Private Plan Change Request – Urban Estates Limited
Appendix D – Integrated Transportation Assessment (Abley)

South West Rolleston Plan Change Integrated Transport Assessment

Urban Estates Limited

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South West Rolleston Plan Change Integrated Transport Assessment

Urban Estates Limited

Quality Assurance Information

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1. Introduction

Urban Estates Limited (Urban Estates) are making a submission on the Proposed District Plan (PDP) which has recently been notified and lodging a Private Plan Change (PPC) application with Selwyn District Council (SDC) to establish residential zoning on a site to the south-east of the current Rolleston built-up area but within the existing urban limit. This Integrated Transport Assessment supports both the submission and the PPC application and refers to the submission and PPC site as the 'Proposal'.

The Proposal site is formed of 14 current lots with an area of approximately 63.3 ha comprising approximately 60% of the area that is bound by Lincoln Rolleston Road to the north-east, Selwyn Road to the south-east, the Acland Park development to the south-west, and the Falcon's Landing development to the north-west. This land is currently zoned as Inner Plains under the Operative Selwyn District Plan and General Rural under the PDP. The proposed zoning is Living Z under the Operative Plan and General Residential under the Proposed Plan, with some areas indicated as medium and low density, and with several public spaces / reserves.

Urban Estates commissioned Abley Limited (Abley) to prepare an Integrated Transport Assessment (ITA) to accompany the submission and Private Plan Change application. The purpose of this ITA is to evaluate the potential transportation-related effects of the Proposal on the future receiving environment. The ITA has been prepared using the guidance specified in the Waka Kotahi NZ Transport Agency Research Report 422 published in November 2010 and entitled "Integrated transport assessment guidelines". The guidelines identify four levels of scope for an ITA, named "Basic assessment", "Neighbourhood transport impact assessment", "Local area transport impact assessment" and "Wide area transport assessment." Given the scale, location and anticipated trip generation of the Proposal a "Wide area transport assessment" has been prepared to prepare a robust and comprehensive assessment of traffic and transportation effects.

1.1 Background

The site is located approximately 3 km south-east of Rolleston Town Centre and has a total area of approximately 63 ha. A total of 756 residential lots are proposed in the Proposal area. The current land use is a mix of farmland and rural residential properties.

The site has frontages on Lincoln-Rolleston Road and Selwyn Road and will link into the Acland Park development to the west. There are three nearby intersections that provide access to the wider transport network, these being as follows:

- Intersection of Lincoln Rolleston Road and Selwyn Road;
- Intersection of Selwyn Road and Weedons Road; and,
- Intersection of Springston Rolleston Road and Selwyn Road.

In addition, there is one nearby intersection that is proposed as further development occurs in the south of Rolleston township:

- Intersection of Lincoln Rolleston Road with CRETS Collector Road.

2. Existing land use and transport environment

2.1 Locality

The site is located approximately 3 km south-east of Rolleston town centre, 6 km north-west of Lincoln town centre, 8 km south-west of Prebbleton town centre and 18 km south-west of Christchurch CBD. It fronts onto Lincoln-Rolleston Road to the north-east and Selwyn Road to the south-east, both of which are important rural arterials connecting Rolleston with Lincoln, Prebbleton, Christchurch and areas further afield.

2.2 Zoning

The site has been identified in **Figure 2.1** and **Figure 2.2**, which show it in relation to the Operative Proposed District Plans, respectively. Under the Operative Plan, the site is within the Rural Inner Plains (IP) zone, apart from the north-west corner which is in the Living Z zone (LZ). Under the Proposed District Plan, the site is within the General Rural Zone (GRUZ), apart from the north-west corner which is in the General Residential Zone (GRZ).

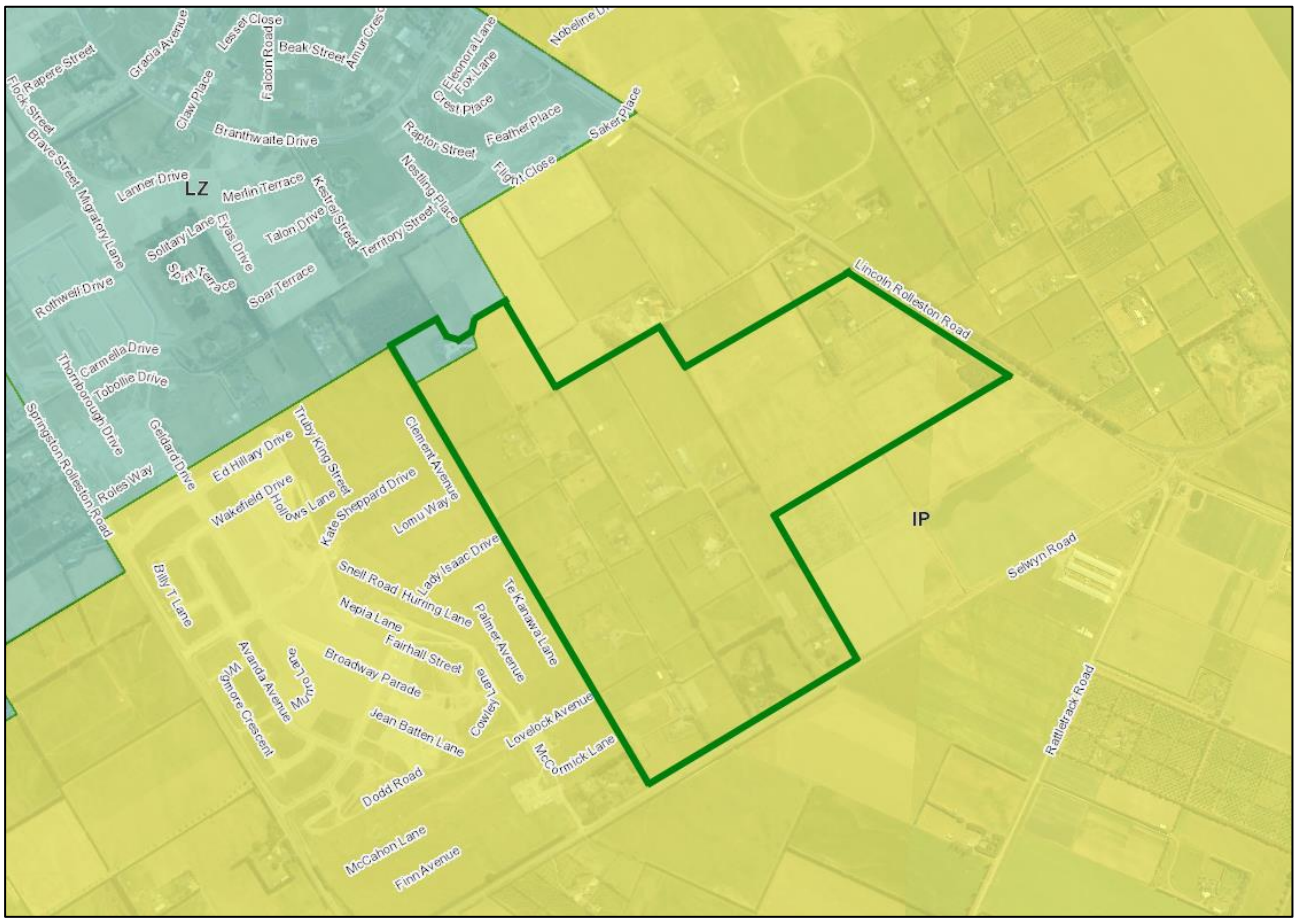


Figure 2.1 Location of site with Operative District Plan zoning

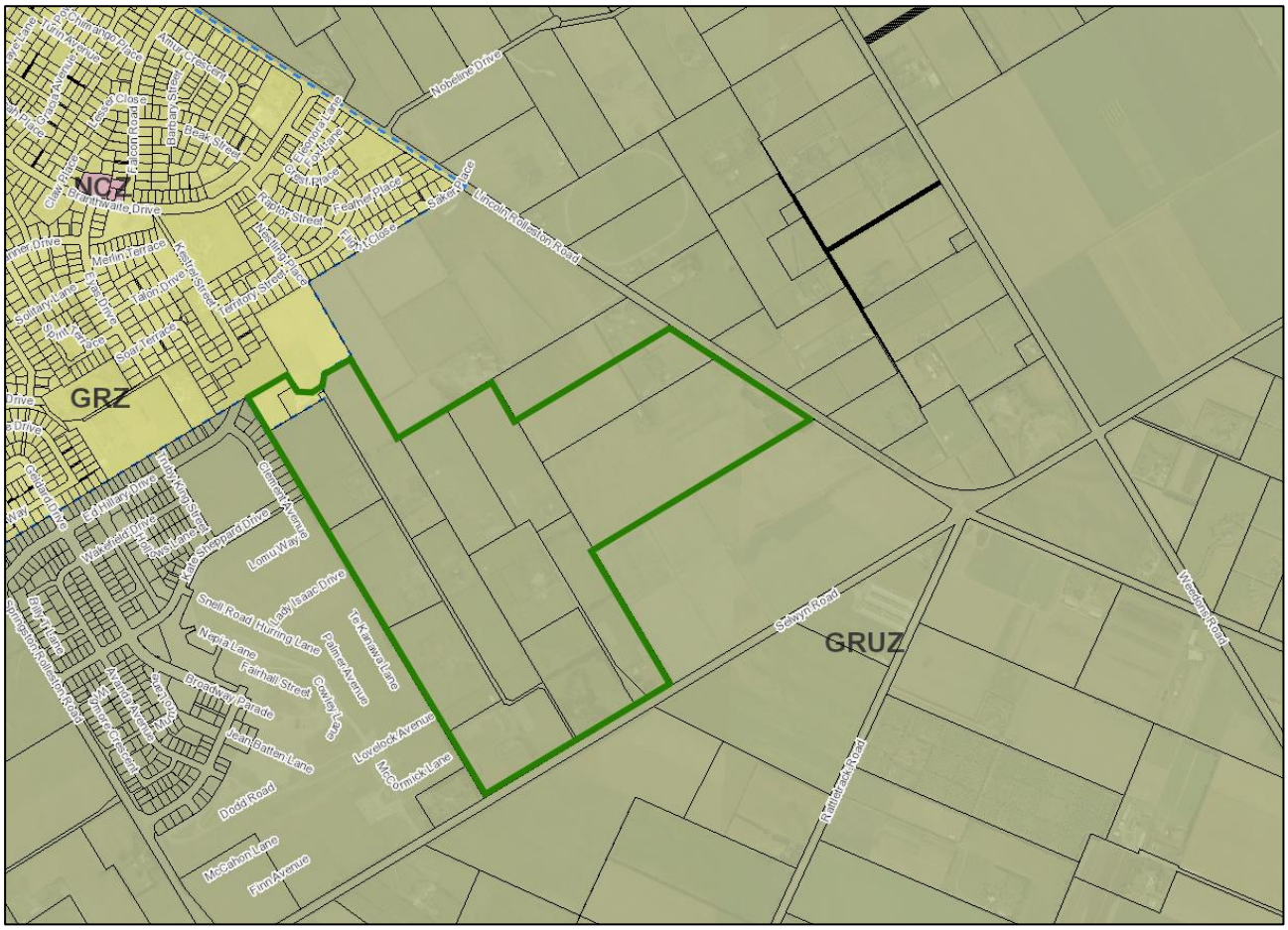


Figure 2.2 Location of site with Proposed District Plan zoning

2.3 Existing land use

The site is currently occupied by rural activities, predominantly farmland and rural residential properties.

2.4 Surrounding roads

The site has frontage onto Lincoln Rolleston Road along the northeast boundary and Selwyn Road along the southeast boundary.

Lincoln Rolleston Road

Lincoln Rolleston Road runs in a northwest-southeast orientation between the Lowes Road / Levi Road roundabout in the north and Selwyn Road in the south, where it turns east to become Selwyn Road heading east. Heading northwest from the site, it leads towards Rolleston town centre 3km away, while to the southeast it links with roads leading towards Lincoln, Prebbleton and Christchurch.

Both the Operative and Proposed District Plans classify Lincoln Rolleston Road as an arterial road. In the vicinity of the site, the road is designated as open road with a speed limit of 100 km/h. North of the site, the speed limit changes to 60 km/h as it approaches the Rolleston urban area. It is considered that it would be appropriate to extend the speed limit change further south should the Proposal be approved.

Within the One Network Road Classification (ONRC), Lincoln Rolleston Road is classified as an Arterial Road. A general view of Lincoln Rolleston Road along the frontage of the site is shown in **Figure 2.3**. The road is consistent along its length and consists of a single 8.5-metre-wide carriageway that includes 0.75-metre-wide sealed shoulders on either side. There is a 1.5-metre-wide shared path along the western side of the road which is separated from the carriageway by a 1.5-metre-wide berm. The overall road reserve is 20 metres in width.

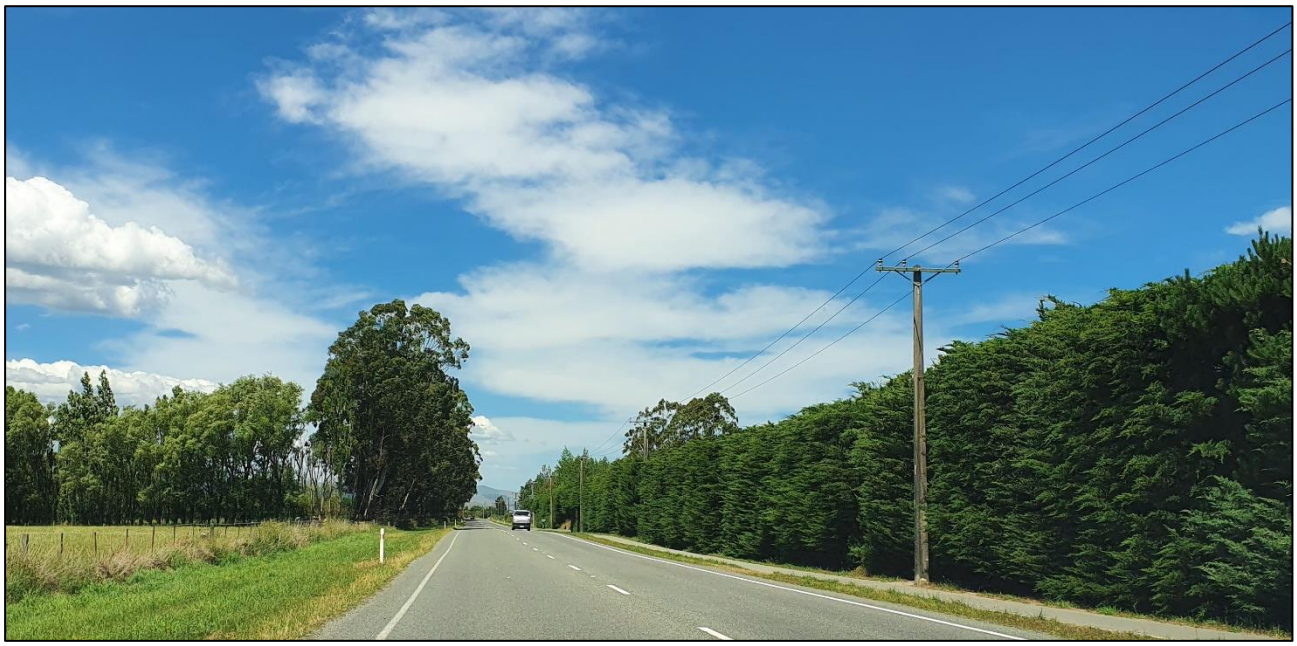


Figure 2.3 Lincoln Rolleston Road looking southeast in the vicinity of the site

Selwyn Road

Selwyn Road runs in a southwest-northeast orientation between Selwyn Lake Road in the southwest and Shands Road in the northeast, a distance of 18.5 km. Over this length its characteristics change several times. To the southwest of the site the road intersects with several roads leading to Rolleston, Lincoln and other townships. To the northeast it intersects with Lincoln Rolleston Road (described above) at a priority intersection to continue towards Prebbleton and Christchurch.

In the Operative District Plan, Selwyn Road in the vicinity of the site is classified as a Local Road, but northeast of its intersection with Lincoln Rolleston Road it is classified as an Arterial Road. In the Proposed District Plan, Selwyn Road would be classified as an Arterial Road over the length between Dunns Crossing Road and Shands Road.

The posted speed limit on Selwyn Road is 80 km/h in the vicinity of the site. It changes to 100 km/h on its approach to the Lincoln Rolleston Road intersection heading northeast. It is considered that it would be appropriate to review this speed limit should residential development in this vicinity occur.

Within the ONRC, Selwyn Road is classified as a Primary Collector along the section which the site has frontage (west of Lincoln Rolleston Road). A general view of this section of Selwyn Road along the frontage of the site is shown in **Figure 2.4**. The road is consistent along its length and consists of a single 6.4-metre-wide carriageway. There are no footpaths on either side of the road. The overall road reserve is 20 metres in width. East of Lincoln Rolleston Road the road is classified as an Arterial Road and west of East Maddisons Road it becomes a Secondary Collector.

Figure 2.4 Selwyn Road looking southwest in the vicinity of the site

2.5 Surrounding intersections

There are three main intersections that connect the site to the surrounding road network as follows:

- Existing intersection of Lincoln Rolleston Road and Selwyn Road
- Existing intersection of Selwyn Road and Springston Rolleston Road
- Existing intersection of Selwyn Road and Weedons Road

These intersections are shown in relation to the site in **Figure 2.5**.

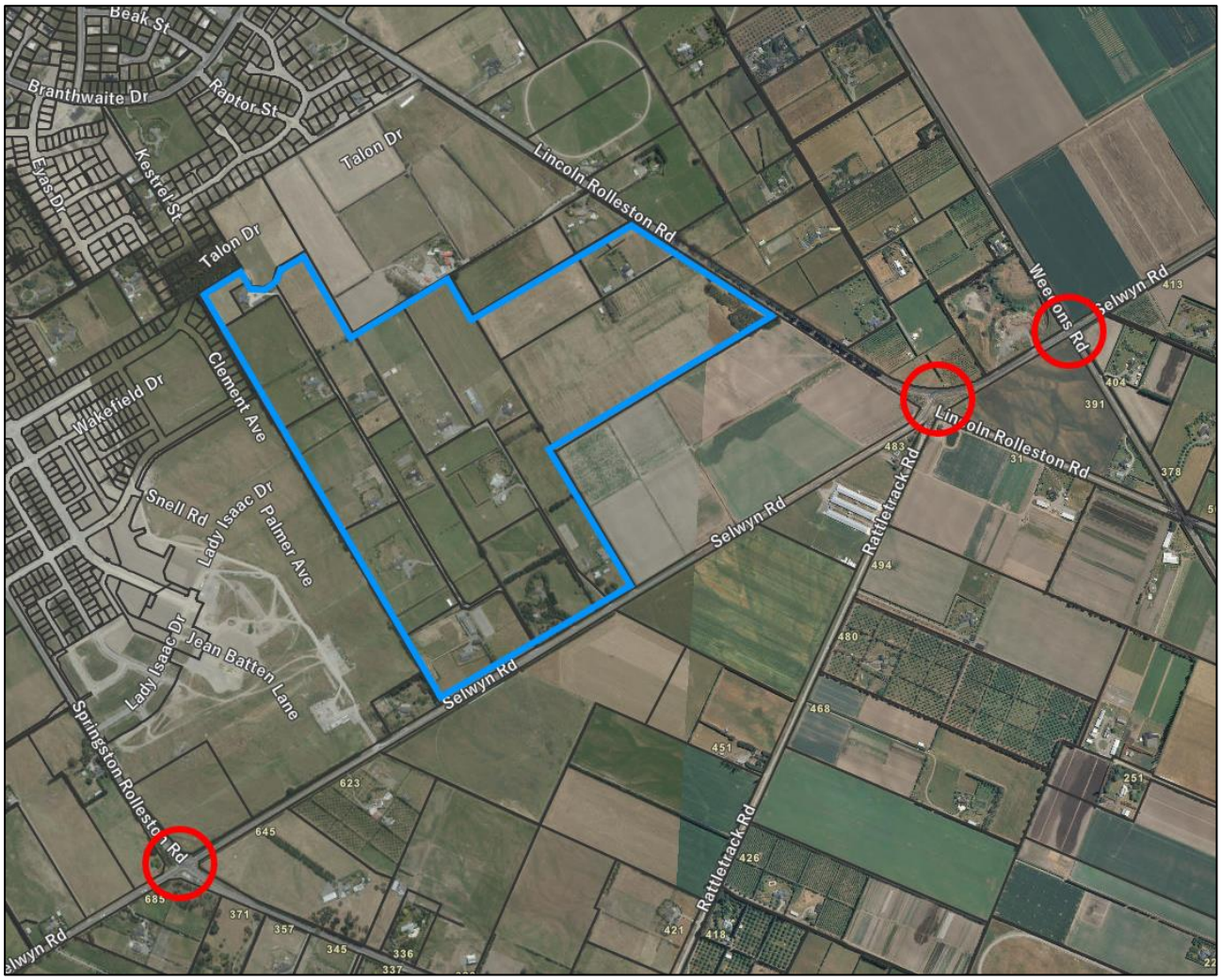


Figure 2.5 Intersections near to the site

Intersection of Lincoln Rolleston Road and Selwyn Road

The intersection of Lincoln Rolleston Road and Selwyn Road located to the east of the site is a stop intersection with the priority given to Lincoln Rolleston Road (northwest arm) and Selwyn Road (northeast arm). It is the southwest arm of Selwyn Road that is stop controlled. To the southwest of the intersection, on Selwyn Road, there is a crossing point for pedestrians and cyclists on the shared path along Lincoln-Rolleston Road that connects Rolleston and Lincoln. This crossing point does not include any formal facilities to improve safety for users. The intersection is on a curve and visibility is relatively poor for vehicles turning right from Lincoln Rolleston Road into Selwyn Road. Vehicles turning out of Selwyn Road have better visibility towards oncoming traffic. There is space for both a left- and right-turning vehicle to wait at the stopline on Selwyn Road.

This intersection is proposed to be upgraded to a seagull-type priority intersection in the future.

Intersection of Springston Rolleston Road and Selwyn Road

The intersection of Springston Rolleston Road and Selwyn Road located to the southwest of the site is a stop-controlled priority crossroads with priority given to Springston Rolleston Road. There are no pedestrian or cyclist facilities at this intersection. The two Selwyn Road arms are slightly offset, making the straight-ahead movements along Selwyn Road slightly misaligned. The intersection is on a curve and there is a variance in levels with Selwyn Road being lower than Springston Rolleston Road. Due to these factors in addition to the proximity of vegetation to the intersection, visibility is

generally poor in all directions. There is space for a left-turning vehicle to get around a vehicle waiting to go straight or turn right at the stopline on both Selwyn Road approaches.

No planned improvement is known at this intersection.

Intersection of Selwyn Road and Weedons Road

The intersection of Selwyn Road and Weedons Road located to the west of the site is a stop-controlled priority crossroads with priority given to Selwyn Road. There are no pedestrian or cyclist facilities at this intersection. Visibility is generally good in all directions. There is only space for a singl;e left-turning vehicle to get around a vehicle waiting to go straight or turn right at the stopline on both Weedons Road approaches.

This intersection is proposed to be upgraded to roundabout in the future.

2.6 Existing traffic volumes

SDC undertakes traffic counts of roads on its network, typically at three yearly intervals. These are used to periodically estimate traffic volumes in the Road Assessment and Maintenance Management (RAMM) database. The most recent counts or estimates for the roads in the immediate vicinity of the site are summarised in **Table 2.1**. It should be noted that these estimates may be influenced by counts recorded when the Christchurch Southern Motorway Stage 2 (CSM2) project was under construction, which is likely to impact flows on some of these key corridors.

Table 2.1 Traffic counts / estimates for nearby roads

Road	Location	Data source	ADT	HGV %	Date
Lincoln Rolleston Road	Between Nobeline Drive and Selwyn Road	SDC estimate (RAMM)	5,924	7%	30 June 2020
Selwyn Road	Between Lincoln Rolleston Road and Weedons Road	SDC estimate (RAMM)	9,534	10%	30 June 2020
Selwyn Road	Between Springston Rolleston Road and Selwyn Road	SDC estimate (RAMM)	3,012	8.5%	30 June 2020

2.7 Safety

Crash history

A search of the NZ Transport Agency Crash Analysis System (CAS) database for the period of 2015 to 2019, inclusive, identified 19 crashes in the vicinity of the site. The crashes are shown in the CAS crash diagram in Appendix A with totals summaries in **Table 2.2**. The search area included:

- Intersection of Lincoln Rolleston Road and Selwyn Road (crashes within 50m)
- Intersection of Selwyn Road and Weedons Road (crashes within 50m)
- Intersection of Springston Rolleston Road and Selwyn Road (crashes within 50m)
- Lincoln Rolleston Road between Branthwaite Drive and Selwyn Road (excluding the intersections above)
- Selwyn Road between Springston Rolleston Road and Weedons Road (excluding the intersections above)

Table 2.2 Crash data for surrounding road network, 2015-2019

	Fatal	Serious	Minor	Injury total	Non-injury	Total
Intersection of Lincoln Rolleston Road and Selwyn Road	0	0	2	**2**	2	**4**
Intersection of Selwyn Road and Weedons Road	0	0	0	**0**	6	**6**
Lincoln Rolleston Road between Branthwaite Drive and Selwyn Road	0	0	0	**0**	3	**3**
Selwyn Road between Springston Rolleston Road and Weedons Road	0	0	0	**0**	1	**1**
Springston Rolleston Road and Selwyn Road	0	1	3	**4**	2	**6**

The crash history shows that the crashes are concentrated at the three intersections discussed in Section 2.5. This is due to the higher levels of traffic travelling on the arterial routes (Lincoln Rolleston Road / Selwyn Road East and Springston Rolleston Road). The single reported serious crash occurred due to a vehicle on Selwyn Road not seeing an oncoming vehicle on Springston Rolleston Road. This may indicate that this intersection is deficient in terms of visibility. Otherwise, the number of crashes on the surrounding road network are low and do not indicate a strong underlying safety issue.

Risk maps

The Waka Kotahi Safer Journeys Risk Assessment Tool as part of the Speed Management Framework 2020 is used to analyse the road safety of road corridors. The two types of risk metrics are summarised as follows:

- Collective risk is a measure of the total estimated death and serious injury (DSi) casualty equivalents for a site. It is effectively a measure of the number of deaths and serious injuries that can be expected at a site over the next analysis period (typically five years). At a corridor level, Collective Risk is the total estimated DSi casualty equivalents derived from the intersection and midblock components divided by the length of the corridor. It is expressed as estimated DSi / km. This is shown in **Figure 2.6**.

- Personal risk is a measure of the risk of an individual dying or being seriously injured at a site. It is calculated by dividing Collective Risk by a measure of traffic volume exposure. This is shown in **Figure 2.7**.

The risk rating will identify if there are any underlying safety issues along any of the corridors. These risk assessments are based upon crash data from 2015-2019.

Figure 2.6 Collective risk for surrounding road network

Figure 2.7 Personal risk for surrounding road network

Along the site frontage, the collective risk is low on Lincoln Rolleston Road and low-medium on Selwyn Road.

Along the site frontage, the personal risk is low on Lincoln Rolleston Road and low-medium on Selwyn Road. Overall, there is no indication of any underlying safety issues with the surrounding roads along the frontage of the site.

High risk intersections

Waka Kotahi's Mega Maps is a risk assessment tool which displays the location of the top 200 high-risk intersections based on Collective Risk using the estimated DSi casualty equivalents risk assessment process as used in the High-Risk Intersections Guide. There are no high-risk intersections near the site.

2.8 Walking facilities

Due to the rural nature of the site, there are limited walking facilities particularly on Selwyn Road which has only a grass verge. However, the Lincoln Rolleston Road has a shared path on the western side of the road which connects Rolleston to the town of Lincoln and can be seen in **Figure 2.8**.

Figure 2.8 Shared path on Lincoln Rolleston Road (Source Google Streetview Sept 2019)

The Acland Park and Falcon Landing subdivisions have extensive walking networks with footpaths on most roads and shared path connections in key locations where there are no roads.

Figure 2.9 Walking Facilities in Falcon Landing near site (Source Google Streetview Sept 2019)

2.9 Cycling facilities

Much like the walking network there can be limited facilities depending on the nature of the road. Selwyn Road is rural in nature, approximately 6.4 metres wide and cyclists would need to share the lane with vehicles. On Lincoln Rolleston Road there is the shared path mentioned earlier enabling cyclists to ride off road and for those cyclists that are more confident there are also wide sealed shoulders. In the neighbouring subdivisions there is a mix of on road and off-road cycling which have been designed appropriately depending on the local hierarchy with connected neighbourhoods in mind.

2.10 Public transport

The regional public bus network is shown in **Figure 2.10**. The dominant service provision is connecting Rolleston and Lincoln to the City of Christchurch but there are also local connecting services between Burnham, Rolleston, Springston and Lincoln. The nearest bus service is Route 820 as shown in **Figure 2.11** which is 730m to the west of the site through Acland Park although as the area is still developing the stops for this service are 900m further away to the north. This is likely to change going forwards as the dwellings being built in Acland Park become occupied. Not shown on the map is Route 85 which is an express service between Rolleston and Christchurch that uses a variable route depending on traffic conditions.

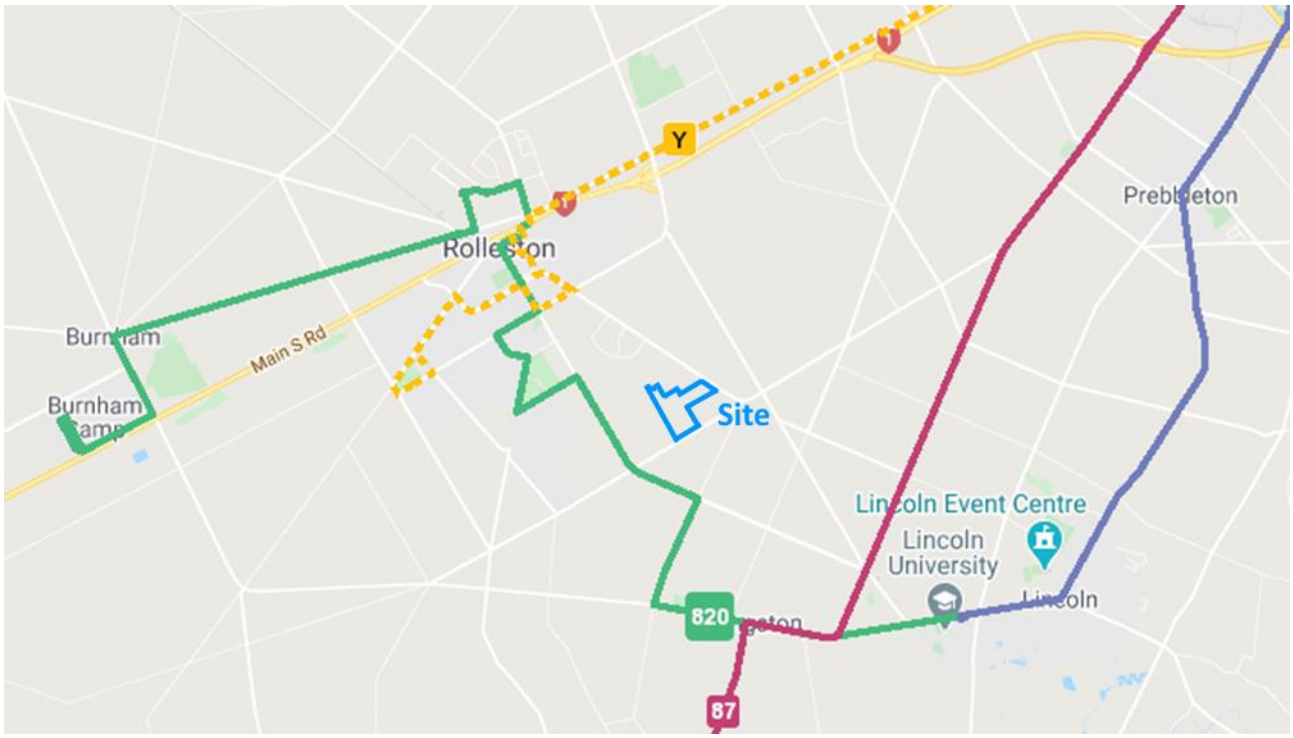


Figure 2.10 Regional Bus Services (Source Metroinfo Website Network Map)

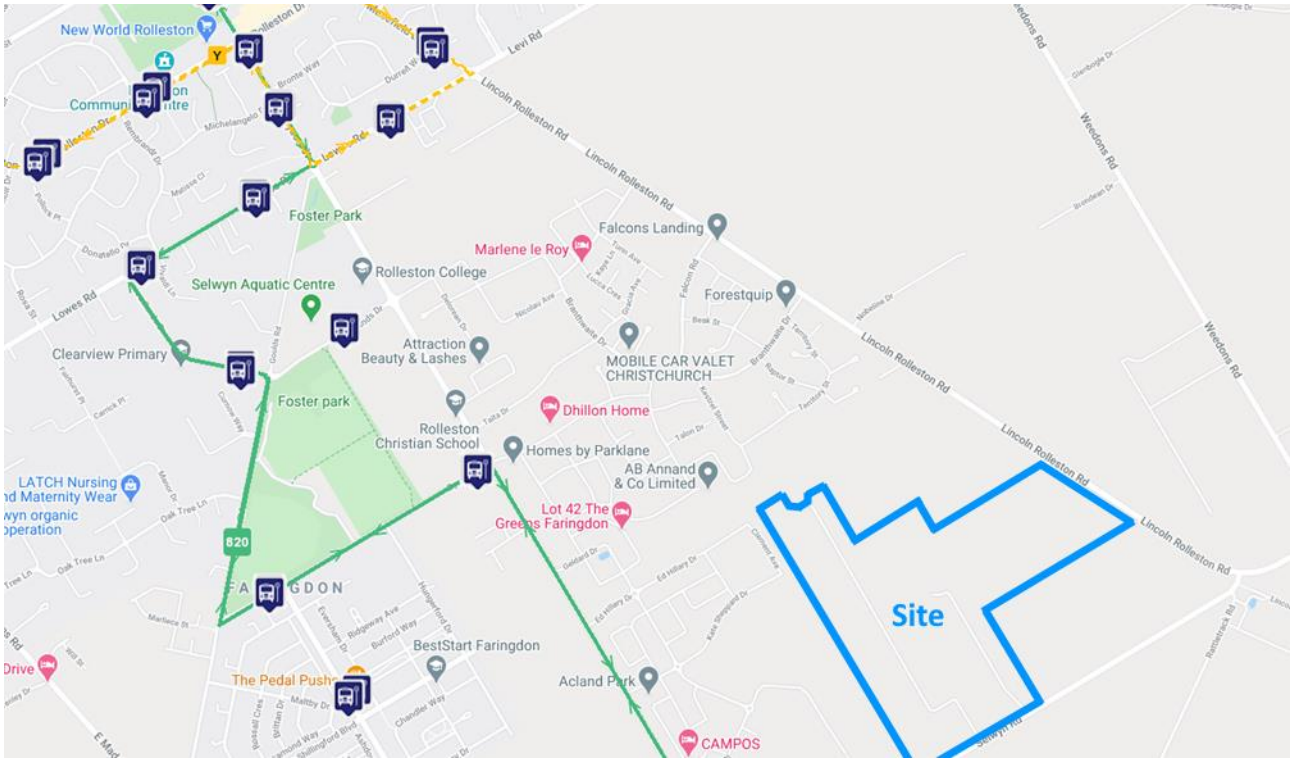


Figure 2.11 Local Bus Services and Stops (Source Metroinfo Website Network Map)

3. Future receiving environment

3.1 Future infrastructure

There are several roading upgrades planned in the vicinity of the site and included in the draft SDC 2021-2031 Long Term Plan (LTP). The LTP sets out the key projects and activities the Council is planning over the current 10 year period and how these will be funded. At the time of writing, the following works are planned for 2021-2031:

- Upgrade of Selwyn Road / Weedons Road intersection to a roundabout;
- Upgrade of Lincoln Rolleston Road / Selwyn Road intersection to a seagull-type priority intersection;
- Extension of Broadlands Drive to Lincoln Rolleston Road; and,
- Improvement of Levi Road / Lincoln Rolleston Road / Masefield Drive roundabout.

The Selwyn Road / Weedons Road roundabout is programmed in the draft LTP for implementation in 2027/28. For the purposes of this assessment it is assumed that this will be a dual-lane rural roundabout similar to those proposed at Marshs Road / Springs Road and Shands Road / Blakes Road in Prebbleton. These would suggest an inscribed circle diameter (ICD) in the order of 50 to 60 metres.

The seagull-type intersection at Lincoln Rolleston Road / Selwyn Road is programmed in the draft LTP for implementation in 2028/29 and is intended to include improved left-turning facilities and a seagull traffic facility for right-turning vehicles.

The improvement of the Levi Road / Lincoln Rolleston Road / Masefield Drive roundabout is programmed in the draft LTP for 2025/26. The form of the improvement is assumed to be conversion to traffic signals.

The extension of Broadlands Drive is programmed in the draft LTP for 2024/25.

Significant improvements are planned for Rolleston town centre and its connections to State Highway 1 and the Rolleston Izone. This includes introducing a flyover across SH1 between Rolleston town centre and the Izone, which has been allocated funding through the New Zealand Upgrade Programme (NZUP). These changes will reduce the level of access from SH1 at Rolleston Drive and Tennyson Street, and completely remove access between SH1 and Hoskyns Road. These changes will improve access between residential areas of Rolleston and the Izone and Iport industrial zones to the north.

The LTP also includes $9.5 million of cycleway improvements across the district over the next 10 years rising to $14.8 million in the longer term to provide safe and convenient between-township routes that will encourage active transportation.

2009 Rolleston Structure Plan

The Rolleston Structure Plan was last updated in 2009. A review of SDC structure plans is planned for 2020/21. The current Rolleston Structure Plan highlights the CRETS Collector Road as a main road to be developed to improve the main roads network. The road is proposed to run between Dunns Crossing Road in the west and Weedons Road in the east, providing an alternative to other roads running the whole distance across the township along this axis – Lowes Road / Levi Road to the north and Selwyn Road to the south.

The CRETS Collector Road is being constructed in stages as subdivisions are developed. Of the six planned stages, one stage (Shillingford Boulevard through Faringdon) has been completed to date and a further stage is currently being constructed (Ed Hillary Drive through Acland Park). However, as the stages are dependent on the development of subdivisions, these have not been occurring as originally planned in the 2009 Structure Plan due to accelerated development and changes in the ordering of subdivision construction. The Structure Plan suggests the CRETS Collector Road will be completed only in the long-term (beyond 2041), though at the rate of development that has occurred since 2009 it is assumed this figure will change when the plan is reviewed.

The 2009 Structure Plan also explores the potential for improved bus services, including an orbital service around the township. The plan does not place any dates on bus services improvement, stating this is dependent on development and will occur through ongoing liaison with Environment Canterbury (ECan).

4. Description of Proposal

The Proposal site is approximately 63 hectares of land which is presently zoned Inner Plains rezoned to Living Z (under the Operative District Plan) and is proposed General Rural Zone to General Residential Zone under the Proposed District Plan.

The latest Outline Development Plan shown in **Figure 2.1** allows for 756 dwellings at an average 12 dwellings per hectare.

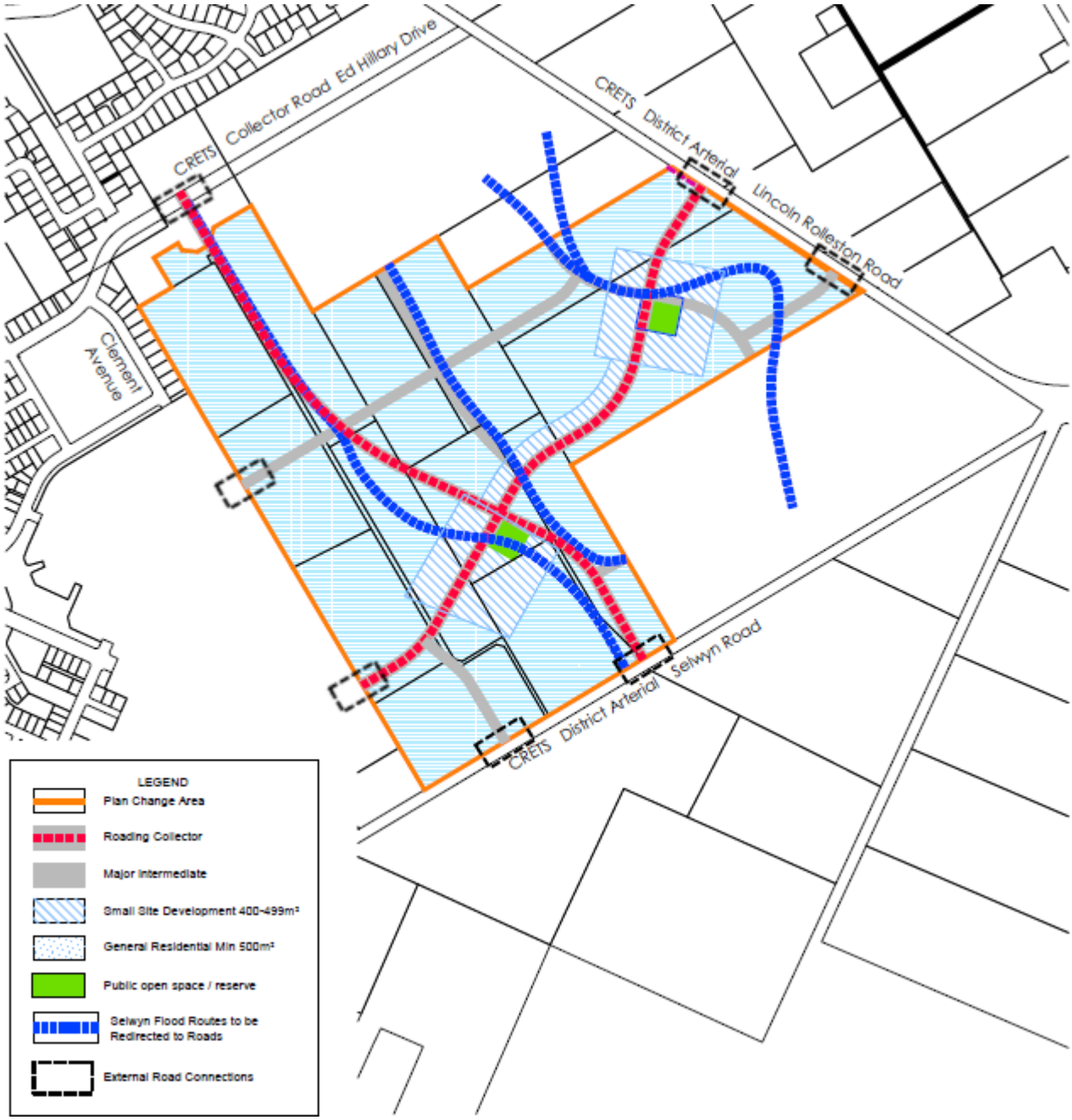


Figure 4.1 Outline Development Plan (ODP)

The figure shows how the Proposal will connect to the road network. It is intended that properties will have direct access to the road work and via a right of way (ROW) for lots without road frontage. The Proposal area will gain access to the existing road network in the following seven locations:

- Two access points on Lincoln Rolleston Road;
- Two access points on Selwyn Road;
- Extension of Lovelock Road;
- Extension of Lady Isaac Drive; and,
- One access on CRETS Collector Road (variously titled as Ed Hillary Drive / Talon Drive).

These access points will integrate the site into the overall road network by providing four accesses to district arterials, one to a district collector, and two into the adjacent Acland Park development.

Additional cul-de-sacs are proposed that in the future can be extended into any potential development in adjacent greenfield areas – two to the north and two to the southeast.

4.1 SDC road hierarchy

SDC Operative District Plan defines arterial, collector and local roads as following:

- **Arterial road:**
  - *"They connect areas of district importance not already provided by State Highways. Arterial roads connect the districts townships and other important places and activities together, including across district boundaries. Arterial roads are subject to tighter access controls than collector and local roads to promote efficient traffic flow."*
- **Collector road:**
  - *"Their prime role is to distribute and collect local traffic within and between neighbourhood areas. In some situations they may link smaller rural communities to the arterial road network. Collector roads are required to balance the necessary traffic movement function against the property access function that they also need to provide."*
- **Local road:**
  - *"means a road that is not intended to act as a main through route for motorised vehicle traffic as their primary network function is to provide property access, and they generally have lower traffic volumes. Any road in the district that is not specifically identified in this Plan as a State Highway, Arterial or Collector road is a 'local road'. New Local roads are further classified into the following sub categories.*
    - *i)* **Local Major Road:** means a local road that connects to collector and arterial roads (and other local roads). They are likely to form part of a wider network of connected roads of a similar standard that extends over an urban area. Council's urban design terminology refers to these roads as "local area Streets"
    - ii) **Local Intermediate Road (includes cul de sacs)**: means a local road with low traffic volumes and speeds and primarily provides only for property access in urban areas, while maintaining some degree of connectivity best suited for walking and cycling between streets. The Councils urban design terminology refers to these as "neighbourhood streets",
    - iii) **Local Minor (includes cul de sacs):** means a local road that primarily provides for property access. Local minor roads are referred to as "resident's streets" Local minor roads are required to maximize street amenity in a space shared by all road users and have a low speed environment (less than 50km/hr)."

The Proposed District Plan updates these definitions as follows:

- **Arterial road:**
  - *"Arterial Roads connect areas of district importance not already provided by State Highways. They also connect the districts townships and other important places and activities together, including across district boundaries."*
- **Collector road:**
  - *"The primary role of a Collector Road is to distribute and collect local traffic within and between neighbourhood areas. In some situations, they may link smaller rural communities to the Arterial Road network."*
- **Local road:**
  - *"A Local Road has low traffic volumes and speeds and primarily provides only for property access in urban areas, while maintaining some degree of connectivity best suited for walking and cycling between streets and to*

maximise street amenity, including in a space shared by all road users. The Councils urban design terminology refers to these as "neighbourhood streets" and "resident's streets". (includes cul de sacs)"

The red 'roading collectors' in **Figure 4.1** fall under the definition of Local Major Road under the Operative Plan while the 'major intermediate' roads in the ODP are defined as Local Intermediate Roads. Under the Proposed Plan these are more simply defined as Local Roads without any further sub-division. These roads will have pedestrian and carriageway streetscapes to support low traffic volumes and speeds and provide connectivity for walking and cycling.

The road heading between the southeast and the northwest of the site connects a collector (CRETS Collector Road) with an arterial (Selwyn Road). The road heading between the northeast and the southwest connects an arterial (Lincoln Rolleston Road) with the extension of a Local Major Road in Acland Park. The connection on Lincoln Rolleston Road will join into the existing Rolleston to Lincoln shared path while the connection into Acland park will connect into similar type roads in the adjacent development.

5. Accessibility

Statistics New Zealand has recently updated their commuter maps to show the destinations people are travelling to, from a selected area. These are based off Statistical Area 2 (SA2) parcels. The SA2 containing the Proposal site is Rolleston South East. The map shown in **Figure 5.1** shows employment and education departures from Rolleston South East (in green) to other SA2s which are represented in a shade of red depending on the number of departures. The main areas that residents of Rolleston South East travel to are Rolleston South West (6.2%), Lincoln West (5.4%), Islington-Hornby Industrial (4.1%) Christchurch Central-South (3.9%), Rolleston Izone (3.7%) and Rolleston North East (3.7%).

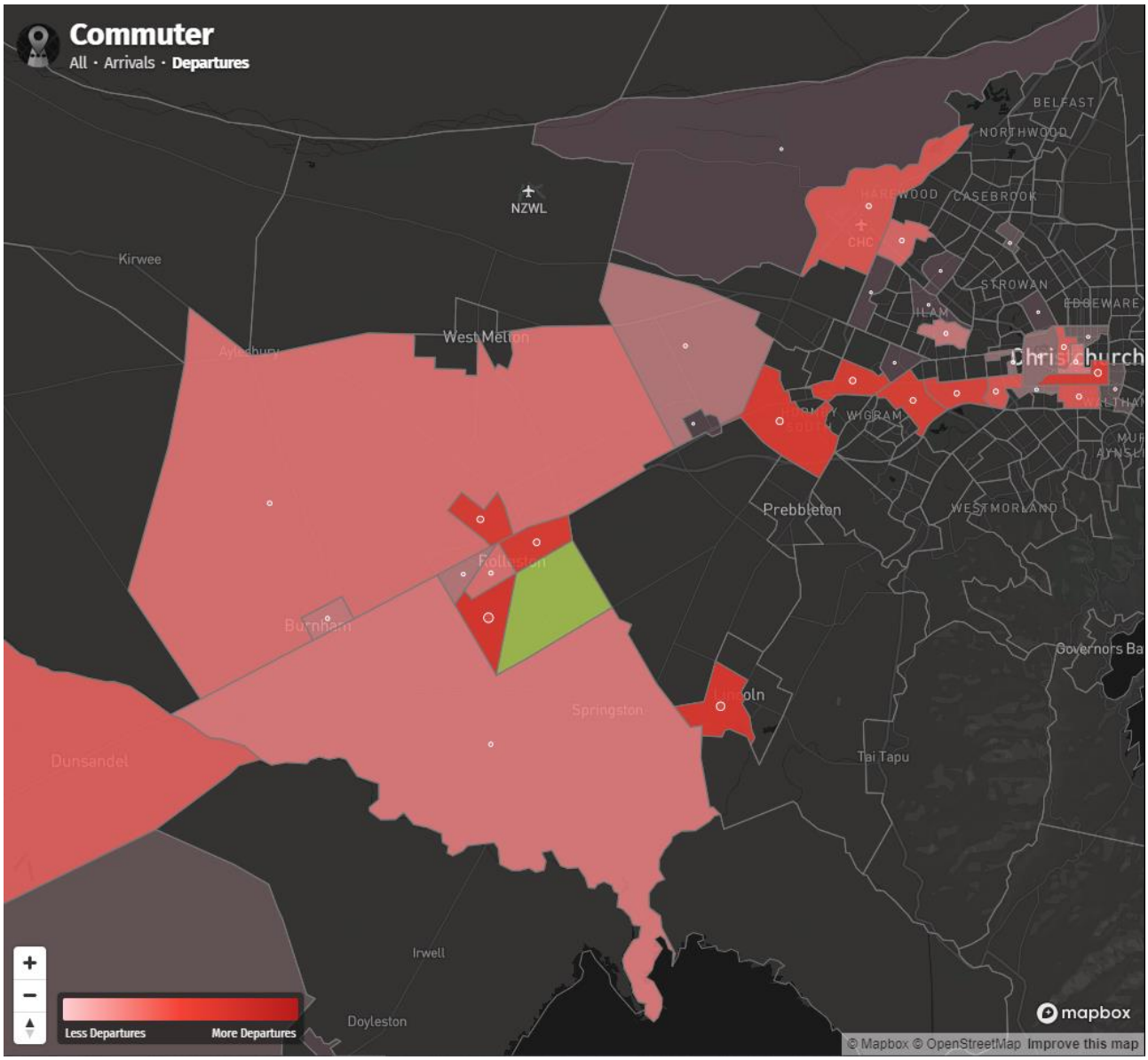


Figure 5.1 Rolleston South West departure destinations (Source: Stats NZ / Commuter Waka)

The accessibility to these areas via different modes of travel is shown in **Table 5.1**.

Table 5.1 Travel times to and from main commuter destinations from Rolleston South East

Mode and period	Rolleston South West	Lincoln West	Islington-Hornby Industrial	Christchurch Central-South	Rolleston Izone	Rolleston North East
Private vehicle (AM peak)	8 mins to Rolleston South West	12 mins to Lincoln West	18 mins to Islington-Hornby Industrial	45 mins to Christchurch Central-South	12 mins to Rolleston Izone	5 mins to Rolleston NE
Private vehicle (PM peak)	8 mins to Rolleston SE	12 mins to Rolleston SE	16 mins to Rolleston SE	35 mins to Rolleston SE	12 mins to Rolleston SE	4 mins to Rolleston SE
Public transport (AM peak)	N/A	19 mins to Lincoln West (Route 820)	21 mins to Islington-Hornby Industrial (Yellow Line)	50 mins to Christchurch Central-South (Route 85)	N/A	N/A
Public transport (PM peak)	N/A	18 mins to Rolleston SE (Route 820)	21 mins to Rolleston SE (Yellow Line)	53 mins to Rolleston SE (Route 85)	N/A	N/A
Cycling (AM peak)	13 mins to Rolleston South West	23 mins to Lincoln West	38 mins to Islington-Hornby Industrial	73 mins to Christchurch Central-South	18 mins to Rolleston Izone	10 mins to Rolleston NE
Cycling (PM peak)	13 mins to Rolleston SE	25 mins to Rolleston SE	38 mins to Rolleston SE	79 mins to Rolleston SE	17 mins to Rolleston SE	10 mins to Rolleston SE

Public transport has not been included for trips within Rolleston as the first- and last-mile component of these trips is likely to account for a disproportionately large amount of the trip travel time.

From this table, travel durations within Rolleston are observed to be largely comparable between private vehicle and cycling in terms of travel time. For travel between Rolleston and Lincoln West, all three modes are comparable. For trips to Islington-Hornby Industrial and Christchurch Central-South, which are further afield, travel times for private vehicle and public transport are comparable but cycling is much longer.

In summary, Rolleston South East is well connected to the rest of Rolleston and Lincoln across all modes. It is also well connected to Christchurch, though cycling takes an increasing amount of time due to the distance that needs to be covered.

Public transport

Rolleston is currently served by Route 85 and the Yellow Line to Christchurch and the 820 to Lincoln, with existing Park & Ride facilities at Foster Park and on Kidman Street. It is considered unlikely that these services will change in the near future. Service reviews are undertaken every five years by the Regional Council (Environment Canterbury). SDC liaise with Environment Canterbury regarding the provision of public transport to ensure sustainable growth in townships.

At the time of writing it is understood that there are no proposed bus route changes proposed in Rolleston, however it is anticipated that this would be reviewed as the township continues to grow.

Walking and cycling

The SDC 2018 Walking and Cycling Strategy targets relatively short trips for walking and cycling, recognising that these are the most likely to be taken up over private car travel. This strategy targets improved walking and cycling permeability in urban areas through, for example, providing footpaths on both sides of urban streets and addressing missing links in local township networks. As the Proposal is located adjacent to developments that are already underway or planned for the future, it is envisaged that there will be strong connections with these areas which will provide onward connections through the rest of the township. In addition, the strategy suggests that 5-7 km is the maximum trip distance the average person is likely to feel comfortable cycling. All of Rolleston township is within this distance.

The Walking and Cycling Strategy also looks at “between-township” cycleways to improve transport between major population centres. A significant amount of development has occurred in this area in recent years, with new routes including the Rolleston to Lincoln cycleway, which opened in 2015, and the Little River Rail Trail which provides onward travel from Lincoln to Christchurch, where it connects into the Christchurch cycleway network. In addition, future cycleways are planned that will connect Rolleston with the surrounding townships. Specifically, future cycleways proposed in the Walking and Cycling Strategy Action Plan are:

- Rolleston to Templeton;
- Rolleston to Burnham;
- West Melton to Rolleston; and,
- Springston to Rolleston

6. Network effects assessment

Transportation modelling for the Proposal has been completed to understand local and wider network effects using the 2028 Rolleston model developed in Paramics Discovery for SDC. The 2028 model is a 'partial development' model representing a snapshot of how traffic may behave when planned development and LTP projects are partially implemented, as compared with a 2048 'full development' model.

6.1 Trip generation and distribution

The 2028 model includes trip demands for planned urban growth within existing approved ODP and SHA areas. These demands have been informed by the state of completion of development in these areas as directed by SDC. In addition, SDC has identified areas for future urban growth in the Proposed District Plan, and it has been assumed that 25% of these areas will be developed by 2028. Note that the Proposal forms part of the area identified as being for future urban growth.

The entirety of the Urban Estates site falls within a single future urban growth zone within the Paramics model. This zone is bound by Lincoln Rolleston Road to the north-east, Selwyn Road to the south-west, the ongoing Acland Park development to the south-west and the ongoing Falcons Landing development to the north-west. The site forms 54% of the previously assumed households in this Paramics Zone.

Two sets of trip demands have been generated to analyse the effect of the Proposal in the 2028 model. These have pivoted off the trip demands originally generated for the model. The existing Paramics zone described above was subdivided into two new zones: one for the ODP area (accounting for 54% of the maximum households in the original zone) and one for the remaining area in that zone that does not form part of the ODP (accounting for 46% of the maximum households in the original zone).

For the scenario without the Proposal, the Proposal area was set to have no traffic demands. Meanwhile, the remainder of the zone was set to have 46% of the traffic demand it had in the original 2028 model.

For the scenario with the Proposal, the remainder of the zone was again set to have 46% of the traffic demand originally in the 2028 model. The Proposal area was set to be 100% complete including demands for 756 dwellings.

No further apportionment of traffic has been performed for this assessment. All origin-destination pairs remain as in the original 2028 model apart from those involving the affected zone.

6.2 Modelled infrastructure

The 2028 Rolleston model as previously developed include infrastructure planned for implementation up until 2027/28 as indicated by the 2021-2031 LTP provided by SDC. The Selwyn Road / Weedons Road roundabout is included in this infrastructure In addition, the following inclusions relevant to the Proposal site have been made:

- The intersection of Lincoln Rolleston Road and Selwyn Rd has been upgraded to a seagull-type priority intersection as proposed in the 2021-2031 LTP for implementation in 2028/29. It is considered that it is appropriate to include this infrastructure improvement as it is only barely outside the timeframe of the model and is proximate to the Proposal site. The need for this improvement is closely linked with the rate of development in the south of Rolleston along the Selwyn Road corridor which includes two Special Housing Areas (SHA) currently in development, a new secondary school planned to open prior to 2028, and several areas earmarked for future urban growth.
- The CRETS Collector Road has been assumed to be complete between Lincoln Rolleston Road and the cul-de-sac at the western end of Shillingford Boulevard (i.e. without the Goulds Road / Shillingford Boulevard roundabout). The CRETS Collector Road is an important planned east-west link that is being delivered in section as individual subdivisions are implemented. The link is already present through Faringdon (as Shillingford Boulevard) and is currently being developed through Acland Park (as Ed Hillary Drive). Again, the need for this road is closely linked with the rate of development in the south of Rolleston. The intersection of the CRETS Collector Road with Lincoln Rolleston Road has been assumed to be priority controlled.

6.3 Modelling results

To assess the potential effects at the key intersections in the vicinity of the Proposal site, two scenarios have been assessed:

- 2028 base scenario. This scenario evaluates the network based on 2028 trip demands for existing and development that is present in the 2028 model
- 2028 future development scenario. This scenario evaluates the network with the addition of trip demands for the Proposal site, assuming it to be at full development.

The infrastructure in the two scenarios is identical except that the network internal to the proposed site is only included for the future development scenario.

To assess the intersections, journey paths were set in Paramics. These provide the number of vehicles making each movement through the intersections and the travel time taken. The results have been averaged across four model runs. This methodology evaluates the intersections in terms of two outputs:

- Average delay, in seconds
- Level of service (LOS), a rating calculated as a function of the delay, and generally describes the traffic conditions in terms of travel time, volume, capacity, freedom to manoeuvre and convenience. The LOS ranges from A to F where A represents the least impediment to vehicle movement and F represents heavy congested conditions. A general summary of the level of service descriptions is shown in **Table 6.1**.

Table 6.1 Level of service (LOS) general descriptions

Level of service band	General traffic flow description
LOS A	Primarily free-flow operation
LOS B	Reasonably unimpeded operation
LOS C	Stable operation
LOS D	A less stable condition in which small increases in flow may cause substantial increases in delay and decreases in travel speed
LOS E	Characterised by unstable operation and significant delay
LOS F	Characterised by flow at extremely low speed. Congestion is likely occurring at the boundary intersections, as indicated by high delay

Typically, in assessments of intersections in peak demand periods the industry best practice is to keep the operation of an intersection at or below LOS E in peak periods.

The delay and LOS calculations for the intersections are contained within Appendix B. The intersections assessed are as follows:

- Selwyn Road / Weedons Road roundabout;
- Lincoln Rolleston Road / Selwyn Road seagull-type priority intersection;
- Lincoln Rolleston Road / CRETS Collector Road priority intersection (assumed); and,
- Springston Rolleston Road / Selwyn Road priority intersection.

Intersection assessment: 2028 future base scenario

The results of the 2028 future base scenario for the AM and PM peak, respectively, can be found in **Table 6.2** and **Table 6.3**. The overall intersection performance is that of the worst approach for stop and give-way controlled intersections, and the volume-weighted average across all approaches for roundabouts. This is in alignment with industry best practice. As a general rule, LOS E or better during peak periods is considered to be acceptable. LOS E and F performance are highlighted in blue and red, respectively.

Table 6.2 2028 future base scenario AM peak results (08:00 – 09:00)

Intersection	Approach	Flow	Average delay (s)	Level of service
Selwyn Road / Weedons Road	Selwyn Road east	298	4	A
	Weedons Road south	251	4	A
	Selwyn Road west	826	4	A
	Weedons Road north	140	7	A
	Intersection	***1515***	***4***	***A***
Lincoln Rolleston Road / Selwyn Road	Selwyn Road east	527	1	A
	Selwyn Road south	344	8	A
	Lincoln Rolleston Road	513	2	A
	Intersection	***1384***	***8***	***A***
Lincoln Rolleston Road / CRETS Collector Road	Lincoln Rolleston Road south	358	3	A
	CRETS collector west	150	7	A
	Lincoln Rolleston Road north	451	4	A
	CRETS collector east	26	8	A
	Intersection	***985***	***A***	***A***
Springston Rolleston Road / Selwyn Road	Springston Rolleston Road north	320	2	A
	Selwyn Road east	240	11	B
	Springston Rolleston Road south	192	5	A
	Selwyn Road west	331	13	B
	Intersection	***1084***	***13***	***B***

Table 6.3 2028 future base scenario PM peak results (17:00 – 18:00)

Intersection	Approach	Flow	Average delay (s)	Level of service
Selwyn Road / Weedons Road	Selwyn Road east	855	6	A
	Weedons Road south	198	6	A
	Selwyn Road west	522	3	A
	Weedons Road north	211	5	A
	Intersection	***1785***	***5***	***A***
Lincoln Rolleston Road / Selwyn Road	Selwyn Road east	1102	2	A
	Selwyn Road south	210	19	C
	Lincoln Rolleston Road	334	2	A
	Intersection	***1645***	***19***	***C***
Lincoln Rolleston Road / CRETS Collector Road	Lincoln Rolleston Road south	625	4	A
	CRETS collector west	128	7	A
	Lincoln Rolleston Road north	330	6	A
	CRETS collector east	19	12	B
	Intersection	***1101***	***12***	***B***

Intersection	Approach	Flow	Average delay (s)	Level of service
Springston Rolleston Road / Selwyn Road	Springston Rolleston Road north	336	3	A
	Selwyn Road east	374	53	F
	Springston Rolleston Road south	440	4	A
	Selwyn Road west	197	19	C
	Intersection	***1348***	***53***	***F***

Intersection assessment: 2028 future development scenario

The results of the 2028 future development scenario for the AM and PM peak, respectively, can be found in **Table 6.4** and **Table 6.5**.

Table 6.4 2028 future development scenario AM peak results (08:00 – 09:00)

Intersection	Approach	Flow	Average delay (s)	Level of service
Selwyn Road / Weedons Road	Selwyn Road east	319	4	A
	Weedons Road south	264	3	A
	Selwyn Road west	927	4	A
	Weedons Road north	171	7	A
	Intersection	***1680***	***4***	***A***
Lincoln Rolleston Road / Selwyn Road	Selwyn Road east	598	1	A
	Selwyn Road south	381	9	A
	Lincoln Rolleston Road	554	1	A
	Intersection	***1533***	***9***	***A***
Lincoln Rolleston Road / CRETS Collector Road	Lincoln Rolleston Road south	478	5	A
	CRETS collector west	178	9	A
	Lincoln Rolleston Road north	505	4	A
	CRETS collector east	26	12	B
	Intersection	***1187***	***12***	***B***
Springston Rolleston Road / Selwyn Road	Springston Rolleston Road north	347	1	A
	Selwyn Road east	284	10	B
	Springston Rolleston Road south	208	1	A
	Selwyn Road west	342	18	C
	Intersection	***1182***	***18***	***C***

Table 6.5 2028 future development scenario PM peak results (17:00 – 18:00)

Intersection	Approach	Flow	Average delay (s)	Level of service
Selwyn Road / Weedons Road	Selwyn Road east	915	8	A
	Weedons Road south	211	7	A
	Selwyn Road west	606	3	A

Intersection	Approach	Flow	Average delay (s)	Level of service
	Weedons Road north	334	6	A
	Intersection	***2067***	***6***	***A***
Lincoln Rolleston Road / Selwyn Road	Selwyn Road east	1303	2	A
	Selwyn Road south	234	17*	C*
	Lincoln Rolleston Road	376	1	A
	Intersection	***1913***	***17****	***C****
Lincoln Rolleston Road / CRETS Collector Road	Lincoln Rolleston Road south	729	5	A
	CRETS collector west	156	9	A
	Lincoln Rolleston Road north	443	10	B
	CRETS collector east	22	15	B
	Intersection	***1350***	***15***	***B***
Springston Rolleston Road / Selwyn Road	Springston Rolleston Road north	426	4	A
	Selwyn Road east	310	78	F
	Springston Rolleston Road south	474	1	A
	Selwyn Road west	179	44	E
	Intersection	***1389***	***78***	***F***

* Average delay for this approach taken from 16:00 – 17:00 period as it is higher than 17:00 – 18:00 period

Comparison of scenarios

A comparison pf the intersection performance results for both scenarios is shown in the following tables for each of the intersections.

The performance of the Selwyn Road / Weedons Road roundabout is compared in **Table 6.6**. The change in average delay is small, with there being at most 2 seconds increase on any approach. None of the delay changes result in a worsening of LOS, and these changes will not be noticeable to road users.

Table 6.6 Selwyn Road / Weedons Road roundabout performance comparison

Period	Approach	Average delay, base	Average delay, full development	LOS, base	LOS, full development
AM peak	Selwyn Road east	4	4	A	A
	Weedons Road south	4	3	A	A
	Selwyn Road west	4	4	A	A
	Weedons Road north	7	7	A	A
	Intersection	***4***	***4***	***A***	***A***
PM peak	Selwyn Road east	6	8	A	A
	Weedons Road south	6	7	A	A
	Selwyn Road west	3	3	A	A
	Weedons Road north	5	6	A	A
	Intersection	***5***	***6***	***A***	***A***

The performance of the Lincoln Rolleston Road / Selwyn Road seagull intersection is compared in **Table 6.7**. Again, the change in average delay is small, with there being at most one second increase on any approach. None of the delay changes result in a worsening of LOS, and the delay changes will not be noticeable to road users.

Table 6.7 Lincoln Rolleston Road / Selwyn Road priority intersection performance comparison

Period	Approach	Average delay, base	Average delay, full development	LOS, base	LOS, full development
AM peak	Selwyn Road east	1	1	A	A
	Selwyn Road south	8	9	A	A
	Lincoln Rolleston Road	2	1	A	A
	Intersection	***8***	***9***	***A***	***A***
PM peak	Selwyn Road east	2	2	A	A
	Selwyn Road south	19	17	C	C
	Lincoln Rolleston Road	2	1	A	A
	Intersection	***19***	***17***	***C***	***C***

The performance of the Lincoln Rolleston Road / CRETS Collector Road priority intersection is compared in **Table 6.8**. Changes in delay for this intersection are small, with no approach increasing by more than four seconds. There are two changes in LOS, with the CRETS collector road east approach changing from LOS A to LOS B in the AM and the Lincoln Rolleston Road north approach changing from LOS A to B in the PM due to increased numbers of right-turning vehicles. These changes not be perceptible to the average road user.

Table 6.8 Lincoln Rolleston Road / CRETS Collector Road priority intersection performance comparison

Period	Approach	Average delay, base	Average delay, full development	LOS, base	LOS, full development
AM peak	Lincoln Rolleston Road south	3	5	A	A
	CRETS collector west	7	9	A	A
	Lincoln Rolleston Road north	4	4	A	A
	CRETS collector east	8	12	A	B
	Intersection	***A***	***12***	***A***	***B***
PM peak	Lincoln Rolleston Road south	4	5	A	A
	CRETS collector west	7	9	A	A
	Lincoln Rolleston Road north	6	10	A	B
	CRETS collector east	12	15	B	B
	Intersection	***12***	***15***	***B***	***B***

The performance of the Springston Rolleston Road / Selwyn Road seagull intersection is compared in **Table 6.9**.

In the AM, there is an increase in delay on the Selwyn Road west approach amounting to a change of five seconds. This is a marginal increase but does change the LOS from B to C.

In the PM, there are more noticeable changes as this intersection is already stressed in the base model. The delay on the Selwyn Road east approach increases by 25 seconds, with the LOS being F in both cases. The delay on the Selwyn Road west approach also increases by 25 seconds, but in this case the LOS increases from C to E. This modelling indicates that the intersection requires an upgrade regardless of the traffic generated by this Proposal.

Table 6.9 Springston Rolleston Road / Selwyn Road priority intersection performance comparison

Period	Approach	Average delay, base	Average delay, full development	LOS, base	LOS, full development
AM peak	Springston Rolleston Road north	2	1	A	A
	Selwyn Road east	11	10	B	B
	Springston Rolleston Road south	5	1	A	A
	Selwyn Road west	13	18	B	C
	Intersection	***13***	***18***	***B***	***C***
PM peak	Springston Rolleston Road north	3	4	A	A
	Selwyn Road east	53	78	F	F
	Springston Rolleston Road south	4	1	A	A
	Selwyn Road west	19	44	C	E
	Intersection	***53***	***78***	***F***	***F***

Sensitivity testing

Due to the high delays observed at the Springston Rolleston Road / Selwyn Road intersection in both the base model and the full-development model, some sensitivity testing has been undertaken to rerun the models without the 25% allowed for in the future urban development areas. That is to say:

- For the 2028 base model, all trip demands in the future urban development areas have been set to 0. Trip demands in approved ODP and SHA areas have been retained as above; and,
- For the 2028 future development, all trip demands in the future urban development areas have been set to 0 except the Proposal where full development has been assumed. Again, trip demands in approved ODP and SHA areas have been retained as above.

The infrastructure assumed in the assessment above has been retained.

This assessment allows the Springston Rolleston Road / Selwyn Road intersection to be assessed only on the basis of development that is permitted under current zoning. LOS calculations for this sensitivity testing are included within Appendix B. The results from this sensitivity testing show:

- In the AM, the intersection is at LOS A in both the base and full development models. No increases in delay are observed; and,
- In the PM, the intersection is at LOS C in the base model rising to LOS D in the full development model. This is due to a 10 second increase in delay on the Selwyn Road east approach.

This sensitivity testing indicates that without the assumed 25% future urban development the intersection would still operate at an acceptable level both with and without the Proposal. While there is a moderate increase in delay in the PM, it is not nearly as severe as suggested in the original assessment. These results show that the delays at this intersection cannot be attributed to this Proposal in isolation from wider development in the vicinity which also requires a Plan Change to enable residential development. Rather, it results from the cumulative effect of the substantial residential development set to occur in the south of Rolleston township.

The delays at this intersection arise primarily from the high volumes of traffic commuting from the southwest of Rolleston township towards Christchurch in the AM and then returning in the PM. At present this consists of traffic based in Faringdon, but this is set to grow with the development of ODP and SHA areas in that corner of Rolleston township. The effect of additional traffic added by the Proposal is to force more of this traffic to use Selwyn Road rather than a route further north. It must be noted that the modelling does not include the planned roundabout at the intersection of

Shillingford Boulevard (CRETS Collector Road) and Goulds Road, which is programmed for 2029/30 according to the draft LTP. When this intersection is completed, more east-west connections will be available.

7. Strategic planning framework

Canterbury Regional Land Transport Plan 2015 – 2025

The Canterbury Regional Land Transport Plan 2015 – 2025 describes a list of primary objectives to achieve the vision of "Canterbury has an accessible, affordable, integrated, safe, resilient and sustainable transport system"[1].

These primary objectives are:

- Progressively reduce transport-related fatalities and serious injuries
- Improve levels of access in an environmentally sustainable way by increasing the attractiveness of public transport, walking and cycling, so there is greater use of these modes:
  - For public transport the focus is on timeliness, convenience, affordability, efficiency, connectedness, and sustainability; and
  - For walking and cycling the focus is on safety, amenity, convenience, connectivity and being able to take a direct route
- Increased capability for appropriate roads and bridges to carry heavy vehicles
- All roads comply with One Network Road Classification performance measures
- Improve journey time reliability on key corridors, with a focus on freight, public transport and tourism
- Improve access to freight hubs
- Resilience routes are in place for strategic routes that are most at risk of disruption
- Reduce the number and duration of road closures
- Identify routes that are at risk of being impacted by climate change, and how to manage these risks to improve resilience
- Increased uptake of energy efficient and environmentally sustainable vehicles
- Increased transport and land use integration
- Reduced air and water pollution
- Improved storm water management

The Proposal is not anticipated to give rise to adverse effects on the strategic transport network and does not require any new external roading links. The site is immediately to the south and east of existing development land and will enable the general area to be connected. This includes all transport mode linkages and a consistent approach will be applied to ensure network connectivity is legible and consistent. The main road to the west is Ed Hillary Drive and we understand it will form part of a main east to west collector road known as the CRETS collector road. Eventually this road will extend from Dunns Crossing Road in the west to the Lincoln Rolleston Road and the site can link into the eastern end of the route.

As the surrounding area is still developing, and public transport studies for the Greater Christchurch Areas are underway, the existing level of public transport provision nearby is limited. However, the site can be developed to enable good access to public transport particularly if it is to be provided along the CRETS collector road at some stage in the future. As the site will be integrated into the transport networks of the surrounding area, walking and cycling networks will assist in limiting car use.

Environment Canterbury is proposing future changes to the Christchurch bus network which are expected to increase bus services to Rolleston to further improve public transport accessibility, as the township continues to grow.

Canterbury Regional Public Transport Plan 2018 – 2028

The Canterbury Regional Public Transport Plan 2018-2028 sets out Environment Canterbury's objectives and policies for delivering public transport in Canterbury.

One of the key objectives of the plan is to achieve "*A network of public transport services in the Greater Christchurch and Timaru urban areas that provides people with access to key destinations."* This includes services to and from the satellite

[1] Page 4 of Environment Canterbury's 'Canterbury Regional Land Transport Plan 2015 – 2025' (June 2018)

centres, including Rolleston. To achieve this objective, four new high frequency routes are proposed. One of these being the already implemented Lincoln to Christchurch CBD express service. With these four routes and increased frequency, this will overall improve public transport accessibility in Christchurch where 47% more people will be able to travel from home to the city within 30 minutes.

The proposed route network is shown in Figure 7.1, which shows high frequency routes between Rolleston/Lincoln and the Christchurch CBD. There is also a connecting service between Rolleston and Lincoln which currently uses the Springston Rolleston Road 730m to the west of the site. The connecting service can be used from the site to access Rolleston or Lincoln and if required transfer onto a high frequency service into Christchurch.

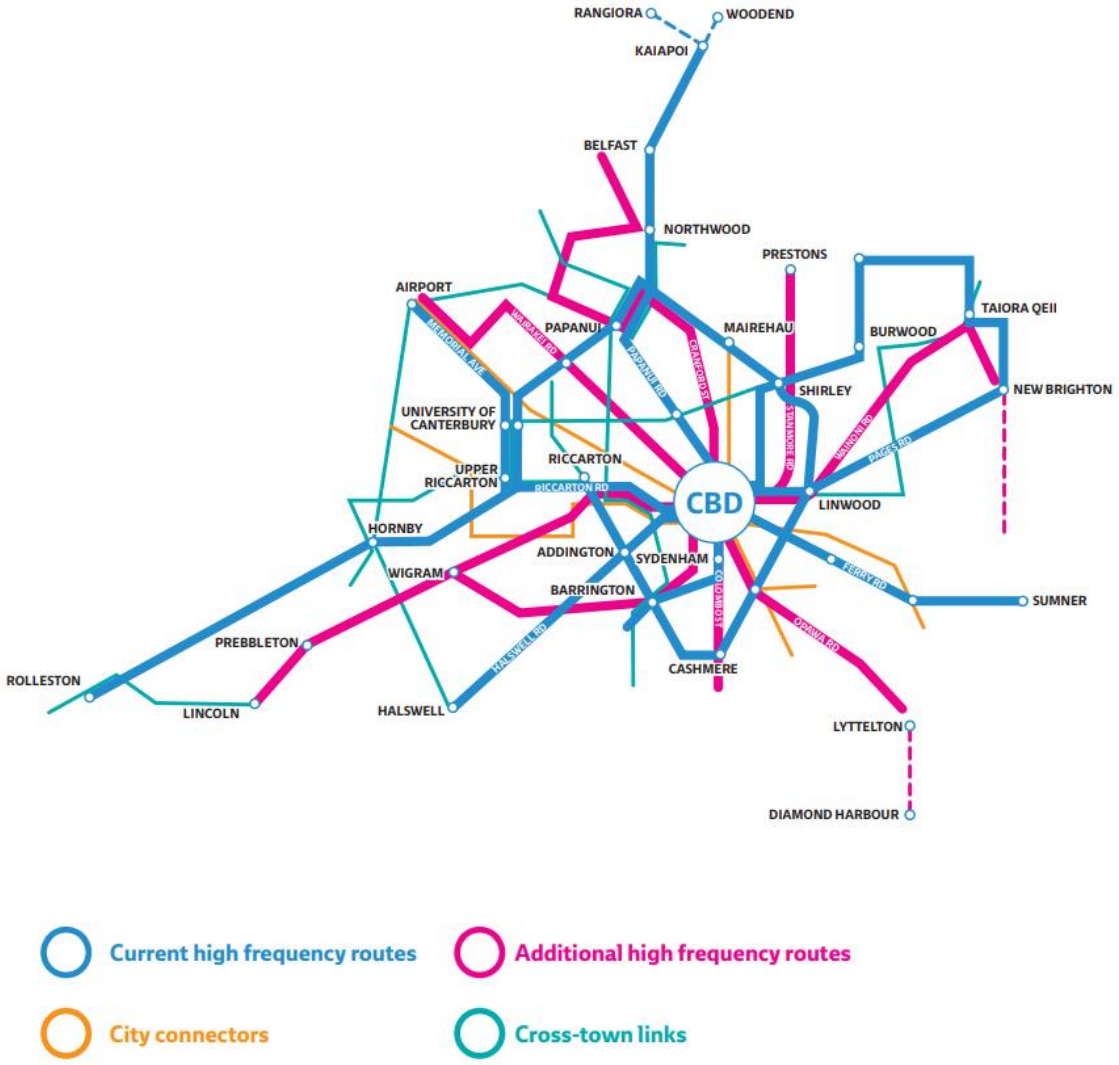


Figure 7.1 Proposed Changes to the Christchurch Bus Network

In the long-term, rapid transit is desired from Rolleston to the Christchurch CBD which will greatly increase the Public Transport accessibility of Rolleston in general. There will be the opportunity to expand current supporting infrastructure such as park and ride in Rolleston and active modes can be used to provide access to this enhanced provision.

7.1 Local Policy Environment

Assessment against the Selwyn Operative District Plan

Objectives and policies

An assessment of the Proposal against the transport related objectives and policies in the Operative District Plan is included in **Table 7.1**.

Table 7.1 SDC Operative District Plan Objectives and Policies

Objectives and Policies	Assessment	Comments
Township Volume / B2 Physical Resources		
Objective B2.1.1 An integrated approach to land use and transport planning to ensure the safe and efficient operation of the District's roads, pathways, railway lines and airfields is not compromised by adverse effects from activities on surrounding land or by residential growth.	**Consistent**	The Proposal will form new Local Roads within the site to connect to the wider road network via Lincoln Rolleston Road and also into the neighbouring residential suburbs. The development will connect to the future main east-west CRETS collector road as an extension of Ed Hillary Drive in Acland Park to the west. The residential development is proposed to be of a similar nature to the existing residential areas and reflect and continue any active mode corridors. The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation.
Objective B2.1.2 An integrated approach to land use and transport planning to manage and minimise adverse effects of transport networks on adjoining land uses, and to avoid "reverse sensitivity" effects on the operation of transport networks.	**Consistent**	Traffic modelling has demonstrated that the effects on the receiving transport network are not adverse due to the increased trip generation of the Proposal. Sensitivity testing showed general development along the southern edge of Rolleston will place strain on the Selwyn Road / Springston Rolleston Road intersection.
Objective B2.1.3 Future road networks and transport corridors are designed, located and protected, to promote transport choice and provide for: a range of sustainable transport modes; and alternatives to road movement of freight such as rail.	**Consistent**	The Proposal takes into account the future road network and appropriately designed connections will be made. The development will connect to the future main east-west CRETS collector road as an extension of Ed Hillary Drive in Acland Park to the west which could be used as a public transport corridor if needed. The transport network will be designed to be consistent for the area and accommodate sustainable transport modes.
Objective B2.1.4 Adverse effects of land transport networks on natural or physical resources or amenity values, are avoided, remedied or mitigated, including adverse effects on the environment from construction, operation and maintenance.	**Consistent**	The Proposal can be accommodated by the land transport network and any adverse effects from construction of the residential dwellings and internal roads can be avoided, remedied or mitigated with Temporary Traffic Management Plan(s).
Objective B2.1.5 The future, unrestricted operation of Christchurch International Airport is not jeopardised by "reverse sensitivity" effects from residential development in the Selwyn District.	**Not contrary**	The future, unrestricted operation of Christchurch International Airport is not expected to be jeopardised by the Proposal.

Objectives and Policies	Assessment	Comments
Policy B2.1.1 Apply a road hierarchy classification in Selwyn District to recognise the different functions and roles of the District's roads.	**Consistent**	The Proposal will apply the road hierarchy classification of Selwyn District and form new Local Major Roads and Local Intermediate Roads within the site to connect to the wider road network via Lincoln Rolleston Road and into the neighbouring residential suburbs.
Policy B2.1.2 Manage effects of activities on the safe and efficient operation of the District's existing and planned road network, considering the classification and function of each road in the hierarchy.	**Consistent**	As mentioned under Objective B2.1.2, traffic modelling has demonstrated that there are no adverse effects on the receiving transport network due to the Proposal.
Policy B2.1.3 Recognise and protect the primary function of roads classified as State Highways and Arterial Roads in Part D, Appendix 7, to ensure the safe and efficient flow of 'through' traffic en route to its destination.	**Can be Consistent**	The nearby Arterial roads are the Lincoln Rolleston Road, Springston Rolleston Road and Selwyn Road. Where the site is adjacent to one of these roads the access can be limited to the Arterial Road by utilising internal access roads. Where the main access roads intersect an arterial the intersection design can be done to ensure Arterial through movements are prioritised. The details of protecting the arterials can be finalised and agreed with Council through the subdivision consent stage.
Policy B2.1.4(a) Ensure all sites, allotments or properties have legal access to a legal road which is formed to the standard necessary to meet the needs of the activity considering: • the number and type of vehicle movements generated by the activity; • the road classification and function; and • any pedestrian, cycle, public transport or other access required by the activity.	**Consistent**	The Proposal will ensure all dwellings have legal access to a legal road that is formed to the appropriate standard required. The new legal roads with the Proposal will reflect the existing neighbouring residential roads and integrate all modes.
Policy B2.1.4(b) Avoid adverse effects on the safe flow of traffic along State Highways and Arterial Roads from new property access, where the speed limit is more than 70 km/hr.	**Can be Consistent**	By internalising the property access it is possible to stop direct new property access onto Arterial Roads where the speed limit is more than 70km/hr. The details of protecting the arterials can be finalised and agreed with Council through the subdivision consent stage.
Policy B2.1.5 Ensure the development of new roads is: • integrated with existing and future transport networks and landuses; and • is designed and located to maximise permeability and accessibility; through achieving a high level of connectivity within and through new developments to encourage use of public and active transport; whilst having regard to the road hierarchy.	**Consistent**	The development of the new internal roads within the Proposal will integrate with the existing and future transport networks and landuses and is designed and located to maximise vehicle, cycle and pedestrian permeability and accessibility. Active transport will be encouraged with the level of pedestrian and cyclist permeability within the site. The CRETS collector road could be used for public transport provision which the site wil have connections to..

Operative District Plan Rules

It is anticipated that at resource consent stage of any development, the transport related District Plan Rules set out in Section C5 LZ Roading (Living Zone Rules – Roads and Transport) of the Township Volume in the Selwyn District Plan will form an appropriate basis for the design and layout of the internal site. However, it is also envisaged that there may be occasional departures from these since, to achieve the optimum urban design outcome, non-compliances may arise and any effects of these non-compliances would be assessed accordingly.

Assessment against the Proposed Selwyn District Plan

Objectives and policies

An assessment of the Proposal against the transport related objectives and policies in the Proposed District Plan is included in **Table 7.2**.

Table 7.2 SDC Proposed District Plan Objectives and Policies

Objectives and Policies	Assessment	Comments
Part 2 - District Wide Matters / Energy, Infrastructure and Transport / TRAN - Transport		
TRAN-O1 People and places are connected through safe, efficient, and convenient land transport corridors and land transport infrastructure which is well integrated with land use activities and subdivision development.	**Consistent**	The Proposal will form new Local Roads within the site to connect to the wider road network via Lincoln Rolleston Road, Selwyn Road, and also into the neighbouring residential suburbs. The development will connect to the future main east-west CRETS collector road as an extension of Ed Hillary Drive in Acland Park to the west. The residential development is proposed to be of a similar nature to the existing residential areas and reflect and continue any active mode corridors. The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation.
TRAN-O2 Land transport corridors and land transport infrastructure are protected from incompatible land use activities and subdivision development.	**Can be consistent**	The Proposal will support the function of Lincoln Rolleston Road and Selwyn Road as Arterial Roads and the CRETS collector road as a Collector Road by providing appropriate connections to these roads from internal local roads. The details of protecting the arterials can be finalised and agreed with Council through the subdivision consent stage. The Proposal will support the existing Local Road network in the adjacent Acland Park subdivision to the west by providing appropriate connections to those roads.
TRAN-O3 Land transport corridors and land transport infrastructure support the needs of people and freight, while ensuring adverse effects on the surrounding environment from their establishment and operation are managed.	**Consistent**	Traffic modelling has demonstrated that the effects on the receiving transport network are not adverse due to the increased trip generation of the Plan Change. Sensitivity testing showed the cumulative effect of development along the southern edge of Rolleston will place strain on the Selwyn Road / Springston Rolleston Road intersection, but this cannot be attributed to this site in particular.

Objectives and Policies	Assessment	Comments
TRAN-P1 The safety and efficiency of the District's land transport network and systems are enabled through integrated land use and subdivision development that: 1. Manages the levels of service, formation standards and the types of land transport corridors and land transport infrastructure, including through the network road classifications and compliance with the design and operational standards; 2. Provides land transport infrastructure that is consistent with the form, function, and character of each zone; 3. Ensures there is enough space within land transport corridors to support the efficient and effective operation of network utilities; 4. Provides for the safe and efficient movement and operation of emergency services; and 5. Recognises cross-boundary connections with adjoining districts.	**Can be consistent**	The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation. The Proposal will apply the road hierarchy classification of Selwyn District and form new Local Roads within the site to connect to the wider road network via Lincoln Rolleston Road, Selwyn Road, and into the neighbouring residential suburbs. The Local Road network within the site will be consistent with the form, function, and character of the General Residential Zone and the necessary space will be provided to support the efficient and effective operation of network utilities. The details of the Local Road network can be finalised and agreed with Council through the subdivision consent stage.
TRAN-P2 Manage any extensions to the District's land transport network to ensure it occurs in an integrated way by: 1. Co-coordinating the timing of land use activities and subdivision development with the availability of capacity in land transport corridors; 2. Providing a range of travel modes and ensuring these are integrated, including between walking, cycling, public transport, freight and private vehicle modes; and 3. Ensuring land use activities and subdivision development do not foreclose on the opportunity for land transport corridors to meet future land transport needs.	**Can be consistent**	Traffic modelling has demonstrated that there is appropriate capacity in land transport corridors. Sensitivity testing showed the cumulative effect of development along the southern edge of Rolleston will place strain on the Selwyn Road / Springston Rolleston Road intersection, but this effect cannot be attributed to this site in particular. The new legal roads with the Proposal will reflect the existing neighbouring residential roads and integrate all types of transport networks from roads to cycle and walking networks. The site does not include any proposed Arterial Roads or Collectors, but interactions with those which provide access to the site will be in accordance with the plan rules. The details of protecting the arterials can be finalised and agreed with Council through the subdivision consent stage
TRAN-P3 Require Integrated Transport Assessments to assess the effects of high trip generating activities on the surrounding land transport network to: 1. Maintain the safety and efficiency of land transport infrastructure by ensuring there is sufficient capacity in land transport corridors, including by integrating development with funded improvements to the network and	**Can be consistent**	Traffic modelling has demonstrated that there is appropriate capacity in land transport corridors. This modelling has included network improvements from the draft 2021-2031 LTP. Sensitivity testing showed the cumulative effect of development along the southern edge of Rolleston will place strain on the Selwyn Road / Springston Rolleston Road intersection, but this effect cannot be attributed to the site in particular. The transport network will be designed to be consistent for the area and utilise

Objectives and Policies	Assessment	Comments
ensuring the timing aligns with capacity; and 2. Establish whether the high trip generating activity can be supported by active transport modes, including accessibility to safe and convenient walking and cycling connections and access to public transport and public transport facilities.		connections to neighbouring communities intended to connect into the site land. This includes active mode corridors and other features to accommodate and prioritise sustainable transport modes. The details of the active transport network can be finalised and agreed with Council through the subdivision consent stage.
TRAN-P4 Manage the adverse effects of activities within the General Rural Zone that exceed the maximum number of vehicle movements for each site**.**	**Consistent**	The Proposal will have little effect on vehicle movements for sites in the General Rural Zone.
TRAN-P5 Promote a range of transport options to reduce the number of trips and distances travelled in private motor vehicles by: 1. Encouraging land use activities and subdivision development to include connected walking and cycling networks and access to public transport and public transport facilities, including within and between townships; and 2. Managing the design, layout and function of new land transport infrastructure to ensure they integrate with existing and future land transport corridors.	**Can be Consistent**	The Proposal takes into account the future road network and appropriately designed connections will be made. The development will connect to the future main east-west CRETS collector road as an extension of Ed Hillary Drive in Acland Park to the west which could be used as a public transport corridor if needed. The transport network will be designed to be consistent for the area and utilise connections to neighbouring communities intended to connect into the site land. This includes active mode corridors and other features to accommodate and prioritise sustainable transport modes.
TRAN-P6 Enable safe, multi-modal connections that support walking, cycling, and access to public transport and public transport facilities through land use activities and subdivision development that: 1. Establish levels of service and multi-modal transport options based on the network road classifications, including the provision of strategic level walking and cycling connections where they are identified in Development Plans or ODP; 2. Encourage residential blocks to be small, navigable and convenient to move around through legible, convenient and attractive walking and cycling routes to public transport facilities and between residential areas, business centres, community facilities, recreation space and local services; 3. Manage the number and design of cul de sacs, rear lots and accessways; 4. Provide for the interaction between vehicle access and manoeuvring, loading and parking areas when	**Can be Consistent**	The Proposal will form new Local Roads within the site to connect to the wider road network via site boundary roads and into the neighbouring residential suburbs. The site will be developed in line with nearby areas and focus on best practice to encourage active mode use by being highly permeable for these modes of transport as set out in the items of this policy's intentions.

Objectives and Policies	Assessment	Comments
determining on-site pedestrian and cycling routes; and 5. Align street layouts to maximise views and landscape features to promote attractive streets.		
TRAN-P7 Recognise and protect the function of the District's land transport network and systems by managing land use activities and subdivision development to ensure the safe and efficient movement of people and goods by: 1. Managing adverse effects from activities on land transport corridors and land transport infrastructure, particularly where it may reduce safe and efficient traffic flows within the strategic transport network and links with Christchurch City; 2. Ensuring land transport corridors and land transport infrastructure can support the volume and type of transport movements based on the network road classifications; and 3. Requiring the design, positioning, and maintenance of accessways, corner splays, vehicle crossings, intersections, footpaths, plantings, and signs to ensure appropriate sightline visibility is provided to road users to support safe and efficient vehicle, pedestrian, and cycle movements.	**Consistent**	The Proposal will form new Local Roads within the site to connect to the wider road network via Lincoln Rolleston Road and into the neighbouring residential suburbs. The development will connect to the future main east-west CRETS collector road as an extension of Ed Hillary Drive in Acland Park to the west. Connections to the external network will be appropriately designed to mitigate any potential effects. The residential development is proposed to be of a similar nature to the existing residential areas and reflect and continue any active mode corridors and provide suitable protection for safety and efficiency. The development is proposed in a location that can accommodate the growth whilst both ensuring safety and efficiency of transport operation.
TRAN-P8 Recognise and protect rail networks and systems by managing land use activities and subdivision development to ensure the safe and efficient movement of people and goods by: 1. Managing adverse effects of activities on rail networks and systems, while encouraging land use activities and subdivision development that support the movement of people and goods via rail; 2. Managing the location of buildings, structures or trees to ensure they do not impair the visibility of motorists, pedestrians, cyclists, or train drivers within the sightlines of railway lines at road/rail crossings; 3. Controlling the design and location of land use activities and subdivision development to reduce the need for pedestrians, cyclists, motorists, or other road users from crossing railway lines; and 4. Encouraging the movement of freight via rail as a viable alternative to road transportation.	**Consistent**	Site is not on/near the rail network.

Objectives and Policies	Assessment	Comments
TRAN-P9 Manage on-site parking areas and loading facilities to maintain the safe and efficient operation of land transport corridors and land transport infrastructure.	**N/A**	
TRAN-P10 Supporting the economic growth of commercial centres through the appropriate supply of vehicle and cycle parking areas and the establishment of public transport facilities that correspond with the type and function of each centre.	**N/A**	
TRAN-P11 Manage vehicle access, vehicle crossings and manoeuvring areas to maintain the safe and efficient operation of land transport corridors and land transport infrastructure by: 1. Requiring all sites to have access to a road and to ensure that this access is constructed to the appropriate formation standards and is compatible with the network road classification; 2. Avoiding the need to reverse vehicles onto the strategic transport network; 3. Avoiding the establishment of new accessways and vehicle crossings to roads that require access across a rail line; and 4. Minimising the need to reverse onto Collector and Local Roads through the provision of appropriate on-site manoeuvring areas.	**Consistent**	Site is not on/near the rail or strategic road networks. The site can be developed to avoid reversing movements from properties which will all have appropriately formed access to a road.
TRAN-P12 Enable works to be carried out by network utility operators to construct, renew, improve, and operate network utilities within land transport corridors in an efficient manner, while managing the scale and types of works and activities.	**Can be Consistent**	The Proposal and supporting utility infrastructure can be designed and set out to be consistent with this policy. Any specifics to support this can be worked out in resource consenting stages.
TRAN-P13 Minimise the adverse effects of development on the physical and natural environment by: 1. Locating, designing and operating development while minimising the effects on, the amenity values of the surrounding environment, public access, and the health and safety of people. 2. Encourage development to consider alternative sites, routes or methods. 3. Limiting the presence and effects of development within Outstanding Natural Landscapes, Visual Amenity Landscapes, Areas of Significant Indigenous Vegetation and habitats of indigenous fauna, sites of historic	**Can be Consistent**	The Proposal is within an area of farmland and rural residential housing and within future urban growth area identified in the proposed plan. The Proposal will provide connections to the currently developing areas and make the area more permeable for transport routes potentially reducing effects of trips to exiting areas by providing more direct and appropriate passage. Design measures can be finalised and agreed with Council through the resource consenting stages.

Objectives and Policies	Assessment	Comments
heritage and site and areas of significance to Māori to those which: 4. can demonstrate an operational or functional requirement for the location; and 5. can demonstrate through site, route or method selection the minimisation of effects on the environment; and 6. integrate design measures and management methods to mitigate adverse effects. 7. Requiring restoration of indigenous biodiversity and habitat following development in areas of Areas of Significant Indigenous Vegetation and habitats of indigenous fauna, and the on-going monitoring of that restoration. 8. Considering biodiversity off-setting or compensation where the loss of significant indigenous vegetation cannot be restored and significant habitats of indigenous fauna or wetlands cannot be fully mitigated where the adverse effects cannot be avoided or remedied. 9. Using the substantial upgrade of land transport infrastructure as an opportunity to reduce existing adverse effects.		

Proposed District Plan Rules

It is anticipated that at resource consent stage of any development, the transport related District Plan Rules set out in Part 2 - District Wide Matters / Energy, Infrastructure and Transport / TRAN – Transport will form an appropriate basis for the design and layout of the internal site. However, it is also envisaged that there may be occasional departures from these since, to achieve the optimum urban design outcome, non-compliances may arise and any effects of these non-compliances would be assessed accordingly.

8. Conclusion

This ITA has been developed in accordance with Waka Kotahi ITA guidelines and supports the Assessment of Effects for the UEL submission on the Proposal District Plan and Private Plan Change application in Rolleston. The Proposal site amounts to 63 hectares on the southeast fringe of Rolleston. UEL seek to rezone the land from General Rural Zone to General Rural Zone under the Proposed District Plan (equivalent to Inner Plains to Living Z under the Operative District Plan). The Proposal would accommodate up to 756 households and will result in an increased level of traffic activity compared to current rural and rural-residential activity on the site.

The location has good accessibility by all modes to key destinations within Rolleston and Lincoln. It has good accessibility by private car and public transport to key destinations in the Greater Christchurch area, and it is noted that public transport services would likely expand as Rolleston continues to develop. Future planned infrastructure upgrades in the draft SDC 2021-2031 LTP will deliver important safety and efficiency improvements in the vicinity of the site. This includes intersection upgrades at Selwyn Road / Weedons Road and Lincoln Rolleston Road / Selwyn Road, as well as the continued development of the CRETS Collector Road.

A comprehensive traffic modelling assessment has been performed in Paramics Discovery using the 2028 Rolleston model to understand the effects of increased traffic volumes associated with the Proposal. The impact of performance on nearby intersections has been assessed through two modelling scenarios, a base scenario and one with full development of the Proposal site. The results of the analysis demonstrate that the planned upgrades to the Selwyn Road / Weedons Road and Lincoln Rolleston Road / Selwyn Road intersections will have ample capacity to accommodate the extra traffic that would result from the Proposal.

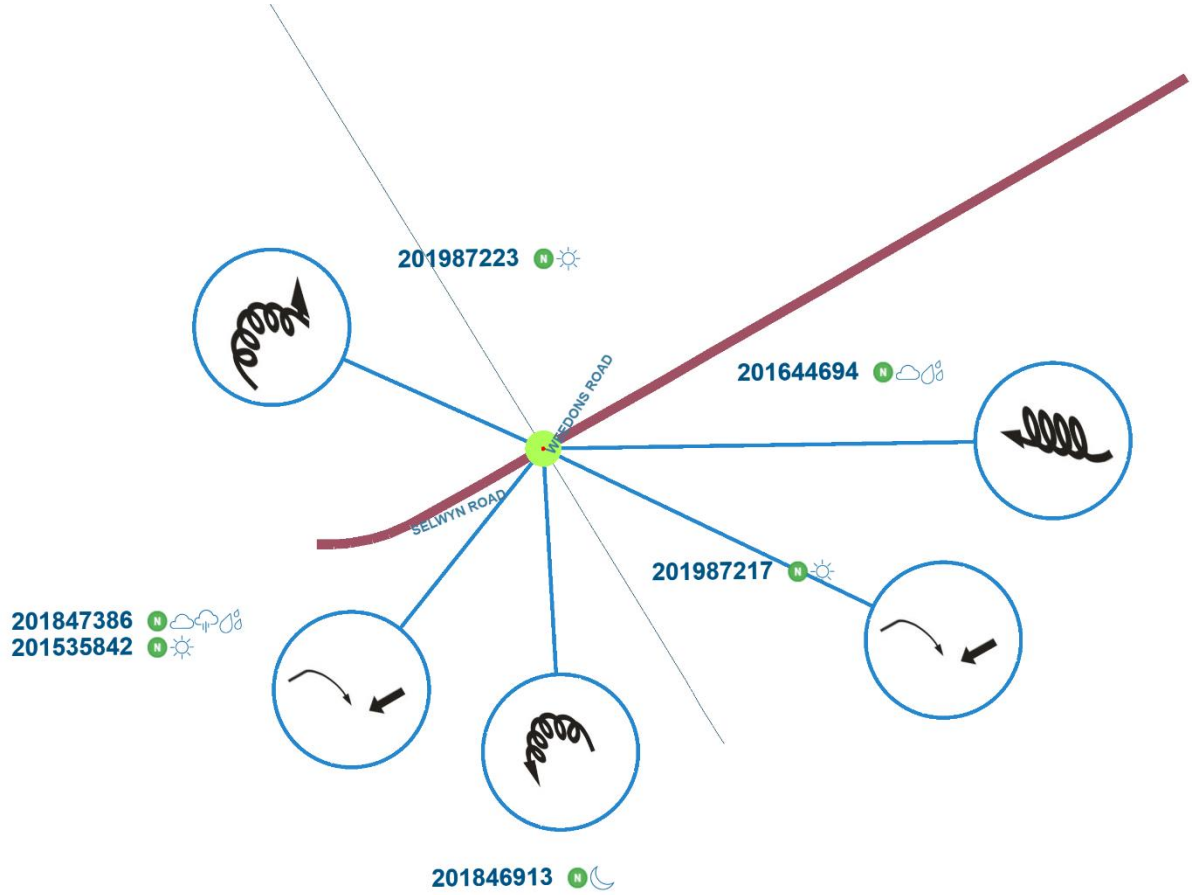
As a part of the safety and modelling assessment, deficiencies have been identified at the Springston Rolleston Road / Selwyn Road intersection, which has not been identified in the draft LTP for improvement. However, the modelling indicates that the deficiencies will result from cumulative effects across the south of Rolleston township and cannot be attributed to this Proposal in particular. Irrespective of this Proposal, it appears that improvements will be required at this intersection within the 2021-2031 LTP period, or, alternatively, other projects will need to be established to provide relief at this intersection both in terms of safety and capacity.

The Proposal has been assessed against the relevant transport planning framework contained in regional and local strategies and policies, and overall, it is considered that the Proposal is consistent with the transport-related objectives and policies of those documents. It is also anticipated to comply with the Proposed District Plan Rules which would be fully assessed at resource consenting stages.

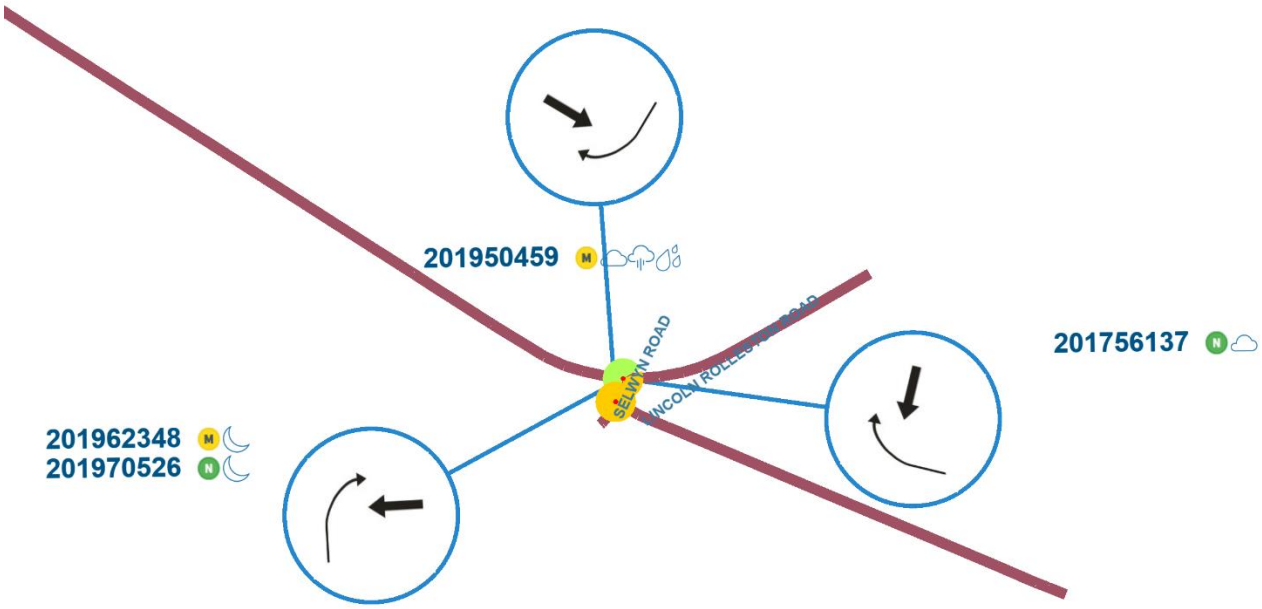
Overall, the Proposal can be supported from a traffic and transportation perspective and it is considered that there are no traffic and transportation reasons why the Proposal could not be approved either through the District Plan Review submission process or as a Private Plan Change.

Appendix A
CAS collision diagrams

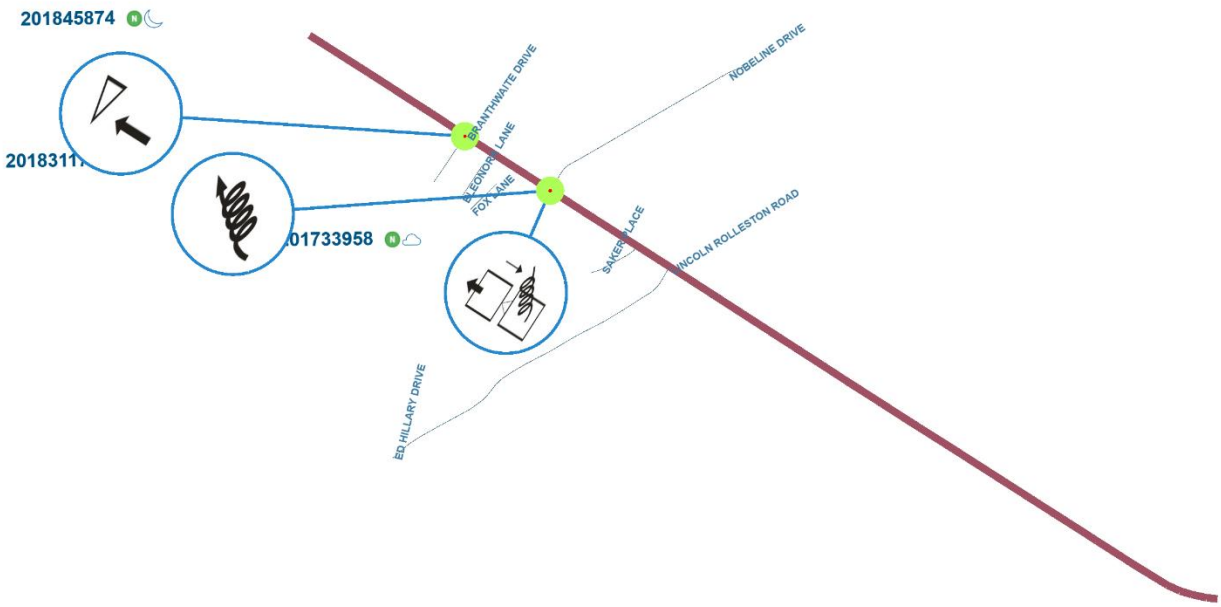
A1 Selwyn Road / Weedons Road



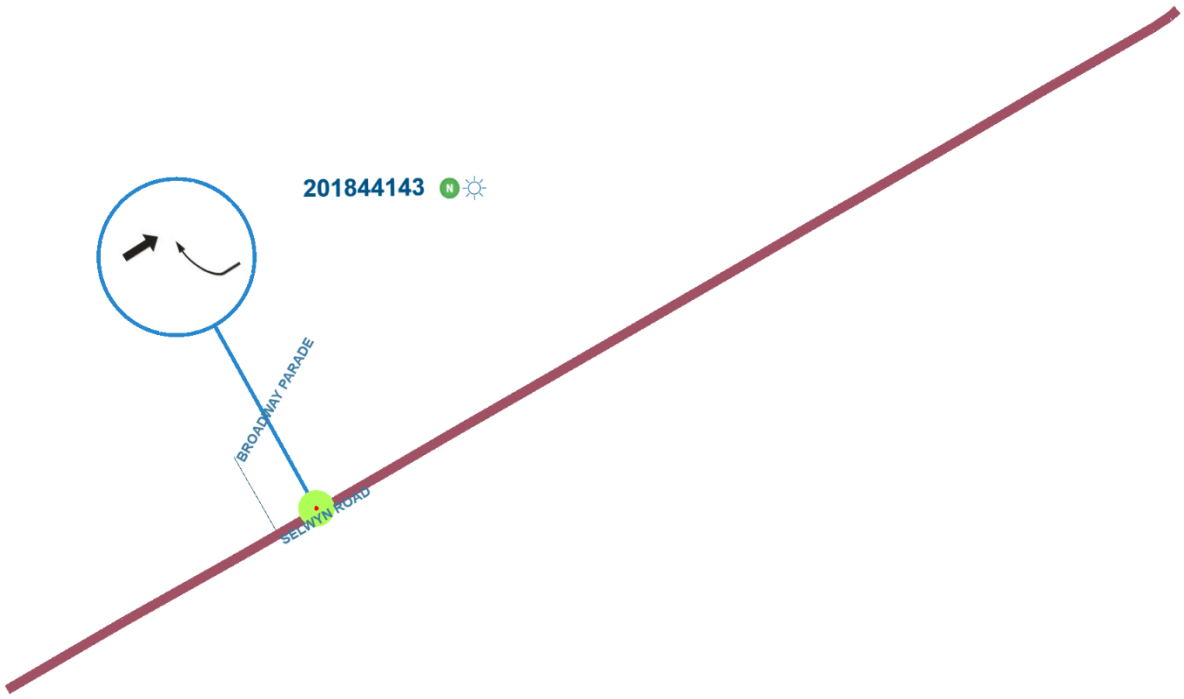
A2 Lincoln Rolleston Road / Selwyn Road



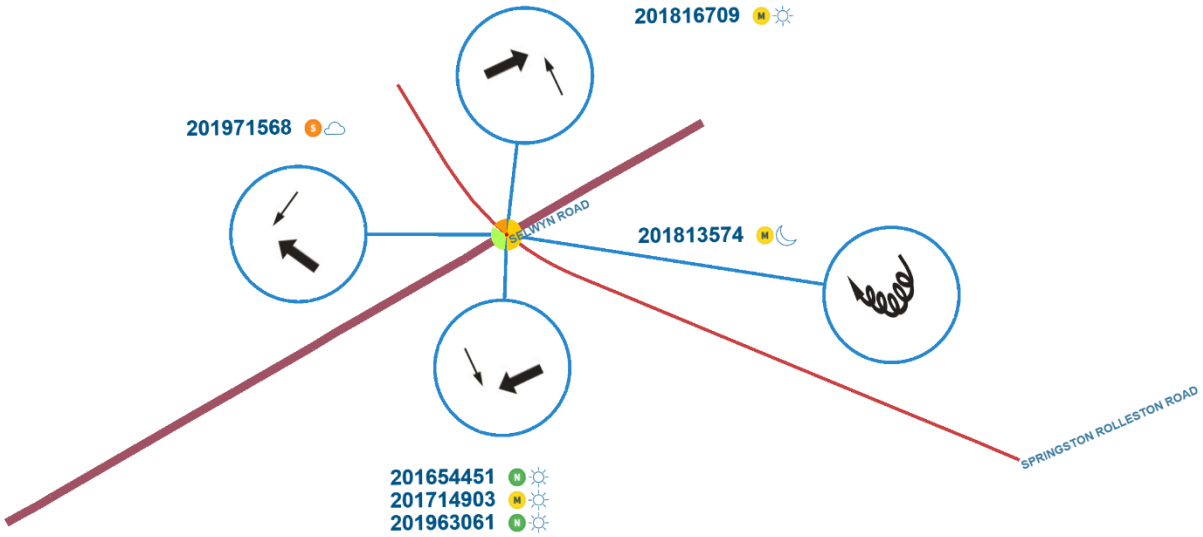
A3 Lincoln Rolleston Road



A4 Selwyn Road



A5 Springston Rolleston Road / Selwyn Road



Appendix B
Level of service calculations

B1 2028 Rolleston model

Selwyn Road / Weedons Road roundabout

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road East	Through	252	19	4	A	4	A	286	18	4	A	4	A	797	27	5	A	5	A	834	28	6	A	6	A
Selwyn Road East	Right	10	7	2	A			12	16	5	A			23	18	5	A			21	18	5	A		
Weedons Road South	Left	164	13	3	A	3	A	165	15	4	A	4	A	134	25	6	A	6	A	146	26	6	A	6	A
Weedons Road South	Through	76	12	3	A			87	13	3	A			56	20	5	A			52	24	6	A		
Selwyn Road West	Left	74	10	2	A	3	A	79	11	2	A	4	A	59	8	1	A	2	A	63	7	1	A	3	A
Selwyn Road West	Through	564	15	4	A			634	19	4	A			279	13	3	A			315	13	3	A		
Selwyn Road West	Right	99	14	4	A			113	16	4	A			126	11	2	A			145	18	3	A		
Weedons Road North	Left	9	9	3	A	6	A	10	9	4	A	7	A	8	7	3	A	5	A	11	7	3	A	5	A
Weedons Road North	Through	54	13	5	A			55	13	4	A			69	9	4	A			79	13	4	A		
Weedons Road North	Right	43	33	9	A			76	30	9	A			96	22	6	A			121	24	7	A		
Intersection total		**1345**		**4**	**A**	**4**	**A**	**1515**		**4**	**A**	**4**	**A**	**1645**		**4**	**A**	**4**	**A**	**1785**		**5**	**A**	**5**	**A**

Lincoln Rolleston Road / Selwyn Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road east	Left	195	6	1	A	1	A	229	7	1	A	1	A	472	8	1	A	2	A	490	9	1	A	2	A
Selwyn Road east	Through	261	6	1	A			298	7	1	A			552	8	2	A			612	9	2	A		
Selwyn Road south	Left	11	19	6	A	7	A	13	32	7	A	8	A	17	45	10	A	14	B	14	94	18	C	19	C
Selwyn Road south	Right	295	38	7	A			332	46	8	A			179	98	14	B			196	159	19	C		
Lincoln Rolleston Road	Through	448	7	1	A	2	A	496	6	1	A	2	A	288	5	1	A	3	A	328	6	1	A	2	A
Lincoln Rolleston Road	Right	14	43	13	B			17	42	13	B			8	177	61	F			6	225	80	F		
Intersection total		**1224**		**13**	**B**	**7**	**A**	**1384**		**13**	**B**	**8**	**A**	**1515**		**61**	**F**	**14**	**B**	**1645**		**80**	**F**	**19**	**C**

Lincoln Rolleston Road / CRETS Collector Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Lincoln Rolleston Road south	Left	53	9	3	A	4	A	86	8	2	A	3	A	117	8	3	A	4	A	138	9	3	A	4	A
Lincoln Rolleston Road south	Through	233	14	4	A			272	12	4	A			435	14	4	A			482	16	5	A		
Lincoln Rolleston Road south	Right	3	8	3	A			1	0	0	A			4	6	2	A			5	9	3	A		
CRETS Collector west	Left	34	15	3	A	6	A	42	16	3	A	7	A	27	18	5	A	7	A	34	21	5	A	7	A
CRETS Collector west	Through	1	1	0	A			6	25	8	A			3	8	3	A			5	27	11	B		
CRETS Collector west	Right	75	37	8	A			103	42	9	A			85	45	8	A			89	35	8	A		
Lincoln Rolleston Road north	Left	7	1	1	A	3	A	14	3	1	A	4	A	20	28	3	A	6	A	19	35	4	A	6	A
Lincoln Rolleston Road north	Through	380	19	3	A			418	23	4	A			236	43	6	A			268	41	5	A		
Lincoln Rolleston Road north	Right	15	17	4	A			20	21	6	A			33	39	9	A			44	44	11	B		
CRETS Collector east	Left	2	4	2	A	6	A	2	4	2	A	8	A	2	8	3	A	7	A	1	1	1	A	12	B
CRETS Collector east	Through	4	13	6	A			7	33	14	B			4	21	8	A			6	41	18	C		
CRETS Collector east	Right	16	24	7	A			17	20	6	A			11	24	7	A			12	31	11	B		
Intersection total		**822**		**8**	**A**	**6**	**A**	**985**		**14**	**B**	**8**	**A**	**977**		**9**	**A**	**7**	**A**	**1101**		**18**	**C**	**12**	**B**

Springston Rolleston Rd / Selwyn Rd priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Springston Rolleston Road north	Left	60	5	2	A	2	A	75	5	2	A	2	A	48	6	2	A	3	A	58	6	2	A	3	A
Springston Rolleston Road north	Through	190	9	1	A			216	12	1	A			180	7	1	A			210	7	1	A		
Springston Rolleston Road north	Right	28	14	5	A			30	24	6	A			53	35	9	A			68	41	11	B		
Selwyn Road east	Left	17	12	3	A	8	A	19	29	6	A	11	B	10	112	36	E	46	E	11	103	35	D	53	F
Selwyn Road east	Through	135	35	8	A			149	47	11	B			307	145	48	E			316	167	54	F		
Selwyn Road east	Right	49	30	11	B			73	48	13	B			53	128	39	E			48	154	50	F		
Springston Rolleston Road south	Left	34	5	1	A	5	A	40	6	1	A	5	A	156	8	1	A	4	A	161	7	1	A	4	A
Springston Rolleston Road south	Through	118	13	6	A			142	10	6	A			244	9	6	A			254	12	6	A		
Springston Rolleston Road south	Right	9	12	5	A			11	11	4	A			18	18	5	A			26	15	5	A		
Selwyn Road west	Left	23	56	12	B	14	B	32	40	12	B	13	B	28	49	12	B	14	B	31	58	13	B	19	C
Selwyn Road west	Through	191	70	15	B			199	56	14	B			109	71	14	B			107	99	20	C		
Selwyn Road west	Right	91	63	13	B			100	52	12	B			55	68	15	B			58	95	22	C		
Intersection total		**945**		**15**	**B**	**14**	**B**	**1084**		**14**	**B**	**13**	**B**	**1261**		**48**	**E**	**46**	**E**	**1348**		**54**	**F**	**53**	**F**

Selwyn Road / Weedons Road roundabout

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road East	Through	276	20	4	A	4	A	307	16	4	A	4	A	859	40	7	A	7	A	895	41	8	A	8	A
Selwyn Road East	Right	7	12	3	A			13	8	3	A			20	30	8	A			21	20	7	A		
Weedons Road South	Left	179	12	3	A	3	A	186	15	4	A	3	A	145	33	7	A	7	A	160	41	7	A	7	A
Weedons Road South	Through	69	10	3	A			78	11	3	A			55	29	7	A			51	27	6	A		
Selwyn Road West	Left	111	12	2	A	3	A	137	9	2	A	4	A	106	9	2	A	3	A	102	8	2	A	3	A
Selwyn Road West	Through	594	16	4	A			659	17	4	A			299	11	3	A			342	13	3	A		
Selwyn Road West	Right	114	14	4	A			131	14	4	A			134	12	3	A			163	11	3	A		
Weedons Road North	Left	7	7	3	A	7	A	10	10	4	A	7	A	11	8	3	A	7	A	12	6	2	A	6	A
Weedons Road North	Through	51	12	4	A			54	16	4	A			69	10	3	A			77	11	3	A		
Weedons Road North	Right	73	35	9	A			106	39	9	A			209	32	8	A			246	30	7	A		
Intersection total		**1481**		**4**	**A**	**4**	**A**	**1680**		**4**	**A**	**4**	**A**	**1905**		**6**	**A**	**6**	**A**	**2067**		**6**	**A**	**6**	**A**

Lincoln Rolleston Road / Selwyn Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road east	Left	226	7	1	A	1	A	268	6	1	A	1	A	570	8	2	A	2	A	588	8	2	A	2	A
Selwyn Road east	Through	300	6	1	A			330	7	1	A			636	7	2	A			715	7	2	A		
Selwyn Road south	Left	5	13	5	A	6	A	5	27	8	A	9	A	2	15	7	A	17	C	4	28	10	B	14	B
Selwyn Road south	Right	326	44	7	A			377	58	10	A			216	129	17	C			231	128	14	B		
Lincoln Rolleston Road	Through	499	6	1	A	1	A	551	5	1	A	1	A	330	5	1	A	1	A	375	5	1	A	1	A
Lincoln Rolleston Road	Right	4	25	11	B			3	52	19	C			2	45	24	C			1	219	109	F		
Intersection total		**1360**		**11**	**B**	**6**	**A**	**1533**		**19**	**C**	**9**	**A**	**1755**		**24**	**C**	**17**	**C**	**1913**		**109**	**F**	**14**	**B**

Lincoln Rolleston Road / CRETS Collector Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Lincoln Rolleston Road south	Left	56	11	3	A	5	A	79	10	3	A	5	A	108	11	3	A	4	A	135	13	4	A	5	A
Lincoln Rolleston Road south	Through	372	13	5	A			398	12	5	A			540	17	5	A			590	17	5	A		
Lincoln Rolleston Road south	Right	3	7	3	A			2	3	1	A			5	10	5	A			4	12	6	A		
CRETS Collector west	Left	70	22	5	A	8	A	77	20	5	A	9	A	58	25	6	A	8	A	64	26	6	A	9	A
CRETS Collector west	Through	2	9	3	A			6	21	8	A			5	30	13	B			4	19	6	A		
CRETS Collector west	Right	83	48	11	B			96	61	13	B			74	46	10	B			89	46	11	B		
Lincoln Rolleston Road north	Left	8	5	1	A	4	A	11	6	1	A	4	A	17	22	3	A	8	A	21	40	5	A	10	B
Lincoln Rolleston Road north	Through	420	31	4	A			469	26	4	A			333	67	8	A			382	80	10	B		
Lincoln Rolleston Road north	Right	20	26	5	A			24	27	7	A			40	62	12	B			41	72	16	C		
CRETS Collector east	Left	3	12	6	A	10	B	2	1	1	A	12	B	2	2	1	A	11	B	3	2	1	A	15	B
CRETS Collector east	Through	5	36	13	B			9	46	14	B			3	21	10	B			5	43	20	C		
CRETS Collector east	Right	16	31	10	B			15	33	12	B			15	40	13	B			14	42	16	C		
Intersection total		**1056**		**13**	**B**	**10**	**B**	**1187**		**14**	**B**	**12**	**B**	**1198**		**13**	**B**	**11**	**B**	**1350**		**20**	**C**	**15**	**B**

Springston Rolleston Rd / Selwyn Rd priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Springston Rolleston Road north	Left	57	1	0	A	1	A	81	3	1	A	1	A	52	5	0	A	3	A	69	8	1	A	4	A
Springston Rolleston Road north	Through	208	11	1	A			230	11	1	A			195	14	1	A			240	12	1	A		
Springston Rolleston Road north	Right	29	11	3	A			36	16	4	A			71	44	10	A			116	45	11	B		
Selwyn Road east	Left	31	26	6	A	8	A	33	25	6	A	10	B	22	179	43	E	56	F	18	218	59	F	78	F
Selwyn Road east	Through	169	44	9	A			187	59	11	B			293	203	58	F			274	269	81	F		
Selwyn Road east	Right	43	33	8	A			64	41	10	B			32	171	51	F			19	211	67	F		
Springston Rolleston Road south	Left	37	2	0	A	1	A	39	2	1	A	1	A	160	3	1	A	1	A	167	3	1	A	1	A
Springston Rolleston Road south	Through	120	2	1	A			149	6	1	A			245	6	1	A			261	4	1	A		
Springston Rolleston Road south	Right	16	18	4	A			21	15	4	A			43	17	4	A			46	22	4	A		
Selwyn Road west	Left	28	33	6	A	12	B	27	54	12	B	18	C	30	80	12	B	20	C	23	142	30	D	44	E
Selwyn Road west	Through	195	58	13	B			214	94	19	C			119	134	21	C			114	237	44	E		
Selwyn Road west	Right	86	51	12	B			102	82	18	C			55	120	23	C			43	220	50	F		
Intersection total		**1018**		**13**	**B**	**12**	**B**	**1182**		**19**	**C**	**18**	**C**	**1316**		**58**	**F**	**56**	**F**	**1389**		**81**	**F**	**78**	**F**

B2 Sensitivity testing

Selwyn Road / Weedons Road roundabout

		07:00 to 08:00							08:00 to 09:00							16:00 to 17:00							17:00 to 18:00					
Approach	Movement	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road East	Through	228	12	3	A	3	A		259	14	3	A	3	A		727	22	5	A	5	A		747	23	4	A	4	A
Selwyn Road East	Right	5	6	2	A				6	4	2	A				9	6	3	A				9	10	4	A		
Weedons Road South	Left	143	14	3	A	3	A		155	15	3	A	3	A		110	19	5	A	5	A		124	25	6	A	5	A
Weedons Road South	Through	77	10	3	A				81	13	3	A				58	16	4	A				54	19	5	A		
Selwyn Road West	Left	5	3	1	A	3	A		15	6	2	A	3	A		4	4	2	A	3	A		3	1	1	A	2	A
Selwyn Road West	Through	523	15	3	A				594	15	3	A				248	14	3	A				285	12	3	A		
Selwyn Road West	Right	88	14	3	A				102	14	3	A				109	10	3	A				131	12	3	A		
Weedons Road North	Left	1	0	0	A	3	A		1	1	0	A	3	A		3	4	2	A	3	A		5	4	2	A	4	A
Weedons Road North	Through	46	13	4	A				54	13	4	A				68	11	3	A				78	11	4	A		
Weedons Road North	Right	4	8	3	A				4	8	4	A				14	10	4	A				18	10	4	A		
Intersection total		**1119**		**3**	**A**	**3**	**A**		**1272**		**3**	**A**	**3**	**A**		**1350**		**4**	**A**	**4**	**A**		**1453**		**4**	**A**	**4**	**A**

Lincoln Rolleston Road / Selwyn Road priority intersection

		07:00 to 08:00							08:00 to 09:00							16:00 to 17:00							17:00 to 18:00					
Approach	Movement	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road east	Left	150	5	0	A	1	A		164	6	0	A	1	A		391	7	1	A	1	A		405	7	1	A	1	A
Selwyn Road east	Through	223	5	1	A				252	6	1	A				457	8	1	A				482	7	2	A		
Selwyn Road south	Left	3	1	0	A	3	A		2	3	1	A	3	A		2	1	1	A	4	A		1	0	0	A	4	A
Selwyn Road south	Right	218	17	3	A				260	21	3	A				129	30	5	A				140	21	4	A		
Lincoln Rolleston Road	Through	402	2	0	A	0	A		454	3	1	A	1	A		234	4	1	A	1	A		277	3	1	A	1	A
Lincoln Rolleston Road	Right	0	0	0	A				0	0	0	A				1	0	0	A				1	0	0	A		
Intersection total		**995**		**3**	**A**	**3**	**A**		**1133**		**3**	**A**	**3**	**A**		**1213**		**5**	**A**	**4**	**A**		**1306**		**4**	**A**	**4**	**A**

Lincoln Rolleston Road / CRETS Collector Road priority intersection

		07:00 to 08:00							08:00 to 09:00							16:00 to 17:00							17:00 to 18:00					
Approach	Movement	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Lincoln Rolleston Road south	Left	40	5	2	A	3	A		42	6	2	A	2	A		80	7	3	A	4	A		88	5	2	A	4	A
Lincoln Rolleston Road south	Through	184	10	3	A				212	10	3	A				368	11	4	A				398	11	4	A		
Lincoln Rolleston Road south	Right	0	0	0	A				0	0	0	A				0	0	0	A				0	0	0	A		
CRETS Collector west	Left	3	7	3	A	5	A		11	8	2	A	6	A		5	8	4	A	5	A		5	6	2	A	6	A
CRETS Collector west	Through	0	0	0	A				0	0	0	A				0	0	0	A				0	0	0	A		
CRETS Collector west	Right	66	28	5	A				69	28	6	A				55	22	5	A				62	23	6	A		
Lincoln Rolleston Road north	Left	0	0	0	A	3	A		0	0	0	A	3	A		0	0	0	A	3	A		0	0	0	A	3	A
Lincoln Rolleston Road north	Through	339	8	3	A				384	12	3	A				182	8	3	A				214	7	3	A		
Lincoln Rolleston Road north	Right	0	0	0	A				3	7	3	A				0	0	0	A				1	0	0	A		
CRETS Collector east	Left	0	0	0	A	0	A		0	0	0	A	0	A		0	0	0	A	0	A		0	0	0	A	0	A
CRETS Collector east	Through	0	0	0	A				0	0	0	A				0	0	0	A				0	0	0	A		
CRETS Collector east	Right	1	1	0	A				1	0	0	A				1	0	0	A				0	0	0	A		
Intersection total		**633**		**5**	**A**	**5**	**A**		**721**		**6**	**A**	**6**	**A**		**690**		**5**	**A**	**5**	**A**		**768**		**6**	**A**	**6**	**A**

Springston Rolleston Rd / Selwyn Rd priority intersection

		07:00 to 08:00							08:00 to 09:00							16:00 to 17:00							17:00 to 18:00					
Approach	Movement	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Springston Rolleston Road north	Left	34	5	2	A	1	A		53	7	2	A	2	A		39	5	1	A	2	A		44	5	2	A	2	A
Springston Rolleston Road north	Through	176	9	1	A				205	6	1	A				169	8	1	A				191	6	1	A		
Springston Rolleston Road north	Right	16	11	3	A				18	15	5	A				33	32	8	A				38	31	8	A		
Selwyn Road east	Left	4	6	2	A	7	A		6	8	2	A	7	A		5	22	6	A	19	C		5	33	13	B	19	C
Selwyn Road east	Through	94	27	7	A				108	28	7	A				256	86	19	C				282	78	19	C		
Selwyn Road east	Right	38	26	9	A				45	24	10	A				54	70	20	C				54	61	20	C		
Springston Rolleston Road south	Left	24	4	1	A	5	A		31	4	1	A	5	A		141	6	2	A	4	A		146	5	1	A	4	A
Springston Rolleston Road south	Through	113	11	6	A				139	11	6	A				226	11	6	A				241	11	6	A		
Springston Rolleston Road south	Right	4	5	2	A				4	6	3	A				9	9	2	A				9	8	3	A		
Selwyn Road west	Left	15	17	7	A	7	A		15	21	8	A	9	A		23	22	8	A	8	A		24	24	9	A	10	B
Selwyn Road west	Through	134	30	7	A				147	40	10	A				67	45	8	A				70	49	11	B		
Selwyn Road west	Right	76	27	7	A				88	37	7	A				42	38	7	A				52	41	11	B		
Intersection total		**726**		**9**	**A**	**7**	**A**		**858**		**10**	**A**	**9**	**A**		**1064**		**20**	**C**	**19**	**C**		**1154**		**20**	**C**	**19**	**C**

Selwyn Road / Weedons Road roundabout

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road East	Through	250	15	3	A	3	A	282	15	3	A	3	A	775	30	6	A	6	A	812	31	6	A	6	A
Selwyn Road East	Right	3	3	1	A			7	10	3	A			9	20	6	A			9	20	6	A		
Weedons Road South	Left	152	12	3	A	3	A	164	14	3	A	3	A	128	25	6	A	6	A	129	27	6	A	6	A
Weedons Road South	Through	79	11	3	A			79	16	4	A			56	32	6	A			58	22	6	A		
Selwyn Road West	Left	82	10	2	A	3	A	69	8	2	A	4	A	56	7	2	A	2	A	56	9	2	A	2	A
Selwyn Road West	Through	553	15	4	A			627	17	4	A			270	10	3	A			310	11	2	A		
Selwyn Road West	Right	97	14	4	A			115	14	4	A			124	11	2	A			143	13	3	A		
Weedons Road North	Left	2	1	1	A	5	A	2	1	0	A	5	A	3	5	2	A	5	A	4	3	1	A	5	A
Weedons Road North	Through	48	13	4	A			52	11	4	A			66	10	3	A			76	13	3	A		
Weedons Road North	Right	32	22	7	A			33	28	7	A			135	22	6	A			176	23	6	A		
Intersection total		1296		3	A	3	A	1429		4	A	4	A	1621		5	A	5	A	1772		5	A	5	A

Lincoln Rolleston Road / Selwyn Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Selwyn Road east	Left	181	6	1	A	1	A	200	6	1	A	1	A	500	9	1	A	2	A	530	8	1	A	2	A
Selwyn Road east	Through	249	5	1	A			280	6	1	A			533	8	2	A			587	7	2	A		
Selwyn Road south	Left	2	6	3	A	4	A	3	6	2	A	4	A	0	0	0	A	6	A	2	4	2	A	7	A
Selwyn Road south	Right	280	31	4	A			297	26	5	A			174	42	6	A			189	70	7	A		
Lincoln Rolleston Road	Through	460	4	1	A	1	A	510	4	1	A	1	A	280	3	1	A	1	A	319	3	1	A	1	A
Lincoln Rolleston Road	Right	0	0	0	A			0	0	0	A			1	0	0	A			0	0	0	A		
Intersection total		1173		4	A	4	A	1290		5	A	4	A	1487		6	A	6	A	1627		7	A	7	A

Lincoln Rolleston Road / CRETS Collector Road priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Lincoln Rolleston Road south	Left	45	8	2	A	4	A	48	8	3	A	5	A	81	9	3	A	4	A	98	9	2	A	4	A
Lincoln Rolleston Road south	Through	288	13	5	A			333	12	5	A			464	13	4	A			499	13	5	A		
Lincoln Rolleston Road south	Right	0	0	0	A			0	0	0	A			0	0	0	A			0	0	0	A		
CRETS Collector west	Left	30	15	3	A	7	A	48	16	3	A	7	A	28	20	5	A	7	A	32	18	4	A	7	A
CRETS Collector west	Through	0	0	0	A			0	0	0	A			0	0	0	A			0	0	0	A		
CRETS Collector west	Right	62	44	9	A			66	44	10	A			50	30	8	A			60	26	8	A		
Lincoln Rolleston Road north	Left	0	0	0	A	3	A	0	0	0	A	3	A	0	0	0	A	4	A	0	0	0	A	4	A
Lincoln Rolleston Road north	Through	386	14	3	A			447	17	4	A			294	33	4	A			330	24	4	A		
Lincoln Rolleston Road north	Right	6	15	4	A			8	14	3	A			11	31	7	A			11	18	6	A		
CRETS Collector east	Left	0	0	0	A	0	A	1	0	0	A	0	A	0	0	0	A	0	A	0	0	0	A	0	A
CRETS Collector east	Through	0	0	0	A			0	0	0	A			0	0	0	A			0	0	0	A		
CRETS Collector east	Right	0	0	0	A			0	0	0	A			0	0	0	A			0	0	0	A		
Intersection total		**817**		**9**	**A**	**7**	**A**	**951**		**10**	**A**	**7**	**A**	**929**		**8**	**A**	**7**	**A**	**1030**		**8**	**A**	**7**	**A**

Springston Rolleston Rd / Selwyn Rd priority intersection

Approach	Movement	07:00 to 08:00						08:00 to 09:00						16:00 to 17:00						17:00 to 18:00					
		Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS	Flow	Max Delay	Avg Delay	LOS	Approach delay	Approach LOS
Springston Rolleston Road north	Left	36	1	0	A	1	A	42	1	0	A	1	A	39	3	1	A	2	A	41	2	0	A	2	A
Springston Rolleston Road north	Through	186	7	1	A			216	12	1	A			180	5	1	A			207	8	1	A		
Springston Rolleston Road north	Right	15	10	3	A			23	17	3	A			38	32	7	A			48	33	7	A		
Selwyn Road east	Left	21	21	5	A	6	A	24	20	5	A	7	A	17	63	15	B	21	C	17	87	22	C	29	D
Selwyn Road east	Through	121	28	6	A			136	41	7	A			277	106	22	C			301	116	30	D		
Selwyn Road east	Right	32	23	5	A			50	31	8	A			28	60	21	C			27	88	20	C		
Springston Rolleston Road south	Left	27	2	1	A	1	A	32	2	0	A	1	A	140	5	1	A	1	A	149	5	1	A	1	A
Springston Rolleston Road south	Through	118	2	1	A			142	3	1	A			242	3	1	A			240	3	1	A		
Springston Rolleston Road south	Right	13	14	4	A			14	11	3	A			27	17	4	A			30	17	4	A		
Selwyn Road west	Left	15	15	4	A	8	A	22	21	5	A	9	A	23	21	5	A	10	A	25	17	4	A	10	A
Selwyn Road west	Through	152	48	9	A			165	43	10	A			82	51	11	B			92	53	10	B		
Selwyn Road west	Right	75	37	8	A			85	38	9	A			41	43	10	B			47	52	12	B		
Intersection total		**810**		**9**	**A**	**8**	**A**	**951**		**10**	**A**	**9**	**A**	**1133**		**22**	**C**	**21**	**C**	**1223**		**30**	**D**	**29**	**D**

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