



APPENDIX D

Proposed Upgrade of Recycling Facility at 191 Miller Rd, Chester Hill Traffic Impact Assessment

Prepared for:
Builders Recycling Operations Pty Ltd
12/06/2018

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Proposed Upgrade of Recycling Facility at 191 Miller Rd, Chester Hill

Traffic Impact Assessment

Client: Builders Recycling Operations Pty Ltd

Version: Final

Date: 12/06/2018

TTPP Reference: 17322

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
Final	12/06/18	Melinda Jiang	Michael Lee	Michael Lee	

The Transport Planning Partnership (TTPP) has prepared this report in accordance with the instructions of Builders Recycling Operations Pty Ltd for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

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1 Introduction

Builders Recycling Operations Pty Ltd (BRO) owns and operates the Chester Hill Materials Recycling Facility at 191 Miller Road, Chester Hill. The facility has an existing approval (MP 06_0052) granted in February 2007 (and subsequent approved modifications (MP 06_0052 MOD 1) granted in June 2009) to process building and demolition waste materials. The existing approval permits the facility to process up to 100,000 tonnes per annum of building and construction waste including ferrous and non-ferrous metals.

Since BRO has taken ownership of the facility in 2016, it was found that the facility has a number of non-compliances in relation to the consent conditions in terms of environmental and amenity performance.

A Section 75W (S75W) application is to be submitted to address the legacy compliance issues. The S75W will seek approval to:

- staged upgrade of the site including the erection of an enclosure for the sorting of materials
- establishment of a daily processing limit of approximately 910 tonnes, and
- increase in the annual processing limit from 100,000 tonnes per annum to 250,000 tonnes per annum.

The Transport Planning Partnership (TPPP) has been engaged by BRO to prepare this traffic assessment to accompany the S75W application.

The remainder of the report is structured as follows:

- Chapter 2 discusses the existing conditions including a description of the subject site
- Chapter 3 provides a brief description of the proposed development
- Chapter 4 examines the traffic generation and its impact, and
- Chapter 5 presents the conclusions of the assessment.

2 Existing Conditions Assessment

2.1 Site Description

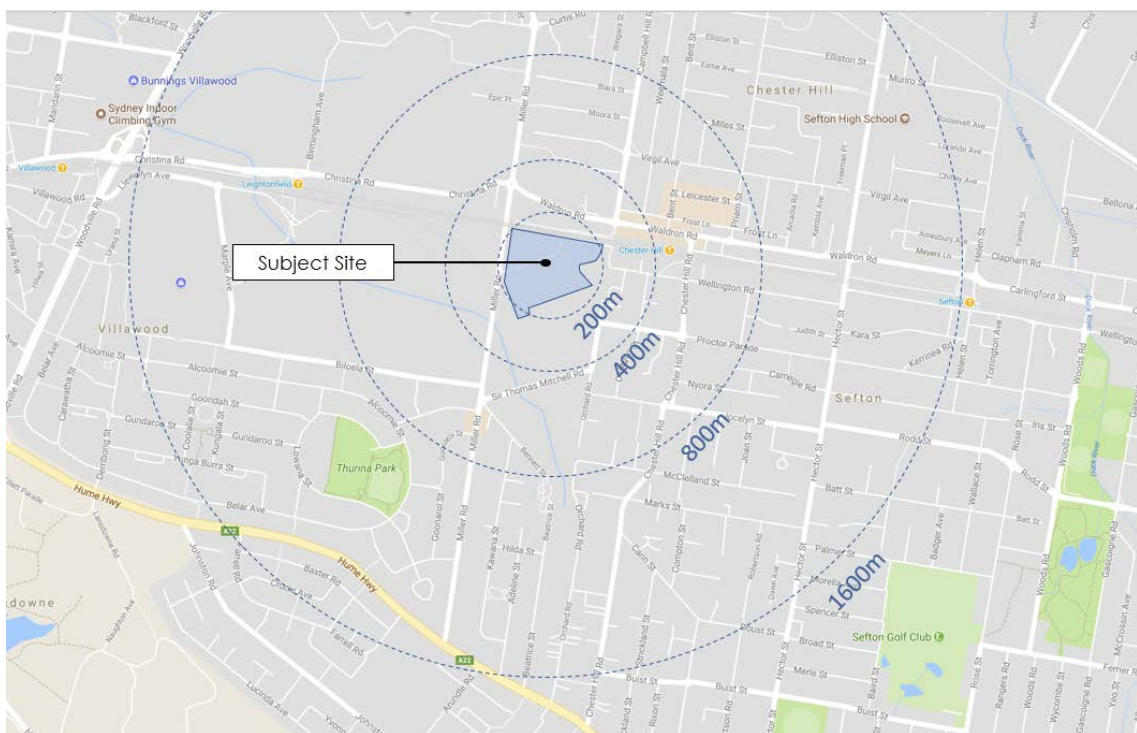
The subject site is located at 191 Miller Road, Chester Hill, and occupies the northern portion of the block bordered by Miller Road and the T3 Bankstown trainline. The subject site is located within the local government area of Canterbury Bankstown Council. The site can be accessed from Hume Highway, a major arterial road, via Miller Road as well as Christiana Street/Waldron Road via Miller Street.

Facilities within the subject site include parking areas, uncovered recycling facility and administrative buildings.

Land use to the south and west of the subject site consists of predominately industrial uses, including warehouses, factories and other recycling facilities, whilst residential dwellings surround the northern and eastern sides of the site.

A locality map showing the surrounding environs of the site is shown in Figure 2.1 below

Figure 2.1: Locality Map



Basemap Source: Google Maps Australia

2.2 Abutting Road Network

2.2.1 Hume Highway

The Hume Highway is a classified State Road and forms part of the National Highway connecting Sydney to Melbourne. Near the subject site, the highway operates two-way with six lanes, and has a posted speed limit of 70km/h. Miller Road connects to Hume Highway at a trafficked T-intersection, less than 1.6km from the site.

2.2.2 Miller Road

Running in a north-south direction along the western boundary of the site, Miller Road functions as a two-way collector road providing connectivity to and from the Hume Highway. In the vicinity the site, the road consists of four lanes with unrestricted kerbside parking in the outer lanes and has a posted speed limit of 60km/h. In the northern corner of the site, Miller Road narrows to become two separated lanes over a railway overbridge.

Two roundabouts control the intersections with Christina Road/Waldron Road and Sir Thomas Mitchel Road to the north and south of the site respectively.

Vehicle access to the subject site is located on Miller Road.

2.2.3 Waldron Road/Christina Road

Waldron Road and Christina Road intersect Miller Road at a roundabout to the north of the site. Waldron Road is a four-lane, two-way road, aligned in the east-west direction with a posted speed limit of 60km/h. Signage at the roundabout restricts heavy vehicles three tonnes and over access onto Waldron road except for deliveries. Therefore, trucks three tonnes and over approaching from the southern direction on Miller road, will be directed onto Christina Road. Vehicles turning into Christina Road from Miller Road will be required to form one lane and adhere to a speed limit of 60km/h.

2.3 Site Access

The existing access from the recycling facility lies on Miller Road at an uncontrolled intersection, approximately 300m south of the intersection with Christina/Waldron Road. The access is divided by a concrete island creating separate ingress and egress driveways measuring approximately 9m each.

The access is shared with an adjoining site operating as a sorting/logistics facility.

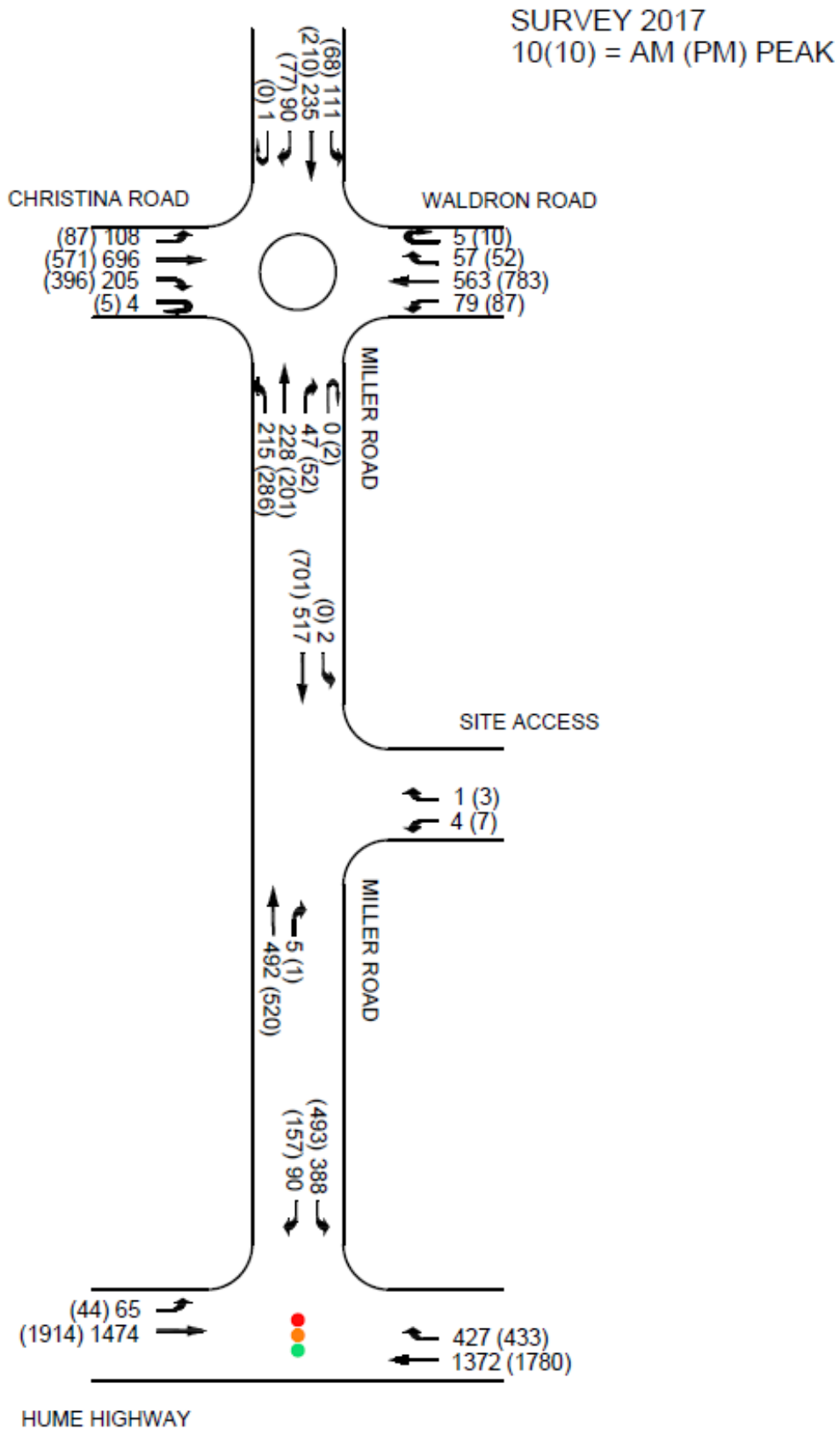
2.4 Existing Traffic Volumes

Intersection turning movement counts at nearby intersections have been conducted on Wednesday 1st of November 2017 from 8:00am to 9:00am and from 4:00pm to 5:00pm. The following intersections were surveyed:

- Miller Road – Hume Highway
- Miller Road – Christina Road
- Miller Road – Recycling Centre Access

Surveyed peak hour intersection movement volumes are presented in Figure 2.2 below

Figure 2.2: Peak Hour Intersection Movement Volumes



2.5 Existing Approvals

The existing Project Approval for the site, granted in February 2007, under Projected Application MP 06_0052, allows the facility to process 100,000 tonnes of ferrous and non-ferrous metals per year.

In June 2009, a modification to the Project Approval under Modification Application 06_0052 MOD 1 was granted, amending the approval limit to 100,000 tonnes of building and construction waste including ferrous and non-ferrous metals per year.

3 Development Proposal

3.1 Development Description

The main purpose of the proposal is to address the legacy compliance issues consistent with the requirements set out in an Order (No. 18) issued on 29 June 2016 under Section 121B of the EPA Act 1979. The delivery and processing of waste on-site have ceased pending the determination of this application or an agreement as to compliance with the provisions of the Order.

The modification involves the:

- the staged upgrade of the site including the:
 - erection of an enclosure for the sorting and recycling of waste
 - rectification of the layout including waste stockpiles
 - progressive development of hardstand areas for the operational areas of the facility, and
 - improvements to stormwater and wastewater management to ensure required water quality standards.
- establishment of a daily processing limit of approximately 910 tonnes which better aligns with the current EPL and which is based on the ability to meet key amenity and environmental criteria, and
- increase in the annual processing limit from 100,000 tonnes of building and construction waste (including metal) to 250,000 tonnes per annum.

Essentially, the proposal involves the construction of a new, state of the art, purpose built facility that would enclose key impact activities. The enclosure would include contemporary environmental management controls such as mist sprays and a dust extraction system. The shed and operation as a whole would be designed to ensure openings and more audible operations would be located away from sensitive receptors.

BRO would also implement a superior screening process within the new enclosure to enable more recycling and diversion of waste from landfill. The material is dropped off in one location, a machine feeds it into the hopper of the screen and sends it up to the second level to be sorted by machines and workers. All material drops into the relevant bin below the mezzanine floor (inside the bays on the right) and a forklift picks up the full bin and allocates it accordingly.

The modification seeks to align the current consent with the operational requirements of BRO's Environmental Protection Licence (EPL). Under its current EPL, BRO is able to store up to 30,000 tonnes of material per day. While it is not proposed to seek any change to this limit, the modification proposal seeks to establish a daily processing limit of 910 tonnes which better aligns with the current EPL. This would enable the consent to

operate more efficiently alongside the EPL in terms of daily operations and ongoing compliance. This approach is consistent with conditions of approval and environmental protection licenses applicable to similar facilities in the Sydney Metropolitan area.

The modification would not change the intent or purpose of the approved development given that:

- it would remain a waste processing facility
- it would retain essentially the same development as approved, and
- the environmental consequences of the modification would be similar but vastly improved to that of the existing operations at the site.

3.2 Proposed Method of Operation

3.2.1 Operating Hours

The operating hours for the facility will be as follow:

- Monday to Friday – from 7:00am to 6:00pm
- Saturday – from 8:00am to 1:00pm, and
- Sunday – closed.

The above operating hours are consistent with the current approval. In addition, the approval also requires the operation of heavy machinery to cease one hour before the approved closure time on weekdays and no operation of heavy machinery is permitted during Saturday.

The facility will also shut down for a period of two weeks over the Christmas and New Year period.

On this basis, the facility will be in operation 275 days per year.

3.2.2 Staff Number

The proposed facility is expected to employ a total of 13 staff comprising three admin staff and 10 processing staff.

3.2.3 Material Transportation

Recyclable waste materials from construction sites around Sydney would be delivered to the facility for processing and sorting using 12.5 tonnes trucks. These trucks would arrive at the facility fully laden and depart empty. These trucks would arrive at the facility throughout the day.

The processed materials from the facility would be delivered to various locations throughout Sydney using trucks up to 42 tonnes. These trucks would arrive at the facility empty and depart the facility fully laden.

The Australian Standard (AS2890.2:2002 Part 2 Off-street Commercial Vehicle Facilities) indicates that a 12.5 tonne truck would be equivalent to a 12.5m long heavy rigid vehicle. Similarly, the National Heavy Vehicle Regulator (NHVR) indicates a 42 tonne truck would be equivalent to 19m semi-trailer and/or truck and dog trailer.

3.3 Proposed Vehicle Access Arrangements

The proposed modification does not include any alterations to existing access arrangements to the site. It will continue to operate as an uncontrolled intersection with separated ingress and egress driveways as per existing geometric configuration and will continue to be shared with the adjoining site.

3.4 Proposed Site Layout

It is proposed to retain the existing administration building (including the nearby car parking spaces) located near the access to the site. The proposed shed would be constructed over land to the east of the existing administration building.

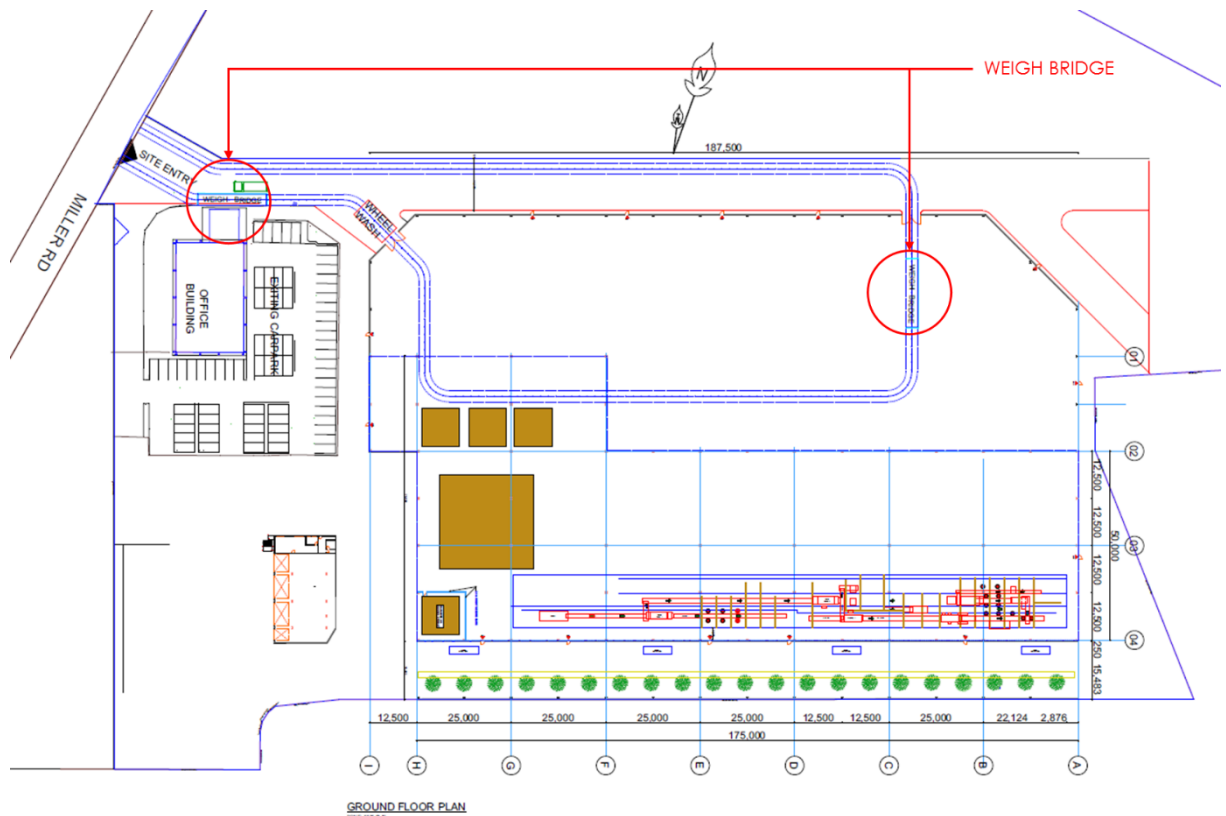
Staff traffic upon entering the site would veer to the south to gain access to the car parking spaces. Trucks would continue down the shared access road to gain entry into the proposed shed at the eastern end of the shared access road.

Upon entering the shed, trucks would be weighed before proceeding to the relevant internal areas within the shed depending on whether the truck is to drop off the materials for processing or to be loaded with processed recycled materials.

Following this, trucks would proceed to exit the shed via the wheel wash area and then to the second weigh bridge to be weighed before exiting the site.

Figure 3.1 shows the proposed site layout.

Figure 3.1: Proposed Site Layout



3.5 Proposed Parking Arrangements

The existing site layout includes some 74 car parking spaces located adjacent to the existing administration building. This will continue to be available for the parking of staff vehicles. It is further noted that the proposed modification is not expected to generate any additional parking demand.

It is noted that the relevant development control plan does not include a specific use similar to that being proposed on the subject site. However, it is noted that the proposed facility is expected to employ up to 13 staff as noted in Section 3.2.2. Therefore, the proposed parking retention of the existing 74 car parking spaces would be more than adequate.

3.6 Truck Parking

Trucks are not expected to remain on the site for any extended period of time as the trucks would be processed as they come in. Therefore, parking for trucks would not be required.

4 Traffic Assessment

4.1 Traffic Generation

As previously stated, the proposed modification seeks approval for the facility to process 250,000 tonnes of materials per annum. As the facility is proposed to be in operational 275 days per year, the daily processing limit would be 910 tonnes per day.

Recyclable materials for processing would be delivered to the facility using 12.5 tonne or 12.5m long heavy rigid vehicles. These trucks would arrive at the facility fully laden and depart the facility empty. Processed materials would be transported away from the facility using 42 tonne or 19m long articulated vehicles. These would arrive at the facility empty and depart fully laden.

On this basis, the facility is expected to generate 148 movements per day (74 arrivals and 74 departures) generated by 12.5 tonne waste delivery trucks and 52 movements per day (26 arrivals and 26 departures) from 42 tonne processed waste removal trucks.

Average hourly flows have been calculated from the generated daily trips, assuming 10 working hours (7:00am – 5:00pm) per day. The hourly traffic generated is broken down as follow:

- approximately 16 movements (8 arrivals and 8 departures) per hour from 12.5 tonne (12.5m) waste delivery trucks
- approximately 6 trips per hour (3 arrivals and 3 departures) from 42 tonne (19m) processed waste removal trucks in each direction

In addition, the facility is expected to employ 13 staff. However, to be consistent with the previous traffic assessment which has been accepted by the Department of Planning and Environment (DoPE), this assessment has conservatively adopted additional traffic generation relating to 40 staff. In relation staff traffic generation, the following assumptions are made:

- each staff member would drive themselves to and from the facility
- all staff arrive at the site during the morning peak hour to report for work, and
- all staff depart from the site during the evening peak hour.

The assumptions relating to staff traffic generation are the same as that adopted in the previous assessment.

On this basis, staff traffic would result in additional 40 inbound trips during the morning peak hour and 40 outbound trips during the evening peak hour.

In summary, the expected traffic generation during the peak periods is as follow:

- 16 heavy rigid vehicle movements per hour
- 6 articulated vehicle movements per hour, and

- 40 passenger vehicle movements per hour.

The above expected traffic generation is generally consistent with that assumed in the previous traffic assessments which anticipated the proposed facility as approved would generate 18 truck movements per hour and 40 passenger vehicle movements per hour. On this basis, the proposed development would generate 4 additional truck movements per hour above the approved development.

4.2 Future Background Traffic Growth

Roads and Maritime Services (RMS) maintains and operates a strategic traffic forecasting model. Plots showing traffic growth from the 2016 and 2026 models have been obtained.

The 2016 to 2026 growth factors are shown Figure 4.1 and Figure 4.2 for the morning and evening peak periods respectively. These show typically growth factors between one to two per cent per annum. Accordingly, these have been applied to 2017 surveyed traffic volumes to provide 2027 future base case volumes for assessment of the future cases.

Figure 4.1: RMS 2016/2026 Strategic Traffic Forecasting Model Difference Plots – Morning Peak (Per Cent Growth Per Annum)



Figure 4.2: RMS 2016/2026 Strategic Traffic Forecasting Model Difference Plots – Morning Peak (Per Cent Growth Per Annum)



4.3 Traffic Distribution

Traffic distribution ratios to and from the site have adopted based on the previous traffic assessment which have also been accepted by the DoPE. These are as follow:

- 25 per cent inbound - access the site from the north via Christina Rd and Miller Road
- 25 per cent inbound – access the site from the north via Gurney Rd and Miller Road
- 50 per cent inbound – access the site from the south via Miller Road
- 25 per cent outbound – travel to the north via Miller Road and Christina Road
- 25 per cent outbound – travel to the north via Miller Road and Gurney Road, and
- 50 per cent outbound – travel to the south via Miller Road and Hume Highway.

4.4 Intersection Assessment

The existing operation of the nearby intersections to the site have been assessed using SIDRA Intersection 7, a computer based modelling package which assesses intersection performance under prevailing traffic conditions.

SIDRA calculates intersection performance measures such as 'average delay' that vehicles encounter and the level of service (LoS). SIDRA provides analysis of the operating conditions which can be compared to the performance criteria set out in Table 4.1.

Table 4.1: Level of Service Criteria for Intersection Operation

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 71	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing; requires other control mode

Source: RMS Guide to Traffic Generating Developments, 2002

RMS uses level of service as a measure to indicate the operating efficiency of a given intersection. The level of service (LoS) ranges from A to F. Levels of service between A and D indicate the intersection is operating within capacity with LoS A providing exceptionally good performance to LoS D indicating satisfactory performance. LoS E and F indicate the intersection is operating at or near capacity and would require

intersection improvement works to maintain reasonable performance. LoS D is the long term desirable level of service for most intersections in Sydney.

Level of service is directly related to the average delay experienced by vehicles travelling through the intersection. At signalised intersections, the average delay is the volume weighted average of all movements. For roundabouts and priority controlled intersections (give way and stop sign), the average delay relates to the worst movement.

SIDRA intersection modelling has been carried out for three nearby intersections. The following three scenarios have been assessed in this regard:

- Scenario 1: existing conditions using 2017 survey data and observed traffic patterns
- Scenario 2: 2027 future base case with Scenario 1 traffic with growth of the background traffic to 2027 using RMS provided growth factors, and
- Scenario 3: 2027 post development condition with Scenario 2 plus the additional development traffic estimated as part of this proposal.

The peak hour intersection traffic movement volumes for Scenario 1 are shown in Figure 2.2. The traffic movement volumes for Scenario 2 and Scenario 3 are shown in Figure 4.3 and Figure 4.4 respectively.

Figure 4.3: Scenario 2 2027 Future Base Case Peak Hour Intersection Movement Volumes

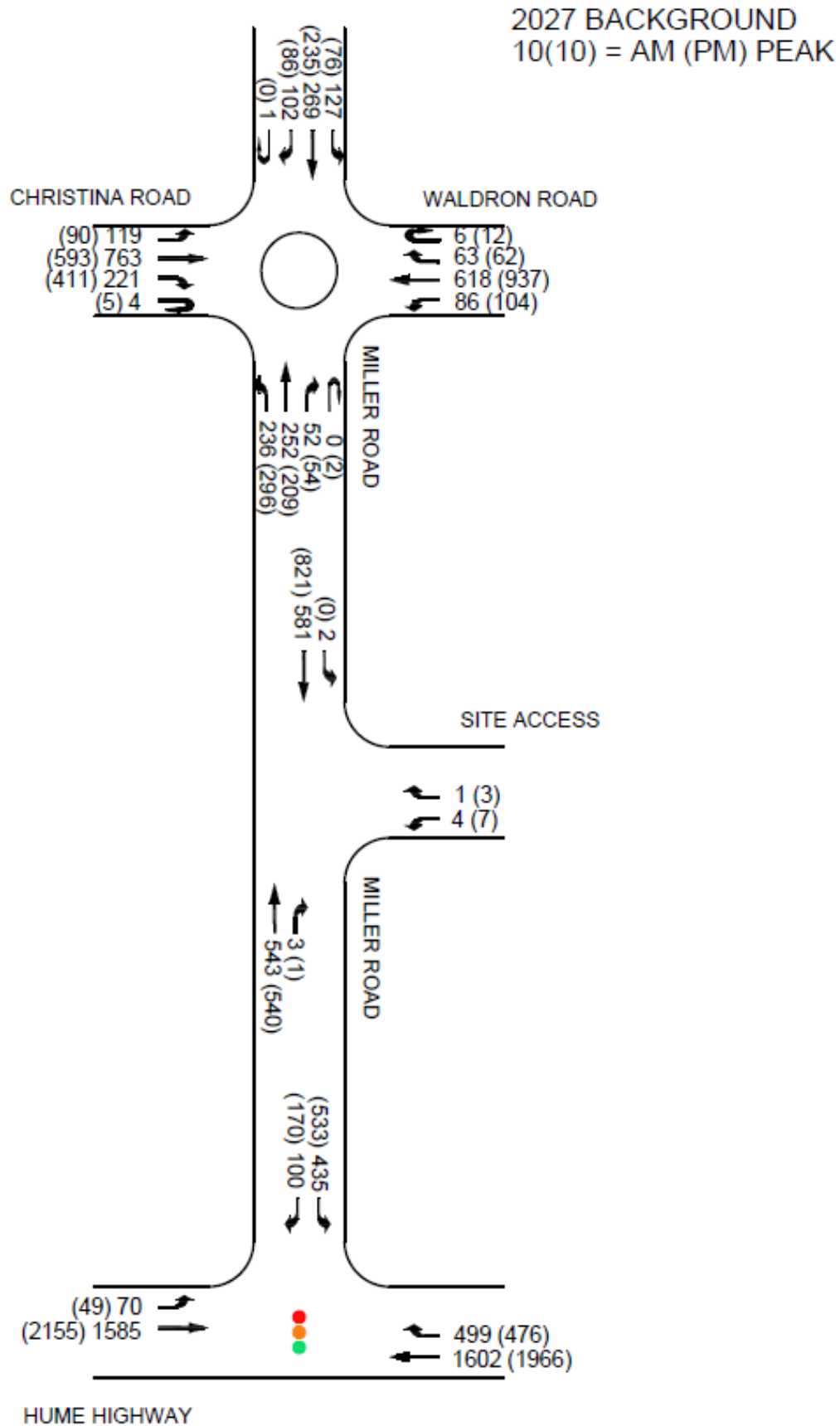
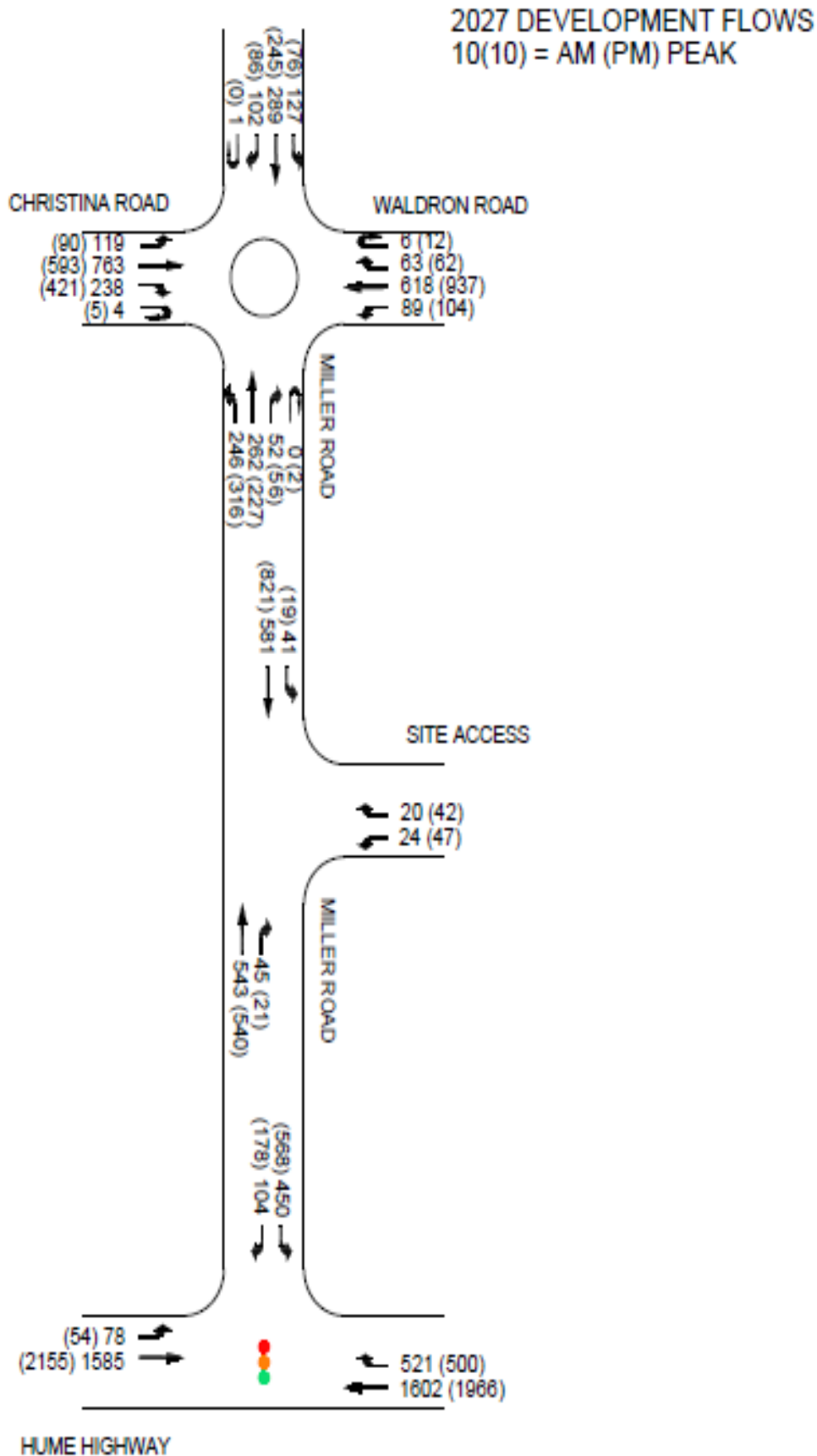


Figure 4.4: Scenario 3 2027 Post Development Peak Hour Intersection Movement Volumes



4.4.1 Scenario 1 Existing Operation

The results for Scenario 1 existing conditions are summarised in Table 4.2.

Table 4.2: Scenario 1 – 2017 Existing Condition Intersection Operation

Intersection	Morning Peak		Evening Peak	
	Avg. Delay (sec/veh)	Level of Service	Avg. Delay (sec/veh)	Level of Service
Miller Rd-Hume Hwy	21	B	27	B
Miller Rd-Site Access	9	A	13	B
Miller Rd-Christina Rd	18	B	20	B

Table 4.2 indicates that operation of the assessed intersections is performing well under existing traffic conditions with acceptable delays and overall LoS of B or better in both peak periods.

4.4.2 Scenario 2 Future Base Case

The results for Scenario 2 2027 future base case is summarised in Table 4.3.

Table 4.3: Scenario 2 – 2027 Future Base Case Intersection Operation

Intersection	Morning Peak		Evening Peak	
	Avg. Delay (sec/veh)	Level of Service	Avg. Delay (sec/veh)	Level of Service
Miller Rd-Hume Hwy	22	B	30	C
Miller Rd-Site Access	11	A	18	B
Miller Rd-Christina Rd	26	B	33	C

Table 4.3 indicates that operation of the assessed intersections is performing satisfactorily in the future base case scenario with an overall LoS C or better in both peak periods.

The performance of the assessed intersections in the future base case is generally similar with those found in the existing conditions, albeit some intersections would experience slightly longer delays.

4.4.3 Scenario 3 Post Development

The results of the SIDRA model for Scenario 3 post development is summarised in Table 4.4.

Table 4.4: Scenario 3 – Post Development Intersection Operation

Intersection	Morning Peak		Evening Peak	
	Avg. Delay (sec/veh)	Level of Service	Avg. Delay (sec/veh)	Level of Service
Miller Rd-Hume Hwy	23	B	33	C
Miller Rd-Site Access	12	A	23	B
Miller Rd-Christina Rd	29	C	40	C

With the additional traffic generated by the proposed development, it can be seen from Table 4.4 that the assessed intersections would continue to operate satisfactorily. All the assessed intersections would continue to have LoS C or better operation in both peak periods.

With the additional traffic from the proposed development, the assessed intersections would have similar performance to 2027 future base case conditions.

4.5 Queue Analysis

As indicated previously, the proposed facility includes weigh bridges to record the tonnage of vehicles entering and leaving the facility. The proposed weigh bridges will have the potential to generate vehicle queues. The extent of queuing will be depending on the arrival rate of vehicles and the service rate or the processing time of the weigh bridges. This section of the report assesses the potential traffic implications of these resultant queues.

Based on discussion contained in Section 4 of this report, the proposed facility is expected to generate a total of 11 trucks per hour in each direction comprising:

- 8 x 12.5m long rigid trucks per hour, and
- 3 x 19m semi-trailers per hour.

It is noted that only trucks will be required to be weighed. Staff vehicles will not be required to use the weigh bridges. As such, only trucks contribute to the queues at the weigh bridges.

In relation to the service rate, BRO has advised that the processing time for arriving trucks at the weigh bridge vary from half a minute to no more than four minutes which equate to service rates ranging from 15 vehicles per hour (vph) to 120 vph.

Traffic queueing theory based on probability principles for a single-channel queueing system as described in the Transportation and Traffic Engineering Handbook (ITE) has been used to determine the likely queues that would be generated by the weigh bridge. The analysis has been carried for a range of service rates as discussed above. The results are presented in Table 4.5.

Table 4.5: Weigh Bridge Expected Queues

Processing Time	Service Rate	Arrival Rate	Average Queue ^s	95th Percentile Queue ^s
0.5 minutes (30 seconds)	120 vph	11 trucks per hour	8m	21m
1 minute (60 seconds)	60 vph	11 trucks per hour	9m	27m
2 minutes (120 seconds)	30 vph	11 trucks per hour	11m	43m
3 minutes (180 seconds)	20 vph	11 trucks per hour	17m	72m
4 minutes (240 seconds)	15 vph	11 trucks per hour	32m	138m

s- based on a weighted average truck length of 14.3m

From Table 4.5, it can be seen that in the worst case scenario (with a processing time of four minutes) the 95th percentile queue length would be approximately 138m.

Based on the site layout provided by BRO (see Figure 3.1), the arrival weigh bridge is located approximately 240m from Miller Road meaning that there is available queue storage within the site of the same length.

As the expected 95th percentile queue for the worst case scenario is significantly less than the available queue storage (138m queue vs 240m storage area), it is unlikely the proposed facility would generate vehicle queues at the weigh bridge overflowing onto Miller Road.

Separately, it is noted that the shared access road has sufficient width to accommodate queued trucks while still permit other vehicles to access the other sites on either side of the queued trucks.

On this basis, the expected queues would be satisfactory.

5 Summary and Conclusion

This report examines the traffic impacts of a proposed upgrade of the existing building waste recycling facility at 191 Miller Street, Chester Hill. The key findings of this report are summarised as follows:

- The recycling facility has an existing approval for processing 100,000 tonnes of building and construction waste materials per year.
- A S75W application is being prepared seeking approval to upgrade the facility to address legacy compliance issues as well as increasing the approved processing limit to 250,000 tonnes per year.
- The upgrade of the facility is expected to generate an additional 22 truck movements per hour and 40 passenger vehicle movements per hour during the morning and evening peak periods.
- It is noted that the anticipated level of development traffic is similar to that assumed for the approved development.
- Intersection analysis of the nearby intersections using SIDRA indicates that there is sufficient capacity to accommodate the expected additional traffic generated by the proposed upgrade of the facility. The assessed intersections would continue to operate satisfactorily with similar performance to that found under existing and future base case conditions.
- The assessment of the nearby intersections includes growing the background traffic to a future year 2027 using growth factors obtained from RMS.
- The proposed development will continue to use the existing access arrangements without any modifications.
- The proposed development does not include any changes to existing parking arrangements.
- The proposed development would generate some vehicle queues, but this is expected to be contained within the site.

On this basis, it is concluded that the overall traffic impacts of the proposed upgrade of the facility are satisfactory and is unlikely to create any adverse impacts to the surrounding road network.

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