Muswellbrook Waste Transfer Station

Road Safety Assessment

Prepared for Central Waste Station
April 2022

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Muswellbrook Waste Transfer Station

Road Safety Assessment

Report Number

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Client

Central Waste Station

Date

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Prepared by	**Approved by**
	
Abdullah Uddin Associate Traffic Engineer 28 April 2022	**Dr Timothy Nicholas Brooker** Associate Transport Planner 28 April 2022

Executive Summary

A Road Safety Assessment (RSA) on Thomas Mitchell Drive at the vicinity of the intersection of Glen Munro Road, Muswellbrook (Figure 1.1). As part of the development application assessment for a waste transfer facility at 32 Glen Munro Road, the Hunter and Central Coast Regional Planning Panel recommended a Road Safety Audit at Thomas Mitchell Drive/Glen Munro Road. As a result of a series of discussions between the Muswellbrook Shire Council (MSC) and the applicant, it was decided that a RSA would be the best approach to investigate the existing road deficiencies and identify the short, medium and long term mitigation measures.

The key objectives of an RSA are to:

- identify any existing safety deficiencies of design, layout and road furniture which are not consistent with the road's function or use;
- identify potential safety issues for general road users;
- identify potential safety issues that may occur due to the operation of the development; and
- ensure that measures are identified to improve road user safety.

As such, the scope of the RSA is not a formal Road Safety Audit. The RSA has been carried out by Abdullah Uddin, a qualified Traffic Engineer with more than 18 years' experience. Abdullah's CV can be found in Appendix A.

A day-time and night-time site inspection has been carried out on Thursday 31 March 2022. The RSA has identified a number of existing road safety issues. The issues identified and potential mitigation measures are detailed in Section 2. The key findings and mitigation measures are summarised in Table 3.1. In summary, the short term measures should be implemented at a matter of priority. The recommended sign and line marking plan could be implemented by the applicant, as part of the development approval consent. The other recommendations can be implemented by jointly Transport for NSW (TfNSW) and MSC.

In the longer term a basic right turn bay or similar upgraded treatment will be likely to be required for the Thomas Mitchell Drive/Glen Munro Road intersection, which will be implemented by MSC, subject to availability of funding.

It should also be noted that there is no guarantee that the recommended road safety upgrade measures in this report will totally eliminate all future road safety issues at the intersection, or that all potential road safety issues currently at the intersection have been identified by this report.

Therefore, in the longer term, after approximately a future five year period, a formal Road Safety Audit for the intersection, including all relevant upgrade works to the intersection during the intervening period, should be undertaken by an independent Road Safety Auditor.

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1 Introduction

This report documents the Road Safety Assessment (RSA) undertaken on 31 March 2022 on Thomas Mitchell Drive at the vicinity of the intersection of Glen Munro Road, Muswellbrook (Figure 1.1).

1.1 Project overview

Central Waste Station (CWS) is dedicated to the pursuit of environmental sustainability by recovering recyclable materials from waste and thereby diverting a significant percentage of waste from landfill. CWS provides waste collection and disposal services through the Hunter Region with waste collected being processed the Kurri Kurri resource recovery facility (RRF). The RRF is owned by Central Waste Plant Pty Ltd (Central Waste Plant) and operated by CWS. This facility is currently the region's only mechanised, large-scale resource recovery plant and achieves high rates of resource recovery from mixed waste. Materials recovered include wood, ferrous and non-ferrous metals, concrete, plasterboard, and cardboard which are then recycled such that they remain within the circular economy.

To achieve greater efficiencies in transport and collection, with the goal of directing more waste to the Kurri Kurri facility for processing, CWS intends to establish and operate a waste transfer station on behalf of Central Waste Plant Pty Ltd (the Applicant) at 32 Glen Munro Road, Muswellbrook (the Site). The Site is legally described as Lot 10 in DP 1131270 and located in the Muswellbrook LGA.

The development of this waste transfer station will facilitate the collection of General Solid Waste (non-putrescible) (GSW) and is proposed to receive:

- commercial and industrial (C&I) waste;
- construction and demolition (C&D) waste; and
- municipal solid waste (MSW).

These will be consolidated and then transferred to the CWS-operated RRF, located at 8 Styles Street, Kurri Kurri for processing.

The Applicant seeks approval for the development of a waste transfer facility with a maximum throughput of 98,500 tonnes per annum (tpa) of the waste streams described above. A maximum of 7,500 t of waste will be stored on site at any one time to provide sufficient short-term storage capacity during periods of peak waste deliveries.

The proposed development includes the construction of:

- shed 1: 1,500 square metre (m^2) including ancillary office and amenities;
- shed 2: 1,935 m^2;
- four (4) 10 m x 10 m materials bays, covered by awning along south boundary;
- 27.5 m weighbridge and truck queue distance;
- 19 car parking spaces and demonstrated 21 m semi-trailer turn path within the site boundaries;
- boundary fencing for screening and security; and

- entire yard to be heavy duty concrete paved.

The activities to be carried out at the Site would include the receipt of waste, basic pre-sorting of waste, temporary storage as well as the loading of waste onto trucks for transport to the Kurri Kurri processing plant.

Hours of operation would be 24 hours a day, six days a week, with the majority of activity from 7:00 am to 5:00 pm Monday to Friday, and 7:00 am to 2:00 pm on Saturdays with no operation on Sundays and Public Holidays.

The Project falls within the meaning of waste storage under the *Protection of the Environment Operations Act 1997* (POEO Act) to store more than 1,000 tonnes of waste on the premises at any time, and to receive from off-site more than 6,000 tpa of waste. The Project will likely be declared a scheduled activity pursuant to Clause 42 of the POEO Act and an EPL is required to undertake the works. The Project will be referred to the NSW Environmental Protection Authority (EPA) as part of the assessment process and is therefore deemed to be integrated development.

This RSA examines the key road safety and deficiencies that currently exists and identifies a short and long term implementation strategy.

1.2 Hunter and Central Coast Regional Planning Panel comments

The Hunter and Central Coast Regional Planning Panel briefing notes, dated 20 January 2022, outlines the following traffic related comments:

- Applicant's Traffic Impact Assessment concludes no impact. Council considers shoulder widening works will likely be required. The Panel requires Council consider and assess safety impacts. Council to request a road safety audit;
- DA should be considered by Council's Traffic Committee (likely requirements eg signs, geometry, speed zones etc); and
- main transport route to be designated as Thomas Mitchell Drive.

This RSA addresses the above comments.

1.3 Consultation with Muswellbrook Shire Council

An online meeting was held between EMM Consulting Pty Limited (EMM) and Muswellbrook Shire Council (MSC) staff to discuss the Road Safety Audit at the Thomas Mitchell Drive/Glen Munro Road intersection. In the meeting it was agreed that a Road Safety Assessment would be more appropriate for this development as Road Safety Audits have a formal structure that considers the existing roads/intersections and identifies any deficiencies. Generally, they do not provide recommendations regarding identified deficiencies and they do not consider the impacts of future projects. As such, it is more appropriate to undertake a Road Safety Assessment that will consider the existing intersection and propose measures to mitigate any reduction in safety as a result of truck movements associated with this development.

The recommended road safety mitigation measures and treatments which are identified by this report should be reviewed and confirmed by a MSC Traffic Engineer and the local Council Traffic Committee (LTC).

1.4 Scope of the road safety assessment

The scope of the RSA has been agreed between MSC and EMM. The objective of the RSA is summarised below:

- undertake a day and night time safety assessment in 1 km section of Thomas Mitchell Drive (Figure 1.1);

- identification of any existing roadside vegetation that currently restricts the sight distance within the study area;
- undertake a visual inspection for the existing road geometry and any notable wheel track at this intersection;
- observe drivers' behaviour eg their compliance of the Australian Road Rules;
- undertake a speed survey and verify compliance of the speed limit;
- identify vehicular pavement damage and vehicular wheel track;
- identify any existing safety deficiencies of design, layout and road furniture which are not consistent with the road's function or use;
- Identify any potential safety issues due to the development's traffic;
- Identify potential mitigation measures and group measures together as minor and moderate treatments; and
- Preparation of an implementation plan for consideration by Council's Local Traffic Committee.

As this assessment is not a formal Road Safety Audit, a risk matrix has not been prepared for the identified safety issues. The crash data analysis at the study area was previously undertaken in the original Traffic Impact Assessment (TIA) prepared for this development, which identified generally good safety record for the intersection currently (one recorded crash at this intersection over the past five years).

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Source: EMM (2022); DFSI (2017); GA (2011)

0 250 500 m

GDA 1994 MGA Zone 56

N

KEY

- Site boundary
- Study area
- Minor road
- Vehicular track
- Named watercourse
- Waterbody

Study area

Muswellbrook Waste Transfer Station
Traffic impact assessment
Figure 1.4

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1.5 Road Safety Assessor

The Road Safety Assessment has been undertaken by Abdullah Uddin, a qualified Traffic Engineer with more than 18 years' experience in Australia (Appendix A).

2 Road Safety Assessment

2.1 Site location and surroundings

The Thomas Mitchell Drive/Glen Munro Road intersection is located approximately 6 km south of Muswellbrook CBD. The locality is industrial nature, where Thomas Mitchell Drive serves access to businesses located to the east. From the south, Glen Munro Road is the first side street connecting Thomas Mitchell Drive. Both Thomas Mitchell Drive and Glen Munro Road are council controlled local roads.

Due to industrial nature of the precinct, the road network in the locality carries high proportion of heavy vehicles. Both Thomas Mitchell Drive and Glen Munro Road is Transport for NSW (TfNSW) approved 25/26 m B-double Routes and are suitable for heavy vehicle operation.

2.2 Site inspection

The site inspection has been contracted on Thursday 31 March 2022 (during non-school holiday period) between the following hours:

- day time: 4 to 5.30 pm; and
- night time: 7.30 to 8.30 pm

The weather condition was light to moderate rain for the day time survey and cloudy for the night time survey.

2.3 Road geometry

At the vicinity of Thomas Mitchell Drive/Glen Munro Road intersection, Thomas Mitchel Drive is approximately 13 m wide. The centre line is disproportionately located towards the west to facilitate the left and right turning movements by heavy vehicles between Thomas Mitchell Drive and Glen Munro Road. An approximately 2 m wide sealed shoulder is provided on the western side of the road. Kerb and gutter are provided on the eastern side.

There is a moderate bend approximately 150 m south of the intersection where a guard rail is generally provided on both sides of Thomas Mitchell Drive, until the end of the bend/ crest. However, the guard rails are not continuous at all sections. Typically, continuous guard rail is provided along the outer curve of the road.

Glen Munro Road is an approximately 11 m wide and 650 m long ‘no through’ road from Thomas Mitchell Drive. At the western end of the road, a large cul-de-sac (diameter approximately 30 m) is provided to facilitate turnaround of heavy vehicles. The following figures and photographs show the intersection at various angle.

Source: Six Maps

Figure 2.1 Thomas Mitchell Drive/ Glen Munro Road intersection

Plate 2.1 Thomas Mitchell Drive (looking north)

Plate 2.2 Thomas Mitchell Drive (looking south)

Plate 2.3 Glen Munro Road (looking east)

2.4 Pavement condition

The pavement considtion has been inspection during wet weather conditions which is ideal as it clearly shows the worst condition of the pavement, eg any water ponding, flooding, etc.

During the inspection, alligator cracking has been noted on the asphalt on southern side of Glen Munro Road at Thomas Mitchell Drive (Plate 2.4) . This is often caused by a structural failure in the underlying base construction, which develops from when the pavement was initially installed. The failure can be caused by either a weakness in the original surface, a base layer that is too thin, or insufficient drainage. Cracks often begin appearing in the wheel paths, before flaring out into the larger scale cracks.

To fix this type of cracking, the thikness of the ashphalt and the underlying base material should be investigated by MSC. Based on the observed deformation, appropriate remedial action needs to be undertaken.

Plate 2.4 Cracked pavement on the southern side of Glen Munro Road at Thomas Mitchell Drive intersection

In addition to above, minor deformation of the existing pavement at a section of Glen Munro Road has been noted. This section of the roadway is not within the study area; however, it is recommended that a full investigation of the pavement should be conducted by MSC along Thomas Mitchell Drive and adjoining sections of Thomas Mitchell Drive (eg 100 m on each side of Glen Munro Road).

The drainage pits adjacent to the road pavement should also be cleaned regularly by MSC to minimise any water ponding during heavy rain (Plate 2.5).

Plate 2.5 **Uncleaned drainage pit located on eastern side of Thomas Mitchell Drive, south of Glen Munro Road**

2.5 Speed survey

Currently, approximately 3.2 km section of Thomas Mitchell Drive (between Denman Road and approximately 500 m south of Glen Munro Road) is restricted to 80 km/h. Further to the south, the speed limit increases to 100 km/h. Glen Munro Road is restricted to 50 km/h.

A speed gun has been used to determine speed for the vehicles travelling along Thomas Mitchell Drive. A 15 minute sample data has been collected during both day (approximately 40 vehicles) and night time (approximately 10 vehicles). The night time sample was lesser due to less traffic during the survey period. The average and [1]85%ile speed survey data are tabulated below.

[1] The speed at or below which 85% of all vehicles are observed to travel under free-flowing conditions past a monitored point

Table 2.1 Average and 85%ile speed in Thomas Mitchell Drive

Time	Direction	Average speed (km/h)			85%ile speed (km/h)		
		Light vehicles	Heavy vehicles	All vehicles	Light vehicles	Heavy vehicles	All vehicles
Daytime (4pm)	Northbound	79.7	78.8	79.3	87.3	87.0	87.5
	Southbound	77.1	84.5	77.8	85.6	87.7	86.0
	Bidirectional	77.9	79.9	78.4	86.2	86.4	86.9
Night time (8pm)	Northbound	79.4	79.0	79.3	85.8	79.0	84.0
	Southbound	68.0	-	68.0	73.6	-	73.6
	Bidirectional	76.1	79.0	76.5	80.9	79.0	80.9
All	Northbound	79.6	78.8	79.3	87.1	86.5	87.0
	Southbound	76.4	84.5	77.0	86.0	87.7	86.0
	Bidirectional	77.6	79.8	78.1	86.7	86.5	86.7

The data in the above table shows that the 85%ile speed is generally higher than the posted speed limit of 80 km/h in Thomas Mitchell Drive. It is observed that many vehicles arrive at the intersection at higher than the posted speed limit, especially in the northbound direction. The southbound traffic speed was generally lower than northbound as a large proportion of the southbound traffic turned left from other side streets (eg Carramere Road) and the vehicles were still accelerating while they were passing through Glen Munro Road.

Based on the speed count survey and site observation, the posted 80 km/h speed limit along Thomas Mitchell Drive serving the industrial driveways and a number of side streets (between Denman Road and Glen Munro Road) appears to be excessive. The speed survey data indicates that many motorists (up to 50% currently) do not obey the 80 km speed limit, as such there is a strong merit in reducing the speed limit to 60 km/h for the section which is currently restricted to 80 km/h. However, it should be noted that a [2]transition zone may be necessary as it may not be possible to directly reduce the speed from 100 km/h to 60 km/h.

TfNSW controls the speed limit in all public roads in NSW. Any amendment to speed zone would require following TfNSW's specific speed zoning guidelines. Therefore, MSC could raise this matter with TfNSW to improve safety and accessibility along this section of Thomas Mitchell Drive. As a start, this can be discussed at the MSC's Local Traffic Committee (LTC).

2.6 Sight distance

In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), all unsignalised T-intersections must provide adequate visibility for turning traffic safety. This is assessed in further detail below, in terms of the safe intersection sight distance (SISD) at each intersection, which varies according to the design speed of the road. Normally a design speed 10 km/h higher than the posted speed limit is used to calculate the SISD.

[2] A short length of speed zone used to provide a stepped change between adjacent sections of road that have different speed limits.

This section of Thomas Mitchell Drive has a speed limit of 80 km/h near the intersection. In accordance with *Austroads Guide to Road Design Part 4A (Unsignalised and Signalised Intersections)* (Austroads, 2017), for a road with design speed of 90 km/h (noting that design speed is generally 10 km/h higher than the speed limit), the minimum safe intersection sight distance (SISD) required for a general minimum [3]2.5 second driver reaction time is 226 m.

The sight distances on Glen Munro Road at Thomas Mitchell Drive have been estimated based on the line of sight and observation, as shown in Plate 2.6. Based on the estimated sight distance analysis, the sight distance to the right meets the minimum requirement (226 m), as stipulated in the Austroads Guide to Road Design.

However, sight distance to the left is limited due to the curve in the road, a TfNSW road upgrade sign and a number of existing roadside trees, on Thomas Mitchell Drive on approach to this intersection. This has restricted the sight distance to approximately 140 m to the right (Plate 2.6).

Sight distance to the left (<150 m)

Sight distance to the right (>400 m)

Plate 2.6 Sight distance on Thomas Mitchell Drive from Glen Munro Road

As a short-term mitigation measure, the sight distance could be improved by removing the existing three roadside trees and the TfNSW road upgrade sign which are all located on the eastern side of Thomas Mitchell Drive, as shown in the following pictures. This will allow visibility to a greater distance to the left.

[3] Due to the industrial nature of the precinct and the moderate horizontal curve at south of the subject intersection, 2.5 sec driver's reaction time has been adopted.

Plate 2.7 **Overgrown vegetation and street trees restricting sight distance on Thomas Mitchell Drive**

Figure 2.2 TfNSW Road upgrade signage needs reaction

The exact locations of the recommended measures are shown in Figure 2.3.

Figure 2.3 Recommended removal of existing trees and TfNSW road upgrade sign

It should be noted that due to the current horizontal bend, there are existing risks for the northbound motorists along Thomas Mitchell Drive as there is insufficient driver's reaction time if there is a static right turning vehicle waiting to turn from Thomas Mitchell Drive to Glen Munro Road. To minimize this risk, the speed limit reduction should be proposed to TfNSW as a mid-term recommendation. In addition, a "Reduce Speed" warning sign (Figure 2.4) for the northbound traffic could be installed just before the bend, which would warn motorists to reduce speed before the sharp bend.

Source: TfNSW online sign database

Figure 2.4 Recommended speed reduction warning sign for the northbound traffic along Thomas Mitchell Drive, on approach to the bend

In the longer term, the warrants for intersection turn treatments (eg basic, auxiliary lane and channelised) should be assessed based on the Austroads Guide to Road Design Part 4, Intersections and Crossings General (2017b). Until a basic right turn bay for northbound traffic turning from Thomas Mitchell Drive into Glen Munro Road is provided, the risks for rear end type crash will still persist at this intersection at some extent.

2.7 Signage and line marking

Sign and line marking at the intersection was found to be generally adequate. However, there are some existing deficiencies in terms of sign and line marking at this intersection which are discussed in the sections below.

2.7.1 Signage

There is no speed limit sign at the entrance to Thomas Mitchell Drive at the primary side (left hand side of the motorists). In addition, the speed limit sign on the secondary side is faded which should be replaced by a new sign (Plate 2.8).

Plate 2.8 Faded 50 km/h sign on Glen Munro Road at Thomas Mitchell Drive intersection

2.7.2 Line marking

There is no existing ‘give way’ line marking for the traffic entering onto Thomas Mitchell Drive from Glen Munro Road. Installing ‘give way’ line marking at this intersection will improve safety.

Plate 2.9 No ‘Giveway’ line marking

Further, some motorists were observed cutting the corner while turning left or right at this intersection. Therefore, subject to swept path assessment, there is a merit of providing a BB type centre line on Glen Munro Road, which would help to prevent any illegal “corner cutting” turn movements at this intersection.

There are also no pavement reflectors on Thomas Mitchell Drive. Installing road pavement reflectors on Thomas Mitchell Drive and Glen Munro Road on each approach to the intersection will improve road safety, especially during the night time.

The full recommended signage and line marking measures for the intersection are depicted in Figure 2.5. A sign and line marking plan should be prepared by MSC for consideration by the LTC.

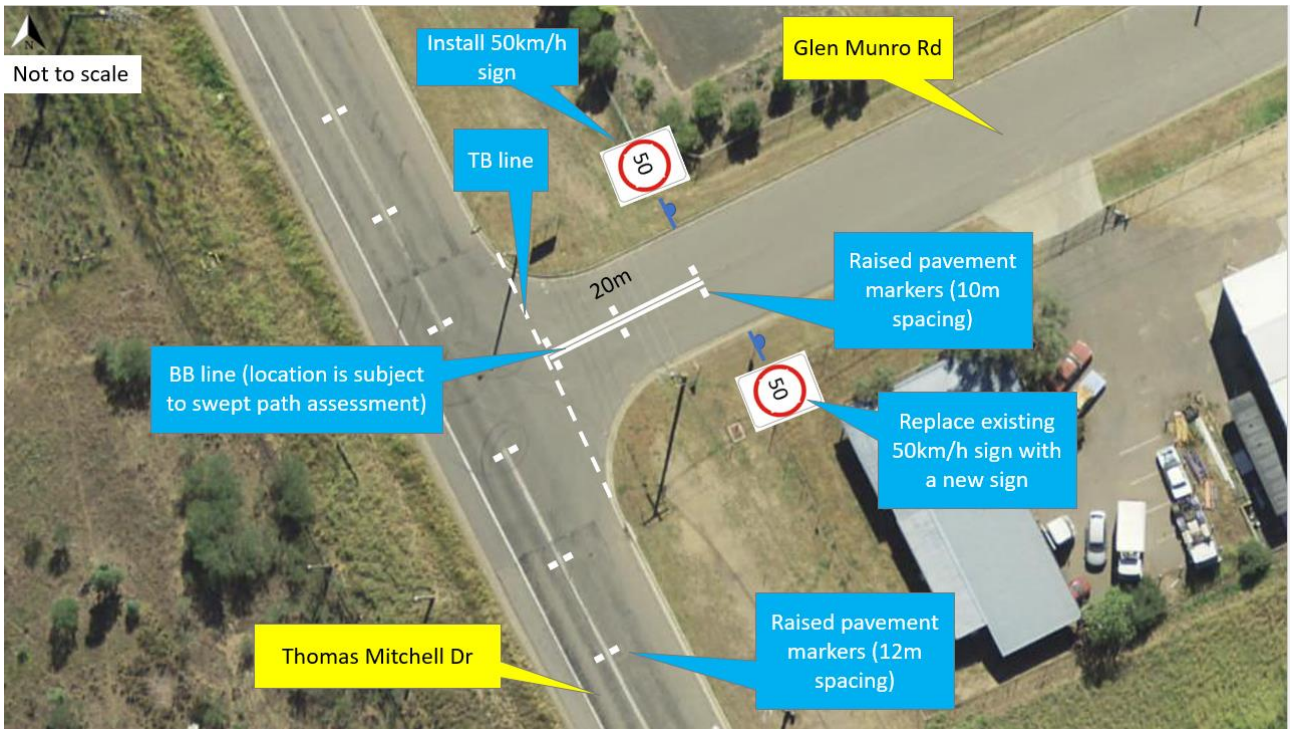

Figure 2.5 Recommended sign and line marking measures at Thomas Mitchell Drive/Glen Munro Road intersection

2.8 Drivers' behaviour

As shown in Plate 2.10 and Plate 2.11 during the site inspection, some vehicles were observed to park on Thomas Mitchell Drive southbound within approximately 50-100 m of the intersection. However, no Illegal parking was noted in closer proximity to the intersection which would restrict the sight distance or heavy vehicle turning movements at the intersection.

Apart from the speeding motorists along Thomas Mitchell Drive, discussed in section 2.5, another behaviour of concern was a truck driver taking a rest break (for approximately 15 minutes) parked on the road verge at the southeast corner of the intersection. This practice appears to be an ongoing occurrence which is obvious by the wheel tracks and lack of grass along the vehicular path (Plate 2.10 and Plate 2.11).

This illegal practice is potentially damaging the existing kerb, gutter and utility pits located in this area. Also, the vehicle was observed to cross the centre line of Thomas Mitchell Drive while exiting turning left, which is also a safety issue. Therefore, MSC should take appropriate action to stop this section of the area being use as a truck rest area, eg installation of high kerb, fencing etc. This should be discussed at the MSC's LTC.

Plate 2.10 **Truck driver resting at the south-east corner of Thomas Mitchell Dr/Glen Munro Rd intersection**

Plate 2.11 **Truck leaving the rest area (turning left)**

There were numerous tyre marks noted along Glen Munro Road, which as a result of inappropriate car driver behaviour (Plate 2.12). Despite, this not being within the study area, MSC and/or NSW Police should conduct further investigations of this situation and identify appropriate action to control the behaviour.

Plate 2.12 Tyre marks in Glen Munro Road (looking east)

2.9 Lighting conditions

The night time lighting at this intersection is supported by two power poles with lanterns which appears to be adequate (Plate 2.13). When looking south, any presence of oncoming northbound traffic can be clearly noted by the headlights of the approaching vehicle. The observed traffic volumes using Thomas Mitchell Drive were significantly lower during the night time, so any arrival of traffic was also apparent from the sound of the vehicles.

There is no street lighting along Glen Munro Road, however, the existing site lighting from the industrial properties is generally sufficient to provide adequate street lighting along this road (Plate 2.14).

Plate 2.13 Existing lighting at Thomas Mitchell Drive/ Glen Munro Road intersection

Plate 2.14 Glen Munro Rd (looking east from Thomas Mitchell Drive)

2.10 Overhead cables on Glen Munro Road

Overhead electrical cables were noted along Glen Munro Road, mostly on the southern side. The height of these cables when crossing Glen Munro Road, appeared to be over 4.5 m high (Plate 2.15).

To be certain, a trial run of the largest likely size of the vehicle using the site, should be undertaken by the applicant before commencing the site operations to confirm the existing overhead cables do not cause any safety risk to the site traffic.

Plate 2.15 Existing electrical cables on Glen Munro Road

3 Key findings and mitigation measures

The key findings and potential mitigation measures from the Road Safety Assessment are summarised in Table 3.1. In regard to the timing of their implementation, the following indicative timeframes should be followed for each recommendation:

- short term: 0 to 6 months;
- mid-term: 6 months to 2 years;
- longer term: 5+ years.

Table 3.1 Key road safety findings and mitigation measures

Item No.	Issue	Section of this report	Suggested mitigation measures	Responsibilities	Indicative timeframe
1	Damaged pavement	Section 2.4	Pavement testing and repair of damaged pavement	MSC	**Short term**, as over time the payment may deteriorate further.
2	Vegetation on drainage pits	Section 2.4	Cleaning of drainage pits	MSC	**Short term**, as due to heavy rain, any blockage of the drainage may cause localised ponding which may cause further damage to the pavement.
3	Permanent reduction of speed in Mitchell Drive	Section 2.5	Council to liaise with TfNSW or raise the matter in LTC	TfNSW & MSC	**Mid-term**, as any reduction of speed limit in public road needs to follow certain procedure which takes time.
4	Sight distance	Section 2.6	Removal of trees and overgrown vegetation	MSC	**Short term**, as tree removal can occur in short period of time as it is a road safety issue.
5	Sight distance	Section 2.6	Removal of TfNSW road safety sign	TfNSW	**Short term**, as the sign can be removed by TfNSW in short time, following council's request.
6	Sight distance	Section 2.6	Implementation of speed reduction warning sign	TfNSW & MSC	**Short term**, as the sign can be installed by TfNSW in short time, following council's request.
7	Sight distance	Section 2.6	Intersection warrant treatment assessment (eg for provision of a basic right turn bay on Thomas Mitchell Drive)	MSC	**Longer term**, as provision of a basic right turn treatment is subject to availably of funding.

Table 3.1 Key road safety findings and mitigation measures

Item No.	Issue	Section of this report	Suggested mitigation measures	Responsibilities	Indicative timeframe
7	Implementation of signage and line marking plan	Section 2.7	A signage and line marking plan can be prepared for consideration by the LTC.	Council to raise the matter to LTC and the applicant to bear the cost associated with installation of the approved plan as part of the approval of the DA.	**Short term**, as the sign and line marking plan can be considered by LTC in short period of time.
8	Illegal driver behaviour	Section 2.8	Illegal driver behaviour to be investigated and appropriate necessary actions to be undertaken.	MSC to investigate the matter and take necessary action. This matter can also be referred to LTC.	**Short term**, as immediate action is necessary to deter the illegal drivers' behaviour.
8	Overhead cables on Glen Munro Road	Section 2.10	Possibly a live vehicular test by the applicant	The applicant to ensure the existing overhead cable would not cause any safety issues.	**Short term**, as any impact on the existing overhead cables must be resolved before operation of the subject development.

4 Conclusions

The Road Safety Assessment, which included day and night time inspections, have identified a number of current traffic safety and road pavement condition/ line marking deficiencies at the Thomas Mitchell Drive/ Glen Munro Road intersection.

It is recommended that the need for these items which are outlined in Table 3.1 of this report, should be reviewed and confirmed by a MSC Traffic Engineer. Some of the items may also need to be referred to TfNSW for appropriate action (eg for the recommended speed limit reduction along Thomas Mitchell Drive and the sign and line marking measures) which should be confirmed by LTC.

It is important to note that not all safety issues at this intersection have necessarily been identified during the site inspections for this Road Safety Assessment and there is no guarantee that the recommended safety measures would totally eliminate all potential future traffic hazard or safety risk at this intersection. Therefore, whilst EMM has been responsible for identifying the road safety issues to date at this intersection, this report takes no responsibility for the implementation of these recommendation.

Upon implementation of the longer term recommendations, a formal Road Safety Audit should also be undertaken by independent Road Safety Auditors at the Thomas Mitchell Drive/Glen Munro Road intersection in due course, after approximately five years.


Appendix A

Road Safety Assessor's CV




Abdullah Uddin

Associate Traffic Engineer |National Technical Leader – Transport

Curriculum vitae

Abdullah has worked as a traffic engineer for over 18 years and has significant knowledge and experience in managing traffic engineering and planning projects. He has in depth knowledge of relevant traffic engineering codes and guidelines including development and planning.

Abdullah has managed multidisciplinary transport and civil engineering teams. He has considerable experience in traffic impact assessments, car park design, strategic transport planning and road safety reviews with a view to sustainability.

Abdullah has a strong understanding on the traffic engineering software including SIDRA, Auto CAD and GIS.

Qualifications

- Bachelor of Civil Engineering, Khulna University of Engineering and Technology, Bangladesh, 1998
- Post Graduate Diploma in Information Technology, University of Southern Queensland, 2001
- Master of Engineering Studies, University of Technology Sydney, 2011
- Chartered Professional Member of Engineers Australia (CPEng)
- Registered Professional Engineer of Queensland (RPEQ)
- TfNSW Traffic Management Plan Designer (PWZ) certificate
- Department of Fair Trading Registered Engineer for Class 2 buildings in NSW

Career

- EMM Consulting, 2019 – Present
- Senior Traffic Engineer, PTC, 2017-2019
- Manager Traffic and Transport, Lane Cove Council, 2015-2017
- Senior Traffic Engineer, Bayside Council, 2011–2015
- Traffic Engineer, Arup, 2007-2011
- Traffic Engineer, Inner West Council, 2005-2007
- Traffic Engineering Assistant, Cumberland Council, 2004-2005

Representative experience

Mining, quarry and renewable energy projects

- Great Cobar, Queen Bee, Lake Cowal, Balranald mines
- Dubbo, Luddenham, Dunmore Lakes, Peppertree, Gunlake, Sandy Point, Menangle quarry
- Sundown, Polo Flat, Birriwa Solar farms, Oven Mountain Pumped Hydro
- Penrith, Girraween, Kurri Kurri, Cardiff, Muswellbrook recycling facilities

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Transport planning projects

- Victoria Park, Zetland Masterplan, NSW (TSA Project Management)
- Mascot Transport management and accessibility plan (TMAP), NSW (DPIE)
- Harold Park Paceway, Glebe Land Use and transport accessibility study, NSW (City of Sydney)
- St Leonards and Lane Cove microsimulation modelling projects, NSW (Lane Cove Council)
- Sutherland transport interchange development, NSW (RailCorp)
- Sydney light rail feasibility analysis (TfNSW)

Traffic engineering projects

- Peakhurst, Penhurst & Punchbowl, James Sheahan school developments (SINSW)
- Campbelltown, Bankstown, Mudgee, Wagga Wagga, Nepean, Katoomba, Liverpool, Griffith, Tumut hospital developments NSW (Health Infrastructure NSW, CPB Contractors, CBRE)
- World Square car park and loading dock development (JLL)
- Schofields commuter car park development (TfNSW)
- B-Double route assessment, Matraville NSW (Randwick Council)

Parking study projects

- Georges River Council parking strategies, NSW (Georges River Council)
- Marrickville resident and business parking strategy (Inner West Council)
- Ku-ring-gai town centre parking strategy (Ku-ring-gai Council)

Active transport projects

- Moore Park Road Cycleway REF (City of Sydney)
- Bike plans (Lane Cove and City of Canada Bay Councils)
- Pedestrian And Mobility Plans (PAMP), (Lane Cove & Willoughby City Councils)
- Powells Creek bicycle option development (Strathfield Council)

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