



SUMMERSET RANGIORA PLAN CHANGE INTEGRATED TRANSPORT ASSESSMENT

PREPARED FOR SUMMERSET VILLAGES (RANGIORA) LIMITED

October 2019

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Executive Summary

Summerset Villages (Rangiora) Limited is requesting a private plan change to amend parts of the Waimakariri District Plan (WDP). The requested plan change relates to a 13.83ha site, located in south west Rangiora at 104 Townsend Road and 141 South Belt. It is proposed to change the zoning of the land from Residential 4B to Residential 2 zone which would enable typical residential sections and dwellings to be constructed on the site. It is also proposed to incorporate within the zone some specific rules that would provide for the construction of a retirement village.

Site Location and Transport Environment

The site is currently an undeveloped greenfield site, with road frontage to both South Belt and Townsend Road. South Belt is defined in the District Plan as an Urban Collector Road and provides an east west link servicing the southwest part of the township, connecting with the primary route into and through Rangiora being Southbrook Road. It is formed mostly to an urban standard, although the southern side next to the site is not yet to a full urban standard. It carries a traffic volume of approximately 2,200 vehicles per day (vpd), which is at a lower volume range for a collector road and represents its primary function as a local area collector route.

Townsend Road is currently defined as a local road and has recently been developed north of South Belt to provide a connector route on the western side of Rangiora. That route, through Townsend Road, connects with Fernside Road and Flaxton Road as an alternate route to the south. Intersection traffic counts indicate a recent increase in traffic on Townsend Road as a result of the link, indicatively carrying approximately 4,000vpd (up from traffic estimate of approximately 2,700vpd before the extension).

The local area also includes a range of north-south residential roads that provide options to connect to the Rangiora town centre. It is noted Southbrook Road carries significantly higher arterial volumes and function, and there is a set of traffic signals that manage traffic flows at the Southbrook Road / South Belt intersection.

A review of road safety records shows that there have been no reported crashes along the site frontage on South Belt. Some crashes have occurred at the intersections with South Brook Road and Townsend Road. The Townsend Road intersection crashes were prior to the change in form, and the Southbrook Road intersection crashes reflect the high volumes of traffic movements.

It is considered the site is well located with respect to access to a range of road links for access to the wider transport network. There are no inherent safety concerns in the immediate vicinity of the site.

In addition to good connections to the wider road network, there is a nearby core route bus service that is only 200m from the site, providing access to both the Rangiora town centre, and Christchurch. The existing road and pedestrian network also provide good connectivity for pedestrians and cyclists.

Proposed Plan Change Site

The Plan Change will facilitate development of additional housing, estimated to be up to 150 households. This is compared with the existing provisions that would facilitate approximately 13 households. In addition, the Plan Change assessment has considered a scenario of a retirement village establishing on part of the site. From a transport perspective the key elements include the positioning of vehicle access for new roads, and allowance for pedestrian movement. Other matters would be addressed through later development phases.

Having considered the expected traffic environment, existing rules and potential traffic engineering outcomes the new intersection positions on South Belt to service the site have been recommended. They will largely fix the locations and consist of new road connection between Townsend Road and Pentecost Road, and between Rowse Street and Martyn Street. It is considered these locations will enable safe and efficient access to be provided to South Belt.

Pedestrian connections to the wider network can be readily achieved. Although it will be addressed at the time of future development, upgrades of the site frontage on South Belt and Townsend Road will be readily achievable to extend the available network.

Transport Network Performance with Plan Change

The Plan Change site will generate between approximately 1,200vpd and 1,400vpd, with up to 135 vehicles per hour (vph) forecast. This is an increase compared to existing zoning which would generate approximately 110vpd. By way of context, the traffic volume generated represents a volume typical of a

local road connection. The option with a retirement village results in slightly higher daily traffic volumes, but less peak hour traffic.

This traffic volume will be split across the two access points and split across the various routes to destinations in all directions. In that respect, the change in traffic at any one point on the transport network will be low, and less than 55vph two way on surrounding roads. Such volume increases can readily be accommodated by the existing road formation.

Alternative routes are available in the local road network. Intersection analysis has been carried out at the South Belt intersections that connect with each of those roads. It is noted as above, the contribution of the Plan Change to changes in traffic volume is small.

The intersection analysis has confirmed that South Belt / Townsend Road will operate with excellent level of service with low delays.

The South Belt / Southbrook Road intersection is forecast to operate with lower levels of service, LOS E, in the longer term (2028). That makes it more sensitive to changes in traffic volume. However as indicated by the analysis, only small changes in traffic are forecast to use the intersection as a result of the plan change. Overall level of service is retained at LOS E with or without the Plan Change. It is understood Council is investigating both the western corridor, and the Southbrook Road corridor to determine how future capacity can be achieved.

Overall, it is considered that even though the South Belt / Southbrook Road intersection is under pressure in the future, the contribution of the site to traffic at the intersection is negligible, and the site is sufficiently well located to allow flexibility in travel routes such that additional traffic can readily be accommodated on the transport network.

Conclusion

The site is well located with the transport network for good connectivity by a range of travel modes, including pedestrian, cycle, bus, and private vehicles. With the key site access provisions identified, the remainder of the internal transport related site layout matters can be addressed through subdivision and, if necessary, resource consent processes. The traffic generated is relatively low in the context of the wider transport network. Assessment has shown that the adjacent road network will operate efficiently, and the wider area South Belt / Southbrook intersection will retain the same level of service.

It is on this basis that the proposed plan change activity may be supported from a transport perspective.

Summerset Villages (Rangiora) Limited

INTEGRATED TRANSPORT ASSESSMENT

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Appendix A Proposed Site Outline Development Plan

1. Introduction

This request by Summerset Villages (Rangiora) Limited is for a private plan change to amend parts of the Waimakariri District Plan (WDP) pursuant to Section 73(2) and Clauses 21(1) and 22 of the First Schedule to the Resource Management Act 1991 (RMA).

The requested plan change relates to a 13.83ha site, located in south west Rangiora at 104 Townsend Road and 141 South Belt, as shown on Figure 1-1 and Figure 1-2 below.

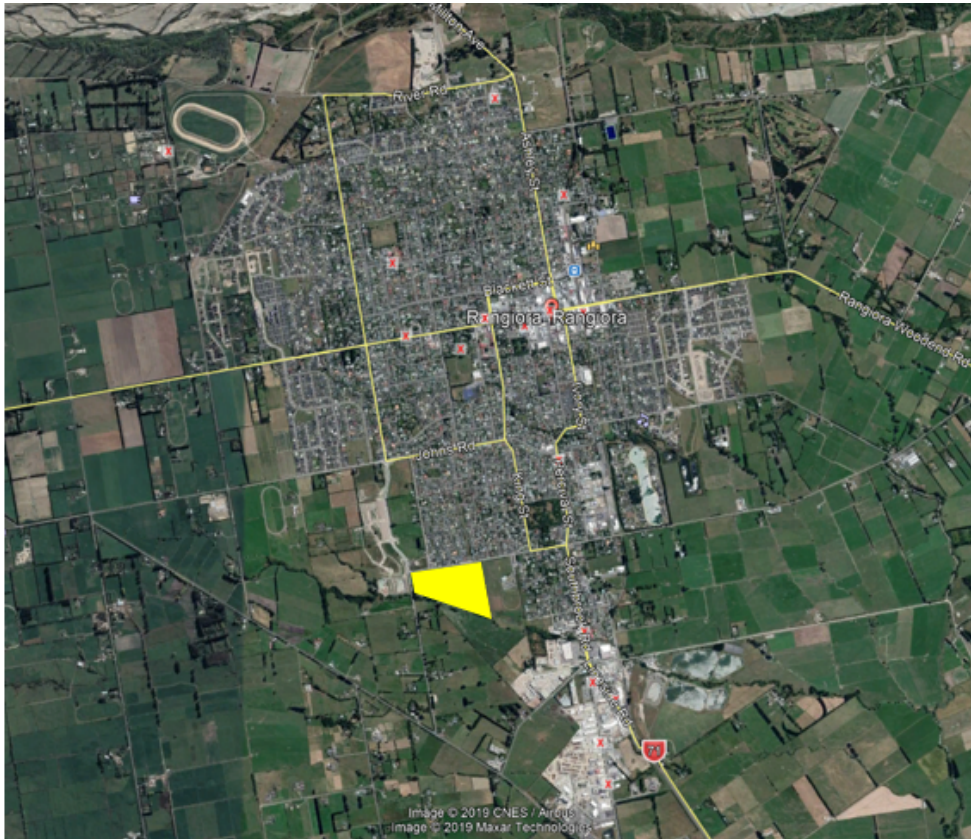


Figure 1-1: Plan Change Site Location

The site is currently used for rural and residential activities. It is located within the identified infrastructure capacity area defined by the Council.

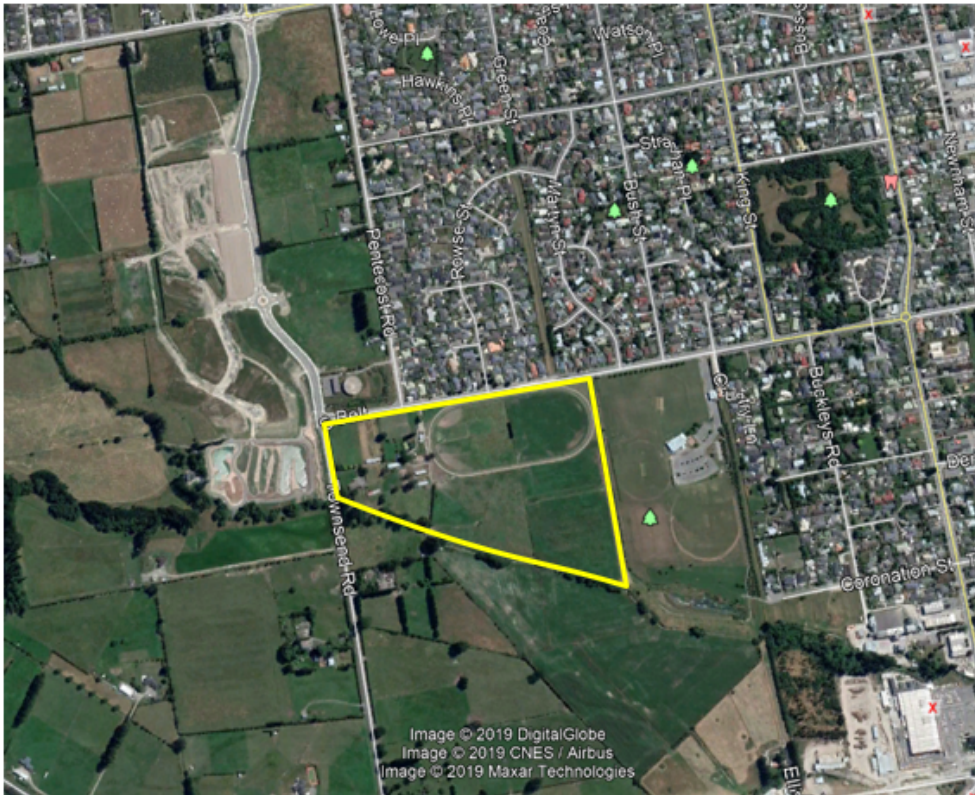


Figure 1-2: Plan Change Site Location

It is proposed to change the zoning of the land to Residential 2 zone which would enable typical residential sections and dwellings to be constructed on the site. It is also proposed to incorporate within the zone some specific rules to provide for the construction of a retirement village. This would result in allowing a retirement village to be constructed on all or part of the site, with all or part of the site to be developed for typical residential dwellings (in accordance with the Residential 2 zone rules).

The site is currently zoned Residential 4B, this would enable the site to be developed into lifestyle blocks with approximately 13 sections (and dwellings). The proposed new provisions for the Residential 2 zone will allow for up to 150 sections (and dwellings).

It is proposed to primarily adopt the Residential 2 zone rules as they are currently in the operative WDP, although consideration has been given to the likely direction for this zone in the future District Plan Review process. The specific changes to the WDP are to:

- Insert an Outline Development Plan (ODP) showing key elements that are required for any future development of the land.
- Modify the Residential 2 zone rules to require compliance with the ODP.
- Include a definition of 'retirement village' in the WDP.
- Modify the Residential 2 zone rules as they apply to this site, to include bulk and location provisions for a retirement village and enable consideration of the design and appearance of a village.
- Modify the planning maps to show the area of rezoning.

This report provides an assessment of transportation matters associated with the Plan Change, including integration of the site with the adjacent transport network, and the future performance of the surrounding road network with the Plan Change.

2. Site Description

2.1 Application Site

Located in the south western area of Rangiora township (see Figure 2-1), the northern boundary of the site adjoins South Belt and Townsend Road adjoins the western boundary. East of the site is Southbrook Park, and the southern boundary adjoins South Brook Stream (which flows west to east).



Figure 2-1: Plan Change Site and Surroundings

As shown in Figure 2-1, currently the site is dominated by grassed paddocks. The site is generally flat, sloping gently from north down to the south. Established trees and vegetation are situated along the stream and some scattered trees are within the site itself.

There are two dwellings and numerous farm buildings located towards the north western corner of the site and a horse training track adjacent to South Belt. There are a variety of established trees and gardens around the buildings. An existing hedge is located along parts of the road boundary.

Vehicle access to the site is proposed via two access points, one will be located toward the eastern end of the site off South Belt, and one will be located toward the western end of the site off South Belt. The site access points will be discussed in more detail in Section 6 of this report.

The application site was previously part of a 23ha title that extended from South Belt, across South Brook stream and south towards Ellis Road. An application to subdivide the property has been lodged with Waimakariri District Council to split the land at South Brook stream creating the application site of some 13.83ha in area.

The current Residential 4B zone is a low-density residential zone allowing sites of at least 5,000m² and an average of 1ha across the site. Despite being zoned for residential activity, the site has not yet been utilised for that purpose and has a rural character typical of sites on the edge of the township.

2.2 Previous Private Plan Change

A Private Plan Change (Plan Change 27) was previously lodged to rezone the site to yield approximately 150 dwellings. It was put on hold after the Land Use Recovery Plan (LURP) was issued, and although submissions were received Plan Change 27 has not progressed further. A Transport Assessment supporting that Plan Change Application anticipated the rezoned site would generate approximately 1,200vpd. The road network proposed included two new road connections to South Belt, one opposite Pentecost Road, and the other 50m east of Rowse Street.

The traffic effects assessment for that Plan Change allowed for future residential development northwest of the site (which is now progressing), and traffic signals at South Belt / South Brook (which have now been installed). Key conclusions of that assessment included:

- The road network will operate efficiently even with full development of the Plan Change area;

- No adverse effects on non-car modes of travel were anticipated;
- The current safety record is good, and future issues were not expected.

The submissions received on that Plan Change raised some concerns with traffic matters. Reporting on transport matters by WDC concentrated on the status of the internal layout and requested elements be 'firmed-up' to ensure general compliance with relevant ODP. Another matter raised by WDC focussed on ensuring pedestrian connectivity around the proposed stormwater management area.

2.3 Surrounding Land Use

The wider environment surrounding the site is mixed in character with a range of land uses as can be seen in Figure 2-1.

On the northern side of South Belt, opposite the site, much of the land contains typical suburban residential dwellings. Opposite the north western corner of the site is a large Council water reservoir and pumping station surrounded by an earth bund and plantings. The land to the north is zoned Residential 2, which allows allotments down to 600m².

To the north west of the site is the substantial greenfield residential subdivision known as Townsend Fields. This development has provided a new road link from the northern end of Townsend Road through to the corner of West Belt and Johns Road, where a new roundabout has been constructed. In addition, a new public primary school is being constructed in the northern most portion. That subdivision is serviced by a substantial stormwater management area directly west of the application site and feeding into South Brook stream.

The LURP changed the Townsend Fields land from rural to Residential 2 to accommodate growth for recovery purposes. The District Plan now includes an ODP and associated policies and rules to this effect. The ODP is known as the 'South West Rangiora Outline Development Plan' area.

East of the site is Southbrook Park which is approximately 11.23ha and contains a playground, toilets, sports club buildings, parking, and sports fields. The park is known as the home of Saracens Rugby Football Club and several other sports teams. An area of 2.1ha at the south of the park near South Brook stream is primarily managed for flood mitigation purposes (although designed to also be suitable for recreation use). There is also an area dedicated as a dog park accessed from Coronation Street. A Reserve Management Plan for the park was adopted by the Council in September 1999. The park is separated from the application site by a drain which is substantially planted and includes a public walking path.

Land to the south and south west is zoned Rural and is predominantly rural land use with lifestyle blocks and larger established land holdings, and large separation distances between the dwellings on each land holding. It is generally in grassed paddocks with scattered large houses, trees, and shelterbelts.

Southbrook commercial area is located approximately 1km south east of the site. The central commercial area of Rangiora is approximately 1.75km to the north east. In addition to Southbrook Park immediately adjacent to the site, the large reserve area of Matawai Park is also some 400m to the east of the site.

The speed limit on South Belt and most surrounding streets is 50km/hr. The speed zone changes to an 80km/hr zone at the bridge over South Brook on Townsend Road. South of the bridge is 80km/hr, and north of the bridge is 50km/hr.

South Belt carries traffic for the residential areas via the local roads of Pentecost Road, Rowse Street, Martyn Street, Bush Street, and Buckleys Road, and the Urban Collector of King Street. Adjacent to the site, South Belt is flat and straight and around 8.8m wide with a kerb along the northern side, and edge line marking along the south side. There is a variable width sealed shoulder ranging from 0.5m to 1.7m, and a berm of around 2.5-3m along the southern edge. Along the majority of the northern edge of South Belt there are existing residential vehicle crossings.

South Belt is accessed by a signalised intersection with Southbrook Road in the east and terminates at a priority T intersection with Townsend Road in the west. The road speed limit is 50kph. South Belt has no turning lanes at the side road intersections.

At the time of the site visit (22 July 2019), South Belt had recently been widened along its southern edge, from the Southbrook Park vehicular access through to the western perimeter of Southbrook Park. The widening provides a defined vehicle parking area to replace the on-street parking that served to obstruct vehicles travelling along South Belt.



Photograph 1: South Belt road widening looking east



Photograph 2: South Belt road widening looking west

3.2 Townsend Road

Townsend Road is a local road in the WDC District Plan. From the intersection with Fernside Road in the south to a point approximately 140m south of the South Belt intersection, the road has a 'rural feel' with a 6.8m carriageway and wide berms. It is flat and straight, and predominantly has an 80kph speed limit.



Photograph 3: Townsend Road view looking south

The speed limit changes to 50km/h at a slight road narrowing where a culvert channels South Brook under Townsend Road. The section of Townsend Road from the Give Way controlled South Belt intersection to the culvert in the distance is shown in the photograph below.



Photograph 4: South Belt - link road intersection looking south

As part of the recent greenfield residential development north of South Belt, Townsend Road has been developed to a suburban through route standard, with shared pedestrian / cycle paths on both sides of the road. The road provides convenient passage for vehicle north-south movements and replaces the previous need to turn into South Belt and then into Pentecost Road (or vice-versa). This road is expected to reduce the vehicle traffic demand on the western end of South Belt.



Photograph 5: New Townsend Road – Johns Road link

3.3 Public Transport

There is currently one public bus route to Rangiora. The Blue Metro bus service connects Rangiora to Princess Margaret Hospital / Cashmere via Christchurch City with a headway of approximately 30 minutes during the day. During the commuter peak hours buses run with a higher frequency on an express service. As shown in Figure 3-2, the bus does not directly pass the site as it turns from South Belt onto Bush Street. The nearest bus stops to the site are approximately 200m away on Bush Street (for northbound travel) and on South Belt east of Bush Street (for southbound travel).

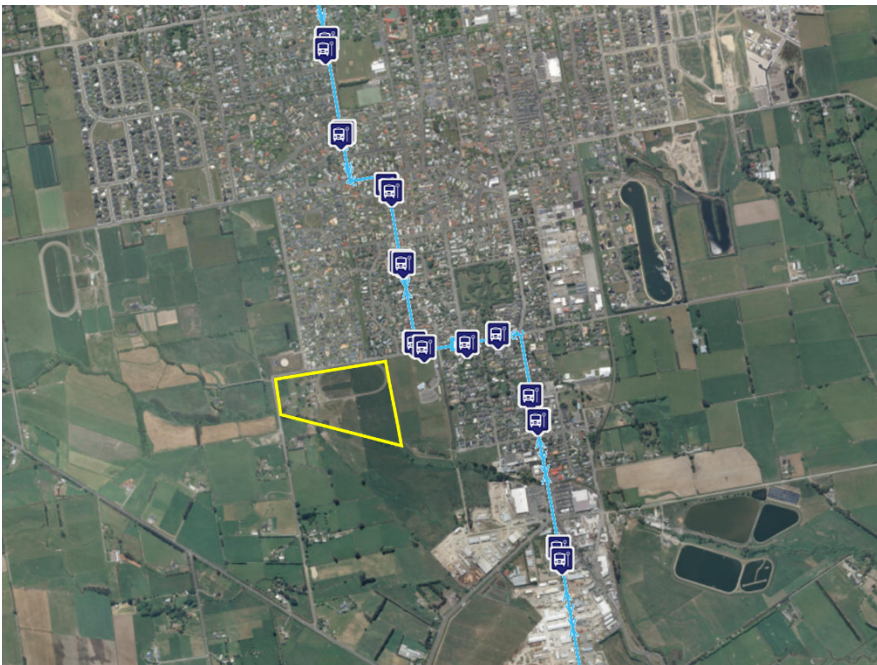


Figure 3-2: Metro Blue route with the subject site shown in yellow¹

3.4 Crash History

The NZTA Crash Analysis System (CAS) has been used to review crash records in Rangiora in the vicinity of the site for the full five-year period of 1st April 2014 to 1st April 2019. Figure 3-3 is an extract from CAS highlighting crash locations. Two non-injury crashes have been reported at the bend on Townsend Road

¹ Base image sourced <http://www.metroinfo.co.nz/map/>

where drivers have lost control. Sixteen crashes have been reported at, or near, the South Belt / Southbrook Road intersection: two resulting in serious injury, four resulting in minor injury, and ten crashes that were without injury. No crashes have been reported in the last five years along the site frontage.

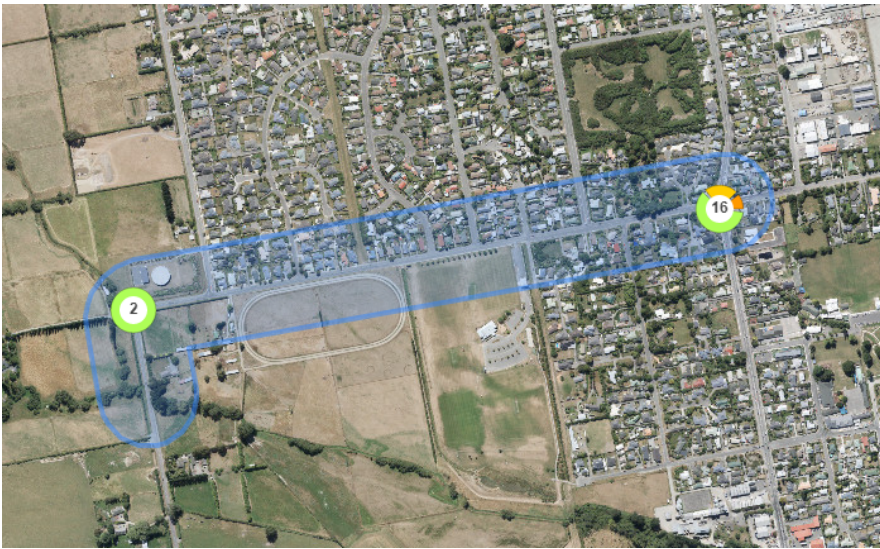


Figure 3-3: Crashes 1st April 2014 to 1st April 2019²

The two serious crashes have both occurred following the upgrade of the intersection from a roundabout to a signalised intersection and are both associated with drivers undertaking a right turn:

- Motorcyclist turning right from South Belt into Southbrook Road has given way to a Ute travelling straight through and then attempted to turn but was unaware of the 5m long trailer being towed by the Ute.
- Learner driver attempting a right turn failed to give way to an oncoming vehicle and then hit a pedestrian who was crossing the side road.

One of the four minor injury crashes also involved a vehicle turning right and hitting a pedestrian who was crossing on a green pedestrian light. The remaining three minor injury crashes involved: a right turning vehicle hitting a through vehicle, a u-turning vehicle pulling out in front of a vehicle, and a vehicle rear ending a vehicle in the right turn lane due to a possible distraction.

Based on the crash history there are no specific safety concerns along the site frontage, however, the filtering right turn movement at the intersection of South Belt and Southbrook Road does appear to have been a causative factor in crashes.

² NZTA CAS database, extracted 29th July 2019

4. Current Traffic Conditions

4.1 Daily Traffic Volumes

The estimated daily traffic flows along the principal roads in the vicinity of the proposed development are shown in the table below.

Table 4-1: Average Daily Traffic Flow Estimates

Road Name	Average Daily Traffic*	Road Hierarchy ³	Source
South Belt (east end)	4,190vpd	Urban Collector Road	Mobile Road
South Belt (west end)	2,170vpd	Urban Collector Road	Mobile Road
South Belt (100m east of Rowse Street)	2,200vpd	Urban Collector Road	Stantec Survey
Townsend Road (south of South Belt)	2,730vpd	Local Road**	Mobile Road
Pentecost Road	3,400vpd	Local Road	Mobile Road
King Street	5,600vpd	Urban Collector Road	Mobile Road

*Mobileroad.org sourced data indicates a 2017 dataset from WDC, prior to Townsend Road Extension

** The extension of Townsend Road may change the classification to an urban collector road in the future

These indicate that the key roads in the vicinity are carrying traffic volumes consistent with a collector road function. The traffic volumes at the west end of South Belt are lower than the east end. It is expected that there will be an increase in traffic volume at the intersection at the west end of South Belt as a result of the new Townsend Road extension, and further development of west Rangiora is completed.

As indicated in Table 4-1, an automatic traffic counter (ATC) was also laid across South Belt, approximately 100m east of Rowse Street, for seven days (week starting 22 July 2019). This provided an up to date record of traffic volumes throughout the day for a week, following the recent opening of the Townsend Road extension.

The table below shows the recorded average traffic volumes on South Belt over a five-day (working week) and seven-day period.

Table 4-2: ATC Summary for South Belt – Average Daily Traffic (vehicles per day)

Period	Eastbound	Westbound	Both Directions
Five Day (Mon-Fri)	1,040	1,180	2,220
Seven Day	970	1,130	2,100

These show a slight westbound bias overall, and traffic volume consistent with the Mobileroad.org data.

4.2 Hourly Traffic Patterns

The graph below summarises for the South Belt ATC count the hourly traffic profiles across the surveyed week. The graph illustrates a defined morning peak and confirms a pronounced late afternoon peak generally building up from 3pm onwards until 6pm before tailing off sharply into the late evening for the five weekdays. During the weekend the busiest period on Saturday was around mid-day. The busiest day by volume was Friday. Across the whole week the peak traffic volume was approximately 250 vehicles per hour, which is low for a Collector Road.

³ Map 136, WDC Road Hierarchy 22/04/2013

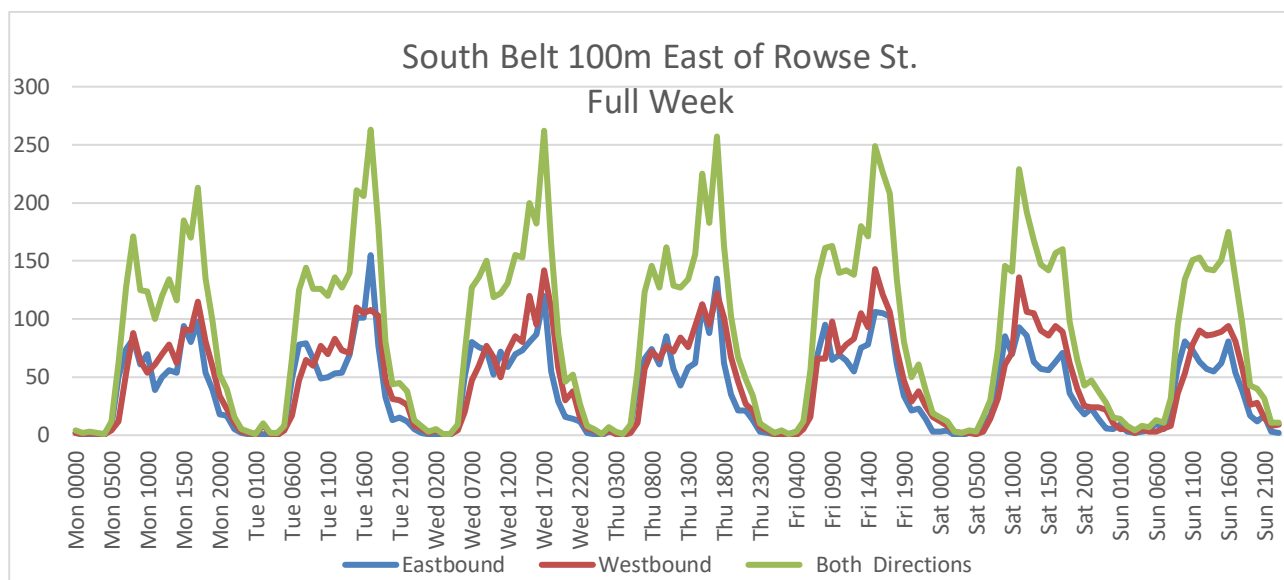


Figure 4-1 South Belt Traffic Patterns (week starting 22 July 2019)

4.3 Intersection Turning Counts

Traffic turning count surveys were undertaken on Tuesday 23rd July 2019 at two key intersections along South Belt in the vicinity of the subject site. The intersections were:

- the Southbrook Road / South Belt signalised intersection and
- the South Belt / Townsend Road extension priority T intersection.

The survey provides an indication of peak hour traffic movements and volumes at key locations. The surveyed peak hour turning volumes at Southbrook Road / South Belt intersection are shown in the Figure 4-2 below.

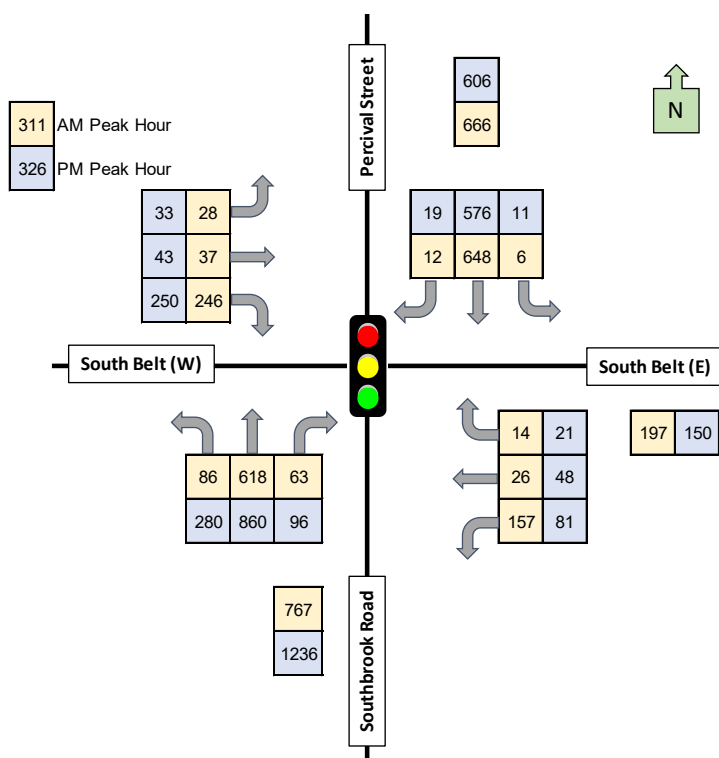


Figure 4-2 Southbrook Road / South Belt Intersection Peak Hour Turning Counts

The surveyed peak hour turning volumes at Townsend Road / South Belt intersection are shown in Figure 4-3 below.

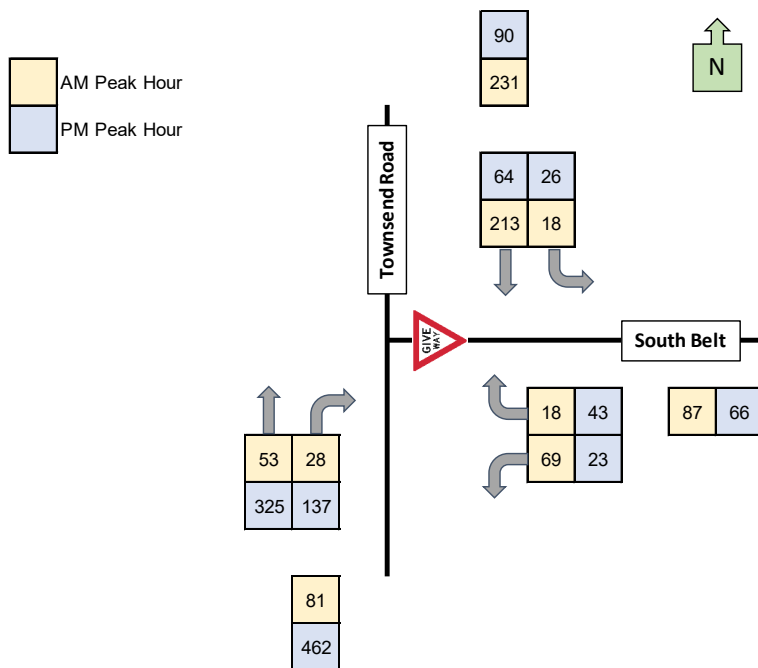
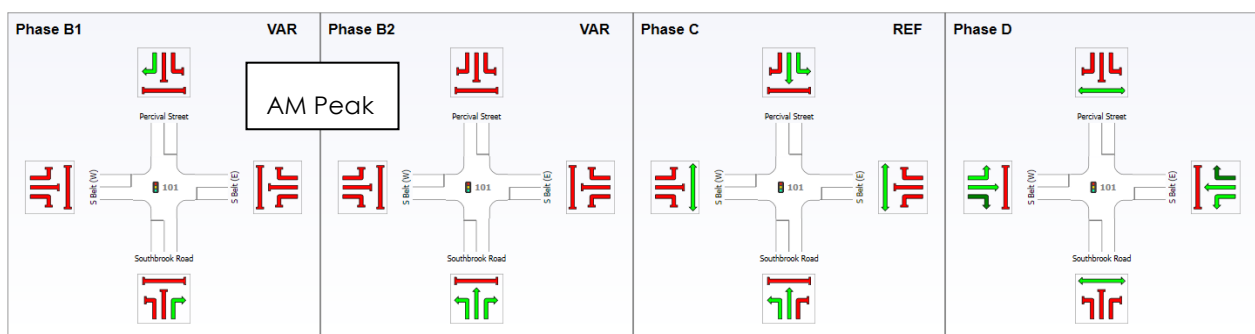


Figure 4-3 Townsend Road / South Belt Intersection Peak Hour Turning Counts

A comparison of the intersection flows confirms there is much less traffic demand on the Townsend Road intersection than at Southbrook Road.

4.4 Existing Intersection Performance

The operational characteristics of the intersections have been assessed with SIDRA Intersection based on existing peak hour traffic flows and, in the case of Southbrook Road intersection, the existing intersection phasing. Observed traffic survey data indicates the intersection is operating with different traffic signal phasing during each of the peak periods. The phasing diagrams for the peak periods are illustrated in Figure 4-4 below.



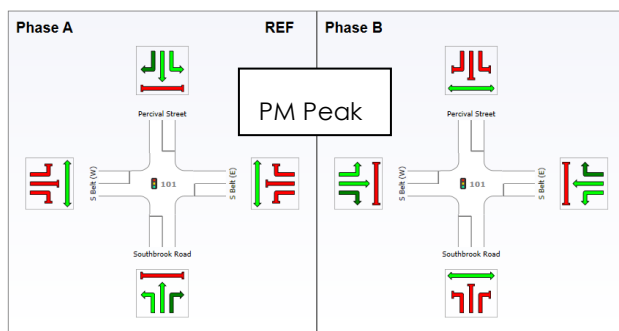


Figure 4-4 Southbrook Intersection Phasing Diagrams (AM Peak and PM Peak)

The measure of intersection performance has been summarised in terms of Level of Service and average delay to vehicles (measured to the nearest second). The table below summarises the Level of Service and corresponding description of general state of the road in terms of traffic flow.

Table 4-3: Level of Service Definitions

Level of Service	Description
A	A condition of free flow in which individual drivers are virtually unaffected by the presence of others in the traffic stream. Freedom to select desired speeds and to manoeuvre within the traffic stream is extremely high, and the general level of comfort and convenience provided is excellent
B	In the zone of stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is a little less than with level of service A.
C	Also, in the zone of stable flow, but most drivers are restricted to some extent in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience declines noticeably at this level.
D	Close to the limit of stable flow and approaching unstable flow. All drivers are severely restricted in their freedom to select their desired speed and to manoeuvre within the traffic stream. The general level of comfort and convenience is poor, and small increases in traffic flow will generally cause operational problems.
E	Traffic volumes are at or close to capacity, and there is virtually no freedom to select desired speeds or to manoeuvre within the traffic stream. Flow is unstable and minor disturbances within the traffic stream will cause breakdown
F	In the zone of forced flow, where the amount of traffic approaching the point under consideration exceeds that which can pass it. Flow breakdown occurs, and queuing and delays result. Analysis outputs that register this LOS cannot be relied upon at this stage.

The result of the analysis of existing performance is summarised in the table below.

Table 4-4: Existing Intersection Performance – Existing Peak Hours

Intersection	Approach arm	Movement	Existing AM Peak		Existing PM Peak	
			LOS	Average Delay (s)	LOS	Average Delay (s)
Southbrook Road / South Belt	Southbrook Rd (S)	Left	C	26	B	12
		Through	D	47	D	42
		Right	D	55	B	18
		Overall	D	40	C	33
	South Belt (E)	Left	C	27	C	22
		Through	C	23	B	18
		Right	C	27	C	23
		Overall	C	27	C	21
	Percival St (N)	Left	C	26	B	12
		Through	C	25	A	8
		Right	D	50	C	27
		Overall	C	26	A	9
	South Belt (W)	Left	C	26	C	22
		Through	C	21	B	17
		Right	E	59	D	54
		Overall	D	50	D	44
	Overall Intersection		D	36	C	27
Townsend Road / South Belt	Townsend Rd (S)	Through	A	1	A	0
		Right	A	6	A	5
		Overall	A	3	A	2
	South Belt (E)	Left	A	6	A	5
		Right	A	6	A	8
		Overall	A	6	A	7
	Townsend Rd (N)	Left	A	5	A	5
		Through	A	0	A	0
		Overall	A	1	A	2
	Overall Intersection		A	2	A	2

During the AM and PM peak hour of the current base year the Southbrook Road / South Belt intersection is operating to a LOS of D and C respectively. At this level of service, the intersection will be functioning adequately, but some queuing will be occurring. This is typical of an urban arterial road intersection. The efficiency of some traffic movements starts to be impacted by the need to maintain overall efficiency at the intersection. It is noted that the AM peak performance is lower as there were additional traffic signal phases being called when compared to the PM peak. WDC staff have advised that the signal phasing has been adjusted recently to improve operational characteristics of the Southbrook Road intersection.

The intersection analysis shows that the Townsend Road / South Belt intersection is operating with a high level of service.

5. Future Traffic Conditions

The Christchurch Assignment and Simulation Traffic model (CAST) has been used, at the request of WDC, to provide forecasts for future changes in traffic flow throughout Rangiora's roading network. The CAST model supplies strategic traffic volumes and routings for identified land use zones within the township and beyond. It has assessment years of 2018, 2028 and 2038. The model has been used to quantify the estimated traffic growth on the surrounding road environment between now and the modelled future year of 2028.

The figure below illustrates the CAST model roading network and zones for Rangiora. The subject site is contained within Zone 11 in the lower left area of the figure.

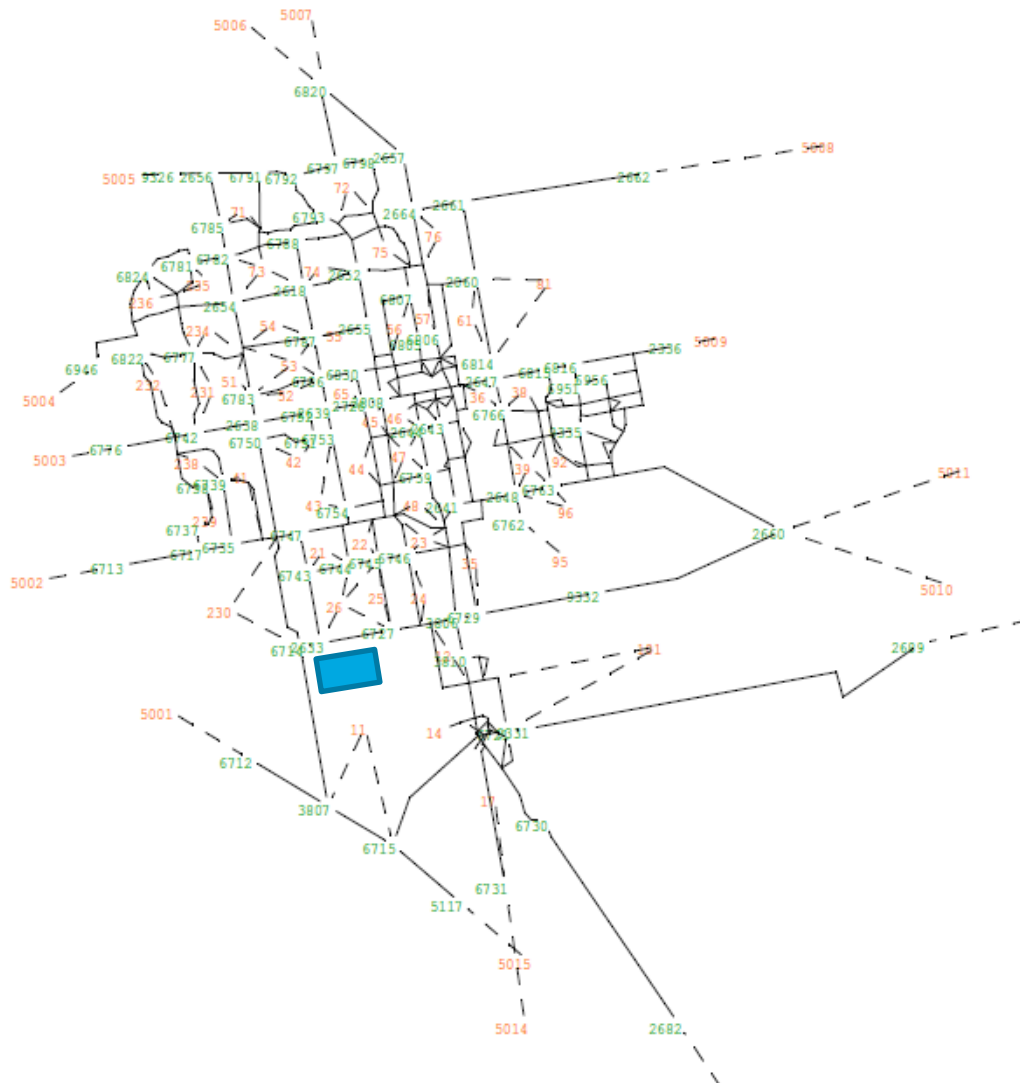


Figure 5-1 2028 Cordoned Network for Rangiora

The CAST modelled change in traffic volumes between the initial year and the future year scenario has been investigated to inform future assessment. The modelled growth on surrounding roads is shown in Table 5-1 and Table 5-2.

Table 5-1: Changes in traffic volumes - AM peak hour (vehicles per hour)

Road Name	2018 CAST	2028 CAST	Absolute Difference	% Difference
Townsend Road (south of South Belt)	323	388	65	20%
Pentecost Road (north of South Belt)	288	71	-217	-75%
Southbrook Road	1,597	1,820	223	14%
South Belt (west of Pentecost)	322	136	-186	-58%
South Belt (west of Southbrook)	353	396	43	12%

Table 5-2: Changes in traffic volumes - PM peak hour (vehicles per hour)

Road Name	2018 CAST	2028 CAST	Absolute Difference	% Difference
Townsend Road (south of South Belt)	450	560	110	24%
Pentecost Road (north of South Belt)	324	103	-221	-68%
Southbrook Road	1,753	1,969	216	12%
South Belt (west of Pentecost)	450	286	-164	-36%
South Belt (west of Southbrook)	307	385	78	25%

Both periods show similar changes in traffic volumes. The reduction in traffic volumes on Pentecost Road and along South Belt west of Pentecost Road reflects the Townsend Road northern extension being recently opened (not included in the 2018 model). The volume reduction is due to traffic reassigning onto the Townsend Road extension.

For assessment of the intersections, the surveyed intersection traffic flows have been adjusted by the growth represented by the absolute difference in volumes derived from the CAST model from the base 2018 year to the 2028 future year. This represents a future 'Do-nothing' scenario as it assumes the traffic generated by the current land use zone will not alter as a result of the proposed Plan Change. The volumes derived are shown in the diagrams below.

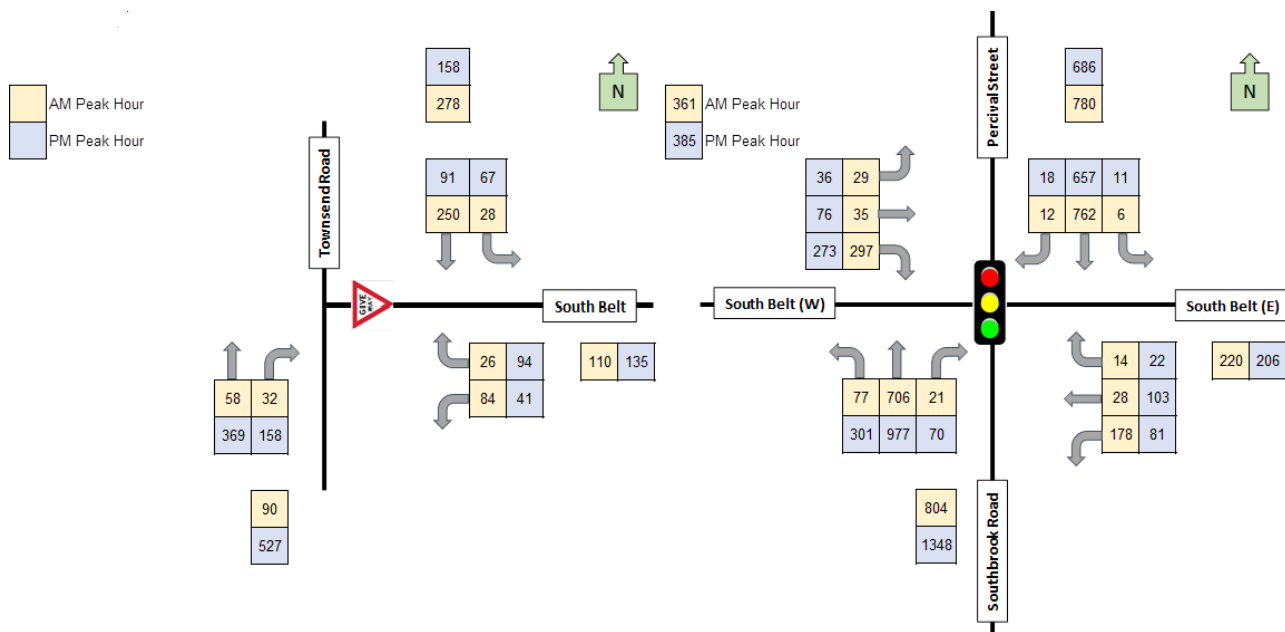


Figure 5-2 2028 Forecast Base Volumes

The operational characteristics of the intersections have been assessed based on a future year 'Do-nothing' scenario, and the result of the analysis is summarised in the tables below.

Table 5-3 Intersection Operational Assessment – Future Year 'Do-Nothing'

Intersection	Approach arm	Movement	2028 Do Nothing AM Peak		2028 Do Nothing PM Peak	
			LOS	Average Delay (s)	LOS	Average Delay (s)
Southbrook Road / South Belt	Southbrook Rd (S)	Left	C	32	B	15
		Through	E	67	E	77
		Right	E	62	C	22
		Overall	E	63	E	60
	South Belt (E)	Left	C	27	C	26
		Through	C	22	C	22
		Right	C	27	C	27
		Overall	C	27	C	24
	Percival St (N)	Left	C	33	B	14
		Through	D	47	B	11
		Right	E	62	D	42
		Overall	D	48	B	12
	South Belt (W)	Left	C	26	C	25
		Through	C	21	C	21
		Right	F	94	F	98
		Overall	E	79	E	71
	Overall Intersection		E	57	D	46
Townsend Road / South Belt	Townsend Rd (S)	Through	A	1	A	1
		Right	A	6	A	6
		Overall	A	3	A	2
	South Belt (E)	Left	A	6	A	5
		Right	A	7	A	10

Intersection	Approach arm	Movement	2028 Do Nothing AM Peak		2028 Do Nothing PM Peak	
			LOS	Average Delay (s)	LOS	Average Delay (s)
	Townsend Rd (N)	Overall	A	6	A	8
		Left	A	5	A	5
		Through	A	0	A	0
		Overall	A	1	A	2
	Overall Intersection		A	2	A	3

The results of the analysis for the 2028 'do nothing' scenario indicate that the South Belt / Southbrook intersection will be operating at, or close to capacity. Some drivers will experience higher delays of more than a minute, and some may not pass through the intersection in one cycle of traffic lights on the more congested traffic movements.

In the Waimakariri Long Term Plan 2018-2028 the Council recognises that roading improvements will be necessary to encourage population and economic growth of Rangiora. Key strategic priorities for the Council include improvements to Southbrook Road and improvements to the eastern and western routes around Rangiora.⁴ In that respect it is anticipated the intersection performance would be investigated as part of that process.

⁴ WDC Long Term Plan 2018-2028 – Infrastructure Strategy 2048.

6. Proposed Plan Change

6.1 Proposal

This Private Plan Change proposes to amend the Waimakariri District Plan to change the zoning of the site from the Residential 4B to Residential 2 Zone.

The Plan Change Request will provide for more typical residential activity within the existing Rangiora urban area. The zone will provide for new residential dwellings providing for additional residential growth in this part of the town. In addition, the zone will incorporate additional rules that would enable the creation of a new retirement village, providing specialised living for older residents. Should the opportunity to construct a retirement village not be taken up on any part of the site, the opportunity for typical residential activity under the Residential 2 zoning would remain.

The proposed amendments to the WDP to enable these changes in summary include:

- Modify the planning maps (Maps 116 and 117) to show the new Residential 2 zoning for the land.
- Insert a new planning map for the South Belt Outline Development Plan and within this insert an Outline Development Plan (ODP) showing key elements that are required for future development of the land.
- Include a definition of 'retirement village' in the WDP as applicable to this site.
- Modify the Subdivision and Residential 2 zone rules relevant to this site to require compliance with the ODP.
- Modify the Residential 2 zone rules as they apply to this site, to include bulk and location provisions for a retirement village and enable consideration of the design and appearance of a village.

No other changes are proposed to the Waimakariri District Plan as it is considered that the existing Residential 2 zone provisions are appropriate for the development of the site.

The Residential 2 Zone provides for residential construction with allotments having a minimum 600m² net area with a minimum dimension of 18x18m. The anticipated number of allotments that could be created on the site is approximately 140.

A higher density of housing would be enabled within a retirement village area. The proposed rules and Outline Development Plan (ODP) provide for this approach and allow for a specified area of the site to accommodate a larger main building.

The ODP, located in Appendix A of this report, shows key elements to be incorporated into future residential activity on the site, including the required location of future links to the existing transport network, the provision of an esplanade reserve adjacent to Southbrook Stream, the location and extent of stormwater management areas and the allowance of a specified area for a taller main retirement village building. The intention of the ODP is to provide certainty regarding key requirements for any future residential activity on the site, whilst allowing flexibility as detailed design phases evolve in the future.

Pedestrian and cycle access will be provided to enable connections to be made to adjoining land, to Southbrook Park, the Southbrook Stream, and the wider area. The specific design for access will be determined at the time of future subdivision or Land Use consents of the land.

No new objectives or policies to the District Plan are proposed. However, new provisions are proposed including adding a definition of retirement village to the WDP, provision for a taller main retirement village building, and recognition of the need to consider the design and appearance of a retirement village complex through a resource consent process. Future residential activity on the site would be undertaken in general accordance with an Outline Development Plan (ODP) and specific requirements for the site.

An existing ODP called South West Rangiora Outline Development Plan covers the new residential area west of Pentecost Road on District Plan Map 173. It is proposed that the ODP for the subject site be referenced as South Belt Outline Development Plan to avoid confusion.

6.2 Vehicle Access

The site has access to a road frontage of approximately 650m consisting of the north and west site perimeter. Two vehicle site access intersection points are proposed along South Belt. This is consistent with the number of intersections serving residential activity on the northern side of South Belt. The minimum spacing of road intersections in the WDC District Plan is set at 125m for access onto 50kph roads. The location of the existing

intersections precludes full compliance to the spacing standard at the west end of South Belt, such that further traffic engineering assessment has been carried out to confirm the optimal location for the ODP.

It is proposed to employ an alternative intersection spacing criteria, using the Austroads recommendation⁵ that intersections should desirably be separated by at least 5 seconds of travel time. With South Belt being a 50Km/h road, this equates to 70 metres of intersection separation. This is consistent with the reduced King Street to Buckleys Road intersection spacing along South Belt, east of the application site.

The location of the proposed access points, measured from the boundary of the existing intersection to the centreline of the new access site are shown in Figure 6-1 below.

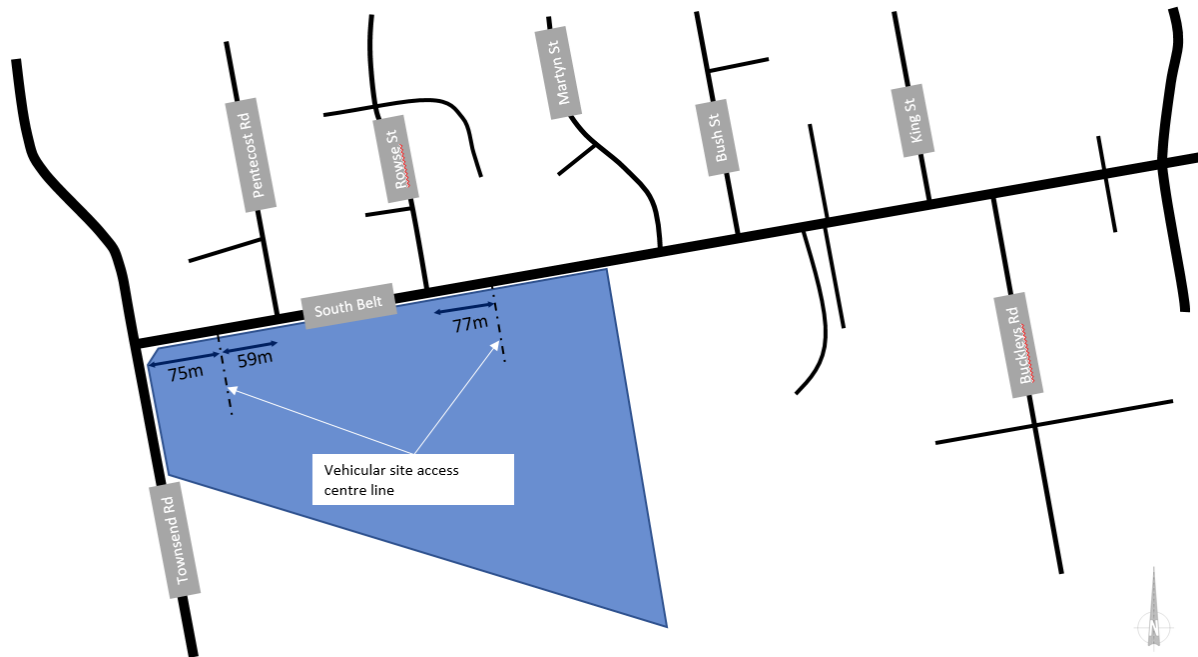


Figure 6-1: Indicative Site Access Location Plan

The eastern access has no intersections on the same side of the road, so the primary consideration from a traffic engineering perspective is ensuring right turn movements at the new intersection do not conflict with right turns at the intersections' opposite. The separation available to the nearby low volume Rowse Street will ensure enough separation is available to have safe right turns that do not overlap.

The western access is sufficiently separated (by 5 seconds) from Townsend Road to ensure there is no confusion associated with proximity of the intersection. As a low volume intersection, a basic treatment will apply, so that it would not impact the layout of nearby intersections. The visibility available from the proposed access point, to the right along South Belt is excellent and fully complies with the requirements of the District Plan. Traffic turning right into South Belt from the western access will also have clear visibility to traffic at the Pentecost Road Give Way line. Traffic turning right from Pentecost Road are expected to be travelling at a slower speed given the proximity of the South Belt / Townsend Road intersection and is expected to afford traffic exiting the western access additional time to negotiate the intersection. As the intersection is on the opposite side of the road it is considered the proposed separation distances provide the optimal solution at this location.

6.3 Pedestrian Access

There is an existing 1.5m wide footpath running along the northern kerb edge of South Belt which links to existing footpath connections along the north streets. The Plan Change site provides further opportunities to link areas via an esplanade reserve to strengthen the pedestrian infrastructure provision in South west Rangiora.

Figure 6-2 below illustrates external pedestrian routes and connections that may be available and will be enabled at the time of future development of the land. The precise location and extent of provision would be addressed through subdivision and/or land use consent.

⁵ Austroads Guide to Road Design Part 4: Intersections and Crossings – General B.2.2

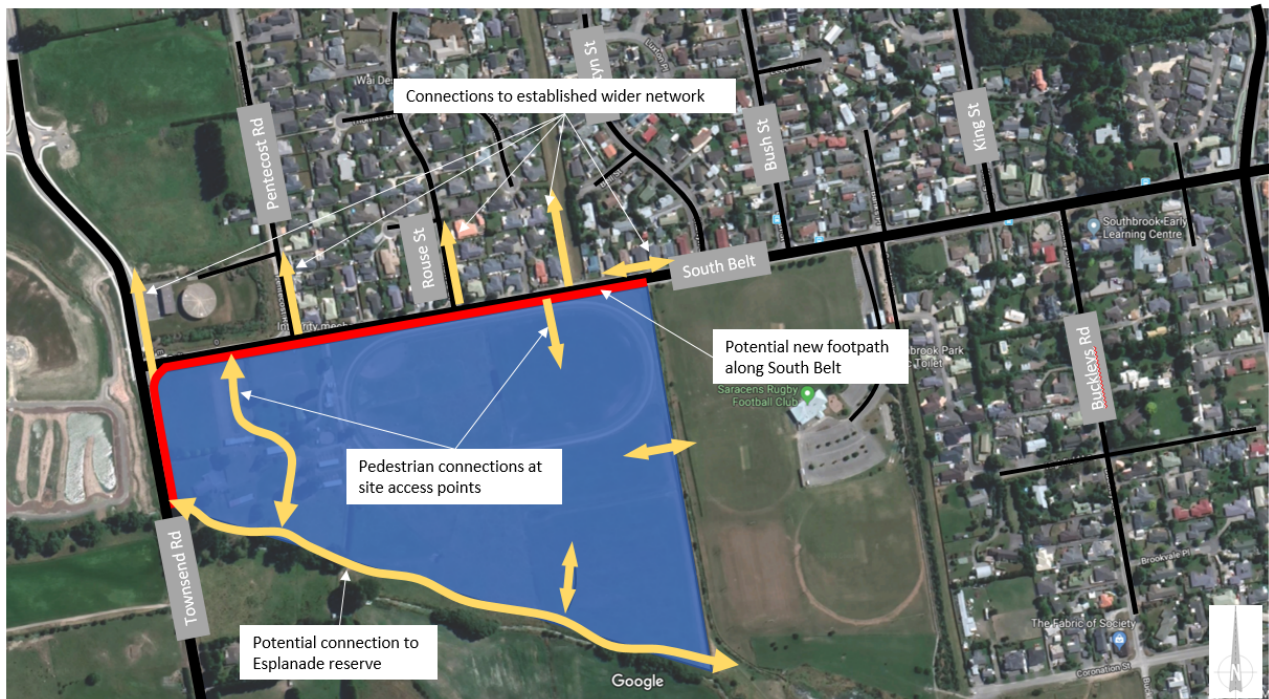


Figure 6-2: Site Pedestrian Connections to The Wider Pedestrian Network

6.4 Public Transport Convenience

With the eastern site entrance being approximately 250m from the bus stops at Bush Street / South Belt the site is ideally located to take advantage of the public transport services in Rangiora. The service links Rangiora Centre to Central Christchurch and the Princess Margaret Hospital. The buses are fitted with bike racks which provides flexibility on route choice without using private cars.

6.5 Other Site Layout Considerations

With the key site access provisions identified, the remainder of the internal transport related site layout matters can be addressed through subdivision and, if necessary, resource consent processes.

7. Traffic Generation and Distribution

7.1 Traffic Generation

7.1.1 Analysis of Existing Land Use Traffic Generation

The site is currently zoned for Residential 4B land use. The predominant characteristics of this zone as described by the District Plan are:

- Lowest form of dwelling density, with average lot sizes of 0.5-1.0 hectare;
- Detached dwellings and associated buildings in generous settings;
- Rural style roads or accessways with limited kerb, channelling and street lighting;
- Limited farming or horticultural activity;
- Opportunity for rural outlook from within zone.

Based on the low-density subdivision it is anticipated that the site may yield 13 dwellings. The typical traffic generation rate (85th percentile) for assessment are taken from NZ Transport Agency Research Report 453 'Trips and Parking related to Land Use' for a residential dwelling (outer suburban). The published rates are 0.9 peak hour trips and 8.2 daily trips per dwelling. Therefore, the site is expected to have a peak hour generation of 12vph and a daily generation of 107vpd.

7.1.2 Analysis of Plan Change Land Use Traffic Generation

The applicant seeks to change the zoning of the site from the Residential 4B to Residential 2 zone. Based on information supplied by the applicant, the anticipated number of lots that could be created on the site is up to 151. Using the rates in NZTA RR 453, the site is expected to have a peak hour generation of 135vph and a daily generation of 1,230vpd.

As the plan change seeks to include reference for a Retirement Village within the WDP for the site, the expected generation of a retirement village has also been calculated as shown in Table 7-1. A traffic generation report undertaken in 2018 by TDG (now Stantec) reported traffic generation across a week at the comparable Summerset Wigram Village. The report identified that the peak hour for the site activity was 3pm-4pm and not the traditional commuter peak periods, and an even arrivals and departures split.

Table 7-1: Traffic Generation – Scenario with Retirement Village

Land Use	Quantity	AM Peak Hour (rate)	PM Peak Hour (rate)	Daily (rate)
Villas & Cottages	245	27vph (0.11)	64vph (0.26)	742vpd (3.03)
Assisted Living Suites	56	3vph (0.06)	13vph (0.24)	143vpd (2.56)
Memory Care Suites	20	1vph (0.06)	5vph (0.24)	51vpd (2.56)
Care Facility Beds	43	3vph (0.06)	10vph (0.24)	110vpd (2.56)
Village Total		34vph	92vph	1,047vpd
Dwellings on Balance Land	39	35vph (0.9)	35vph (0.9)	320vpd (8.2)
Total Generation		69vph	127vph	1,367vpd

A summary of the expected traffic generation for each of the three development scenarios is given in Table 7-2.

Table 7-2: Traffic Generation Summary

Land Use	AM Peak Hour	PM Peak Hour	Daily
All Residential 4B	12vph	12vph	107vpd
All Residential 2	135vph	135vph	1,230vpd
Part Residential 2, Part Retirement Village	69vph	127vph	1,367vpd

7.2 Traffic Distribution

The distribution profile for traffic using the subject site has been derived using the distribution from comparable landuse zones in the CAST model. The Rangiora area has been split into sectors based on routes that will be used to and from the site, and volumes derived.

For the residential landuse, the distribution is taken from a zone adjacent to the Plan Change site, which also has Residential 2 land use. Table 7-3 provides the proportion of traffic generated by the site that will use each of the nearby roads to and from the wider area. The traffic distribution forecast from the sector and route analysis results in a spread of traffic onto the road network, rather than providing concentrated volumes on any one road. This will assist with minimising change to other users in the area. Of particular note is the expected use of Townsend Road to access areas both north and south of the site, as it provides a convenient connection and bypasses the busier Southbrook Road.

Table 7-3: Site Traffic Distribution for Residential 2 Development

Origin / Destination Route	AM Peak		PM Peak	
	Percentage Site Arrivals	Percentage Site Departures	Percentage Site Arrivals	Percentage Site Departures
Townsend Road Sth of South Belt	15%	25%	25%	11%
Townsend Road Nth of South Belt	37%	13%	16%	28%
Pentecost Road	3%	9%	8%	5%
Bush Street	4%	3%	4%	6%
King Street	17%	22%	23%	22%
Percival Street Nth	10%	14%	16%	16%
South Belt east of Southbrook	11%	8%	5%	8%
Southbrook Sth of South Belt	3%	7%	3%	4%
Total	100%	100%	100%	100%

A relatively small percentage of traffic will use local roads such as Pentecost Road and Bush Street for trips in the local area. The site traffic will otherwise be able to access a range of classified roads that are intended for carrying through traffic. The modelling indicates that in the morning peak hour, 70% will be exiting the site, and in the evening peak hour 38% will be exiting the site.

A review of the potential distribution profile for the site for a retirement village land use has also been undertaken. The zone containing the large retirement village in northwest Rangiora has been used as a basis for assessing the traffic distribution. The traffic distribution forecast from the sector and route analysis results in a spread of traffic onto the road network, with traffic routing concentrated to the north into Rangiora as opposed to southbound towards Christchurch. This is consistent with the retirement village traffic not contributing commuter-based trips to / from employment zones in Christchurch. Around half of the traffic generated by the retirement village will use Townsend Road intersection. The distribution associated with the residential only landuse is considered to be the "worst case" for assessing potential effects on the transport network.

8. Effects on the Transportation Network

8.1 Change in Traffic Volumes

In order to confirm the operation of the surrounding road network, the roads have been assessed for the future year based on the following two scenarios:

- Existing consented Residential 4B traffic generation; and
- Proposed Plan Change Residential 2 traffic generation.

An assessment on intersection performance if a retirement village forms part of the site has also been undertaken. The following changes in hourly traffic volume have been forecast.

Table 8-1: Changes in Traffic Volume on the Road Network (vph two way)

Road	AM Peak			PM Peak		
	Resi 4B	Resi 2	Resi 2 with Retirement	Resi 4B	Resi 2	Resi 2 with Retirement
Townsend Road Sth of South Belt	3	30	8	2	27	7
Townsend Road Nth of South Belt	2	27	25	2	28	52
Pentecost Road north of South Belt	1	10	5	1	10	8
Bush Street north of South Belt	0	5	2	1	6	4
King Street north of South Belt	2	27	15	3	30	30
Percival Street north of South Belt	2	17	11	2	22	24
South Belt east of Southbrook Rd	1	12	3	1	9	2
Southbrook Rd	1	7	2	0	4	1

The change in volumes on any one road are very low, and no more than 52vph two-way beyond the immediate site surrounds. That is equivalent to less than one vehicle every minute. The change would not require any changes to the formation of the roads in the area and would not be a generator of the need to reclassify roads in the road hierarchy.

8.2 Vehicle Access Performance

Additional analysis has been undertaken at the two recommended points of vehicle access to the site. It has been confirmed that access can be achieved to South Belt with LOS A in all scenarios, and all peak periods. In that respect, it is considered basic intersection formation will be achievable, and therefore no specific provision around intersection form needs to be included in the plan change provisions. That can be addressed in future design stages.

8.3 Intersection Performance

In order to confirm the operation of the surrounding intersections, the two key intersections have also been assessed under the various scenarios. These will be the busiest intersections in the area, and it is considered the other intersections along South Belt do not require further investigation due to the low additional traffic volumes. The results of the analysis are shown in the tables below.

Table 8-2: Southbrook Road / South Belt Intersection Performance

Peak Period	Approach	Existing 2018		2028 'do nothing'		2028 – Residential 4B		2028 – Residential 2		2028 – Retirement Village	
		Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS
AM	Southbrook Road	40	D	62	E	62	E	68	E	68	E
	South Belt (E)	27	C	27	C	27	C	25	C	25	C
	Percival Street	26	C	48	D	48	D	48	D	48	D
	South Belt (W)	50	D	75	E	76	E	82	F	77	E
	Overall Intersection	36	D	56	E	56	E	59	E	58	E
PM	Southbrook Road	33	C	60	E	60	E	67	E	67	E
	South Belt (E)	21	C	24	C	24	C	23	C	23	C
	Percival Street	9	A	12	B	12	B	13	B	13	B
	South Belt (W)	44	D	71	E	71	E	62	E	62	E
	Overall Intersection	27	C	46	D	46	D	48	D	48	D

Table 8-3: Townsend Road / South Belt Intersection Performance

Peak Period	Approach	Movement	Existing 2018		2028 'do nothing'		2028 – Residential 4B		2028 – Residential 2		2028 – Retirement Village	
			Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS	Av. Delay (s)	LOS
AM	Townsend Road (S)	Right	6	A	6	A	6	A	6	A	6	A
	South Belt	Left	6	A	6	A	6	A	6	A	6	A
	South Belt	Right	6	A	7	A	7	A	7	A	7	A
	Townsend Road (N)	Left	5	A	5	A	5	A	5	A	5	A
PM	Townsend Road (S)	Right	5	A	6	A	6	A	6	A	6	A
	South Belt	Left	5	A	5	A	5	A	6	A	6	A
	South Belt	Right	8	A	10	A	10	A	11	B	11	B
	Townsend Road (N)	Left	5	A	5	A	5	A	5	A	5	A

The results of the analysis for the 2028 'with development' scenarios show negligible change in intersection LOS between scenarios. In that respect even though the South Belt / Southbrook intersection is operating with low levels of service, it is considered the Plan Change would not bring forward the need for wider area intersection improvements.

The proposed access points have been assessed to understand the levels of service expected along South Belt based on the provision of Residential 2 development activity completed by 2028. The results of the analysis are shown in the tables below.

Table 8-4: Proposed Site Access Performance

Peak Period	Approach	Movement	2028 – Residential 2	
			Av. Delay (s)	LOS
AM	West site access	Left	7	A
		Right	7	A
	South Belt East	Left	5	A
		Through	-	A
	South Belt West	Right	5	A
		Through	-	A
AM	East site access	Left	7	A
		Right	7	A
	South Belt East	Left	5	A
		Through	-	A
	South Belt West	Right	5	A
		Through	-	A
PM	West site access	Left	7	A
		Right	8	A
	South Belt East	Left	5	A
		Through	-	A
	South Belt West	Right	5	A
		Through	-	A
PM	East site access	Left	8	A
		Right	9	A
	South Belt East	Left	5	A
		Through	-	A
	South Belt West	Right	5	A
		Through	-	A

The results of the analysis for the 2028 Residential 2 development scenario indicates the site access points will be operating at very high levels of service and minimal delay.

9. Conclusion

Summerset Villages (Rangiora) Limited seek a private plan change to amend parts of the Waimakariri District Plan (WDP) to rezone a site off South Belt from Residential 2 zone instead of the current zone (Residential 4B). It is also proposed to incorporate within the zone some specific rules to provide opportunity for a retirement village. The site has been assessed to determine the impacts from a change in zoning in transport terms.

The site is ideally located to take advantage of existing public transport services operating in proximity to the site. The bus service links the site to Rangiora centre and Central Christchurch.

The site is at the edge of the urban area of southwest Rangiora but within the identified urban boundary. It is expected that the site would need to be serviced by improved pedestrian infrastructure provision in order to integrate the site into the urban framework. This can be enabled through the provision of new footpaths along the site's road frontage and potential links to dedicated pedestrian routes along the southern edge of the site. The details of these linkages are best developed at the time of future land use or subdivision of the land. It is proposed that the site includes details of the access location, which have been proposed to provide a balance between meeting existing District Plan rules and the traffic engineering considerations assessed in this report.

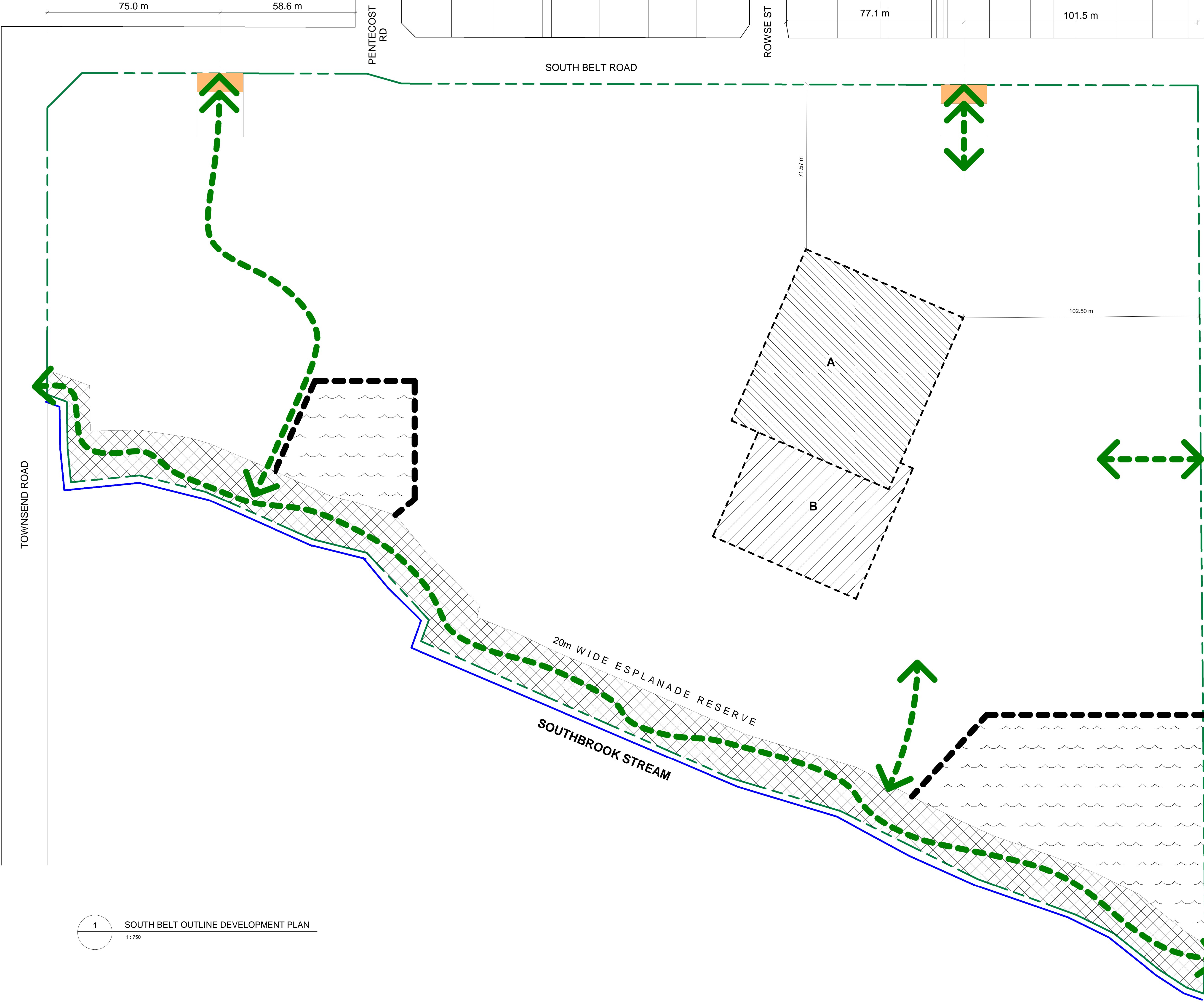
The additional traffic generated on the surrounding road network will be low, and changes in volumes will be readily accommodated without requiring changes to the road infrastructure. Nearby intersections have been assessed, and whilst the Southbrook Road / South Belt signalised intersection will perform with low levels of service in the future, the change due to development of the Plan Change site will be negligible and would not bring forward the need for improvements. Overall the site is well located to provide drivers with flexibility to choose appropriate routes through the transport network.

It is on this basis that the proposed plan change activity may be supported from a transport perspective.

Appendices

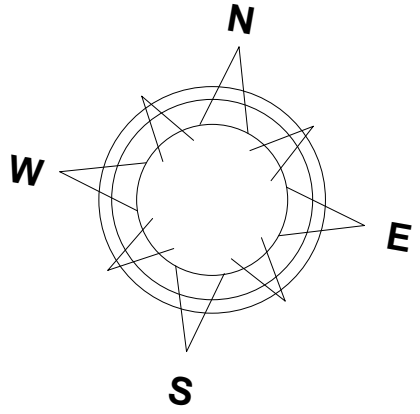


Appendix A Proposed Site Outline Development Plan



LEGEND

- Outline Development Plan Area
- Fixed Road Connection (20m)
- Esplanade Reserve
- South Brook Stream
- Stormwater Management Area
- Height Restriction Area A (14m)
- Height Restriction Area B (10.5m)
- Indicative Pedestrian / Cycle connection (location and alignment may vary)



Rev	Date	Description

Client.

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Project Name.
SUMMERSET VILLAGE
RANGIORA

Project Stage. Block Number.
DRAFT

Drawing Title.
SOUTH BELT OUTLINE
DEVELOPMENT PLAN

DO NOT SCALE DRAWINGS. DATE
Original Sheet Size: A1 18/09/19
Project Number. Drawing Number. Rev
048 MP.001

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