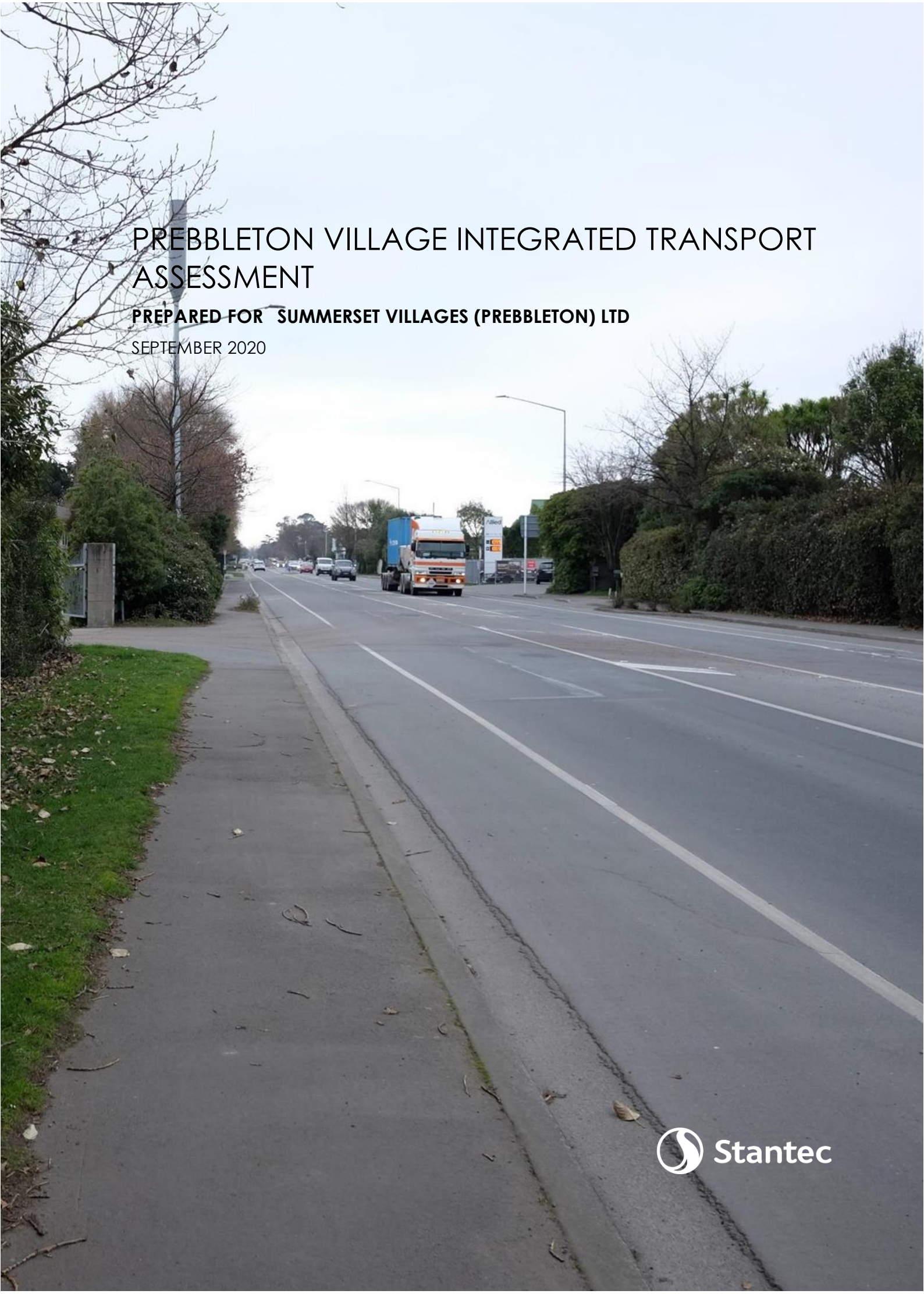

PREBBLETON VILLAGE INTEGRATED TRANSPORT ASSESSMENT

PREPARED FOR SUMMERSET VILLAGES (PREBBLETON) LTD

SEPTEMBER 2020

Stantec

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SUMMERSET VILLAGES (PREBBLETON) LTD

PREBBLETON VILLAGE INTEGRATED TRANSPORT ASSESSMENT

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1. Introduction

Summerset Villages (Prebbleton) Ltd proposes to construct and operate a comprehensive care retirement village on a Living zone X site on Springs Road in Prebbleton. The village is proposed to accommodate 224 independent retirement units and a total of 119 assisted living suites, care beds and memory care units in a main building in the centre of the site. Primary access to the village will be from Springs Road with a secondary access proposed to the adjacent neighbourhood to the west.

The proposed retirement village requires a resource consent for transportation non-compliances with District Plan standards, which are outlined in this Integrated Transport Assessment (ITA). This ITA, which has been prepared in support of the consent application, provides background discussion on the existing transport environment surrounding the site, describes the transport-related elements of the proposed village and integration with the existing transport network, and then is focussed on safe and efficient vehicle access to and from the village and the compliance of the on-site arrangements with District Plan standards.

2. Site Location

The proposed retirement village site is on the western side of Springs Road in Prebbleton. Figure 2-1 shows the site location, Springs Road connecting from Christchurch to Lincoln and other key roads near Prebbleton.

Figure 2-1: Site Location Wider Context

The site for the proposed village is the former Meadow Mushrooms site in Prebbleton, as outlined in Figure 2-2 in the context of the surrounding area and roads.

Figure 2-2: Proposed Site and Surrounding Roads (Aerial Image Source: LINZ)

As well as frontage to Springs Road, the site has access from Glenary Drive, a short local residential road which has been built to the western site boundary.

Trents Road is one of several roads which link between the parallel Springs Road and Shands Road.

The site is zoned Living X in the Selwyn District Plan. The site is included in the 'Prebbleton Preferred Growth Area' in the District Plan (Figure 2-3) however there is no Outline Development Plan for the site.

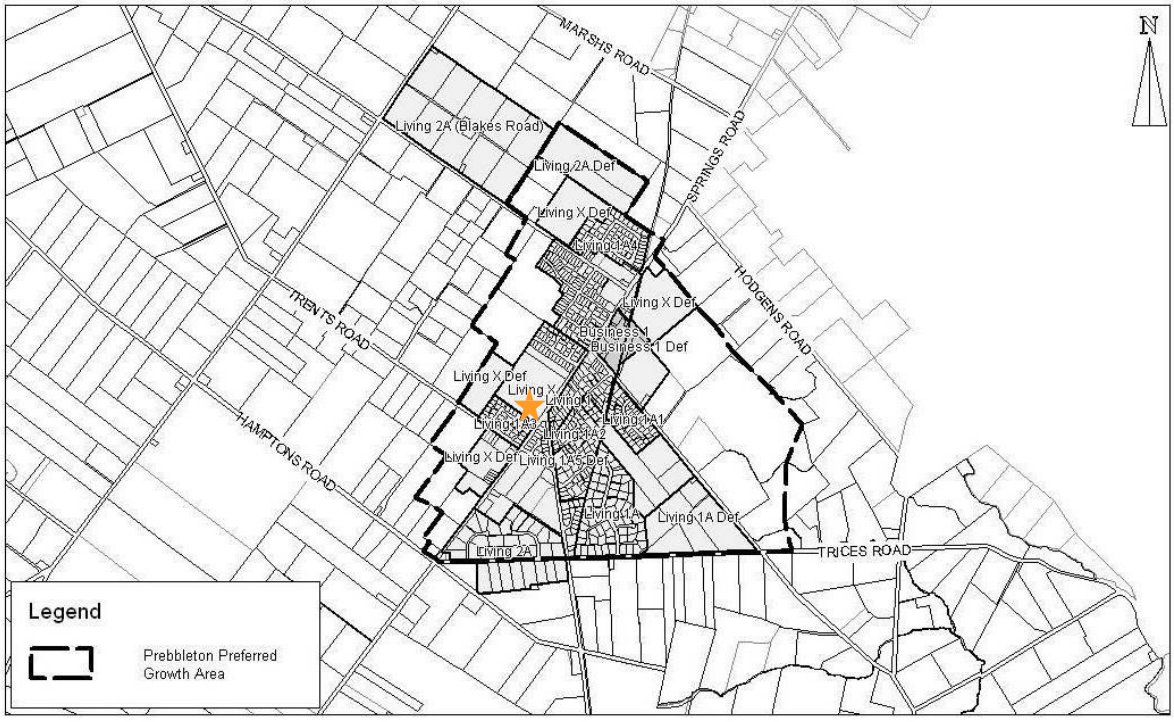

Figure 2-3: Selwyn District Plan Prebbleton Preferred Growth Area

The site is surrounded by predominantly Living zones, with the Prebbleton business zone to the northeast of the site on the eastern side of Springs Road accommodating a supermarket and various food outlets and commercial activities.

3. Existing Transport Environment

3.1 Road Network

3.1.1 Springs Road

Springs Road is classified as an Arterial Road in the Selwyn District Plan and has a posted speed limit of 50km/h within Prebbleton.

Adjacent to the site, Springs Road is flat and straight (Photographs 1 and 2). It has single traffic lanes and cycle lanes in each direction and a flush median. There is a car parking lane on the eastern side of the road and a section of indented parking on the western side at the northern end of the site. There are footpaths on both sides of the road.

Photograph 1: Springs Road, South of Existing Site Access, Looking North

Photograph 2: Springs Road, North of Existing Site Access, Looking South

3.1.2 Lindsay Drive and Glenary Drive

Lindsay Drive (Photograph 3) is a local residential road which runs between Trents Road and Cairnbrae Drive. It has an 8m wide carriageway and a curving alignment. There is a footpath on the eastern side of the road.

Photograph 3: Lindsay Drive, At Trents Road, Looking North East

Glenary Drive (Photograph 4) is an approximately 55m long no-exit residential street which currently provides access to two residential lots. It has been formed with an 8m wide carriageway and a footpath on the southern side of the road. No turning head has been provided.

Photograph 4: Glenary Drive, From Lindsay Drive, Looking East

The two roads meet at a standard T-intersection with give-way signage and markings on Glenary Drive.

Lindsay Drive meets Trents Road at a crossroad intersection opposite Farthing Drive, and Cairnbrae Drive at a crossroad intersection opposite Skye Lane.

3.2 Public Transport Provisions

There is currently one Metro bus service (number 80) which runs through Prebbleton between Christchurch City and Lincoln. It has a number of bus stops through Prebbleton (Figure 3-1), with the closest pair being near the northern end of the site on Springs Road.

The bus stops in Prebbleton every half hour, with more frequent trips in the commuter peaks, including one Express trip in each of the morning and evening peaks that only stops at major stops. This service ends at Ara Institute in the morning and at Lincoln University in the evening.

On Saturdays, the bus runs every half hour between 6:30am and 4:00pm, then hourly until midnight. The Sunday timetable is similar but has reduced hours.

Figure 3-1: Existing Number 80 Bus Route

3.3 Cycle Network

As described, there are on-road cycle lanes marked in both directions on Springs Road past the site.

The Little River Rail Trail cycleway (Figure 3-2) is a cycleway from the southern edge of Christchurch to Banks Peninsula. It makes use of the on-road cycle lanes on Springs Road through Prebbleton and then continues along Birchs Road, as a separated path, to Lincoln.

Figure 3-2: Rail Trail Route Through Prebbleton

3.4 Pedestrian Network

There are footpaths on both sides of Springs Road past the site. The only crossing point provided nearby is a pedestrian refuge south of the Tosswill Road intersection. The flush median provides an informal refuge between traffic lanes, which would assist pedestrians crossing at intermediate locations at peak times.

There is a footpath on the southern side of Glenary Drive connecting to Lindsay Drive.

An off-road footpath has been constructed from Edwin Trent Drive through a reserve to the southern boundary of the site.

4. Existing Traffic Volumes

4.1 Springs Road Traffic Volumes

Selwyn District Council carried out traffic counts on Springs Road, between Cairnbrae Drive and Birchs Road, in August 2019. The weekday average daily traffic volume was recorded as 14,600 vehicles per day (vpd) and the seven-day average was 13,700vpd.

Figure 4-1 summarises the hourly traffic volumes recorded. Springs Road carries its highest traffic volumes during weekday evenings, between 4:00pm and 6:00pm. The Monday-Thursday average peak hour was 4:30pm-5:30pm, when approximately 1,450 vehicles per hour (vph) were recorded. This is a high two-way traffic volume and there would be difficulty with turning right onto Springs Road during peak times.

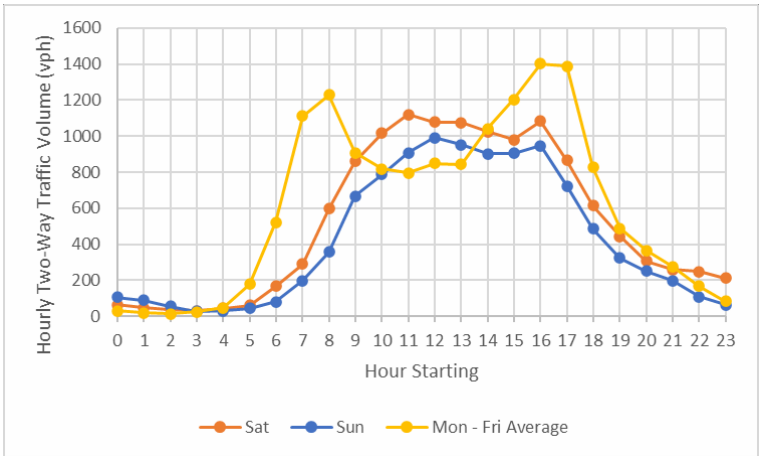

Figure 4-1: Springs Road Two-Way Hourly Traffic Volumes, 23-29 August 2019

Figure 4-2 shows the average weekday hourly traffic volumes by direction. During the evening peak hour, approximately 810vph were southbound, heading away from Christchurch, and approximately 650vph were northbound.

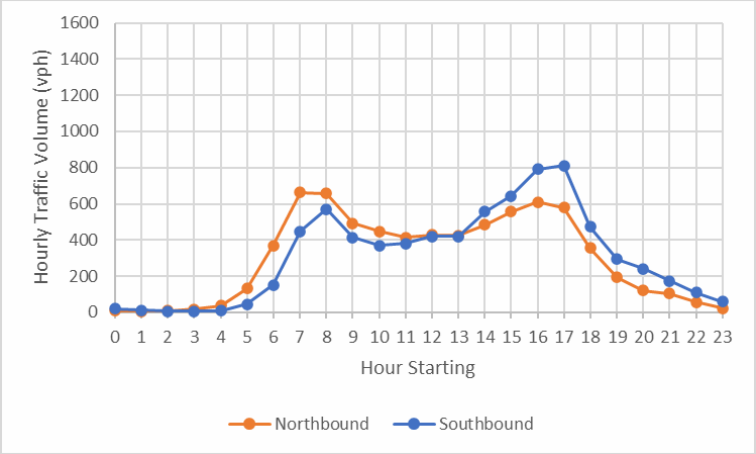

Figure 4-2: Springs Road Weekday Average Hourly Traffic Volumes by Direction, 23-29 August 2019

4.2 Local Traffic Volumes

The following table summarises daily traffic volumes on the surrounding local roads. The Lindsay Drive and Cairnbrae Drive volumes are low volumes consistent with their local road status while Trents Road carries a higher volume likely reflective of some use by through traffic between Springs Road and Shands Road.

Table 4-1: Traffic Volumes on Surrounding Roads

Road	Location	Traffic Volume	Count Date
Lindsay Drive	South of Cairnbrae Drive	700vpd	April 2018
Trents Road	West of Springs Road	1620vpd	November 2017
Cairnbrae Drive	East of Lindsay Drive	720vpd	April 2018

5. Crash History

A crash search of the roads surrounding the site has been carried out using NZTA's Crash Analysis System. The crash search area and the locations of crashes reported since the start of 2015 are shown below in Figure 5-1.

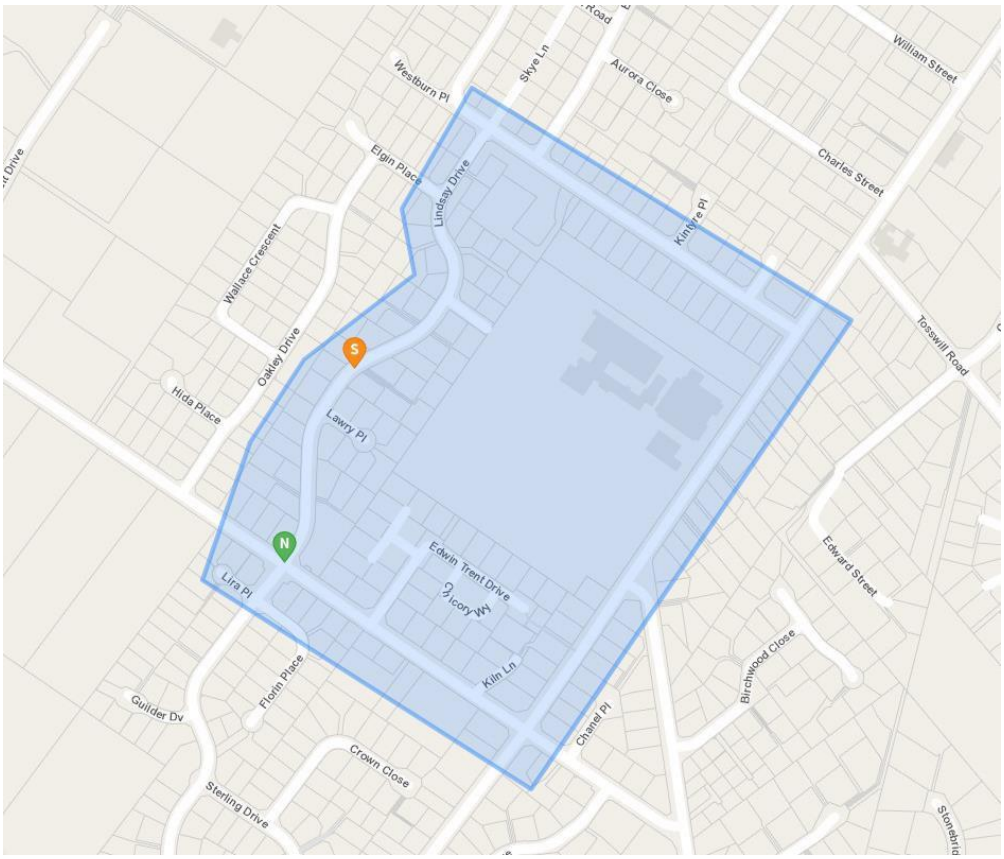

Figure 5-1: Crash Search and Reported Crash Locations

Since the start of 2015, there has been one serious injury and one non-injury crash in the area. The serious injury crash involved one of a group of three skateboarders, who was unfamiliar with their board, colliding with a car travelling south on Lindsay Drive. The skateboarder suffered a broken leg. The non-injury crash occurred when a driver on Lindsay Drive continued straight across Trents Road without giving way to a vehicle on Trents Road.

No crashes have been reported at the Trents Road, Birchs Road or Cairnbrae Drive intersections on Springs Road or at any property accesses on Springs Road including the three Meadow Mushrooms accesses. This shows that, despite the high traffic volumes on Springs Road, accesses and local road intersections in the area are operating safely.

6. Future Transport Network Changes

6.1 Selwyn Long Term Plan

The Selwyn Long Term Plan identifies that traffic volumes will continue to increase on the arterial roads between Selwyn and Christchurch, e.g. Springs Road and Shands Road. It also outlines that the completion of the Christchurch Southern Motorway Stage 2 (CSM2) is expected to result in increased traffic volumes on these roads. The increasing traffic volumes will exacerbate existing safety concerns, particularly at certain intersections, along these routes.

Figure 6-1 outlines a number of proposed Prebbleton projects from the Selwyn Long Term Plan which are aimed to improve the safety of the arterial road network. In the shorter term (pre 2028), these include the construction of a roundabout at the Shands Road / Trents Road intersection and widening of Trents Road. Two other roundabouts are also proposed along Shands Road (at Hamptons Road and Blakes Road), aimed

at improving access to and from Prebbleton. Towards Christchurch, Springs Road will be upgraded between Prebbleton and the CSM2 and a roundabout will be constructed at the Springs Road / Marshs Road intersection. A Selwyn District Council (SDC) Request for Proposal for Professional Services from March 2020 included a target construction completion date of June 2021 for the Springs Road / Marshs Road and Shands Road / Blakes Road roundabouts.

Longer term (post 2028), further upgrades to Springs Road are proposed and traffic calming through the Prebbleton town centre will be carried out. A roundabout is also planned for the Springs Road / Trents Road intersection.

	Net Expenditure incurred pre 2018 $	Expenditure planned 2018-2028 $	Expenditure post 2028 $	Total Cost $	% of total cost funded from Development Contribution %	% funded from other sources %
Roading						
Eastern Selwyn Development Area						
Springs/Hamptons Rd Roundabout	-	3,121,118	-	3,121,118	17%	83%
Springs Rd Upgrade Stage 2	-	-	1,351,424	1,351,424	34%	66%
Springs Rd/Trents Rd roundabout	-	-	357,041	357,041	17%	83%
Hamptons Rd Widening	-	534,255	-	534,255	17%	83%
Shands/Hamptons Rd Roundabout	-	6,723,065	-	6,723,065	17%	83%
Springs Rd town centre traffic calming	-	-	714,081	714,081	17%	83%
Shands/Blakes Rd Roundabout	-	4,936,260	-	4,936,260	17%	83%
Shands/Trents Rd Roundabout	-	5,213,625	-	5,213,625	17%	83%
Trents Rd widening	-	251,655	-	251,655	17%	83%
Springs Rd Upgrade Prebbleton - CSM2	-	522,240	-	522,240	17%	83%
Springs/Marshs Rd Roundabout	-	4,785,807	-	4,785,807	17%	83%
Ellesmere Rd Seal Widening	-	2,411,682	-	2,411,682	34%	66%
Tosswill Road Domain Frontage Upgrade	-	300,000	-	300,000	34%	66%
Blakes Rd Widening	-	163,520	-	163,520	17%	83%
Robinsons Rd Seal Extension	-	191,476	-	191,476	34%	66%

Figure 6-1: Selwyn Long Term Plan Upgrades

6.2 Regional Public Transport Plan

The Environment Canterbury Regional Public Transport Plan 2018-2028 outlines a 'proposed public transport network' for the next 10 years which would see an additional high frequency route running through Prebbleton to Lincoln.

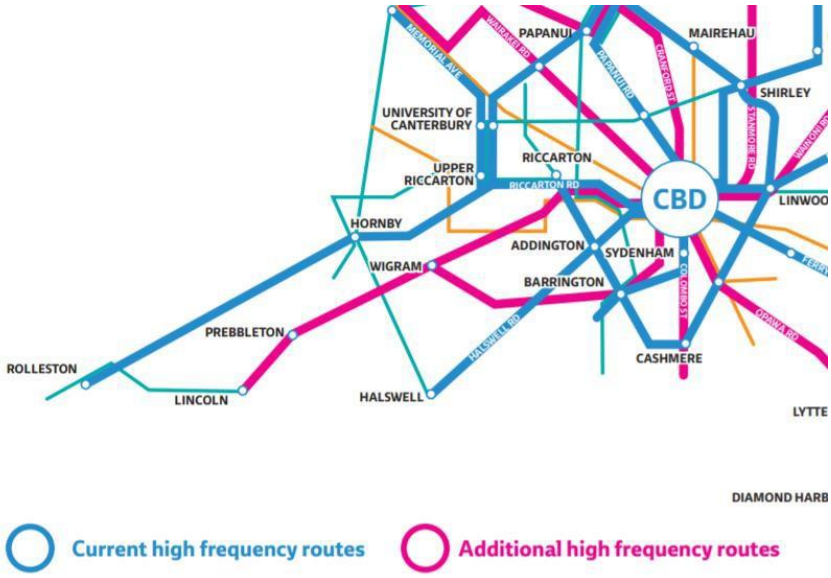

Figure 6-2: Proposed Public Transport Network

The Plan also outlines a long term vision for public transport around Christchurch. It includes a 'core service', being a high frequency service with priority measures, through Prebbleton to Lincoln.

7. Proposed Village

7.1 Village Overview

Summerset proposes to develop a retirement village on the Springs Road site in Prebbleton. Figure 7-1 shows the proposed layout of the retirement village, which is proposed to provide the following:

- 224 independent villas and cottages;
- 56 assisted living suites;
- 43 care facility beds; and
- 20 memory care suites.

Figure 7-1: Proposed Village Layout

The assisted living suites, care facility beds and memory care suites will all be located within the main building which is centrally located within the village.

There will typically be up to 30 staff members on-site through the middle of the day during a shift change.

7.2 Proposed Vehicle Access

The primary vehicle access for the village is proposed on Springs Road approximately 120m north of Birchs Road. It will be constructed as a vehicle crossing with the footpath continuing across the vehicle access.

Good sightlines greater than 113m will be available in both directions for drivers exiting the site. There are existing trees / shrubs to the north of the driveway which will be trimmed / removed as required to maintain the clear sightlines.

The vehicle crossing has been designed to accommodate medium rigid trucks turning in and out of the driveway, as indicated in Figure 7-2.

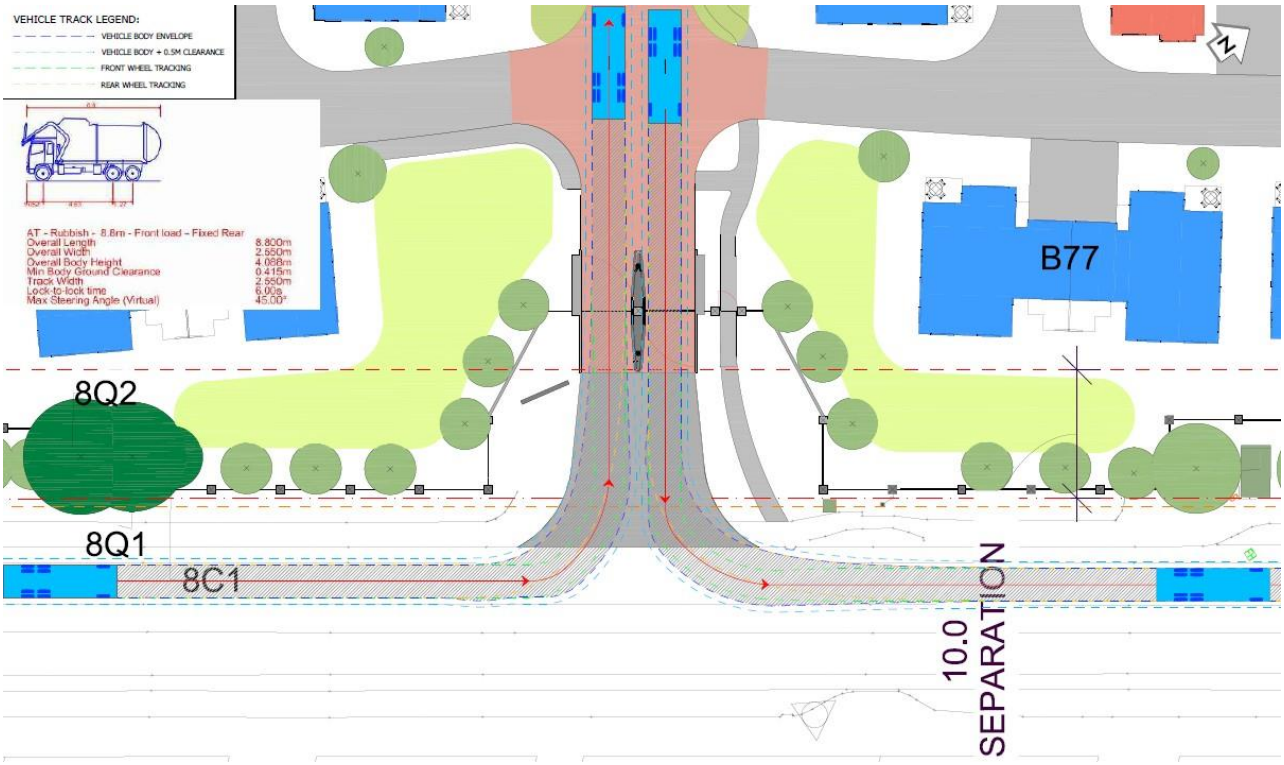

Figure 7-2: Medium Rigid Truck Tracking at Springs Road Access

A security gate will be located 14.6m inside the site boundary. The gate will be open during the day (expected to be approximately 6:15am-8:30pm as adopted at the Summerset Wigram village) when the vast majority of staff and visitor vehicle movements will be made.

Secondary vehicle access is proposed to and from Glenary Drive to the west of the site. This access will operate under gated control, with 5m between the site boundary and the gates. During the day the gates will be continuously open and during the night the gates will be closed. Egress will still be available from the access point during the night-time when the gates are closed and will likely be operated by a fob system.

7.3 Village Roading

Internal road widths are proposed consistent with the village road hierarchy. The main driveway and loop road are proposed to be 6.5m wide with most other roads being 5.5m wide to allow for two-way vehicle movement at slow speeds. A small number of short, no-exit sections of road, only serving 5-8 villas, are proposed to be 4.5m in width. These road widths and the proposed individual villa driveway arrangements are consistent with those adopted regularly at Summerset retirement villages.

7.4 Proposed Pedestrian Provision

Generally, within the village, the slow speed roads will be shared by pedestrians and vehicles, as is typical at Summerset villages. Footpaths are proposed along the main driveway and connecting throughout the village. External pedestrian connections are proposed along the secondary access to Glenary Drive, through an existing reserve onto Edwin Trent Drive to the south, and three locations onto Springs Road - at the vehicle access, at the southern end of the site and near the northern end of the site.

7.5 Proposed Car Parking

All cottages and villas, except for the type C1 and C3 cottages will be provided with a garage and a space in front of the garage for car parking.

Residents of and visitors to the type C1 and C3 cottages will make use of shared parking spaces nearby.

In all, there are 71 car parking spaces around the main building and the nearby type C1 and C3 cottages, for visitors, staff and residents of those cottages. Four disabled parking spaces are proposed in front of the main entrance to the main building.

Most of the parking spaces are proposed as 90-degree spaces, 2.6m wide and 5.4m long, with at least 6.1m wide manoeuvring aisles. The disabled spaces are proposed to be 3.5m wide. Four parallel parking spaces are proposed near the assisted living section of the main building, being 2.5m wide and 6.5m in length.

7.6 Proposed Loading Arrangements

The main building is proposed with a loading area to the rear, accessed from the 6.5m wide loop road around the main building. It is expected that service vehicles will be required to access and egress the site using the main access.

The area has been designed to accommodate a medium rigid truck, as shown in Figure 7-3.

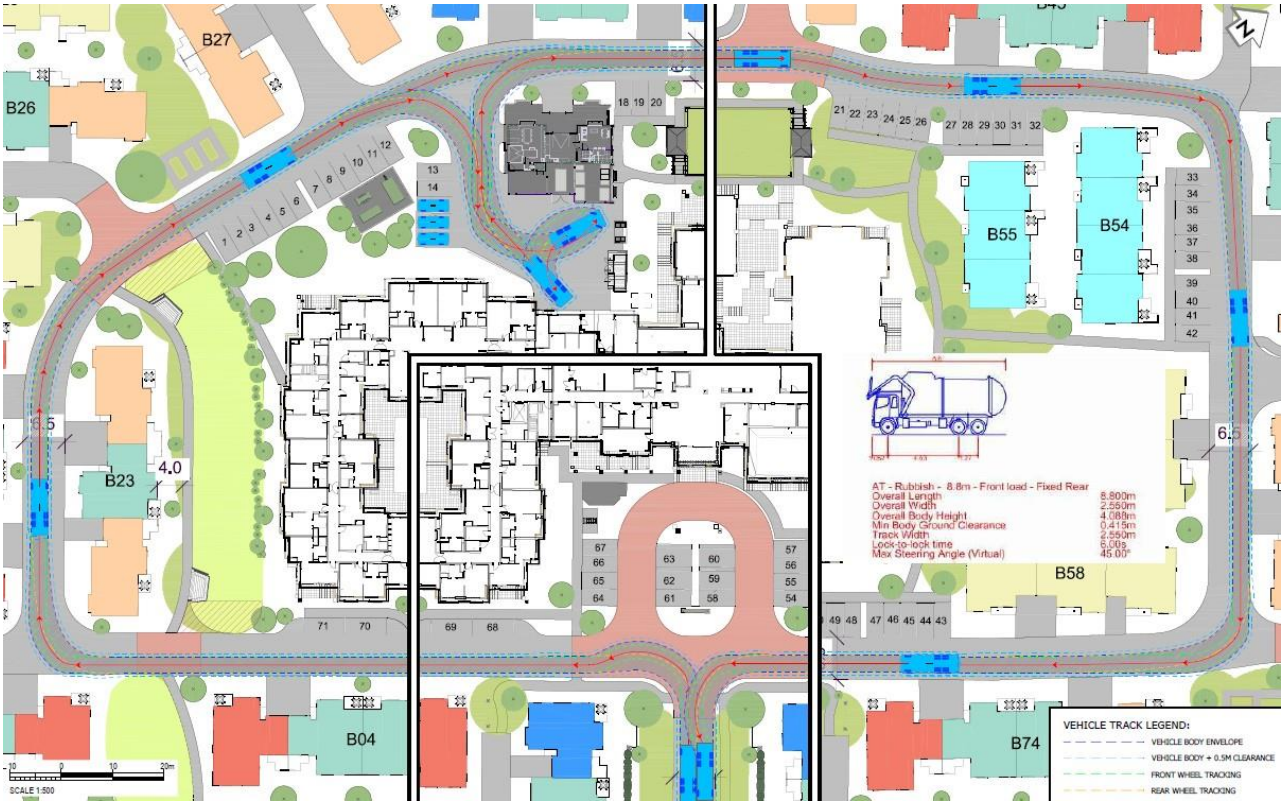

Figure 7-3: Servicing Area Manoeuvring

8. Traffic Generation

The traffic generation rates outlined below for independent villas and care beds / serviced apartments were recorded at the Summerset Wigram village, which is of a similar form and scale to the proposed village (160 villas, 53 serviced apartments and 49 care beds), in June 2018. The AM and PM Peak rates were those recorded during the morning and evening peak periods on the road network (7:00am-9:00am and 4:00pm-6:00pm). The village peak was the busiest hour of village traffic generation recorded which occurred during the mid-afternoon.

Table 8-1: Surveyed Villa Traffic Generation Rates (vehicle movements per day or hour per villa)

Day	Daily (vpd / villa)	AM Peak (vph / villa)	Village Peak (vph / villa)	PM Peak (vph / villa)
Mon - Fri	3.03	0.11	0.25	0.26
Sat	3.28	0	0.36	0.50
Sun	2.44	0.02	0.20	0.30

Table 8-2: Surveyed Care Bed / Serviced Apartment Traffic Generation Rates

Day	Daily (vpd / bed or unit)	AM Peak (vph / bed or unit)	Village Peak (vph / bed or unit)	PM Peak (vph / bed or unit)
Mon - Fri	0.37	0.24		
Day	Daily (vpd / bed or unit)	AM Peak (vph / bed or unit)	Village Peak (vph / bed or unit)	PM Peak (vph / bed or unit)
Sat	1.41	0.07	0.14	0.07
Sun	2.40	0.08	0.16	0.33

The following table summarises the potential weekday traffic generation of the site based on 119 care beds and 224 villas being provided at the Prebbleton site, adopting the Wigram rates:

Table 8-3: Forecast Traffic Generation

Activity	Daily (vpd / bed or unit)	AM (vph / bed or unit)	Village Peak (vph / bed or unit)	PM (vph / bed or unit)
Care Beds	305	7	44	29
Villas	679	25	56	58
Total	983	32	100	87

The daily traffic volume that could be generated by the village is consistent with a typical volume carried by a local residential road.

Based on the site location south-west of Christchurch and the proximity to the main commercial, community and leisure offerings within Prebbleton, the distribution profile for site traffic has been estimated as an 80 – 20 split, with the majority of generated traffic arriving from and departing to the north (Figure 8-1).

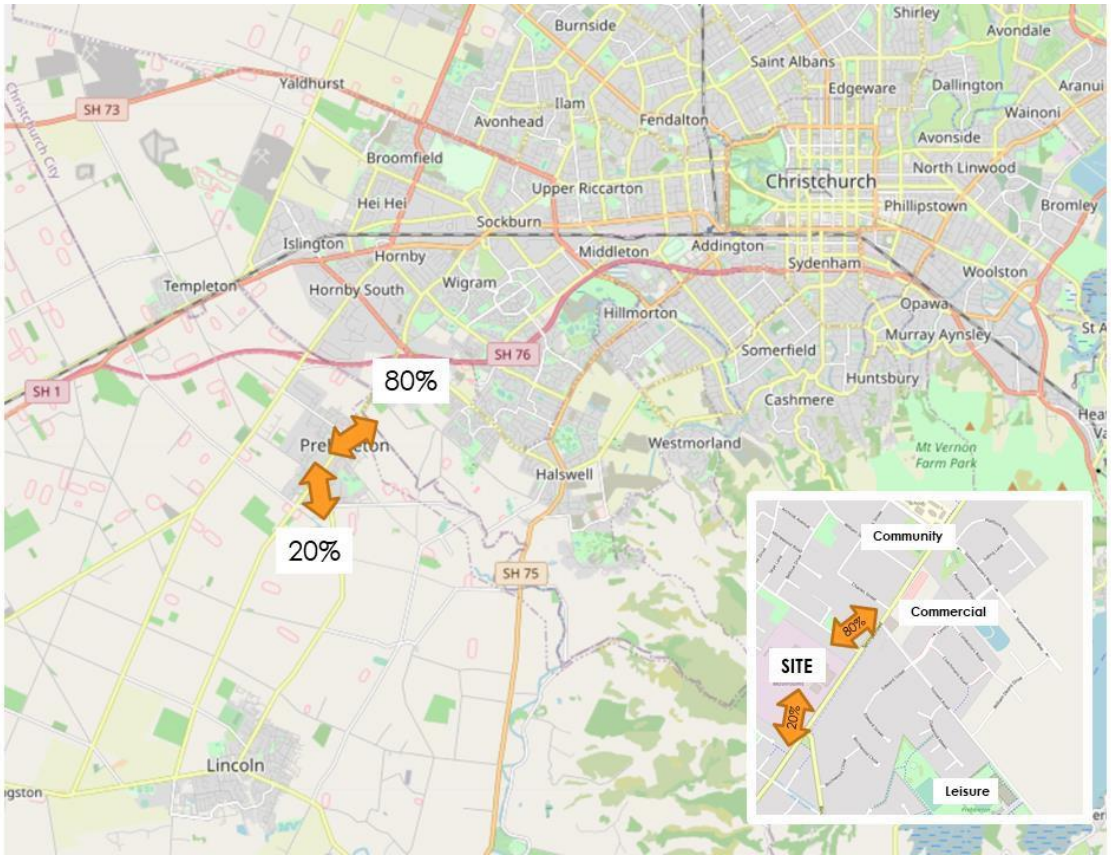

Figure 8-1: Assessed Traffic Distribution

9. Vehicle Access Performance

9.1 Springs Road Vehicle Access Efficiency

The weekday evening peak period has been adopted for analysis of the performance of the proposed Springs Road access, due to Springs Road carrying its highest traffic volumes and the village being expected to generate relatively high traffic volumes during this period.

During the weekday evening peak, it was recorded at Wigram that 53% of traffic generated by the village is entering the village and 47% is exiting the village. This directional split has been adopted for this analysis.

Four access performance scenarios have been tested using Sidra Intersection 8.0 as outlined below. The first three scenarios are based on the existing passing traffic volumes on Springs Road with the proportion of traffic using the rear access to Lindsay Drive and the proportion of Springs Road traffic coming to/from the south varied. The fourth scenario shows the effect of a 10% increase in passing traffic volumes on Springs Road.

Table 9-1: Access Performance Scenarios

Scenario	Using Glenary Drive Access	To/From South at Springs Road	Springs Road Through Volumes
1	20%	20%	Existing
2	0	20%	Existing
3	20%	40%	Existing
4	20%	20%	Existing + 10%

Table 9-2: Assessed Turning Volumes at Springs Road Access

Scenario	Left In	Right In	Left Out	Right Out
1	7	29	26	7
2	9	37	33	8
3	15	22	20	13
4	7	29	26	7

Default gap acceptance parameters have been adopted and the access has been modelled as a T-intersection with a right turn lane on Springs Road which in practice is provided by the flush median.

Scenario 1 results are summarised below. The delay for the right turn out of the village would be approximately 45s but it is a low volume of traffic making that turn and there would be minimal queuing, as indicated by the reported 95 percentile queue length of 0.4 vehicles. In practice, this means that any queues longer than one vehicle would be infrequent and delays would be due to the relatively high passing traffic volumes and not queuing on-site i.e. stopline delay and not queuing delay.

There would be only a small delay and minimal queuing for the right turn into the site, meaning that any vehicles waiting to turn right into the site could do so on the flush median and through traffic would not be affected by the operation of the access.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Springs Road South												
1	L2	7	0.0	0.359	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
2	T1	680	3.0	0.359	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		687	3.0	0.359	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
North: Springs Road North												
8	T1	851	3.0	0.445	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	31	0.0	0.037	7.8	LOS A	0.1	1.0	0.58	0.72	0.58	44.4
Approach		881	2.9	0.445	0.3	NA	0.1	1.0	0.02	0.03	0.02	49.7
West: Village Access												
10	L2	27	0.0	0.117	7.8	LOS A	0.4	2.5	0.75	0.86	0.75	40.9
12	R2	7	0.0	0.117	44.7	LOS E	0.4	2.5	0.75	0.86	0.75	40.5
Approach		35	0.0	0.117	15.6	LOS C	0.4	2.5	0.75	0.86	0.75	40.8
All Vehicles		1603	2.9	0.445	0.6	NA	0.4	2.5	0.03	0.04	0.03	49.5

Figure 9-1: Scenario 1 Springs Road Access Performance Summary

The following summarises the results for Scenario 2. With no traffic using the rear access and all traffic using the Springs Road access, there would not be a noticeable change to the performance of the access.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Springs Road South												
1	L2	9	0.0	0.361	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
2	T1	680	3.0	0.361	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		689	3.0	0.361	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
North: Springs Road North												
8	T1	851	3.0	0.445	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	39	0.0	0.047	7.8	LOS A	0.2	1.3	0.58	0.74	0.58	44.3
Approach		889	2.9	0.445	0.4	NA	0.2	1.3	0.03	0.03	0.03	49.6
West: Village Access												
10	L2	35	0.0	0.139	7.8	LOS A	0.4	3.1	0.75	0.87	0.75	41.1
12	R2	8	0.0	0.139	45.8	LOS E	0.4	3.1	0.75	0.87	0.75	40.7
Approach		43	0.0	0.139	15.2	LOS C	0.4	3.1	0.75	0.87	0.75	41.0
All Vehicles		1622	2.8	0.445	0.7	NA	0.4	3.1	0.03	0.04	0.03	49.5

Figure 9-2: Scenario 2 Springs Road Access Performance Summary

The results from Scenario 3 are summarised below. Doubling the number of vehicles turning to and from the south would have a negligible effect on the performance of the access. This confirms that, with the low site traffic generation, the performance of the access is not sensitive to the proportion of traffic turning to/from the south. There would still be minimal queuing expected on-site due to the low turning volumes and as previously described, the delays for the right turn out movements would be caused by the relatively high passing volumes and not queuing on-site.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Springs Road South												
1	L2	16	0.0	0.364	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
2	T1	680	3.0	0.364	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		696	2.9	0.364	0.2	NA	0.0	0.0	0.00	0.01	0.00	49.9
North: Springs Road North												
8	T1	851	3.0	0.445	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	23	0.0	0.028	7.8	LOS A	0.1	0.8	0.58	0.71	0.58	44.4
Approach		874	2.9	0.445	0.3	NA	0.1	0.8	0.02	0.02	0.02	49.7
West: Village Access												
10	L2	21	0.0	0.178	7.8	LOS A	0.5	3.8	0.83	0.92	0.84	38.0
12	R2	14	0.0	0.178	44.8	LOS E	0.5	3.8	0.83	0.92	0.84	37.7
Approach		35	0.0	0.178	22.4	LOS C	0.5	3.8	0.83	0.92	0.84	37.9
All Vehicles		1604	2.9	0.445	0.7	NA	0.5	3.8	0.03	0.04	0.03	49.5

Figure 9-3: Scenario 3 Springs Road Access Performance Summary

Scenario 4 allows for 10% growth in the through volumes on Springs Road, which would be expected to represent at least 5-10 years' worth of growth. This is particularly so given plans to encourage the use of Shands Road, with improved access to/from Prebbleton planned along that route and the Christchurch Southern Motorway having a full interchange at Shands Road, which could lower traffic volumes, or at least slow their growth, on Springs Road. The Scenario 4 results are summarised below.

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Springs Road South												
1	L2	7	0.0	0.395	4.6	LOS A	0.0	0.0	0.00	0.01	0.00	49.4
2	T1	748	3.0	0.395	0.1	LOS A	0.0	0.0	0.00	0.01	0.00	49.9
Approach		756	3.0	0.395	0.1	NA	0.0	0.0	0.00	0.01	0.00	49.9
North: Springs Road North												
8	T1	936	3.0	0.489	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	49.9
9	R2	31	0.0	0.041	8.4	LOS A	0.2	1.1	0.61	0.76	0.61	44.0
Approach		966	2.9	0.489	0.3	NA	0.2	1.1	0.02	0.02	0.02	49.7
West: Village Access												
10	L2	27	0.0	0.161	8.4	LOS A	0.5	3.3	0.82	0.92	0.82	38.9
12	R2	7	0.0	0.161	63.9	LOS F	0.5	3.3	0.82	0.92	0.82	38.6
Approach		35	0.0	0.161	20.1	LOS C	0.5	3.3	0.82	0.92	0.82	38.8
All Vehicles		1757	2.9	0.489	0.6	NA	0.5	3.3	0.03	0.03	0.03	49.5

Figure 9-4: Scenario 4 Springs Road Access Performance Summary

With a 10% increase in peak hour traffic volumes on Springs Road, the performance of the right turn out of the village access would deteriorate to a Level of Service F. With the low forecast volume of vehicles turning right, the queuing at the access would still be minimal. The right turn into the site would still operate with low delays and negligible queuing, meaning the through traffic on Springs Road would not be impacted by the operation of the access.

9.2 Springs Road Access Safety

Good sightlines will be available for people turning out of the site meaning that drivers will be able to choose safe gaps in the passing traffic. The sightlines will be available from a point where vehicles are clear of the carriageway such that waiting vehicles will not impact the through traffic on Springs Road.

It is noted that most people will be expected to turn left out which is the less onerous exit movement. There will be delays for people turning right out of the site, particularly during peak times. However only low volumes of right turns out of the site would be expected and negligible queuing is anticipated on the driveway. This means that people making the right turn will be able to wait without the pressure of a queue forming behind them, until there is a safe gap. It is noted that no crashes have been reported at the three Meadow Mushrooms accesses on Springs Road or at other nearby vehicle accesses and local road intersections on Springs Road since the start of 2015. Also, it should be noted that the Glenary Drive exit will offer an alternative route for people leaving the village towards the south-west e.g. Rolleston. To summarise, it is considered that people will safely be able to turn out of the village at the proposed Springs Road access.

The flush median on Springs Road will allow anyone waiting to turn right into the site to wait clear of southbound through traffic. Some northbound drivers will occasionally need to slow momentarily behind a vehicle turning left into the site which is common and acceptable at low traffic volume carrying vehicle crossings in urban environments. To summarise, it is considered that the proposed vehicle access will have a negligible effect on through traffic on Springs Road.

The vehicle crossing will operate safely for pedestrians on Springs Road. There will be clear visibility between drivers leaving the site and pedestrians on the footpath. Similarly, drivers turning into the site from Springs Road will be able to see pedestrians on the footpath. The vehicle crossing formation with a continuous footpath will allow pedestrians a continuous surface and priority over vehicles crossing it. It is considered that the proposed vehicle access would have a negligible effect on the relatively low volume of pedestrians on Springs Road.

9.3 Zoned Residential Development

It should be reiterated that the site is zoned for residential use. The site would be expected to provide around approximately 85 dwellings or more, (subject to a higher density agreement), and it is noted that around 100 households would be expected to generate similar daily and evening peak traffic volumes to those that could be generated by the proposed retirement village, based on typical residential traffic generation rates.

If approximately 100 residential lots were developed on the site, it would be preferable from a transportation perspective for the development to have a local road intersection on Springs Road, rather than have all access via Glenary Drive which has been designed as a minor local road not intended to carry approximately 1,000vpd (noting that there is no available connection to the site from Cairnbrae Drive or Edwin Trent Drive.

It is considered that the proposed village vehicle access will operate in a similar manner to how a local residential road intersection would in the same location.

10. Wider Traffic Effects

The Glenary Drive access will provide a convenient access for people travelling to/from the immediately surrounding residential neighbourhoods or from the south-west, e.g. Rolleston, via Lindsay Drive and Trents Road. If 20% of the village traffic uses the Glenary Drive access, this would represent less than 20 vehicle movements per hour during peak times and there would be no concern with Lindsay Drive being able to accommodate these traffic movements. It is considered that the increase in traffic volumes using Glenary Drive and Lindsay Drive associated with the village will be no greater than that which would be expected if the site were to be developed for housing (a zoned development).

Most village traffic will turn directly to/from the arterial road network (Springs Road). If 80% of the peak hour traffic turns to/from Springs Road and 80% of that traffic is to/from the north, the village could result in an increase of approximately 55vph on Springs Road north of the site. This equates to one extra vehicle northbound and one extra vehicle southbound every two minutes and would not have a noticeable effect on the operation of Springs Road. Traffic volume increases in other directions would be much smaller and similarly would not have a noticeable effect on other surrounding roads.

Overall, it is considered that the proposed retirement village will have a negligible effect on the surrounding road network.

11. Non-Car Travel

The site is well located for travel by bus, being on an existing bus route and having a pair of bus stops at the northern end of the Springs Road site frontage. The Regional Public Transport Plan indicates that a more frequent bus service could be offered through Prebbleton in the future.

The proposed village is also well connected for pedestrian access with three connections proposed to Springs Road as well as connections to Glenary Drive and Edwin Trent Drive.

There are currently limited facilities to assist pedestrians in the wider area to cross Springs Road in the vicinity of the bus stops closest to the site. The pedestrian refuge is located approximately 160m northeast of the bus stops, and whilst pedestrians from the site will still be within 400m walking distance, it is likely some will choose to cross closer to the bus stop. As demand increases from the wider area, it is considered there will be community benefit in Council providing an additional refuge crossing on Springs Road. It is considered that can be addressed as part of the council's future traffic calming upgrade to Springs Road. This will improve accessibility for the wider community seeking to use public transport and cross Springs Road in general, and will also support those from the village crossing Springs Road.

Cyclists will safely be able to share the retirement village roads which will carry low traffic volumes at slow speeds.

12. District Plan Compliance

A full assessment against the District Plan 'Roading' rules has been carried out and is summarised in the table in Appendix A of this report. Any matters of non-compliance are assessed below.

12.1 Rule 5.2.1.2- Access to Springs Road

The District Plan requires that access be provided to the lower classified frontage road. The site has frontage to Glenary Drive and Springs Road, with access proposed to both roads. It is considered likely that this rule is intended for individual residential properties which typically only have one access rather than for a comprehensive development such as a retirement village.

As outlined earlier, it is considered preferable that the retirement village has direct access to Springs Road rather than having all village traffic required to use the local road network (Glenary Drive and Lindsay Drive) which has not been designed for such traffic volumes.

It has been assessed that the Springs Road vehicle crossing will operate safely and that there will be negligible adverse effects on the operation of Springs Road from having the proposed vehicle access.

12.2 Rule 5.2.1.6 – Vehicle Accessway Formation

The vehicle accessways (lanes) will exceed the maximum formed width of 3.5m as they will be supporting a comprehensive development of 224 dwelling units and care home. In this situation a maximum width of 3.5m is not appropriate.

It is considered that there are no adverse effects from the non-compliance with this rule.

12.3 Rule 5.2.1.7 – Shared Access to be vested

Non-compliance with this rule means the activity will be deemed a non-complying activity relating to vehicle accessways.

The site is proposed to be developed as a self-contained retirement village with 224 independent living units and assisted living suites, care beds and memory care units in a main building. The accommodation built-form will be supported by landscaping and traffic routes aimed at developing a low speed and calm environment for residents who will be at varying stages of physical and mental cognizance. In order to provide enhanced security and facilities to residents a single operator will administer the site as a private concern, including access and circulation. To enable this the operator will not be vesting the roading with the Council. Notwithstanding this the site will be accessible to the public during defined times (usually dawn-dusk) and as such, the roads within the site would be expected to be maintained to a standard commensurate with the council's engineering code of practice.

It is considered that there are no adverse effects from the non-compliance with this rule.

12.4 Rule 5.3.1.1- E13.2.4.2- Number of Vehicle Crossings

The District Plan has a requirement for developments in Living Zones to only have one vehicle crossing per site. As above, it is considered likely that this is intended for individual residential lots and not for comprehensive developments such as retirement villages. Also as above, it is considered preferable that the village has access directly to/from Springs Road rather than have all traffic use the local road network which has not been designed to accommodate such traffic volumes.

The second vehicle crossing to Glenary Drive will be expected to provide convenient access for some staff and visitors, remove the need for all people driving to the site to use Springs Road and provide a second access for an emergency.

It is considered that there are no adverse effects from the non-compliance with this rule.

12.5 Rule 5.3.1.1- E13.2.4.5 -Widths of Vehicle Crossings

Vehicle crossings are permitted to have widths up to 7m wide in Living Zones. The Springs Road vehicle crossing is proposed to be 11.7m wide to comfortably accommodate service vehicle tracking and two-way

vehicle movements. It has been assessed that the vehicle crossing on Springs Road has been designed appropriately and will operate safely. There will be only low pedestrian volumes across the driveway and it is concluded that any adverse effects from this non-compliance will be negligible.

Glenary Drive will continue into the site without a typical physical vehicle crossing, however the line across the driveway at the boundary has been treated as a vehicle crossing for this District Plan compliance assessment. The vehicle crossing will be 8m wide at the boundary to tie in with the existing Glenary Drive carriageway formation. There will be no adverse effects arising from this non-compliance given there is no footpath crossing the vehicle crossing and effectively the road will continue into the site, albeit as a private driveway.

12.6 Rule 5.3.1.4 - Access on Arterial Road

The wording of this rule is unclear and, depending on interpretation, it may not apply given Springs Road has a speed limit less than 70km/h. However, since the vehicle crossing on Springs Road will accommodate more than 100vpd, it has conservatively been assessed that the activity has a restricted discretionary status under this rule. It has been assessed that the Springs Road access will operate safely and the traffic generated by the village will have a negligible effect on the operation of Springs Road. Also, as above, it is preferable from a transport perspective that a comprehensive development of this size has direct access to/from Springs Road. It is concluded that there will be negligible adverse effects from this non-compliance.

12.7 Rule 5.5.1.2- E13.1.10 - Queuing Space

The District Plan requires 25.5m queuing space for 151 or more car parking spaces. 14.6m is proposed to the gate on the Springs Road driveway and 5m is proposed to the gates on the Glenary Drive access. This is a combined total of 19.6m queuing space.

It is considered that this is a technical non-compliance only. During daytime hours when most staff and visitors are arriving/leaving, the gates on both driveways will be open. There will be approximately 30m from Springs Road to the first internal intersection and approximately 20m from Glenary Drive to the first internal intersection. This will be more than enough queuing space to ensure there are no vehicles queued back onto the frontage roads.

During the night, the Springs Road gate will be closed but set back from the road sufficiently to allow three cars to queue clear of the carriageway. This will be more than enough queuing space to ensure that there will be no adverse effects on the operation of Springs Road based on the low numbers of vehicles that would enter during the night. There will be no vehicle entry from Glenary Drive during the night and therefore no queuing space would be required on the Glenary Drive driveway once the gate is closed.

12.8 Rule 10.8 - Scale of Activity

The memory care suites, rest home are deemed to be non-residential activities and will be staffed by more than two persons who will live off-site. Furthermore, the gross floor area of the memory care suites and hospital will exceed 300m^2 and associated vehicle movements will likely exceed 40 per day. The non-residential activities are deemed to be a Discretionary Activity under Rule 10.8.3. Effects on the road network associated with generating more than 40 vehicle movements per day has been assessed above.

13. Conclusion

Summerset proposes to establish a comprehensive car retirement village on Springs Road in Prebbleton. The development site is within the Living X zone in the Selwyn District Plan.

The proposed retirement village contains 224 independent villas and cottages, 56 assisted living suites, 20 memory care suites, and 49 care facility beds. The proposed layout will create a contained, low-speed internal transport network that is consistent with the established Summerset retirement village model.

The main access to the retirement village will be from Springs Road. It has been concluded that the proposed vehicle access arrangements are appropriate for the location and activity and the access will be expected to operate safely. It has been concluded that the Springs Road vehicle access and the traffic generated by the village will have a negligible effect on the operation of Springs Road. Furthermore, the traffic volumes that could be generated by the village will be similar to those which could be generated by a zoned residential development of the site and a local road intersection on Springs Road would be preferable for a retirement village (rather than having all traffic use Glenary Drive and Lindsay Drive).

There are no safety concerns with the surrounding transport network that would be exacerbated by the addition of the proposed retirement village.

The village will be well located close to public transport facilities and it is proposed to have good connectivity to the surrounding areas for pedestrians.

It is concluded that the proposed village will have negligible effects on the surrounding transport network and can be supported from a transport perspective.

Appendices

Appendix A District Plan Transport Rules Compliance

DP Rule	DP Requirement	Proposed Provision	Compliance
Vehicle Accessways			
5.2.1.1	The site has legal access to a formed, legal road	Direct access to Springs Road and Glenary Drive	Yes
5.2.1.2	Any site with more than one road frontage to a road that is formed and maintained by Council, shall have access to the formed and maintained (and legal) road with the lowest classification, except that where a site has frontage to a collector road and a local road, access may be obtained to either road	Access to both Springs Road (arterial) and Glenary Drive (local)	No, see report section 12.1
5.2.1.3	The vehicle accessway is formed on land which has an average slope of less than 20°	No reason to indicate the site cannot comply	Yes
5.2.1.4	The vehicle accessway does not have a gradient greater than: (a) 1:6 vertical; or (b) 1:20 horizontal; and	No reason to indicate the site cannot comply	Yes
5.2.1.5	The vehicle accessway is not located closer than: (a) 20m to any waterbody listed in Appendix 12; or (b) 20m to a site listed in Appendices 3 or 4; and	The site is not located closer than 20m to a listed waterway or site	Yes
5.2.1.6	The vehicle accessway is formed to the relevant standards in Appendix E13.2.1 and in addition for the Living 3 Zone at Rolleston identified on the Outline Development Plan in Appendix 39 and 40, private vehicular accessways serving less than three sites shall have a maximum formed width of 3.5m at the road boundary and within 10m of the road boundary; and	Vehicle accessway will provide the principal means of access to 224 dwelling units and a care home facility	No, see report section 12.2
5.2.1.7	Shared access to more than six dwellings or sites shall be by formed and vested legal road and not by a private accessway	Accessway serves in excess of 6 dwellings and is not proposed to be vested legal road	No, see report section 12.3
5.2.2	In the Living Z Zone, any activity served by a shared vehicle access that does not comply with Rule 5.2.1.7 shall be a discretionary activity if the following condition is met:		
5.2.2.1	The shared vehicle access provides only secondary access and there is an alternative unshared vehicle access to a formed and vested road	Site is Living X, so this rule does not apply	N/A
5.2.3	Any activity which does not comply with any of Rules 5.2.1.2 to 5.2.1.6 inclusive shall be a discretionary activity	5.2.1.2 and 5.2.1.6 non-compliances	Discretionary Activity
5.2.4	Except as provided in Rule 5.2.2, any activity which does not comply with Rule 5.2.1.1 or Rule 5.2.1.7 or Rule 5.2.1.8 shall be a non-complying activity	Rule 5.2.1.7 is not complied with	Non Complying Activity

DP Rule	DP Requirement	Proposed Provision	Compliance
Vehicle Crossings			
5.3.1.1	The vehicle crossing is formed and sited to comply with the relevant requirements in Appendix E13.2.2, E13.2.4 and E13.2.5		
E13.2.2	No part of any vehicle crossing shall be located closer to the intersection of any roads than the minimum distances specified in Table E13.5 For a vehicle crossing on an arterial road with a 50km/h speed limit, 30m separation to intersection	Springs Road vehicle crossing approximately 100m from Birchs Road intersection. Glenary Drive vehicle crossing 50m from Lindsay Drive	Yes
E13.2.4.2	For all sites in a Living Zone there shall be a maximum of one vehicle crossing per site	One vehicle crossing on Springs Road and one on Glenary Drive	No, see report section 12.4
E13.2.4.5	7m minimum spacing between vehicle crossings 4m-7m widths	More than 150m to nearest vehicle crossings on same side of Springs Road. Springs Road vehicle crossing approximately 11.7m wide at the boundary. Glenary Drive vehicle crossing is the width of Glenary Drive (8m)	No, see report section 12.5
E13.2.5	Heavy duty vehicle crossing required for sites which contain more than 6 dwellings or generate more than 100vpd	Heavy duty vehicle crossing will be provided on Springs Road. Glenary Drive access will be continuation of pavement as no kerb to cross but will be to same standard	Yes
5.3.1.2	The vehicle crossing is to be sealed if the adjoining road is sealed; the crossing shall be sealed for the full length between the site boundary and the sealed carriageway	Vehicle crossing will be sealed	Yes
5.3.1.3	The vehicle crossing complies with the relevant standards in Appendix E13.2.3		
E13.2.3	113m sight distances required for vehicle crossing on arterial road with 50km/h speed limit	Springs Road site access will provide sight distances required	Yes
5.3.1.4	The site does not have access directly on to a State Highway or arterial road listed in Appendix 7; unless: the speed limit on that part of the road to which access is gained is 70km/h or less; or the site is used solely to house a utility structure; and the site generates less than 100 equivalent car movements per day	Direct access to arterial road, speed limit less than 70km/h but access will accommodate more than 100vpd	No, see report section 12.6
Vehicle Parking and Cycle Parking			
5.5.1.1	The number of car parks provided complies with the relevant requirements for the activity as listed in Appendix E13.1.1, E13.1.2, E13.1.3 and E13.1.12		
E13.1.1 Space numbers tables	Residential activities require 2 spaces per dwelling Care homes require 1 parking space per 3 clients. For 119 care rooms, 40 spaces required	All villas with a garage and space in front of the garage except the nine C1 and C3 villas will share the central car parking. 71 parking spaces proposed around the main building- exceeding the 40 spaces	Yes

DP Rule	DP Requirement	Proposed Provision	Compliance
		required for the main building and two spaces for each of the C1 and C3 villas	
E13.1.1 Space dimension table	Long term 90 degree: 2.4m x 5.4m + 6.2m aisle Medium term 90 degree: 2.5m x 5.4m + 5.8m aisle Short term 90 degree: 2.6m x 5.4m + 5.4m aisle Disabled spaces: 3.2m x 5.4m Parallel spaces: 2.5m x 5.4m + 5.5m aisle	All 90-degree spaces 2.6m x 5.4m with at least 6.5m aisles (aisles vary) Disabled spaces 3.5m wide Parallel spaces 2.5m x 6.5m	Yes
E13.1.2	Any area required for on-site parking or loading shall be available at all times for staff and visitors during the hours of operation of the activity and shall not be diminished by any subsequent erection of any structure, storage of goods	As required	Yes
E13.1.3	All parking and loading areas required shall be located on the same site as the activity for which the parking is required	All on the same site	Yes
E13.1.12	The surface of any parking, loading and associated access areas shall be formed, sealed and drained with the parking spaces permanently marked	All driveable surfaces will be formed, sealed and drained and parking spaces will be marked	Yes
5.5.1.2	All car parking spaces and vehicle manoeuvring areas are designed to meet the criteria set out in Appendix E13.1.5.2, E13.1.6, E13.1.7, E13.1.8, E13.1.9, E13.1.10 and E13.1.11		
E13.1.5.2	No loading zone shall obstruct any on-site car parking space or any vehicle or pedestrian access	Loading area will not obstruct parking or access	Yes
E13.1.6	Garage parking spaces for any residential activity in any zone shall have the following minimum internal dimensions: Single- 3.1m x 5.5m Double- 5.6m x 5.5m The minimum width of the entrance to a single garage shall be 2.4m. Any other parking space for any residential activity shall be at least 2.5m x 5.0m. The manoeuvring area to and from the site access to the parking space shall be designed to accommodate at least the design motor car as set out in the Council's Engineering Code of Practice. Where two parking spaces are required for any residential activity, they may be provided in tandem.	Garage spaces and spaces in front of garages will meet these standards	Yes
E13.1.7	The gradient for any on-site parking surface for any non-residential activity, shall be no more than 1:16 at 90 degrees to the angle of parking and 1:20 parallel to the angle of parking.	Site is flat and parking areas will comply	Yes
E13.1.8	The maximum average gradient of any access shall be 1 in 6. The maximum gradient shall be 1 in 4 on any straight section and 1 in 6 around curves.	Site is flat and access gradients will comply	Yes
E13.1.9	On-site manoeuvring shall be provided to ensure that no vehicle is required to reverse either onto or off a site where the site has access to an arterial road.	No vehicle will be required to reverse onto Springs Road. Parking area dimensions mean that no vehicle will be	Yes

DP Rule	DP Requirement	Proposed Provision	Compliance
	Parking spaces shall be located so as to ensure that no vehicle is required to carry out any reverse manoeuvring when entering any required parking space. Vehicles shall not be required to undertake more than one reverse manoeuvre when manoeuvring out of any required parking or loading space.	required to reverse into a parking space (except into the parallel spaces) or undertake more than one reverse manoeuvring when exiting.	
E13.1.10	A queuing space shall be provided on-site for all vehicles entering or exiting a parking or loading area. For 151 or more parking spaces, 25.5m minimum queuing space required.	14.6m to gate on Springs Road access and 30m to internal intersection. Glenary Drive access will have 5m queuing space to gates	No, see report section 12.7
E13.1.11	Any parking and loading areas which are required at night shall be illuminated to a minimum maintained level of 2 lux, with high uniformity, during the hours of operation	Site will be lit as required	Yes
5.5.1.3	Each site that is used for an activity which is not a residential activity and which generates more than 4 heavy vehicle movements per day has one on-site loading space which complies with the requirements set out in Appendix E13.1.5.		
E13.1.5.1	All loading and manoeuvring shall be carried out on-site. The manoeuvring area to and from the loading zone shall be designed to accommodate at least the design truck as detailed in the Council's Engineering Code of Practice.	All loading will be carried out on site. A medium rigid truck will be able to manoeuvre to and from the loading area	E13.1.5.1
E13.1.5.2	No loading zone shall obstruct any on-site car parking space or any vehicle or pedestrian access	Loading area will not obstruct parking or access	E13.1.5.2
5.5.1.4	Each site which is accessed from a road listed as a State Highway or arterial road in Appendix 7 is designed so that a motor vehicle does not have to reverse on, or off, the State Highway or arterial road	No vehicle will need to reverse from the village	5.5.1.4
5.5.1.5	Each site that is used for an activity other than a residential activity, has one car park space for mobility impaired persons for up to10 car parking spaces provided, and one additional car park space for a mobility impaired person for every additional 50 car parking spaces provided or part there-of. For 71 parking spaces- three disabled spaces required.	Four disabled spaces proposed	5.5.1.5
5.5.1.6	Car parking spaces for mobility impaired persons are: a) sited as close to the entrance to the building or to the site of the activity as practical; b) sited on a level surface; and c)clearly marked for exclusive use by mobility impaired persons.	Disabled spaces are proposed as close to the building entrance as possible, on a level surface and clearly marked for exclusive use	5.5.1.6
5.5.1.7	Cycle parking spaces are provided in accordance with the standards in Appendix E13.1.4		
E13.1.4	Any activity, other than residential activities, is to provide cycle parking at a minimum of 2 spaces and then a rate of 1 cycle space for every 5 car parking spaces required, to a maximum of 10 cycle spaces.	12 cycle parks are proposed. Cycle parking is proposed near the main building entrance. Stands will comply	Yes

DP Rule	DP Requirement	Proposed Provision	Compliance
	Based on 40 required car parking spaces, 10 cycle parking spaces would be required. All cycle parking required shall be provided on the same site as the activity and located as close as practicable to the building main entrance and shall be clearly visible to cyclists entering the site, be well lit and secure. The type of stand must comply with the Engineering Code of Practice requirements for cycle parking rack systems.	with the Code of Practice standards	
10.8.1	Any activity, which is not a residential activity, shall be a permitted activity if the following conditions are met:		
10.8.1.1	No more than two full time equivalent staff employed on the site live off site, and		
10.8.1.2	The gross floor area of any building(s) other than a dwelling does not exceed 300m^2, or in the case of any building used for spiritual activities does not exceed 500m^2, and		
10.8.1.3	Vehicle movements do not exceed: State Highways, Arterial Roads and Collector Roads: 40 per day plus 4 heavy vehicle movements per day Local Roads: 20 per day plus 2 heavy vehicle movements per day. (PC42)		No, see report section 12.8

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