

UNDER the Resource Management Act 1991 ("**RMA**")

AND

IN THE MATTER of a notice of requirement ("**NoR**") for a designation by KiwiRail Holdings Limited ("**KiwiRail**") for the Palmerston North Regional Freight Hub ("**Freight Hub**") under section 168 of the RMA

REBUTTAL STATEMENT OF EVIDENCE OF MARK GEORGESON

TRANSPORT

1. INTRODUCTION

- 1.1 This evidence has been prepared in response to the transport evidence of Mr Michael Nixon dated 23 July 2021 on behalf of Foodstuffs North Island Limited, relating to their Distribution Centre at 703 Roberts Line, referred to as "DC site" by Mr Nixon.
- 1.2 This rebuttal evidence will respond to the following issues raised by Mr Nixon:
- (a) sight distances to the Railway Road – Roberts Line intersection;
 - (b) Roberts Line geometry at Railway Road;
 - (c) vehicle crossings for the DC site; and
 - (d) extent of the designation and land take for the roundabout at Roberts Line / Richardsons Line intersection.
- 1.3 I have developed concept designs for the section of Roberts Line between Railway Road and Richardsons Line, fronting the DC site, to inform my responses. They are attached as **Appendix A** to this rebuttal evidence, and labelled as Figures 148, 149, 150 and 151. Figure 148 is an overall drawing, and the other three are panels of the same that I refer to variously throughout my evidence.

2. SIGHT DISTANCE

- 2.1 Mr Nixon is concerned that the geometry of the proposed Railway Road / Roberts Line curve will affect available sight distances at the DC site from the car park and truck exit vehicle crossings. He is specifically concerned with the sight distance to the east (towards the curve).¹
- 2.2 For context, Roberts Line has recently had a downward revision of its speed limit to 60km / hr from the original 100km / hr.
- 2.3 As outlined in Mr Nixon's evidence, the sight distance from the Foodstuffs car park and truck exit vehicle crossing on a 60km / hr road is stated as 115m in the RTS-6 guide.²
- 2.4 It is relevant to review the matter of sightlines in the context of the 2006 application for Resource Consent for the then proposed Distribution Centre. That application was accompanied by an Assessment of Traffic Impacts prepared by Tim Kelly Transportation Planning Limited.³ I include a copy of that report at **Appendix B**. At Section 4.3 of the report, it is stated that vehicles approaching from the east via a left turn from Railway Road can do so at a speed of 60km / hr. The report goes on to state at Page 21 that "a vehicle travelling at this speed would require 63m in which to stop" and concludes that the "separation distance from the intersection is therefore sufficient to minimise the risk of collision."
- 2.5 In my view, the sight distance of 63m as sought by Foodstuffs in its consent application will not be compromised by the changes to the Railway Road / Roberts Line intersection proposed by the Freight Hub.
- 2.6 Mr Nixon also states that the current available sight distance from the DC site carpark vehicle crossing is in fact longer, estimated at 95m. My check gives a very similar existing sight distance of 99m. I show this on Figure 151, and on the same diagram show the sight distance of 96m that will be achieved by the proposed curve changes, within the NoR designation. From a user perspective, these existing and future sight distances to the east can be regarded as the same, being approximately 50% longer than the sight distance of 63m.

¹ Evidence of Michael Nixon dated 23 July 2021, at 3.1.

² Based on Road Traffic Standards 06, Guidelines for Visibility at Driveways (RTS-6).

³ Assessment of Traffic Impacts, November 2006.

- 2.7 I need to comment on the different sight distance values I have mentioned here. The 63m value indicated by Mr Kelly is commonly referred to as the stopping sight distance, and provides time for a driver to perceive a potential conflict, react, and stop if necessary. The 115m from RTS-6 includes an additional time of 3 seconds to allow a driver to observe and make a decision about a potential safety risk, before reacting.
- 2.8 The fact that a sight distance of 115m is not available does not necessarily mean a driveway is unsafe. To understand the safety history for the existing vehicle accesses, I undertook a CAS search for the section of Roberts Line between Railway Road and Richardsons Line for the past five years (2016-2020 inclusive). The search showed no record of crashes along this portion of the road, and none at any of the three existing driveways serving the DC site. While I acknowledge that traffic volumes will increase on Roberts Line in response to development of the Freight Hub, there are no existing safety issues at the existing accesses.
- 2.9 In my opinion, the Freight Hub will not have adverse impact on sight distances at the existing Foodstuffs driveways.

3. ROBERTS LINE GEOMETRY

- 3.1 At his paragraphs 3.6 and 3.7, Mr Nixon determines that a 105m radius curve should be introduced at the Railway Road / Roberts Line corner. I agree with this design requirement, and confirm that the corner alignment can be designed to standard guidelines with a radius of 105m.
- 3.2 I show the proposed curve design in Figure 149. In my view, this demonstrates that the designation extent is sufficient to construct and operate a safe solution for the new curve.

4. VEHICLE CROSSINGS

- 4.1 The proposed closure of Railway Road north of Roberts Line and the redistribution of traffic along Roberts Line, in front of the DC site has raised a concern for Mr Nixon around the safe and efficient operation of the DC site vehicle crossings. He addresses this matter from paragraph 3.12 of his evidence.
- 4.2 I acknowledge that traffic passing the Foodstuffs driveways on Roberts Line will increase a result of the changes planned by the Freight Hub. In order to quantify the impacts on the three Foodstuffs' driveways arising from these

changed future volumes, I undertook an analysis of each using the SIDRA intersection analysis software. The analysis was undertaken for the 2021 existing situation and for future scenarios at 2031 and 2051, without and with the Freight Hub. The SIDRA analysis was undertaken for the PM peak hour, consistent with the analysis reported in Technical Report C – Integrated Transport Assessment ("ITA").⁴

- 4.3 I looked to the Assessment of Traffic Impacts submitted as part of the 2006 Resource Consent for the DC site for truck and car volumes generated by Foodstuffs. In that report, as included in the table I repeat below, car park volumes have been split into Office Worker (36 vehicles) and Warehouse Shift (144 vehicles). Their movements do not overlap. Although the Warehouse Shift times are not coincident with the PM peak hour, I applied a conservative approach insofar as these trips were analysed as happening at the same time as the PM peak.

Event	Time Period	Vehicle Movements in Period		
		Inbound	Outbound	2-Way
AM Warehouse Shift Arrival	05:30 – 06:00	144	-	144
Office Worker Arrival	07:30 – 08:00	36	-	36
PM Warehouse Shift Arrival	13:30 – 14:00	144	-	144
AM Warehouse Shift Depart	14:00 – 14:30	-	144	144
Office Worker Departure	17:00 – 17:30	-	36	36
PM Warehouse Shift Depart	22:00 – 22:30	-	144	144

Table 4.2: Expected Light Vehicle Movements

- 4.4 The Assessment of Traffic Impacts also states that the development will generate 350 trucks between 7.00am and 10.00pm. Since the analysis undertaken as part of the Assessment of Traffic Impacts used 15 trucks (in and out) per hour, my analysis was also undertaken using 15 truck movements per hour.
- 4.5 In summary, the volumes analysed in SIDRA are as follows:
- (a) 15 trucks entering and 15 trucks exiting the site during the PM peak hour;
 - (b) 144 car movements exiting the car park during the PM peak hour; and

- (c) the following PM peak hour traffic volumes for Roberts Line are taken from the modelling analysis undertaken to inform the ITA:

Scenario	Roberts Line PM Peak Hour (vph)
2021 - Existing	160
2031 – without Freight Hub	350
2031 – with Freight Hub	1,000
2051 – without Freight Hub	550
2051 – with Freight Hub	1,250

- 4.6 I have also looked to the Assessment of Traffic Impacts for the traffic distribution for truck and cars, which reports a 60% / 40% split from the west and east for trucks, and a 50% / 50% split for cars.
- 4.7 In order to simulate the gap acceptance requirements for heavy vehicles, I have referred to the Austroads Technical Report – Road Design for Heavy Vehicles.⁵ The details of that report include research of gaps for trucks turning to and from a major road. The gap of most interest in this instance is the right turn from the truck exit driveway. Tables 3.16, 3.17 and 3.18 of the Report summarise critical gaps for different truck types and variously determine ranges of:
- (a) 7.0 - 7.2 seconds for heavy rigid trucks;
 - (b) 9.0 - 9.6 seconds for semi-trailers; and
 - (c) 9.4 - 10.6 seconds for truck-trailers.
- 4.8 At paragraph 3.14 of his evidence, Mr Nixon refers to an estimated time of 10 seconds for semi-trailers to turn right out of the DC site. This aligns well with the above research, and is the value of the critical gap I have adopted for the SIDRA analyses.

⁵

Tables 3.16, 3.17 and 3.18: Austroads Technical Report AP-T293-15 - Road Design for Heavy Vehicles.

4.9 I provide a summary of the results of the SIDRA analysis in the following table.

Intersection	Scenario	Critical Movement	Avg Delays (Sec)
Roberts Line/Foodstuffs Truck Entry	2021 Existing	Right Turn In	5.1
	2031 without Freight Hub	Right Turn In	6.1
	2031 with Freight Hub	Right Turn In	18.7
	2051 without Freight Hub	Right Turn In	8.1
	2051 with Freight Hub	Right Turn In	30.9
Roberts Line/Foodstuffs Truck Exit	2021 Existing	Right Turn Out	2.8
	2031 without Freight Hub	Right Turn Out	6.8
	2031 with Freight Hub	Right Turn Out	88.8
	2051 without Freight Hub	Right Turn Out	19
	2051 with Freight Hub	Right Turn Out	>120
Roberts Line/Foodstuffs Car Park	2021 Existing	Right Turn Out	1
	2031 without Freight Hub	Right Turn Out	1.5
	2031 with Freight Hub	Right Turn Out	4.8
	2051 without Freight Hub	Right Turn Out	3
	2051 with Freight Hub	Right Turn Out	18.4

4.10 Looking at the top part of the table, my analysis of the Foodstuffs truck entry shows that the right-turn-in movement will continue to operate acceptably, with an average delay for the largest truck turning into the DC site of approximately 30 seconds (in 2051, at full build out of the Freight Hub).

4.11 The middle part of the table shows the results for the Foodstuffs truck exit. Not unexpectedly, the analysis predicts that delays to exiting trucks will increase substantially in the future with increased traffic use of Roberts Line.

4.12 It is important to note that the analysis has been undertaken for scenarios 10 and 30 years in the future, when traffic growth and future performance of the road network is difficult to predict. The proposed Operational Traffic Management Plan ("**OTMP**") condition will determine relevant roading works required as a result of the Freight Hub by undertaking traffic monitoring and audits at predetermined intervals in future. In particular, clause (d) of proposed Condition 81 requires that the OTMP includes details of the form and timing of safety and road upgrades to the section of Roberts Line between Railway Road and Richardsons Line, including established accesses. This will inform ongoing responses for the Foodstuffs driveways.

4.13 In the event longer delays do materialise in the future, the option is available for trucks to turn left out of the DC site and use the proposed roundabout at the Roberts Line / Richardsons Line intersection shown in Figures 148 and 150 to undertake a U-turn.

5. LAND TAKE FOR THE ROUNDABOUT

- 5.1 The last matter raised by Mr Nixon relates to the geometry of the proposed Roberts Line / Richardsons Line roundabout. The views he expresses from paragraph 3.17 are that alternative options to avoid taking land from the DC site have not been fully investigated.
- 5.2 The roundabout concept I show in Figure 150 has been developed using the industry-recognised Austroads⁶ standard, for a design speed limit of 80km / hr, as proposed for the connection to the perimeter road. The guidelines state that a roundabout design for this speed environment requires a minimum central island radius of 20m and associated lane widths of 6.2m (single lane) and 4.6m (dual lane). Based on this standard, the land required for a roundabout of this size is appropriate to enable the construction and operation of this roundabout.
- 5.3 I have considered alternative positioning of the roundabout to minimise the impact to the DC site. The option to shift the design inwards to the Freight Hub as suggested by Mr Nixon is not operationally feasible because it will have a significant effect of shortening the length of available stacking between the roundabout and the first internal rail track. This first track enters the freight forwarding facilities and has an alignment that is governed by the location of the freight forwarders buildings, the position of other tracks, and rail design (that has been advanced by other technical experts).
- 5.4 In my view, a less safe outcome would result if the road stacking length between the roundabout and the first track was shortened by the kind of length needed to wholly provide for the roundabout to be built clear of the DC site.
- 5.5 As included in the ITA, Palmerston North City Council has provided for the upgrade of the Roberts Line / Richardsons Line intersection to a roundabout in their 10-year plan. This is one of the "Do Minimum" upgrades I outlined in my primary evidence. In my view, that roundabout would likely be built centrally in the road reserve and if designed to the standards I refer to above, would require land take on all four corners of the intersection, including from the DC site. As such, the roundabout design I include at Figure 150 would require the same land area in this location.
- 5.6 While there are examples of roundabouts off-set from the main road alignments, like the one Mr Nixon refers to at Figure 5 of his evidence, these are not best practice and introduce lesser outcomes, with acute angles, truck

⁶

Austroads Guide to Road Design Part 4B: Roundabouts.

tracking anomalies and differential deflections. In my view, the concept I show at Figures 148 and 150 demonstrates best practice design. I do however acknowledge that the design is only one potential solution and there needs to be some flexibility at this stage for the design to be further developed.

6. PROPOSED CONDITIONS

6.1 In paragraph 4.7 of his evidence, Mr Nixon has recorded that he agrees with Ms Fraser's recommendations and recommends that a Construction Traffic Management Plan ("**CTMP**") cover:

- (a) effects on properties likely to have their access affected by construction (including the DC Site); and
- (b) a requirement for the perimeter road to be constructed and operational prior to the closure of Railway Road.

6.2 Then in paragraphs 4.8 and 4.9, Mr Nixon recommends that trucks access between Railway Road and Roberts Line and to and from the Foodstuffs driveways needs to be maintained at all times.

6.3 I consider that these matters have already been adequately addressed in the Proposed Conditions attached to Ms Bell's evidence (which I support), including as follows:

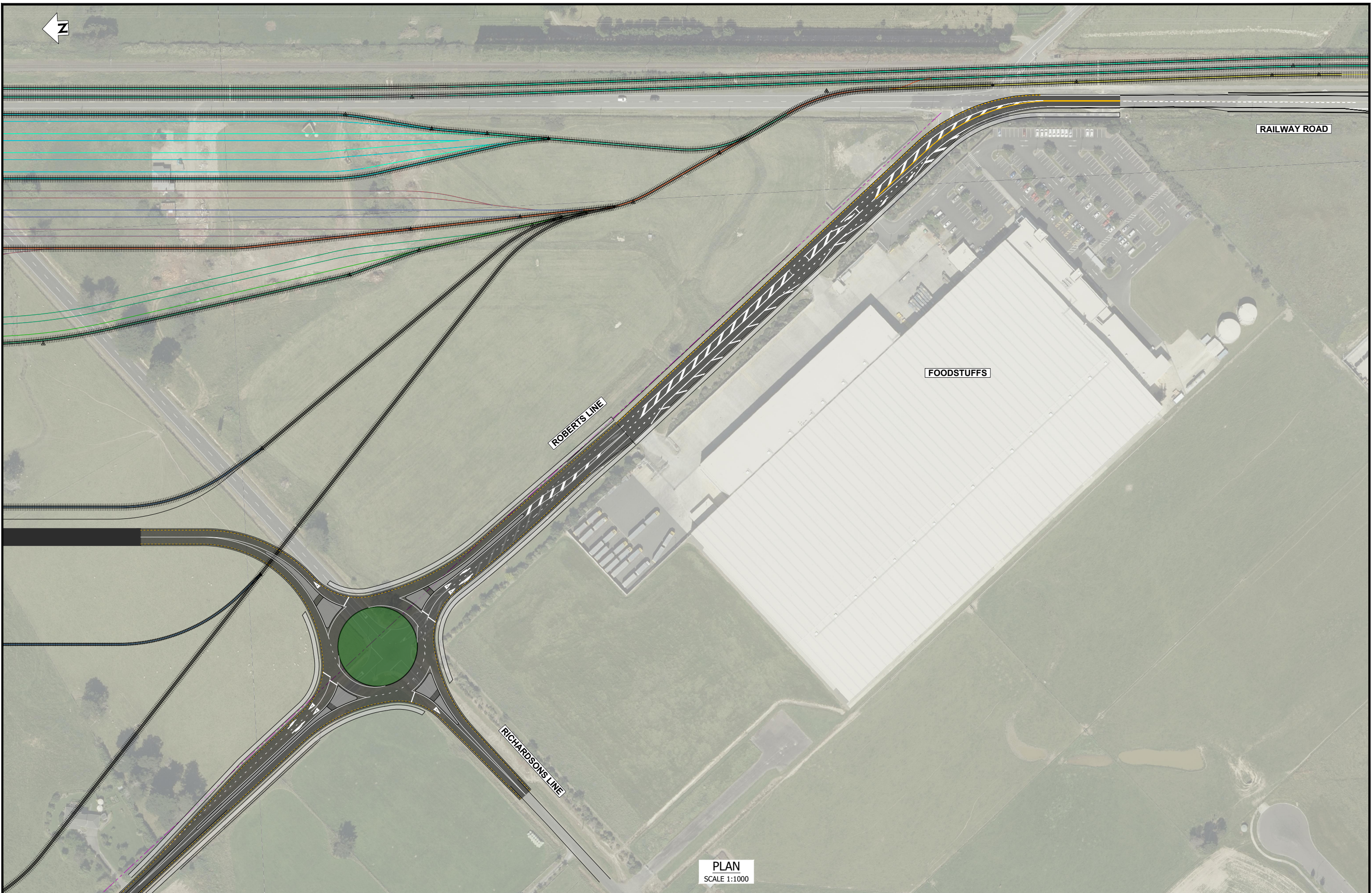
- (a) Condition 51 (being a standalone condition) requires the perimeter road (or relevant part if an alternative connection is provided) to be fully operational prior to the closure of Railway Road; and
- (b) Condition 65(g) requires the CTMP to identify properties affected by construction and outline measures to provide access on Roberts Line (which would include the DC Site).

6.4 Importantly too, the CTMP will be an evolving document that will respond to construction staging and changes, as provided for at Condition 66.

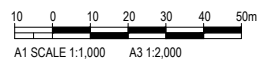
Mark Georgeson
4 August 2021

APPENDIX A

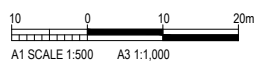
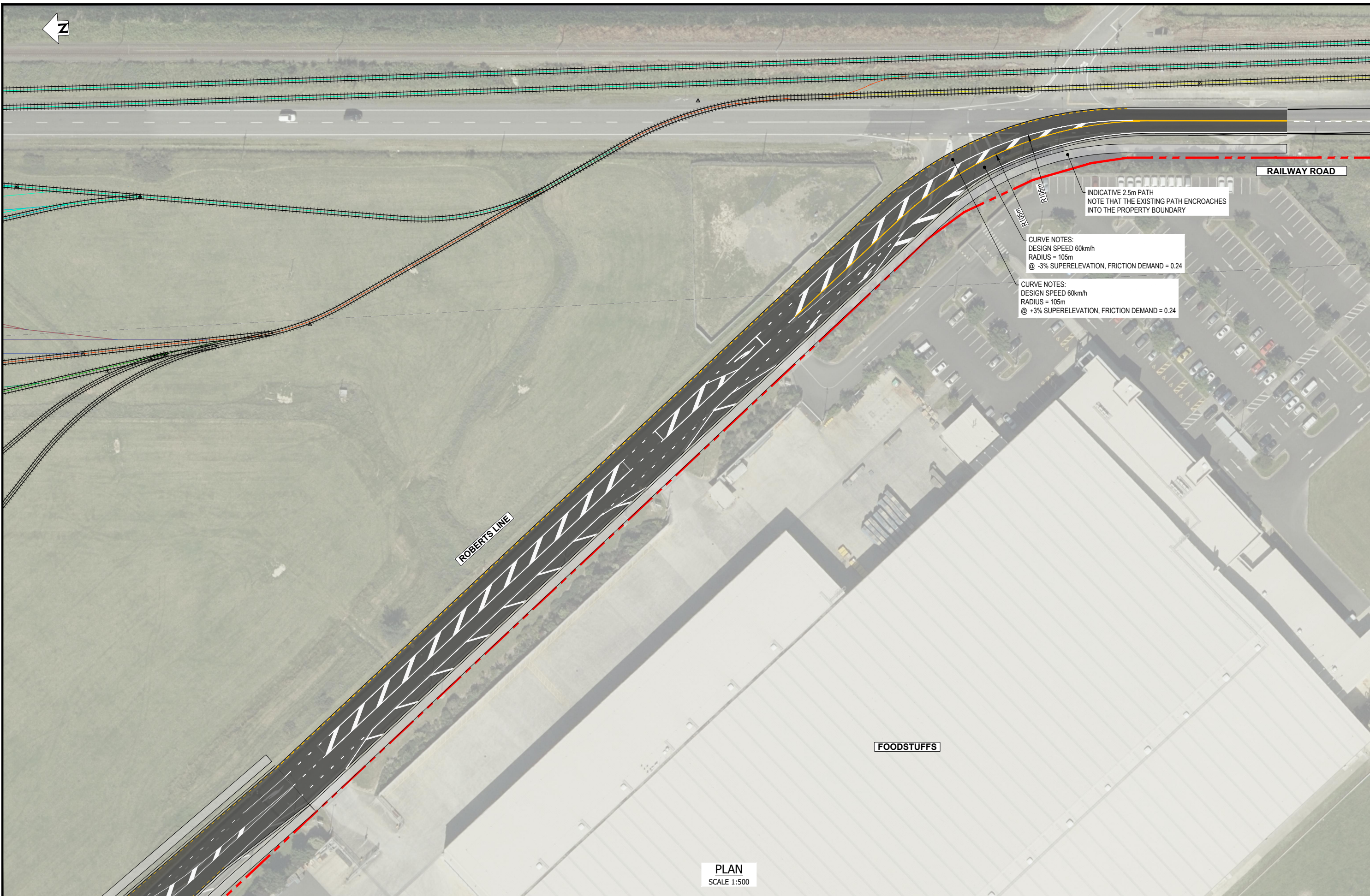
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PLAN
SCALE 1:1000



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Job No: 310003007

REGIONAL FREIGHT HUB
ROBERTS LINE
RAILWAY ROAD CURVE

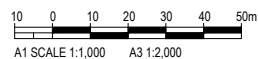
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Scale: AS SHOWN

FIG: 149

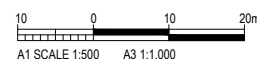
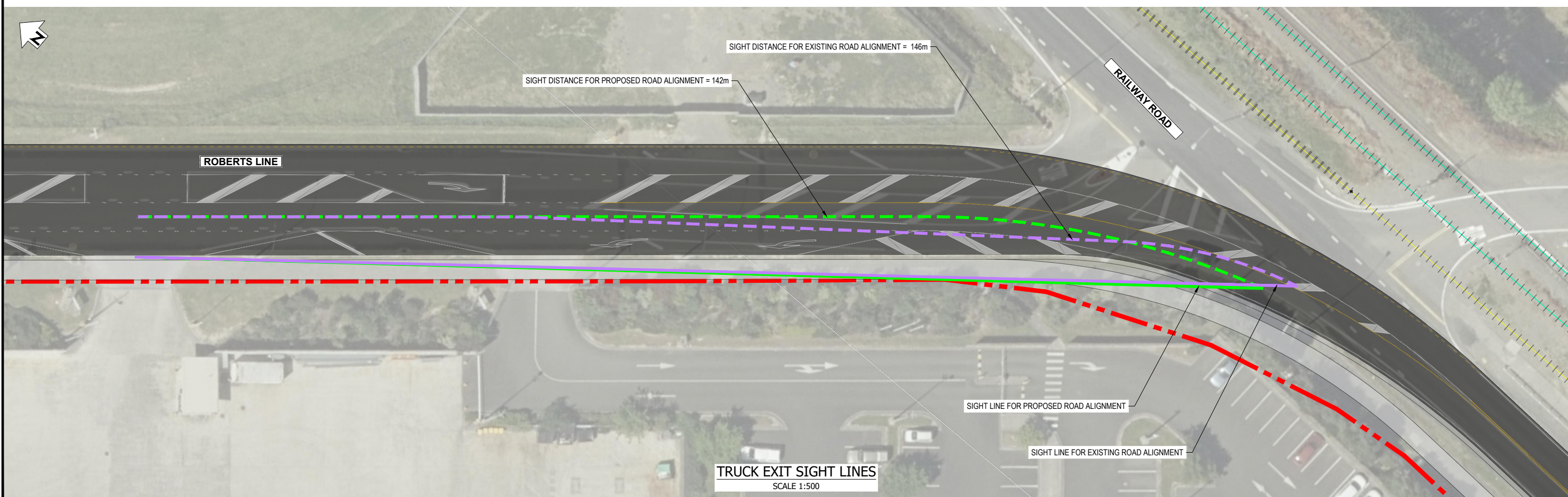
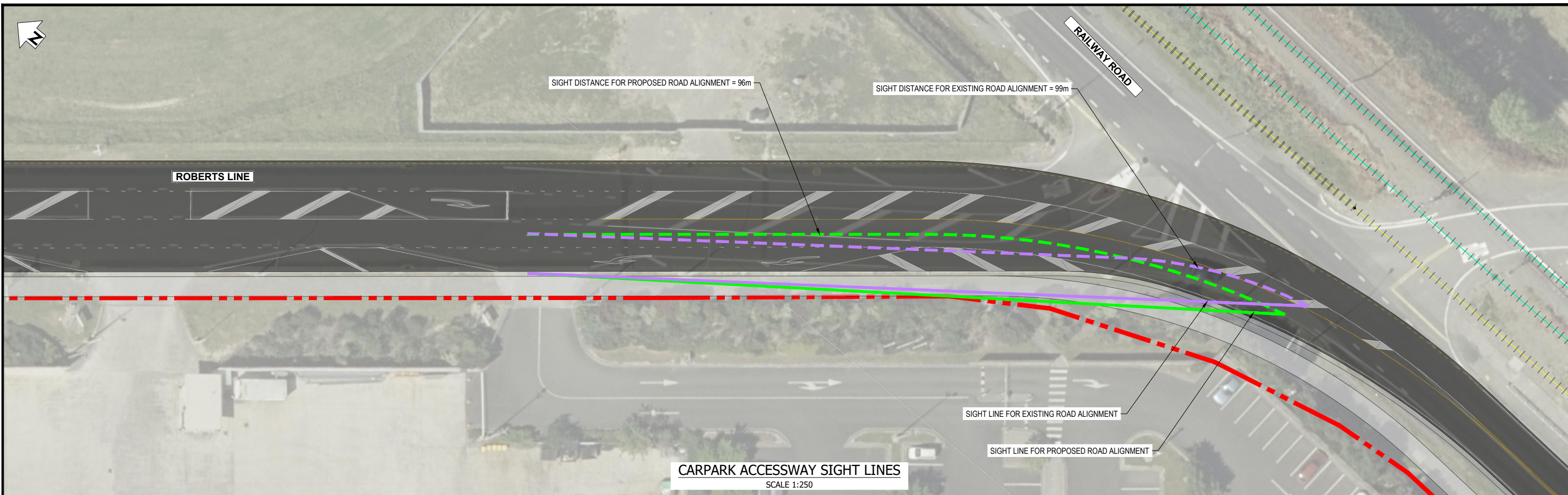


PLAN
SCALE 1:500

DESIGN PARAMETERS
MAXIMUM DESIGN SPEED = 80km/h
CENTRAL ISLAND RADIUS = 23m
CIRCULATING CARRIAGEWAY WIDTH (SINGLE-LANE) = 6.2m
CIRCULATING CARRIAGEWAY WIDTH (TWO-LANE) = 9.2m
MAXIMUM ENTRY PATH RADIUS
SINGLE LANE ENTRY = 55m
TWO LANE ENTRY (STAYING IN CORRECT LANE) = 55m
TWO LANE ENTRY (CUTTING ACROSS LANES) = 83m



8/4/2021 1:52 pm
C:\pwworking\stap_projects\101170463\10003007-FIG-151.dwg



APPENDIX B

Appendix 2

Traffic Assessment

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Foodstuffs Distribution Centre, Palmerston North

Assessment of Traffic Impacts

Revision : FINAL

prepared by
Tim Kelly Transportation Planning Limited

for
Foodstuffs Wellington

November 2006

Reference: pnorthdistributioncentre final nov06.doc

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1 Background

The Foodstuffs (Wellington) Co-operative Society Ltd (Foodstuffs) proposes to construct a distribution warehouse facility on land adjacent to Roberts Line, on the north-eastern edge of Palmerston North.

The facility will improve the efficiency of the distribution function for Foodstuffs, resulting in an overall reduction in truck distances travelled throughout the lower North Island.

However, within the more immediate vicinity of the site, the facility will give rise to a significant number of vehicle movements associated with trucks, staff and visitors. The internal design of the facility has been developed to ensure that all such movements can be accommodated both safely and efficiently. Appropriate improvements to the external road network in the vicinity of the site have also been identified which will ensure that these vehicle movements will take place with minimal impacts upon existing users of the road network in this area.

This document reports a review of the transportation impacts of the distribution warehouse proposal. This considers in detail the movement of all vehicles associated with the activity, and also addresses the likely demands for pedestrian, cycle and bus movements. The proposal has also been assessed against the relevant requirements of the Palmerston North District Plan.

1.1 Content of Report

Section 2 describes the existing conditions in the area, including levels of traffic movement and accident records;

Section 3 describes the relevant aspects of the proposal;

Section 4 describes the likely impacts of the proposal upon traffic conditions in the area;

Section 5 assesses the compliance of the proposals with the requirements of relevant District and Regional plans; and

Section 6 presents the conclusions of the assessment.

2 Existing Conditions

2.1 Location

The location of the application site is shown by **Figure 2.1**.

The site lies approximately 5.3 km north-east of Palmerston North city centre, within a block bounded by Roberts Line, Richardsons Line and Railway Road.

The Palmerston North City / Manawatu District boundary runs along the north-eastern (Roberts Line) and north-western (Richardsons Line) frontages of the site.

2.2 Description of the Area

The area is semi-rural in nature, with 100km/hr speed limits, and no street lighting or footpaths.

Roberts Line

This forms the main frontage to the site. It is defined in the road hierarchy identified by the Palmerston North City District Plan¹ as a 'Local' route.

Roberts Line primarily provides local access and does not have a significant function as a through route. Current frontage activity is rural.

This has two marked carriageways on a sealed width of 5.5m, with grassed shoulders and a drainage ditch on the south-western side. The road is straight and flat, offering good visibility in both directions.

The intersection with Richardsons Line (at the northern corner of the application site) is priority controlled with the Richardsons Line approaches being subject to 'Give-Way' controls. Visibility distances for vehicle turning at this point exceed 300m.

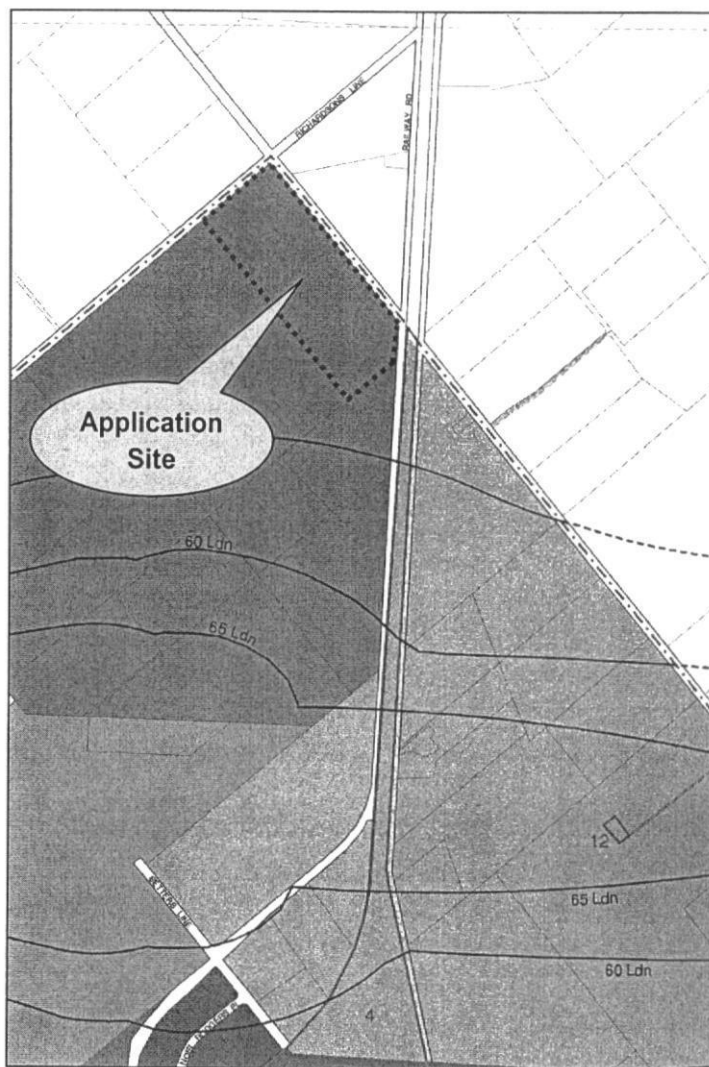


Figure 2.1 : Location Plan

(Source: Palmerston North City District Plan)

¹ Palmerston North City District Plan. Palmerston North City Council (operative March 2005)

Roberts Line continues to the north-west of this intersection, and intersects with the Kairanga – Bunnythorpe Road after a further 2kms. This section generally has a seal width of around 5.5m with grassed verges and two marked carriageways.

Railway Road

Railway Road has a short frontage with the site, immediately to the south of the Roberts Line intersection. The road hierarchy identified by the District Plan defines the section of Railway Road to the south of the Roberts Line intersection as a 'Principal' route.

Railway Road is the main route between Palmerston North and Bunnythorpe. Current frontage activity is mainly rural, with the railway running on a parallel alignment on the eastern side.

The road has two marked carriageways on a sealed width of 7.7m with 0.3m/0.5m shoulders (to the south) and 8.7m width with 0.85m shoulders (to the north). The road is straight and undulating, offering good visibility in both directions.

Railway Road and Roberts Line intersect adjacent to the application boundary. This is a priority intersection with the Roberts Line approaches subject to 'Give-Way' control. These approaches are staggered, with an offset of approximately 23m. The Roberts Line (east) approach crosses the railway approximately 15m back from the intersection; the crossing is controlled by lights and bells but no barriers. No specific lanes are provided for vehicles turning right into Roberts Line. Visibility distances along Railway Road to the north and south exceed 300m.

Richardsons Line

This forms the north-western frontage to the site. It is defined in the road hierarchy identified by the Palmerston North City District Plan as a 'Local' route.

Richardsons Line primarily provides local access but is also used by some movements between Bunnythorpe and points on the northern edge of Palmerston North. Current frontage activity is mainly rural. The airport adjoins the southern side further to the west.

This has a sealed width of 5.3m with grassed shoulders and drainage ditches, and no centreline. In the vicinity of the application site, the road is straight and flat, offering good visibility in both directions.

The intersection between Richardsons Line and Railway Road is priority controlled, with the Richardsons Line approach subject to a 'Give-Way' control. No specific lane is provided for vehicles wishing to turn right from Railway Road in to Richardsons Line. For traffic exiting Richardsons Line, visibility to the right (south) is good. Whilst the visibility to the north is constrained by the vertical alignment of Railway Road, the configuration of roads in this area means that few vehicles would turn right into Railway Road at this point.

2.3 Traffic Conditions

Existing Traffic Volumes – PNCC Count Information

Traffic counts have been supplied by Palmerston North CC for both Railway Road and Richardsons Line. These relate to a typical period in May 2004 and are summarised by **Figures 2.2 and 2.3**.

Traffic volumes on Railway Road (**Figure 2.2**) exhibit peaks in the morning and afternoon associated with commuter vehicle movements. The maximum flow of around 550 vehicles/hour occurs on weekday mornings. Saturday traffic volumes exhibit a single broad peak of traffic activity in the late morning period, of around 400 vehs/hour, whilst Sunday traffic volumes peak at around 300 vehicles/hour in the early afternoon period. Typical weekday daily traffic volumes are slightly below 5,000 vehicles/day.

Traffic volumes on Richardsons Line to the west of Roberts Line (**Figure 2.3**) exhibit a more erratic pattern, with peaks of up to 60 vehicles/hour in the week and only slightly less on Saturdays. Sunday volumes peak at slightly under 45 vehicles/hour in the late afternoon period. Typical weekday daily traffic volumes are slightly above 500 vehicles/day.

Existing Traffic Volumes – Railway Road / Roberts Line Intersection Survey

A survey of vehicle turning movements was undertaken at this intersection on Thursday 4th May 2006. All through and turning vehicle movements were recorded for half-hourly intervals between 7-9am, 10am-12pm, 1-3pm and 4-6pm. Light and heavy vehicles were recorded separately.

Summaries of the survey results are shown at **Appendix A**. Expansion of the counts to a 24-hour day (using a factor of 1.58 from the PNCC count), summarised at **Table 2.1**, shows that volumes recorded on Railway Road are slightly lower than the PNCC figures. This is likely to be because the PNCC figures refer to a point further to the south, where movements could be expected to be higher.

Road	8 Hr Surveyed	24hr Factored	% HV
Railway Rd (North)	2,637	4,166	7%
Railway Rd (South)	2,741	4,331	7%
Roberts Line (west)	562	888	4%
Roberts Line (east)	606	957	5%
Total Intersection (entering)	3,273	5,171	7%

Table 2.1: Summary of Surveyed Traffic Volumes, 2006

Existing Traffic Volumes – Railway Road / Richardsons Line Intersection Survey

A survey was also made of turning movements at this intersection at the same times as that above. This identified low traffic volumes using Richardsons Line (east), with 10 – 20 vehs/hour and an estimated 150 vehs/day on a typical weekday.

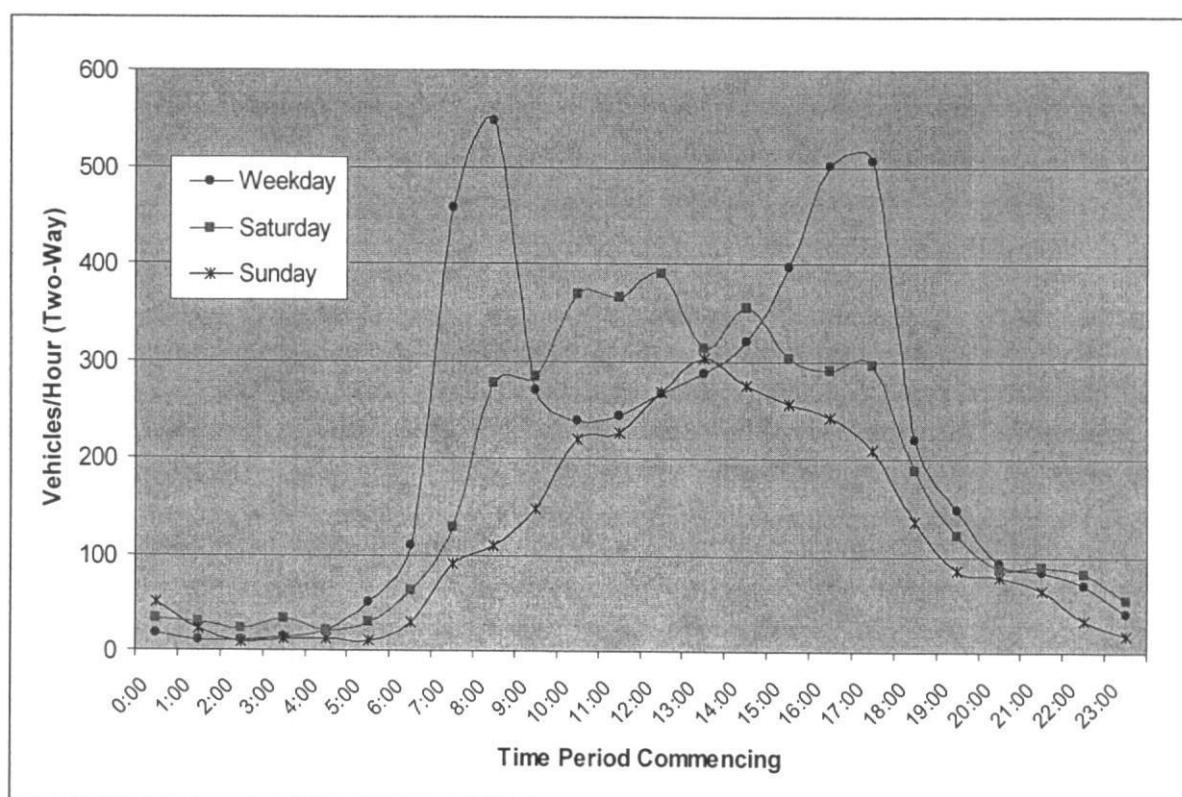


Figure 2.2: Typical Traffic Volumes, Railway Road

(Source: Palmerston North CC, May 2004)

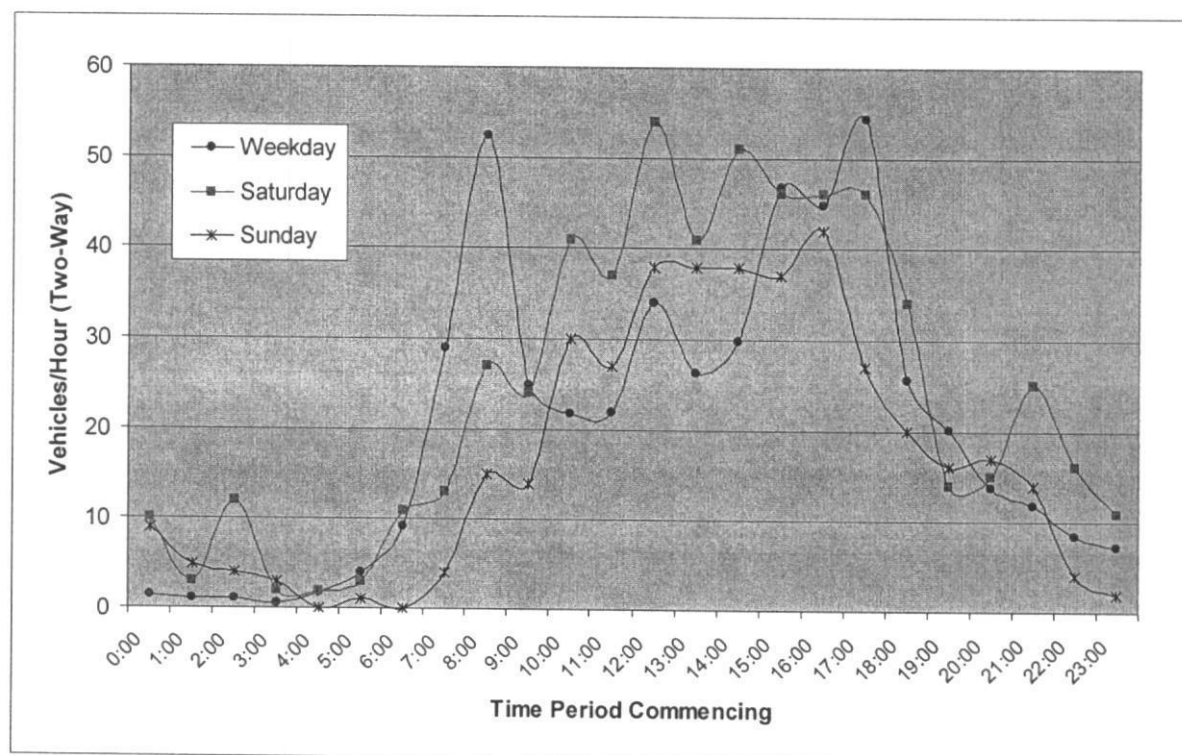


Figure 2.3: Typical Traffic Volumes, Richardsons Line (West of Roberts Line)

(Source: Palmerston North CC, May 2004)

Traffic Growth Rates

No information was available with respect to the annual growth in traffic volumes in this immediate area. Information is available for State Highways in the Palmerston North area, summarised by **Table 2.2**.

Road Section	Annual Growth 2000 – 2005 (% trend growth pa, of 2005 volume)
SH3 (East of Flyers Line)	3.4%
SH3 (North of Tremaine Ave)	4.7%
SH3 (E of P. North, near Te Matai Rd)*	1.6%
SH54 (Kairanga – Bunnythorpe)	5.3%
SH56 (Longburn)	1.4%

Table 2.2: Observed Annual Traffic Growth Rates

(* spurious value for 2001 replaced by estimate)

This suggests a wide spread of growth rates, but indicates growth above the average in the area to the north of the city. The rates relate to observed growth over a relatively short period. Future growth will be determined by a range of factors, including the performance of the regional and national economy, and local development such as that which has recently occurred in this area and this specific proposal. It is considered that a reasonable outlook for longer term growth in this area would be 3% per annum (of current volumes).

Capacity

Existing traffic volumes are well within the physical capacity of the mid-block road sections and hence congestion is not an issue in this area.

2.4 Crash Records

Crash statistics have been obtained for this area for the most recent 5-year period from Land Transport New Zealand.

All recorded crashes in the vicinity of the application site are shown by **Figure 2.4** (application site shown by a star symbol) and tabulated at **Appendix B**.

Summary details of those crashes closest to the application site are as follows;

- 17th March 2000 (ID = 2011362): a westbound car on Roberts Line failed to give way at the Railway Rd intersection and collided with a southbound vehicle; 3 minor injuries
- 18th September 2000 (ID = 2012392): an eastbound car on Roberts Line failed to give way at the Railway Rd intersection and collided with a southbound vehicle; 1 minor injury
- 27th March 2001 (ID = 2111572): an eastbound car on Roberts Line failed to give way at the Railway Rd intersection and collided with a northbound vehicle; 1 minor injury
- 23rd September 2003 (ID = 2354305): a westbound car on Roberts Line failed to give way at the Railway Rd intersection and collided with a southbound vehicle; no injuries
- 25th May 2004 (ID = 2452887): an unsecured load or trailer from a truck hit a car at the Roberts Line / Railway Rd intersection; no injuries

- 30th June 2004 (ID = 2452746): a southbound vehicle on Railway Rd lost control and went into a ditch 100m north of the Roberts Line intersection; no injuries
- 3rd August 2004 (ID = 2412637): a westbound car on Roberts Line failed to give way at the Railway Rd intersection and collided with a southbound vehicle; one minor and one serious injury
- 29th April 2005 (ID = 2551951): a northbound vehicle on Railway Rd lost control and went off the road 100m north of the Roberts Line intersection (possibly due to road-works in area); no injuries.

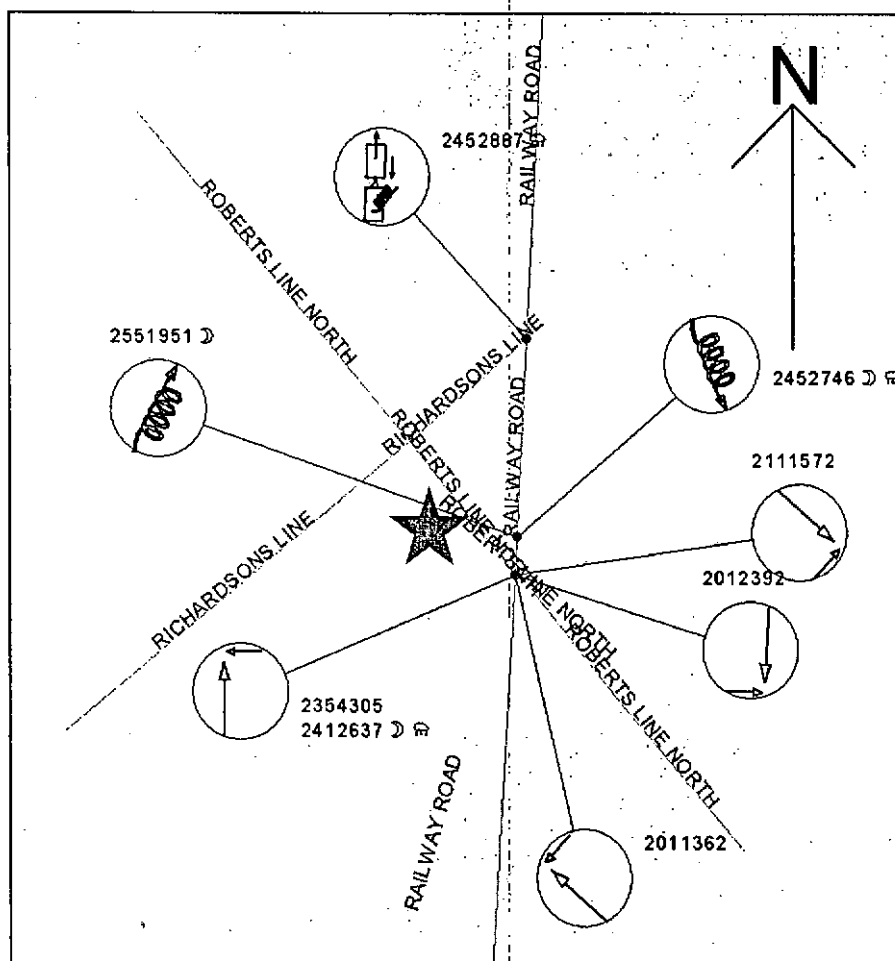


Figure 2.4: Recent Crash History (2000 – April 2006)

(Source: Land Transport NZ)

Only crashes involving personal injuries are required, by law, to be reported. Accordingly, it is likely that a number of non-injury crashes may have occurred but which have not been reported.

Overall, the number, type and severity of these crashes are not indicative of any systemic safety problems in this area.

2.5 Pedestrian & Cycle Routes

This area is semi-rural and there is no specific provision for pedestrian or cycle movements.

2.6 Public Transport

There are no public bus services in this area.

2.7 Existing Activity

The site is currently used for agricultural purposes and gives rise to a negligible volume of vehicular activity.

2.8 Potential Changes to the Roothing Network

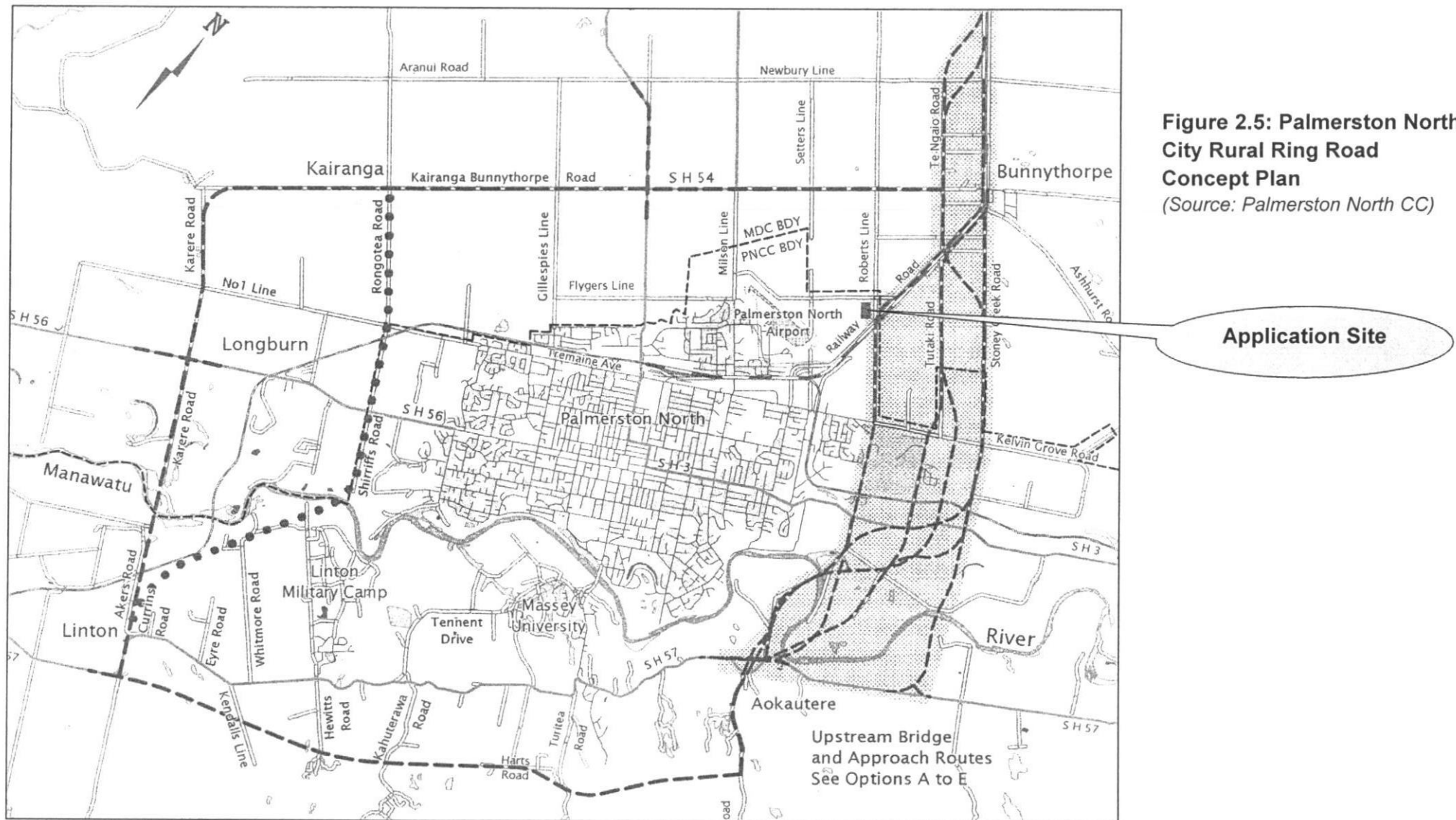
Palmerston North CC (together with Manawatu District Council) has been developing proposals for roading upgrades to accommodate growth in this area and across the city in general.

Figure 2.5 shows a concept plan for a rural ring route of the city which would provide an alternative route for through vehicle movements and provide some traffic relief to existing routes, such as Tremain Avenue. Further investigations are underway to define the route (and associated new crossing of the Manawatu River) to the east of the city between Bunnythorpe and State Highway 57. Sections of this route (for example, the Kairanga – Bunnythorpe road) are already used as an 'unofficial' ring route for some movements, though improvements would be required to accommodate increased traffic volumes associated with a more formal ring route.

The closure of Milson Line to facilitate an extension of the airport runway is still to be confirmed. If this measure were to proceed, then Richardsons Line between Milson Line and Roberts Line would also be closed.

The creation of a through route between Railway Road and Airport Drive is also proposed. When completed, this will create a high standard connection to JF Kennedy Drive and State Highway 3.

Considerable uncertainty exists with regard to the implementation and timing of these projects. These projects are likely to post-date the opening of the distribution warehouse facility and hence aspects such as truck routing will change as and when improved roading links become available. This has been recognised in the assessment of impacts described in **Section 4**.



3 Proposed Development

3.1 Description

The proposal is illustrated by **Figure 3.1**. (Further and more detailed plans are provided within other components of the application material.)

The proposal is for a distribution warehouse facility to service the lower North Island area. It is proposed that the warehouse capacity will be provided in two phases, as summarised in **Table 3.1**.

	Phase 1	Phase 2
Warehousing (m ²)	33,219	57,071
Dispatch Mezzanine (m ²)	252	252
Office (m ²)	2,490	2,490
TOTAL (m²)	35,961	59,813
Car Parks	278	378
Truck Loading Bays	10	10

Table 3.1: Proposed Floor Areas, Parking and Loading

The timing of Phase 2 is uncertain, though completion within 10 years is likely.

For the purposes of this assessment, the full Phase 2 development has been assumed.

3.2 Truck Access and Servicing

The warehouse will consolidate food supplies into deliveries to Foodstuffs' stores throughout the lower North Island. Two main types of truck movements will therefore take place;

- suppliers' trucks arrive loaded, unload their goods into the 'receiving' bays and depart empty
- Foodstuffs' trucks arrive empty, load goods from the 'despatch' bays and depart loaded.

The facility will operate 24 hours/day, 7 days/week. Typically, around 350 truck movements/day² are expected to take place, with at least 80% of these during the period 7am – 10pm. Most of these trucks will be articulated vehicles or B-trains of 20m in length.

To avoid congestion within the site and to smooth loading / unloading activity, trucks will be allocated an arrival time on a 15-minute interval system. Trucks arriving outside of their allotted time will only be accepted if the capacity exists to service them. Communication between trucks and the site will minimise the possibility of trucks arriving outside their allocated time if they cannot be accommodated, and the use of Foodstuffs' other sites in the area (Mihaere Drive and/or Kaimanawa Street) are available to be used to 'hold' trucks, if this is required. These measures will ensure that trucks waiting to be processed are not stored on the road network in the vicinity of the site.

² One movement is either an arrival or a departure.

Trucks will enter from Roberts Line and will be required to stop at a security barrier to ensure authentication before entry to the site. This barrier will be remotely controlled from the gatehouse located at the exit. At this point, trucks will be allocated a loading bay and will then proceed to the bay, driving past it before reversing in. Trucks will then be loaded or unloaded using forklift trucks, for which provision has been made for a 10m clear area behind each truck and 6-7m between adjacent trucks.

The most easterly truck dock will be reserved for use by smaller 12m trucks. This will ensure that these trucks can manoeuvre to and from this loading dock without difficulty.

The one-way circulation system within the site continues with all trucks using a separate point of exit on to Roberts Line, controlled by a gatehouse. Visibility for vehicles exiting at this point would be approximately 130m to the south-east (to the Railway Road intersection) and in excess of 300m to the north-west.

No cleaning or general maintenance of trucks will take place on the site.

The proposed facility will result in the closure of the existing distribution warehouse at Kaimanawa Street. The facility will not process frozen products, which will continue to be distributed from the existing cold store operated by Foodstuffs on Mihaere Drive.

3.3 Staff / Visitor Vehicular Access & Parking

Staff

The full facility will employ approximately 370 staff. Of these, 330 will be employed in the warehouse, with 160 working in each of two shifts 6am-2pm, 2pm-10pm and a nominal number of staff employed overnight. The remaining 40 staff will be office-based, working typical office hours on weekdays 8am – 5pm.

The staff parking area will be located at the south-east side of the site, and will provide parking for 324 staff vehicles. Within this, five spaces will be reserved for use by disabled staff members and these will be located close to the main building entry/exit.

Visitors

Typically, around 20 visitors are expected to be on the site during normal business hours. A maximum of 80 visitors may be present at any one time when a group meeting is being held in the conference room.

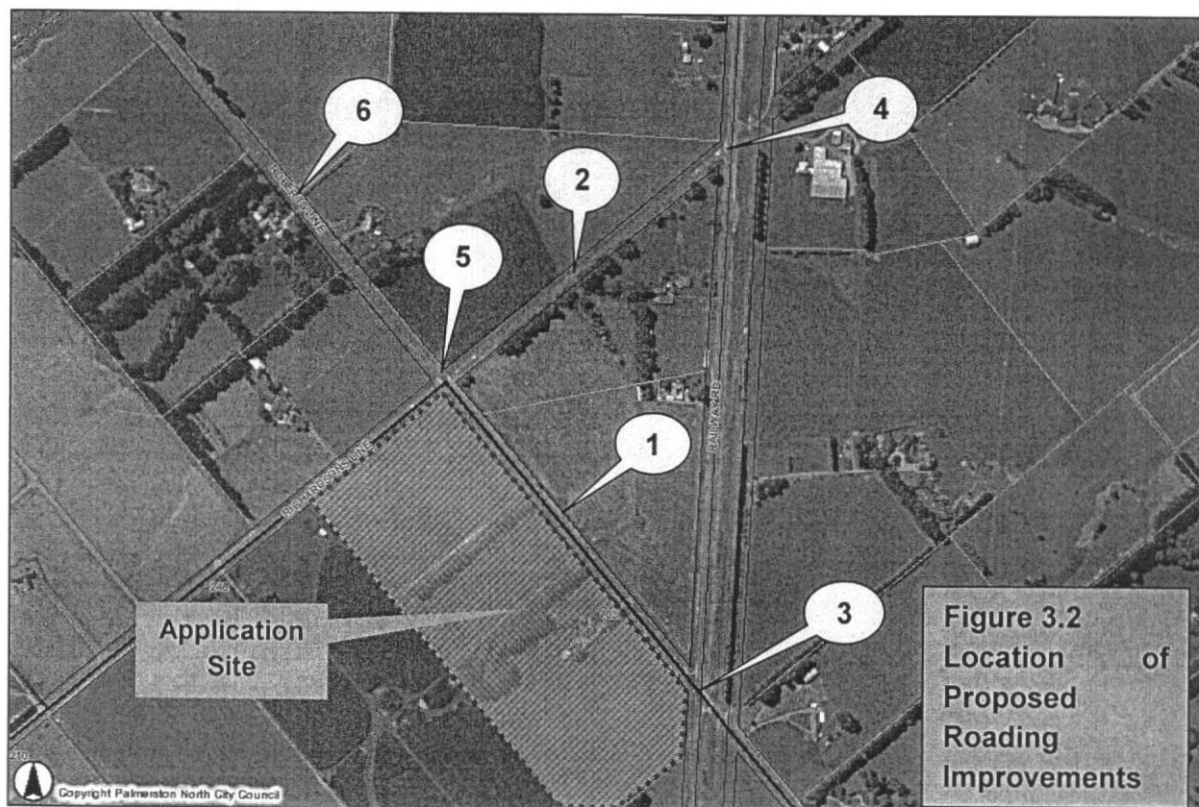
A visitor parking area with 54 spaces will be provided, separate to the staff parking area. This will include four spaces reserved for use by disabled visitors. When this area is full, any additional parking demand will be accommodated by the adjacent staff parking area.

Staff and visitor vehicle movements to and from the site will be segregated from truck movements by the provision of a separate access to/from Roberts Line. Visibility for vehicles exiting at this point would be approximately 80m to the south-east (to the Railway Road intersection) and in excess of 300m to the north-west. Although the staff parking area has a frontage with Railway Road, no direct access is proposed.

3.4 Changes to External Road Network

As described in **Section 2.8**, development in this area has been anticipated by the local authorities with the identification of plans for a number of roading improvements which would service such development and remove through traffic from the Palmerston North urban area.

In consultation with both Palmerston North CC and Manawatu DC, a package of roading upgrades has been identified which would accommodate the additional truck movements in this area. Individual measures are identified by **Figure 3.2** and described below.



Roberts Line (between Railway Road and Richardsons Line intersections) [Measure 1]

This section (of approximately 450m) is to be widened (the existing seal width is approximately 5.5m) and strengthened. The basic standard of construction would be that for a rural minor collector road as defined by NZS4404³. This provides for an 8m seal width comprising 2* 3.5m traffic lanes and 2*0.5m shoulders.

In addition, 3.5m wide lanes would be provided for vehicles turning right into the site from the north-west, and for vehicles turning left into the site from the south-east.

The configuration of the right turn lane would be broadly consistent with the requirements of the Manual of Traffic Signs and Markings⁴. The length of the right and left turning lanes would be sufficient to accommodate two trucks and hence would be a minimum of 40m.

³ Land Development and Subdivision Engineering; New Zealand Standard 4404. *Standards NZ, 2004.*

⁴ Manual of Traffic Signs and Markings (MoTSAM). *Transit NZ, 1994.*

Richardsons Line (Railway Road – Roberts Line intersections). [Measure 2]

This section (approximately 420m) is to be widened and strengthened. The basic standard of construction would be that for a rural minor collector road, as defined above.

Railway Road / Roberts Line Intersection [Measure 3]

Relocation / realignment of this intersection is not considered to be warranted.

Swept path curves for B-trains on a 12.5m turning radius suggest that vehicles turning between Railway Road (South) and Roberts Line (north-west) can do so within the existing seal, and no further modifications are considered necessary.

B-trains turning between Railway Road (north) and Roberts Line (north-west) would have some difficulty, with such manoeuvres necessitating turning across opposing lanes of traffic. For this reason, all truck movements between the site and Railway Road (north) will be encouraged to use Richardsons Line and its intersection with Railway Road to the north. This could, if necessary, be reinforced with the prohibition of the right turn manoeuvre from Railway Road (north) into Roberts Line.

It may also be appropriate for Palmerston North CC to introduce a heavy vehicle restriction upon Roberts Line (south-east). Such a measure could impact upon other truck movements in this area and hence would be the subject of a consultative exercise.

Railway Road / Richardsons Line Intersection [Measure 4]

A lane for vehicles turning right into Richardsons Line from Railway Road (north) is proposed. The configuration of this lane would be broadly consistent with the requirements of the Manual of Traffic Signs and Markings.

The left turn from Richardsons Line to Railway Road (north) would be eased as part of the general widening of this section of Richardsons Line (Measure 2).

Whilst the turns between Richardsons Line and Railway Road (south) are tight, none of the trucks associated with the proposal would be required to make this manoeuvre.

Richardsons Line / Roberts Line Intersection [Measure 5]

Trucks turning between Richardsons Line (north-east) and Roberts Line (south-east) would run across opposing traffic lanes and hence upgrading of this intersection is proposed, consistent with the widening of the adjacent sections of Richardsons Line and Roberts Line. Land appears to be available within the road reserve on the eastern corner of this intersection which would permit the easing of this turn to accommodate B-trains.

Richardsons Line (south-west) is planned to be closed as a through route (due to the extension of the airport runway) and hence this will become a cul-de-sac. This may create an opportunity for a change in the priorities at this intersection, with turns between Richardsons Line (north-east) and Roberts Line (south-east) becoming the priority movements. Furthermore, it may be appropriate for Manawatu DC to introduce a heavy vehicle restriction upon Roberts Line (north-west), though such a measure would impact upon existing truck movements in this area and would be the subject of a consultative exercise. The need for these measures would be governed by the future status of Roberts Line to the north (refer Measure 6).

Roberts Line (Richardsons Line – Kairanga/Bunnythorpe Road) [Measure 6]

This section of road is approximately 2kms in length. The width (5.5m seal), sub-base and culvert crossings would not accommodate significant use by heavy trucks. For this reason, the 'base package' of improvements anticipated the placement of a heavy vehicle prohibition to protect this section of road.

However, Palmerston North CC and Manawatu DC recognise that this represents a potentially more convenient route for trucks between the site and the Kairanga - Bunnythorpe Road which would avoid the use of the Bunnythorpe urban area for movements to/from the north, west and south (movements to/from SH3 would still route via Bunnythorpe to access the Ashhurst Road).

Use as a heavy vehicle route would necessitate works to widen and strengthen the road, and changes may be necessary to the intersections with Richardsons Line and the Kairanga – Bunnythorpe Road. At the time of preparing this report, these issues were being examined by Palmerston North CC.

Funding

It is stressed that the identification of the measures above does not indicate a willingness by Foodstuffs to fund the necessary works. The Councils involved have recognised the need for infrastructural upgrades in this area to service this and potential further development, and hence an apportionment of costs between the parties involved will be appropriate. This will be the subject of negotiation outside of the consent application process.

Traffic Management Plan

A Traffic Management Plan (TMP) has been agreed with Palmerston North CC which provides assurances that appropriate routes will be available for truck movements associated with the warehouse facility both before and after the completion of the strategic ring route around the city. This has been reproduced as **Appendix C**.

3.5 Pedestrian, Cycle and Bus Movements

Some employees or visitors may be dropped off by drivers who do not wish to enter the site. Pedestrian access to the site will be adjacent to the staff/visitor vehicular entrance and a footpath will connect this point to the main building entry, with a marked crossing of the staff vehicle access road.

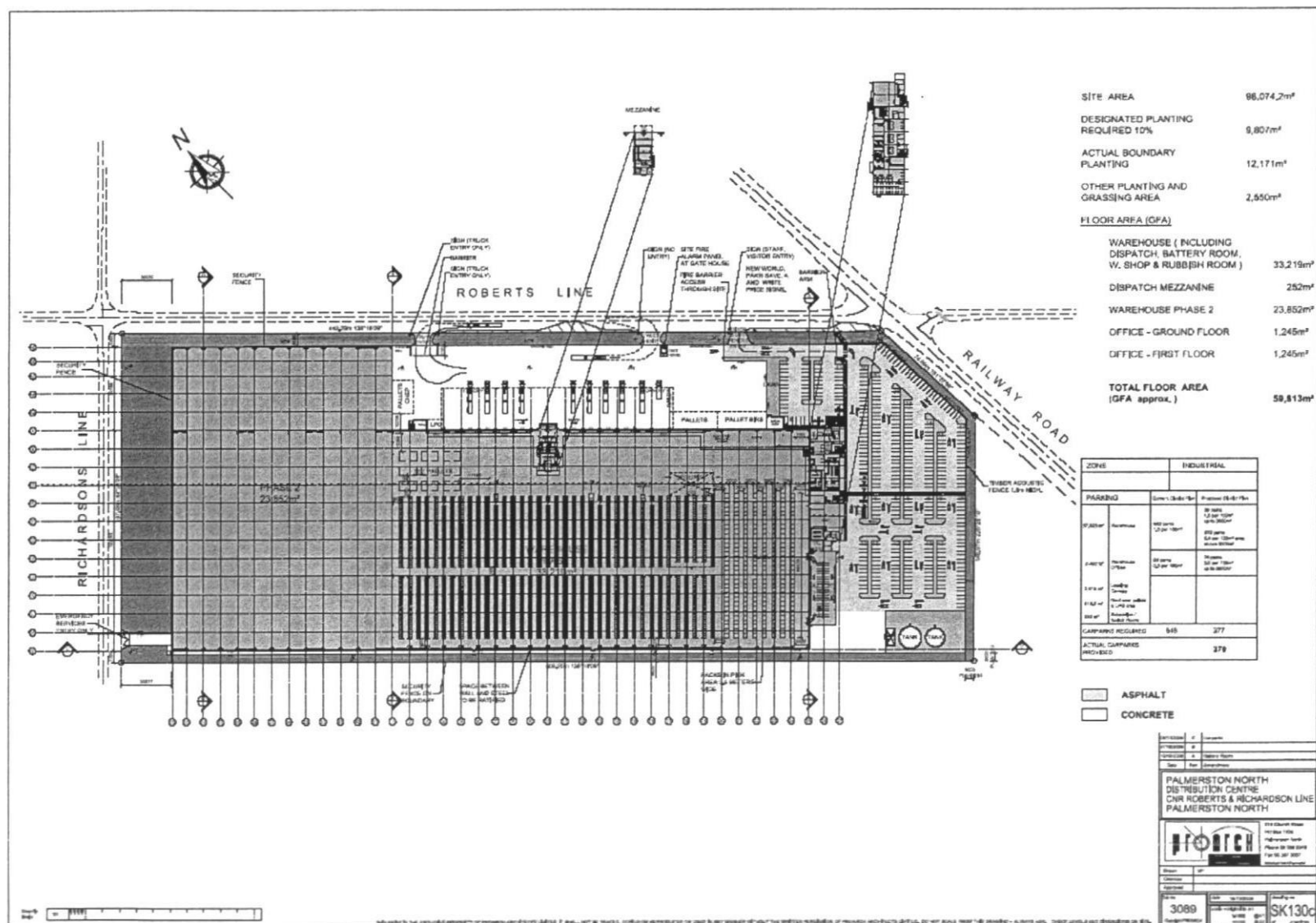
Cycling by staff members will be actively encouraged with the provision of cycle parking facilities adjacent to the main staff car-parking area.

Horizons Manawatu has advised that there are no public bus services which service the adjacent sections of Railway Road or Roberts Line. The dispersed nature of existing and likely future employee residential locations means that the provision of a bus service by Foodstuffs itself is unlikely to offer an efficient solution for staff travel. For these reasons, no specific provision has been made for a bus-stop on the site boundary. However, this does not preclude such provision in the future should this prove to be warranted.

3.6 Emergency Vehicle Access

The Fire Service has been consulted during the design process for the site, and has requested that two points of emergency vehicular access be provided. The first would utilise the proposed truck entry points, with access available from the main truck servicing area through to the staff car park where water tanks will be located.

The second point of access would be on the western side of the site from the Richardsons Line frontage and would provide access to the rear of the building. This access would be around 15m deep and 7.5m wide, and located 180m from the Roberts Line intersection. This would only be used in the event of an emergency or a training exercise.



4 Impacts of the Proposed Development

4.1 Introduction

Development of the type and scale proposed has to some extent been anticipated in plans for this part of Palmerston North. Planned improvements to the roading network in this area (described in **Section 3**) have been designed with the intent of minimising the potential for any adverse effects associated with additional vehicle movements upon existing road users or established communities.

It is important to note that the proposed facility will improve the efficiency of the distribution function for Foodstuffs, resulting in an overall reduction in truck distances travelled throughout the lower North Island. This will include some reductions in truck and staff movements on roads in the vicinity of the existing Kaimanawa Street facility.

However, the focus of this assessment is upon the more immediate vicinity of the proposed warehouse facility, where there is a *potential* to create impacts upon the efficiency of traffic movement in this area, and the safety and sustainability of the transportation network. This section assesses these potential impacts for each of these areas.

4.2 Efficiency

Traffic Generation & Distribution – Truck Movements

As indicated in **Section 3**, it is expected that around 350 truck movements/day will typically take place, with 90% of these between 7am and 10pm. On this basis, it can be expected that an average of 12 trucks will enter and leave the site each hour. Whilst the scheduling of trucks will avoid any significant peaks in activity levels, the arrival and departure of 15 trucks/hour has been assumed for assessment purposes.

The distribution of these truck movements by route has been estimated from schedules supplied by Foodstuffs for its own vehicle fleet, and by assuming a similar general distribution of suppliers' vehicles. The proposed distribution warehouse will not provide facilities for the servicing, cleaning or re-fuelling of the Foodstuffs vehicle fleet. Instead, these activities will take place off-site, most likely at a location in the northern Palmerston North urban area. As a result, many of the Foodstuffs vehicles will route to/from the servicing facility after or before visiting the warehouse. This is reflected in the expected distribution of truck movements by direction shown by **Table 4.1**.

It is stressed that unless heavy vehicle prohibitions or restrictions are placed upon specific routes (for example, Roberts Line south of Railway Road), the use of the routes above would be reliant upon decisions made by individual truck drivers. In this regard, whilst Foodstuffs has identified those routes it would expect truck drivers to use (refer **Appendix C**), it could not guarantee compliance, especially for those vehicles associated with external suppliers.

As described in **Section 3**, controls upon truck processing will ensure that there is no necessity for trucks to wait on the external road network in the vicinity of the site.

Origin / Destination	Route (outwards from site)	Vehicles/Day [vehicles/hour max]		
		In	Out	2Way
North (SH3 Wanganui, Taranaki, etc)	Refer to Agreed Traffic Management Plan (Appendix C)	84 [7]	32 [3]	116 [10]
East (via Manawatu Gorge: Hawke's Bay, Wairarapa)		10 [1]	22 [2]	32 [3]
South (Horowhenua, Wellington)		15 [1]	56 [5]	71 [6]
Palmerston North City		66 [6]	65 [5]	131 [11]
TOTAL		175 [15]	175 [15]	350 [30]

Table 4.1: Estimated Distribution of Truck Movements

* if Roberts Line (north) were improved to accommodate truck movements, these trucks would not be required to pass through Bunnythorpe

Traffic Generation & Distribution – Light Vehicle Movements

Main vehicular activity will be associated with the arrival and departure of the shift and office workers. A number of employees will not bring their own vehicle, either sharing a vehicle with a colleague, getting dropped off, or cycling. Based upon a conservative assumption that 90% of employees bring their own vehicle, then the main arrival or departure patterns will be as summarised in **Table 4.2**. In addition, a small number of vehicle movements will occur throughout the day associated with visitors.

Event	Time Period	Vehicle Movements in Period		
		Inbound	Outbound	2-Way
AM Warehouse Shift Arrival	05:30 – 06:00	144	-	144
Office Worker Arrival	07:30 – 08:00	36	-	36
PM Warehouse Shift Arrival	13:30 – 14:00	144	-	144
AM Warehouse Shift Depart	14:00 – 14:30	-	144	144
Office Worker Departure	17:00 – 17:30	-	36	36
PM Warehouse Shift Depart	22:00 – 22:30	-	144	144

Table 4.2: Expected Light Vehicle Movements

The main movements of staff vehicles associated with shift start and finish times will not coincide with either the movement of office-based staff or peaks in background traffic volumes on the adjacent road network (which occur during the traditional commuting hours, as described in **Section 2.3**).

Based upon the existing distribution of Foodstuffs employees' home locations, adjusted to reflect the new site, the following distribution of staff vehicle movements has been assumed;

- Railway Road (south) 60%
- Roberts Line (south-east) 20%
- Roberts Line (north-west) 10%

- Railway Road (north) 10%.

Capacity Impacts – Road Sections

Peak directional traffic volumes using Railway Road are currently slightly below 400 vehicles/hour. As indicated in **Section 2**, existing volumes are well within the capacity of the road network and hence congestion does not occur.

As described above, the only vehicle movements which would coincide with the existing peaks in activity would be the office based staff, amounting to around 36 vehicle movements, most of which would be travelling in the counter-peak flow direction.

Trucks moving to and from the site would have an impact upon capacity disproportionate to their number, due to their size and relatively slow manoeuvring. Despite this, the movement of trucks on Roberts Line, Richardsons Line and Railway Road can be accommodated without any significant impairment of operating conditions for existing road users.

Capacity Impacts – Intersections

The site access and egress arrangements, for both truck and light vehicles, have been designed to facilitate the efficient movement of vehicles. The provision of a right-turn bay for trucks entering the site from Roberts Line (north-west) will ensure that the movement of other vehicles is not impeded. Similarly, trucks approaching from Roberts Line (south-east) will pull over into a deceleration lane prior to turning into the site. Both of these lanes will be of sufficient length to ensure that trucks will not block through carriageways. The possibility of several trucks approaching or leaving the site at once will be removed by the use of the proposed scheduling system with the allocation of a 15 minute time slot to each truck.

The computer programme SIDRA has been used to simulate the effects of additional vehicular activity upon the Railway Road / Roberts Line intersection. The assessment has been undertaken for a notional period 2-2.30pm when the morning warehouse shift is departing and truck movements are taking place. Existing background traffic volumes were increased by 27% to reflect conditions in the year 2015 with 3% pa growth in the intervening period.

Results are summarised at **Appendix D**. These demonstrate that there would be no degradation of the Level of Service (LOS) on Railway Road. Average delays of around 20 seconds and a queue length of up to 6 vehicles would be experienced on the Roberts Line (NW) approach, though these conditions would be short-lived for the period of the shift departure. If necessary, this could be alleviated by widening this approach to provide separate lanes for left/ahead and right turning movements.

A SIDRA assessment for the Railway Road / Richardsons Line intersection was not considered to be warranted. This intersection currently carries very low turning volumes and delays are minimal. The addition of up to 10 truck movements / hour between the Richardsons Line and Railway Road (north) approaches will not have any appreciable impact upon delays to through vehicle movements, especially with the provision of a lane for movements turning right into Richardsons Line.

Net Effects

As indicated above, it should be noted that some of the vehicle movements associated with the operation of the distribution warehouse will effectively replace existing staff or truck movements which are associated with the Kaimanawa Street facility. Whilst the balance of vehicle movements cannot be accurately determined, the *net effect* of the proposal will be to remove vehicle movements from the more congested parts of the Palmerston North street network, and total truck distances travelled throughout the lower North Island will be reduced.

Remote Impacts

With a number of route options available in the immediate vicinity of the site, delivery and staff vehicle movements will dissipate rapidly.

Table 4.1 suggests that around 130 truck movements/day would use Railway Road to/from the Palmerston North urban area. These trucks would have a range of origins or destinations within the urban area and hence would be likely to divide between Tremaine Avenue and Kelvin Grove Road at their intersection with Railway Avenue. Furthermore, the *net effect* of these movements upon the road network in this area will be small (when allowance is made for the closure of the Kaimanawa Street facility).

Without the upgrading of Roberts Line (between Richardsons Line and the Kairanga – Bunnythorpe Road) to accommodate truck movements, around 150 trucks/day could route through Bunnythorpe. This would be a short-term impact, which would be subsequently alleviated by either the upgrading of Roberts Line or the construction of one of the options for the Palmerston North ring road route to the east of the city.

The proposed warehouse is located some distance from the state highway network. Whilst trucks will utilise parts of SH54, SH3 and SH56, the impacts on these routes will be small, particularly when net effects are considered (as described above). For this reason, and also because no direct or indirect accesses onto the state network are required, Transit NZ is not considered to be materially affected by the proposal.

4.3 Safety

Vehicular Access – Truck Movements

The proposals for the widening of Roberts Line and the provision of lanes for trucks turning both left and right into the site will minimise the risk of any conflicts between truck and other vehicle movements in the area.

The set-back of the truck entry barrier will ensure that a stationary truck will not block the carriageway on Roberts Line. The use of a one-way (clockwise) circulation system for truck movements, combined with the scheduling system and generous working areas around each truck will ensure that safety will be maintained within the site.

Trucks exiting onto Roberts Line will do so from a point around 130m from the Railway Road intersection. Visibility standards are good in this area, providing sight-distances of 130m to the east and over 300m to the west. Whilst Roberts Line is subject to a 100 kms/hr speed restriction, the speed of vehicles approaching from the right at this point is effectively constrained by the intersection, to a maximum of 60kms/hr (for a vehicle turning

left from Railway Road south). A vehicle travelling at this speed would require 63m in which to stop (for example, in response to a truck which was blocking the road). Accordingly, the separation distance from the intersection is sufficient to ensure that the risk of a collision is minimal.

Vehicular Access – Staff / Visitor Movements

Staff/visitor vehicles will exit onto Roberts Line at a point around 80m from the Railway Road intersection. As indicated above, vehicles approaching from the east do so at a maximum speed of 60kms/hr, requiring 63m in which to stop. The separation distance from the intersection is therefore sufficient to minimise the risk of a collision.

Pedestrian & Cycle Movement

The semi-rural location of the proposed facility means that pedestrian movements outside of the site are not expected to occur, other than those associated with staff or visitors being dropped off or collected.

A pedestrian route between the staff/visitor vehicular entrance and the main building will minimise the risk of any pedestrian / vehicle conflicts within the site.

Cycles will use the same routes as staff / visitor vehicles to enter and leave the site; the provision of separate facilities is not warranted. Cycle parking facilities will be provided adjacent to the main entry to the building.

4.4 Parking

Given the location of the site and the lack of any kerbside parking on adjacent roads, it is important that the site is self-sufficient with respect to parking. The proposal will provide 378 parking spaces in total, of which 324 will be in the staff parking area.

The best estimates of the maximum number of staff on the site at any one time is 360. This will occur at the shift change-over at 2pm, when two shifts of 160 staff plus 40 office-based staff will be on the site. Some staff would share vehicles whilst others may cycle, and hence the maximum staff parking demand is likely to be around 320 – 330 spaces.

The provision of 54 spaces for use by visitors will accommodate most visitor requirements. Occasional exceptions may occur when conferences are taking place. Such conferences may have up to 80 attendees, though some will share vehicles or arrive by air / taxi and not require parking.

For these reasons, self-sufficiency in parking will be ensured.

Parking areas will include the provision of permanently marked and reserved spaces for disabled visitors (four spaces) and staff (five spaces).

The staff and visitor parking and circulation areas will meet the geometric requirements of the District Plan, which in turn are set to ensure safety and convenience of use.

4.5 Sustainability

This assessment has assumed the maximum size of warehousing facility envisaged on the site (which may not occur for around 10 years) and associated levels of truck and staff vehicle movements. The scale of warehousing activity is effectively constrained by the size of the site and there would be no scope for either extending the site or intensifying the activity in the future.

Over the longer term, traffic volumes in this area are expected to grow by around 2-3% per annum. Given that existing peak period traffic volumes are well within the capacity of the roads in this area, it will be many years before traffic volumes will grow to the point at which significant capacity problems are apparent. Whilst the operation of this warehousing facility will, in theory, bring this point in time forward, the incremental impact of the facility upon the ability of the road network to serve its intended function will be small.

4.6 Construction & Operational Traffic Management Plans

Construction

The construction of the distribution warehouse will give rise to a significant number of vehicle movements. At this stage, details of the construction sequencing and associated vehicle movements have not been identified. It is proposed that at the appropriate time, a construction traffic management plan will be developed and agreed with the Councils involved. This will address matters such as the movement of trucks to/from the site, the routing and timing of exceptional loads, measures to avoid any transfer of mud onto adjacent roads, etc.

Operation

An operational traffic management plan for the normal operation of the site is also proposed. This will address matters relating to the movement and control of staff and truck movements to/from the site, and emergency vehicle access. If appropriate, this may include provision for the monitoring of traffic movements in terms of volume, routes and impacts. Again, this document will be developed and agreed in consultation with the Councils involved.

4.7 Impacts – Conclusion

The preceding discussion has identified that the proposed distribution warehouse will not be detrimental to the operation of the road network in this area.

The establishment of the North-East Industrial zone by Palmerston North CC anticipates this type of the development and the associated traffic impacts. In this respect, this represents the ideal location for such an activity, in terms of traffic accessibility and an expectation of truck movements. Location elsewhere within the city area would be likely to have given rise to significant impacts upon either the residential street network or the strategic State Highway network.

5 Statutory Context

5.1 Palmerston North City District Plan

The relevant plan is the Palmerston North City District Plan⁵, which became operative in December 2000, and was last updated on 5th May 2006.

The application site is located in the 'North East Industrial' zone. The roading hierarchy defined by the District Plan classifies Roberts Line and Richardsons Line as 'Local Routes', and Railway Road a 'Principal' route.

Objectives, policies and rules relevant to the traffic assessment are those which relate specifically to the NE Industrial zone and also those which relate to traffic, access and parking matters across the city in general. These are considered below, for the full (Phase 2) development. Compliance issues for the intermediate Phase 1 development are addressed in Section 5.4.

5.2 Objectives, Policies & Rules: North East Industrial Zone

Objectives & Policies

Objective 12A.2: To enable industrial use and development of the Zone taking into account topography, any existing site features, natural hazards, the servicing needs of future industry and the ability for people and vehicles to move safely and efficiently through the area.

Policy	Response
2.1: To ensure that the design, layout and servicing of the Zone is, as far as reasonably practicable, in accordance with key design principles outlined in the Design Guide.	<i>Given the location and a requirement to orientate the warehouse to the NE, servicing arrangements are as far as reasonably practicable in accordance with the Design Guide</i>
2.2: To ensure that subdivision, use and development in the Zone generally follows the layout shown on the Structure Plan, particularly in regard to road access points.	<i>Road access from the Roberts Line frontage is in accordance with the Structure Plan intentions</i>
2.4: To provide opportunities for pedestrians, cyclists and vehicles, while ensuring that conflict with industrial traffic is minimised.	<i>Pedestrian and cycle movements are not expected to be significant, but will not be precluded by the design of the proposal.</i>
2.5: To ensure that additional traffic does not put pressure on the safe and efficient operation of the roading network.	<i>Impact assessment has demonstrated that additional vehicle movements in this area can be satisfactorily accommodated without detrimental impacts upon existing road users.</i>

⁵ Palmerston North City District Plan. Palmerston North City Council, March 2005 (updated May 2006).

Policy	Response
2.7: To provide for the efficient movement of vehicles and in particular the access requirements of emergency service vehicles.	<i>The efficiency of all vehicle movements will be ensured. Access requirements for emergency vehicles have been accommodated.</i>

Objective 12A.5: To avoid, remedy or mitigate adverse environmental effects on the amenity of the North East Industrial Zone and areas at the interface with the Zone.

Policy	Response
5.4: To ensure that road access to the NE Industrial sites is provided from Railway Road or Roberts Line and is in general accordance with the Structure Plan.	<i>Road access is proposed from Roberts Line.</i>

Rules

Rule	Response
R12A.10.2: Any activity having an access from Richardsons Line is to be regarded as a Non-Complying Activity.	<i>The <u>intent</u> of this rule is to avoid the use of this route by heavy industrial traffic and hence protect the rural amenity of the area. Whilst the (full) proposal includes an access on this frontage, this is required for emergency purposes only and would be rarely used. Accordingly, the proposal is regarded as being compliant with this rule. The proposal does not meet Permitted or Controlled Activity performance conditions with respect to height and building size and hence is assessed as a Discretionary (Restricted) activity.</i>
R12A.7.1(a): Buildings are to be setback 30m from Richardsons Line, 8m from Roberts Line and 8m from Railway Road, with the provision of a buffer area between the road/site boundary and the specified setback distance.	<i>All setback requirements are met, with the provision of landscaped buffer areas as required.</i>
R12A.6.1(v): Parking, loading and access matters – compliance with the general transportation rules is required.	<i>Refer Section 5.3.</i>

5.3 Objectives, Policies & Rules: General Transportation

Objective 20.1: To maintain and enhance the safe and efficient functioning of the roading network.

Objective 20.2: To protect the roading network ... from the potential adverse effects of all land use activities.

Policy	Response
2.1: To ensure safe and efficient vehicle access is provided to and from activities.	<i>Impact assessment has demonstrated that vehicle access arrangements will be both safe and efficient.</i>
2.2: To ensure safe and efficient loading facilities are provided to service activities.	<i>All loading activity will take place well off the road reserve using facilities specifically designed for this purpose.</i>
2.3: To ensure safe and efficient parking and manoeuvring spaces is provided for all activities.	<i>Space for vehicle parking and manoeuvring will meet or exceed the requirements of AS2890.1 and AS2890.2 which ensure safety and efficiency.</i>

Objective 20.3: To avoid, remedy or mitigate the effects of roads and vehicles on the amenity values of the City.

Policy	Response
3.1: To restrict the movement of through traffic where the movement has adverse visual, noise and safety effects on adjoining streets.	<i>Proposed truck routing arrangements will generally avoid use of residential areas and existing congestion in Tremaine Ave area.</i>
3.2: To avoid, remedy or mitigate the impact of roads and parking areas on visual amenity values of the community by the provision of landscaping.	<i>Appropriate landscaping will be used to screen parking and other areas.</i>

Objective 20.4: To maintain and enhance the use of public transport, walking and cycling as alternative modes to the private motor vehicle.

Policy	Response
4.1: To support and encourage the use of public transport, walking and cycling as an integral part of the transportation system with special provisions made for them as appropriate.	<i>The location and type of activity proposed means that walking and cycling activity is not expected to be significant. However, cycle parking facilities will be provided. The site layout does not preclude provision of a bus stop should such a service prove to be warranted in the future.</i>

Rules

Section 20 (Transportation) of the District Plan identifies rules relating to the transportation aspects of development proposals. The District Plan rules are the means of implementing the policies and ensuring that new developments will not have a detrimental impact upon the safety or efficiency of the roading network.

Compliance of the proposed development with the relevant District Plan rules is addressed in the tabulations which follow.

Rule	Response
R20.3.5.2 Roading Designations. No developments involving permanent structures or building shall be permitted on any land designated for proposed road widening or the establishment of roads.	<i>Compliant: land is not subject to any designations for roading projects.</i>
R20.3.7.1 Parking Spaces for People with Disabilities. Where on-site parking is provided, or is to be provided for all buildings and activities except dwellings, parking spaces for the disabled will be provided as follows; (a) Number: one for up to 10 spaces, two for 10-50 spaces and one for every additional 50 spaces (b) Location: accessible car parking spaces shall connect to an accessible route and the closest building entrance or lift (c) Identification: accessible parking spaces shall have clear ground marking in accordance with the international symbol of access.	(a) <i>Staff Parking : not compliant. 5 staff disabled parking spaces to be provided within a total of 324 spaces. Whilst Foodstuffs is fully committed to the provision of appropriate facilities for the disabled, experience from existing sites and the nature of the warehouse work environment means that the provision of the 8 disabled staff spaces would be excessive and unnecessary. Visitor Parking: compliant. For the visitor parking area, 4 disabled parking spaces would be provided within a total of 54 spaces.</i> (b) <i>Location: compliant. All disabled spaces will be conveniently located close to the building entrance.</i> (c) <i>Identification: compliant. All disabled spaces will be clearly marked.</i>
R20.3.7.2 Parking Provision Standards. Parking provision is to be made on-site in accordance with the following standards; • offices – 3.5 spaces / 100m ² gfa • building or land used for storage, warehousing or distribution – 1.5 spaces / 100m ² gfa	<i>Not Compliant. Based upon 2,490m² office and 57,323m² warehousing, a total of 947 parking spaces would be required, against 378 proposed. Based upon known staff numbers, the DP requirement is well in excess of actual demands. NOTE. The DP parking requirements have been reviewed, with a recommendation that the office requirement be reduced to 3.0 spaces/100m² gfa and the warehousing requirement be reduced to 1.0 spaces/100m² for the first 3,000m² and 0.5 spaces/100m² for each additional 100m². This would significantly reduce the DP requirement to 377 spaces. This more accurately reflects the parking requirements associated with bulk warehouse facilities and would result in the proposal being <u>compliant</u>. This forms the basis of proposed Plan Change 23 which was subject to a hearing in August 2006.</i>
R20.3.7.3 Policies for Assessments of Proposals not meeting Parking Standards (b) Car Parking Spaces and Financial Contribution Waiver Policy. The Council may grant a resource consent without the provision of car parking or the payment of cash in lieu,	<i>The proposed parking provision only fails to meet the <u>existing</u> parking standard, and is compliant with the <u>proposed</u> standard which better reflects the parking requirements of large warehouse operations. This assessment has demonstrated that the level of parking provision is appropriate for the proposed use and there is no risk of 'spill-over'</i>

Rule	Response
if it can be demonstrated that the total parking demand of a proposed development is less than that required by the parking standard and that the design of the development is so specific that it cannot be used for any other purpose	<i>parking onto the external road network. Furthermore, security controls would prevent the use of this parking resource for any other purpose</i>
R20.3.7.6 Car Park Landscape Design Any car parking area shall include the following landscape features; (a) any part of a car parking area (excluding access points) fronting to a road shall feature one specimen tree capable to growing to 5m within 10 years along every 10m of car parking frontage (b) trees planted to meet the requirements above shall be so planted as to separate car parking activities from pedestrian activities on the street (c) any tree planted on a frontage shall be planted in an area with a minimum width of 2m and with a total area per tree of not less than 4m ²	<i>Proposals are the subject of a separate landscaping design which has addressed these requirements</i>
R20.3.7.7 Formation of Parking Spaces External parking spaces are to be constructed to meet the following standards; (a) vehicle circulation routes with a car-parking area must have; • circulation routes of 3.5m width (1-way) and 6.5m (2-way), increased by 800m where there are pedestrian movements unless a separate footpath is provided • turning circles to comply with Fig 20.1 (b) any queuing space shall be sufficient to permit a free-flow of traffic from the road into the car parking area (c) all spaces to comply with the dimensions and construction requirements of Fig 20.2 (d) a formed, permanent, dust-free	<i>Parking spaces will meet all of the geometric requirements of the Plan. All spaces will be permanently marked on a sealed, drained and level surface.</i>

Rule	Response
<p>surface with drainage and marking of spaces</p> <p>(e) additional clearances for any blind aisles</p> <p>(f) an additional 300mm for any spaces adjoining a wall or column</p> <p>(g) gradient no more than 1:40 (disabled), 1:20 (parallel) or 1:16 (900)</p>	
<p>R20.3.8.1 Loading Space Standards</p> <p>(a) any business or industry activity must provide a loading space constructed to a defined standard</p> <p>(b) no loading arrangement shall be permitted where vehicles project onto the road reserve while loading or are required to reverse onto or off an arterial road or principal road.</p>	<p>(a) <i>the nature of the proposed activity means that loading bays will be provided which exceed the defined standards</i></p> <p>(b) <i>all loading activity will take place off the road reserve.</i></p>
<p>R20.3.9.1 Access Standards</p> <p>(d)(iii) (for sites located in an Industrial Zone)</p> <p>(a) where the site has frontage to one road, one two-way crossing, of not more than 8m in width shall be provided</p> <p>(b) where a site has frontage to more than one road, one crossing of not more than 8m in width may be provided to each road. The minimum is one two-way crossing of not more than 8m in width to one road</p> <p>(c) where a site has a frontage length of >30m to a road, it may have two crossings or not more than 8m wide each to that road. As a minimum, one two-way crossing of not more than 8m in width shall be provided to the road</p> <p>(d) no vehicle crossing shall be located <20m from an intersection</p> <p>(e) the minimum distance between access crossings and an intersection with a Principal Road should be 50m.</p>	<p><i>The site has frontages to Railway Road (75m), Roberts Line (448m) and Richardsons Line (197m).</i></p> <p><i>Three accesses on Roberts Line are proposed for the normal operation of the site;</i></p> <ul style="list-style-type: none"> <i>a 10m wide truck entry</i> <i>a 10m wide truck exit</i> <i>an 8m wide 2-way staff/visitor entry/exit.</i> <p><i>None of the vehicle crossings will be located less than 20m from an intersection, or less than 50m from the Railway Road intersection.</i></p>

5.4 Compliance Issues – Phase 1 Development

The Phase 1 development would involve the same provision of visitor parking spaces (54, of which 4 would be reserved for disabled users), but only 224 staff spaces (of which 5 would be reserved for disabled users), a total of 278 spaces.

Based upon the Phase 1 floor area, a total of 591 parking spaces would be required under the existing District Plan rules and 258 under the proposed rules.

Whilst the Phase 1 proposal would be compliant with respect to the total number of parking spaces, the number of disability spaces within the staff parking area would fall marginally below the requirement of 6 spaces.

It is expected that the maximum number of staff on-site at any one time for the Phase 1 warehouse would be 220, and hence the parking proposed will adequately meet the resulting demand.

5.5 Regional Land Transport Strategy

The Regional Land Transport Strategy⁶ (RLTS) provides general policy with regard to transportation matters across the wider Manawatu - Wanganui region.

This document sets out broader objectives at the regional level. Six key objectives arise from the longer term vision for transportation in the region:

- the safest possible transport system;
- a roading network that will meet present and future needs;
- freight moved by the most efficient means;
- public transport services that cater for those with limited private transport options;
- a land transport system that minimises adverse effects on the environment; and
- an administration system which allows the land transport needs of the region to be met.

The proposed distribution warehouse facility and associated vehicle movements would not be contrary to any of these objectives.

5.6 Compliance – Conclusions

The only area of non-compliance with the District Plan rules relates to parking provision, the provision of disabled parking spaces in the staff parking area, and the creation of an emergency access onto Richardsons Line.

With regard to parking, the non-compliance arises from District Plan standards that are inappropriate for warehouse facilities of this type. This has been acknowledged by the Council with a proposed plan change which would lower the requirement and ensure compliance.

⁶ Regional Land Transport Strategy. *Horizons Manawatu, June 2000.*

As indicated above, the number of staff disability spaces required by the District Plan exceeds the reasonable demand for such spaces by the warehouse workforce.

In all cases, these non-compliances are of a minor nature and there will be no detrimental effects associated with them.

With regard to Richardsons Line, the proposed emergency vehicle access would be rarely used and hence the impacts of its provision would be negligible.

This assessment has demonstrated that the proposal is compliant with the intent of the District Plan rules, and with all of the objectives and policies of both the District Plan and the Regional Land Transport Strategy.

6 Conclusions

The Foodstuffs (Wellington) Co-operative Society Ltd (Foodstuffs) proposes to construct a distribution warehouse facility on land adjacent to Roberts Line, on the north-eastern edge of Palmerston North.

The facility will improve the efficiency of the distribution function for Foodstuffs, resulting in an overall reduction in truck distances travelled throughout the lower North Island.

However, within the more immediate vicinity of the site, the facility will give rise to a significant number of vehicle movements associated with trucks, staff and visitors. The internal design of the facility has been developed to ensure that all such movements can be accommodated both safely and efficiently. Appropriate improvements to the external road network in the vicinity of the site have also been identified which will ensure that these vehicle movements will take place with minimal impacts upon existing users of the road network in this area.

This document reports a review of the transportation impacts of the distribution warehouse proposal. This considers in detail the movement of all vehicles associated with the activity, and also addresses the likely demands for pedestrian, cycle and bus movements. The proposal has also been assessed against the relevant requirements of the Palmerston North District Plan.

This assessment concludes that:

- whilst the activity will give rise to a significant number of staff and delivery vehicle movements, these will mostly take place outside of the traditional peak periods;
- this, together with the good accessibility offered by the site, and a package of external roading improvements agreed with the Palmerston North City and Manawatu District Councils, means that impacts upon the functioning of the road network in the immediate vicinity of the site will be minor;
- the location of the site will allow many truck movements to avoid the Palmerston North urban area;
- the site is relatively remote from the state highway network and net effects upon this network will be negligible;
- the internal and external configuration of the site will ensure that all vehicle and pedestrian movements can be made safely;
- the proposals are compliant with the objectives, policies and intentions of the District Plan and areas of non-compliance are of a minor nature with no adverse effects;
- the activity will be self-sufficient with regard to parking with the provision of 377 staff/visitor parking spaces; non-compliance with the existing District Plan rules arises because these rules are not appropriate for large warehouses of this type. This has been recognised by the Council with a proposed plan change which would ensure compliance; and
- the overall impacts of the proposal upon the safe, efficient and sustainable operation of the road network in this area will be no more than minor.

The proposed Foodstuffs distribution warehouse is an appropriate use of this site. This offers a high level of vehicular accessibility, close proximity to the Palmerston North urban area and a site which would be fully self-sufficient in parking.

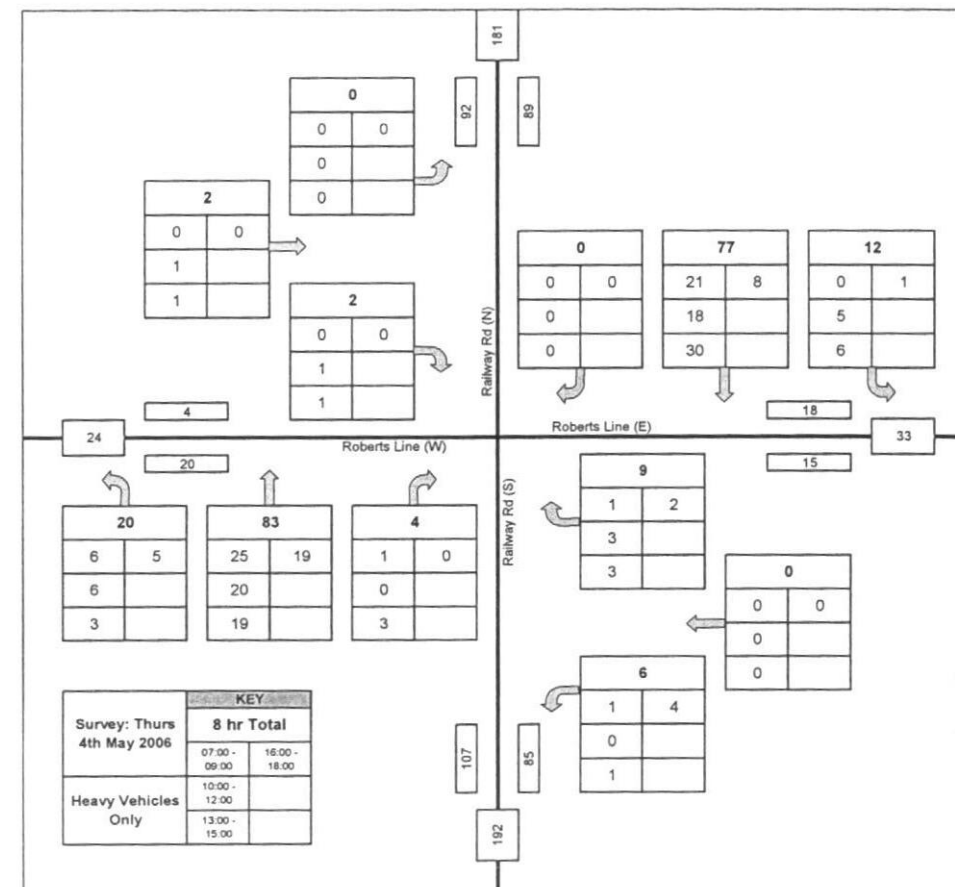
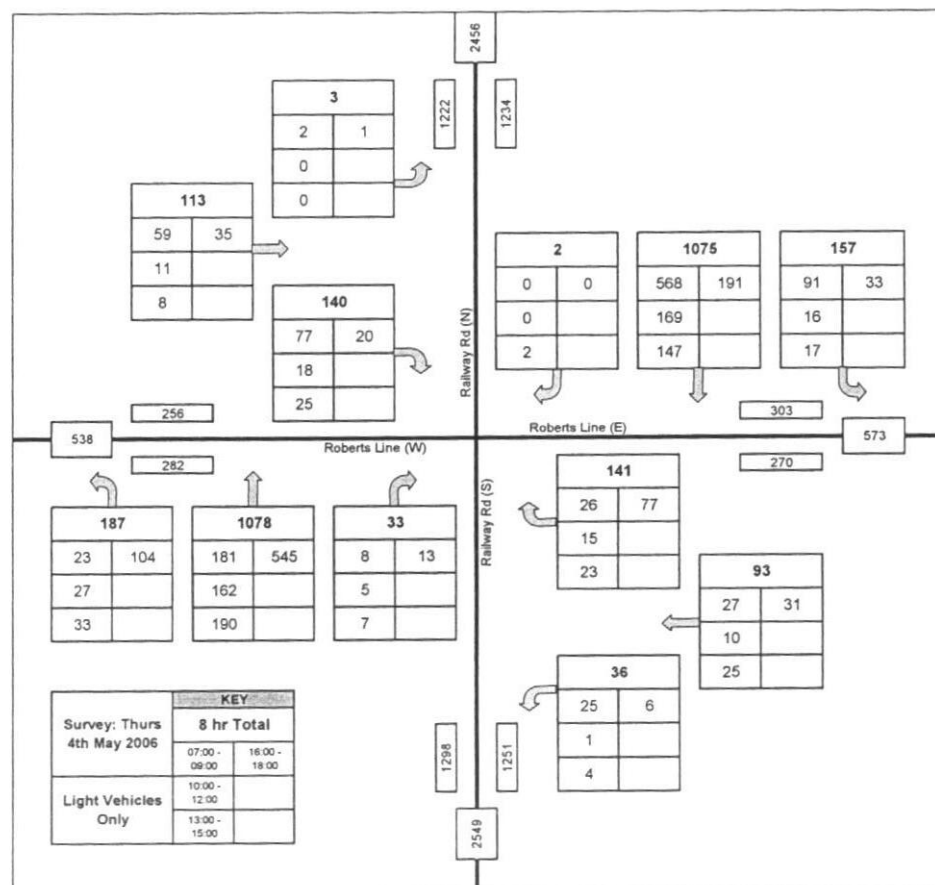
On the basis of the traffic-related issues which this assessment has addressed, there do not appear to be any reasonable grounds for declining consent for this development proposal.

APPENDIX A: RECORDED TRAFFIC COUNTS

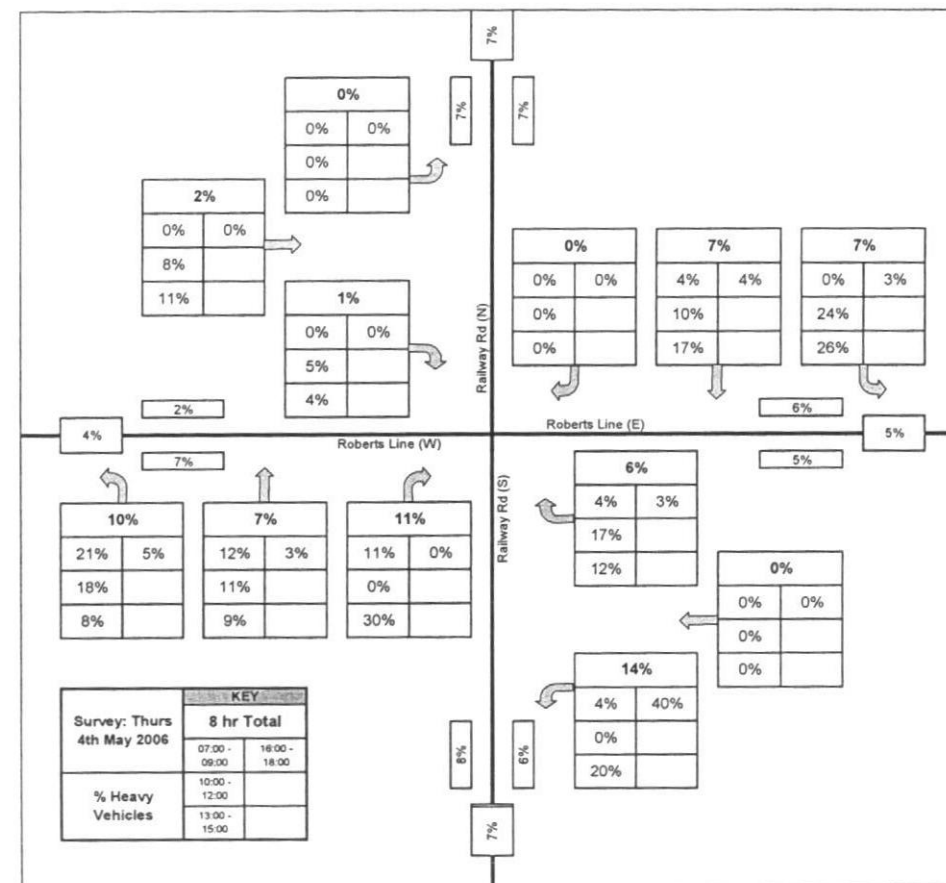
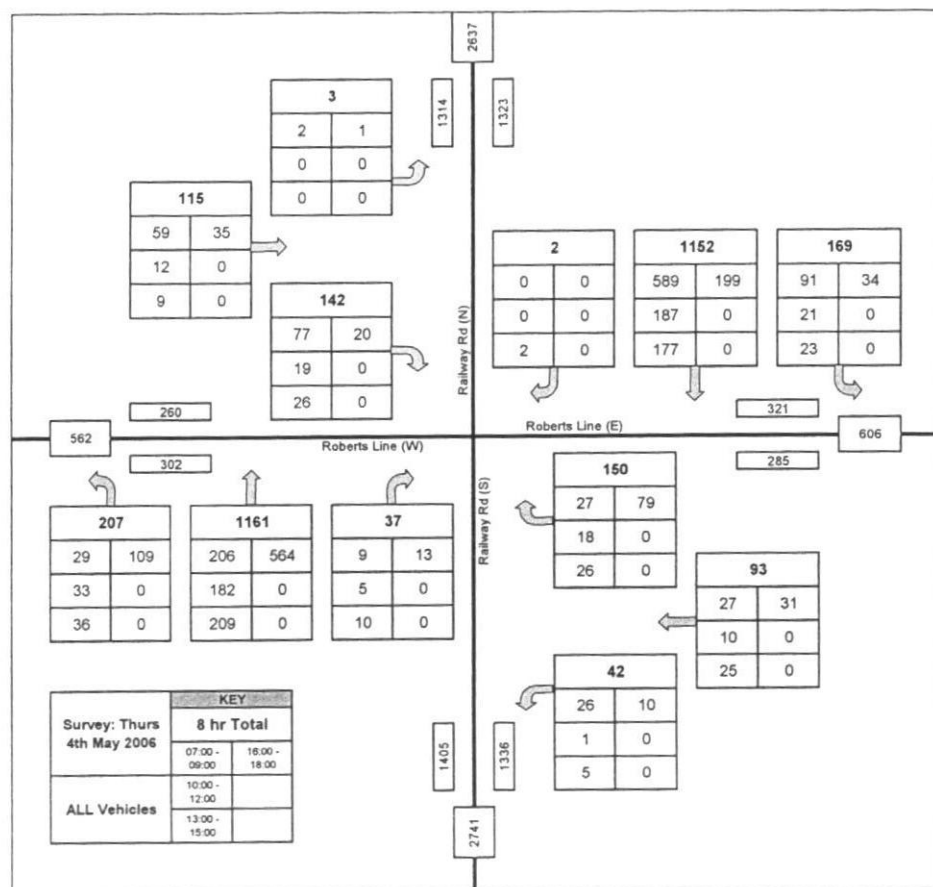
Railway Road / Roberts Line Intersection

Surveyed Thursday 4th May 2006.

Foodstuffs Distribution Centre, Palmerston North: Assessment of Traffic Impacts



Foodstuffs Distribution Centre, Palmerston North: Assessment of Traffic Impacts



APPENDIX B: CRASH RECORDS

Road	Dist	Dir	Side Rd	ID	Date	Description	Causes	Fat	Sev	Min
RAILWAY ROAD		I	RICHARDSONS LINE	2452887	25/05/2004	load or trailer from TRUCK1 NBD on RAILWAY ROAD hit CAR2 TRUCK1 hit Obj thrown/dropped	TRUCK1 load not well secured or moved	0	0	0
RAILWAY ROAD	100	N	ROBERTS LINE NORTH	2452746	30/06/2004	CAR1 SBD on RAILWAY ROAD lost control; went off road to left, CAR1 hit Cliff Bank, Ditch	CAR1 lost control on unsealed road, steering failed suddenly	0	0	0
RAILWAY ROAD	100	N	ROBERTS LINE NORTH	2551951	29/04/2005	CAR1 NBD on RAILWAY ROAD lost control; went off road to right	CAR1 lost control due to road conditions ENV: road surface under construction or maintenance	0	0	0
RAILWAY ROAD		I	ROBERTS LINE NORTH	2012392	18/09/2000	CAR1 SBD on RAILWAY ROAD hit CAR2 crossing at right angle from right	CAR2 failed to give way at give way sign, misjudged speed etc of vehicle coming from another dirn with right of way	0	0	1
RAILWAY ROAD		I	ROBERTS LINE NORTH	2111572	27/03/2001	CAR1 EBD on ROBERTS LINE NORTH hit CAR2 crossing at right angle from right	CAR1 failed to give way at give way sign	0	0	1
RAILWAY ROAD		I	ROBERTS LINE NORTH	2354305	23/09/2003	CAR1 NBD on ROBERTS LINE NORTH hit CAR2 crossing at right angle from right	CAR1 failed to give way at give way sign, didnt see/look when required to give way to traffic from another direction	0	0	0
RAILWAY ROAD		I	ROBERTS LINE NORTH	2412637	3/08/2004	CAR1 WBD on ROBERTS LINE NORTH hit CAR2 crossing at right angle from right	CAR1 too fast to give way at intersection, lost control under heavy braking, failed to give way at stop sign	0	1	1
ROBERTS LINE NORTH		I	ROBERTS LINE	2011362	17/03/2000	CAR1 WBD on ROBERTS LINE hit CAR2 crossing at right angle from right	CAR1 failed to give way at give way sign	0	0	3

APPENDIX C: AGREED TRAFFIC MANAGEMENT PLAN

Context

Foodstuffs proposes to construct and operate a major distribution centre on land adjacent to Roberts Line and Railway Road in Palmerston North.

A key factor in the selection of this site was accessibility to the strategic road network, allowing truck movements to be made efficiently without a necessity to route through congested parts of the urban area.

However, the operation of the distribution warehouse will precede the completion of a strategic ring route around the city. Furthermore, the location of the site immediately adjacent to Manawatu District requires the co-operation of this Council to the provision of access routes, which has not been forthcoming to date.

The purpose of this Traffic Management Plan (TMP) is therefore to confirm the availability of appropriate routes for truck movements for the period prior to the completion of the strategic ring route, which are mutually acceptable to Palmerston North CC and Foodstuffs.

Truck Movements

It is expected that around 350 truck movements/day will be associated with the proposed distribution warehouse facility, with at least 80% of these between 7am and 10pm.

These movements comprise Foodstuffs' own (or contracted) vehicle fleet which distribute goods to supermarkets throughout the lower North Island, and suppliers' vehicles which bring goods into the distribution centre.

The operation of the distribution centre would represent a significant change in the supply chain logistics for the Foodstuffs operation in the lower North Island. Whilst this will result in some increase to such vehicles movements in the Palmerston North area, there will be no change in the overall number of truck movements across the wider road network.

More locally, some truck movements will replace those which are currently associated with the Foodstuffs facility on Kaimanawa Street, or which are routing to/from the existing facility at Silverstream. Whilst most of the trucks will be the larger B-trains, some will be smaller 8-11m vehicles. The number of 'new' movements in the Palmerston North area is therefore considerably less than the total number of movements expected to visit the proposed facility.

An indicative distribution of these truck movements between destinations and their recommended routes prior to and after completion of the strategic ring route is shown in **Table 1**. It should be noted that these numbers are shown for indicative purposes only and are subject to change according to logistical requirements and market conditions.

Status of this TMP

It is intended that this TMP should form part of the consent application, and have the status of a Memorandum of Understanding between Palmerston North CC and Foodstuffs, in which:

- PNCC will seek to maximise the efficiency of the short-term routes within its area through the application of appropriate traffic management and will advise Foodstuffs of any significant planned works which may affect the availability of these routes;
- PNCC will continue to seek the co-operation of Manawatu DC on these matters;
- Foodstuffs will instruct its drivers and those of suppliers' vehicles to use the intended routes;
- Foodstuffs will advise of any significant changes to its operational requirements in terms of the number of truck movements expected to use each route;
- PNCC will strive to ensure the earliest implementation of the strategic ring route proposals.

Origin / Destination	Route (outwards from site)		Indicative Vehicles/Day		
	Short-Term (prior to completion of strategic ring route)	Longer Term (following completion of strategic ring route)	In	Out	2Way
North (State Highway 3 to Wanganui, Taranaki, & State Highway 1 to Taihape and beyond)	Roberts Line, Richardsons Line, Railway Road (north), Bunnythorpe, Waugh's Road to Feilding, South Street, Awahuri Road to State Highway 3	Roberts Line, Kairanga-Bunnythorpe Road, to State Highway 3	84	32	116
East (via Manawatu Gorge: Hawke's Bay, Wairarapa)	Roberts Line, Richardsons Line, Railway Road (north), Bunnythorpe, Bunnythorpe-Ashhurst Road, Ashhurst, State Highway 3	Roberts Line, Richardsons Line, Railway Road (north), Stoney Creek Road to State Highway 3	10	22	32
South (Horowhenua, Wellington)	Roberts Line, Railway Road (south), Tremaine Avenue, No. 1 Line, State Highway 56	Roberts Line, Kairanga-Bunnythorpe Road, Karere Road to State Highway 56	15	56	71
Palmerston North City	Roberts Line, Railway Road (south), Tremaine Avenue, Rangitikei Street (State Highway 3)	Roberts Line, Railway Road (south), Tremaine Avenue, Rangitikei Street (State Highway 3)	66	65	131
		TOTAL	175	175	350

Table 1: Indicative Distribution of Truck Movements

APPENDIX D: SIDRA ASSESSMENT RESULTS, RAILWAY ROAD / ROBERTS LINE INTERSECTION

(For 2015, Period = 2 – 2.30pm and reflects warehouse shift departure and truck movements)

Period	Scenario	From	Railway Road S				Roberts Line SE				Railway Road N				Roberts Line NW				Intersection
		Movement	Left	Ahead	Right	Approach	Left	Ahead	Right	Approach	Left	Ahead	Right	Approach	Left	Ahead	Right	Approach	
2006	Base	Avg Delay (secs)	13.2	0.2	0.2	2.4	14.0	13.3	13.3	13.4	12.4	0.4	0.4	0.9	14.0	13.6	13.6	13.6	4.0
		LOS	LOS B	LOS A	LOS A	LOS A	LOS B	LOS B	LOS B	LOS B	LOS B	LOS A	LOS A	LOS A	LOS B	LOS B	LOS B	LOS B	N/A
		95th % Q (m)	5	5	5	5	3	3	3	3	4	4	4	4	1	1	1	1	5
2015	Base	Avg Delay (secs)	13.4	0.2	0.2	2.4	15.1	14.4	14.4	14.4	12.4	0.3	0.3	0.9	15.1	14.7	14.7	14.7	4.2
		LOS	LOS B	LOS A	LOS A	LOS A	LOS C	LOS B	LOS B	LOS B	LOS B	LOS A	LOS A	LOS A	LOS C	LOS B	LOS B	LOS B	N/A
		95th % Q (m)	7	7	7	7	4	4	4	4	5	5	5	5	2	2	2	2	7
2015	Dypt	Avg Delay (secs)	14.8	0.2	0.2	3.3	15.1	14.4	14.4	14.5	12.4	0.3	0.3	0.9	19.8	19.7	19.7	19.7	10.2
		LOS	LOS B	LOS A	LOS A	LOS A	LOS C	LOS B	LOS B	LOS B	LOS B	LOS A	LOS A	LOS A	LOS C	LOS C	LOS C	LOS C	N/A
		95th % Q (m)	9	9	9	9	4	4	4	4	5	5	5	5	36	36	36	36	36