Road/ Trents Road priority intersection;
- Main South Road/ Halswell Junction Road signals; and
- Halswell Junction Road/ Shands Road signals.

Detailed results of these assessments are contained in Technical Report 2. The first two signalised intersections in Rolleston are beyond the southern extent of the Project, and are expected to have future capacity problems in the Baseline scenario. An increase in traffic volumes on the upgraded section of Main South Road is predicted to incur additional delays at these locations from 2026. As noted above in Section 11.7.1, the NZTA has a strategy for improvements at this location as outlined in the CRETS reports and will continue to monitor the operation of SH1 in this area. Alternative routes bypassing this area of Main South Road to both the western and eastern sides of Rolleston are also being delivered as part of the Project. These are via the Weedons interchange to Jones Road and Levi Road.

#### *New intersections*

Specific assessments have been undertaken on the proposed intersections forming the connections between the Project and the local road network. These include:

- Weedons Road / Weedons Ross Road interchange;
- Weedons Ross Road / Jones Road roundabout;
- Weedons Road / Levi Road priority intersection;
- Main South Road / Waterholes Road / Dawsons Road roundabout;
- Shands Road interchange including Marshs Road intersection;
- Halswell Junction Road / Springs Road roundabout; and
- CSM1 westbound off-ramp / Halswell Junction Road / John Paterson Drive roundabout.

Detailed results of these assessments are contained in Technical Report 2. All of the intersections were assessed to perform satisfactorily, aside from the Halswell Junction Road/ Springs Road roundabout and the CSM1 westbound off-ramp.

Without the Project, significant delays are expected at the Halswell Junction Road/ Springs Road intersection in the Baseline scenario soon after the opening of CSM1. With the Project in place, the roundabout will perform much better initially, but “level of service” problems are still anticipated during the evening peak from 2026 onwards. However, the availability of a reasonable alternative motorway access at Shands Road is expected to mitigate this effect, with motorists having the opportunity to transfer to this interchange should longer delays become evident at Halswell Junction Road.

The CSM1 off-ramp/ Halswell Junction Road roundabout is predicted to start operating poorly at some time between 2026 and 2041 during the PM peak hour. In particular, the CSM1 off-ramp approach will be affected by the predicted increase in traffic turning right from the CSM1 off-ramp. Two future changes to the layout or the operation of the roundabout have been identified to mitigate this effect and improve its expected operation. These are outlined in Section 11.8.4 below, with further details contained in Technical Report 2.

As noted previously in Section 11.2, the NZTA is currently working with the UDS partners on a short study of wider network operations. This includes the operation of the two Halswell Junction Road intersections described above and will help identify any other complementary improvements required on the local road network. Such improvements, however, will be considered outside of this Project.

#### **11.7.4. Effects on road based freight movements**

The Project will enable a faster, more efficient journey on a key freight route which connects the port to the southwest of Christchurch. Heavy vehicle traffic forecasts with the Project in place indicate that an increase in heavy vehicles is expected along the full length of the Southern Corridor, as trucks transfer to the faster, more direct route. By 2026, between 1,950 and 3,600 heavy vehicles are predicted to use the Southern Corridor between Rolleston and Brougham Street each day.

On CSM1 between Brougham Street and Curletts Road, daily truck volumes in 2026 are estimated to increase by approximately 600 vehicles a day with the Project in place. This relative difference increases to 1,100 more heavy vehicles on the section of CSM1 through to Halswell Junction Road, as heavy vehicles do not have to travel along the congested Halswell Junction Road to reach Main South Road.

The alternative routing to the Southern Corridor, using Blenheim Road and Main South Road is expected to see a significant decrease in truck volumes. Between Templeton and Hornby, truck volumes on Main South Road are forecast to halve with the Project in place. The diversion of heavy vehicles from these urban areas will have a noticeable amenity improvement for the Templeton and Hornby communities, as well as improving local access for other road users.

Travel times and travel time reliability will also improve for freight vehicles. This will reduce the cost of the movement of goods and services and help achieve economic growth and improved productivity.

#### **11.7.5. Effects on passenger transport services**

Two scheduled passenger transport services operate within the Project roading network.

Route 81 follows Springs Road and will benefit from a moderate improvement in travel time between Lincoln and Hornby. No discernible change in travel times are predicted for Route 88 which travels along Jones Road/ Waterloo Road and then Main South Road through Hornby, although the service will benefit from a reduction in traffic volumes along this route.

The S15 and S20 school bus services use similar routing to Route 88 and 81 respectively and will benefit from minor improvements to travel times.

#### **11.7.6. Effects on pedestrians and cycling**

It is expected that the Project will have a positive effect on walking and cycling.

The Project includes a 1.7km dedicated walking and cycling path that will link the CSM1 shared use path (which completes at the Halswell Junction Road / Springs Road roundabout) to the Little River Rail Trail at Marshs Road. This will enhance connectivity between the two facilities in the area. An additional shared use path on the southern side of Halswell Junction Road will connect the southbound off-ramp roundabout to the new CSM1 – Little River Rail Trail path.

On-road shoulders and separate footpaths will be provided at each of the local road crossings and interchanges to facilitate movement across the Project alignment. Access and connectivity will therefore be maintained for pedestrians and cyclists across the local road network.

Cyclists will be permitted to ride in the 2.5m outer shoulder on the upgraded Main South Road maintaining connectivity north and south of the highway. The consideration of pedestrian and cyclist needs across Robinsons/ Curraghs Road and Weedons/ Weedons Ross Road will also provide opportunity for less confident cyclists to use either Jones Road, the proposed western rear access road, or a potential future rail corridor facility between Rolleston and Templeton.

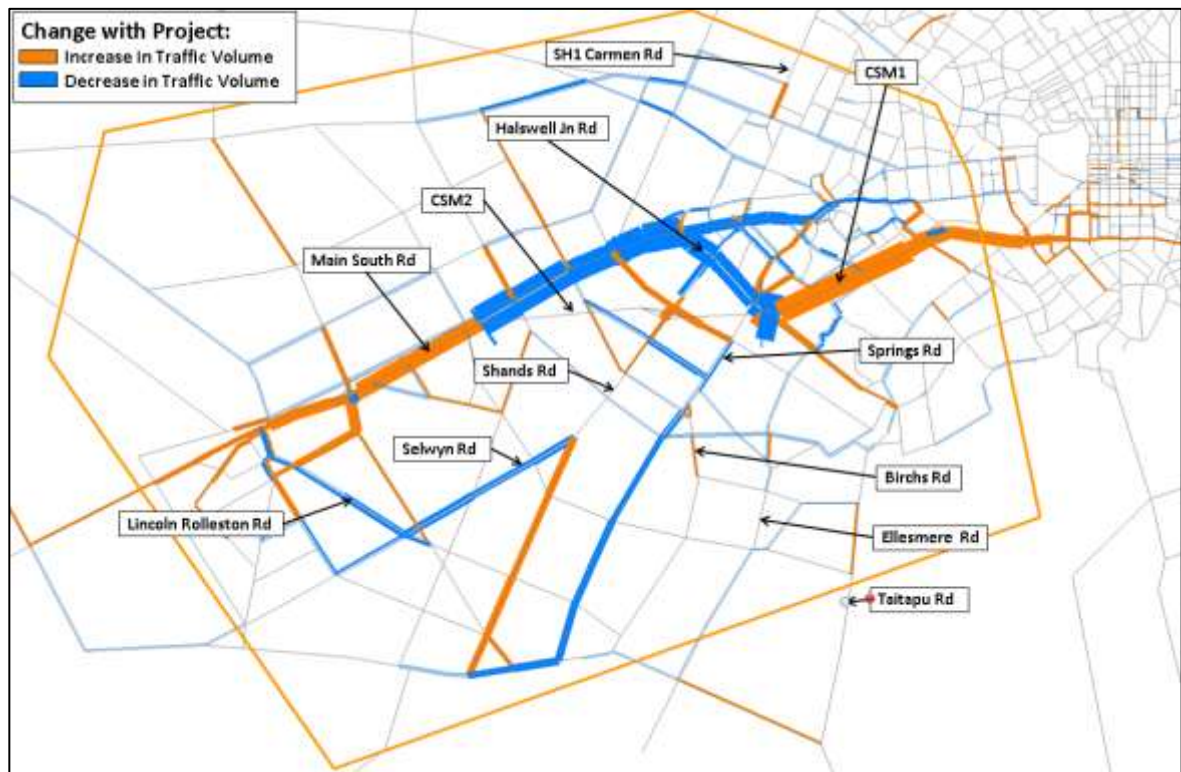
The removal of large volumes of traffic from the bypassed sections of Main South Road and Halswell Junction Road, and moderate reductions on some local roads will create opportunities for an improved environment for walking and cycling.

#### **11.7.7. Effects on road safety**

Safety effects within the study area were assessed at mid-block sections, intersections and interchanges. This assessment adopted a network type approach in consideration of the area wide travel changes predicted to occur when the Project is in place. Overall, 25 intersections and 37 mid-block sections were analysed totalling approximately 110km of road. The area evaluated is shown within the orange boundary line in Figure 48.



Figure 48: Area of Evaluation for Safety Analysis



These sections were analysed using the outputs from the Basecase modelling scenario and crash rate prediction models in the NZTA Economic Evaluation Manual to calculate the estimated number of injury crashes at the selected locations. Historical crash data was also used to help “calibrate” the estimated crash rates.

These crash rates were then compared with the calculated injury crash rates for the “With Project” scenario. The analysis showed:

- Mid-block: Positive safety effects resulting from a significant amount of traffic transferring from the Main South Road / Halswell Junction Road corridor onto the safer motorway. The four-laning on Main South Road results in further safety benefits savings, due to the higher standard median divided highway and diversion of traffic from surrounding local roads onto this safer route; and
- Intersections: The reduction in traffic volumes along the bypassed Main South Road/ Halswell Junction Road corridor results in positive safety benefits due to reduced exposure at these conflict points. The introduction of MSRFL and associated restricted access also results in positive safety effects due to the reduction in risk of high severity turning /crossing type crashes.

Some intersections will also experience an increase in traffic demand such as at the Weedons Ross Road/ Jones Road and Weedons Road / Levi Road intersections. These locations will be designed to modern geometric standards to more safely accommodate the increased traffic demands and mitigate any potential adverse safety effects.

The four new interchanges included in the Project will introduce new ramp terminal intersections and exposure points to the road network. The interchanges do however, separate potential conflicts between large volumes of traffic travelling at high speeds, and play a key role in improving road safety. They also help to improve traffic flows and support an efficient motorway route.

As noted above in Section 11.7.1, the change in traffic volumes on local roads will affect the number of crashes as a result of changes in exposure to crashes. Several local roads were highlighted where traffic volumes are expected to decrease and therefore have a positive road safety effect.

Some local roads are also expected to experience an increase in traffic including:

- Weedons/ Levi Road route into Rolleston;
- Weedons Ross Road between Main South Road and Maddisons Road;
- Shands Road between Ellesmere Junction Road and Selwyn Road; and
- Marshs Road between Main South Road and Springs Road.

While some of these traffic volume increases are significant in percentage terms, the actual increase in vehicle numbers are expected to be able to be accommodated without any deterioration in safety.

Overall, significant positive safety effects are assessed for the Project. In particular, a 40% reduction in the fatal and serious injury accidents is estimated. This highlights the effectiveness that high standard, median separated, limited access highways have in reducing the risk of high severity crashes.

The Project will therefore have a direct contribution in reducing the number of high severity crashes, which is a key focus in implementing New Zealand's Safer Journeys Strategy.

#### **11.7.8. Effects on access to property**

The Project will affect a number of existing accesses to properties. However, the Project has been designed to mitigate any adverse effects on adjoining properties through the provision of alternative access where appropriate. Details of the effects on access to properties are outlined below.

##### *Main South Road – western side*

On the western side of Main South Road, there will be no direct access from properties to Main South Road (with the sole exception of Property 181). Alternative access will be provided via a rear access road to the west of the properties, adjacent to the railway line from Weedons Ross Road to just north of Curraghs Road. A summary of the change in access arrangements for the properties on the western side of Main South Road is shown in Table 19.

**Table 19: Access to property – Main South Road – western side**

Location	Current access	Changed access	#	Change in distance (from/to)			
				North	South	West	East
Hoskyns Rd to Weedons Ross Road	Main South Road	Left-In/Left-Out to Main South Road	1	2.9/-	-/1.9	-/0.3	-/0.2
	Main South Road	Via ROW to Weedons Ross Road	2	0.8/0.5	0.9/1.2	(0.2)/(0.5)	0.1/0.3
	Via ROW to Weedons Ross Road	Via ROW to Weedons Ross Road	1	0.6/0.3	(0.1)/2.3	0.3/-	-/0.2
Weedons Ross Road	Weedons Ross Road	Left-In/Left-Out to Weedons Ross Road	1	0.7/0.6	(0.2)/0.6	-/-	-/0.3
	Weedons Ross Road	No change	2	-	-	-	-
Weedons Ross Rd to Curraghs Road	Weedons Ross Road	Weedons I/C western roundabout	1	-	-	-	-
	Main South Road	Rear access road between Weedons Ross Road and Curraghs Road	15	0.5/0.2	0.3/0.4	(0.1)/(0.2)	0.1/0.1
	Total purchase by the NZTA		1	-	-	-	-
Curraghs Road to Dawsons Road	Curraghs Road	Rear access road off Curraghs Road	1	2.1/1.6	2.7/0.6	-/-	0.1/0.2
	Main South Road	Rear access road off Curraghs Road	1	2.1/1.6	2.7/0.6	(0.1)/(0.1)	-/0.1
	Dawsons Road	No change	1	-	-	-	-
Dawsons Road to Kirk Road	Dawsons Road	No change	1	-	-	-	-

A total of 28 properties are affected, with one of these being totally purchased by the NZTA. For the remaining properties, four properties have no change in their access arrangements and 23 properties have changes to their access arrangements.

For these 23 properties, the majority have their access changed from being directly onto Main South Road to access via the rear access road parallel to the railway line. For the majority of these properties, the changes to access arrangements results in a need to travel further to access properties from most directions. In a limited number of instances, travel distances are reduced, but only by small amounts.

The removal of direct access to Main South Road does produce benefits in terms of reduced crash risks, both for vehicles using these property access points and for the other vehicles travelling on Main South Road. A reduction in the delays associated with access directly onto Main South Road, or crossing Main South Road, is also anticipated, offsetting to an extent the increased travel distance associated with some trips.

#### *Main South Road – eastern side*

On the eastern side of Main South Road there will be no direct property access via Main South Road. Alternative access will be provided through a combination of the extension of Berketts Drive to Robinsons Road and via right of ways. A summary of the change in access arrangements for the properties on the eastern side of Main South Road is shown in Table 20.

**Table 20: Access to property – Main South Road – eastern side**

Location	Current access	Changed access	#	Change in distance (from/to)			
				North	South	West	East
Park Lane to Weedons Road	Park Lane	No change	1	-	-	-	-
	Main South Road	Via new subdivision access to Marlowe Place	2	3.5/3.5	1.0/1.0	1.1/1.1	(0.4)/(2.0)
	Total purchase by the NZTA						
	Weedons Road	No change	1	-	-	-	-
Weedons Road to Larcombs Road	Weedons Road	No change	2	-	-	-	-
	ROW off Paige Place	No change	2	-/4.4	5.7/1.8	3.1/0.9	-/-

Location	Current access	Changed access	#	Change in distance (from/to)			
				North	South	West	East
	Larcombs Road	No change	1	-/4.4	5.7/1.8	3.1/0.9	-/-
Larcombs Road to Berketts Road	Larcombs Road	No change, though Larcombs Rd changed to Left-In only	1	-/5.2	9.9/3.1	9.3/3.2	-/-
	Main South Road	Via ROW from Berketts Rd	3	0.7/6.1	10.0/3.1	9.2/3.4	(0.3)/(0.3)
	Berketts Road	No change, though Berketts Rd changed to Left-In/ Left-Out	1	-/2.3	4.0/-	0.4/0.4	-/-
Berketts Road to Robinsons Road	Berketts Drive	No change	1	-/0.7	-/0.4	-/0.4	-/-
	Main South Road	Berketts Dr	6	2.0/0.7	0.4/0.4	0.4/0.4	0.7/0.5
	Total purchase by the NZTA		1	-	-	-	-
Robinsons Road to Waterholes Road	Total purchase by the NZTA		12	-	-	-	-
	Main South Road	Via new MSR southbound off-slip link to Robinsons Rd	3	0.3/0.6	0.5/0.9	0.1/0.1	(0.4)/(0.4)
	Waterholes Road	No change	3	-	-	-	-
Waterholes Road to Trents Road	Waterholes Road	No change	1	-	-	-	-

A total of 42 properties are affected, with 14 of these being totally purchased by the NZTA. For the remaining properties, eight have no change in their access arrangements, with 20 properties having changes to their access arrangements.

For the 20 properties with changes to their access, again the majority have their access changed from being directly onto Main South Road to accessing them via an extension of Berketts Drive or via a number of rights of ways off the local roads. Changes to how vehicles travel to and from these locations also occur as a result of the change in movements possible at the side road intersections. Again, the changes to property access arrangements results in a need to travel further to access these properties from most directions. In a limited number of instances, travel distances are reduced, but only by small amounts.

Safety benefits are also expected as a result of the removal of direct access to Main South Road. Delays in vehicles entering or leaving these properties are also expected to reduce, as drivers no longer have to wait for gaps between vehicles on Main South Road, instead accessing lower volume local roads.

### *CSM2 alignment*

A summary of the change in access arrangements for the properties along the CSM2 alignment is presented in Table 21.

**Table 21: Access to property – CSM2 alignment**

Location	Current access	Changed access	#	Change in distance (from/to)			
				North	South	West	East
Waterholes Road/Hamptons Road	Hamptons Road	No change	1	-	-	-	-
	Total purchase by the NZTA		6	-	-	-	-
Trents Road	Trents Road	No change	1	-	-	-	-
	Total purchase by the NZTA		2	-	-	-	-
Blakes Road	Blakes Road	Blakes Rd severed to the west	1	3.7/3.8	-/-	3.7/3.8	-/-
	Total purchase by the NZTA		5	-	-	-	-
Shands Road	Shands Road	No change	2	-	-	-	-

Location	Current access	Changed access	#	Change in distance (from/to)			
				North	South	West	East
	Total purchase by the NZTA		3	-	-	-	-
Marshs Road	Marshs Road	No change	6	-	-	-	-
	Sir James Wattie Drive	No change	0.9*	-	-	-	-
	Sir James Wattie Drive	Marshs Rd	0.1*	0.4/0.4	(0.2)/(0.2)	(0.2)/(0.2)	(1.7)/(1.7)
	Total purchase by the NZTA		4	-	-	-	-
Springs Road	Springs Road	No change	2	-	-	-	-
	Total purchase by the NZTA		6	-	-	-	-
John Paterson Drive	Springs Rd via John Paterson Drive	Halswell Junction Rd via John Paterson Dr	7	0.5/0.4	1.2/1.2	1.1/1.1	(0.9)/(0.9)
	Total purchase by the NZTA		1	-	-	-	-
Halswell Junction Road	Halswell Junction Road	Via John Paterson Dr roundabout	2	-	-	-	-
	Total purchase by the NZTA		3	-	-	-	-

\*Refers to Calder Stewart property at corner of Shands Road and Marshs Road, which is split by the motorway alignment.

For the majority of properties along CSM2, there are no changes to their access arrangements. At two locations, the severing of Blakes Road and the rerouting of John Paterson Drive will result in extra travel distance being required to travel to or from some directions. For the properties currently using John Paterson Drive, its rerouting from Springs Road to Halswell Junction Road will result in shorter travel distances to and from the east.

#### 11.7.9. Summary assessment of effects

The Project will have a number of significant positive traffic effects, including the following:

- with the Project in place, large reductions in daily traffic volumes are predicted to occur on the strategic road network, including Main South Road through Templeton and Hornby and on Halswell Junction Road;
- the significant reduction in the volume of traffic will reduce intersection delays and improve congestion on the bypassed sections of Main South Road and Halswell Junction Road;
- traffic volumes are also predicted to decrease on a number of local roads as a result of the Project. These include Springs Road between Lincoln and Prebbleton, Jones Road and Selwyn Road south of Shands Road.
- travel time savings will be experienced for the journey between Rolleston and the end of CSM1 at Brougham Street and travel time reliability is also expected to improve;
- the Project provides a new dedicated walkway/ cycleway to connect the CSM1 shared path with the Little River Rail Trail;
- the Project has the effect of improving road safety through the provision of a high standard, median separated, limited access route;
- the reduced traffic volumes, including trucks, will result in significantly improved amenity and accessibility for Templeton and Hornby; and
- the Project supports the function of a National strategic route, providing for inter-regional travel and more efficient road-based freight movements. Many of these benefits will also apply to local traffic movements.

The Project will also have neutral and/or adverse effects, including the following:

- traffic volumes will increase at the northern end of CSM1 and the southbound merge at end of the four-laning near Rolleston. These are expected to result in worse operating conditions when compared to the Baseline case;
- traffic demand will alter at the Springs Road/ Halswell Junction Road intersection. These are expected to initially result in better levels of service when compared to the Baseline case but congestion issues are predicted to occur in the future;
- increasing volumes of traffic from the CSM1 off-ramp is predicted to effect the future level of service on the approach to the Halswell Junction Road roundabout;
- with the Project in place, traffic volumes are expected to increase on certain local roads, including Shands Road between Lincoln and Prebbleton; Weedons Road between Main South Road and Levi Road; Levi Road into Rolleston; Weedons Ross Road between Main South Road and Maddisons Road; and Marshs Road between Main South Road and Springs Road; and
- the Project proposes to close existing property accesses on Main South Road, sever Blakes Road and realign John Paterson Drive from Springs Road to Halswell Junction Road. These changes will result in re-routing and additional travel time and distances for some property owners.

#### **11.8. Measures to avoid, remedy or mitigate actual or potential adverse effects**

Overall, the Project will provide significant transport infrastructure that will complete the Southern Corridor of the Christchurch Motorway RoNS package. The Project is predicted to significantly improve travel times for people and freight between Rolleston and Christchurch. The

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overall network will operate with significantly improved travel times and journey time reliability, relieving congestion and facilitating planned growth to the south and west of Christchurch and around Rolleston. The higher standard road environment will also lead to improved road safety in the areas served by the Project.

However, there are some actual or potential effects which are adverse to road users as well as residents located in the vicinity of the Project. This section sets out the mitigation measures and features to avoid, remedy or mitigate the identified adverse effects. Some of these measures do not form part of this Project, but have been identified in the CRETS reports as part of a wider package of transportation improvements to accommodate growth in the broad Christchurch to Rolleston area. The NZTA is continuing to work with UDS partners to develop these complementary projects.

#### **11.8.1. Brougham Street**

The NZTA is intending to progress a full corridor study from the City end of CSM to the Port of Lyttelton to investigate options for maintaining the efficient operation of this strategic corridor. Pending the results of this corridor study, the NZTA will continue its normal policy of making incremental operational improvements.

#### **11.8.2. Four laning merge north of Rolleston**

Although the NZTA do not currently have any specific projects on its 10 year programme to improve this section of the State highway network, it has a strategy for improvements as outlined in the CRETS reports involving the removal of the traffic signals on the Main South Road intersections with Hoskyns Road and Rolleston Drive, and provision of a grade separated connection between Rolleston and Jones Road.

Alternative routes bypassing this section of Main South Road to both the western and eastern sides of Rolleston are being delivered as part of the Project. These are via Weedons interchange to Jones Road and Levi Road, and will enable vehicles to bypass any congestion that occurs at the merge.

#### **11.8.3. Halswell Junction Road / Springs Road intersection**

Modelling of the performance of the Halswell Junction Road/ Springs Road roundabout indicates that its performance may become unsatisfactory in the PM peak hour by 2026. The availability of a reasonable alternative motorway access at the Shands Road interchange is expected to mitigate this effect, with motorists having the opportunity to transfer to this interchange should longer delays become evident at Halswell Junction Road. Directional signage will reinforce this option to road users.

The NZTA will undertake on-going monitoring of the performance of this intersection, including crashes, travel time delay and queue lengths. If this monitoring indicates that the operation of this intersection is becoming unsatisfactory, the NZTA will work with Christchurch City Council through the UDS Transportation Group to improve its operation.

Other complementary local road projects have been identified in the CRETS reports to reduce traffic demand at this location. This includes the promotion of a district arterial route between Lincoln and Christchurch using Ellesmere Road, Longstaffs and Whincops Road, connecting to Magdala Place via Wigram Road.

#### **11.8.4. CSM1 off-ramp/ Halswell Junction Road / John Paterson Drive intersection**

Two future changes to the layout or the operation of the roundabout have been identified in Technical Report 2, either of which would significantly improve its expected operation. These include installing traffic signals on the Halswell Junction Road western approach to meter the arrival of vehicles at the roundabout, or changing the road marking to allow for right turns from both lanes on the CSM1 off-ramp approach. The underground ducting necessary for metering traffic signals on the Halswell Junction Road western approach will be considered at the time of construction, allowing these signals to be set up with minimal disruption to road users in the future.

#### **11.8.5. Property access**

Removal of direct access to Main South Road for properties on the western side will be mitigated by the construction of a rear access road between Weedons Road and Curraghs Road, allowing access to Main South Road via the Weedons interchange or at the new Main South Road/ Waterholes Road/ Dawsons Road roundabout.

Removal of direct access to Main South Road for properties on the eastern side will be mitigated by using the existing local road network, right of ways and the extension of Berketts Drive through to Robinsons Road.

The closure of the John Paterson Drive intersection with Springs Road will be mitigated by the provision of an alternative access from the new roundabout at the CSM westbound off-ramp on Halswell Junction Road.

### **11.9. Assessment of construction traffic effects and mitigation measures**

There will be some adverse effects associated with the Project, primarily of a temporary or short term nature, during construction. This section presents a qualitative assessment of the potential traffic and transportation effects during construction, and outlines the measures identified to avoid, remedy or mitigate these effects. There has been no contractor involvement with regard to the construction traffic management at this stage, so the sequences set out in this section are indicative only.

#### **11.9.1. Construction Traffic Management Plan (CTMP)**

In all cases, the Project will utilise a CTMP to manage the potential effects during the construction works. It will outline the procedures for the production of Site Specific Traffic Management Plans (SSTMPs) and the relevant standards that must be complied with. This CTMP will be supported by

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multiple SSTMPs detailing the specific traffic management set ups at each worksite as well as any mitigation measures for identified impacts of the works.

The CTMP prepared for this application is included in Specialised Environmental Management Plan No 4, in Volume 4 of the AEE.

### 11.9.2. Overall philosophy

It has been assumed that the construction of the Project would take three to four years and that the construction activity, as relevant to traffic effects, will take place in the following order:

- the rail sidings in the vicinity of Halswell Junction Road and Springs Road are anticipated to be in the enabling works, along with adjusting the transmission lines at the Shands Road interchange and the relocation of businesses;
- the main alignment of the motorway would be fenced to secure the site;
- local road connections and rear accesses are anticipated to be constructed first, along with the associated structures and embankments; and
- the mainline motorway construction and Main South Road widening would be undertaken last. For the CSM2 section of the Project, it is noted that this Project benefits from having the alignment run through greenfield land for the majority of the route. The widening of Main South Road principally to the western side of the current alignment also enables the existing carriageway to remain operational, so construction of the additional lanes can occur offline.

### 11.9.3. Summary of construction traffic effects and mitigation measures

For the purpose of traffic management activities, the Project has been split into five work zones based on the currently proposed construction methodology:

- Zone 1 – MSRFL including Weedons Road interchange;
- Zone 2 – Robinsons Road / Curraghs Road;
- Zone 3 – Waterholes Road and Trents Road;
- Zone 4 – Shands Road / Marshs Road; and
- Zone 5 – Halswell Junction Road.

A detailed description of the proposed construction methodology is included in Chapter 5 of this AEE and the Construction Environment Management Plan (CEMP) include in Volume 4 of the AEE.

The potential traffic effects associated with each of the Project work zones are summarised in Table 22 below.

### 11.9.4. Construction traffic routing

As discussed earlier in Chapter 5 of this AEE, the extent of construction traffic is dependent on the phase of works. The majority of construction vehicle movements are expected to be to/from quarry's located in areas to the west of the airport (north of Main South Road). Construction

vehicles will therefore access Main South Road from the north via left turn movements, predominantly from Weedons Road, Dawsons Road or Curraghs Road.

Other alternative routes will also be required for some sections. For example, for works on MSRFL west of Weedons Road where access is expected to be via a left turn at Hoskyns Road at Rolleston. Movements through Rolleston will however be avoided where possible to reduce any effects on existing traffic through this area.

Access to the Project from the city will be predominantly via Shands Road and Halswell Junction Road. Construction traffic travelling through Templeton will be encouraged to remain on Main South Road, rather than utilizing Jones Road. Travel through Prebbleton will also be minimised whenever practical, in order to limit adverse effects on those businesses and residents. The site specific traffic management plans (SSTMPs) will detail the acceptable routes for construction vehicles and the expected frequency of heavy commercial vehicle movements. Any required mitigation measures will also be assessed and detailed in the SSTMPs. Truck drivers are to be briefed on the appropriate routes and made aware of sensitive areas and points of high pedestrian and cycle usage.

Movements through certain intersections and roads, at locations to be agreed with the Road Controlling Authorities, will be restricted at AM and PM peak periods to reduce the impact of construction vehicles. In these instances, alternative routes will be established or the timing of construction movements adapted to maintain capacity. These will be detailed in the SSTMPs.

Table 22 below outlines the impact of the works and the proposed mitigation measures (in addition to standard temporary traffic management) to minimise the anticipated effects.

**Table 22: Summary of Project construction traffic effects**

Activity	Road	Impact	Mitigation
Zone 1 – MSRFL including Weedons Road Interchange			
Construction of access road tie-in to Weedons Road and Curraghs Road	Weedons Road and Curraghs Road	Slow traffic through temporary works zone	Effects likely to be minor as these are low volume roads and new access road will link to existing roads.
Construction of roundabout at intersection of Weedons Ross Road and Jones Road.	Weedons Ross Road and Jones Road	Slow traffic through temporary works zone	Effects likely to be minor as these are low volume roads

Activity	Road	Impact	Mitigation
Widening and re-construction on Main South Road	Main South Road	Slow traffic through temporary works zone	Off-line widening expected to minimise length of temporary speed limit zone. In addition, all rear accesses shall be constructed prior to widening works.
Construction of Weedons Road roundabouts, embankments and overbridge	Weedons Road and Weedons Ross Road	Slow traffic through temporary works zone.  Closure of Weedons Ross Road.	Effects likely to be minor as these are low volume roads and each work site will be relatively short.  Detour to utilise Jones Hoskyns Roads
Construction of interchange	Main South Road, Weedons Road and Weedons Ross Road	Slow traffic through temporary works zone.	Majority of works to be undertaken off-line. Use sight screens to prevent 'rubbernecking'.
<b>Zone 2 – Robinsons Road / Curraghs Road</b>			
Construction of Curraghs Road Overbridge	Curraghs Road and Robinsons Road	Requires use of Waterholes Road as a diversion, so additional travel time required.	None proposed as the diversion is not significant.  Split works into two parts to reduce impact on Main South Road.
Use of southbound lanes for two-way running	Main South Road	Slow speeds through the works zone, leading to congestion	Congestion and delays to be monitored.
Upgrading of existing Main South Road	Main South Road	Slow speeds through the works zone, leading to congestion	Congestion and delays to be monitored.  Undertake works during periods of low traffic volumes
<b>Zone 3 – Waterholes Road and Trents Road</b>			

Activity	Road	Impact	Mitigation
Construction of Waterholes Road temporary alignment	Waterholes Road and Hamptons Road	Reduced speed limit through works zone	Waterholes Road is a low volume road able to remain open to traffic at all times. Therefore, no specific mitigation is proposed.
Construction of tie-in between the existing and proposed alignments	Waterholes Road and Hamptons Road	Reduced speed limit through works zone	Waterholes Road is a low volume road able to remain open to traffic at all times. Therefore, no specific mitigation is proposed.
Construction of Trents Road temporary alignment	Trents Road	Reduced speed limit through works zone	Trents Road is a low volume road able to remain open to traffic at all times. Therefore, no specific mitigation is proposed.
Termination of Blakes Road	Blakes Road	Driver Confusion	Underake advertising campaign and on-site signage
<b>Zone 4 – Shands Road / Marshs Road</b>			
Construction of Shands Road temporary alignment	Shands Road	Reduced speed limit through works zone	These are low volume roads so no specific mitigation is proposed
Construction of Marshs Road temporary alignment	Marshs Road	Reduced speed limit through works zone	These are low volume roads so no specific mitigation is proposed
Construction of Shands Road/ Marshs Road intersection	Shands Road/ Marshs Road	Reduced speed through works zone and reduced capacity at intersection.	These are low volume roads so no specific mitigation is proposed
<b>Zone 5 – Halswell Junction Road</b>			

Activity	Road	Impact	Mitigation
Construction of Halswell Junction Road Roundabout, CSM1 exit and tie-in to John Paterson Drive	Halswell Junction Road	Congestion as traffic travels through the works zone. Not considered to be significant.	Diversion of traffic where required to maintain current flow
Construction of Halswell Junction Road temporary alignment	Halswell Junction Road	Reduced speed limit through works zone	Congestion and delays to be monitored.
Construction of the Halswell Junction Road overbridge	Halswell Junction Road	Additional traffic delay at the Springs Road roundabout because of 'U'-turning traffic from Halswell Junction Road to access CSM1 city-bound.  Traffic delay because of speed restrictions on the temporary road	Volume of 'U'-turning traffic expected to be low, so disruption will affect only a small number of drivers.  None proposed as length of temporary road is fairly short.
Construction of Springs Road temporary alignment	Springs Road	Reduced speed limit through works zone	Congestion and delays to be monitored.
Construction of the Springs Road overbridge	Springs Road	Traffic delay because of speed restrictions on the temporary road	None proposed as length of temporary road is fairly short.
Duration of the works until CSM2 is open	CSM1 southbound off-ramp	Traffic delay because of reduced capacity (note that there are currently two lanes in each direction between Springs Road and CSM1)	Restrict activities resulting in reduced capacity when possible.
Construction of CSM1 on-ramp	Halswell Junction Road and CSM1	Traffic delays due to use of new off-ramp as temporary on-ramp	Utilise off-ramp as point of entry to motorway

### 11.10. Conclusion

The Project is reasonably necessary for achieving the Requiring Authority's objectives and will have significant positive traffic effects (i.e. benefits) at a local, regional and national level. This includes providing an important strategic function for inter-regional and longer distance travel and delivering sought outcomes in improved journey times, reliability and safety on a key freight route. There are some localised adverse effects relating to restrictions in access to properties, primarily along the MSRFL section, which will be mitigated by the provision of alternative rear access routes on both sides of Main South Road.

In addition, there will be some adverse construction traffic effects associated with the construction of the Project. A CTMP, supported by individual SSTMPs, will manage as far as is reasonably practicable, the adverse effects on the road network. It is noted that construction traffic effects will be temporary short term effects only.

Finally, the Project is identified as part of a wider package of transportation improvements to manage growth to the southwest and south of Christchurch. The NZTA will continue to work with the UDS partners to develop other complementary local road improvements, as identified in CRETS, to support land use development in the area. These improvements, however, would be separate packages and do not form part of this Project.