Open Country Dairy Ltd

Waharoa Factory Additions

Transportation Assessment

March 2017

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Transportation Assessment

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1. Introduction

Open Country Dairy Ltd (OCD) is proposing to add further processing capacity to its existing factory in Waharoa. A number of operational changes and new are proposed, in a staged development.

- Stage 1 will include a new cheese plant, lactose plant, AMF processing and an additional boiler.
- Stage 2 will consist of an additional spray dryer.
- Stage 3 will not include physical upgrades but accounts for processing efficiencies within the site utilising existing equipment.

The expansion is being progressed as a Plan Change to establish a Development Concept Plan (DCP). All developments will occur on the existing factory site on Factory Road, Waharoa. A provisional layout plan has been prepared, and is assessed within this report. The approach for consenting purposes, however, is to establish development controls for the site which will allow some degree of flexibility over the precise nature and timing of developments, as well as specific locations for various plant and buildings, rather than a resource consent for a specific activity and/or site layout.

This report identifies and assesses the traffic and transportation effects which may be expected as a result of each stage of the proposal. The key element is the level of traffic generation, with particular emphasis on heavy vehicles, and their effects on the safety and efficiency of the surrounding road network.

This and other aspects of the development are described in detail in the body of this report. In summary, it is concluded that the three stages of proposed additional activities at the OCD factory can be established with no more than minor effects on the safe and efficient operation of the road network.

2. Existing Environment

2.1 Site Location and Description

The existing factory is located on the west side of Factory Road, Waharoa. It is an established dairy factory which sits within a larger industrial area on the west side of Waharoa town. The site is zoned as *Industrial* in the Matamata-Piako District Council (MPDC) Operative District Plan, (the District Plan).

The site has two main access points onto the road network, both on Factory Road. The main site gate is located near the northern end of the site frontage, directly opposite New Street. This gate is used by staff and visitors, with few heavy vehicle movements. At the southern end of the site frontage is the gate used by the majority of heavy traffic.

Figure 1 shows an aerial image of the site, with the accesses indicated.

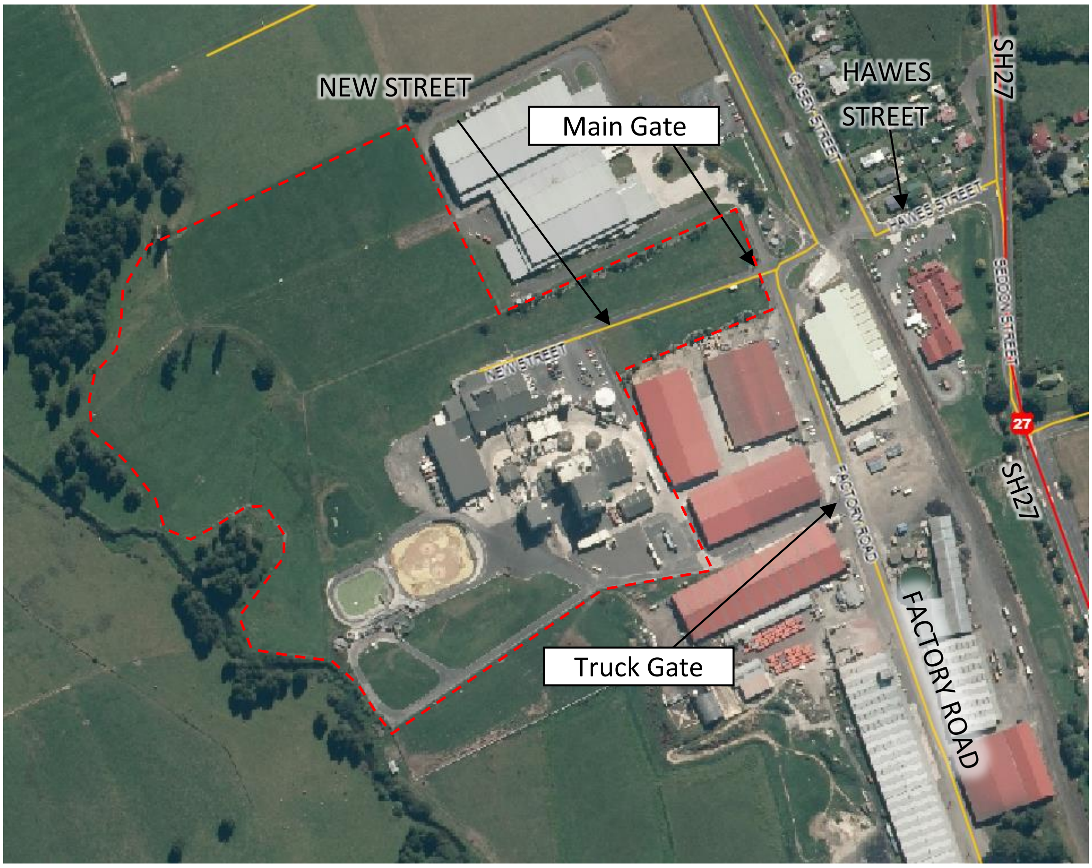

Figure 1: Aerial image of the Site (aerial imagery © MPDC)

2.2 Surrounding Road Environment

Figure 2 shows the location of the existing site and the area subject to the DCP request in the context of the surrounding road network.

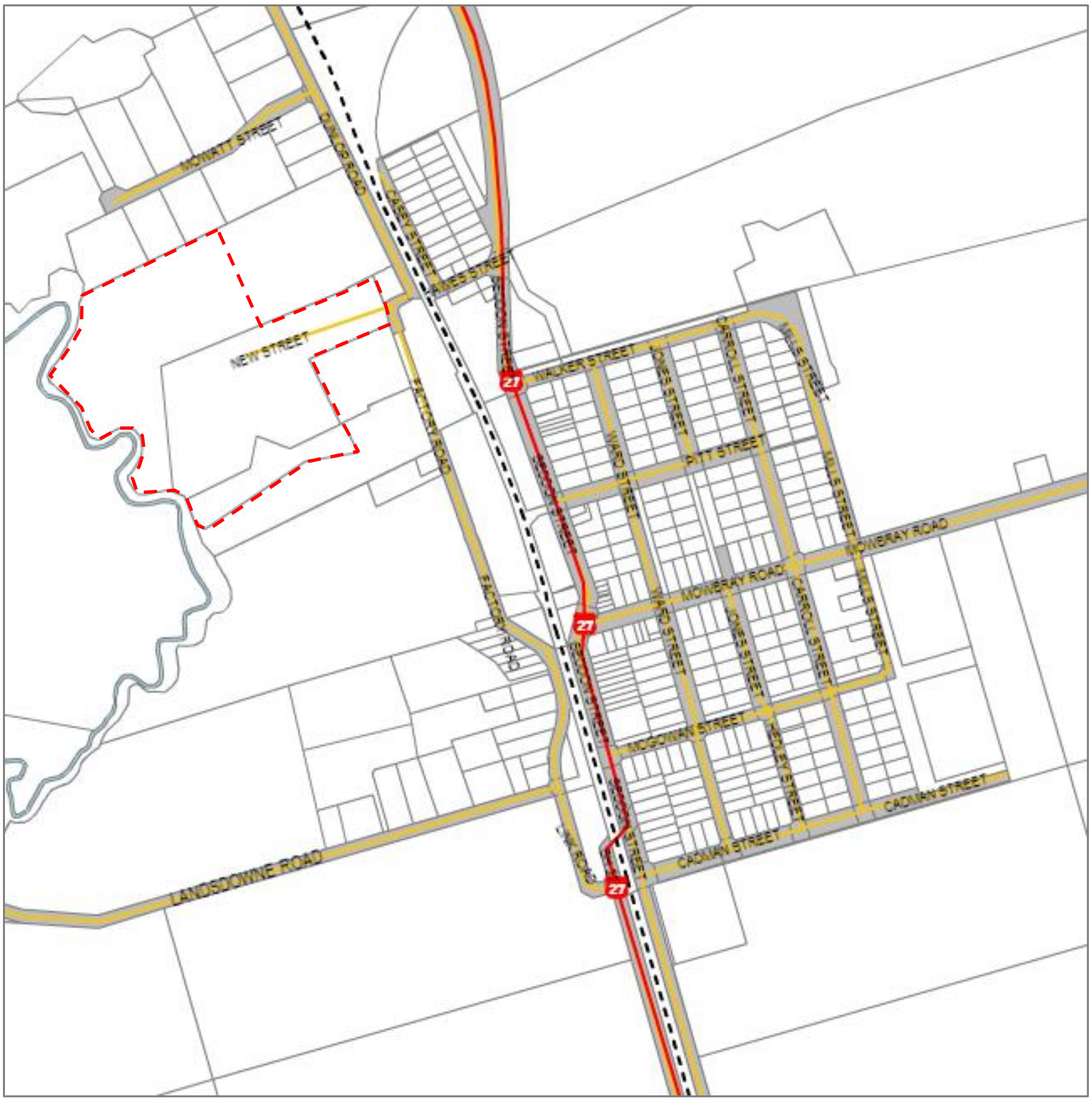

Figure 2: Site Location

The industrial land on the west side of the town is primarily served by a single link road which connects to SH27 at each end. This road has four names along its 1.2km length:

- It is named Hawes Street for approximately 100m at its northern end between SH27 and Casey Street;
- It becomes New Street between Casey Street and the OCD site;
- Along the OCD site frontage and south as far as Landsdowne Road it is called Factory Road; and
- It is named Link Road between Landsdowne Road and SH27.

2.3 State Highway 27

SH27 runs approximately north-south through Waharoa. It is classified in the District Plan as a *Significant Road*. Such roads are described as *"…roads that are a significant element in the national and/or regional economy."*

SH27 is a two-way, two-lane road both through the town and on the rural sections outside of the town. The posted speed limit in Waharoa is 50km/h, increasing to 100km/h at the urban limits.

2.4 Factory Road / Link Road

Factory Road and Link Road are classified in the District Plan as Local Roads. The District Plan does not provide a description or definition for Local Roads, however typically the primary function of this type of road is to provide access to adjacent properties, with a lesser emphasis on the movement of traffic.

The general form of Factory Road adjacent to the site is shown on photographs 1 and 2.

Photograph 1: Factory Rd looking north, showing the main truck access (to the right of the storage tanks)

Photograph 2: Factory Rd looking south, with the main site gate on the right

Adjacent to the site Factory Road is straight and level and has a sealed width of approximately 12m. However, there is no kerb and channel on either side and adjacent properties often have sealed and unfenced yards, which tie in with the road carriageway. There are no visible lane markings on most of the road, and the result is that the roadway is poorly-defined.

The southern end of Factory Road, and Link Road, are better defined. The road here is marked with a centre line and edge lines, and the seal edge is bounded by a grass berm on each side.

Link Road intersects with SH27 at a stop-controlled T-intersection, with Link Road being the minor approach. The general layout of the intersection is shown on Figure 3.

Figure 3: Intersection of Link Road with SH27

To the south of the intersection SH27 is straight and level. The SH27 south approach has a tapered seal widening for vehicles turning left into Link Road. To the north of Link Road, SH27 features two approximately 45-degree horizontal curves as the road crosses the Kinleith Branch rail line. The rail crossing is approximately 80m north of the Link Road intersection. South of the rail crossing SH27 widens to include a right-turn facility which has a marked storage length of 12m.

Photographs 3 and 4 show general form of the intersection.

Photograph 3: Intersection of SH27 and Link Road, looking south

Photograph 4: Dairy truck turning right from Link Rd onto SH27

2.5 New Road / Hawes Street

East of the OCD site, New Street and Hawes Street provide a direct link to SH27. This road is a two-way two-lane road which is marked with a centre line and lane edge markings, and has kerb and channel on both sides. The New Street section has a sealed width of approximately 9m, while Hawes Street has a sealed width of approximately 9.5m. Approximately 60m east of the site gate, New Street crosses the Kinleith Branch rail line. The rail crossing has barrier arms and signals, plus a limit line marked on both road approaches.

Hawes Street intersects SH27 at a give-way-controlled T-intersection, with Hawes Street being the minor approach. The general layout of the intersection is shown on Photographs 5 and 6, and Figure 4.

Photograph 5: Hawes St looking east towards the intersection with SH27

Photograph 6: SH27 looking south, with the Hawes St intersection on the right

Figure 4: Intersection of Hawes Street and SH27

The Hawes Street westbound lane has a wide flare at the intersection to accommodate the heavy vehicle traffic to and from the industrial area it provides access to.

The north approach has a right-turn facility with a storage lane marked at approximately 42m long. A wide tapered shoulder is provided on the northbound exit side of SH27, to assist heavy vehicles turning left from Hawes Street.

The posted speed limit on SH27 changes from 50km/h to 100km/h approximately 125m north of the intersection.

2.6 Sight Distances

The available sight distances for drivers exiting Hawes Street and Link Road onto SH27 are summarised in the following table. The Safe Intersection Sight Distance (SISD) given by Austroads[1] for a 50km/h speed environment is 97m, and for a 60km/h speed environment is 123m. The SISD for a 100km/h speed environment is 248m.

Approach	Direction	Available Sight Distance
Hawes Street	North	250m
	South	230m
Link Road	North	130m
	South	400m +

Table 1: Sight Distances at Hawes Street and Link Road

Vehicles approaching from the north at Hawes Street, and from the south at Link Road, transition from a 100km/h posted speed limit to a 50km/h limit shortly before each intersection. Notwithstanding the fact that most vehicles have slowed considerably by the time they pass each side road, Table 1 shows that the available sight distance from both Hawes Street and Link Road, in the direction of high-speed approach traffic, exceeds the SISD for 100km/h.

In the opposite directions, looking from the side road towards Waharoa town, traffic is approaching at a nominal 50km/h. At Hawes Street northbound SH27 traffic is often speeding up as it transitions from an urban to a rural environment at around this point. Operational speeds were observed to be typically 50 to 60km/h in this direction.

At Link Road vehicle speeds are kept to an observed 30 to 40km/h by the horizontal curves either side of the rail crossing immediately north of the Link Road intersection.

In all cases, the available sight distance exceeds the relevant assessed SISD.

[1] Austroads Guide to Road Design Part 4A: Signalised and Unsignalised Intersections

3. Traffic Patterns

3.1 Daily Traffic Volumes

The nearest NZ Transport Agency (NZTA) traffic count site is located approximately 1km north of Waharoa, approximately 200m south of the SH27 / Wardville Road intersection. The latest available data for this site indicates an annual average daily traffic (AADT) volume of 10,110 vehicles per day (vpd). This volume includes traffic in both directions on the highway. The NZTA data also indicates that heavy vehicles make up approximately 16% of traffic on this part of SH27.

Data provided by MPDC from their RAMM database shows for Hawes Street an ADT of 655vpd, recorded in September 2005. No recent data was available for Factory Road / Link Road. The 2005 data is assessed as still relevant to estimating an indicative ADT of up to 1,000vpd.

3.2 Peak Hour Volumes

The latest data for the SH27 count site has been assessed to identify the peak hours for traffic over the course of one week. Hourly traffic counts for the week beginning 6 November 2015 are shown on Figure 5.

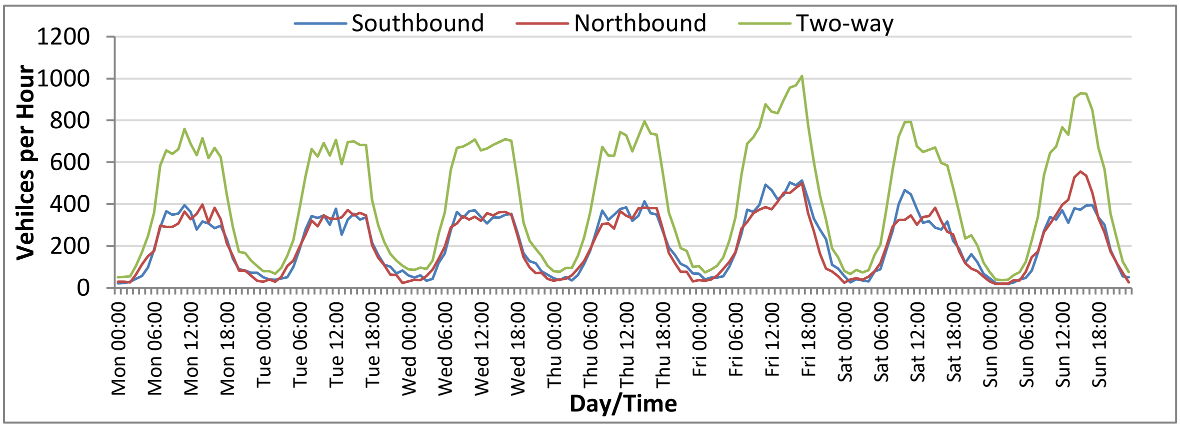

Figure 5: Hourly traffic volumes on SH27, November 2015

Figure 5 shows that the busiest hour occurred on the Friday evening. A two-way total of 1,012 vehicles per hour (vph) were recorded between 5pm and 6pm. On other days, there is typically no significant peak hour, with two-way volumes of approximately 700 to 800vph being recorded between 8am and 6pm.

Peak hour data for Hawes Street is not available, however the peak hour volume is typically approximately 10% of the ADT for any given road (as can be seen for the SH27 data), and on this basis a peak hour traffic volume of approximately 100 vehicles has been assessed for Hawes Street.

3.3 Intersection Count Data

Manual traffic counts were undertaken at the SH27 intersections with Link Road and Hawes Street on Friday 8th April 2016. The surveys recorded all vehicle movements throughout the day. As is demonstrated in Figure 5 traffic patterns on SH27 do not typically conform to urban 'commuter' patterns, but generally increase rapidly in the mornings at approximately 8am, stay level or increase slightly throughout the day, before decreasing rapidly after 5pm.

This was reflected in the intersection count data. While slight peaks have been identified during the AM, midday and PM periods, it is noted that they are only marginally greater hourly volumes than the periods either side, and that the overall traffic volumes increase throughout the day. The peak hour vehicle movements for the two intersections are summarised in Figure 6.

During the midday peak hour the total traffic volume through these intersections was approximately 20% to 30% greater than during the AM peak hour. This is caused almost entirely by an increase in light vehicle movements, as the number of heavy vehicles per hour remains relatively constant.

The total traffic volume through these intersections during the PM peak hour was approximately 55% to 60% greater than during the AM peak hour. Again this is driven primarily by an increase in light vehicle movements, however the number of heavy vehicles per hour decreases by almost half in comparison to the AM peak hour.

The hourly two-way volumes on Hawes Street and Link Road are summarised in the following table.

Road	AM Peak Hour	Midday Peak Hour	PM Peak Hour
Hawes Street	82	103	80
Link Road	93	79	129

Table 2: Hawes Street and Link Road Peak Hour Traffic Volumes

The data in Table 2 is consistent with the estimated AADT for Hawes Street of 1,000vpd, and peak hour flow of 100vph.

Figure 6 below summarises the recorded turning movements at the intersections.

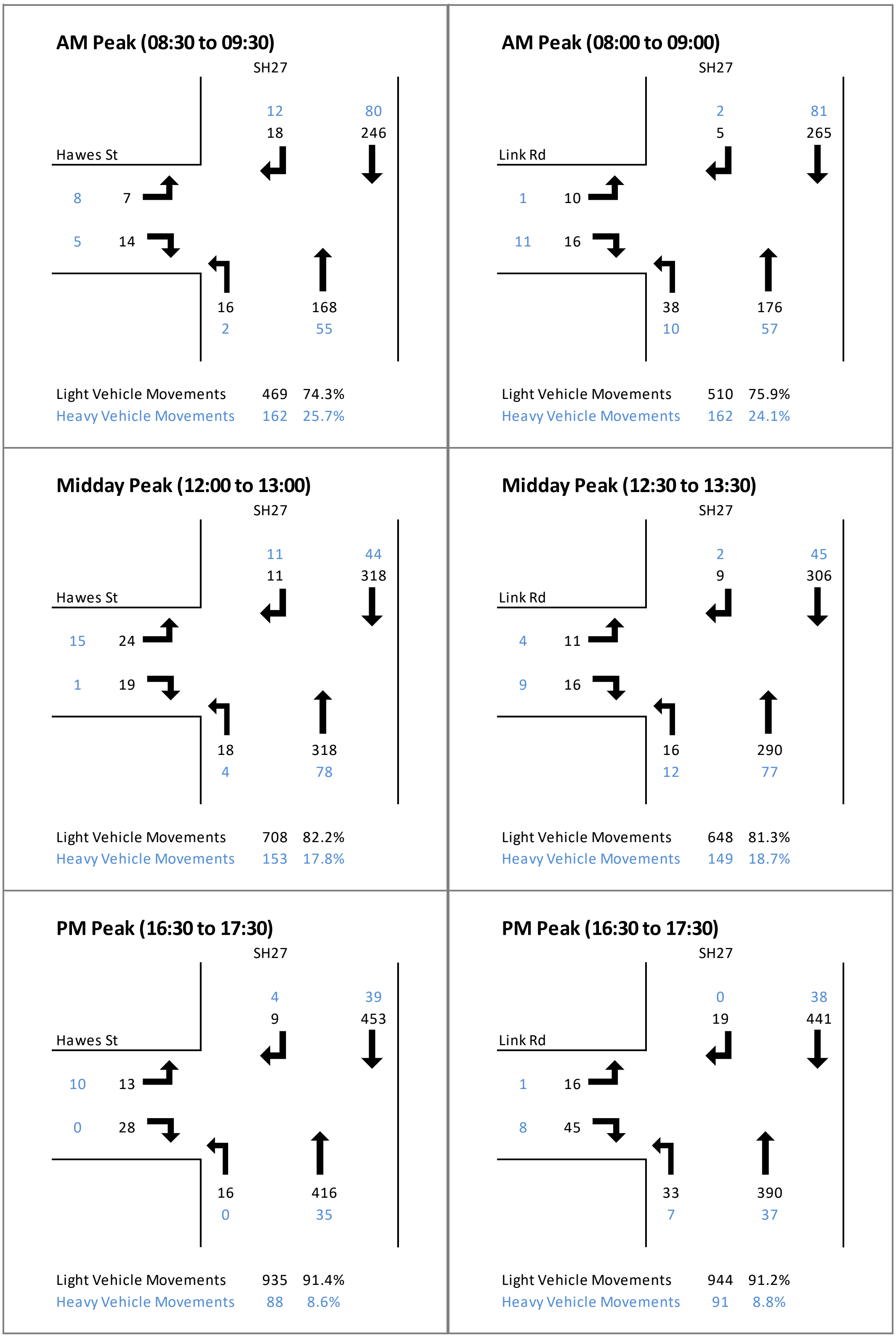

Figure 6: Surveyed Turning Movement Counts for Hawes St (Left) and Link Rd (Right) with SH27

The figure shows that the busiest intersection is Link Road / SH27 and that it is busiest during the PM peak. At this time the number of right turn movements is at its highest.

3.4 Road Safety

A search has been undertaken of the recorded crash data held by the NZTA. The search covered SH27 within 250m of the Hawes Street and Link Road intersections, as well as the entire length of Hawes Street / New Street / Factory Road / Link Road. It included all crashes recorded from 2011 to 2015 inclusive, and any crashes recorded in 2016 to date.

The search identified seven crashes within these parameters, of which one resulted in serious injuries and two in minor injuries.

A non-injury crash occurred when an eastbound driver on Hawes Street, suffering from a medical condition, passed out at the wheel and failed to stop at the intersection with SH27. The vehicle crossed SH27 and went through the fence of the property opposite.

The other six crashes occurred at or on the approach to the 'S' bends at the SH27 rail crossing just north of Link Road. All involved a single vehicle losing control and leaving the traffic lanes; in one crash the out-of-control vehicle collided with another vehicle.

A minor-injury loss of control crash occurred when a southbound car driver on SH27 failed to attempt the right-hand curve. The driver is thought to have fallen asleep at the wheel.

A minor-injury loss of control crash occurred when a northbound car driver on SH27 hit the barrier on the right-hand curve. Inappropriate speed for the conditions (fog) and driver unfamiliarity are listed as contributing factors.

A serious-injury crash occurred when a northbound truck driver on SH27 failed to slow sufficiently to manage the right-hand curve. The truck left the road and came to rest on the rail tracks, overturning in the process.

Two non-injury crashes occurred when northbound drivers entered the first corner too fast and lost control while braking, both in wet conditions.

A non-injury crash occurred when a southbound driver lost control on the second curve, crossing the centreline and hitting the side of a northbound vehicle.

There is a clear trend in the data of drivers entering the S-curve across the rail line with inappropriate speed (although not necessarily over the speed limit). Of note, all of these crashes occurred during wet, foggy or dark conditions, or a combination of these conditions. It therefore appears that inadequate visibility of the curves in adverse conditions is a significant contributing factor.

4. Proposed Activity

Open Country Dairy Ltd (OCD) is proposing to add further processing capacity to its existing factory in Waharoa, in a series of stages:

- Stage one is expected to include a new cheese plant, lactose plant, AMF processing and an additional boiler. This will increase the potential capacity of the factory from the currently consented 475 million litres per annum to 750 million litres per annum.
- Stage two is expected to consist of an additional spray dryer, and will add a further 250 million litres per annum capacity, i.e to a total of 1 billion litres.
- Stage three is not expected to include physical upgrades but accounts for processing efficiencies within the site utilising existing equipment. This will also add a further 250 million litres per annum of processing capacity, i.e. giving a total of 1.25 billion litres.

Figure 7 shows an indicative layout for the site at the completion of stage two. The approach for consenting purposes, however, is to establish development controls for the site which will allow some degree of flexibility over the specific locations for various elements of the site, as well as the precise nature and timing of developments. However, it is understood that it is intended to complete Stage 1 by late 2017 and Stage 2 by late 2018. For the purposes of this assessment Stage 3 has been assumed to occur over the following year

The key transport elements to the proposed layout are as follows:

- The staff and visitor car park will be relocated closer to the main gate.
- An entry-only gate will be added adjacent to, or perhaps combined with, the main gate, which will provide access to the tanker wash and tanker reception facilities.
- One-way access will be provided along the northern boundary to the cool store at the rear of the site.
- An indicative truck parking area has been shown, although the current fleet is contracted out to a local firm and truck parking on site is not needed.

The southern gate will continue to provide two-way truck access. As with the current site layout and operation, all truck exit movements from the site will continue to be from the southern gate.

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5. Trip Generation

5.1 Existing Trip Generation

5.1.1 Daily Traffic

TDG has prepared assessments for a number of earlier developments at the OCD site in Waharoa. OCD has advised that the site is currently operating near the limit of the trip generation assessed for the consented activities. OCD has provided data for the typical daily traffic volumes at the site throughout the year, which is shown in Figure 8.

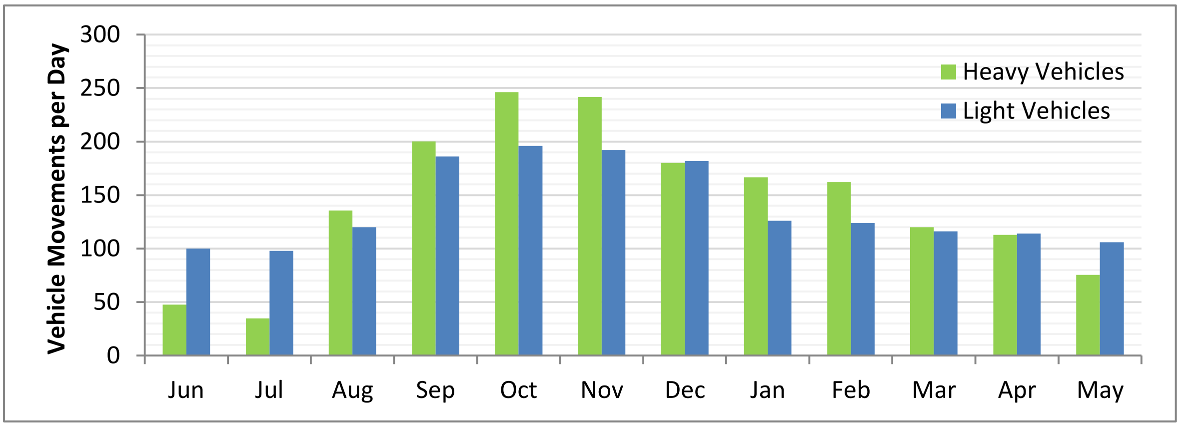

Figure 8: Existing Daily Vehicle Traffic Throughout the Year (Includes Inbound and Outbound)

This data indicates that the activities at the site currently generate between approximately 98 and 196 light vehicle movements per day (vpd) throughout the year. Light vehicle movements are mostly staff arrivals and departures. This is driven by a core office staff and a single day-shift throughout the year, with an additional night-shift during the spring and summer months. A small number of visitors and deliveries also add to the light vehicle traffic. October is typically the busiest month.

Heavy vehicle traffic has more significant seasonal variation, varying from approximately 35 vpd in the winter, to 246 vpd in the spring. Heavy vehicle movements are mostly milk deliveries, with a number of deliveries of consumables and ingredients which fluctuate with in line with the number of milk deliveries. The number of truck movements associated with outbound products has less variation throughout the year. The distribution of these movements is not directly linked to the number of milk deliveries as the processing and on-site storage times for many products (e.g. cheese) can be long. Again, October is usually the busiest month.

5.1.2 Peak Hour Traffic

In the peak season the factory operates 24 hours per day, seven days per week. The majority of milk deliveries occur during a 16-hour period between 6am and 10pm. Deliveries are made by a fleet of trucks which make multiple trips per shift between the factory and the dairy farms which supply the milk. OCD has advised that milk deliveries are not scheduled but arrive at different times based on the pick-up routes they operate, with a fairly even distribution throughout the day.

Other trucks movements, such as deliveries of consumables, also arrive at variable times but typically within a shorter window between 6am and 6pm.

Outbound loads of finished products leave the site during a 14-hour window between 6am and 8pm. The timing of these collections and departures is managed, to avoid inefficiencies which could occur if multiple vehicles arrive at once. As such, these too are generally well-spaced throughout the day.

Light vehicle movements are largely based around shift workers (currently 29 staff), with shift changes occurring at 6am and 6pm. With reference to the peak hours identified in the recent surveys, the traffic associated with shift changes occurs outside of the peak hours on the adjacent road network (8am to 9am and 4.30pm to 5.30pm). Currently 15 administrative staff work hours of approximately 8am to 5.30pm. The evening administrative staff movements are noted to occur on the periphery of the observed PM peak hour.

The remaining light vehicle movements are predominantly deliveries to the site, and occur throughout the day.

For the busiest month, October, Table 3 summarises the average number of vehicles per hour throughout a typical day. Recognising that there will be some variation within this distribution, Table 3 also includes a more conservative assessment for the PM peak hour on the road network, which includes a nominal 50% increase in general movements. Exceptions are the staff movements, which are not evenly distributed throughout the day, and which have been included at 15 peak hour movements to recognise the outbound movements of administrative staff in the evening peak; and the outbound product movements, which are coordinated to avoid peaks in vehicle movements.

Description	Average Movements per Hour Throughout the Day	Movements in PM Peak Hour
Heavy Vehicles		
Milk Deliveries	10	15
Other Deliveries	3	5
Outbound Product	3	3
Total	**16**	**23**
Light Vehicles		
Staff	11	15
Visitors	1	2
Deliveries	5	8
Total	**17**	**25**
All Vehicles		
Total	**33**	**48**

Table 3: Typical Existing Peak-Season Peak Hour Traffic Movements

Table 3 shows that during the busiest month of the year the factory generates an average of 33 vehicle movements per hour, and potentially up to 48 movements during the PM peak hour on the surrounding road network. Approximately 50% of movements are heavy vehicles in both cases.

5.2 Expected Trip Generation

Each stage of the development will increase the capacity of the factory in terms of the volume of milk it can process. Trip generation for the proposed development stages is driven largely by milk deliveries. The trucks in the delivery fleet have a typical capacity of 27,000 litres of milk. A capacity of 26,000 litres is typically used by OCD for calculating vehicle requirements, which allows for the occasional smaller-volume truck, and the fact that while trucks typically operate close to capacity, they may not be 100% full for each delivery. This lower value has been used in the trip generation assessment. Combined with the proposed annual factory throughput, the following table summarises the expected additional heavy vehicle trip generation for each stage.

Stage	Additional Capacity (litres)	Cumulative Capacity (litres)	Milk Deliveries per Year (trucks)	Truck Delivery Movements per Year
Existing	-	475 million	18,269	36,538
Stage 1	275 million	750 million	10,577	21,154
Stage 2	250 million	1 billion	9,615	19,230
Stage 3	250 million	1.25 billion	9,615	19,230

Table 4: Proposed Increases in Annual Milk Processing Capacity

Table 4 shows that each proposed stage is expected to add approximately 19,000 to 21,000 truck movements per annum due to milk deliveries.

In addition to increased milk deliveries, OCD has advised that it also expects the following increases in traffic associated with other aspects of site activity. It is noted that the increases in production do not necessarily require proportional increases in staff numbers, as many processes are automated.

Stage 1

- 7 to 10 truck loads of outbound finished products per day (14 to 20 truck movements).
- Five staff per shift (20 light vehicle movements per day).

Stage 2

- 10 truck loads of outbound finished products per day (20 truck movements).
- Two deliveries per day (four truck movements per day)
- Eight staff per shift (32 light vehicle movements per day)

Stage 3

- 10 truck loads of outbound finished products per day (14 to 20 truck movements).

- Two deliveries per day (four truck movements per day)

This data has been summarised in the following figures. The additional daily vehicle movements have been distributed throughout the year in proportion to the existing profile of traffic distribution, on the basis that the proposal is effectively an intensification of existing activity. The data includes inbound and outbound vehicle movements.

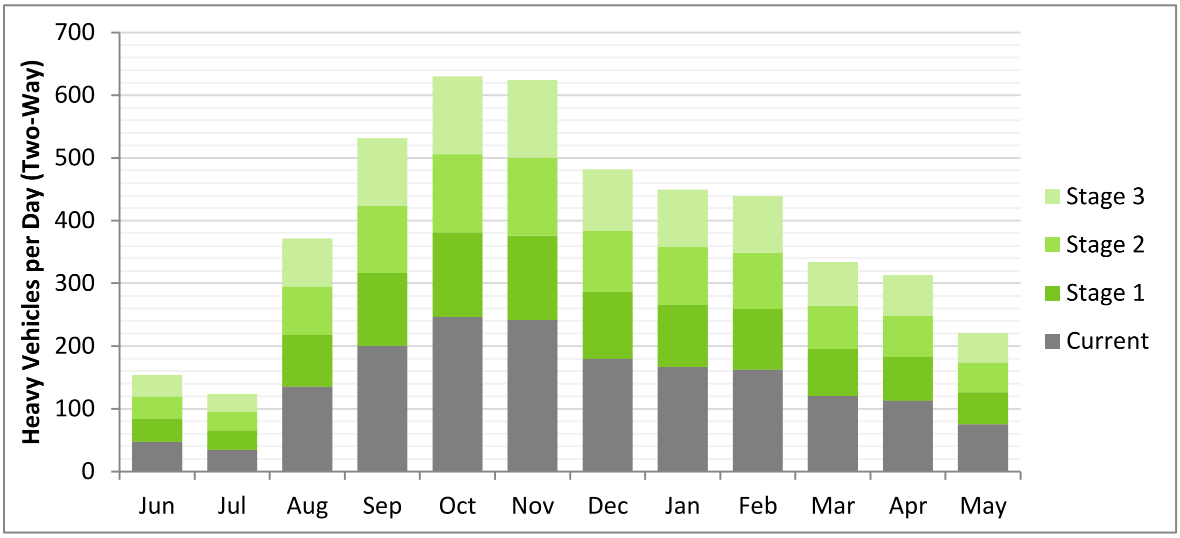

Figure 9: Expected Distribution of Daily Heavy Vehicle Movements for Proposed Development Stages

Figure 9 shows that during October the daily volume of truck movements is expected to increase from approximately 246vpd at present to 381vpd at Stage 1; 505vpd at Stage 2; and 630vpd at Stage 3.

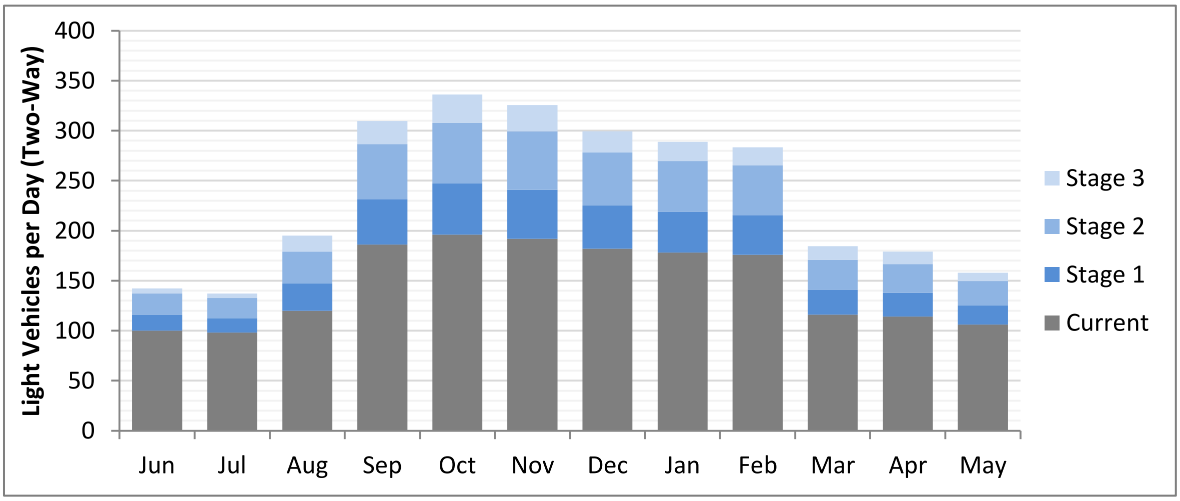

Figure 10: Expected Distribution of Daily Light Vehicle Movements for Proposed Development Stages

Figure 10 shows that the relative increase in light vehicle traffic is expected to be less than for heavy vehicles. It is anticipated that the number of daily light vehicle movements will increase from the current 196vpd to 248vpd at Stage 1; 308vpd at Stage 2; and 336vpd at Stage 3.

5.2.1 Peak Hour

The weekday PM peak hour has been identified as being the busiest time of day on the adjacent road network. The following table shows the expected additional traffic at this time during each development stage, from the activities at the site.

Activity	Current	Stage 1	Stage 2	Stage 3
Heavy Vehicles				
Milk Deliveries	15	6	5	5
Other Deliveries	5	2	1	1
Outbound Product	3	1	1	1
Total	***23***	***9***	***7***	***7***
Cumulative Total	**23**	**32**	**39**	**46**
Light Vehicles				
Staff	15	0	0	0
Visitors	2	0	0	0
Deliveries	8	3	2	2
Total	***25***	***3***	***2***	***2***
Cumulative Total	**25**	**28**	**30**	**32**
All Vehicles				
Cumulative Total	**48**	**60**	**69**	**78**

Table 5: Expected Additional Vehicle Movements in the PM Peak Hour on the Road Network

Table 5 shows that by Stage 3 the number of heavy vehicles generated by the site in the PM peak hour is expected to double from 23 vph to approximately 46 vph. Light vehicle traffic is expected to increase by 7 vph to approximately 32 vph in total. These values are all two-way volumes, i.e. they include inbound and outbound vehicles.

By the completion Stage 3, therefore, activities at the site are expected to generate up to 23 additional heavy vehicle movements and seven additional light vehicle movements in the peak hour, compared to the current site activities.

5.3 Trip Distribution

OCD has provided the following description of vehicle origins or destinations:

- Staff live in a number of towns in the region, as well as in Waharoa itself;
- Farms supplying milk are located throughout the Waikato region;
- Outbound products are delivered primarily to the ports of Tauranga and Auckland;
- Deliveries and visitors arrive from a variety of destinations.

On this basis an even north/south distribution of traffic has been assessed for all activity types.

- Vehicles travelling to and from the north will use the Hawes Street route between the site and SH27.
- Vehicles travelling to the south will use the Link Road Route to SH27.
- While a small proportion of site traffic may travel to and from the west via Landsdowne Road, for the purposes of this assessment all traffic has been assigned to the north or south via SH27. This results in a slightly more conservative assessment of effects at the SH27 intersections.

Table 6 summarises the increases in traffic volume which are expected at each intersection during the PM peak hour. The data is cumulative, i.e. for each stage it includes the traffic for the previous stage(s).

Development Stage	Stage 1		Stage 2		Stage 3	
Additional Traffic per Stage	**Heavy**	**Light**	**Heavy**	**Light**	**Heavy**	**Light**
Total Additional Traffic for Stage	9	3	7	2	7	2
Cumulative Additional Traffic	*9*	*3*	*16*	*5*	*23*	*7*
Cumulative Traffic Movements	**Heavy**	**Light**	**Heavy**	**Light**	**Heavy**	**Light**
Left from Hawes St onto SH27	2	1	4	1	6	2
Right from SH27 into Hawes St	2	1	4	1	6	2
Right from Link Rd onto SH27	2	1	4	1	6	2
Left from SH27 into Link Rd	2	1	4	1	6	2

Table 6: Cumulative Additional Vehicle Peak Hour Movements Expected Due to Each Stage of Development

Table 6 shows that by Stage 3 of the development it is expected that there will be approximately six additional heavy vehicle movements and two light vehicle movements during the peak hour for each of these four turn movements.

6. Network Effects

6.1 Factory Road Corridor

Two-way two-lane urban roads typically have a capacity for up to approximately 900 vph per lane. The Factory Road corridor (Link Road to Hawes Street) currently has peak hour volumes of up to 130 vph. This indicates that the corridor is currently operating well below capacity. The addition of the expected 30 vph from the combined Stages 1 to 3 of the proposed development, as described in Section 5.2.1, is expected to have less than minor effects on the continued safe and efficient operation of traffic on this road.

6.2 Peak Adjustments

Traffic models of the Hawes Street and Link Road intersections with SH27 have been prepared to help quantify the effects of the development traffic on their operation.

The turning movement surveys at these intersections were undertaken in April. As noted in Figures 8 to 10, site traffic volumes vary throughout the year. In order to model the effects of the peak season, additional site traffic movements have been added at these intersections, to account for the difference between typical peak hour traffic volumes in April and October. Table 7 shows the typical peak hour volumes for both months, and identifies the number of additional turn movements which have been added to the models to represent peak season.

Of note, traffic associated with shift workers occurs outside of the peak hours, and the number of administrative staff – who *do* travel during peak hours – does not change throughout the year. Therefore, the difference in light vehicles effectively reflects visitor and light-vehicle deliveries only.

Vehicle Type	April	October	Difference (Added to Model)
Heavy Vehicles per Hour	12	23	11
Light Vehicles per Hour	18	22	4
Total	**30**	**45**	**15**

Table 7: Peak Hour Traffic Volume Comparison

These 15 additional vehicle movements have been applied in accordance with the assessed distribution described in Section 5.3 and added to the models as shown in Table 8[2]:

[2] Note that the figures in Table 8 sum to 16 vehicle movements, due to rounding.

Intersection	Movement	Additional Vehicles
Hawes Street	Left turn out onto SH27	Three heavy, one light.
	Right turn in from SH27	Three heavy, one light.
Link Road	Right turn out onto SH27	Three heavy, one light.
	Left turn in from SH27	Three heavy, one light.

Table 8: Additional Traffic Movements

The base models described in the following assessment include these additional movements.

6.3 Future Growth

In order to account for future growth on the network, additional through-movements have been added to the SH27 approaches for the Stage 1 to 3 models, such that a nominal 2.5% per annum growth is achieved.

6.4 Hawes St / SH27 Intersection

The performance of the intersection during the peak season has been modelled using SIDRA v6.1. The key performance metrics as the traffic volumes increase with each stage are summarised in Tables 9 to 12.

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
1	L2	17	0.0	0.265	4.6	LOS A	0.0	0.0	0.00	0.02	49.4
2	T1	475	7.8	0.265	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		492	7.5	0.265	0.2	NA	0.0	0.0	0.00	0.02	49.8
North: SH27											
8	T1	518	7.9	0.279	1.2	LOS A	0.0	0.0	0.00	0.20	59.4
9	R2	18	41.2	0.022	8.7	LOS A	0.1	0.8	0.53	0.66	43.2
Approach		536	9.0	0.279	1.4	NA	0.1	0.8	0.02	0.21	58.7
West: Hawes Street											
10	L2	28	48.1	0.047	7.5	LOS A	0.2	1.7	0.54	0.66	41.4
12	R2	29	0.0	0.106	14.9	LOS B	0.3	2.3	0.77	0.88	37.0
Approach		58	23.6	0.106	11.3	LOS B	0.3	2.3	0.65	0.77	39.0
All Vehicles		1085	9.1	0.279	1.4	NA	0.3	2.3	0.04	0.16	53.0

Table 9: Hawes St / SH27 Intersection, PM Peak, Existing Traffic

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
1	L2	17	0.0	0.270	4.6	LOS A	0.0	0.0	0.00	0.02	49.4
2	T1	484	7.8	0.270	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		501	7.6	0.270	0.2	NA	0.0	0.0	0.00	0.02	49.8
North: SH27											
8	T1	528	8.0	0.285	1.2	LOS A	0.0	0.0	0.00	0.20	59.4
9	R2	21	45.0	0.026	9.0	LOS A	0.1	1.0	0.54	0.68	43.1
Approach		549	9.4	0.285	1.5	NA	0.1	1.0	0.02	0.22	58.5
West: Hawes Street											
10	L2	32	50.0	0.053	7.7	LOS A	0.2	1.9	0.54	0.68	41.1
12	R2	29	0.0	0.111	15.4	LOS C	0.3	2.4	0.78	0.89	36.8
Approach		61	25.9	0.111	11.4	LOS B	0.3	2.4	0.66	0.78	38.9
All Vehicles		1112	9.5	0.285	1.4	NA	0.3	2.4	0.05	0.16	52.9

Table 10: Hawes St / SH27 Intersection, PM Peak, Stage 1

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
1	L2	17	0.0	0.275	4.6	LOS A	0.0	0.0	0.00	0.02	49.4
2	T1	494	7.9	0.275	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		511	7.6	0.275	0.2	NA	0.0	0.0	0.00	0.02	49.8
North: SH27											
8	T1	539	8.0	0.291	1.2	LOS A	0.0	0.0	0.00	0.20	59.4
9	R2	23	50.0	0.030	9.3	LOS A	0.1	1.2	0.55	0.69	42.9
Approach		562	9.7	0.291	1.5	NA	0.1	1.2	0.02	0.22	58.5
West: Hawes Street											
10	L2	34	53.1	0.059	8.0	LOS A	0.2	2.2	0.55	0.69	40.6
12	R2	29	0.0	0.115	15.9	LOS C	0.3	2.4	0.79	0.89	36.6
Approach		63	28.3	0.115	11.7	LOS B	0.3	2.4	0.66	0.78	38.6
All Vehicles		1136	9.8	0.291	1.5	NA	0.3	2.4	0.05	0.16	52.8

Table 11: Hawes St / SH27 Intersection, PM Peak, Stage 2

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
1	L2	17	0.0	0.281	4.6	LOS A	0.0	0.0	0.00	0.02	49.4
2	T1	504	7.9	0.281	0.0	LOS A	0.0	0.0	0.00	0.02	49.8
Approach		521	7.7	0.281	0.2	NA	0.0	0.0	0.00	0.02	49.8
North: SH27											
8	T1	548	7.9	0.296	1.2	LOS A	0.0	0.0	0.00	0.20	59.4
9	R2	26	52.0	0.036	9.5	LOS A	0.1	1.4	0.56	0.71	42.8
Approach		575	9.9	0.296	1.5	NA	0.1	1.4	0.03	0.22	58.4
West: Hawes Street											
10	L2	37	54.3	0.066	8.3	LOS A	0.2	2.5	0.56	0.70	40.3
12	R2	29	0.0	0.119	16.5	LOS C	0.4	2.5	0.80	0.90	36.4
Approach		66	30.2	0.119	11.9	LOS B	0.4	2.5	0.67	0.79	38.5
All Vehicles		1162	10.1	0.296	1.5	NA	0.4	2.5	0.05	0.16	52.8

Table 12: Hawes St / SH27 Intersection, PM Peak, Stage 3

The intersection currently operates with a low degree of saturation (v/c) of 0.279. The level of service (LOS) for each movement is between LOS A and C.

The data indicates that the intersection is expected to continue to operate well through to Stage 3 of the proposed development, with negligible changes to the overall operation of the intersection. The traffic which is expected to be added to this intersection only has to give way only to the northbound through movement on SH27. This opposing flow is typically between 400 and 500 vph, and has a reasonable degree of platooning due to the proportion of HCVs. This means that there are frequent gaps available to the left-turn out and right-turn in traffic movements.

It is assessed that the expected development traffic of all three stages can be accommodated at this intersection with less than minor effects.

6.5 Link Road / SH27 Intersection

The performance of this intersection during the peak season has also been modelled. The key performance metrics as the traffic volumes increase with each stage are summarised in Tables 13 to 16.

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
4	L2	46	22.7	0.272	5.8	LOS A	0.0	0.0	0.00	0.23	55.9
5	T1	449	8.7	0.272	1.1	LOS A	0.0	0.0	0.00	0.23	58.9
Approach		496	10.0	0.272	1.6	NA	0.0	0.0	0.00	0.23	58.6
North: SH27											
11	T1	504	7.9	0.272	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
12	R2	20	0.0	0.013	4.9	LOS A	0.1	0.4	0.50	0.55	37.6
Approach		524	7.6	0.272	0.2	NA	0.1	0.4	0.02	0.02	39.9
West: Link Road											
1	L2	18	5.9	0.285	10.6	LOS B	1.0	8.0	0.77	1.05	33.3
3	R2	60	19.3	0.285	23.4	LOS C	1.0	8.0	0.77	1.05	39.4
Approach		78	16.2	0.285	20.4	LOS C	1.0	8.0	0.77	1.05	37.8
All Vehicles		1098	9.3	0.285	2.3	NA	1.0	8.0	0.06	0.19	46.4

Table 13: Link Rd / SH27 Intersection, PM Peak, Existing Traffic (2016)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total	HV				Vehicles	Distance			
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
4	L2	49	25.5	0.280	5.9	LOS A	0.0	0.0	0.00	0.24	55.8
5	T1	459	8.7	0.280	1.1	LOS A	0.0	0.0	0.00	0.24	58.9
Approach		508	10.4	0.280	1.6	NA	0.0	0.0	0.00	0.24	58.6
North: SH27											
11	T1	515	8.0	0.278	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
12	R2	20	0.0	0.018	5.4	LOS A	0.1	0.5	0.50	0.59	37.6
Approach		535	7.7	0.278	0.2	NA	0.1	0.5	0.02	0.02	39.9
West: Link Road											
1	L2	18	5.9	0.318	11.2	LOS B	1.1	9.3	0.79	1.07	32.8
3	R2	63	21.7	0.318	25.3	LOS D	1.1	9.3	0.79	1.07	38.4
Approach		81	18.2	0.318	22.2	LOS C	1.1	9.3	0.79	1.07	37.0
All Vehicles		1124	9.6	0.318	2.4	NA	1.1	9.3	0.07	0.19	46.3

Table 14: Link Rd / SH27 Intersection, PM Peak, Stage 1 (including growth to 2017)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
4	L2	52	28.6	0.287	5.9	LOS A	0.0	0.0	0.00	0.24	55.6
5	T1	468	8.8	0.287	1.1	LOS A	0.0	0.0	0.00	0.24	58.9
Approach		520	10.7	0.287	1.6	NA	0.0	0.0	0.00	0.24	58.6
North: SH27											
11	T1	525	8.0	0.283	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
12	R2	20	0.0	0.019	5.5	LOS A	0.1	0.5	0.51	0.60	37.5
Approach		545	7.7	0.283	0.2	NA	0.1	0.5	0.02	0.02	39.9
West: Link Road											
1	L2	18	5.9	0.351	11.9	LOS B	1.3	10.5	0.81	1.08	32.3
3	R2	65	24.2	0.351	27.5	LOS D	1.3	10.5	0.81	1.08	37.4
Approach		83	20.3	0.351	24.1	LOS C	1.3	10.5	0.81	1.08	36.2
All Vehicles		1148	10.0	0.351	2.6	NA	1.3	10.5	0.07	0.20	46.2

Table 15: Link Rd / SH27 Intersection, PM Peak, Stage 2 (including growth to 2018)

Movement Performance - Vehicles											
Mov ID	ODMov	Demand Flows Total	Demand Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	v/c	sec		veh	m		per veh	km/h
South: SH27											
4	L2	55	30.8	0.296	5.9	LOS A	0.0	0.0	0.00	0.24	55.5
5	T1	479	8.8	0.296	1.1	LOS A	0.0	0.0	0.00	0.24	58.9
Approach		534	11.0	0.296	1.6	NA	0.0	0.0	0.00	0.24	58.5
North: SH27											
11	T1	537	8.0	0.290	0.0	LOS A	0.0	0.0	0.00	0.00	40.0
12	R2	20	0.0	0.019	5.6	LOS A	0.1	0.5	0.51	0.61	37.5
Approach		557	7.8	0.290	0.2	NA	0.1	0.5	0.02	0.02	39.9
West: Link Road											
1	L2	18	5.9	0.392	12.9	LOS B	1.5	12.1	0.83	1.11	31.7
3	R2	68	26.2	0.392	29.9	LOS D	1.5	12.1	0.83	1.11	36.4
Approach		86	22.0	0.392	26.4	LOS D	1.5	12.1	0.83	1.11	35.3
All Vehicles		1177	10.3	0.392	2.8	NA	1.5	12.1	0.07	0.20	46.1

Table 16: Link Rd / SH27 Intersection, PM Peak, Stage 3 (including growth to 2019)

The performance data shows that all movements currently operate with good levels of service (LoS A to C) and low delays. As additional site traffic is added, along with background traffic growth, most movements are expected to experience small effects except for the right turn out of Link Road. This movement currently operates with a LoS C in the peak hour with existing traffic volumes, with an average delay of approximately 23 seconds per vehicle. Delays for this movement are expected to increase by approximately 2 seconds with each development stage, to approximately 29 seconds per vehicle with the Stage 3 traffic. While this is a modest increase of approximately six seconds per vehicle, it moves the level of service to LoS D. The overall LoS for the Link Road approach is LoS D, which is assessed as being an acceptable overall performance. Queuing on this approach is expected to remain at very low levels, with a 95th percentile queue length of less than two vehicle expected by Stage 3 of the development. The movement will continue to have a low degree of saturation (v/c) of less than 0.4.

This is considered acceptable for a minor side road entering the strategic network at peak times. The modelling indicates that through traffic on SH27, and traffic turning from SH27 into Link Road, is expected to be largely unaffected by the additional movements.

6.6 Limit of Effects

The expected increase in activity is assessed as having less than minor effects at the Hawes Street intersection, and no mitigation is considered necessary at that intersection.

The additional traffic is expected to be able to be accommodated at the Link Road intersection with no more than minor effects, although it is noted that for the right-turn out of Link Road a LoS D and additional delays of 6 seconds can be expected. A key element of this analysis is recognising that this level of effects is not expected to occur on a daily basis throughout the year.

Figure 11 shows that traffic associated with all three stages of development, between March and August, is less than that expected for Stage 1 during the peak season. Similarly, traffic associated with Stage 2 is less than the Peak Season Stage 1 traffic volume for much of the year (December to early September). During these months, the effects of the additional right-turn traffic are expected to maintain a LoS D, and would be considered less than minor.

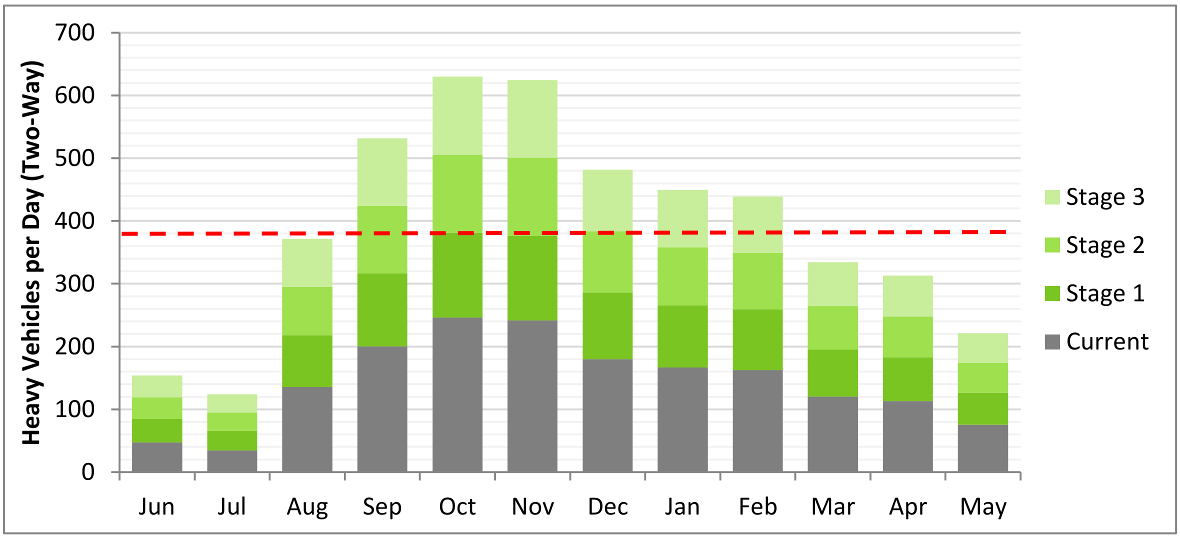

Figure 11: Seasonal Traffic Volumes Relative to Stage 1 Traffic in the Peak Season

With reference to the hourly flows on SH27, the analysis above is based on Friday PM peak volumes. Section 3.2 of this report notes that on the other six days of the week the busiest hour peak volumes are significantly lower, at some 80% or less compared to the Friday PM peak. Analysis of the intersection with only the SH27 through movements reduced by 80 % (leaving all turn movements at their existing + Stage 3 traffic values) indicates a LoS C and delays of approximately 24s for the right-turn exit movement.

To summarise, the expected traffic effects are assessed as being limited to one turn movement at the Link Road intersection, during the PM peak hour on Fridays during the peak season only. On other days of the week, and outside of the peak season for milk processing, this movement is expected to operate with significantly better performance. With the potential to manage fleet movements to some degree during this short window of time, it is assessed that overall the development up to Stage 3 as described herein, can be accommodated on the road network with no more than minor effects.

7. Parking and Loading

7.1 District Plan Parking Requirements

The District Plan lists a number of activity types, and identifies appropriate rates for the provision of parking for each one. The existing and proposed activities are a mixture of:

- Industry, which has a parking requirement of 1 space per $100m^2$ gross floor area (GFA); and
- Office, which has a parking requirement of 1 space per $40m^2$ GFA.

The District Plan parking demand has been calculated based on the following approximate areas for each activity type.

Activity Type	Required Parking Supply Rate	Approximate GFA (m^2)	Required Parking Supply (Spaces)
Office	1 space per $40m^2$ GFA	400	10
Industry	1 space per $100m^2$ GFA	10,000	100
Total			110

Table 17: District Plan Parking Requirements after Stage 3

The District Plan requires that approximately 110 spaces are provided, based on the estimated GFA described above.

7.2 Expected Parking Demand

The factory currently has up to 44 staff on site at any one time. It is understood that this will increase incrementally as each stage is developed, to a total of 62 staff by the completion of Stage 3. OCD has advised that visitors and contractors may increase the demand by up to ten spaces. While OCD has indicated that up to 10% of staff live locally and walk or cycle to the factory, the assessed demand includes all staff travelling by car. This gives a total peak parking demand of approximately 72 spaces.

7.3 Proposed Parking Supply

A concept parking layout shown on Figure 7 includes 107 marked spaces in the main car park. This is significantly more than the assessed peak demand, but does not meet the District Plan requirement.

The factory has many automated processes, meaning that despite the large floor area a relatively small number of staff is need for its operation. It is assessed that the rates described above for the District Plan requirements, while being the ‘best fit’ of the activities listed, are not a good match for the specific activities which occur at the OCD factory.

It is assessed that an appropriate minimum provision of parking for a given stage of development would be equal to the number of staff expected on site at any one time, plus ten spaces for visitors. It is further noted that contractors may be permitted to park elsewhere on the site, in locations that may be more convenient to their specific work site, at the discretion of the site manager. This provides added flexibility and capacity in addition to the main car park. Furthermore, the availability of space adjacent to the car park means that the parking supply can be increased as required by extending the formed and sealed area.

It is therefore assessed that while the proposed parking supply will not meet the requirements of the District Plan, it will be able to readily accommodate the expected parking demand. The ability to park in other locations around the site, and the potential for adding further parking as required, means that the risk of off-site parking effects is assessed as being negligible.

7.4 Parking Design

The concept plan does not have dimensions marked on the parking spaces, however based on scaled measurements they provisionally measure 2.4m wide by 5.0m long.

The District Plan requires parking spaces to meet the dimensions given in the MPDC Development Manual. For 90-degree long-term (e.g. employee) spaces the Development Manual requires 2.5m by 4.9m spaces. The spaces on the concept plan do not therefore meet the dimensional requirements of the District Plan.

Notwithstanding this, the national parking standard, NZS2890.1:2004 Part 1, notes that 2.4m by 5.0m is the minimum acceptable space size for employee parking, so the proposed spaces are assessed as being appropriate in that regard. It is assessed that the concept layout dimensions are appropriate for staff parking, however ten visitor spaces should be provided at the slightly easier to use 2.5m width.

No accessible spaces are marked on the concept plan, however should be provided in any future parking layout. These should be provided at a rate commensurate with the size of the overall car park at the time of development. The relevant standard, NZS4121:2001, notes the following requirements:

Total number of Parking Spaces	Number of Accessible Parking Spaces.
1 to 20	Not less than 1
21 to 50	Not less than 2
For every additional 50 spaces	Not less than 1

Table 18: Mobility Parking Space Requirements

For a car park with 101 to 150 spaces, four accessible spaces are therefore required.

7.5 Parking Summary

For the purposes of formulating development standards specific to the development of the OCD site, it is assessed that meeting the District Plan requirement for parking provision is not necessary, as it would result in an inefficient use of space, and under-utilisation of the parking provided. A more appropriate requirement is to provide sufficient on-site parking to accommodate all staff and the maximum number of expected visitors (including contractors), for each stage of the development, such that no off-site parking occurs. A development control rule to this effect is recommended.

7.6 Loading and Servicing

The District Plan requires activities to provide a loading space for a courier van, rigid truck or articulated truck as appropriate to the types and frequency of deliveries expected.

On this basis, the production activities are required to provide a loading space for an articulated truck, while the office activity would require a space for courier van.

The nature of the primary activity at the factory means that dedicated facilities are provided for each type of truck which delivers to, or collects from, the factory.

The parking area shown on the concept plan does not specify a loading space, however the standard spaces marked are suitable for use by courier vans. It is assessed that an appropriate provision would be to mark one loading space within the car park, close to the office building. Given the potential number of spaces which can be provided (approximately 100) being higher than the assessed peak demand (up to 72 spaces), it is assessed that there is ample space for a loading space to be marked to service the office.

It is therefore recommended that one space suitable for a courier van be provided close to the office building. A development control rule to this effect is recommended.

8. Access

The existing truck access onto Factory Road at the southern boundary of the site will remain in its current form, and will retain two-way truck access for all proposed stages.

Light vehicle traffic will continue to have two-way access via the north access only, for all stages of the proposed development.

The key change in site access is the proposal to allow inbound truck movements at the northern access. No outbound truck movements will occur from this access.

This means that for outbound traffic there is no change to the current access use. Inbound trucks, however, will now primarily use both accesses. With milk deliveries making up the bulk of inbound movements, this means that the northern access would accommodate the majority of inbound truck movements.

The concept site plan shows a new, separate vehicle crossing for inbound tankers adjacent to the existing northern access. This would provide direct access to the tanker wash and tanker reception, where the milk is transferred from the vehicles. Inbound trucks would also need to access the cool store at the rear of the site, accessed via a one-way lane to the north of the car park. Further truck access is required to the load-out areas in the centre of the site, where trucks are loaded with finished products.

In order to minimise the number of access points onto Factory Road, it is recommended that a single access be used to accommodate all of these movements. In practice, this is likely to mean a modification to the existing vehicle crossing to accommodate truck movements. The inbound lane will be used by light and heavy vehicles, while the outbound lane will be used by light vehicles only.

Factory Road has peak hour traffic volumes of up to 130vph. The expected inbound rate of heavy vehicle arrivals, in the peak hour during the busiest month of the year, is up to 20vph. These heavy vehicle movements will all be inbound movements. It is assessed that these expected site traffic volumes can be redistributed as described with no safety or efficiency concerns.

The District Plan requires that a new or altered vehicle crossing shall be designed, formed, and constructed in accordance with the Development Manual.

It is recommended that a development control rule require the proposed access and egress arrangement to be designed by a suitably qualified traffic engineer and submitted to Council for approval prior to implementation.

9. Summary and Conclusions

OCD is proposing to add additional plant and processing capabilities at its current factory at Waharoa. Expected developments include (but are not limited to) milk drying facilities, and the processing of cheese, lactose, cream and other products. The majority of the possible additions would simply be increasing the capacity of an existing process at the factory. Rather than applying for resource consent for a specific type and scale of activity, the preferred approach is to seek approval for a set of Development Controls for the site which allow a little flexibility in the precise positioning, scale and location of activities within the site.

It is expected that with each development stage, the number of milk deliveries to the factory would increase, along with deliveries of products and ingredients, and the number of loads of outbound finished products would also increase.

The nature and timing of the various additional processes is not fixed, and depends on a number of factors including developments at other OCD facilities which may negate the need for a specific process, or increase in production, at the Waharoa site.

A provisional site plan has been created to show a possible layout with all of the possible developments included. The development has also been divided into provisional stages, based on the most likely scenario for developing activities.

- Stage one is expected to increase the potential capacity of the factory from 475 million litres per annum to 750 million litres per annum.
- Stage two is expected to add a further 250 million litres per annum capacity.
- Stage three will not include physical upgrades but accounts for processing efficiencies within the site utilising existing equipment. This will also add a further 250 million litres per annum capacity.

These increases in milk processing capacity have been assessed on the basis of additional trip generation, to establish the likely effects on the surrounding road network. It is concluded that the additional movements can be accommodated on the surrounding road network with less than minor effects for much of the year. Analysis of traffic flow on SH27 indicates that on Fridays the PM peak hour traffic is significantly higher than on other days of the week. During the peak season for activity at the OCD site, it is expected that the additional right-turn movements from Link Road onto SH27 may cause a small increase in delays of approximately 6 seconds per vehicle, causing the level of service for this one movement to reach LoS D. During this same hour queues are not expected to exceed two vehicles, and the degree of saturation (v/c) for the movement is expected to be less than 0.4.

These effects are limited to one turning movement during the peak period of one day per week, during the peak season only. At other times this movement is expected to operate with significantly better performance. Accordingly, the overall effects of the additional traffic on the road network are assessed as being no more than minor. Notwithstanding this, it is recommended that OCD develops a fleet management strategy to manage the movements of trucks such that south bound movements can be limited during these short periods of time if exiting onto SH27 does prove to be difficult.

It is proposed to redistribute truck movements between the two existing site access points on Factory Road. Currently all truck traffic uses the south access, and the proposed layout will require the majority of inbound trucks to use the north access. The south access will still accommodate a proportion of inbound truck traffic. It is recommended that the north entrance be widened to accommodate the expected truck turning movements, and that the final design for the access be prepared by a suitably qualified traffic engineer and approved by Council prior to implementation. The number of trucks expected at this access has been considered in conjunction with the traffic volumes on Factory Road, and it is expected that the additional vehicle movements can be accommodated with negligible adverse effects.

The concept layout for the site includes a large car park which has the capacity to provide significantly more parking than the assessed peak parking demands, however it is unlikely to be able to provide enough parking to meet the requirements of the District Plan. For the purposes of establishing development controls, it is recommended that the requirement for parking provision be equivalent to the number of permanent staff working at the site at one time, plus ten spaces for visitors. This allows for a growth in provision of parking which is proportional to the demand, and not related to the floor area of the factory.

In summary, it is concluded that the three stages of proposed additional activities at the OCD factory, as described herein, can be established with no more than minor effects on the safe and efficient operation of the road network.

TDG

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TDG Ref: 13752.001
4 August 2017

Issued via email: **patrick.edwards@opencountry.co.nz; colin @dcs.gen.nz**

Dear Patrick

Open Country Dairy, Waharoa – Proposed Plan Change
Further Information on Traffic Matters

Following my recent correspondence with Colin Hopkins of DCS Planning Consultants I am pleased to provide the following clarifications with regard to the assessments made in TDG's Integrated Transportation Assessment (ITA) for the Plan Change, dated 16 March 2017.

1. Fleet Management

Section 5.2 of the ITA assessed the current levels of trip generation at the factory, and also that which would be expected under the plan change. This identified a clear seasonal peak of site traffic in October/November, and also noted that traffic flows on SH27 are higher on Friday afternoons than on other days.

Section 6 of the ITA discusses the effects of the expected additional traffic. The conclusion, based on the forecast site trip generation and accounting for traffic growth on SH27, was that the additional traffic for all stages of production can generally be accommodated on the road network with less than minor effects. The one exception to this is during the Friday evening peak, in the busiest part of the season, when Stage 3 of the development is reached. Modelling of this specific scenario indicated a decrease in the expected Level of Service (LOS) for vehicles exiting Link Road onto SH27.

To mitigate this a Fleet Management Plan was recommended, to reduce the number of outbound vehicles heading south (via Link Road) during this peak period.

Whilst a fleet management strategy can be employed by the applicant as part of their day to day management of fleet movements, it is recommended that any provision in the Development Control Plan relate to ensuring an acceptable LOS at the intersections with SH27 (at the time of the application to increase capacity is made) is maintained. To ensure this is the case, an assessment (including traffic count surveys to establish an accurate base) should be undertaken at the time of the Stage 3 expansion, to determine the existing LOS and demonstrate that any change to it is acceptable with the additional volume of expected traffic movements. This may require mitigation, which could include fleet management measures.

2. Access

It is understood that a likely outcome of the site development will be the upgrade of the existing northern site access to allow truck entry movements as well as all light vehicle movements. This is described in the ITA.

The ITA notes that a single access onto Factory Road is preferred. For clarification, this relates specifically to the northern access upgrade, i.e. the design should be for a single driveway and not a new, separate driveway adjacent to the existing one.

The ITA anticipated that the existing southern site access would be retained, with all movements permitted.

From a traffic effects perspective, it is assessed that the only control for accesses (new and existing) is that they be designed and constructed appropriately i.e. in accordance with the MDPC Development Manual, and with the design prepared by an appropriately qualified engineer.

Any trigger relating to the upgrade of this access would therefore relate to the relocation of the tanker bay and the provision of inbound tanker access, rather than the increase in volume of milk processed on the site.

We trust that the above provides sufficient clarification.

Yours sincerely
Traffic Design Group Ltd

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