CLEARWAY
CONSULTING LIMITED

INTEGRATED TRANSPORT ASSESSMENT

FOR A

RESOURCE CONSENT APPLICATION

COMMERCIAL CENTRE

63-67 TENNYSON STREET, ROLLESTON

BENZ (2007) LIMITED

Date 20161201

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<table>
<tr><th colspan="3">Quality Assurance Statement</th></tr>
<tr><td rowspan="4">Clearway Consulting Ltd
Po Box 17
Nightcaps 9644
New Zealand

Phone: (09) 929 4697
Fax: (09) 929 4698</td><td></td><td></td></tr>
<tr><td>Project Manager:

Nigel Williams</td><td>  </td></tr>
<tr><td>Prepared by:

Nigel Williams</td><td>  </td></tr>
<tr><td>Reviewed by:

Helen Daymond</td><td>  </td></tr>
<tr><td colspan="3">Project Number: 8588

Project Name: Tennyson Street Commercial</td></tr>
</table>

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INTRODUCTION

1. The proposal entails the establishment of a block of retail and food and beverage outlets on a site at the corner of Tennyson Street and Markham Way, Rolleston (Figure 1). Vehicle access to the site will be from Markham Way, while most pedestrian access to the businesses will be from the Tennyson Street frontage.

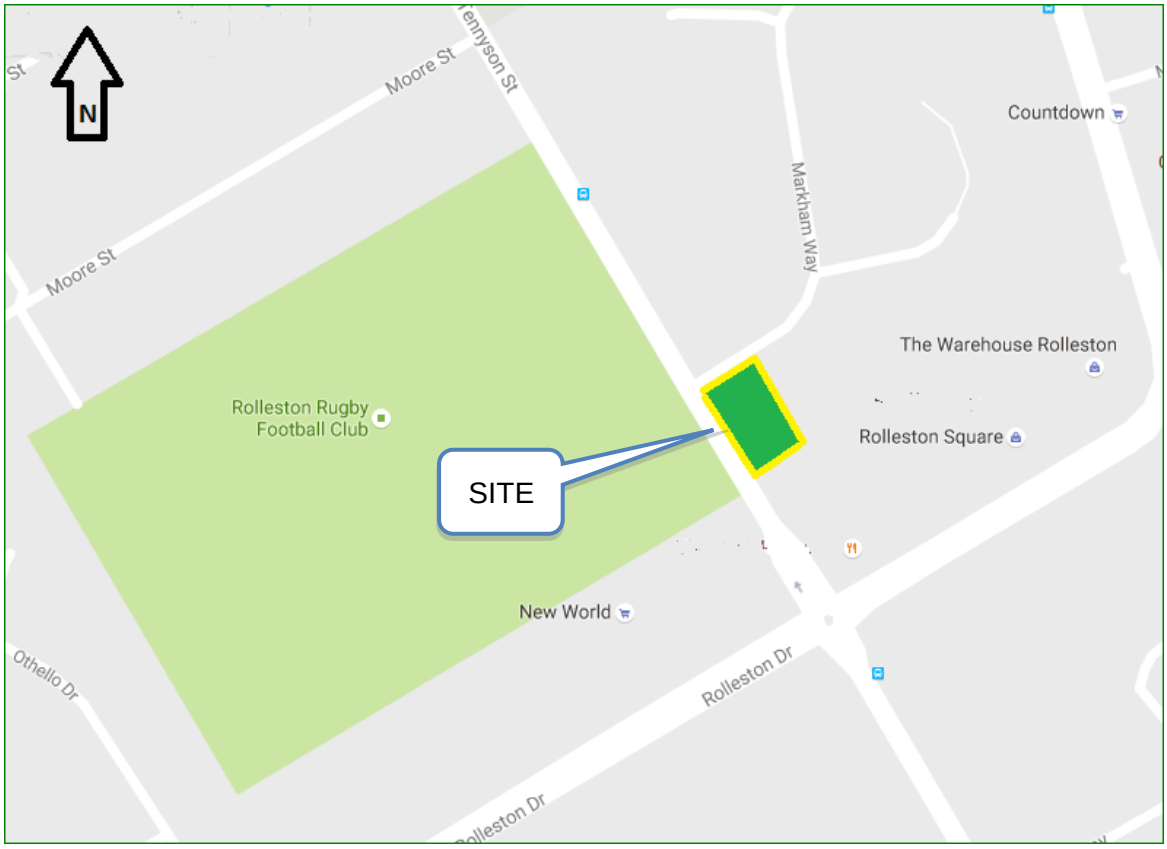

Figure 1: Location of site.

2. The layout of the site is fully described in the application plans.
3. This report reviews the proposal with respect to the relevant transport-related rules of the District Plan.

EXISTING LANDUSE AND TRANSPORT ENVIRONMENT

EXISTING WALKING AND CYCLING NETWORKS

4. The site is located adjacent to the main retail and business centre of Rolleston, and close to the proposed Town Square precinct.
5. Sealed footpaths for pedestrian use are located on most frontages near the site, and the stock water race which currently occupies the area between the roadside kerb and the road boundary on the Tennyson Street frontage is to be piped and a sealed footpath built as part of this proposed development.
6. This work will complete the pedestrian network near the site.

PUBLIC TRANSPORT SERVICES

7. The Yellow Line public transport services operate to and from Christchurch City. These services are available for staff and customers relating to the site. Bus stops in Rolleston Drive are within 500 metres of the site. These services operate on a 30-minute headway over most of the working day (Figure 2).

Figure 2. Bus services in the locality.

8. It is reasonable to assume that public transport services will continue to be enhanced to serve the increasing activity in the new town centre and residential developments which have recently been established in the area.
9. This level of public transport service provides viable transport options for staff and customers to the site. In particular, the presence of this public transport service will provide a useful alternative travel mode for people who may find car use increasingly difficult and/or expensive.
10. The adoption of active transport and public transport modes will also provide staff and customers relating to the site with increased resilience in the face of oil price or availability shocks or other interruptions to travel by private motor vehicles.

ON AND OFF-STREET PARKING FACILITIES.

11. Kerbside parking is permitted on the roads adjoining the site, with some parking restrictions near vehicle crossings and intersections.
12. Most commercial activities in the locality provide some on-site car parking.

ROAD CLASSIFICATION AND FUNCTION

13. Tennyson Street is classified as a *Collector Road*, while Markham Way is a *Local Road*.

14. Tennyson Street provides a collector function and connections to arterial routes. It also provides for vehicle access to commercial properties in the vicinity of the Tennyson Street / Rolleston Drive intersection, and to residential properties north of Markham Way.
15. In the Outline Development Plan for the Rolleston Key Activity Centre, the portion of Tennyson Street between Rolleston Drive and the northern end of the Rolleston Recreation Reserve is designated as Proposed High Street. This would suggest that the present road format is likely to be amended to a more pedestrian-focussed layout which would enhance connections within the overall town centre precinct, with a focus on the proposed Town Square precinct in Tennyson street opposite the site.
16. Markham Way is a residential cul-de-sac containing about 50 dwellings.

NEARBY ACTIVITIES

17. The application site adjoins the business area fronting Rolleston Drive to the south of the site, and the residential area of Markham Way and Tennyson Street north of the site.
18. An access to a goods loading area serving a large supermarket and other retail outlets is located in Tennyson Street opposite the site.
19. Traffic generated by these activities in Tennyson Street does not have any significant effect on the operation of the site's proposed vehicle access within Markham Way.
20. At present in Markham Way, the only traffic generators are residential dwellings.
21. The Town Square precinct is located on the western side of Tennyson Street immediately north of the application site. This precinct is eventually expected to give rise to high pedestrian volumes typical of those seen in integrated town centre areas. These pedestrians will relate to the retail and food and beverage activities proposed on the nearby application site. Footpaths are available on both sides of Tennyson Street, and the Proposed High Street designation indicates that Tennyson Street near the Town Square is likely to be modifies to create a more pedestrian friendly environment within the street, and to support the overall Town Centre concept.

TRAFFIC VOLUMES

22. The NZTA CAS database was examined to ascertain the traffic flows on the frontage roads.
23. Markham Way is shown as carrying 453 vehicles a day, while Tennyson Street carries 4298 a day.
24. These volumes are consistent with the Local Rad and Collector Road classifications and roles of these roads.
25. As a check, the Markham Way cul-de-sac provides access to a total of approximately 50 dwellings. Allowing ten vehicle trips per day per dwelling, this gives an estimated generation of 500 trips per day, and 50 vehicles in the peak hour. This is consistent with the volume reported in CAS.

CRASH RECORD

26. A search of the NZTA CAS crash database was conducted within the area defined in the polygon shown in Figure 3 (below).

Figure 3. Crash search polygon

27. This search found a total of two recorded vehicle crashes over the five and a half year period to date.

28. These crashes entailed: -

- **Crash 30/06/2011 at intersection of Tennyson Street with Markham Way.**

CAR1 SBD on TENNYSON ST hit CAR2 turning right onto TENNYSON ST from the left

CAR1 headlights inadequate or no headlights. CAR2 failed to give way when turning to non-turning traffic

No injuries

- **Crash 08/02/2011 on Tennyson Street 100 metres north of Rolleston Drive**

VAN1 NBD on TENNYSON ST lost control; went off road to left, VAN1 hit Parked Vehicle

VAN1 attention diverted by cigarette etc

No injuries

29. Both these crashes occurred in 2011. No crashes were recorded in the more recent period with a potentially higher level of urban and commercial development in the locality.

30. Neither of these crashes indicate that there are any underlying traffic safety issues in the locality which could be exacerbated by the traffic generated by the proposal.

THE PROPOSAL

ACTIVITY AND PARKING PROVISION

31. The proposal entails the establishment of a commercial block containing six tenancies. These tenancies are expected to accommodate retail and food and beverage activities.
32. The application plans show the provision of 38 car parking spaces in a complying 90-degree layout.
33. The required two accessible spaces are provided with direct footpath and ramp access to the building.
34. Cycle parking is provided for up to ten cycles on five hoop-type stands at the southern end of the parking area.

CAR PARKING LAYOUT

35. The parking spaces are all 2.6 metres wide and 5.4 metres long. The aisle width is 5.5 metres. This conforms to the district plan's standard for short term parking, and for the minimum width of the two-way aisle (5.5 metres).
36. The spaces are all defined as being 5.4 metres long (as required by the district plan) however it is proposed to mark the spaces at only 4.8 metres to ensure that drivers are encouraged to drive fully into the spaces. Experience with the 5.4 metre long parking module has found that in some cases drivers only enter the space until the rear of the vehicle is enclosed by the space marking. This can leave a significant unused space at the nose of the vehicle, while leading to minimum aisle widths for manoeuvre. By marking the spaces at 4.8 metres long (while still maintaining the overall module) the available aisle width is maximised.
37. The accessible spaces are both 2.6 metres wide by 5.4 metres long with a 1.1 metre wide shared space between them. This meets the requirements of the NZ Building Code.

LOADING PROVISION

38. The site's rear yard is configured to provide access and turning for the 99 percentile motor car (ASNZS2890.1 B99 Car). This vehicle can turn on the site at any time by utilising the service areas at the south end of the parking area (Figure 4).

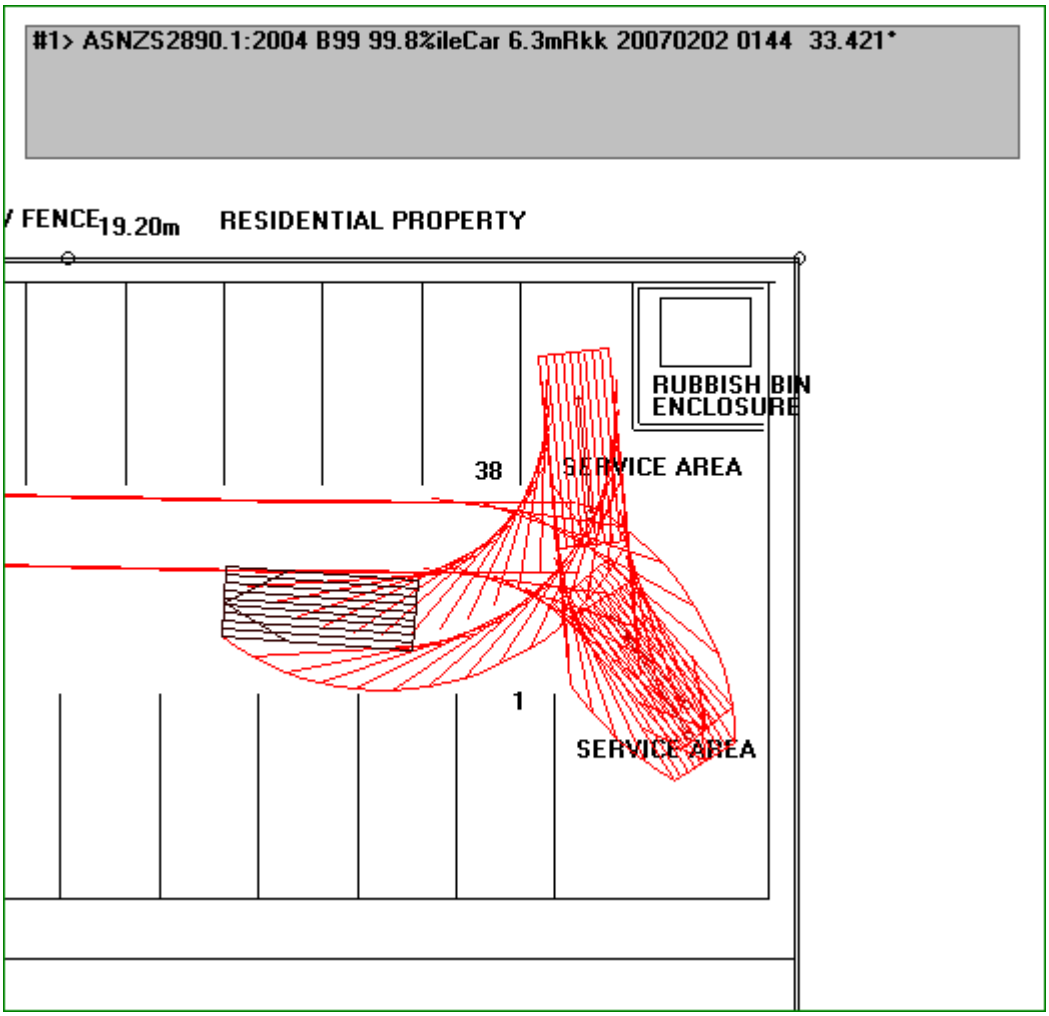

Figure 4. 99 percentile motor car (light van) turning in service area.

39. Outside peak times where some parking spaces are vacant, the layout also enables on-site turning by larger delivery and servicing vehicles such as the design 8 metre truck (Figure 5).

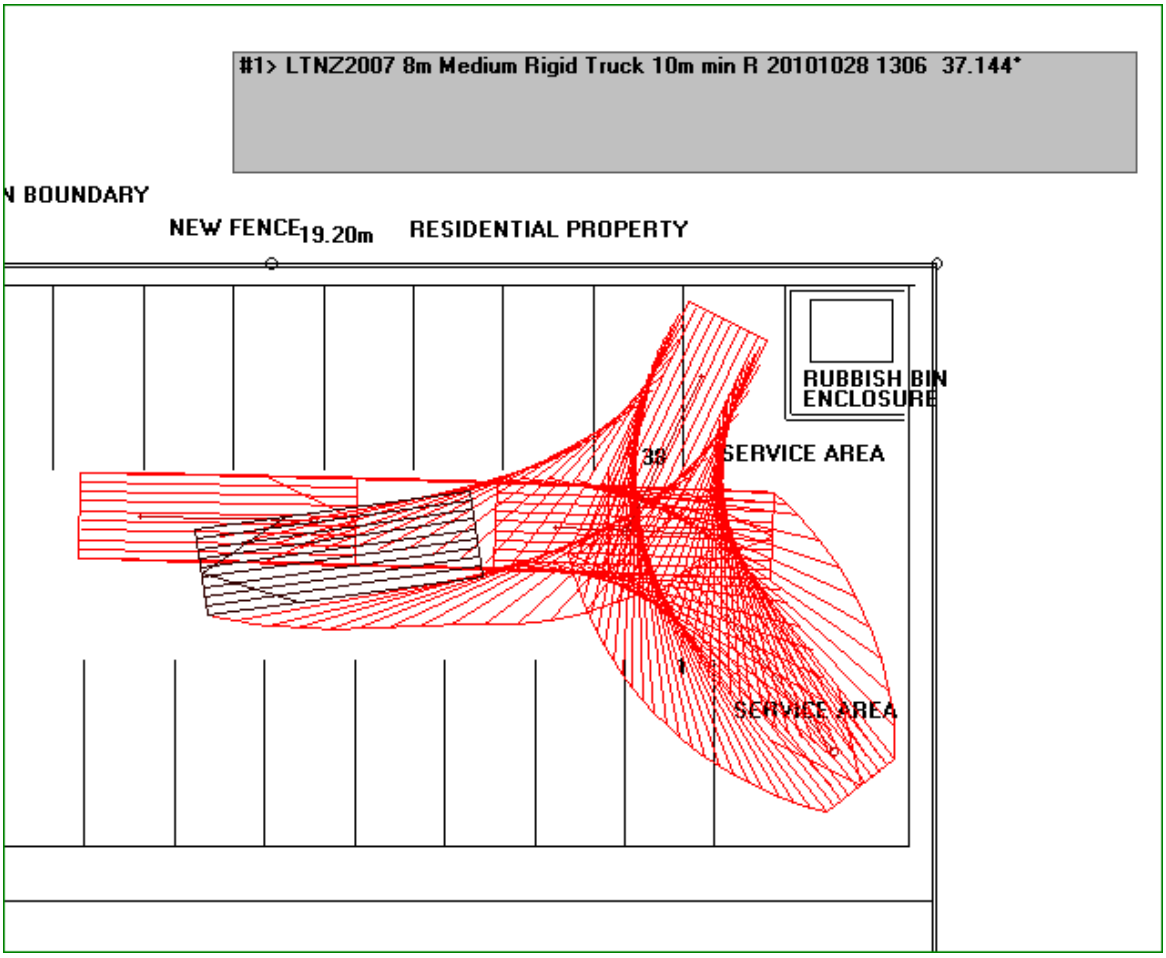

Figure 5. 8-metre truck turning in partly-empty car park.

40. This combination of service opportunities will provide servicing by smaller goods service vehicles during middle of the day times (when the parking areas is likely to be well utilised) and for access by larger trucks during off-peak times.

41. Goods vehicle arrivals are able to be scheduled by the site's business operators, and thus the delivery times and types of vehicles can be configured to provide satisfactory loading performance for all classes of vehicles which may be required to service the site.

VEHICLE ACCESS

42. Access to the site is to be from Markham Way at a position approximately 32 metres from the kerbline of Tennyson Street.

43. This location allows right turn entry and exit around the end of the central island

44. Sight distances in both directions are sufficient for the prevailing operating speed environment. Currently there is no demand for on-street parking in the vicinity of the site's vehicle crossing which could obstruct sight lines. Should such a demand arise, then the site operator can contact the council to assess the need for parking restrictions, such as the installation of No Stopping At Any Time (NSAAT) lines. No such restrictions are considered to be necessary at this stage.

TRAFFIC GENERATION ANALYSIS

45. The overall peak hour trip generation of the proposed activity is expected to follow the pattern shown in Table 1. This estimate of the generation of the retail and restaurant activities on the site use the values in NZTA RR453 report - **Trips and parking related to land use**, Table 8.10.

Table 1. Estimated vehicle trip generation

Facility	Retail / Food & Beverage
RR453 Activity	50% Restr'nt, 50% Shops (Small)
GFA	1154
Daily Trip Rate	107.0
PkHr Trip Rate	18.5
Daily Generation	1235
PkHr Generation	213
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46. This estimate assumes that the peak generation of the various activities on the site will occur at the same time of the day. It is more likely, however, that the restaurant activities will see peak levels of customer activity during the midday period, and in evenings, while the retail activities will peak between 15:00 and 18:00 – during the after school and end of day commuter period.

47. Thus, the likely peak hour generation of the site will be significantly less than the 213 trips implied by this calculation. For the purpose of examining peak traffic effects at the intersection of Markham Way and Tennyson Street a generation of 150 trips in the peak hour is assumed.

ASSESSMENT OF INTERSECTION PERFORMANCE.

48. The background peak hour volumes on Tennyson Street and Markham Way are assumed to be 10% of the daily total volume. Turning movements are assumed to be evenly distributed to north and south. Goods vehicles are assumed to make up about 1% of the traffic using Markham Way. This gives the following through and turning movements at the intersection.

Table 2. Estimated peak hour turning movements

Design Turning Volumes - Tennyson Street / Markham Way						
Approach	nyson (South)		Markham Way		Tennyson (North)	
Period	Through	Right	Left	Right	Left	Through
Peak Hr	165	50	50	50	50	165
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49. The intersection layout employed in the analysis assumed shared 3.3 metre approach and departure lanes on all legs with all turns occurring from the same lane. In practice all approaches are configured with sufficient width to allow simultaneous queuing for two vehicles side by side (for example a through vehicle could queue beside a left turning vehicle) and so the analysis is very conservative. The layout of the intersections used in the analysis is shown below (Figure 6).

Figure 6. Intersection layout for SIDRA analysis.

50. The SIDRA model used default New Zealand parameters for all settings.

51. The Movement Tables depicting the results of this analysis are shown below.

Table 3. Movement table – With Development

MOVEMENT SUMMARY

Site: 101 [8588 Tennyson St]

Tennyson Street / Markham Way with development.
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Tennyson Street											
2	T1	174	3.0	0.128	0.3	LOS A	0.4	2.7	0.18	0.13	46.7
3	R2	53	1.0	0.128	5.4	LOS A	0.4	2.7	0.18	0.13	42.5
Approach		226	2.5	0.128	1.5	NA	0.4	2.7	0.18	0.13	45.9
East: Markham Way											
4	L2	53	1.0	0.099	5.1	LOS A	0.4	2.5	0.31	0.59	37.0
6	R2	53	1.0	0.099	6.4	LOS A	0.4	2.5	0.31	0.59	37.8
Approach		105	1.0	0.099	5.8	LOS A	0.4	2.5	0.31	0.59	37.4
North: Tennyson Street											
7	L2	53	1.0	0.119	4.6	LOS A	0.0	0.0	0.00	0.13	46.2
8	T1	174	3.0	0.119	0.0	LOS A	0.0	0.0	0.00	0.13	48.0
Approach		226	2.5	0.119	1.1	NA	0.0	0.0	0.00	0.13	47.6
All Vehicles		558	2.2	0.128	2.1	NA	0.4	2.7	0.13	0.22	44.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

52. This analysis confirms that the intersection will operate with a high level of service (LOS = A) for all movements, with delays of less than 10 seconds for all movements. During the busiest hour, about 60% of vehicles leaving Markham Way will need to pause briefly to wait for opposing traffic to clear before completing their turn into Tennyson Street.
53. For residents in Markham Way, the proposal will possibly give rise to occasional instances where a driver may have to wait a few seconds longer than they do today to complete their turn into Tennyson Street. This additional delay will be barely perceptible and will not give rise to any unsafe or undesirable driver behaviour.
54. Beyond the immediate vicinity of the site the trip generation of the activity will diffuse onto the wider road network. The proposal is not expected to have any discernible impact on other roads or intersections in the district.

PEDESTRIAN AD CYCLE FACILITIES

55. The proposal entails the development of a footpath along the Tennyson Street frontage of the site. This will activate this frontage and enable pedestrian access to the retail and food service activities on the site.
56. Within the rear parking area, a footpath is provided along the face of the buildings to give drivers and passengers safe access to the buildings.
57. A cycle stand providing hoop-type stands is to be established within the site beside the footpath. This stand will accommodate up to ten cycles.

CONSTRUCTION TRAFFIC

58. The site's vehicle access is suitably located to provide sufficient visibility for safe operation by all types of construction traffic likely to be involved with the development of the site.
59. As part of the building consent process a specific Temporary Traffic Management Plan will be prepared and submitted to council for approval. This TTMP will cover all aspects of the project's traffic requirements including cartage of materials, house relocation, production and crowd control matters.
60. The implementation of the TTMP is the responsibility of the building consent holder.

ASSESSMENT OF EFFECTS

61. Appendix 1 of this report contains a detailed assessment of the proposal against the traffic-related rules of the district plan. This finds that activity requires resource consent in relation to the following traffic-related matters:

    - Rule E13.1.1.1 Car Parking shortfall
    - Rule E13.1.5 Loading – Manoeuvre for 8-m truck
    - Rule E13.1.10 Queue Space – 10.5 m required, 2.0 m available.

62. These matters are addressed as follows: -

RULE E13.1.1. PARKING REQUIREMENTS

63. The application plans show a total of 38 car parking spaces are to be provided.

64. The internal layout of the tenancies which are expected to be used for food and beverage activities has not yet been determined, and thus, perforce, the Gross Floor Area has been used to assess the car parking. It is quite likely, once these activities are established, that the Public Floor Area would be found to be less than the overall Gross Floor Area of the buildings on the site.

65. The activity is located in the Transitional Living Precinct (5) of the Rolleston Key Activity Centre. This precinct provides for a mix of commercial and residential activities.

Figure 7. Precinct Plan – Rolleston (Appendix 29A)

66. The site adjoins and is opposite land zoned Core Retail Precinct (1), and land on the western side of Tennyson Street by the reserve is zoned Community Anchor /Town Square Precinct (8). Other land adjoining the Core Retail Precinct is zoned as Retail Fringe Precinct (2).

67. Thus, the application site is located close to the Town Square and adjacent to the Core Retail area, while Tennyson Street in the vicinity of the site is designated to be developed as a 'High Street' where high volumes of pedestrian movement are anticipated.

68. The following table identifies the parking requirements for the floor area proposed with this development in each of the nearby precincts (Table 4).

69. The table includes two columns which identify the total GFA(or PFA) allowed on a site which is providing the required number of parking spaces, and the land area required to provide that car parking.

Table 4. Car parking requirements by precinct

#	Activity by Precinct	Parking requirement	Proposed GFA	Spaces Required	Allowed GFA	Area for Parking
1	**1. Core Retail**					
2	Food and Beverage	3.5 spaces per 100m2 PFA or GFA	845	29.6		
3	Retail	3.5 spaces per 100m2 PFA or GFA	308	10.8		
4	Totals		1153	40	1281	1057
5	**2. Retail Fringe**					
6	Food and Beverage	3.3 spaces per 100m2 PFA or GFA, whichever is the greater.	845	27.9		
7	Retail	3.3 spaces per 100m2 PFA or GFA, whichever is the greater.	308	10.2		
8	Totals		1153	38	1247	1091
9	**5. Transitional Living (Application site)**					
10	Food and Beverage	4.5 spaces per 100m2 PFA for the first 150m2 then 19 spaces per 100m2 PFA thereafter.	845	138.8		
11	Retail	Nil	308	0.0		
12	Totals		1153	139	501	1836
13	**8. Community Anchor/Town Square**					
14	Food and Beverage	3.5 spaces per 100m2 PFA or GFA	845	29.6		
15	Retail	3.5 spaces per 100m2 PFA or GFA	308	10.8		
16	Totals		1153	40	1247	1091
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70. The parking requirement for the activity within the Precinct 5 Transitional Living zone is based only on the Food and Beverage component of the activity. There is no parking required for Retail activities. This rule gives rise to a parking requirement of up to 139 spaces for the proposed mix of activities on the site.

71. If the application's individual tenancies are assessed separately (and thus each tenancy has the first 150 sqm of GFA assessed at 4.5 spaces per 100 sqm and the remainder assessed at 19 spaces per 100 sqm GFA), the total parking requirement reduces to 78 spaces.

72. The table identifies the GFA which would be allowed for a development on the 2338 sqm application site which provided the required amount of car parking. In the Core Retail precinct up to 1281 sqm of GFA would be allowed, while in the Retail Fringe and Town Square precinct up to 1247 sqm of GFA would be allowed with complying number of car parking spaces.

73. In the Precinct 5 Transitional Living zone the table shows that high parking requirement would allow only 501 sqm of Food and Beverage activities on the site (assuming no retail on the site), together with a total of 74 car parking spaces. I am assured by the applicant that a development with this GFA would not be viable, and would not proceed.

74. Examining the parking requirements for the other adjoining precincts finds that these zones have a parking requirement which supports a reasonably high intensity of development. The district plan's parking rate requires about 83 to 88 square metres of site area for parking for every 100 sqm of GFA provided. The disposition of the precincts in the vicinity of the Town Square precinct and the 'High Street' would suggest

that the application site would be expected to have a similar high density of development.

75. I note that the parking requirement which the district plan applies to the application site (19 spaces per 100 sqm for GFA over 150 sqm) is one which was derived from the parking demands of large usually isolated 'booze barn' type drinking establishments. The former Aranui Tavern and Bush Inn Courts in Christchurch were examples of this type of facility. The majority of patrons attending these types of 'food and beverage' activities travelled by motor car, and there was little or no interaction between these activities and other nearby commercial or social activities. This contrasts strongly with the nature of the activities proposed on the application site, where the floor areas of the tenancies range between about 99 and 252 square metres, and the location of the site close to the Town Square and High Street will ensure a high level of interaction between the site and other nearby commercial, social and residential activities.

76. The district plan recognises this 'town centre' effect in relation to retail activities in the Transitional Living precinct by allowing retail uses to establish without any car parking provision. In relation to the proposed development, recognising the position of the site in the core of the town's commercial centre, on the proposed High Street and close to the Town Square it would be appropriate to impose, at the most, a modest 'transitional' car parking requirement. In my view the parking requirement for the Retail Fringe precinct of 3.3 spaces per 100 sqm GFA or PFA would be appropriate.

77. This Retail Fringe parking requirement (identified in lines 5 to 8 of the above table) comes to 38 spaces for the proposed mix of activities on the application site.

78. The site is providing 38 car parking spaces, which meets this fringe zone requirement.

79. I note that the explanation for Policy B4.3.11 says:

    The Town Centres within each township serve an important function as significant physical resources providing for the social, cultural and economic wellbeing of their respective communities of influence. Crucially such Town Centres serve as focal points in terms of ***providing important public and private services and facilities in the most efficient manner*** *to the wider community, and should remain the focus of commercial, business and retail development in future.* [My emphasis]

80. The imposition of the district plans parking Transitional Living Precinct parking requirement would result in a very inefficient use of the site, with almost 80% of the land area of this town centre site required to provide car parking. The use of the lower Retail Fringe precinct parking requirement will ensure that the activity is providing for a reasonable proportion of the likely car parking demand. The site will not attract the large volumes of motor cars anticipated at 'booze barn' scale sites, and the overall intensity of development would support the council's town centre objectives.

81. The location of the site is expected to see a significant portion of the clientele walking to the site from nearby commercial and residential areas, and for there to be a high level of multi-purpose trip making – where customers visit several activities in the area as part of the one vehicle trip. Both these effects will reduce the site's customer car parking demand and thus reduce any impact which may arise from any technical shortfall in parking supply.

82. Thus, I believe that the provision of 38 car parking spaces on the site will provide sufficient car parking for the mix of activities proposed, and the non-compliance with the district plan's higher car parking rate will not have any significant adverse traffic or amenity consequences on other businesses, or on residential amenity.

RULE E13.1.5. LOADING

83. The site's parking and loading area is configured to allow for light vehicle servicing during peak times (vans, light courier vehicles etc), and for on-site turning by 8-metre class trucks when there are some vacant spaces on the site.
84. Some loading is also likely to occur from the Tennyson Street frontage of the site, utilising parking spaces on that frontage.
85. These loading facilities are expected to provide adequately for the day to day operations of the activity.

RULE E13.1.10. QUEUE SPACE

86. The proposal provides a queue space of approximately two metres in the vehicle entry to the site.
87. The development of a queue on the exit from the site will only occur when a departing vehicle has paused to wait for opposing traffic to clear before the departing vehicle can complete its exit manoeuvre. The principal issue which arises with queue formation at the vehicle access is the risk of conflicts between vehicles leaving the site and other vehicles manoeuvring into or out of parking spaces near the entrance.
88. Traffic volumes on Markham Way are estimated to be approximately 50 vehicle trips in the peak hour, of which 30 trips would be outbound in the morning peak and 20 trips outbound in the evening peak. The peak hour generation of the site could see up to 100 vehicles leaving the site, which are opposed by 20 to 30 vehicles approaching the crossing point. These low conflicting volumes are unlikely to see any significant queue formation at the access.
89. The likelihood of any impact on the safe and efficient operation of the adjacent road network, or on pedestrian safety and amenity arising from this non-compliance will be negligible.

CONSULTATION SUMMARY & IMPLEMENTATION PLAN

90. The on-road works arising from the proposal include the construction of the vehicle crossing from Markham Way to the site's parking area, the piping of the stock water course and the provision of footpaths along the site's frontage.
91. This work will require the relevant approvals and permits from council for the connection to the road carriageway and the construction of the footpaths.

CONCLUSION

92. The proposed commercial development is to be adequately provided with car parking and loading facilities that are to be located on the site.
93. Provision is made for the expected use of cycles by staff and visitors to the site in a ten-space cycle stand.
94. A SIDRA analysis has confirmed that the moderate traffic generation of the activity can be readily accommodated on the frontage roads without giving rise to any undesirable traffic conditions in Markham Way, or at the nearby intersections with the district's arterial road network.

95. From a traffic perspective, I am satisfied that the development can proceed as proposed without having any significant adverse effect on the safe and efficient operation of the roads in the locality, or on other existing or proposed activities in the vicinity of the site.

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APPENDIX 1 – ASSESSMENT OF COMPLIANCE

The relevant traffic-related rules of the District Plan are tabulated below.

Rule	SELWYN DISTRICT PLAN	Proposal	Comment
	PLANNING MAPS		
Zoning	Transitional Living Precinct (5) in the Rolleston Key Activity Centre		Noted
Roading Hierarchy	Markham Way– *Local Road*. Tennyson Street – *Collector Road*	Vehicle access to Markham Way.	Noted
E13	**ROADS and TRANSPORT**		
E13.1(b)	**Parking Requirements for Rolleston Key Activity Centre**		
E13.1.1.1	**Retail: No parking required.** **Food and Beverage: 4.5 spaces per 100m2 PFA for the first 150m2 then 19 spaces per 100m2 PFA thereafter.**	Refer table above. Between 78 and 138 spaces required. 38 spaces provided	See discussion
Table E13.2	**Parking space dimensions** **Short term 2.6x5.4+5.4aisle**	All spaces 90-degrees at 2.6 m x 5.4 m with 5.4 m aisle.	Complies
E13.1.2	Availability of spaces	All spaces available during hours of operation	Complies
E13.1.3	**Parking area location**	On same site	Complies
E14.1.4	**Cycle parking** **2 + 1 space per 5 cars paces to a maximum of 10**	10 spaces required for 40 car spaces. 10 spaces provided in hoop type stand at south end of car park.	Complies
E13.1.5	**Loading.** **To accommodate the design 8- metre truck.**	Loading area provided for bins and manoeuvre by vans during peak demand for parking. On-site turning by 8-m truck provided using vacant parking spaces.	See discussion
E13.1.6	**Spaces for residential activities**		Not applicable.
E13.1.7	**Gradient**	Refer to engineering and architectural plans.	-
E13.1.8	**Maximum gradients**	Refer to engineering and architectural plans.	
E13.1.9	On-site manoeuvring	Standard 90-degree module. All vehicles turn on site.	Complies

E13.1.10	Queue space. 10.5 metre queue space required.	2.0 m queue space provided (boundary to first space). Low volume frontage road. Minimal queuing..	See discussion
E13.1.11	Illumination. Light car park to standard	Refer architecture details	-
E13.1.12	Surface of parking and loading areas	Surface will be sealed and drained. Spaces will be marked	Complies
E13.2	Vehicle Accessway and Crossing Standards		
E13.2.1	Private Vehicle accessway		Not applicable
E13.2.2 **Table E13.5**	Distance of crossings from intersections Crossing on local road required to be 25 metres from collector road.	Crossing 32 metres from Tennyson Street	Complies
E13.2.3	Sight distances from crossings Living zones 45 metres required. Business zone 113 metres required.	>45 m sight distance available to left and right of crossing.	Complies
E13.2.4	Vehicle crossing design and siting Crossing for non-residential activity to be between 4 and 7 metres wide	Crossing 5.2 metres wide	Complies
E13.2.5	Standard of crossing Heavy duty vehicle crossing required	Heavy duty crossing to be provided	Complies

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