



## **APPENDIX E**

Transportation Assessment Report –  
Commute Transportation Consultants



**Ryman Healthcare Retirement Village  
26 Donald Street and 37 Campbell Street, Karori,  
Wellington**

**Transportation Assessment Report**

20 July 2020





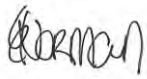
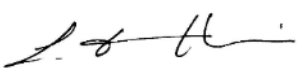
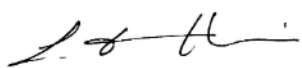
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## 1 INTRODUCTION

Commute Transportation Consultants has been commissioned by Ryman Healthcare Limited (“Ryman”) to assess the potential transport effects of a proposed comprehensive care retirement village (“Proposed Village”) at 26 Donald Street and 37 Campbell Street, Karori, Wellington (“Site”).

The 3.06 ha Site was previously the Victoria University Teachers’ College. This assessment considers the transportation effects of the Proposed Village, comprising:

- 60 care beds;
- 68 assisted living suites; and
- 180 independent apartments.

The Site is within the ‘Outer Residential Area’ zone in the Wellington District Plan (“District Plan”).

This report assesses the transport-related effects of the Proposed Village, including:

- A description of the Site and its surrounding traffic environment;
- A description of the key transportation-related aspects of the Proposed Village;
- The proposed form of access and egress;
- The adequacy of the proposed parking supply in relation to anticipated parking demands;
- The proposed servicing arrangements for the Proposed Village;
- The nature and expected volumes of vehicular traffic likely to be generated by the Proposed Village;
- The expected impact of the additional traffic flows on the surrounding road network; and
- The construction traffic effects of the Proposed Village.

These and other matters are addressed in detail in this report. This report concludes that the establishment of the Proposed Village can be undertaken in a way so that its effect on the function, capacity and safety of the surrounding road network will be minimal.

## 2 EXISTING ENVIRONMENT

### 2.1 TRANSPORT ENVIRONMENT

Figure 2-1 is an aerial photograph showing the Site in relation to the surrounding road network. The Site is located at 26 Donald Street and 37 Campbell Street, Karori, Wellington. Existing access to the Site is via two access points located on Donald Street, and one access point located on Campbell Street.

Karori Road is classified as a “Principal Road” in the District Plan. Both Donald Street and Campbell Street connect to Karori Road to the north of the Site. Campbell Street is classified

as a 'Collector Road' and Donald Street a 'Local Road'. The speed limit on all the roads in the area is 50km/h.

The intersection of Karori Road and Donald Street is signalised, with pedestrian crossings provided across the southern and western legs.

Donald Street extends approximately 900m to the south of the site and has a number of streets that intersect with it. The street ends in a cul-de-sac. Donald Street has a 9.0m carriageway width providing for one lane in each direction and allowing on street parking on both sides over most of the length.

The intersection of Karori Road and Campbell Street is a controlled intersection. Campbell Street connects to Croyden Street to the south and provides a single lane in each direction with on street parking provided for much of the length. To the south of the Site around Ben Burn Park, on-street angle parking is provided on the western side of Campbell Road. The carriageway immediately south of the Site access is 12m in width. To the north of the Site, the road narrows to around 9m in width with intermittent on street parking on either side of the road.

The Site is in close proximity to schools and recreational facilities. Immediately north of the Site is the Karori Town Centre providing retail and business activities.

Figure 2-1: Site Location



## 2.2 DISTRICT PLAN

The Site is zoned as 'Outer Residential Area' in the District Plan (as noted in Figure 2-2 below).

The District Plan maps note that the Site is subject to an Education Precinct overlay and Rule 5.1.2.B, which allows educational services to be provided onsite. Much of the surrounding land is also zoned 'Outer Residential Area' with two nearby recreational areas zoned Open Space A. An educational precinct overlay is also notated on a site located to the north-east of the Proposed Village. The Karori Shopping Centre and Marsden Village are both located on Karori Road in the vicinity of the site and are zoned Centre.

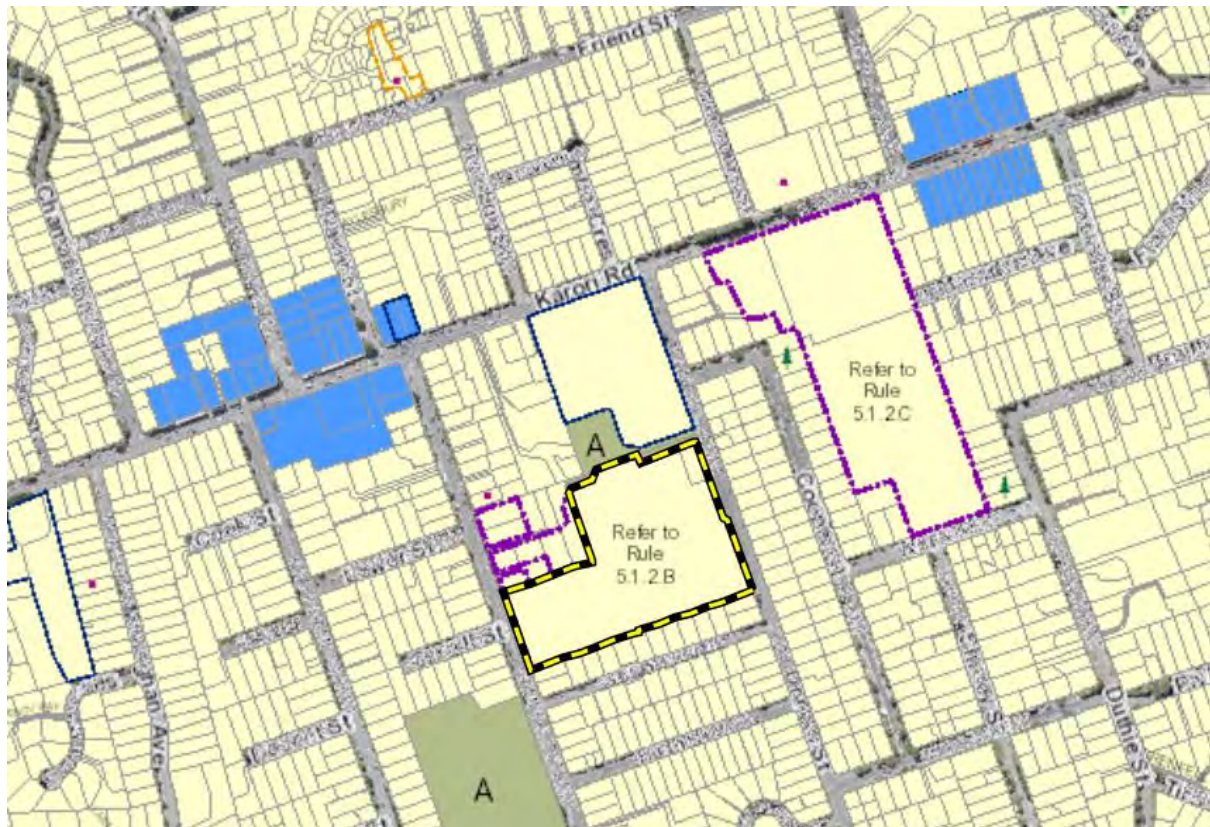


Rule 5.3.7 of the District Plan addresses multi-unit developments. The matters of discretion include:

- Siting (including landscaping, parking areas, vehicle manoeuvring and site access);
- Provision of parking and site access; and
- Traffic effects.

The signage for the Proposed Village is a restricted discretionary activity under Rule 5.3.11, and the matters of discretion include impacts on traffic safety.

Figure 2-2: District Plan zoning



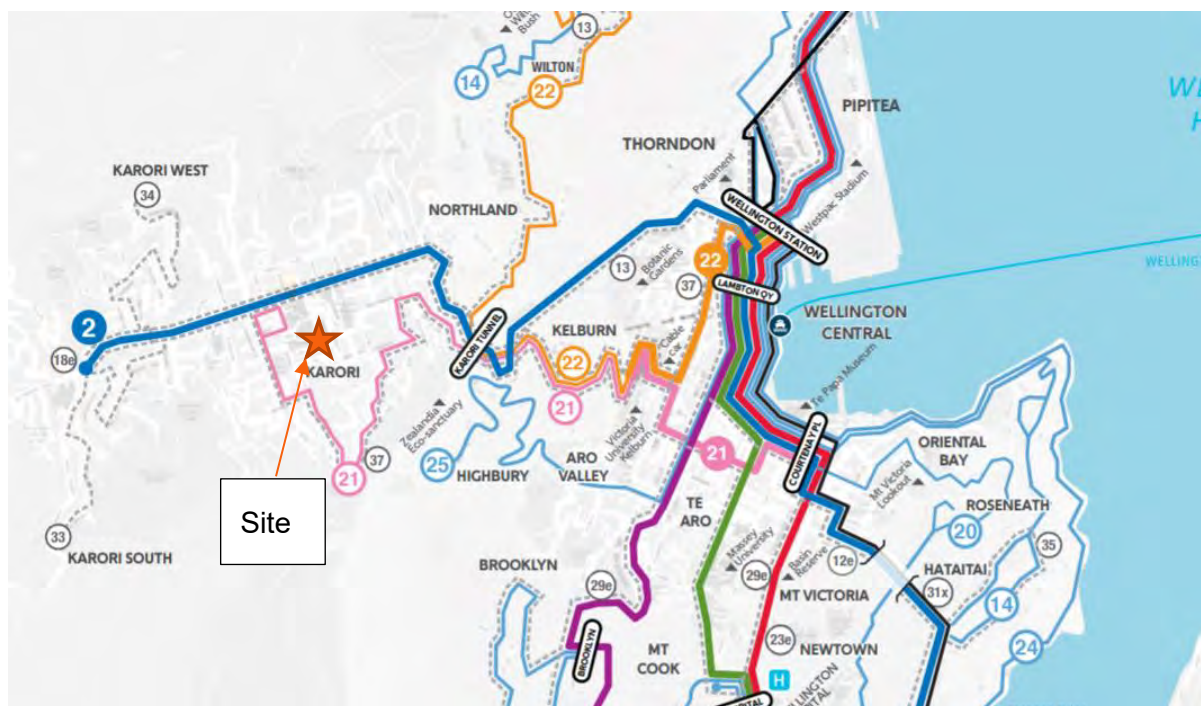
## 2.3 PUBLIC TRANSPORT

A number of bus services pass the Site in close proximity including the following services (as noted in Figure 2-3):

- Service 21 – Karori (Wrights Hill) – Kelburn – Courtenay Place;
- Service 2 – Karori – Wellington – Hataitai – Seatoun;
- Service 33 – Karori South;
- Service 34 – Karori West; and
- Service 37 - Brandon Street - Kelburn - Karori (Wrights Hill) (via The Terrace).
- Bus stops are provided on Karori Road within 300m of the Site, providing access to Services 2, 33 and 34 above.

Service 21 and 37 make use of Beauchamp Street (located west of the Site) and connect to Campbell Street at a point south of the Site. The closest bus stops servicing these routes are located around 350m from the Site, on Verviers Street.

Figure 2-3: Metlink bus network for Wellington



The easily accessible bus services to various destinations means that public transport would be a viable transport option to and from the Proposed Village.

## 2.4 EXISTING TRAFFIC VOLUMES

Traffic data from Wellington City Council indicates that Donald Street had an estimated annual daily traffic (“ADT”) of 1,500 vehicles per day (“vpd”), while Campbell Street carries 1,900 vpd (2015 data). The data was recorded while the former Victoria University Teachers’ College was in operation.

Commuter commissioned traffic surveys in February 2019 to collect data on volumes of traffic on Campbell and Donald Street and Karori Road. In Table 2-1 these recent counts have been compared against historic volumes to highlight any changes in traffic patterns. Karori Road has seen an increase in peak hour volumes particularly during the PM peak. Donald Street volumes can be observed to drop in the AM peak, perhaps as a result of reduced activity from the closure of the Teachers College. During the PM peak, no such reduction is evident.

Table 2-1: Peak hour traffic volumes

Site	2015 (September / November)		2019 (February)		AM % change	PM % change
	AM peak	PM peak	AM peak	PM peak		
Campbell Road	133	187	93	193	70%	103%
Karori Road (west of Campbell)	986	1104	1094	1486	111%	135%
Donald Street	n/a	n/a	92	210	n/a	n/a
Karori Road (east of Donald)	n/a	n/a	1293	1574	n/a	n/a

## 2.5 ROAD SAFETY

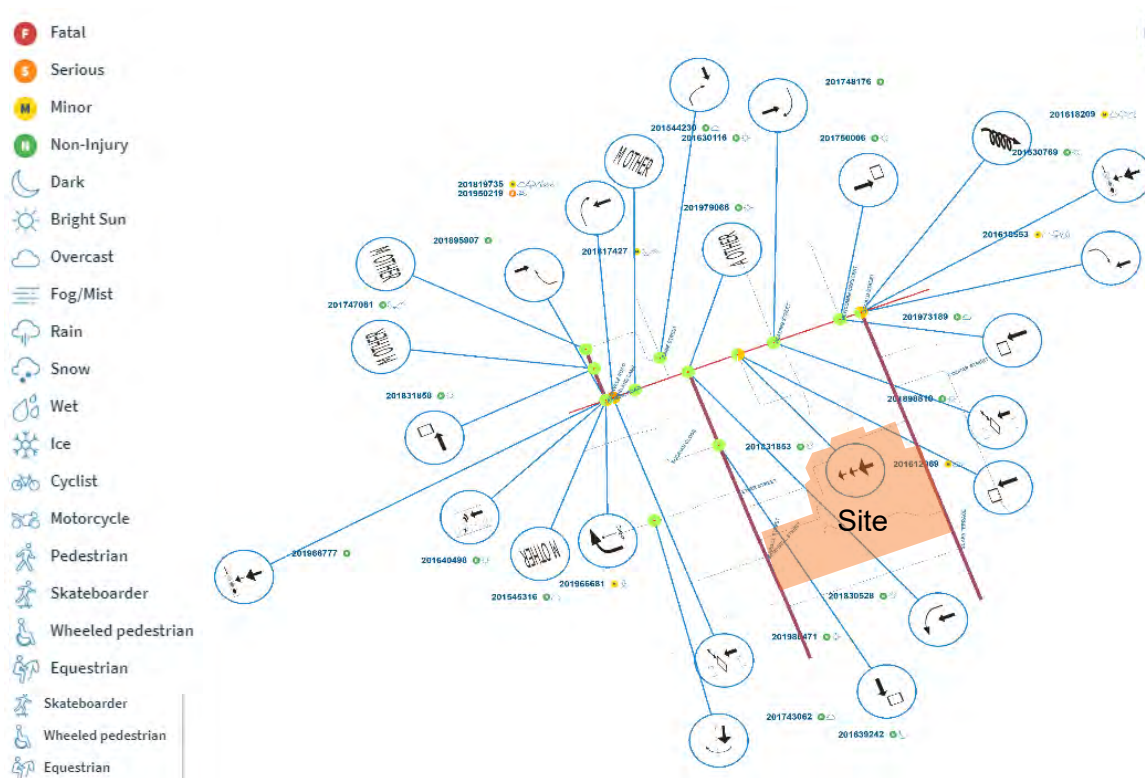
A review of the New Zealand Transport Agency’s (“NZTA”) Crash Analysis System (“CAS”) has been carried out to identify all reported crashes in the vicinity of the Site during the five-year period 2015 - 2019 inclusive of any available 2020 data. The search area included Donald Street, Campbell Street and their intersections with Karori Road.

The crash record for the surrounding area can be summarised as follows:

- The intersection of Donald Street and Karori Road has four recorded crashes:
  - The two minor injury crashes involved a loss of control with alcohol suspected and a right turn movement colliding with through traffic respectively: and
  - The two non-injury crashes involved a rear end type crash and a collision with a parked vehicle and a car failing to give way at a red light and crashing into a turning vehicle.
- The intersection of Campbell Street and Karori Road has two recorded crashes. Both crashes involved a collision between two vehicles travelling in the same direction.
- One midblock crash occurred on Campbell Street involving a vehicle colliding with a parked vehicle.

The collision diagram for the surrounding area is provided in Figure 2-4 below.

**Figure 2-4: Collision Diagram**



There is no history of accidents occurring that relate specifically to movements into and out of the Site (or near the Site). There is no evidence of safety issues related to the existing Site access points.

No common trends or issues with the form of the Donald Street/Karori Road or Campbell Street/Karori Road intersection have been identified.

Therefore, from the assessment of the crash history, there is no indication that the Proposed Village will have a negative effect on road safety in the surrounding road network.

### 3 PROPOSED VILLAGE

Ryman proposes to construct and operate a comprehensive care retirement village at 26 Donald Street and 37 Campbell Street, Karori consisting of the following:

- 60 care beds;
- 68 assisted living suites;
- 180 independent apartments;
- 190 covered parking spaces; and
- 40 parking spaces on grade.

One vehicle access point is proposed on Donald Street and one vehicle access point is proposed on Campbell Street. Figure 3-1 shows the proposed layout of the Site.

Figure 3-1: Proposed Village Layout



### 4 ACCESS

#### 4.1 GENERAL

The primary access to the Site is provided via Donald Street in the same position as the existing access to the Site. The proposed access is located around 40m from closest adjacent vehicle crossing (to the south of the site) and around 115m from the access to the school/pool to the north.

The proposed access to Campbell Street is located on the southern end of the Site frontage. The existing access to Campbell Street (located at the northern end of the frontage) is proposed to be disestablished.

Access provision for the Site has been assessed against the District Plan Section 5.6.1.4.

#### 4.2 NUMBER OF ACCESS POINTS

Section 5.6.1.4 of the District Plan sets out rules regarding the number of access points. For a Site with two road frontages and access to a collector (Campbell Road) and one accessway is permitted to the local road (Donald Street). The Site currently has two access points. Given the Site currently caters for two access points and has over 240m (1 per 80m) of actual road frontage, the proposed access arrangement of two access points equates to 1 per 120m of site frontage and is considered appropriate for access to a site of this size.

#### 4.3 WIDTH OF ACCESS

Section 5.6.1.4 of the District Plan outlines rules relating to access width. For an access point in the 'Outer Residential Area' zone, a maximum of 6.0m in width is allowed for. The proposal includes 2 access points, one of which exceeds 6.0m in width. The main vehicle access on Donald Street is 9m in width, and the Campbell Street access is proposed to be 6.0m.

As such only the Donald Street access exceeds the maximum width for the zone. An assessment has been undertaken of the sight distance and pedestrian provision for each access point in the sections below to determine whether the proposed 9m wide access is appropriate.

#### 4.4 SIGHT DISTANCE

The Land Transport Safety Authority "Guidelines for visibility at driveways" (RTS-6 Guide) recommends that for high volume driveways accessing a local road, with a 50km/h operating speed, the required sight distance is 40m while for a collector road the requirement is 90m. Over 90m of clear sight distance is provided from both the primary Donald Street access and the Campbell Street access point. The access on Donald Street has unrestricted sight distance to the south, however to the north sight distance is restricted to approximately 65m due to a vertical curve north of the access point. Given Donald Street is a local road, this meets the RTS-6 guidelines.

Photograph 1 and Photograph 2 show the available sight distance from the main (east) vehicle access point on Donald Street.

Photograph 3 and Photograph 4 show the available sight distance from the vehicle access point on Campbell Street.

**Photograph 1: Available sight distance from main entrance (east) looking south (Donald Street)**



**Photograph 2: Available sight distance from main entrance (east) looking north (Donald Street)**



**Photograph 3: Available sight distance from Campbell Street access looking north**



**Photograph 4: Available sight distance from Campbell Street access looking south**



#### 4.5 INTERNAL ROAD LAYOUT

The proposed internal road network has been designed to provide a central roading link with access to the parking areas within the Site and to the key buildings.

The main access road through the Site will have an approximate width of 5.5m providing for two-way access while also moderating vehicle speeds. Cross sections and long sections have been provided by BECA and are included in the Drawings attached to the Civil Design Report.

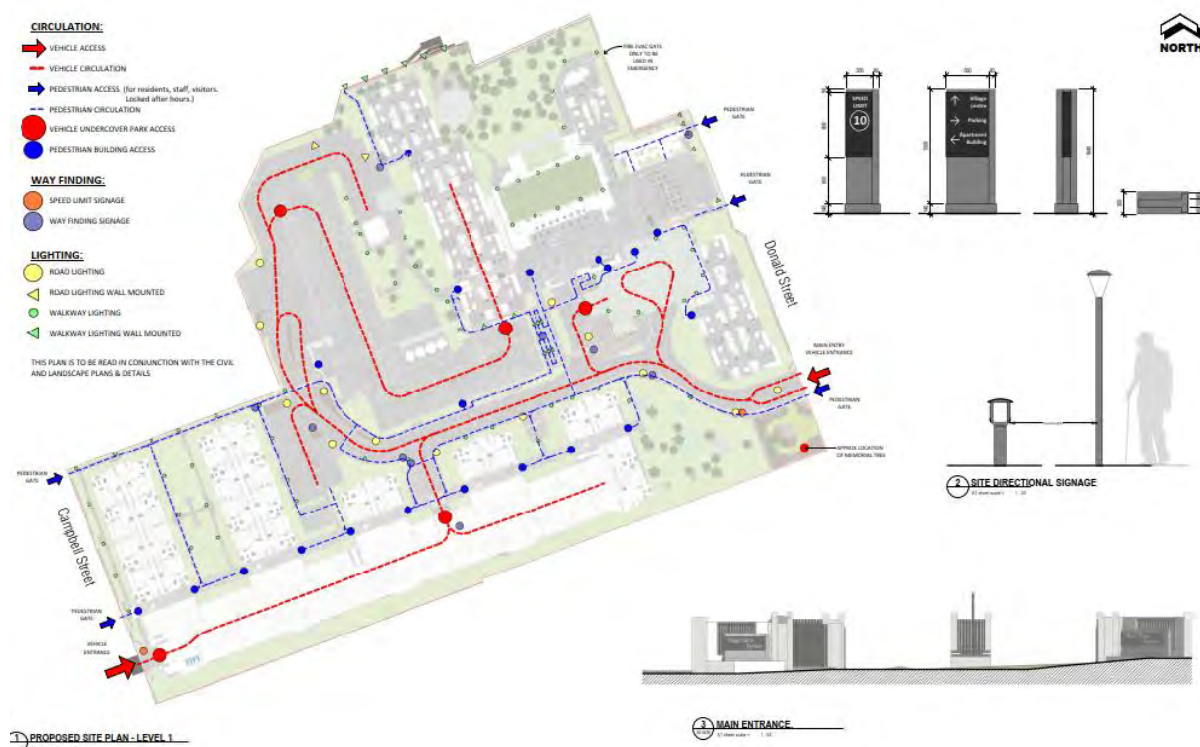
**Attachment A** shows an AS/NZS2890 90<sup>th</sup> percentile car tracking through the Site without difficulty.

Overall, it is considered that the internal road network will provide a high level of convenience for residents and staff and will be simple for all drivers to negotiate.

#### 4.6 PEDESTRIAN PROVISION

Pedestrian footpaths will be provided throughout the Proposed Village, with pedestrian crossings provided at regular intervals ensuring a safe pedestrian environment. Figure 4-1 shows the proposed pedestrian access / provision over the Site (blue lines). RCA06 provides further detail on pedestrian movement through the Site. Appropriate pedestrian paths are provided throughout the Site, including through the parking areas via pedestrian markings.

Figure 4-1: Pedestrian Access Over Site

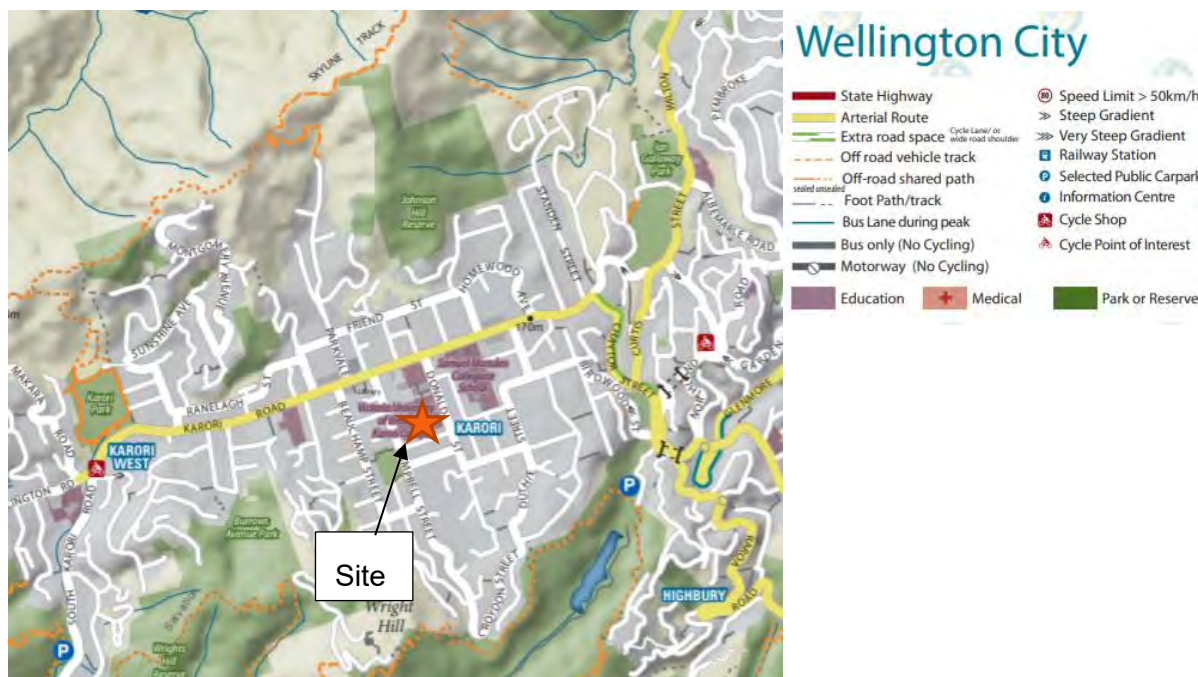


Footpaths exist on both sides of Campbell Street and Donald Street. A zebra pedestrian crossing is provided immediately north of the Site on Donald Street. Further crossing facilities are provided at the Donald Street / Karori Road signalled intersection. A public footpath is located on the northern boundary of the Site, with the parts of the footpath within the Site to be transferred to Council following a boundary adjustment.

While limited formal infrastructure is provided on the surrounding street network, Karori Road is identified by Greater Wellington Regional Council as providing for 'On road cycling (cycle with care)' as shown in Figure 4-2.



Figure 4-2: Cycle routes around the site



The Proposed Village will provide a comprehensive network of internal pedestrian paths and good connectivity to the surrounding footpath network. Overall the Site is considered to be well connected from a walking and cycling perspective.

## 5 TRAFFIC EFFECTS

For multi-unit developments, traffic effects are identified as one of the areas of assessment. For the purposes of this assessment, local traffic effects have been considered at the vehicle access points and at the two key intersections, being Karori Road/Campbell Street and Karori Road/Donald Street.

### 5.1 PROPOSED TRIP GENERATION

Trip rates for the Proposed Village have been determined using the New South Wales (“NSW”) Roads and Traffic Authority Guide to Traffic Generating Developments (“RTA Guide”), NZTA research reports and empirical data from surveys of other Ryman villages in New Zealand.

#### Existing Ryman Village Trip Generation Data

Two operational Ryman retirement villages (Howick and Orewa) have been surveyed as outlined in Table 5-1 to provide some comparison. The survey was undertaken with an automatic tube count over two weeks (14 February to 27 February 2017).

Table 5-1: Survey Results of two operational Ryman Retirement Villages

Place and Date	Howick	Orewa
<b>Details</b>	192 Independent Units 197 Assisted Living Suites / Care Beds <b>389 total units</b>	231 Independent Units 107 Assisted Living Suites / Care Beds <b>338 total units</b>

<b>Average Daily Traffic (daily tripcounts)</b>	942	916
<b>AM commuter peak (between 8-9am) counts</b>	42	54
<b>Interpeak period (typically afternoon) counts</b>	82	85
<b>PM commuter peak (between 4:30-5:30 pm) counts</b>	59	61

One of the key findings in the survey results in Table 5-1 is that drivers within the retirement villages adjust their travel to avoid the peak periods on the surrounding road network. Based on the survey information only 6-7% of the daily trip generation occurs during the peak periods for Ryman retirement villages. Trip generation within this period is mainly a result of staff movements given that residents generally avoid peak traffic periods.

The survey results in Table 5-1 further show that the peak activity from these retirement homes usually occurs on the shoulder of the peak period (i.e. afternoon 2-4pm). Typically, around 9% of daily trips occur during this time-period.

Each of the two surveyed sites have been compared against the NZTA Research Report 453: trips and parking related to land use ("NZTA Report 453") and NSW RTA Guide in Table 5-2. Both documents are commonly used in the New Zealand traffic engineering industry when it comes to estimation of trip generation.

**Table 5-2: Comparison of trip rates - RTA Guide**

	<b>Research report 453</b>	<b>Howick survey</b>	<b>Orewa Survey</b>	<b>RTA</b>
<b>Independent apartments / townhouses</b>	2.6 trips per day per unit	2.4 trips per unit per day	2.7 trips per unit per day	1-2 trips per dwelling per day
	0.4 trips per unit in the peak hour	0.11 trips per unit in AM peak hour	0.16 trips per unit in AM peak hour	0.1 - 0.2 trips per dwelling in peak hour
<b>Assisted living suites / care beds / care suites</b>	2.4 trips per day per unit	0.21 trips per unit in the interpeak	0.25 trips per unit in the interpeak	
	0.3 trips per unit in the peak hour	0.15 trips per unit in the PM peak	0.18 trips per unit in the PM peak	

For the purposes of estimating daily trips from the Site, the NZTA Report 453 rate of 2.6 trips per unit has been adopted (as it aligns with Ryman surveys). When considering peak hour

trips, the Orewa and Howick surveys show a lower traffic generation expected than suggested in NZTA Report 453. Given the surveyed sites are of operational Ryman facilities, the peak hour rates from those surveys are considered more relevant than the rates outlined in NZTA Report 453. A peak hour rate of 0.14 trips per unit in the AM peak hour, 0.23 trips in the interpeak period and 0.17 trips in PM peak hour has been adopted for the purposes of this assessment (average of Ryman surveys).

**Table 5-3: Trips generated by Proposed Village**

Accommodation Type	Trips	Total Units at Site	Total Trips per day	Trips per AM peak hour (8-9am)	Trips in the interpeak hour	Trips per PM peak hour (4:30-5:30pm)
<b>Independent Apartments</b>	2.6 trips per day 0.14 trips in the AM peak hour	180	468	25	41	31
<b>Assisted Living Suites / Care Beds / Care Suites</b>	0.23 trips in the interpeak hour 0.17 trips in the PM peak hour	68 + 60	333	18	29	22
<b>Total</b>		<b>308</b>	<b>801</b>	<b>43</b>	<b>70</b>	<b>53</b>

As shown in Table 5-3, a total of 801 vehicle trips can be expected to be generated by the Proposed Village per day. A peak hour trip generation of 43 trips is expected in the AM peak hour, 70 trips in the interpeak hour and 53 trips in the PM peak hour from the Proposed Village.

## 5.2 ANTICIPATED ACTIVITIES

A useful comparison in terms of the assessment of effects of the increase in vehicle trips that will be generated by the Proposed Village is to consider the educational use of the Site and the associated vehicle trips and also consider an alternate residential development on the Site.

For the residential scenario, a multi-unit development<sup>1</sup> of the Site has been assumed given the Site is a large 'windfall' site identified for more intensive development in the District Plan. Trip rates have been assumed as per a 'dwelling house' as defined in the RTA Guide.

The NZTA Report 453 guide outlines trip generation for a tertiary education use based on a survey of the University of Canterbury. Trip rates per 100m<sup>2</sup> GFA have therefore been applied to estimate the likely number of trips associated with the previous educational use of the Site.

<sup>1</sup> Assumed 300m<sup>2</sup> average lot size based on a mix of 450m<sup>2</sup> standalone lots and higher density lots

The expected trip generation for each scenario is detailed in Table 5-4.

**Table 5-4: Development Scenario Trip Total**

Development type	Trip Rate	Development Scenario Total	Total Trips
Educational use (Victoria University Teachers' College)	<i>NZTA 453 research report</i>  <i>1 movement per 100m<sup>2</sup> GFA in peak hour</i>  <i>6.2 movements per 100m<sup>2</sup> per day<sup>2</sup></i>	3.05 Ha  Measured approximately 7150m <sup>2</sup> building coverage  13,300m <sup>2</sup> GFA	133 peak hour trips  and  825 trips per day
Residential development	<i>RTA guidelines</i>  <i>'0.85 peak hour trips per dwelling'</i>  <i>and</i>  <i>'8.5 daily vehicle trips per dwelling'</i>	3.05Ha at 300m <sup>2</sup> lot size and 20% removed for infrastructure  81 (assumed)	69 peak hour trips  and  689 daily vehicle trips

The use of the Site for the previous educational purpose is expected to generate significantly more traffic movements in the peak period and slightly more daily traffic than the Proposed Village based on the analysis in Table 5-4.

Development of the Site in accordance with the underlying 'Outer Residential Area' zoning is likely to generate more traffic in the peak hour (30% more) and less daily traffic (14% less) than the Proposed Village.

As such, the Proposed Village is expected to generate less vehicular trips in the commuter peak hours than the previous education use of the Site or if the Site was developed for residential purposes. It will generate less daily trips than an educational occupation of the Site, but more than an alternative residential development. In relation to traffic effects, peak hour movements are considered more relevant than daily trips.

### 5.3 TRAFFIC DISTRIBUTION AND EFFECTS

Two vehicular access points are proposed to serve the Proposed Village. Traffic is expected to be distributed across the access points:

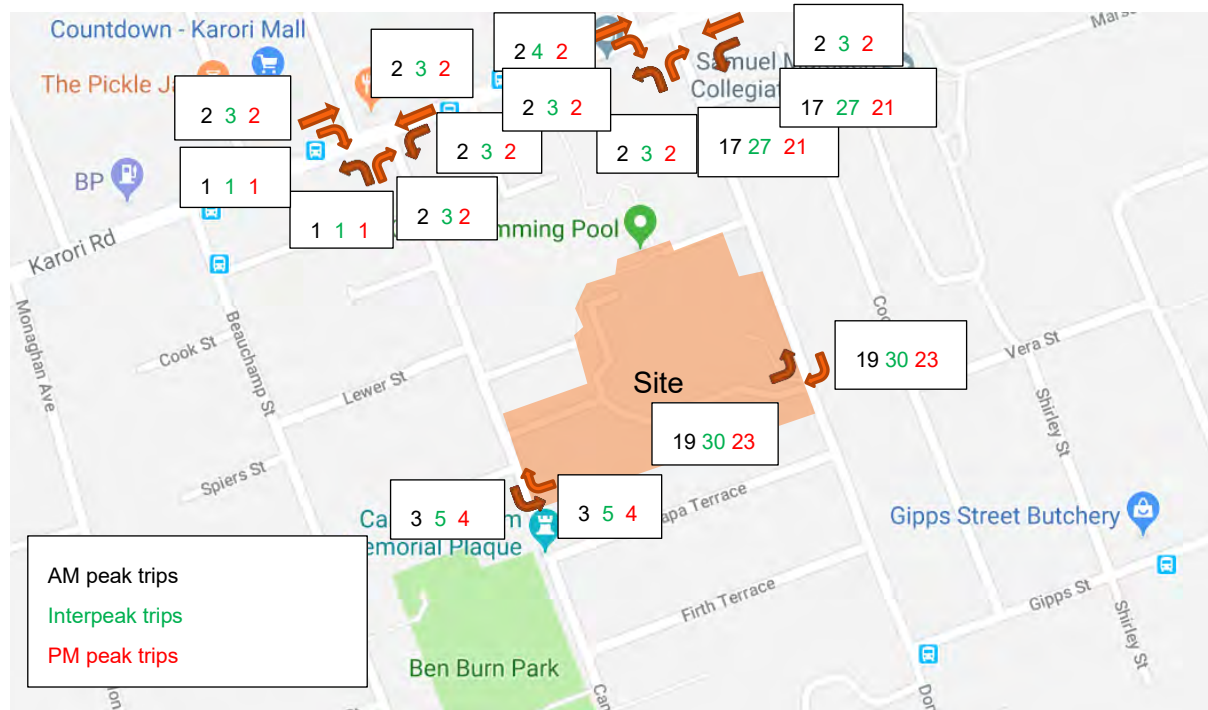
- Due to the nature of the road network, the access on Donald Street is expected to cater for the majority of traffic 85% of Proposed Village traffic assumed.
- The resident only access onto Campbell Street will cater for around 15% of retirement home movements.

<sup>2</sup> Approximately based on AM, IP and PM rates

As access in and out of Karori is primarily to the east it has been assumed that 90% of trips entering and exiting the Site will come from / go towards the east. The remaining 10% of trips have been assumed to come from / go towards local destinations in the wider Karori area.

It has been assumed that movements to, and from, the Site will be evenly split in the peak hours (which is based on the previous surveys summarised in Section 5.1). Figure 5-1 shows the anticipated movements in and out of the Site access points during the peak hours (AM, interpeak and PM).

**Figure 5-1: Site Traffic Distribution in AM and PM Peak Periods (vehicles per hour vph)**



## 5.4 INTERSECTION MODELLING

The majority of trips from the Proposed Village pass through the Campbell Street / Karori Road priority intersection and the Donald Street / Karori Road signalised intersection. As such traffic modelling has been undertaken to assess the effects of the additional traffic on intersection performance.

Traffic surveys were undertaken to establish current turning movements at the Donald Street/Karori Road intersection and Campbell Street/Karori Road intersection over two days; 19-20th February 2019. The surveys recorded traffic between 7-9am and 2:30-6pm.

A base model using SIDRA 8.1 has been developed reflecting existing turning movements (based on an average of the two surveyed days) for the AM peak (7:15-8:15am), interpeak (2:45-3:45pm) and PM peak (5-6pm).

Additional traffic from the Proposed Village has been added to the base network to assess the effects on the two modelled intersections. Traffic has been added to the intersections as per the assumptions set out in Section 5.3.

At the Donald Street/Karori Road intersection, the intersection operates well within capacity with an overall Level of Service<sup>3</sup> (LOS) B in all modelled periods (AM, interpeak and PM peak). In the PM peak hour, the 85<sup>th</sup> percentile vehicle queue on the Karori Road East approach reaches 30.5 vehicles. During the PM peak hour, the Donald Street approach operates with a LOS D and an average of around 38 seconds of delay. A summary of performance has been outlined in Table 5-5.

**Table 5-5: Intersection performance of Donald Street / Karori Road with existing flow**

ID	Unit	AM peak					Interpeak					PM peak				
		Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile
		veh/h	%	seconds		veh		%	seconds		veh		%	seconds		veh
South: Donald Street																
1	L2	9	0.176	16.5	LOS <sub>B</sub>	0.7	69	0.525	24.9	LOS <sub>C</sub>	3.1	72	0.694	38.3	LOS <sub>D</sub>	5.7
3	R2	41	0.176	16.3	LOS <sub>B</sub>	0.7	57	0.525	25	LOS <sub>C</sub>	3.1	81	0.694	38.3	LOS <sub>D</sub>	5.7
Approach		51	0.176	16.3	LOS <sub>B</sub>	0.7	126	0.525	25	LOS <sub>C</sub>	3.1	153	0.694	38.3	LOS <sub>D</sub>	5.7
East: Karori Road E																
4	L2	19	0.752	22.9	LOS <sub>C</sub>	7	78	0.738	18.6	LOS <sub>B</sub>	16.9	34	0.814	20.4	LOS <sub>C</sub>	30.5
5	T1	312	0.752	18.2	LOS <sub>B</sub>	7	613	0.738	14	LOS <sub>B</sub>	16.9	902	0.814	15.9	LOS <sub>B</sub>	30.5
Approach		331	0.752	18.5	LOS <sub>B</sub>	7	691	0.738	14.5	LOS <sub>B</sub>	16.9	936	0.814	16	LOS <sub>B</sub>	30.5
West: Karori Road W																
11	T1	845	0.817	12.8	LOS <sub>B</sub>	16.9	509	0.389	4	LOS <sub>A</sub>	6.1	540	0.384	3.7	LOS <sub>A</sub>	7.3
12	R2	15	0.053	21.2	LOS <sub>C</sub>	0.3	56	0.317	33.9	LOS <sub>C</sub>	1.6	42	0.302	45	LOS <sub>D</sub>	1.7
Approach		860	0.817	13	LOS <sub>B</sub>	16.9	565	0.389	6.9	LOS <sub>A</sub>	6.1	582	0.384	6.7	LOS <sub>A</sub>	7.3
All Vehicles		1241	0.817	14.6	LOS <sub>B</sub>	16.9	1382	0.738	12.4	LOS <sub>B</sub>	16.9	1671	0.814	14.8	LOS <sub>B</sub>	30.5

When the Proposed Village traffic is added to the intersection, an increase in delay and vehicle queue can be observed. During the AM peak periods, the change in intersection operation is minimal with a nominal additional 2 seconds of average delay across the intersection. During the interpeak, additional traffic leads to an additional 6 seconds of average delay and increase of vehicle queues on Karori Street East of 4 vehicles. Overall, the intersection continues to operate within capacity and remains at LOS B.

In the PM peak the additional traffic adds an additional 3 seconds of delay across the intersection, with LOS remaining at B. Vehicle queues on Karori Street East increase from 31 to 36 vehicles. Overall, the intersection accommodates the forecasted traffic and remains

<sup>3</sup> Level of service (LOS) is a qualitative measure used to relate the quality of motor vehicle traffic service

within capacity and at an acceptable LOS. A summary of performance has been outlined in Table 5-6.

**Table 5-6: Intersection performance of Donald Street / Karori Road with development traffic**

ID		AM peak					Interpeak					PM peak				
		Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile
Unit		veh/h	%	seconds		veh	veh/h	%	seconds		veh	veh/h	%	seconds		veh
South: Donald Street																
1	L2	12	0.246	15.8	LOS <sub>B</sub>	1	73	0.612	24.8	LOS <sub>C</sub>	3.9	74	0.751	36.3	LOS <sub>D</sub>	6.4
3	R2	59	0.246	15.6	LOS <sub>B</sub>	1	85	0.612	24.8	LOS <sub>C</sub>	3.9	103	0.751	36.3	LOS <sub>D</sub>	6.4
Approach		71	0.246	15.7	LOS <sub>B</sub>	1	158	0.612	24.8	LOS <sub>C</sub>	3.9	177	0.751	36.3	LOS <sub>D</sub>	6.4
East: Karori Road E																
4	L2	37	0.799	24.5	LOS <sub>C</sub>	7.8	106	0.8	22.5	LOS <sub>C</sub>	20.3	56	0.855	25.3	LOS <sub>C</sub>	36
5	T1	316	0.799	19.8	LOS <sub>B</sub>	7.8	618	0.8	17.9	LOS <sub>B</sub>	20.3	906	0.855	20.8	LOS <sub>C</sub>	36
Approach		353	0.799	20.3	LOS <sub>C</sub>	7.8	724	0.8	18.5	LOS <sub>B</sub>	20.3	962	0.855	21	LOS <sub>C</sub>	36
West: Karori Road W																
11	T1	847	0.82	13	LOS <sub>B</sub>	17.1	514	0.401	4.5	LOS <sub>A</sub>	6.6	542	0.392	4.1	LOS <sub>A</sub>	7.7
12	R2	17	0.06	21.2	LOS <sub>C</sub>	0.3	59	0.334	33.9	LOS <sub>C</sub>	1.7	44	0.317	45.1	LOS <sub>D</sub>	1.8
Approach		864	0.82	13.2	LOS <sub>B</sub>	17.1	573	0.401	7.5	LOS <sub>A</sub>	6.6	586	0.392	7.2	LOS <sub>A</sub>	7.7
All Vehicles		1287	0.82	15.3	LOS <sub>B</sub>	17.1	1455	0.8	14.9	LOS <sub>B</sub>	20.3	1725	0.855	17.9	LOS <sub>B</sub>	36

With the existing traffic levels, the performance of the priority intersection of Campbell Street / Karori Road is set out in Table 5-7. In the AM and interpeak the intersection operates well with no significant delay or queuing.

In the PM peak, the Campbell Street approach right turn movement operates at a LOS E with 42 seconds of delay. A vehicle queue of five vehicles is likely to occur.

**Table 5-7: Intersection performance of Campbell Street / Karori Road intersection**

ID		AM peak					InterPeak					PM peak				
		Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile	Demand	V/C ratio	Delay	LOS	Queue 85th percentile
Unit		veh/h	%	seconds		veh	veh/h	%	seconds		veh	veh/h	%	seconds		veh
South: Campbell St																
1	L2	26	0.026	6	LOS <sub>A</sub>	0.7	76	0.112	8.4	LOS <sub>A</sub>	3	61	0.169	13.9	LOS <sub>B</sub>	4.1

3	R2	22	0.105	20.5	LOS <sub>C</sub>	2.3	33	0.155	20.9	LOS <sub>C</sub>	3.6	24	0.238	42.3	LOS <sub>E</sub>	5.1
Approach		48	0.105	12.6	LOS <sub>B</sub>	2.3	108	0.155	12.2	LOS <sub>B</sub>	3.6	85	0.238	21.9	LOS <sub>C</sub>	5.1
East: Karori Road E																
4	L2	25	0.014	4.6	LOS <sub>A</sub>	0	47	0.026	4.6	LOS <sub>A</sub>	0	59	0.032	4.6	LOS <sub>A</sub>	0
5	T1	285	0.163	0	LOS <sub>A</sub>	0	594	0.315	0	LOS <sub>A</sub>	0	916	0.478	0.1	LOS <sub>A</sub>	0
Approach		311	0.163	0.4	NA	0	641	0.315	0.4	NA	0	975	0.478	0.3	NA	0
West: Karori Road w																
11	T1	809	0.433	0.1	LOS <sub>A</sub>	0	528	0.29	0	LOS <sub>A</sub>	0	520	0.279	0	LOS <sub>A</sub>	0
12	R2	24	0.024	6.1	LOS <sub>A</sub>	0.7	48	0.074	8.5	LOS <sub>A</sub>	1.9	59	0.161	13.8	LOS <sub>B</sub>	3.9
Approach		834	0.433	0.2	NA	0.7	577	0.29	0.7	NA	1.9	579	0.279	1.4	NA	3.9
All Vehicles		<b>1193</b>	<b>0.433</b>	<b>0.8</b>	<b>NA</b>	<b>2.3</b>	<b>1326</b>	<b>0.315</b>	<b>1.5</b>	<b>NA</b>	<b>3.6</b>	<b>1639</b>	<b>0.478</b>	<b>1.9</b>	<b>NA</b>	<b>5.1</b>

Vehicles from the Proposed Village will increase traffic at the intersection by a small amount, as outlined in 7. The operation in AM and interpeak periods remains similar to the existing situation. In the PM peak, the critical right turn movement out of Campbell Street is forecast to increase in average delay by one second with the LOS remaining at E. An increase to the 85<sup>th</sup> percentile queue is expected to result in a six-vehicle queue.

**Table 5-7: Intersection performance of Campbell Street / Karori Road with development traffic**

ID		AM peak					School Peak					PM peak				
		Demand	V/C ratio	Delay	LOS	Queue 85 <sup>th</sup> percentile	Demand	V/C ratio	Delay	LOS	Queue 85 <sup>th</sup> percentile	Demand	V/C ratio	Delay	LOS	Queue 85 <sup>th</sup> percentile
Unit		veh/h	%	seconds		veh	veh/h	%	seconds		veh	veh/h	%	seconds		veh
South: Campbell St																
1	L2	27	0.028	6	LOS <sub>A</sub>	0.8	77	0.114	8.5	LOS <sub>A</sub>	3	62	0.173	14	LOS <sub>B</sub>	4.2
3	R2	24	0.115	20.7	LOS <sub>C</sub>	2.6	38	0.181	21.5	LOS <sub>C</sub>	4.2	26	0.261	43.4	LOS <sub>E</sub>	5.6
Approach		52	0.115	12.9	LOS <sub>B</sub>	2.6	115	0.181	12.8	LOS <sub>B</sub>	4.2	88	0.261	22.7	LOS <sub>C</sub>	5.6
East: Karori Road E																
4	L2	27	0.015	4.6	LOS <sub>A</sub>	0	51	0.028	4.6	LOS <sub>A</sub>	0	61	0.033	4.6	LOS <sub>A</sub>	0
5	T1	287	0.164	0	LOS <sub>A</sub>	0	597	0.317	0	LOS <sub>A</sub>	0	918	0.479	0.1	LOS <sub>A</sub>	0
Approach		315	0.164	0.4	NA	0	647	0.317	0.4	NA	0	979	0.479	0.4	NA	0
West: Karori Road w																
11	T1	812	0.434	0.1	LOS <sub>A</sub>	0	532	0.291	0	LOS <sub>A</sub>	0	522	0.28	0	LOS <sub>A</sub>	0
12	R2	25	0.026	6.1	LOS <sub>A</sub>	0.7	49	0.076	8.6	LOS <sub>A</sub>	2	60	0.165	13.9	LOS <sub>B</sub>	4
Approach		837	0.434	0.2	NA	0.7	581	0.291	0.8	NA	2	582	0.28	1.5	NA	4
All Vehicles		<b>1203</b>	<b>0.434</b>	<b>0.8</b>	<b>NA</b>	<b>2.6</b>	<b>1343</b>	<b>0.317</b>	<b>1.6</b>	<b>NA</b>	<b>4.2</b>	<b>1649</b>	<b>0.479</b>	<b>1.9</b>	<b>NA</b>	<b>5.6</b>



## 5.5 EFFECTS DISCUSSION

The Proposed Village will add between 40-73 vph to the surrounding road network depending on the time of day. Overall the additional traffic to the Donald Street/Karori Road signalised intersection and the Campbell Street/Karori Road priority-controlled intersection results in small increases in the level of delay and vehicle queues expected. Critically, both intersections continue to operate within capacity and with insignificant changes from current operation. The additional traffic expected from the Proposed Village can be accommodated in a safe and efficient manner within the surrounding road network.

The surrounding network provides good facilities for both bus transit, walking and cycling (including past the Site), allowing staff, visitors and residents to use public and active transport options.

As noted, the Proposed Village will generate less peak hour traffic than that generated by the previous use of the Site for educational purposes, or for an alternative residential development that aligns with the underlying zoning.

Overall, the Proposed Village will cause minimal traffic / transportation effects on the surrounding road network.

## 6 PARKING

### 6.1 DISTRICT PLAN REQUIREMENT

The District Plan sets out parking standards for residential areas in Section 5.6 of the District Plan. The District Plan does not specifically outline requirements for a retirement village.

The District Plan has requirements for parking per household unit. Standard 5.6.1.3 require a minimum of 1 space per household unit and 1 visitor space per 4 households. Given the Proposed Village includes 180 apartments and 68 assisted living units, 248 resident parking spaces are required and 62 visitor spaces.

The proposed provision (230 spaces) falls short of the 310 spaces required by the District Plan standard. However, the District Plan standard is not specific to the parking demands associated with a retirement village.

### 6.2 RTA PARKING DEMAND

For comparison purposes, the RTA Guide has been used to estimate actual parking demand. The RTA Guide recommends the following parking requirements for housing for the aged in Table 6-1.

**Table 6-1: RTA Parking Rate**

Activity	Parking Rate
Self-Contained Unit	2 spaces per 3 units (residential) and 1 space per 5 units (visitor)
Hostels / Nursing	1 space per 10 beds and 1 space per 2 employees

It is considered that all independent apartments within the Proposed Village are classified as 'self-contained units' and all assisted living suites, care suites and care beds are classified as 'hostels/nursing' activities.

The RTA Guide requirements are summarised in Table 6-2 below:

**Table 6-2: RTA Parking Requirement**

Use	Number	RTA Specification	Number of Spaces Required
Apartments	180	2 per 3 Units (Residential) 1 per 5 Units (Visitors)	120 36
Assisted Living Suites / Care Beds	68+60 =128	1 space per 10 beds	13
Staff	50	1 space per 2 employees	25
Total for Site			194

As shown above, the RTA Guide recommends providing a minimum of 194 parking spaces to meet the expected parking demand. This requirement is exceeded by 36 spaces with the 230 car parking spaces to be provided.

### 6.3 PARKING PROVISION

Table 6-3 outlines the overall provision of parking at the Site.

**Table 6-3: Parking Provisions Per Building / Area**

Building Name	Number of General Carparks Provided	Number of EV Carparks Provided	Number of Accessible / Mobility Carparks
<b>B01 - Basement</b>	61	4	4
<b>B02 – B06 Basement</b>	92	2	3
<b>B07 - Basement</b>	20	2	2
<b>At grade</b>	36	2 (van parking)	3
<b>Total</b>		<b>230</b>	

Parking at other Ryman Villages are based on a ratio per unit type; this being one parking space per apartment, one parking space per five assisted living suites / care beds and one parking spaces per two members of staff. This rate has been applied successfully at recently approved Ryman villages in Lower Hutt, Christchurch, Hamilton, Auckland and Havelock North.

In conclusion, the proposed 230 onsite parking spaces does not comply with the District Plan requirement of 310 onsite parking spaces, but is more than recommended by the RTA Guide. The District Plan requirement does not specifically relate to parking demand from a

retirement village. Based on the parking ratio used at other recent Ryman Villages and the RTA Guide, the proposed 230 onsite parking spaces are considered to meet the parking demand of residents, staff, and visitors at the Proposed Village. The assignment of specific parking spaces to residents, staff and visitors is typically undertaken by Ryman’s Village Operations Manager prior to the opening of a new village and has not been undertaken at this time.

In our experience, this parking provision is expected to fully satisfy demand on the Site without any parking overspill expected.

#### 6.4 PARKING DIMENSIONS

The District Plan states the following with regard to the design of car parking:

*‘all parking must be provided and maintained in accordance with sections 1, 2, and 5 of the joint Australian and New Zealand Standard 2890.1 – 2004, Parking Facilities, Part I: Off-Street Car Parking.’*

The AS/NZS 2890 guide recommends different parking dimensions for different kinds of users. Given the proposed activity onsite, users fall into two categories:

- User class 2: Medium term parking - Retirement village residents and staff are considered to fall into this category. They require 2.5m width, 5.4m stall depth and 5.8m manoeuvring space.
- User class 3: Short term parking – Visitors to the Site are considered to fall into this category. They require 2.6m width, 5.4m stall depth and 5.8m manoeuvring space.

All new buildings contain basement car parks. Car parking dimensions and manoeuvrability has been designed in accordance with AS/NZS 2890.1:2004. The majority of car parks are either 2.5m or 2.6m wide, 5.4m deep and therefore require 5.8m manoeuvring space as recommended in AS/NZS 2890.1:2004.

A summary of key dimensions for each parking area are outlined in Table 6-4 below with a comparison against the AS/NZS 2890.1:2004 standard.

**Table 6-4: Carparking dimensional summary**

Building	General Dimensions	AS/NZS 2890.1:2004
B01	2500 x 5400 with manoeuvring of between 6.2m and 7.6m	✓
B02 – B06	2500 x 5400 with manoeuvring of 6.2m	✓
B07	2500 x 5400 with manoeuvring of 7.8m	✓
On grade	2600 x 4900 with overhang of 550mm and manoeuvring between 6.2m and 10m	✓

The parking space dimensions are considered acceptable for retirement village purposes as residents and staff are medium / long term users.

The on-grade parking spaces cater for short term visitor parking. The parking dimensions meet AS/NZS 2890 requirements for short term use.

The position of columns located within parking areas has been checked and the columns are located outside space required for the tracking of vehicles. Vehicle tracking for spaces at the end of blind aisles has been checked in those locations where spaces have less than the

recommended 1m clearance as specified in AS/NZS 2890 and are considered sufficient. This tracking can be seen in Appendix A.

## 6.5 RAMPS

Due to the topography of the Site, the presence of basement parking under all apartment buildings and an elevated parking area in Building B07, a number of ramps will be provided. Grades and transitions for vehicle ramps have been checked against AS/NZS 2890. AS/NZS 2890 outlines the following rules with regard to grades of ramps:

- Maximum grade of 1:5 for ramps greater than 20m;
- Maximum grade of 1:4 for ramps less than 20m; and
- Grade transitions are required for a change of more than 1:8 for summit or 1:6.7 for sags

The vehicle ramp proposed for the Building B01A pick up and drop off area presents a 1:5 grade with a 2m 1:8 transition at both ends of the ramp. The ramp into the Building B01B car park will have a grade of 1:8.

All ramps comply with maximum gradient standards and provide appropriate grade transitions.

## 6.6 MOBILITY / ACCESSIBILITY SPACES

NZS 4121 outlines requirements for the provision of mobility parking spaces. Given there is to be a total of 230 parking spaces on-site the NZS 4121 requirement is to provide seven mobility parking spaces.

A total of 11 mobility spaces are proposed, therefore complying with NZS 4121. All the mobility parks will be designed as per NZS 4121.

## 7 TRAVEL PLAN

Staff travel requirements at a Ryman retirement village reflect the shift based nature of employment. While Ryman do not prepare a formal travel plan, staff shifts are arranged to avoid peak commuter peak periods. This can be seen by the low traffic generation shown in surveys of operating villages.

In addition, staff parking is provided at a rate of 1 space per 2 staff members. The Site is well positioned from a public transport perspective with access to bus stops within 350m of the Site. The Site is also well positioned from a walking and cycling perspective.

While some staff may be able to make use of public transport and walking and cycling, these options may not suit all staff. In particular, shifts starting early or late in the day may be outside the services times of public transport or outside times staff feel comfortable using active modes to get to work. While alternative transport modes are not likely to suite some shift work staff, private vehicular travel will usually be outside of peak periods as noted above.

In light of the assessed transport effects and staff travel characteristics, we do not consider a staff travel plan is necessary for the Proposed Village.

## 8 LOADING AND SERVICING

The Proposed Village includes one main loading bay outside Building B01 on the same side of the building as the main village entrance.

One loading space has proved more than sufficient at other retirement villages operated by Ryman, as they are largely residential in nature. This loading area can accommodate the turning of a 9.2m rigid truck (as specified by the waste management contractor).

**Appendix B** shows the tracking path of a 9.2m truck using the proposed loading space.

The internal road layout is also able to support emergency vehicles such as ambulances and fire engines.

## 9 CONSTRUCTION TRAFFIC

The construction methodology for the Proposed Village has not been finalised as it will depend on a range of factors, including any resource consent requirements. As such, it is proposed that provision be made in the resource consent conditions for a Construction Traffic Management Plan to be developed for the works anticipated (as has been accepted by various Councils around New Zealand for recent Ryman proposals in Wellington, Hamilton, New Plymouth, Auckland and Christchurch).

The Construction Traffic Management Plan for the Site will include:

- i. Construction dates and hours of operation including any specific non-working hours for traffic congestion/noise etc. In this location, construction traffic movements should look to avoid school pick up and drop off times during school terms;
- ii. Truck route diagrams both internal to the Site and external to the local road network;
- iii. Temporary traffic management signage/details for both pedestrians and vehicles to appropriately manage the interaction of these road users with heavy construction traffic; and
- iv. Details of Site access/egress over the entire construction period. Noting that all egress points are to be positioned so that they achieve appropriate sight distance as per the Land Transport Safety Authority "Guidelines for visibility at driveways" RTS6 document.

Based on experience of constructing similar retirement villages and bearing in mind capacity within the existing roading network, with a Construction Traffic Management Plan in place as recommended above, it is considered that construction activities will be managed to ensure that any traffic effects are mitigated where possible.

Of note, the anticipated construction activities for this site are temporary in nature. With the recommended measures in place, the construction traffic effects of the Proposed Village are able to be appropriately managed and therefore are considered less than minor.

## 10 RECOMMENDATIONS

In order to manage the potential transport effects of the Proposed Village, it is recommended that the following measures are addressed in resource consent conditions:

- A Construction Traffic Management Plan is prepared and implemented in accordance with Section 9 of this Report.

## 11 CONCLUSIONS

On the basis of the assessment contained in this report, the following conclusions can be made:

- The level of traffic that will be generated by the Proposed Village is significantly less than that of the previous occupation of the Site and less than what could be expected at peak hours from a residential development on the Site anticipated by the District Plan;
- The surrounding road network can accommodate the expected development traffic with minimal effect on the efficiency of the network and will not compromise traffic safety in the area;
- While the proposed parking provision is less than the District Plan requirement, the proposed parking provision is expected to cater for the parking demand generated by the Proposed Village. No parking overspill is expected;
- The loading provisions are provided on-site and considered appropriate to cater for loading requirements of the Proposed Village;
- The access provision does not meet the District Plan standard in term of number of access points or width. The provision of two access points are considered appropriate for the intended use of the Site and are not expected to lead to any safety or efficiency issues. The design of the Donald Street access is not expected to adversely affect pedestrians; and
- It is appropriate to manage the temporary construction traffic through a Construction Management Plan to suitably avoid or mitigate the temporary adverse effects that may arise from construction activities. As such, a Construction Traffic Management Plan should be required as a condition of consent.

Overall, it is concluded that there is no traffic engineering or transport planning reason that would preclude the construction and operation of the Proposed Village on the Site as intended.

## ATTACHMENT A: VEHICLE TRACKING PLANS

ATTACHMENT B: TRUCK TRACKING (LOADING BAY)





**Revision notes:**

Rev:	Date:	Notes:

**Drawn by:**

GMN  
J00980

**Client:**

**Project:**

**KARORI VILLAGE**

Vehicle tracking

**Drawing Title:**

Ground level  
Car

**Date:**

9 March 2020

**Scale @ A3:**

1:500 @A3

**Revision:**

A- FOR INFORMATION



**Figure:**

**A1**



**Revision notes:**

Rev:	Date:	Notes:

**Drawn by:**

GMN  
J00980

**Client:**

**Project:**

**KARORI VILLAGE**  
Vehicle tracking

**Drawing Title:**

Level 1  
Car

**Date:**

9 March 2020

**Scale @ A3:**

1:500 @A3

**Revision:**

A- FOR INFORMATION



**Figure:**

**A2**



**Revision notes:**

Rev:	Date:	Notes:

**Drawn by:**

GMN  
J00980

**Client:**

**Project:**

**KARORI VILLAGE**  
Vehicle tracking

**Drawing Title:**

Level 2  
Car and Transit van

**Date:**

9 March 2020

**Scale @ A3:**

1:500 @A3

**Revision:**

A- FOR INFORMATION



**Figure:**

**A3**



**Revision notes:**

Rev:	Date:	Notes:

**Drawn by:**

GMN  
J00980

**Client:**

**Project:**

**KARORI VILLAGE**  
Vehicle tracking

**Drawing Title:**

Ground level  
Ambulance / Transit van

**Date:**

9 March 2020

**Scale @ A3:**

1:500 @A3

**Revision:**

A- FOR INFORMATION



**Figure:**

**B1**



Revision notes:		
Rev:	Date:	Notes:

**Drawn by:**  
GMN  
J00980

**Client:**

**Project:**  
KARORI VILLAGE  
Vehicle tracking

**Drawing Title:**  
Ground level  
8m Rigid Truck (RTS16)

**Date:**  
9 March 2020

**Scale @ A3:**  
1:500 @A3

**Revision:**  
A- FOR INFORMATION



**Figure:**  
**B2**