Grima Recycling

Traffic Management Plan

| Final Rev 3

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Revision	Date	Description	By	Review	Approved
0	15/ 11/ 2017	Draft Report for review	S.Read	D. Lowe	D Lowe
1	20/ 11/ 2017	Final Report	S.Read	D. Lowe	D Lowe
2	15/ 1/ 2018	Final Report	S.Read	D. Lowe	D Lowe
3	15/ 1/ 2018	Final Report analysis for 75,000 tonnes	S.Read	D. Lowe	D Lowe

Contents

1. Introduction

Jacobs has been commissioned by Jackson Environment and Planning to prepare this traffic management plan for the Grima Recycling Facility at 88 Redfern Street Wetherill Park. This traffic management plan has been developed to address the potential impacts of proposed increase in activity from 28,000 tonnes per annum to 75,000 tonnes per annum. The 75,000 tonne per annum capacity has been recommended by Fairfield Council.

This document is in addition to the traffic impact assessment which addresses the potential impacts on the wider road network.

1.1 Background

Grima Environmental Services Pty Ltd (Grima Recycling) is a family-owned company that operates a resource recovery facility in Wetherill Park.

The site currently comprises a fully enclosed warehouse, office and maintenance building for the recycling of paper, cardboard and plastic film that is collected from a range of commercial customers across Sydney. These materials are collected separately from other waste materials, transported via truck to Wetherill Park, and are baled and compacted ready for truck transport to market.

Grima Recycling began operations in 2009, receiving Development Consent from Fairfield City Council for the purpose of consolidating waste paper to a maximum waste-processing amount of 28,000 tonnes per year. It is currently seeking approval to increase this capacity to 75,000 tonnes per year. The site upgrade is to improve the operational efficiency of the site so that it can process up to 75,000 tonnes per year, which will permit an increase in the processing and receipt of paper, cardboard and plastic film to approximately 205 tonnes per day. The upgrades will include:

- An extension to the existing warehouse to accommodate a new maintenance workshop and hardstand
- Modifications to the existing office to accommodate new disabled bathroom facilities
- Demolition of an existing maintenance shed and replacement with a new recycled product storage shed
- Construction of a new two-metre high masonry screen along the north-eastern site boundary.

It is noted that this report is an addendum to the Traffic Impact Assessment completed by Jacobs on 17 June 2016. We also note that in our impact assessment report, the study considered an increase in processing capacity of the development to 99,000 tonnes per annum. Following consultation with Fairfield City Council on 7 November 2017, it was resolved that a maximum processing capacity of 75,000 tonnes per year may be a more appropriate limit under the development application DA 786.1/2016. Traffic projections therefore made in this addendum report replaces all previous projections provided to Council as part of the assessment process for the proposed development.

Conservatively we have based our assessment on a capacity of 85,000 tonnes per year. We note that the traffic projections at full capacity of 85,000 tonnes per year are based on a scaling of weighbridge records from a typical day of operations (over a 24 hour period on 3 August 2017). The analysis considered the type of truck movement into the facility, entry time, exit time and the amount of product either dropped off for baling or collected for off-site transport and recycling. Traffic projections therefore differ from the original impact assessment, which were based on estimates made by Jacobs at the time of the study.

1.2 Report Structure

This report has been structured to address the standard items as set out in the ‘Procedures for the use in the preparation of a Traffic Management Plan (TMP)’, Roads and Maritime Services (Roads and Maritime). Where a specific item has been addressed it is referenced as item A to H in the sub heading. The report structure is as follows:

- Description of Measures (Item A) – This includes a description of the existing and proposed operation of the site.
- Impacts of Proposed Measures (Items B to H) – This section describes the potential impacts and measures that may be used to ameliorate the impacts.

2. Description of Measures (Item A)

2.1 Existing Conditions

The site currently accepts two types of trucks.

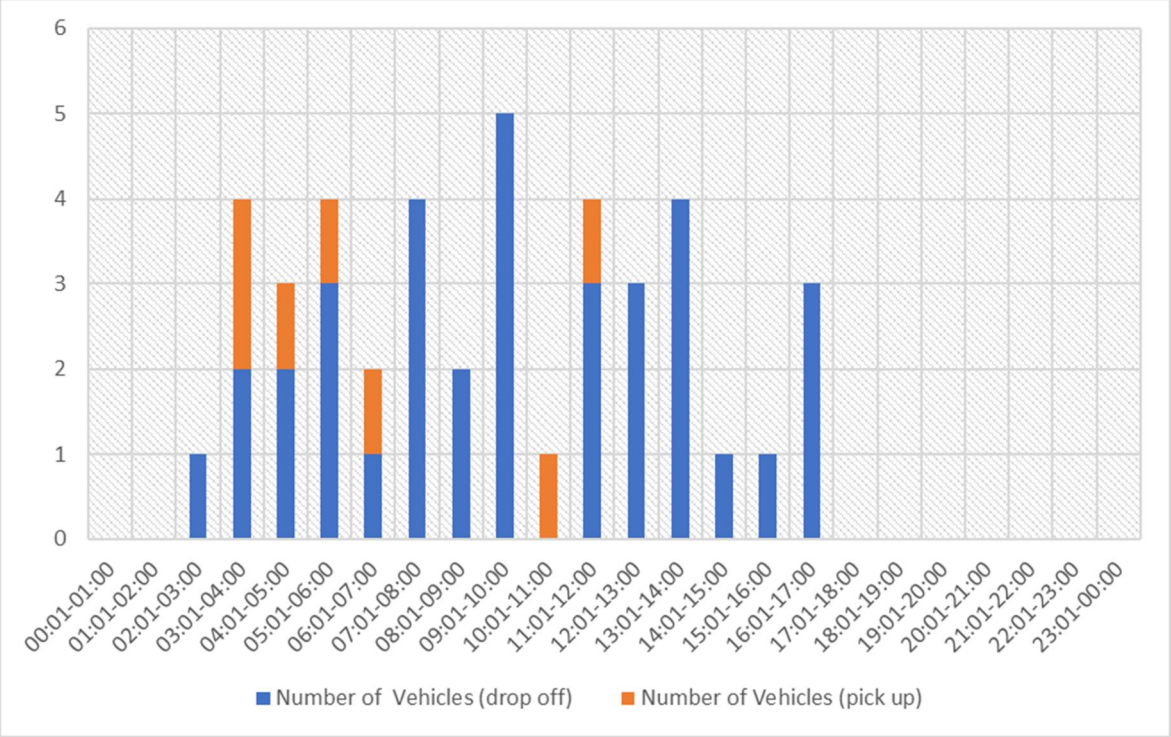
- Delivery of recyclable materials (Medium Rigid Trucks)
- Trucks to pick up the bailed materials (semi-trailers)

All trucks that arrive on site are first weighed on the weighbridge. From there they travel to the delivery area or to the loading area.

A sample of the weighbridge records for a typical day has been obtained. The record is presented in Figure 2.1 The deliveries occurred between 2:00am and 5:00pm. The average arrival rate for deliveries was 2.3 trucks per hour. Trucks used to pick up are managed directly and are typically limited to 2 per hour though there is capacity to managed up to 3 per hour.

It is noted that the traffic impact assessment for the site has significantly over estimated the existing number of trips. The empirical data from the weighbridge indicates that there were only 35 truck deliveries on a typical day whose arrival was randomly distributed throughout the day while the traffic impact assessment indicated 70 trucks per hour.

Figure 2.1 : Weigh Bridge Records for a typical day



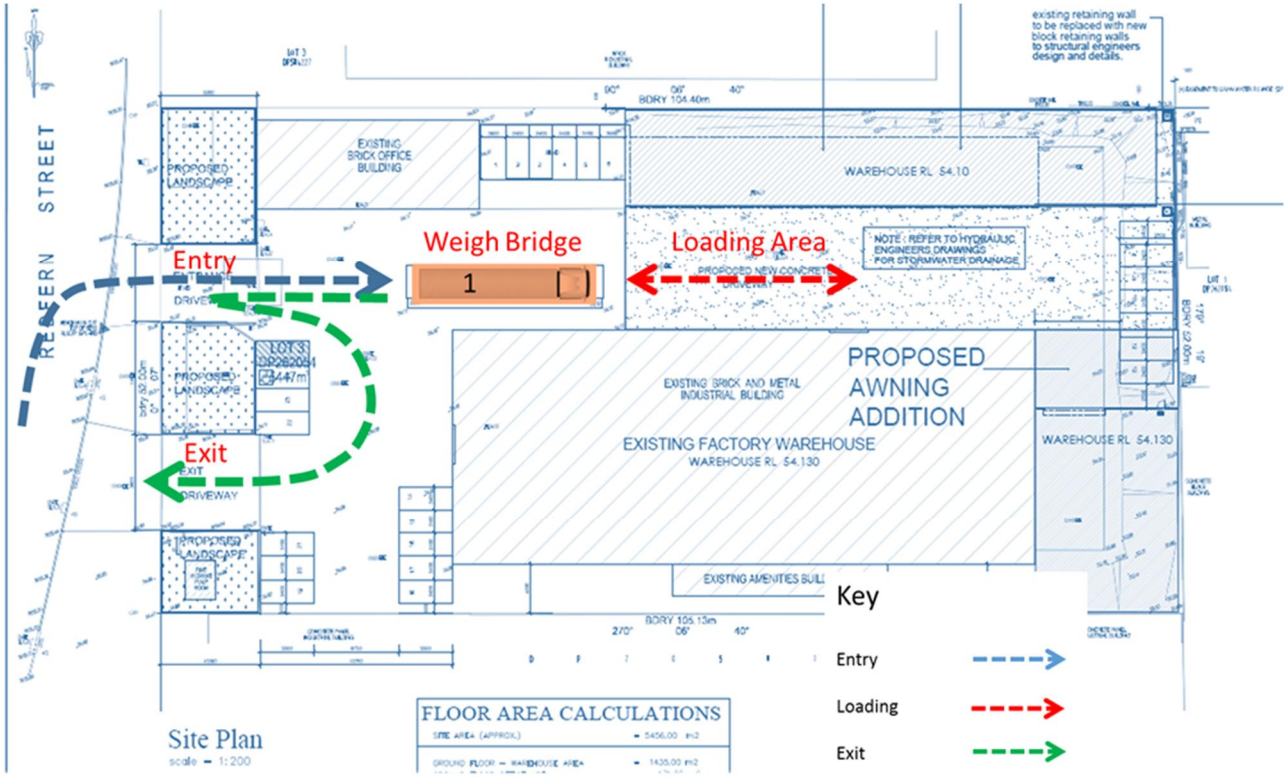
2.1.1 Collection movements

Collection trucks are semi-trailers that arrive to collect the baled product to be transported to paper recycling facilities.

1) The trucks arrive at site and are weighed at the weighbridge.
2) They then continue forward to the area that is used for loading.
3) They are then weighed again at the weigh bridge.
4) They then turn around within the site to leave the site in a forward direction through the exit driveway.

This whole process can take from 10minutes to 20minutes depending on the type of trucks. These truck arrivals are managed on site and can be distributed throughout the day to avoid congestion within the site. The proposed upgrade of the facility is expected to reduce the service time as trucks will be able to be more quickly loaded. The typical collection truck movements are shown in Figure 2.2.

Figure 2.2 : Truck Pickups



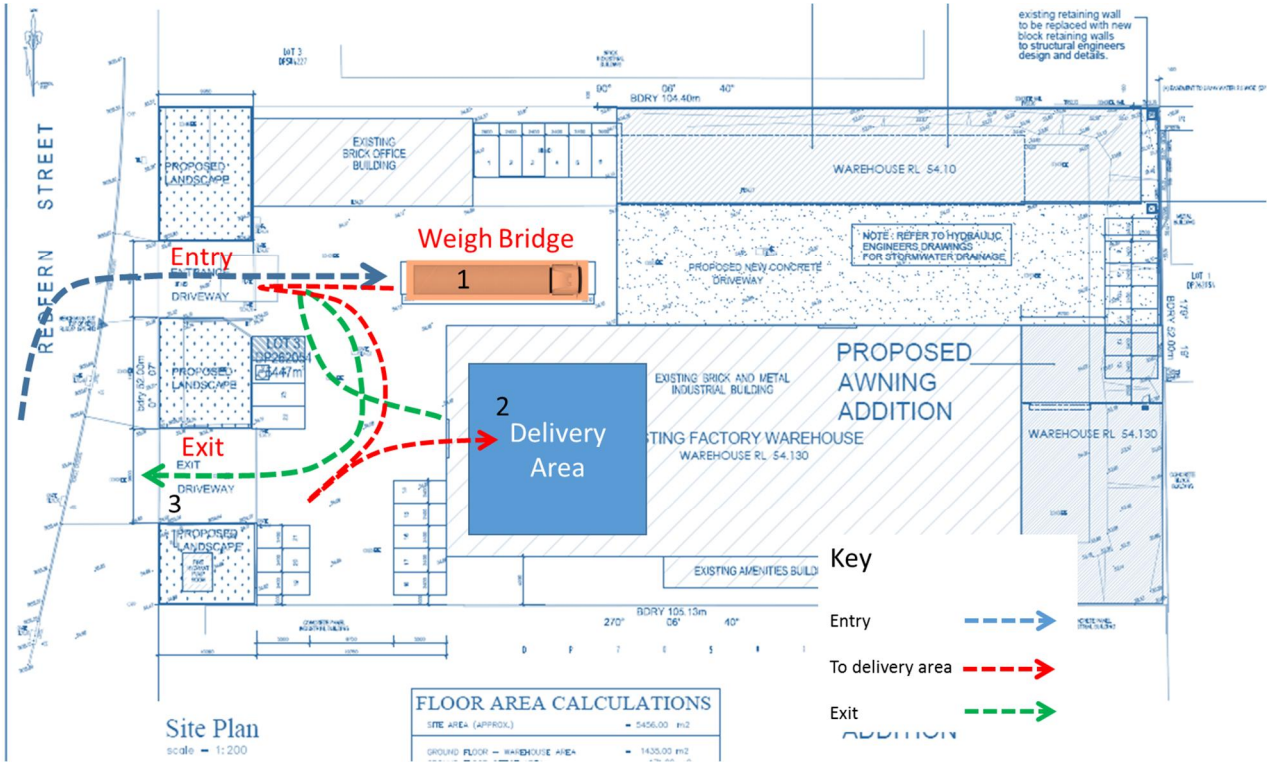
2.1.2 Delivery Trucks

Delivery trucks arrive randomly throughout the day. They are typically medium rigid vehicles and carry between 0.5 and 8 tonnes of product. The process for delivery trucks is:

1) The trucks arrive at site and are weighed at the weighbridge.
2) They then wait to be received in the delivery area.
3) Trucks then deliver the product within the warehouse.
4) If they do not have an 'auto tare' they are weighed on departure otherwise they leave the site directly. Most trucks leave the site without needing to be reweighed.
5) The trucks turn around within the site to leave the site in a forward direction through the exit driveway.

The process typically takes about 5 minutes per truck with a rate of up to 12 trucks per hour. The typical truck movements are shown in Figure 2.4

Figure 2.3 : Typical Delivery Truck Movements

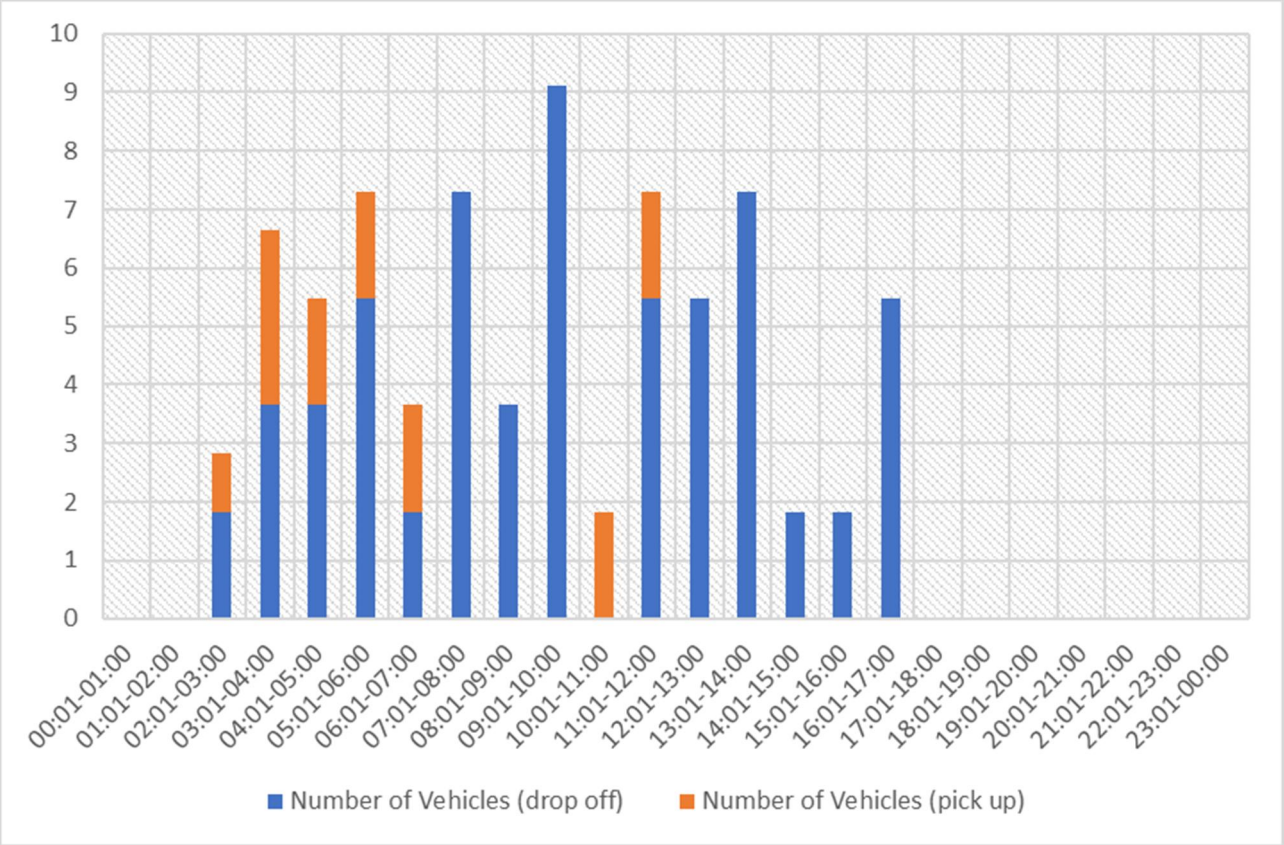


2.2 Proposed Uplift

The assessment has examined an increase in the amount of product that can be processed on-site to 75,000 tonnes per annum. On the sample day 112 tonnes were delivered by 35 trucks which equates to 41,000 tonnes annually. Factoring this to 75,000 tonnes annually the forecast is that there would be 64 truck deliveries per day at an average of 4.3 vehicles per hour.

An indicative arrival pattern by extrapolating the existing data gives the pattern shown in Figure 2.3.

Figure 2.4 : Indicative future truck arrival pattern



The arrival of semi-trailers can be limited to 2-3 semi-trailers per hour to meet the demand as collections are scheduled. In the example above the number of semi-trailers has been limited to 3 per hour but could be further capped at 2 per hour.

It is noted again that the previous traffic impact assessment had estimated up 160 trucks per day. From this analysis based on empirical data the number of trucks forecast would be around half that initial estimate at 77 trucks per day.

The analysis of traffic impacts was undertaken based on a much higher total and was shown to have minimal impact on the road network.

2.3 Vehicle Turn Paths

Vehicle turn paths have been provided as shown in Figure 2.5 and 2.6. They show the design vehicles are able to manoeuvre within the site.

Figure 2.5 : Semi Trailer Turn Path

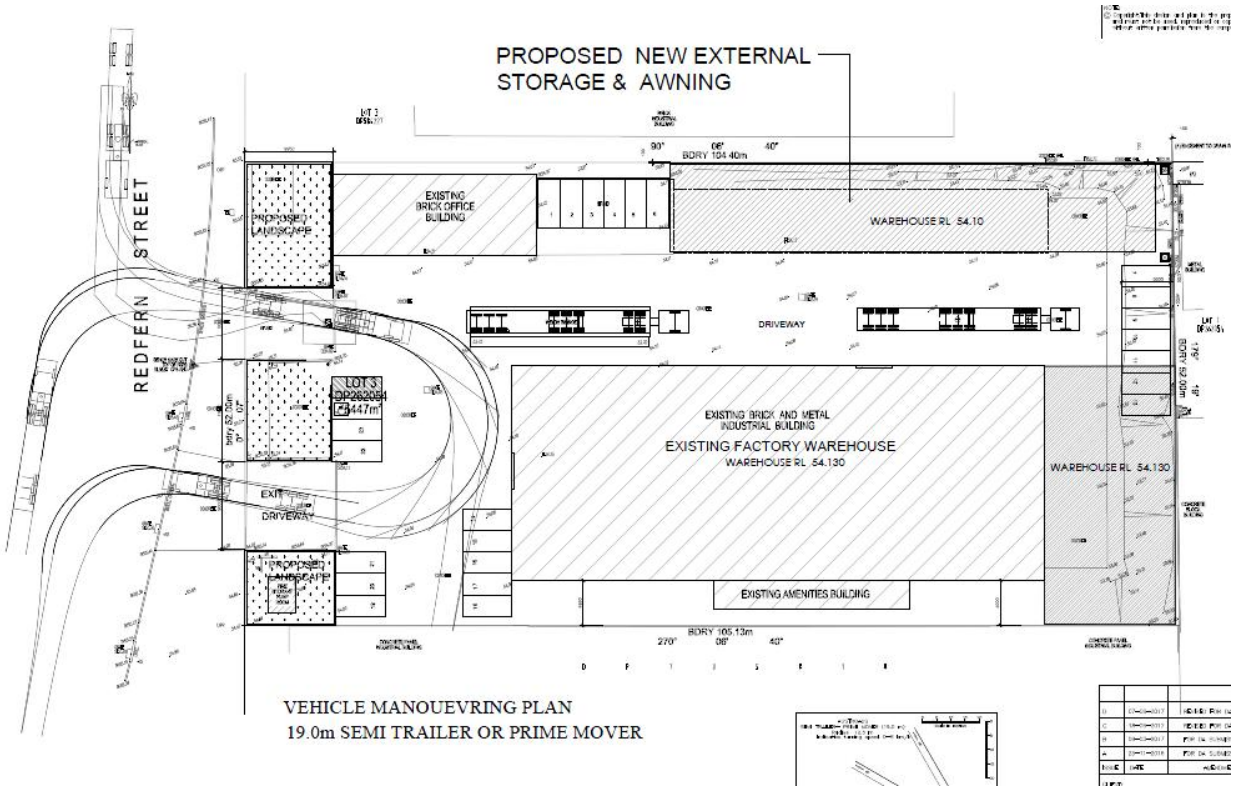
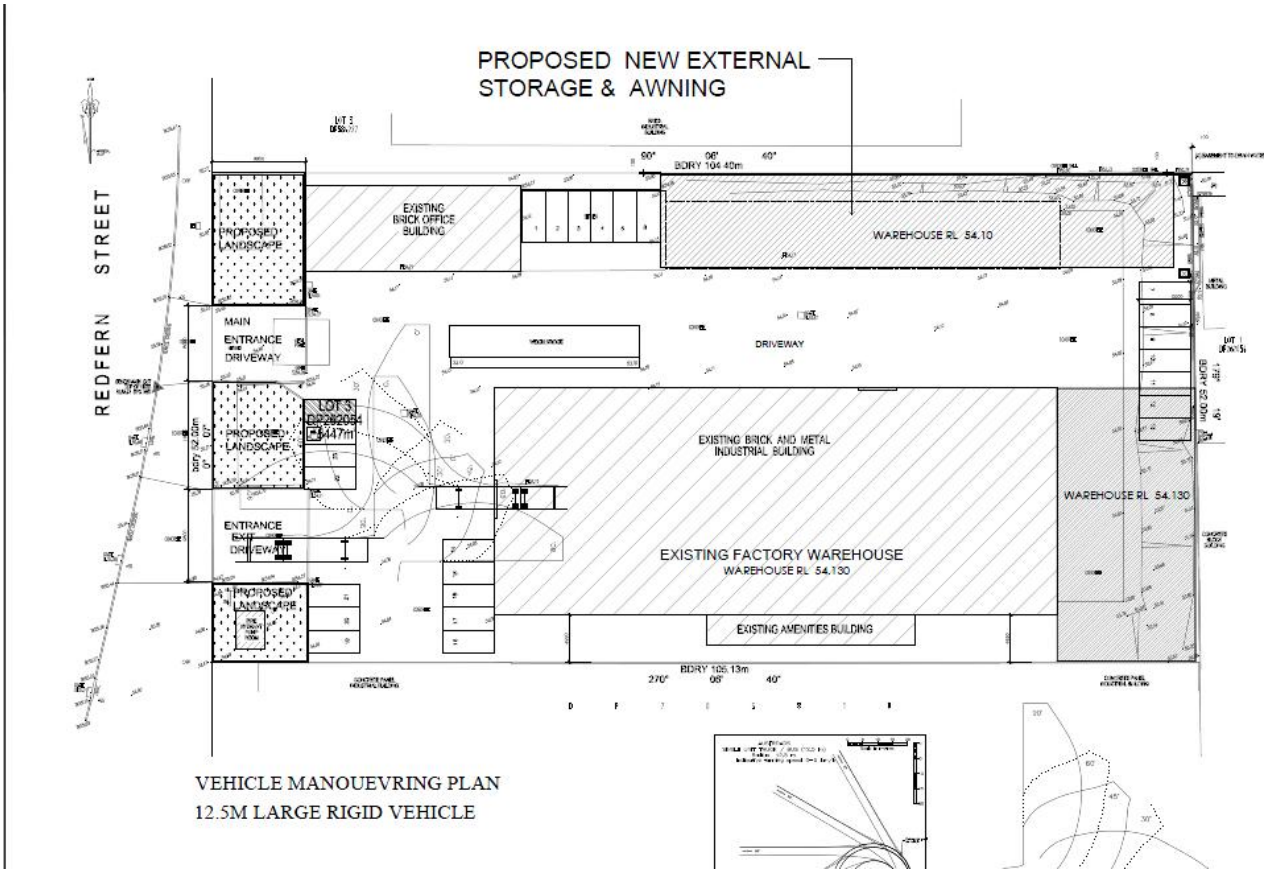


Figure 2.6 : Heavy Rigid Vehicle Turn Path



3. Impact of Proposed Measures (Items B to H)

3.1 Site Capacity and Queuing (Item B)

We have been advised that the site can store up to 5 delivery trucks at a time using areas of the site for temporary layover. Should this volume be exceeded then trucks are turned away and are required to layover until there is capacity for them.

We have assessed the probability of there being more than 5 trucks arrive in the same time period. The assessment is based on standard queuing theory for random arrivals and service time. The formulas are based on standard queuing theory practise and can be found in section 5.1.2 of the AustRoads Guide to Traffic Management Part 3 (2017). The probability of the queue (n) being exceeded is given by the formula:

$$P_{>n} = \rho^{n+1}$$

Where:

$$\rho = \frac{(\lambda)\ Arrival\ Rate}{(\mu)\ Service\ Rate}$$

3.1.1 Delivery vehicles

The arrival rate is assumed to be 4.3 trucks per hour and the service rate is assumed to be 12 trucks per hour based on the typical 5 minute service time.

$$\rho = \frac{4.3\ trucks\ per\ hour}{12\ trucks\ per\ hour}$$

$$\rho = 0.358$$

$$P_{>5} = \rho^{5+1}$$

$$P_{>5} = 0.002$$

The probability of there being more than 5 vehicles on site is 0.2%.

3.1.2 Weighbridge

The other constraint within the site is the weighbridge. Typically trucks spend approximately two minutes on the weighbridge. This means that the site could theoretically process up to 30 trucks an hour. Most delivery trucks only need to be weighed once on arrival. While the semi-trailers weigh on arrival and on departure. The average usage of the weighbridge is assumed to be 1.5 times the delivery truck arrivals and 2 times the collection truck arrivals to account for weigh in and weigh out. This gives an average arrival of 4.3 x 1.5 + 2.4 x 2 = 11.25 trucks an hour.

$$\rho = \frac{11.25\ trucks\ per\ hour}{30\ trucks\ per\ hour}$$

$$\rho = 0.375$$

$$P_{>5} = \rho^{5+1}$$

$$P_{>5} = 0.003$$

The probability of there being more than 5 trucks waiting for the weigh bridge is 0.3%

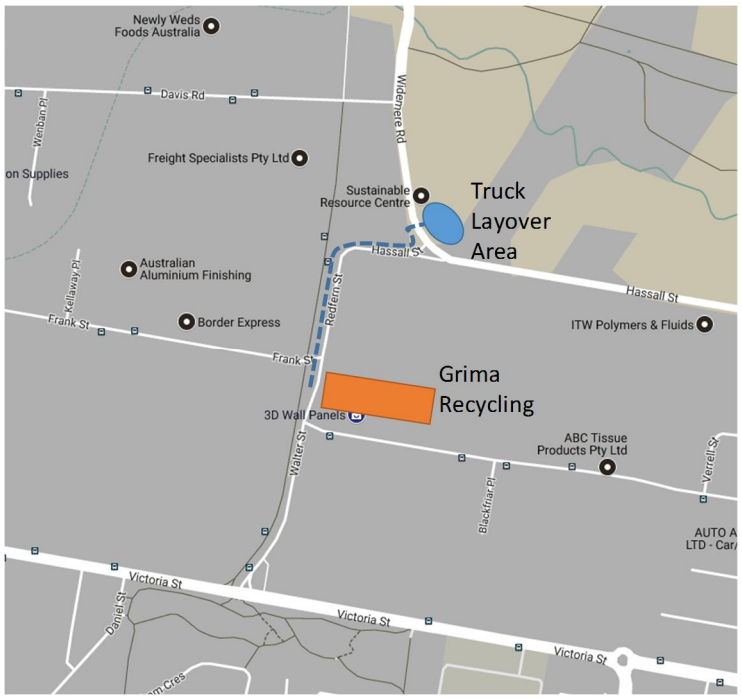
3.2 Measures to ameliorate the impact of re-assigned traffic (C)

The greatest probability of the queue being exceeded at any one time has been estimated to be 0.3%. Should an additional truck arrive at a time when the site is full then the following actions would be implemented:

- Truck drivers will be provided with information before arriving on what to do if there is no capacity at the centre for trucks. This will include the location of layover areas and the person to contact
- The recycling centre are to provide a temporary 'A' frame sign or similar that would be displayed when there is no capacity for trucks.
- Trucks will be diverted to a layover area in Hassell Street and await instruction to enter the site.
- When there is capacity, drivers will be alerted by SMS and asked to proceed to the centre.

The driver information leaflet may look similar Figure 3.1.

Figure 3.1 : Driver information sheet



If Grima Recycling is Full –

Do not queue on roadway

Continue to layover area in Hassell Street

Contact Grima Recycling on

02 9609 4117 to await instruction to enter the site.

The layover area in Hassell Street should be adequate for a number of trucks as shown in Figure 3.2.

Figure 3.2 : Hassell Street Truck Layover

3.3 Assessment of impact to Public Transport (Item D)

The proposed uplift is likely to have minimal impact on existing public transport services.

3.4 Emergency Vehicles, Heavy Vehicles cyclists and pedestrians (Item E)

There is likely to be minimal impacts on access for emergency services, heavy vehicles, cyclists and pedestrians.

3.5 Assessment of effect on existing and future developments with transport implications in the vicinity of proposed measures (Item F)

The proposed development is unlikely to impact on any existing or future developments in the area.

3.6 Effects on adjacent Council Areas (Item G)

Adjacent Council areas are not likely to be impacted by the proposal.

3.7 Public Consultation process (Item H)

Consultation and public display would be undertaken as part of the normal process for a development application with notification to neighbouring developments.

4. Conclusion

Jacobs has been commissioned to develop a traffic management plan for the proposed upgrade of the Grima Recycling facility at Redfern Street, Wetherill Park. Analysis of the forecast increase in development based on the existing deliveries indicates that the number of truck deliveries may increase from 35 per day to 72 per day based on 75,000 tonnes per annum.

The 75,000 tonnes per annum capacity has been recommended by Fairfield City Council, however previous analysis has found that the site can accommodate up to 85,000 tonnes per annum.

An analysis of potential queuing indicates that the storage on-site for 5 trucks would only be exceeded 0.3% of the time. In the event that there is no capacity on site drivers will be advised to use truck layovers in Hassell Street and await instruction to enter the site.

It is expected that the proposed uplift in activity will have minimal impacts on other road users.