Biala Wind Farm
Balance of Plant
Traffic Management Plan

Client / /	Newtricity Developments Biala Pty Ltd
Office / /	NSW
Reference / /	N142520
Date / /	17/10/2018

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Traffic Management Plan

Issue: D 17/10/2018

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Reference: N142520
GTA Consultants Office: NSW

Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
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D	17/10/18	Final – Response to DPE	Siew Hwee Kong	Dora Choi	Dora Choi	Dora Choi

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Acronyms and Abbreviations

Acronyms and Abbreviations	Definitions
ASD	Approach Sight Distance
BAL	Basic Left-Turn
BAR	Basic Right Turn
BoP	Balance of Plant
BWF	Biala Wind Farm
CoC	Conditions of Consent
Council	Upper Lachlan Shire Council
DPE	Department of Planning and Environment
EIS	Environmental Impact Statement
EMS	Environmental Management Strategy
FFS	free flow speed
GMC	Goulburn Mulwaree Council
HCM	Highway Capacity Manual, 2010
km/h	kilometre per hour
NHVR	National Heavy Vehicle Regulator
OSOM	Oversize Overmass
RAVs	Restricted Access Vehicles
Roads and Maritime	Roads and Maritime Services
Secretary	Secretary of Department of Planning and Environment
SISD	Safe Intersection Sight Distance
SSD6039	State Significant Development Application
TGS	Traffic Guidance Scheme
TMP	Traffic Management Plan
TTA	Traffic and Transport Assessment
WAD	Works Authorisation Deed
WTG	Wind Turbine Generator

Executive Summary

Newtricity Developments Biala Pty Ltd commissioned GTA Consultants to prepare a Traffic Management Plan (TMP) for the balance of plant construction works for a proposed wind farm development in Biala, NSW. The TMP is to examine and manage the impact of the proposed works on the surrounding road network and to detail the construction related traffic management measures. The TMP is also prepared to meet the requirements of Development Consent Section 89E of the Environmental Planning and Assessment Act 1979 – Application Number SSD 6039, dated 12 April 2017. This TMP is prepared to address Condition of Consent (CoC) 28 - Traffic Management Plan.

The Biala Wind Farm (BWF) site is located approximately 12 kilometres southwest of the town of Crookwell, near the township of Grabben Gullen. The purpose of the traffic and transport assessment is to determine whether the surrounding road network has the operational capacity and geometric layout to physically and safely accommodate the likely traffic generation of the proposal and identify appropriate mitigation measures and controls to manage potential impacts.

To satisfy the requirements of CoC 28, the TMP is being prepared in two stages. This approach has been approved by Department of Planning and Environment. This TMP details the traffic management associated with the balance of plant works for the project, including the civil and electrical works. A subsequent TMP will be prepared for the wind turbine component delivery phase of the project. When approved, the wind turbine TMP will form Appendix A of this document. At the time of preparation of this Stage 1 TMP, a balance of plant contractor is yet to be appointed.

An assessment of the existing conditions determined that the surrounding road network, which consists of mainly two-way, two-lane rural roads, operates with good levels of service with spare capacity. Previous wind farm developments in the area, have resulted in a number of roads and intersections being upgraded to accommodate restricted access vehicles.

The proposal includes construction of 31 wind turbines and a substation on 1,936 hectares of land spanning across 37 individual land parcels. The wind turbines will be serviced by a network of access roads within the project area and will be connected to the existing road network via two new priority access points located along Grabben Gullen Road. Appropriate signage warning motorist of heavy vehicle traffic will be erected, especially during the construction period.

The total construction timeframe is expected to be about 12 months. It is anticipated that the traffic generation for both the balance of plant works and wind turbine supply for the BWF site could generate during peak construction up to 110 loads per day. An overall figure of 7,374 loads of material, equipment and personnel are expected over the construction period of the project and a maximum of 52 vehicle trips per hour at the beginning and end of the working day during peak construction periods. Road capacity assessments suggest that the surrounding road network would continue to operate at acceptable levels of service of C or better during the construction phase.

Finally, it is concluded that by applying the controls contained within this TMP, the BWF development would not have significant adverse impacts on the surrounding road network operations and safety of its users.

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1. Introduction

1.1 Background

A State Significant Development Application (SSDA) has been approved by the Department of Planning and Environment (DPE) for a proposed wind farm in Biala, referred to herein as the Biala Wind Farm (BWF). The proponent of Biala Wind Farm is Newtricity Developments Biala Pty Ltd (Developments Biala). The BWF gained Project Approval (SSD 6039) on 12 April 2017 under Section 89E of the Environmental Planning and Assessment Act 1979 (EP&A Act), subject to the conditions of consent (CoC).

BWF is located approximately 14.5 kilometres southwest of the town of Crookwell and 8.5 kilometres east of Biala in the Upper Lachlan local government area (LGA). The project area covers approximately 1,936 hectares, which encompasses 37 individual land parcels. It will accommodate a total of 31 wind turbine generators with a maximum height of 185 metres and a range of ancillary infrastructure, including up to three new intersections off Grabben Gullen Road, internal access roads, an operation/ maintenance facility, internal electricity transmission lines and a substation.

There are two separate work streams, which will generate traffic during project construction, occurring in distinct periods of the proposed project schedule, as follows:

- Balance of plant (BoP) civil and electrical cabling works, substation and operations/ maintenance buildings, which includes site establishment, earthworks, concrete foundations for Wind Turbine Generators (WTG) and electrical reticulation requiring transport of heavy plant and machinery, aggregate deliveries and other supplies.
- Wind turbine components supply and installation, which is when the bulk of over-size and over-mass haulage will occur, including large cranes, WTG towers, nacelles and blade components.

Two different contractors would be appointed for the two separate work streams, with the overall project interfaces and organisation chart shown in Figure 1.1 and Figure 1.2, respectively. Developments Biala has applied to DPE for permission to prepare the Traffic Management Plan (TMP) for the BWF in a staged approach. This request was granted on 12 July 2018 and can be seen in Appendix B. The two TMP stages for this proposed development are:

- Stage 1 of the TMP will describe the traffic management for the BoP works phase of the project (this document).
- Stage 2 of the TMP will describe the traffic management for the turbine component delivery phase of the project. When approved, the Stage 2 TMP will form Appendix A of this document.

Figure 1.1: Project interfaces

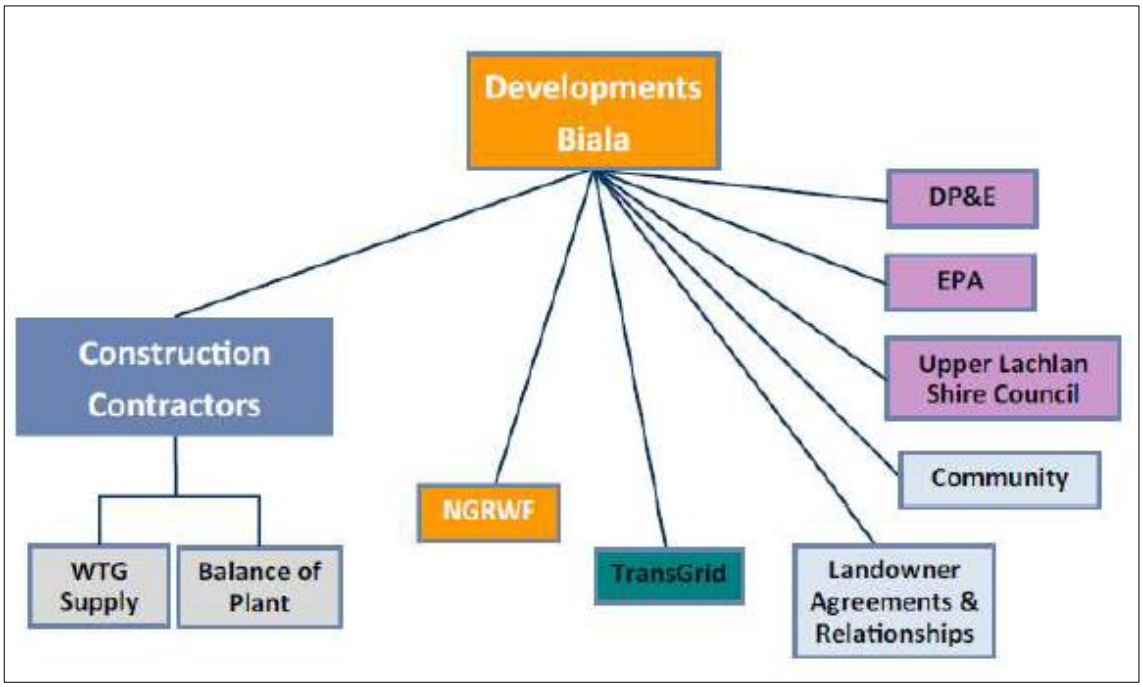
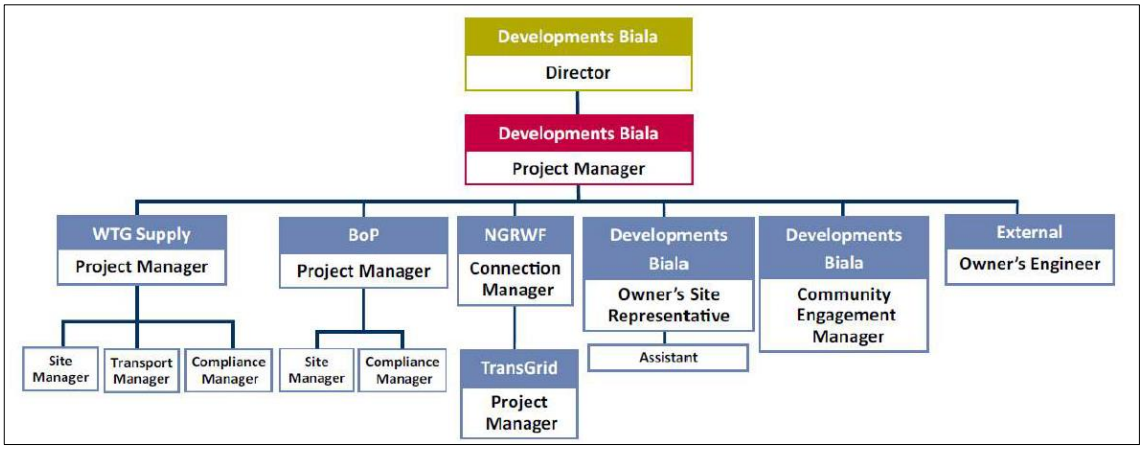


Figure 1.2: Project organisation chart



GTA Consultants (GTA) was commissioned by Developments Biala in January 2018 to prepare a TMP for the BoP construction works, to examine and manage the impacts of the works on the surrounding road network and to detail the construction related traffic management measures.

A TMP has been developed in consultation with the Roads and Maritime Services (Roads and Maritime) - Southern Traffic Operations Unit and Upper Lachlan Shire Council's (ULSC) Local Traffic Committees. The TMP and Traffic Guidance Schemes (TGSs) would be submitted to the Secretary of the Department of Planning NSW for final acceptance.

Stage 1 of the Traffic Management Plan (TMP) relating to BoP works has been prepared in consultation with Roads and Maritime and ULSC.

Stage 2 of the TMP, relating to wind turbine component delivery will be prepared in consultation with Roads and Maritime, ULSC and Goulburn Mulwaree Council (GMC). Any TGSs prepared will be submitted to the relevant stakeholders for approval prior to implementation.

A copy of the accepted TMP would be forwarded to Roads and Maritime at development.southern@rms.nsw.gov.au prior to any transportation occurring or works commencing on the site.

Developments Biala will implement the TMP after obtaining the DPE Secretary's approval and after completing all other required conditions listed in the CoC prior to construction.

Developments Biala has made a separate planning application to ULSC for an underground electricity transmission line from BWF to an existing electricity substation at Gullen Range Wind Farm, approximately 12 kilometres to the east of the BWF. A minor extension to the existing Gullen Range Wind Farm is included in this application. The application is currently being determined by the Joint Regional Planning Panel. If approved, Developments Biala plans to undertake works to install the underground cable and substation extension concurrently with the construction of the BWF. Developments Biala plans to prepare a separate TMP, meeting the terms of any planning approval granted by the Joint Regional Planning Panel for these works.

These works have not been covered in this TMP. However, the cumulative traffic impact of this work has been considered in Section 4.6.

1.2 Purpose of this Report

The primary purpose of this TMP is to provide a reference document to maximise safety of all road users and personnel during the BoP construction works. The TMP of wind turbine delivery and construction works will be prepared by the wind turbine supply and installation contractor for Developments Biala. This TMP considers the potential transport impact arising from access to and from the BWF site and identifies appropriate management measures to address the impact. It presents a set of mitigation measures, monitoring procedures and protocols that:

- Describe how Developments Biala will manage and control risks associated with traffic management during construction activities of the BWF site
- Address the requirements of applicable legislation
- Meet the Schedule 3 – Environmental Conditions – General (Transport – Traffic Management Plan), CoC 28.

The TMP is based on consultation with Roads and Maritime and ULSC. This ensures that the TMP serves as an effective tool to manage potential impacts based on changes in project design or other circumstances.

This TMP has been prepared in accordance with the recommendations provided within the *Traffic Control at Work Sites* manual (Roads and Maritime, 2010). Reference is also made to the Roads and Maritime *Supplements to Austroads Guide to Road Design*.

1.3 References

In preparing this report, reference has been made to the following:

- An inspection of the site and its surrounds on Thursday 18 January 2018
- Transportation Research Board's Highway Capacity Manual, 2010 (HCM)
- Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections, 2010
- Plans for the proposed development prepared by Developments Biala
- Various traffic reports prepared for surrounding wind farm developments, including:

- New Gullen Range Wind Farm (Bega Duo Designs, March 2013)
- Rye Park Wind Farm (Epuron, April 2016)
- Crookwell 3 Wind Farm (URS, September 2010)
- Crookwell 2 Wind Farm (GTA, February 2018)
- Paling Yards Wind Farm (URS, April 2012)
- Flyers Creek Wind Farm (Aurecon, May 2011)
- Jupiter Wind Farm (GTA, September 2017)

- *Procedures for use in the Preparation of a Traffic Management Plan* (Roads and Maritime, June 2010, Version 4.0)
- *Traffic Control at Work Sites* manual (Roads and Maritime, June 2010)
- Australian Standard *AS1742.3 – 2009 Manual of Uniform Traffic Control Devices – Part 3: Traffic control for works on roads*
- Other documents as referenced throughout the report.

1.4 Section 89E Requirements

This TMP should be read in conjunction with the Development Consent Section 89E of the EP&A Act application number SSD 6039, dated 12 April 2017. This TMP was prepared to address CoC Schedule 3, Condition 28 - Traffic Management Plan requirements and the associated sections in response to these requirements as provided in Table 1.1.

Table 1.1: Section 89E Requirements – CoC 28: Traffic Management Plan

Requirement	Relevant section
Prior to the commencement of construction, the Contractor must prepare a Traffic Management Plan for the development in consultation with Roads and Maritime and Council, and to the satisfaction of the Secretary. This plan must:	Sections 4.9 and 7, Table 4.4
a) detail the measures that would be implemented to:	
○ minimise the traffic safety impacts of the development and disruptions to local road users during the construction and decommissioning of the development, including:	
○ temporary traffic controls, including detours and signage	
○ notifying the local community about development-related traffic impacts	Section 6.3, Table 4.4
○ avoiding potential conflicts between development-related traffic and the stock movements of the owner of Residence H07 by implementing measures such as: i consulting with the landowner to confirm likely stock movement frequency, timing and duration ii notification protocols for stock movements, including a dedicated phone number iii temporary traffic controls on Grabben Gullen Road such as traffic flags or signals	Section 2.8, Table 4.4 and Appendix D
○ avoiding potential conflict between development-related traffic and school buses in consultation with school bus operators by implementing measures such as avoiding traffic	Sections 2.6, 5.1.2, 5.1.3 and 6.3, Table 4.4
○ movements during school bus service times or providing an escort for school buses	
○ ensuring development-related traffic does not track dirt onto the public road network	Section 3.2.4
○ ensuring loaded vehicles entering or leaving the site have their loads covered or contained	Section 5.1.3, Table 4.4
○ there is sufficient parking on site for all development-related traffic	Section 3.6, Table 4.4

Requirement	Relevant section
○ responding to any emergency repair requirements or maintenance during construction and/ or decommissioning	Section 4.8.2
○ a traffic management system for managing OSOM vehicles	Appendix A
○ comply with the traffic conditions in this consent b) include a driver's code of conduct that addresses: ○ travelling speeds ○ procedures to ensure that drivers adhere to the designated heavy and OSOM vehicle routes and ○ procedures to ensure that drivers implement safe driving practices	Section 5, Table 4.4
c) include a detailed program to monitor and report on the effectiveness of these measures and the code of conduct	Section 7
Following the Secretary's approval, the Applicant must implement the Traffic Management Plan.	Section 1.1

In addition to the above-mentioned response to the CoC, Biala will comply with management methods for over size over mass deliveries as set out in Roads and Maritime Services letter of 17 September 2018, attached to Appendix I of this report.

1.5 Performance Targets

Targets for traffic management practices/ controls associated with the construction of the BWF, which are consistent with other wind farm projects, are as follows:

- 100 per cent compliance with all applicable legislation, regulations, standards, codes and licenses that relate to the BWF site
- No significant degradation to the environment or existing roadways as a result of traffic movements
- No safety incidents for construction vehicles
- Maximise the safety of all road users and construction staff
- No significant traffic delays caused by the BWF site activities
- Standard industry environmental management practices implemented for traffic management
- Implementation of measures in accordance with the commitments in the BWF Environmental Impact Statement (EIS) 2015, unless superseded by requirements of the relevant road authorities.

2. Project Overview and Existing Circumstances

2.1 Overview

The BWF gained project approval (SSD6039) on 12 April 2017 under Section 89E of the EP&A Act, subject to the CoC. The approved SSDA allows for construction of up to 31 wind turbines and ancillary facilities for access, substation, electrical connection of the turbines to the substation, temporary construction facilities, permanent meteorological monitoring masts, and an associated access road network within 1,936 hectares of land.

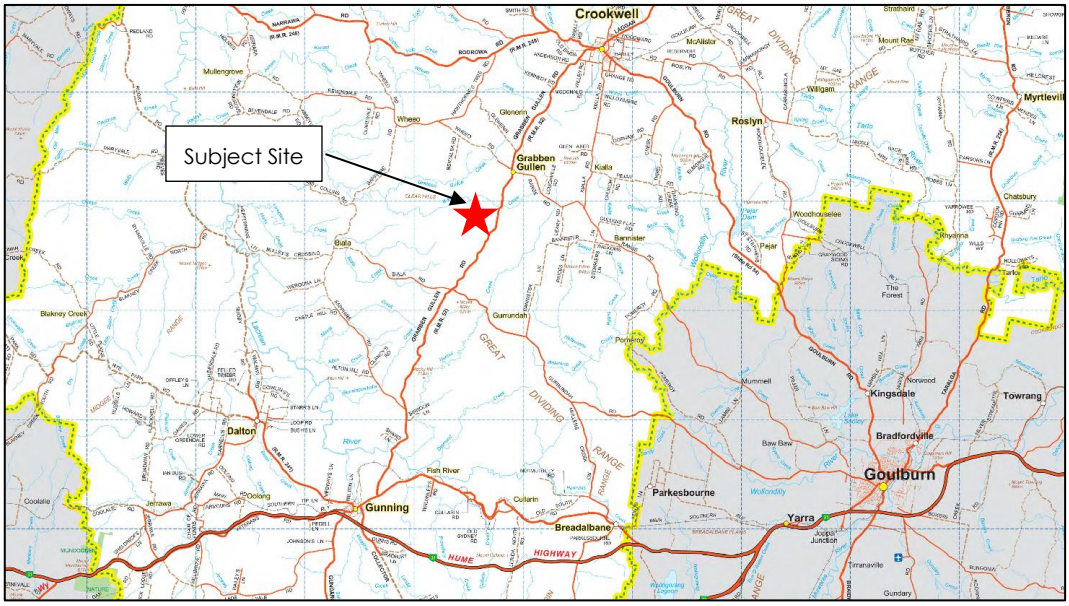
It is planned that the construction of BoP, civil and electrical cabling works will commence in the fourth quarter of 2018. The works will include site establishment, earthworks, WTG foundations and electrical reticulation requiring transport of heavy plant and machinery, aggregate deliveries and deliveries of other supplies.

As discussed, this TMP applies to the BoP construction works only. An addendum to this TMP will be submitted by Developments Biala applicable to transportation of WTG components at a later date.

2.2 Project Location

The proposed wind farm is located approximately 12 kilometres southeast of Crookwell in southern New South Wales (NSW), approximately 45 kilometres northwest of Goulburn. The proposed development covers an area of 1,936 hectares and is within the Upper Lachlan Shire LGA. The surrounding properties are predominantly used for agriculture and grazing. The location of the project area is shown in Figure 2.1.

Figure 2.1: Project area



Basemap source: https:/ / www.upperlachlan.nsw.gov.au, accessed 11/ 01/ 18

2.3 Road Network

2.3.1 Adjoining Roads

Grabben Gullen Road

Grabben Gullen Road links the township of Gunning with Crookwell via Grabben Gullen. It is classified as a State Road (State No. 52) and is controlled by Roads and Maritime. It runs in a north-south direction in rolling terrain and is a two-way road with one lane in each direction. Grabben Gullen Road is signposted as a 100 km/h speed limit road.

Grabben Gullen Road is shown in Figure 2.2 and Figure 2.3.

Figure 2.2: Grabben Gullen Road – Looking north

Source: GTA (2018)

Figure 2.3: Grabben Gullen Road - Looking south

Source: GTA (2018)

Crookwell-Goulburn Road

Crookwell-Goulburn Road runs between Crookwell and Goulburn in an east to west direction. It is classified as a State Road (No. 54) and traverses 45 kilometres in rolling terrain. It is a two-way road with one lane in each direction with marked centrelines and edge lines. Crookwell-Goulburn Road is a part of the Roads and Maritime Restricted Access Vehicle (RAV) route network and is approved for 26-metre B-double vehicles.

Crookwell-Goulburn Road is shown in Figure 2.4 and Figure 2.5.

Figure 2.4: Crookwell-Goulburn Road - Looking west

Source: GTA (2018)

Figure 2.5: Crookwell-Goulburn Road - Looking east

Source: GTA (2018)

Kialla Road

Kialla Road is a local road (controlled by ULSC) and is configured with a two-way sealed carriageway. It is noted that Kialla Road was previously used to transport wind turbine components to the nearby Gullen Range wind farm and was upgraded to cater for the RAVs accessing that site. Additional upgrades would be completed for Kialla Road as part of the BWF project, as detailed in Section 4.7.

Kialla Road is shown in Figure 2.6 and Figure 2.7.

Figure 2.6: Kialla Road – Looking north

Source: GTA (2018)

Figure 2.7: Kialla Road – Looking south

Source: GTA (2018)

Range Road

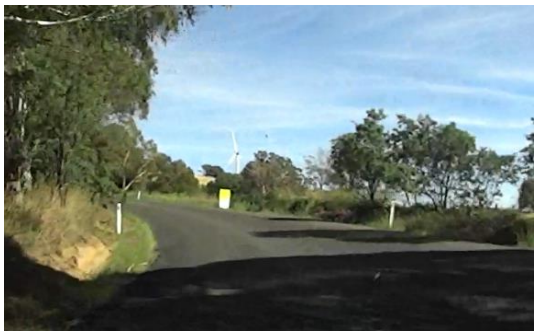
Range Road is a local road (controlled by ULSC) and is configured with a two-way sealed carriageway. It is noted that part of Range Road, west of Kialla Road, was upgraded to accommodate RAVs used for the Gullen Range Wind Farm construction works. An eight-kilometre section of Range Road west of Kialla Road will be upgraded as part of the BWF project, to meet condition Schedule 3 Condition 25, as detailed in Section 4.7.

Range Road is shown in Figure 2.8 and Figure 2.9.

Figure 2.8: Range Road – Looking east

Source: GTA (2018)

Figure 2.9: Range Road – Looking west



Source: GTA (2018)

2.3.2 Surrounding Intersections

The following intersections currently exist near the site:

- Grabben Gullen Road/ Range Road (unsignalised)
- Grabben Gullen Road/ Biala Gurrundah Road (unsignalised).

In addition, the following intersections provided in Gunning, Bannister, Crookwell and Goulburn need to be considered for the proposed development during the construction stages:

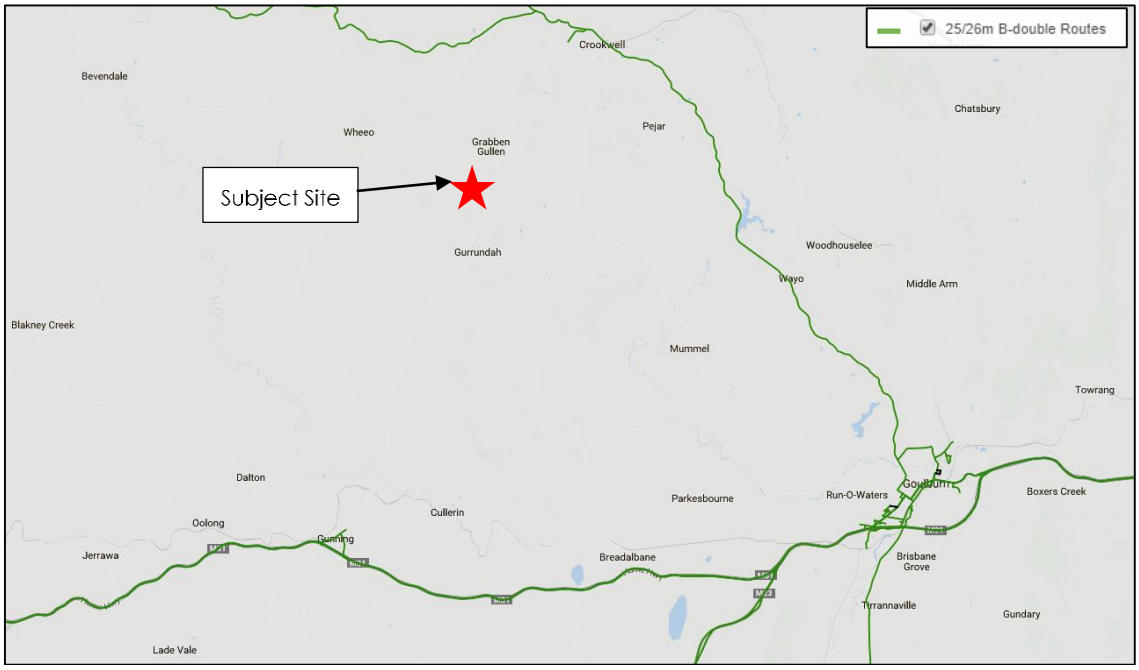
- Gunning:
  - Hume Highway/ Gundaroo Road (unsignalised)
  - Hume Street/ Gundaroo Road (unsignalised)
  - Cullerin Road/ Grabben Gullen Road (unsignalised)
- Bannister:
  - Kialla Road/ Range Road (unsignalised)
- Crookwell:
  - Kialla Road/ Cullen Street (unsignalised)
  - Grange Road/ Cullen Street (unsignalised)
  - Grange Road/ Goulburn Road (unsignalised)
- Goulburn:
  - Deccan Street / Fitzroy Street (unsignalised)
  - Clinton Street/ Deccan Street (roundabout)
  - Cowper Street/ Clinton Street (unsignalised)
  - Hume Street/ Hume Highway (roundabout).

2.3.3 Restricted Access Vehicle Map

The existing B-double (26-metre vehicles) approved routes in the broader vicinity of the site are detailed on the Roads and Maritime website[1] and are reproduced in Figure 2.10. Crookwell Road, Hume Street, Clinton Street, Deecan Street and the Hume Highway near and on-route to the site are approved B-double routes.

[1] Roads and Maritime website - http://www.rms.nsw.gov.au/business-industry/heavy-vehicles/maps/restricted-access-vehicles-map/index.html

Figure 2.10: Existing B-double approved routes



Basemap source: http:/ / www.rms.nsw.gov.au, accessed 23/07/18

2.3.4 Traffic Volumes

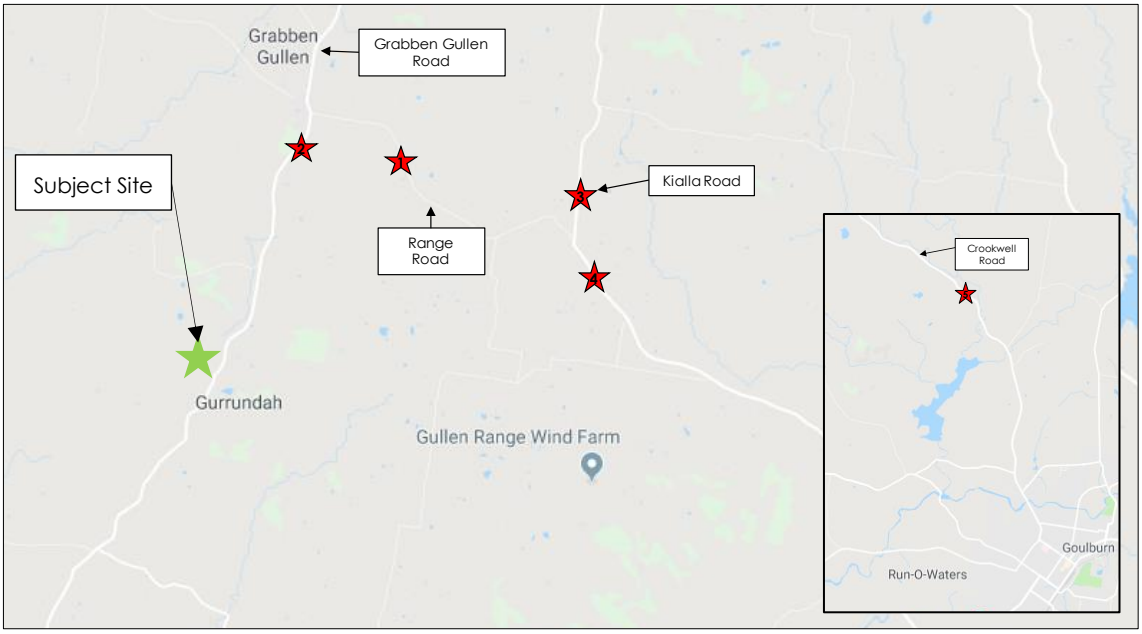
Consultation with the community highlighted that Tuesday is the busiest day of the week on local roads, particularly Grabben Gullen Road, due to nearby sheep sales. Existing daily traffic volumes were surveyed for Tuesday 6 February 2018 at key locations near the site. The results are summarised in Table 2.1, with full results included in Appendix C and the survey locations are illustrated in Figure 2.11.

Table 2.1: Traffic volume estimates

	Location	Time of count	Recorded peak hour traffic volume (vehicles per hour)	Recorded daily traffic volume (vehicles per day)
1	Range Road (east of Grabben Gullen Road)	24 hours, Tuesday 6 February 2018	25	192
2	Grabben Gullen Road (south of Range Road)		64	585
3	Kialla Road (north of Range Road)		25	188
4	Range Road (south-east of Kialla Road)		42	296
5	Crookwell Road (north of Marble Hill Road)	[1]	188	2,300

[1] Based on Roads and Maritime 2018 traffic data.

Figure 2.11: Traffic survey locations



Basemap source: Google Maps

2.4 Road Network Capacity

To determine the existing operation of the road network, reference has been made to the *Guide to Traffic Generating Developments* (Roads and Maritime, October 2002). For sites in rural areas, the Guide recommends the following:

Developers should consider the following points when designing developments near rural roads:

- *As intersections are less frequent in rural areas, they are less of a determinant of rural road capacity.*
- *The need for overtaking opportunities on two-lane roads is greater, as the level of service is determined by average travel speeds and the percentage of time spent delayed.*
- *Determine if the volume threshold from one lane to two lanes per direction may be reached.*

Given these design guidelines, rather than assess the operation of intersections, the midblock capacity of each of the key roads has been assessed. As suggested in the Roads and Maritime Guide reference has been made to the Highway Capacity Manual (HCM) 2010 to determine the existing levels of service of each of the roads.

2.4.1 Level of Service (LOS)

As mentioned previously, Grabben Gullen Road is configured with one traffic lane in each direction. As a result, passing a slower vehicle requires the use of the opposing lane when suitable sight distance and gaps are present.

As traffic volumes increase, and as roadway, terrain and traffic conditions become less than ideal, drivers are increasingly affected by the presence of other vehicles on the road, and bunches form in the traffic stream. Vehicles in these bunches are subjected to delay because of the inability to overtake slower moving vehicles.

The HCM's LOS volume table for roads with one traffic lane in each direction is provided in Table 2.2. Based on Table 2.2, the hourly volume, of vehicle movements, that can be accommodated at a given LOS, terrain and free flow speed (FFS) can be determined under specific conditions.

Table 2.2: LOS hourly volumes for a Class 1 two-lane rural highway

FFS (km/h)	Terrain	LOS				
		A	B	C	D	E
110	Level	260	490	900	1570	2680
	Rolling	130	260	710	1490	2500
	Mountainous	40	160	310	610	1410
100	Level	260	490	900	1570	2680
	Rolling	130	260	710	1490	2500
	Mountainous	40	160	310	510	1410
90	Level	NA	490	900	1570	2680
	Rolling	NA	260	710	1490	2500
	Mountainous	NA	160	310	510	1410

The Roads and Maritime Guide recommends that a LOS of C or better should be achieved during weekday peak periods. However, the minimum LOS value that should be adopted for sustainable operations at 100 km/h is LOS D.

2.5 Existing Road Network Performance

An assessment of the existing operation of the key roads near the site is presented in Table 2.3, with existing peak hour traffic volumes extracted from the traffic surveys undertaken on Tuesday 6 February 2018, as shown in Table 2.1.

Table 2.3: Midblock existing operation of key roads

Location	Speed limit	Terrain [1]	Existing peak hour traffic volumes (vehicles per hour)	LOS
Range Road (east of Grabben Gullen Road)	100 km/h	Rolling	25	A
Grabben Gullen Road (south of Range Road)			64	A
Kialla Road (north of Range Road)			25	A
Range Road (south-east of Kialla Road)			42	A
Crookwell Road (north of Marble Hill Road)			188	B

[1] Terrain: Level = 20% no overtaking, Rolling = 40% no overtaking, Mountainous = 60% no overtaking.

Table 2.3 indicates that each of the roads near the site currently operates at an acceptable LOS of B or better.

2.6 Public Transport/ School Bus Routes

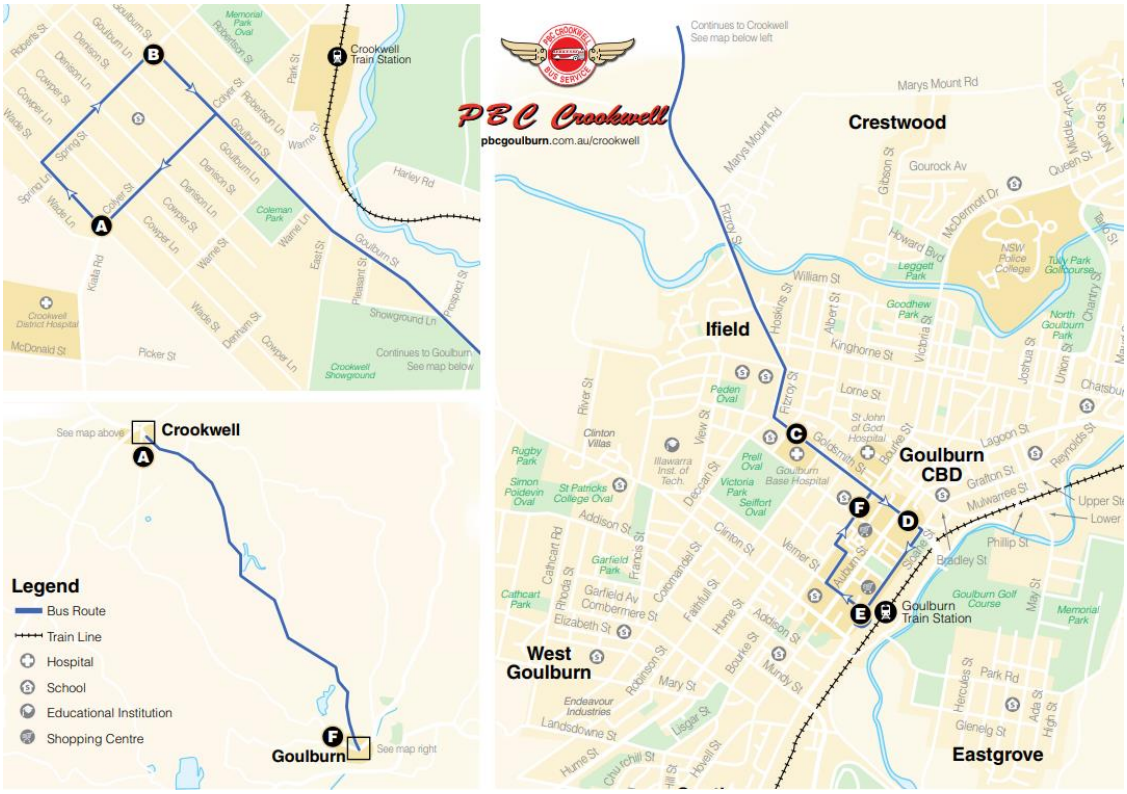
A review of the public transport available near the site indicates that public bus services run along Crookwell-Goulburn Road. The 818 service coincides with school times, and effectively serves as a school bus. A summary of this service is shown in Table 2.4.

Table 2.4: Public transport/ school bus routes

Service	Monday to Friday (school term)	Monday to Friday (school holidays)
818 – Goulburn to Crookwell	9:15am, 1:30pm and 3:15pm	9:15am, 12:00pm and 3:15pm
818 – Crookwell to Goulburn	7:32am, 9:51am and 2:06pm	8:26am, 10:56am and 2:13pm

The 818 bus service routes are shown in Figure 2.12 and the schedules are detailed in Figure 2.13.

Figure 2.12: Bus route 818 network map



Source: http://www.pbcgoulburn.com.au/crookwell/files/818%20-Crookwell%20to%20Goulburn.pdf, accessed 16 January 2018

Figure 2.13: Bus route 818 schedule

	Monday to Friday								Monday to Friday							
map ref	Route	818	818	818	818	818	818	map ref	Route	818	818	818	818	818	818
		am	am	am	am	pm	pm			am	am	pm	pm	pm	pm
A	Colyer St at Wade St (access to Hospital)	S7:32	H8:26	S9:51	H10:56	S14:06	H14:13	F	Cartright Pl, Goulburn	S9:15	H9:15	H12:00	S13:30	S15:15	H15:15
B	Spring St at Goulburn St.	S7:35	H8:30	S10:00	H11:00	S14:15	H14:15		Mulwaree High School, McDermott Dr	...	...	...	...	S15:20	...
	Roslyn Rd	S7:37	H8:35	S10:05	H11:05	S14:20	H14:20		West Goulburn, Knox St	...	...	...	...	S15:40	...
	Third Creek Rd	S7:39	H8:36	S10:06	H11:06	S14:21	H14:21		Cnr Deccan & Verner St (access to TAFE)	...	OR	OR	...	S15:40	OR
	Wind Farm	S7:43	H8:39	S10:09	H11:09	S14:24	H14:24	C	Goulburn Hospital, Goldsmith St	S9:17	H9:17	H12:02	S13:32	S15:41	H15:17
	Pejar Rd	S7:45	H8:41	S10:11	H11:12	S14:26	H14:26		Marble Hill Rd	S9:23	H9:23	H12:08	S13:37	S15:49	H15:21
	Pejar Rest Area	S7:48	H8:44	S10:14	H11:15	S14:29	H14:29		Fenwick Creek Rd	S9:25	H9:25	H12:10	S13:40	S15:53	H15:24
	St Stephens Rd	S7:52	H8:46	S10:16	H11:17	S14:31	H14:31		Woodhouselee Rd	S9:30	H9:30	H12:15	S13:45	S16:02	H15:29
	Woodhouselee Rd	S7:55	H8:47	S10:17	H11:18	S14:32	H14:32		St Stephens Rd	S9:31	H9:31	H12:16	S13:46	S16:06	H15:30
	Fenwick Creek Rd	S7:59	H8:51	S10:20	H11:22	S14:36	H14:36		Pejar Rest Area	S9:34	H9:34	H12:19	S13:49	S16:10	H15:33
	Marble Hill Rd	S8:04	H8:54	S10:23	H11:25	S14:39	H14:39		Pejar Rd	S9:36	H9:36	H12:21	S13:51	S16:15	H15:35
C	Goulburn Hospital, Goldsmith St	S8:10	H8:59	S10:28	H11:30	S14:44	H14:44		Wind Farm	S9:39	H9:39	H12:24	S13:54	S16:19	H15:38
D	Centro, Goldsmith St	S8:11	H9:00	S10:29	H11:31	S14:46	H14:46		Third Creek Rd	S9:42	H9:42	H12:27	S13:57	S16:21	H15:41
E	Goulburn Railway Station, Sloane St	S8:13	H9:02	S10:31	H11:33	S14:48	H14:48		Roslyn Rd	S9:43	H9:43	H12:28	S13:58	S16:22	H15:42
	West Goulburn, Knox St	S8:25	...	...	...	...	...	A	Colyer St at Wade St (access to Hospital)	S9:48	H9:48	H12:33	S14:03	S16:35	H15:47
	Cnr Deccan & Verner St (access to TAFE)	S8:30	OR	...	OR	...	OR	B	Spring St at Goulburn St.	S9:50	H9:50	H12:35	S14:05	S16:40	H15:50
	Mulwaree High School, McDermott Dr	S8:37	...	...	...	...	...								
F	Cartright Pl, Goulburn	S8:45	H9:04	S10:35	H11:35	S14:58	H14:50								

Source: https:/ / www.visitupperlachlan.com.au/ 2015BusTimetable.pdf accessed 16 January 2018
S – Times for the service during the School Term
H – Times for the service during the School Holidays (including school development days)

In addition, Valmar Community Transport also offers a Thursday fortnightly service from Crookwell to Goulburn. A fortnightly community bus runs twice a day from Grabben Gullen to Crookwell/ Goulburn and Gunning via Grabben Gullen Road with departure in the morning and return in the afternoon.

There are other school bus services that operate in and around the area.

Based on Developments Biala and GTA consultation with the bus operators, a summary of the contact details for all school bus operators and whether the routes are relevant to the construction related traffic routes are summarised in Table 2.5.

Table 2.5: Other school bus services

Company	Contact details	Affected by construction routes	Comments provided by school bus operator contact
John Laverty	John Laverty Phone: 02 4821 2320 jlaverty@skymesh.com.au	Yes	o Bus runs along Kialla Road to Range Road. o Will need to communicate times and dates when the trucks will be moving along Kialla Road.
Col Pitt	Col Pitt 0417 295 598 col11pitt@bigpond.com	Yes	o Bus service runs from Grabben Gullen township along Range Road and continues past Kialla Road towards Goulburn. Bus runs between 8:10am and 8:30am and between 3:30pm and 4pm.
A little bus Bailey's garage, Gunning	Craig Southwell 02 4845 1224 cdsouthwell@bigpond.com	Yes	o 14-seater bus with 12 to 13 students on the bus. o Morning run leaves Gunning at 7:10am. o Drops four to five children to Goulburn bus at Clean Hills, Gurrundah Road at 7:35am. o Crookwell bus drop meeting Col Pitt bus at Grabben Gullen, then back to Gunning via Sapphire road 9am at 8:15am. o Operator concerned with heavy vehicle traffic during transfers between Crookwell bus and Goulburn bus at Grabben Gullen Road. o Afternoon run leaves Gunning at 3:30pm Crookwell Road to Sapphire Road and onto Grabben Gullen departs at 4:10pm to Gunning along Grabben Gullen Road.
PBC Goulburn	Greg Taylor 02 4821 2320 greg@pbcgoulburn.com.au	Yes	o Runs one service between Gunning and Goulburn along Grabben Gullen Road, with an expected arrival in Goulburn at 8:30am. o Similarly, a service runs between 3pm and 4pm.
Road coach Goulburn	Joe Cymet 040 981 9543 joekmet@roadcoach.com.au	No	o No routes along the intended route in Goulburn or Gunning.
Neil/ Carol Skelly	Neil and Carol Skelly 02 4832 1910 kimboneil@bigpond.com.au	No	o Runs one service out along Boorowa Road, heading into Goulburn.

Consultation will continue with all bus operators throughout the construction period.

Given the low volume of over-sized, over-mass vehicles during BoP works compared to the delivery of turbine components, it is not anticipated that BoP works will cause adverse impacts to school bus services. Nonetheless, during the BoP construction, the following mitigation measures shall be implemented to avoid impact on school buses.

i The information collected on bus routes and times will be included in the induction for Developments Biala and form part of the Drivers Code of Conduct.

ii Regular drivers will be instructed to be aware of the potential for passengers waiting at bus stops and buses stopping to pick up passengers during these times.

iii If complaints are received from bus operators or passengers then the procedures in section 5.1.6 will be implemented, including reviewing vehicle tracking information for vehicles in the vicinity at the time of the complaint. Additional traffic management controls may be implemented where required, such as providing escorts for buses.

The TMP for wind turbine component delivery will be provided in a second submission and when approved will form Appendix A of this TMP. It will include mitigation measures for school bus services in relation to delivery of wind turbine components.

2.7 Surrounding Wind Farm Developments

Due to excellent wind resources by international standards, the Southern Tablelands is a popular region for wind farms. Currently, a number of wind farms are either operational, under construction or proposed for the region. Wind farms in the same region as BWF, which are at a similar stage include Crookwell 2 and Crookwell 3. Crookwell 2 is under construction and due to be completed before BWF construction begins. Crookwell 3 has not been granted approval and therefore has no firm timeline for construction.

2.8 Livestock Movements

CoC schedule 3, condition 28(a)(iii), requires this TMP to detail the measures to be implemented to avoid potential conflicts between development related traffic and the stock movements of the owner of residence H07.

In preparing this TMP, Developments Biala has consulted with the owner of H07 regarding this requirement. Details of the consultation is included in Appendix D and includes frequency, timing and duration of stock movements.

H07's farm is located on both sides of Grabben Gullen Road, to the north of the wind farm's site entrances. This means that it is on the route defined for use by oversize and over mass vehicles including RAVs. Light vehicles generated by the project may also use this route. It is not on the route for other deliveries including heavy vehicles, such as trucks carrying stone for tracks or concrete aggregate.

Currently, the owner of H07 erects temporary signage when their stock will be crossing Grabben Gullen Road.

Developments Biala will implement the following mitigation measures to avoid conflicts with H07's stock movements. These measures have been developed after consultation with construction contractors and the owners of H07. The measures are focused on the traffic that Developments Biala has direct control of, being the traffic associated with the wind farm.

-
- Developments Biala will provide the landowner with enhanced temporary signage. This will assist the landowner in their stock crossing operations with both wind farm and non-wind farm traffic at all hours on all days.
- Developments Biala will ensure every worker on the site is informed of the operations of H07 and the need to be aware of the warning signage that H07 will put in place should stock be crossing the road (as part of the site induction). Each worker will be instructed to slow down to 40 km/h and be ready to stop as required when the signage is in place.
- Vehicle monitoring systems will be used to log the behaviour of all regular wind farm traffic. In the case that H07 believes vehicles have not slowed appropriately,

Developments Biala will assess the recorded data available to determine whether this TMP has not been followed. In such instances, workers will be given one warning and if there is a repeat offence they will be removed from site.

- RAVs approaching the site will also adhere to these signs and the proposed speed restrictions. RAV drivers will be informed of the signage and possibility of stock movement operations prior to arrival at site. RAVs will slow or queue with other traffic as required while the stock movements are occurring. Turbine delivery traffic will be covered in an addendum to this plan (see Appendix A).

Developments Biala will provide a dedicated phone number for the owner of H07 to contact in the case of stock movements. During consultation with the owner of H07, it was determined that it is not possible for the owner of H07 to reliably provide prior notice of stock movements. This is due to the unpredictability of farming. As such, the measures above have been designed to mitigate risk with or without such notification.

Temporary traffic controls were not seen as appropriate by Developments Biala or the owners of H07 as it will result in delays to all traffic, not just traffic associated with the BWF.

3. Construction Arrangements

3.1 Vehicle Access

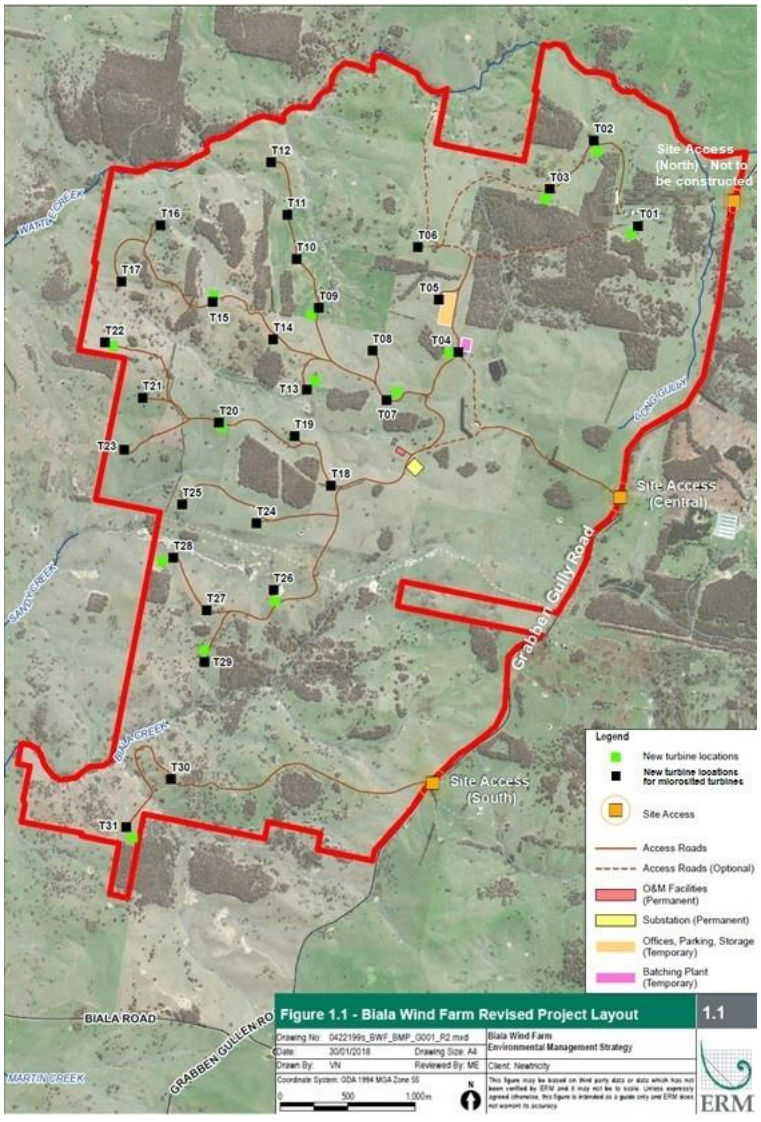
The wind turbines will be serviced by a network of access roads within the project area and will be connected to the existing road network via two new stop-controlled (unsignalised) access points, located along Grabben Gullen Road, as follows and illustrated in Figure 3.1:

- Central: Private Access to Grabben Gullen Road
- Southern: Private Access to Grabben Gullen Road.

The proposed vehicle access points will be used for the construction and operational phases.

A third access point at the northern end of the site is referred to in this project approval but this access is not proposed to be constructed.

Figure 3.1: Project area layout and vehicle access locations



Basemap source: Development Consent, Section 89E of the Environmental Planning and Assessment Act 1979, dated 12 April 2017

3.2 Site Intersection Design Requirements

There are no further upgrades required to off-site intersections for the BoP over-sized, over-mass vehicles. Further upgrades are required to off-site intersections for the delivery of WTG components. These upgrades will be detailed in the wind turbine component delivery TMP which will be attached to this document as Appendix A after it is approved.

Each of the site access points will form stop-controlled T-intersections with Grabben Gullen Road. The central and southern site access locations were revised as part of the EIS response to submissions. This revision was required by DPE and ULSC (refer to Appendix 7 to the CoC).

A review of the following design considerations against the relevant design standards is provided in the following subsections, including:

- Sight distances and sight lines
- Turn lane warrants
- Indicative signage provisions.

3.2.1 Sight Distance Requirements

Reference to the Austroads Guide indicates that a minimum sight distance of 248 metres should be provided for a 100 km/h road as proposed for Grabben Gullen Road during construction periods. The Australian Standards include less stringent sight distance requirements than Austroads, however, in this instance the Austroads requirements are considered more appropriate, noting the number and type of vehicles generated by the site access points.

To confirm the approved access locations met this standard, Developments Biala commissioned a specialist consultant to complete a distance assessment study in 2017. The findings of this study are summarised in Table 3.1 and the full report is provided in Appendix E of this report.

Table 3.1 summarises the approach sight distance (ASD) requirements from Austroads *Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections*, 2010 and the available safe intersection sight distances (SISD), at the two proposed access points. It also displays the mitigation measures to be implemented to ensure these intersections reach Austroads requirements.

Table 3.1: Sight distances at access points

Access point	Available sight distance (metre)
Central Access	○ Southbound - No ASD or SISD issues at 100 km/h ○ Northbound - No ASD issues. SISD limited to 80 km/h due to fence on the western side blocking sight ○ To achieve SISD at 100 km/h need to relocate 200 m of fence and remove any trees in the SISD area.
Southern Access	○ Southbound - No ASD or SISD issues at 100 km/h ○ Northbound - No ASD issues at 100 km/h. SISD limited to 90 km/h due to fence on the western side blocking sight ○ To achieve SISD of 100 km/h need to relocate 50 m of fence to achieve 100 km/h and remove any trees in the SISD area.

ASD = Approach Sight Distance
SISD = Safe Intersection Sight Distance

Developments Biala commits to implementing measures specified in Table 3.1 as part of the site intersection upgrade works.

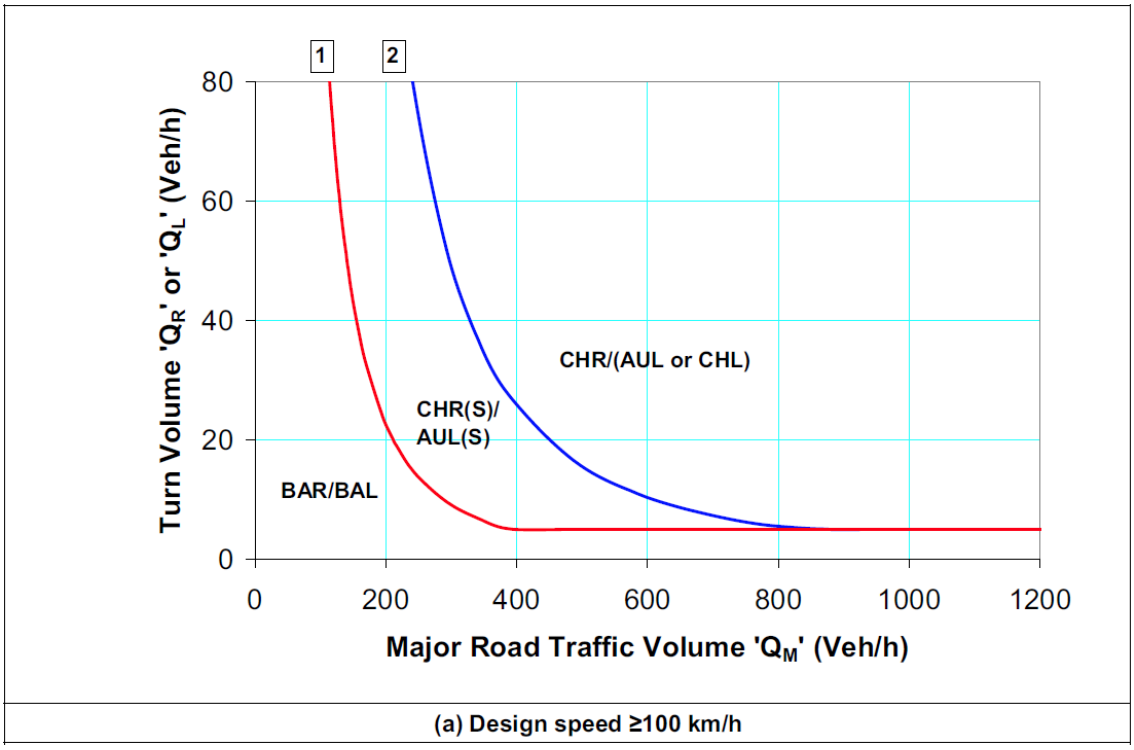
3.2.2 Turn Lane Warrants

The warrants for the various types of turn lane treatments at unsignalised intersections is provided in Austroads *Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections*. The warrants are based on the volume of through and turning traffic at unsignalised intersections.

Grabben Gullen Road (through traffic) currently carries 64 vehicles per hour, whilst the site (turning traffic) is predicted to generate up to 52 vehicles per hour in a peak hour distributed across both access points (refer to Section 4.4). This equates to up to 116 vehicles per hour.

The turn lane warrants from the Austroads Guide are reproduced in Figure 3.2.

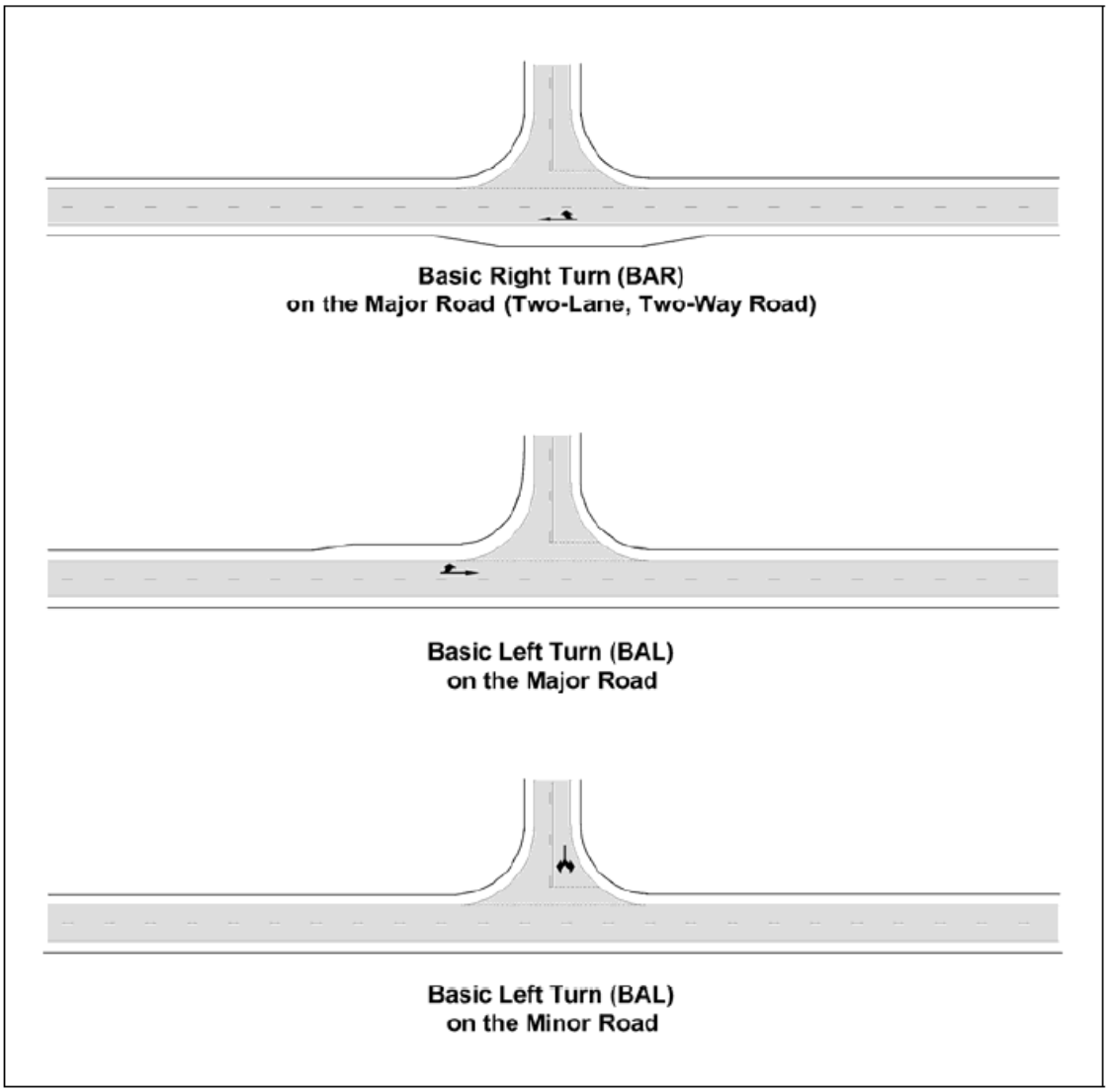
Figure 3.2: Warrants for turn treatments on major road



(Source: Reproduced from Figure 4.9 of the Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections)

An analysis has been undertaken by applying the existing through traffic volumes (major road traffic) and predicted turning volumes (turn volume) assuming a worst-case scenario where all vehicles are turning into one site intersection. Figure 4.9 indicates that basic right turn (BAR)/ basic left turn (BAL) treatments should be provided. Typically, a BAR/ BAL turn treatment involves the widening of the road shoulder to allow a through vehicle to pass a turning vehicle. The indicative layout of a BAR/ BAL turn treatment is set out in the Austroads Guide and reproduced in Figure 3.3.

Figure 3.3: Rural basic turn treatment layouts



Note: Arrows indicate movements relevant to the turn type. They do not represent actual pavement markings.
Source: QDMR (2006).

Source: Reproduced from Figure 4.1 of the Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections

It is recommended that the BAR/ BAL turn treatments be provided at each of the vehicle access points to Grabben Gullen Road. Developments Biala commits to completing these treatments as part of the BoP construction activities. All upgrade works completed on these intersections will undergo design review by ULSC prior to the issue of a section 138 approval, under the NSW Roads Act.

3.2.3 Temporary Signage

During the peak construction periods, there will be heavy vehicles accessing the site. As per the requirements of the Roads and Maritime *Traffic Control at Work Sites* manual, temporary truck signage should be provided throughout the construction period on Grabben Gullen Road. Signs will also be positioned prior to the site entrances to advise the drivers to minimise the use of compression brakes.

Specifically, signage should be provided in accordance with Traffic Guidance Scheme 195 provided in the Roads and Maritime *Traffic Control at Work Sites* manual.

Developments Biala commits to providing this signage.

3.2.4 Upgrades to Site Access Pavement

The internal access roads will be generally made up of unsealed carriageways. To limit loose gravel and dirt being transferred to the Grabben Gullen Road carriageway, the first 20 metres of the site access carriageway will be sealed. Developments Biala will monitor the public road and if excessive loose gravel and dirt is evident additional measures such as tyre cleaning grids will be implemented.

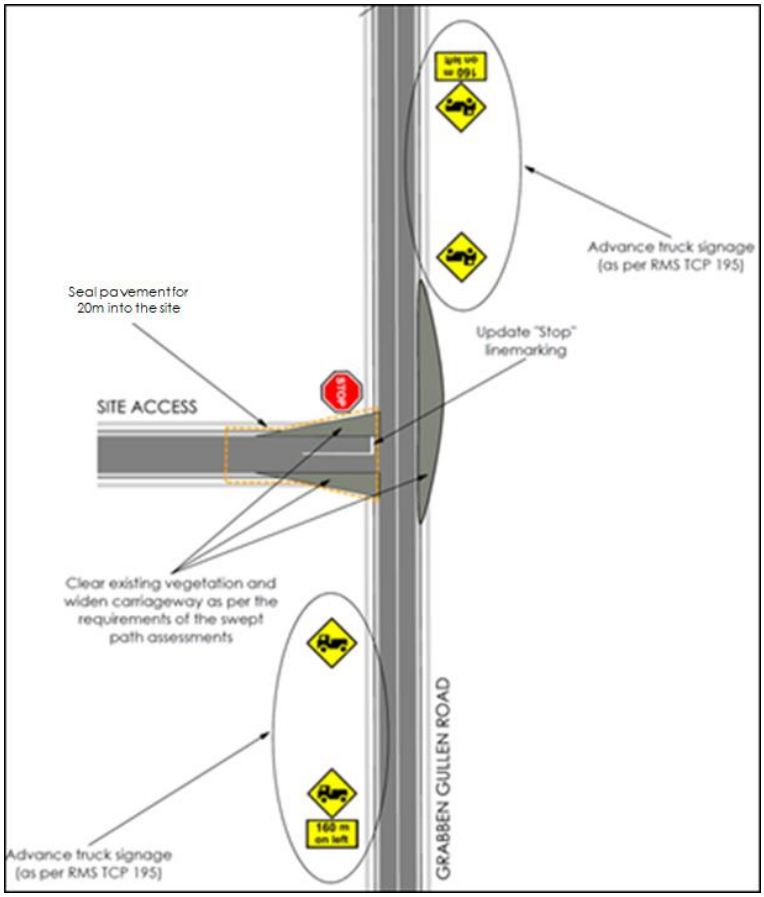
It is also recommended that "Stop" linemarking and signage be provided on each of the vehicle access points to reinforce the priority of Grabben Gullen Road. Developments Biala confirms that this will be put in place.

3.2.5 Summary

To summarise an indicative layout of each of the access points, detailing temporary signage, widening, turn treatments and intersection control, is provided in Figure 3.4. A works authorisation deed and Road Occupancy Licence will be obtained from Roads and Maritime and ULSC prior to any work commencing.

The TGSs for the two site access points are included in Appendix G.

Figure 3.4: Site access works during construction to Grabben Gullen Road (indicative only)



3.3 Construction Program

The total construction timeframe is expected to be about 12 months, with the construction stages and expected duration summarised in Table 3.2.

The construction work is scheduled to commence in quarter four of 2018, with completion by quarter four of 2019. The BoP phase of construction is expected be completed within quarter three of 2019.

Table 3.2: Construction program

Activity	2018	2019			
	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Site intersection upgrade	X				
Site establishment, compounds and amenities	X				
Access tracks and earthworks	X	X	X		
Batch plant operation	X	X	X		
Prepare turbine hardstands and turbine footings		X	X	X	
Install 33 kV cabling		X	X		
Deliver turbine components			X	X	
Erect towers, nacelles and rotors			X	X	

De-mobilise site					X

3.4 Work Hours

The CoC prescribes working hours in schedule 3 condition 7, as follows:

Unless the Secretary agrees otherwise, the Applicant must only undertake construction or decommissioning activities between:

(a) 7 am to 6 pm Monday to Friday;

(b) 8 am to 1 pm Saturdays; and

(c) at no time on Sundays and NSW public holidays.

The following construction or decommissioning activities may be undertaken outside these hours without the approval of the Secretary:

- *activities that are inaudible at non-associated residences;*
- *the delivery of materials as requested by the NSW Police Force or other authorities for safety reasons; or*
- *emergency work to avoid the loss of life, property and/or material harm to the environment.*

Developments Biala commits to complying with this condition throughout construction. Developments Biala will ensure the BoP contractor is contractually responsible for instructing and controlling all subcontractors regarding the hours of work.

3.5 Location of Concrete Batch Plants and Quarries

A concrete batching plant will be provided within the site boundary. Water for concrete batching may be sourced from offsite. Other materials used for making the concrete and the sand required to line the cable trenches will be sourced external to the site.

3.6 Project Personnel Car Parking

Sufficient dedicated on-site worker car parking will be provided. No development related vehicles are permitted to park on public roads at any time. A drop-off and storage facility will be provided on-site for larger tools and equipment. As such, the car parking impact of construction workers will be negligible on Grabben Gullen Road.

4. Construction Traffic Impact

4.1 Type of Vehicles Accessing the Site

4.1.1 RAVs

RAVs will be used to deliver the turbine components (tower sections, nacelles, hubs and blades) to the project area. They will also be used for mobilisation and de-mobilisation of cranes for the assembly of the wind turbines. As this TMP is staged, the details of transport of turbine components will be submitted separately. Once approved, it will form Appendix A of this document.

4.1.2 Over Sized or Over Mass Vehicles

It is anticipated that around 30 over sized/ over mass vehicles will be required for the construction of the BoP works for the BWF. That is, 30 over sized/ over mass vehicles travelling to the wind farm and then 30 vehicles travelling from the wind farm site. Developments Biala will ensure that each load will obtain a permit from the Roads and Maritime Special Permits Unit in Glen Innes. The contact number is 1300 656 371. This permit will follow the specified route for over sized/ over mass vehicles as detailed in Section 4.2.

The definition of an over sized/ over mass vehicle is from the Commonwealth of Australia - Heavy Vehicle National Law Multi-State Class 1 Load Carrying Vehicles Dimension Exemption Notice 2016 (No. 1) Notice 2016. The definition has been summarised in Table 4.1 and Table 4.2. Developments Biala confirms that this definition will be complied with for the BoP construction activities. For further detail of the swept path assessment for these vehicles, refer to Section 4.3.

Table 4.1: Maximum dimension limits

Vehicle	Width (metre)	Length (metre)	Height (metre)
Truck	4.6	12.5	5.0
Truck and heavy trailer combination		19.0	
Prime mover and heavy trailer combination		30.0	

Table 4.2: Maximum rear overhang

Length of vehicle and load (metre)		Maximum rear overhang (metre)
Over	Up to and including	
22	25	5.5
25	26	6.5
26	27	6.8
27	28	7.0
28	29	7.3
29	30	7.5

4.1.3 Construction Heavy Vehicles

Heavy vehicles will be required to access the project site and surrounding areas during the construction period. A heavy vehicle is defined in the development conditions as follows:

Heavy Vehicle – As defined under the Heavy Vehicle National Law (NSW), *but excluding light and medium rigid trucks and buses no more than 8 tonnes and with not more than 2 axles.*

Heavy vehicles anticipated to be generated by the BoP works comprise the following:

- Truck
- Truck and heavy trailer combination
- Prime mover towing
    - Low loader
    - Low loader dolly and a low loader
    - Semitrailer
    - Jinker trailer

These heavy vehicle movements are for the following works:

- Existing road upgrades
- Wind turbine construction
- Substation construction
- Underground cabling
- Transport of plant and equipment, construction materials and temporary and permanent facility components
- Office and maintenance facility construction
- Transport of imported quarry fill materials for the new access tracks and hardstand sites
- Transport of potable water and water for concrete batching.

The heavy vehicles will consist of vehicles up to and including 19-metre long semi-trailers and 19-metre truck and dog trailers.

4.1.4 Light Vehicles

The majority of trips to the project area will be light vehicle movements (attributed to project personnel) comprising of cars, 4x4s and utility vehicles.

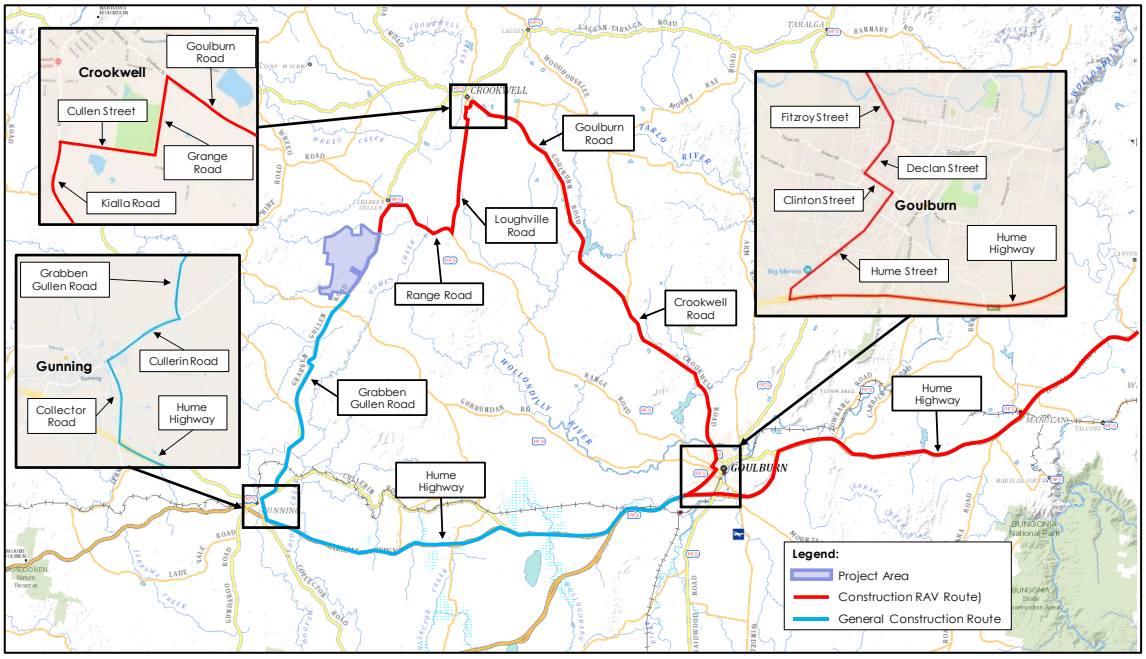
4.2 Construction Vehicle Routes

The designated heavy and over sized/ over mass vehicle routes for the BWF have been approved and included in Appendix 8 of the CoC.

All over sized/ over mass vehicle access to and from the site is via the Hume Highway southern interchange through Goulburn, north along Crookwell-Goulburn Road and then bypassing the Crookwell township via Grange Road, Cullen Street, Kialla Road and Range Road, connecting to Grabben Gullen Road. All heavy vehicle access to and from the site is via the Hume Highway to Gunning then north along Grabben Gullen Road. At all times, the developmental related heavy vehicles must not travel on Hume Street and Yass Street in Gunning (south of Collector Road).

The approved heavy and over sized/ over mass vehicle access routes are shown in Figure 4.1. The BoP contractor will obtain relevant permits under the Heavy Vehicle National Law (NSW) for the use of over dimensional vehicles on the road network.

Figure 4.1: Designated heavy and over sized/ over mass vehicle routes



4.3 Swept Path Assessment

Although the specific details of over sized/ over mass vehicles are not yet known, swept path assessments have been conducted on a 19-metre long semi-trailers and a 19-metre truck and dog trailers, for the BoP works, which is anticipated to be the largest vehicles to access the site.

Considering Grange Road, Cullen Street, Kialla Road and Range Road have historically been used for the over sized/ over mass vehicles (which are much larger than a 19-metre long semi-trailers and a 19-metre truck and dog trailers) for the Gullen Range Wind Farm, no swept path assessment has been provided along these roads.

Swept path assessments (using AutoTURN) have been completed for the intersection of Range Road/ Grabben Gullen Road as well as the central and southern site accesses along Grabben Gullen Road, using a 19-metre long semi-trailers and 19-metre truck and dog trailers. The swept path assessments are provided in Appendix E.

These assessments have determined that the 19-metre long semi-trailers and 19-metre truck and dog trailers used to deliver the over sized/ over mass vehicles can be accommodated within the existing intersection.

Swept path assessments for the WTG supply have been included in Appendix A.

4.4 Traffic Generation

The construction phase of the project is planned to be of 12 months duration. Wind turbine deliveries which are detailed in Appendix A have been included in this traffic generation to provide an assessment of the total project traffic generation.

Project activities related to traffic generation include:

- Movement of large cranes to and from the site

- Deliveries of construction raw materials, sand, gravel, cement, water, steel for foundations and cables
- General preliminary works, site establishment, civil works, laydown area establishment and development of temporary construction facilities e.g. site compound
- Mobilisation and demobilisation of construction plant equipment e.g. excavator, loaders, grader, water cart
- Deliveries of WTG components.

4.4.1 Overall Traffic Generation

The overall traffic generation has been summarised for both the BoP works and the turbine supply and is presented in Table 4.3. Numbers presented indicate number of loads required for material, equipment and personnel. Number of loads has been calculated considering expected access track distance, expected site geotechnical conditions, HV cable lengths, crane requirements, size of turbine foundations, tonnes of material and personnel carried in each vehicle, construction equipment required and the size of the site compound. This calculation results in a total predicted number of loads to site of approximately 7,374. Each of these vehicles will also need to return from site.

Table 4.3: Overall traffic generation for BoP works and WTG supply

Works	Number of loads	Vehicle type
BoP		
Raw materials	2,434	Heavy vehicle
Steel	145	Heavy vehicle
Cable	17	Heavy vehicle
Personnel	1,764	Light vehicle
Construction plant equipment	24	Over sized/ over mass
Construction plant equipment	16	Heavy vehicle
Site compound	14	Heavy vehicle
Site compound	6	Over sized/ over mass
WTG Supply		
Turbine delivery	341	Over sized/ over mass
Turbine delivery	93	Heavy vehicle
Turbine delivery	186	Light vehicle
Crane mobilisation	10	Over sized/ over mass
Crane mobilisation	15	Heavy vehicle
Crane mobilisation	5	Light vehicle
Personnel	2,304	Light vehicle

4.4.2 Maximum Trips per Hour

It is estimated that during peak construction periods there will be up to 74 construction personnel on site. Given that most personnel will be required to travel some distance to the site it is anticipated that there would be a component of carpooling and as such, a vehicle occupancy rate of 1.5 people per vehicle has been assumed. Construction personnel are likely to start and finish work shifts at the same time. Consequently, the maximum vehicle loads per hour is anticipated to be approximately 52 trips (50 construction personnel plus two over sized/ over mass or heavy vehicles) during the peak construction periods.

4.4.3 Maximum Daily Traffic Volumes

As per the construction program outlined in Section 3.3, for a short period of time there will be some overlap in the construction of the access tracks and turbine foundation construction. This period of construction will result in the highest volume per day of heavy vehicles delivering materials to site. These deliveries will be spread across the duration of the day within the allowed construction hours. The maximum daily traffic volumes will then be a combination of the light vehicles for staff and the loads for access track and turbine foundation construction.

Latest forecasts for the maximum daily traffic volumes align with the expected generation as forecast as part of the EIS, is up to 110 total loads per day of material, equipment or personnel. As described earlier, about 50 of these will be generated by personnel accessing the site.

This daily traffic peak of BoP activities is not predicted to align with the delivery of turbine components. During this peak time of construction there will be a focus on community engagement, ensuring that the surrounding community and school buses are informed of the vehicle movements occurring and the contact details for Developments Biala will be provided.

4.5 Traffic Distribution

It is anticipated that the construction related traffic generated by the project area would be distributed across the surrounding regional hubs of Crookwell, Goulburn, Yass and Canberra. These hubs will most likely supply the construction personnel and materials for the construction works.

4.6 Traffic Impact

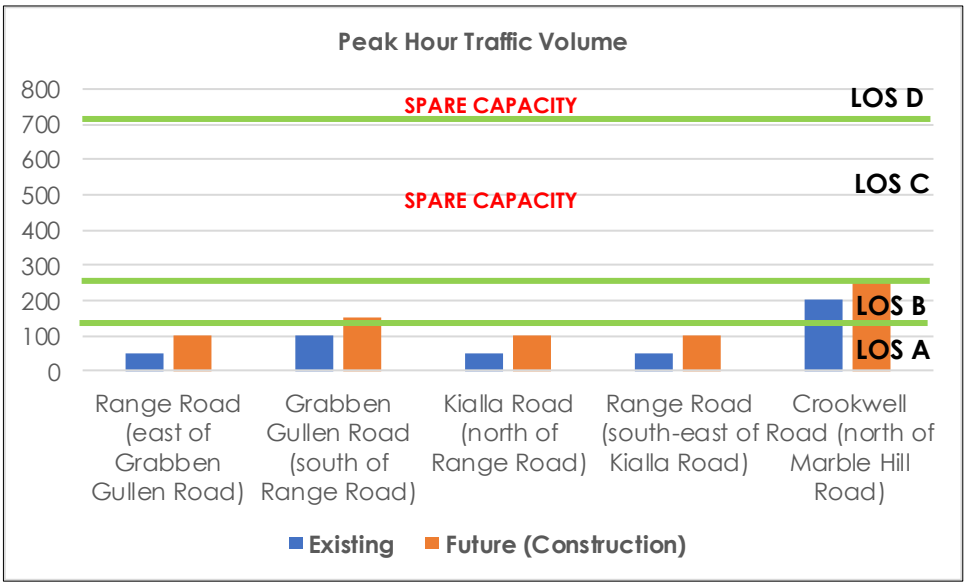
As described previously, the maximum peak hour traffic generated during construction is estimated to be up to 52 vehicles per hour. As this traffic is travelling from different destinations, the maximum impact on any part of the network is likely to be less than 52 vehicles per hour.

Figure 4.2 shows that a section of road with a 100 km/h speed limit and rolling terrain would not reach LOS C until the traffic volume reaches 710 vehicles per hour. Crookwell-Goulburn Road currently operates with a LOS B and a peak hour traffic volume of approximately 200 vehicles per hour, indicating that the road will continue to operate at an acceptable LOS, with sufficient spare capacity with the addition of the estimated maximum number of construction vehicles. This level of operation will be maintained if all 52 vehicles per hour are presumed to travel on this route.

The remaining roads near the project area carry less than 50 vehicles per hour during the peak hour. The addition of the maximum 52 vehicles per hour would result in the performance of that route remaining the same at a LOS of B or better.

However, the additional developmental related traffic would likely be spread across a number of routes accessing the site, which will reduce the operational impact on the surrounding road network.

Figure 4.2: Road network spare capacity for BoP construction works only



It is anticipated that during the peak construction period, large and heavy vehicle movements would occur outside the general peak periods, whilst general construction vehicle movements (i.e. construction personnel) could be expected to coincide with the road network peak period.

4.6.1 Cumulative Impacts

As discussed in Section 0 there are no other wind farms likely to be constructed concurrently, which could cause a cumulative loading on the access routes for the BWF during its construction period. Although there are other local developments, these are much smaller and are not anticipated to cause a significant cumulative impact.

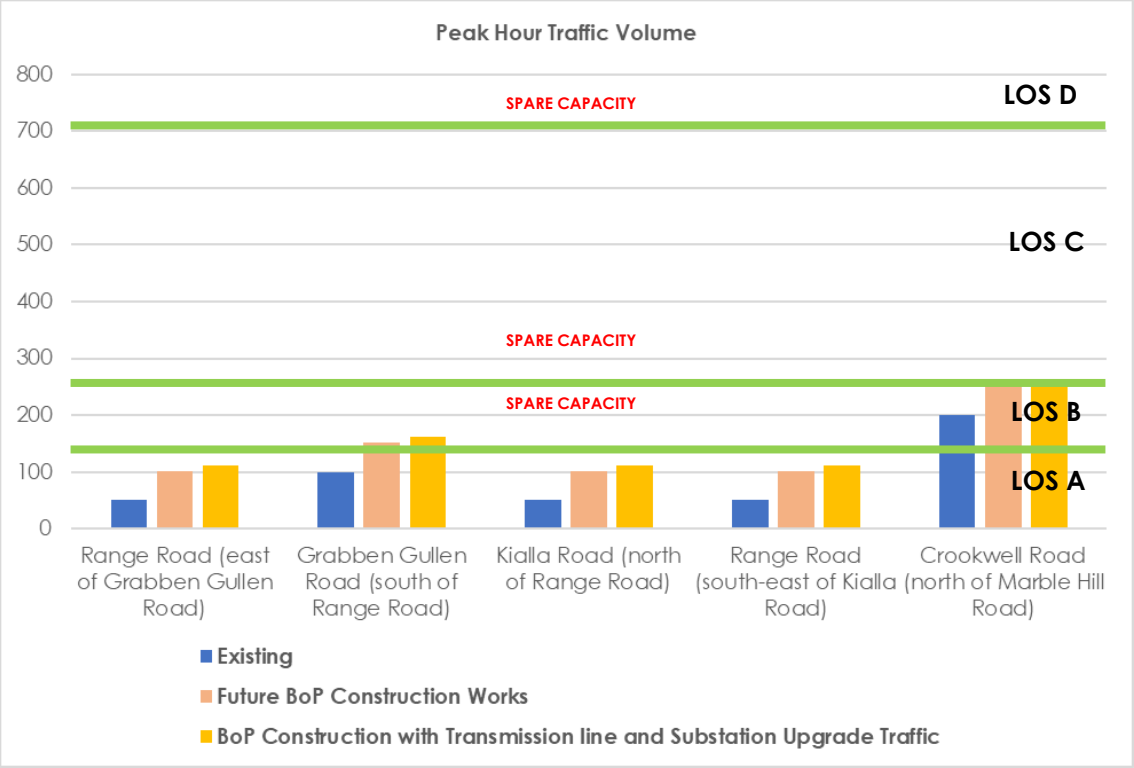
As part of the BWF project, a 12-kilometre underground transmission line will need to be constructed between BWF and Gullen Range Wind Farm. The Gullen Range Wind Farm will also require a minor extension.

These works are subject to a separate planning approval. The Statement of Environmental Effects for these works estimates that the transmission line works will result in approximately 73 heavy and 300 light vehicles using local roads. The substation upgrade will involve approximately 119 heavy and 450 light vehicles. These works are expected to occur concurrently with the BWF construction and last for a period of four months, such that the predicted increase to traffic volume would be 10 vehicles a day.

In this regard Figure 4.3 indicates that there is sufficient spare capacity to accommodate the likely cumulative traffic generation of transmission line and substation upgrade works whilst maintaining a LOS of B or better.

Grabben Gullen Road (south of Range Road) which is currently operating at LOS A, is expected to operate at LOS B with the cumulative traffic generation.

Figure 4.3: Road network spare capacity for cumulative traffic



4.7 Road Upgrades

The CoC includes the requirement to complete road upgrades under Schedule 3 Condition 25. The upgrade works are to be completed to the satisfaction of council and are listed in Appendix 7 of the CoC.

These works will be completed prior to any over-dimensional vehicles accessing site. In summary, they include replacing causeways on Kialla Road, rehabilitating pavement on Range Road and intersection treatments. Developments Biala is required to fund these works. Work has already begun in designing these road upgrades, in consultation with Council.

It is noted that ULSC is currently upgrading Grabben Gullen Road at the hairpin bend approximately 14 kilometres north of Gunning (known as "Devil's Elbow"), with works to be completed by end of March 2018.

4.8 Monitoring and Maintenance of Roads

4.8.1 Monitoring

To ensure that the roads used by traffic associated with the construction of the BWF site are maintained to a suitable standard commensurate with their function, Developments Biala has been conditioned as part of the CoC to provide pre- and post-construction road dilapidation report surveys (see Schedule 3 - Condition 26).

During construction the condition of the road surfaces will be monitored monthly and following any complaint or incident.

4.8.2 Maintenance and Emergency Repair

Any emergency repair requirements or maintenance during construction and/ or decommissioning would be completed as required, in consultation with ULSC.

4.9 Mitigation and Management Measures

Table 4.4 summarises all mitigation measures committed to throughout this TMP. For each measure, the responsible party and stage of project is listed.

Table 4.4: Mitigation and management measures

Factor	Management of control measure	Responsibility	When does this apply?
Permits/ Consent/ Licences	○ Contractors will abide by this TMP once approved by the Secretary. ○ All construction will comply with requirements of Section 138 of the Roads Act 1993 'Works and Structures'. ○ The BoP contractor will obtain a Road Occupancy Licence from Roads and Maritime Traffic Operations Unit prior to commencing work within the classified road reserve or within 100 metres of traffic signals. ○ The BoP contractor will ensure that all requirements for Road Occupancy Licences are obtained from both ULSC and from Roads and Maritime prior to any work commencing on the stipulated roads. ○ A Works Authorisation Deed (WAD) will be agreed between Developments Biala and Roads and Maritime for the construction works proposed to upgrade site access points. The design and construction of the access points will be in accordance with the current Austroads Guidelines, Australian Standards and Roads and Maritime Supplements. ○ The BoP contractor will be responsible for obtaining all access permits and approvals under the National Heavy Vehicle Law and Regulations.	BoP contractor (Developments Biala to ensure compliance)	Throughout construction
Haulage	○ The BoP contractor will use an appropriately licensed haulage contractor for haulage of any items to site. The contractor will have experience in transporting similar loads and be responsible for obtaining all required approvals and permits from Roads and Maritime or National Heavy Vehicle Regulator and Councils and for complying with conditions specified in the approvals. ○ All loaded vehicles entering or leaving site will have their loads covered or contained.	BoP contractor (Developments Biala to ensure compliance)	During construction
Access point requirements	○ Sight distance requirements will meet Austroads Guide. ○ BAR/ BAL turn treatments will be provided at each of the access points. ○ The entrances to the Grabben Gullen Road will incorporate 20 metres of sealed access track. ○ Drag-out from vehicles onto the public road will be monitored. A tyre cleaning grid will be installed if needed. ○ Temporary truck signage will be installed, throughout the construction period.	BoP contractor (Developments Biala to ensure compliance)	Throughout construction

Factor	Management of control measure	Responsibility	When does this apply?
Road condition and dilapidation	○ Developments Biala will undertake dilapidation surveys in accordance with Schedule 3 condition 26 of the Project Approval. ○ The BoP contractor will ensure monthly monitoring occurs of the road conditions on the heavy vehicle route.	Developments Biala in conjunction with BoP contractor	Prior to, throughout and post construction
Consultation	○ Effective on-going consultation will be undertaken with relevant stakeholders as per section 6.2. ○ Liaison activities will include a combination of the following: ○ Text message alerts ○ One on one meetings ○ Newspaper articles or advertisements ○ Monthly project newsletter distributed via email ○ Email and Phone discussions ○ Follow through of complaints as per procedure ○ An up to date website ○ Operating a Community Consultative Committee.	Developments Biala in conjunction with BoP contractor	Prior to, throughout and post construction
Traffic control plans	○ Any specific TGSs required will be developed by personnel duly qualified and certified by training in accordance with *Traffic Control at Work Sites*. TGSs will be based on the *AS1742.3 Manual of uniform traffic control devices – Part 3: Traffic control for works on roads*, the Roads and Maritime *Traffic Control at Work Sites* (2010) and The Workplace Health and Safety Act 2011 in consultation with Roads and Maritime and local councils, as required.	BoP contractor (Developments Biala to ensure compliance)	Pre-construction and as required during construction
Delays to traffic	○ Construction trucks are to follow approved routes at all times. ○ Light vehicles to always drive responsibility and consider other road users. This will be incorporated in the site induction. ○ As the loading on the road network will remain below a LOS of C no substantial delays to traffic are expected. ○ Sufficient dedicated onsite personnel car parking will be provided. ○ Construction trucks' arrival and departure are to be planned with consideration to minimising effect to other road users during peak traffic periods.	BoP contractor (Developments Biala to ensure compliance	During construction
Safety of road users and construction staff	○ Work is to be arranged so workers can undertake work safely, and where possible road users and workers are kept separated. ○ Place signs and devices before proceeding with works. ○ Ensure signs are not obscured by vegetation, vehicles, plant or other traffic control signs/ devices and that signs are placed in the correct order. ○ Where traffic controllers are required, they must be suitably qualified having passed Roads and Maritime approved training courses. ○ Traffic controllers (or portable traffic signals if directing traffic to cross barrier lines) shall be used if road users are to be directed to disobey a traffic regulation. ○ All traffic controllers are to wear high visibility external clothing. ○ Signs, devices and TGSs shall be used to warn, inform and guide road users safely around, through or past work areas. ○ Signs, devices and TGSs are to be removed from the site upon completion of the work. ○ Specific TGSs will be prepared for all work which involves any form of traffic control or restriction. ○ An increased risk of rear end collisions arises in any location where road traffic is stopped for a period of time. Ensuring that there is	BoP contractor (Developments Biala to ensure compliance)	During construction

Factor	Management of control measure	Responsibility	When does this apply?
	sufficient warning to road users before encountering the queue is essential. ○ Depending on the situation this may require extending the length of a sign posted roadwork speed zone in the development of the TGS, using oversized signs, flashing light signs and variable message signs.		
Driver's code of conduct	○ The drivers code of conduct has been developed in consultation with balance of plant, transport contractor(s) and reviewed by Developments Biala. The TMP it will be implemented by Development Biala and the appointed BoP contractor for all traffic and transport construction activities associated with the balance of plant construction. A Code of Conduct is included in section 5. ○ Training records will be kept for all inductions and the Transport code of conduct. ○ Controls in the code include: ○ Travelling speeds ○ Haulage routes ○ Details on school zones and school bus routes including times ○ Details on stock crossing locations ○ Safe driving practices ○ All traffic will be courteous to other users ○ Heavy vehicle driver fatigue policies ○ Vehicle maintenance requirements ○ Complaints resolution ○ Disciplinary procedure.	BoP contractor and all those involved in the project	During construction
Stock Movements	○ Enhanced temporary signage will be provided by Developments Biala to the owners of Residence H07. ○ Every worker onsite will be informed of the potential for stock movements through the site induction. ○ Slowing at the temporary stock signs is part of the driver's code of conduct. ○ If complaints are received that traffic is not behaving appropriately, vehicle tracking information will be reviewed, and disciplinary action taken where appropriate. ○ Developments Biala will provide a dedicated phone number to the owners of Residence H07 to discuss traffic and stock movements on Grabben Gullen Road throughout construction. ○	Developments Biala in conjunction with BoP contractor	During construction
School Bus Routes	○ Details and times of school bus routes will form part of the site induction, so all drivers will be aware. ○ Consultation is to be ongoing with bus operators. ○ If deemed necessary, an escort vehicle may be provided.	Developments Biala in conjunction with BoP contractor)	During construction

5. Driver's Code of Conduct

The following code of conduct will be revised by Developments Biala in conjunction with the BoP contractor prior to commencement of on-site works for the project. After Developments Biala's approval it will be implemented for all traffic and transport construction activities associated with the BoP construction.
The following code of conduct will form part of Development Biala's requirements of the BoP contractor, where the BoP contractor is expected to comply with the code of conduct in full. It is Development Biala's expectation that the Code of Conduct will be implemented for all traffic and transport construction activities associated with the BoP construction.

5.1 Driver's Code of Conduct

This code of conduct will be communicated to all site workers during the site induction process. Workers will be reminded of the requirements of the code of conduct regularly in toolbox meetings.

The code of conduct will be revised prior to commencement of on-site works and when required during construction works.

5.1.1 Travelling Speeds

All vehicles associated with the BWF site are required to travel within the posted speed limits on public roads. In situations where driver's visibility and traffic safety on public roads is affected by weather related conditions such as heavy rainfall or fog, construction vehicles should reduce their speed limit until visibility and traffic safety has improved.

Vehicle tracking management systems will be used for all site-based vehicles during construction.

5.1.2 Haulage Routes and Timing of Transport

All large vehicles associated with the BWF site will follow the designated heavy and over sized/ over mass vehicle routes in the surrounding area. A map of the haulage routes highlighting critical locations is attached to the transport code of conduct. Any school zones and school bus routes corresponding to the transport routes will be marked on the route maps. The route maps identified for OSOM and HV routes are detailed in Figure 5.1, 5.2 and 5.3.

Figure 5.1: OSOM Route – Woolongong to Mittagong

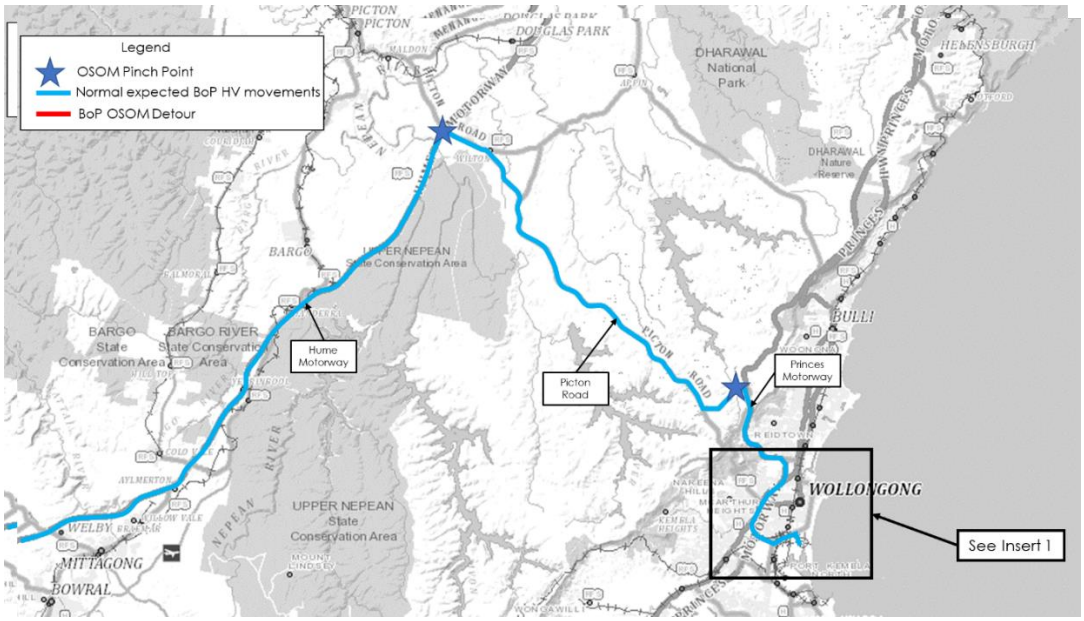


Figure 5.2: OSOM Route - Woolongong

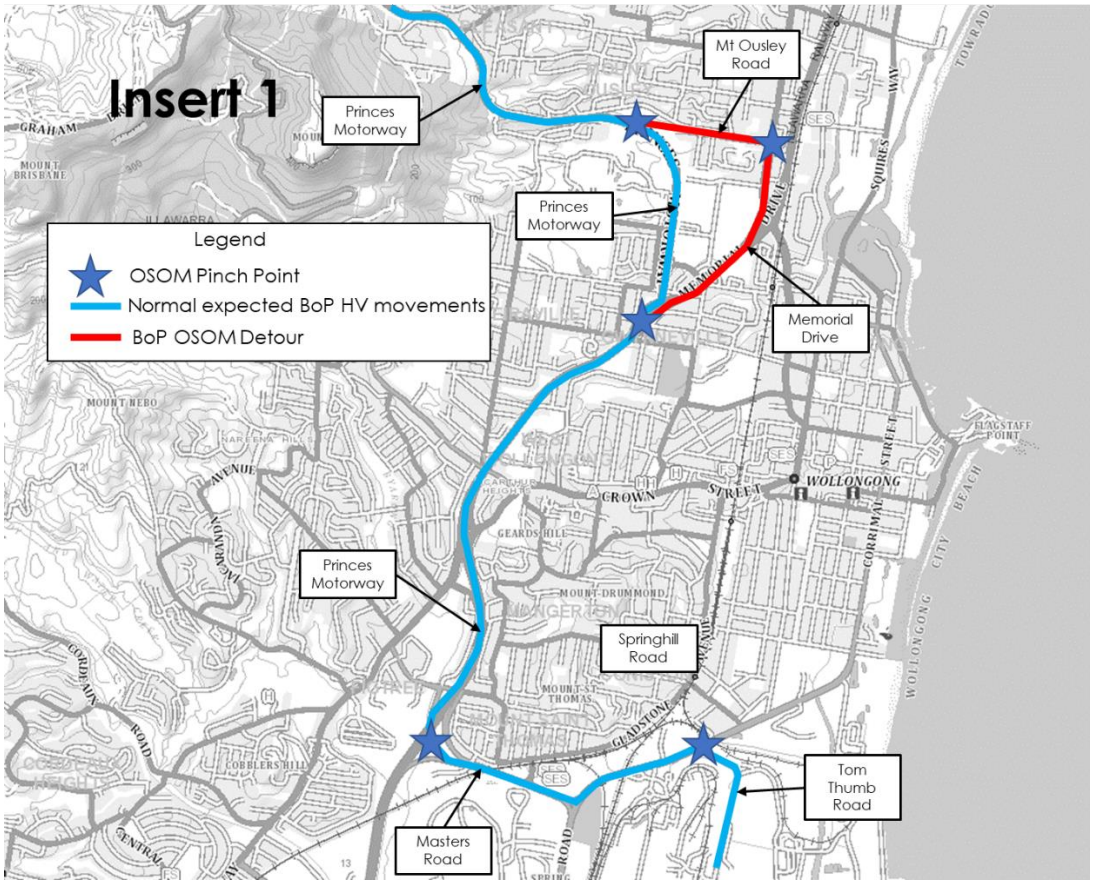
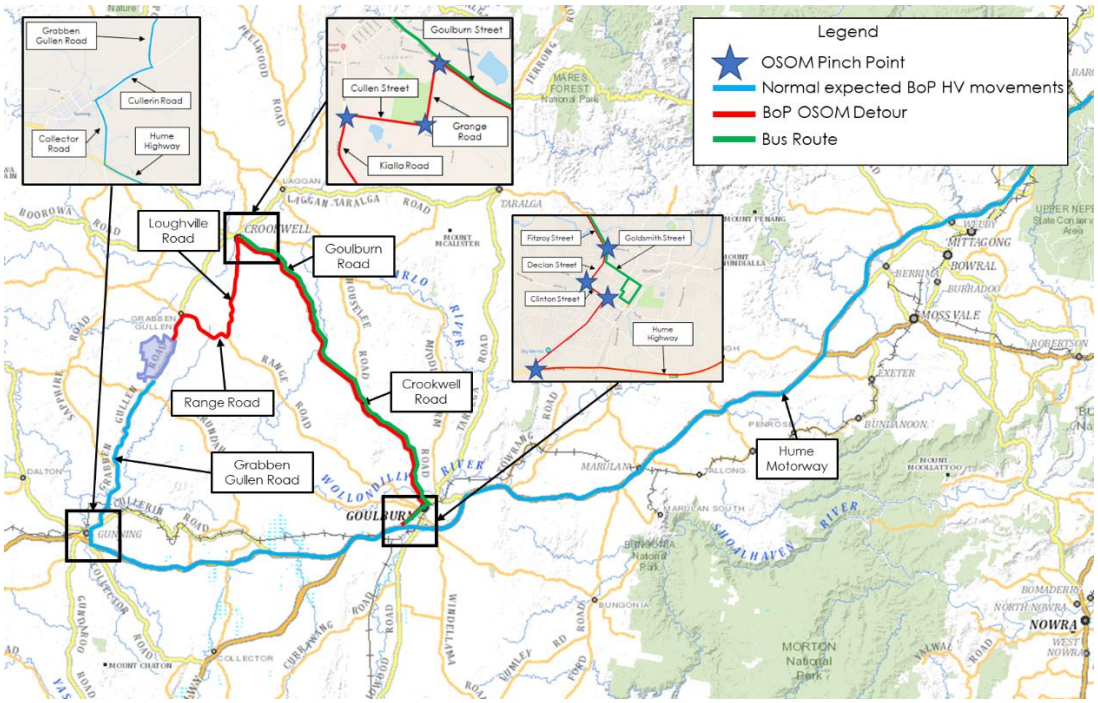


Figure 5.3: OSOM Route and HV movements – Mittagonog – Crookwell



When Gunning Road is being used for transporting the components, all drivers of heavy vehicles associated with the development shall be required to use the grade separated intersection of the Hume Highway and Gunning-Collector Road for all movement onto the Hume Highway eastbound.

The BoP contractor will complete the following measures to minimise impact on school bus routes:

- Details and times of school bus routes will form part of the site induction.
- Consultation will be ongoing with bus operators.
- If deemed necessary, an escort vehicle for the school bus will be provided.
- Over dimensioned and over mass deliveries are subject to the BoP contractor obtaining relevant approvals from RMS, with such deliveries typically escorted outside school bus operation hours. Refer to Appendix I for the RMS letter outlining the OSOM approval process.

5.1.3 Safe Driving Practices

The operators of all vehicles associated with the BWF site would maintain a high level of awareness and respect for all other road users. All on-site staff will receive a site induction, which will include details regarding the TMP and this code of conduct. Regular toolbox meetings will be held to maintain awareness of required controls. Details of the traffic and access training and induction will focus on:

- Objectives of the TMP
- Performance goals
- Mitigation measures required to be implemented
- Traffic and access monitoring and reporting requirements
- Incident investigation and response protocols.

Training is to be provided prior to start-up of any traffic and access related management tasks and updated if task, equipment or procedures are expected to, or have changed.

The following requirements would be adhered to at all times:

- Obey all laws and regulations
- Do not drive whilst under the influence of alcohol, drugs, nor any medication which may affect ability to drive
- Be medically fit to drive at all times and must inform site coordinators if they have any medical condition which may affect their ability to drive
- Drive in a considerate manner at all times and respect the rights of others to use and share the road space
- Report all vehicle defects to their employer. Serious defects must be corrected immediately, or an alternative vehicle supplied
- Any vehicle crash or incident resulting in injury or significant damage to property must be reported to the police
- Report any near misses
- Always adhere to the site working hours
- Only drive the construction vehicle when conducting works related to the project
- Securely fasten and cover loads, as appropriate
- Keep their vehicle clean and in good mechanical condition to reduce the environmental impact
- Extra care should be taken when driving at dawn or dusk, being particularly watchful for wildlife and/ or livestock
- Vehicles must give way to pedestrians, cranes, forklifts, mobile plant, emergency vehicles and livestock
- Drivers must reduce speed to below 40 km/h and be prepared to stop when the temporary signs for stock movement are erected, on Grabben Gullen Road, north of the Central Access and south of Range Road.

The transport BoP contractor is to develop and implement a maintenance program for the heavy transport vehicles that is consistent with these safety requirements.

5.1.4 Heavy Vehicle Driver Fatigue

Fatigue is one of the biggest causes of crashes for heavy vehicle drivers. The Heavy Vehicle Driver Fatigue Reform was therefore developed by the National Transport Commission and approved by Ministers from all States and Territories in February 2007. The heavy vehicle driver fatigue law commenced in NSW on 28 September 2008 and applies to trucks and truck combinations over 12 tonne gross vehicle mass (however there are Ministerial Exemption Notices that can apply). Under the law, industry has the choice of operating under three fatigue management schemes:

- Standard hours of operation
- Basic fatigue management
- Advanced fatigue management.

Developments Biala will be responsible to ensure all heavy vehicle drivers operating out of the BWF site are to be aware of and understand the adopted fatigue management scheme and operate within its requirements, as included in Appendix H.

5.1.5 Maintenance Requirements

The operators of all vehicles associated with the BWF site would maintain a high level of maintenance. The following requirements would be adhered to at all times:

- Ensure their vehicle complies with relevant State legislation in relation to roadworthiness and modifications
- Undergo regular vehicle checks and maintenance and
- Ensure their vehicles have correctly fitted mufflers to minimise noise disturbance.

5.1.6 Complaint Resolution and Disciplinary Procedure

All traffic related complaints will be managed in accordance with the BWF Complaints Handling Procedure included in the annexure section of the Environmental Management Strategy.

A brief overview is described as follows, and all complaints will be collated via the following means and be responded within two business days:

- Toll Free Phone: 1800 370045
- Email: info@bialawindfarm.com
- Write: Biala wind farm, Suite 3, Level 21, 1 York Street, Sydney, NSW 2000
- Feedback Form: http://bialawindfarm.com/contact-us/

Failure to comply with these procedures for safe transport may result in disciplinary action. Vehicle tracking will be used to follow-up on any complaints lodged. If a complaint occurs on Grabben Gullen Road north of the Central access and South of Range Road, one warning to the involved driver will be issued. If a second complaint against the involved driver occurs that driver will be removed from site.

6. Consultation

In accordance with the requirements of the CoC Schedule 3, Condition 28 this TMP must be developed in consultation with Roads and Maritime and ULSC. Developments Biala will liaise with both Roads and Maritime and ULSC regarding construction schedules and truck routes and will raise any potential conflict with both authorities at the earliest time.

6.1 Roads and Maritime

Consultation with Andrew Lissenden (Assistant Manager of Land Use Development – Network and Safety Southern, Roads and Maritime) on Wednesday, 17 January 2018 identified the conditions as part of the STH13/ 00123 correspondence dated 5 August 2013, these comments are shown in Table 6.1.

Table 6.1: Roads and Maritime comments prior to TMP preparation

Roads and Maritime comment	Addressed
Prior to transporting any over sized/ over mass loads, the applicant shall obtain a permit for an over sized/ over mass load from the Roads and Maritime Special Permits Unit in Glen Innes. The contact number is 1300 656 371.	Section 4.1.2
Roads and Maritime recommends that the applicant liaise with the Roads and Maritime Special Permits Unit early in the process to assess the appropriateness of the route for transporting over sized/ over mass loads and identify any other potential issues.	Routes already specified in the CoC
It should be noted that the issuing of a Special Permit may be subject to route and bridge assessment(s) if deemed necessary by the Roads and Maritime Special Permits Unit as these issues have not been covered by the Traffic and Transport Assessment (TTA). While the TTA has considered the length, width, height and swept paths for over-sized loads/ vehicles, no details have been provided as to the expected weight of loads or axle loadings for the over sized/ over mass movements. The maximum weight of loads associated with the subject development to be moved should be provided.	Sections 4.1.2 and 4.2
A TMP shall be developed in consultation with the Roads and Maritime Southern Traffic Operations Unit and with Council's Local Traffic Committees. The TMP (and associated TGSs) shall be submitted to Council's Local Traffic Committee for final acceptance.	Section 1
A copy of the accepted TMP shall be forwarded to Roads and Maritime (development.southern@rms.nsw.gov.au) prior to any transportation occurring or works commencing on the site for this development.	Section 1
During the use of Gunning Road for the transporting of the components is adopted, all drivers of heavy vehicles associated with the development shall be required in any Transport Code of Conduct or similar policy/ document to use the grade separated intersection of the Hume Highway and Gunning-Collector Road for all movement onto the Hume Highway eastbound.	Section 5.1.2
Prior to any road construction works commencing on State-owned roads, the applicant will need to provide detailed road design for approval and enter into a Works Authorisation Deed (WAD). A WAD (in respect of site accesses along Grabben Gullen Road) will be submitted to Roads and Maritime for approval with the works identified in the WAD to be undertaken by a Roads and Maritime pre-qualified contractor.	Table 4.4

A Draft copy of the BoP TMP was submitted to Roads and Maritime on the 5 September 2018 for comment. On the 17 September 2018 Roads and Maritime provided formal comments and required no amendments on the draft BoP TMP. Refer to Appendix I for a copy of the letter.

6.2 Council

The local council of the project area and surrounding road network is the ULSC. Developments Biala will liaise with ULSC regarding the construction access, construction methodology, approach routes and potential impacts on the existing road and pedestrian activities.

A draft copy of the BoP TMP was submitted to ULSC on 27 August 2018 for comment. On 13 September 2018 ULSC provided approval with no further comments on the draft BoP TMP. Refer to Appendix J for a copy of the correspondence from Council.

6.3 Community

Developments Biala community consultation in relation to traffic and access will include on-going consultation and engagement with relevant stakeholders and community members including, local landholders, emergency services, business owners, school bus companies and local community groups.

As per the Community Consultative Strategy, Annex C of the BWF Environmental Management Strategy, Developments Biala will engage with the community using the following methods:

- Notifications, prior to commencement of any significant on site works that may cause a change to the traffic accessing the site (both type of vehicles or number of vehicles).
- Notifications prior to any works on the public road, such as works to the site entry intersections.
- Notifications will include ads in local newspapers (depending on predicted impact), updates on the project website, monthly electronic newsletters, regular text message updates and any other notifications required by licences or other approvals.
- One on one meetings with all residents with three kilometres of a turbine, and those that specifically request a meeting.
- Monthly newsletter distribution to registered email contacts. In April 2018 the distribution list was 40 recipients and growing. Key newsletters may also be distributed by post runs and inserts in the Crookwell Gazette.
- Developments Biala will operate a project website, a dedicated project email address and a dedicated project 1800-number. Enquiries relating to traffic can be submitted through these means. Developments Biala aims to respond to enquiries within two business day of receipt.
- Important announcements may also be made in the Crookwell Gazette and Gunning Lions Club Newsletter as required.
- Developments Biala will operate a Community Consultative Committee for the life of the project.

Engagement completed to date includes one on one meetings with over 60 local residents, two newsletter mailouts via letterbox drop, email and post. Developed a distribution list of over 60 email addresses for future distribution. Responded to 20 email and phone enquiries which have been mainly about subcontractor opportunities. Held a stall at the Crookwell show explaining the project and discussing renewable energy with the community.

Developments Biala has begun compiling a contact list of mobile numbers to ensure all interested parties receive the text message updates on traffic movements when they occur.

Developments Biala is contactable via:

- Post, Suite 3, Level 21, 1 York St Sydney 2000
- Email, info@bialawindfarm.com
- Phone, 1800 370045.

All traffic related complaints will be managed in accordance with our complaints handling procedure, which is available on our website along with the previous complaints register. All

complaints are taken seriously and initial response is completed within two days. To date there have been no complaints submitted to Developments Biala.

7. Monitoring, Reporting and Compliance

Monitoring and reporting of the effectiveness of the measures outlined in this TMP will occur in accordance with Table 7.1.

Table 7.1: Monitoring and reporting of TMP measures

Action	Frequency
Review of Traffic Management Plan and Transport Code of Conduct	Review every 6 months or after a complaint or incident requires amendment.
Review of Site Induction to ensure it includes relevant traffic related information	Monthly during construction.
Review training records to ensure all site staff have completed the site induction and the transport code of conduct	Monthly during construction.
Review that driver behaviour is in accordance with this TMP and the Drivers Code of Conduct	Developments Biala will remain vigilant to any non-compliance by any site staff during construction. Developments Biala will undertake monthly safety audits including spot checks on compliance with the TMP, evidence of truck and trailer safety inspections and the Drivers Code of Conduct.
Review of complaints relating to traffic	Any complaints will be handled in accordance with BWF's Complaints Handling Procedure. An updated (anonymised) complaints register will be placed on the project website at monthly intervals. Any traffic related complaints will be discussed immediately with any relevant contractors. During monthly project meetings, traffic related complaints will be discussed as an agenda item.
Traffic Incident follow-up	Monthly review of incident reports on register to ensure actions are closed out and all follow-ups are completed.
Monitor conditions of access roads to site	Monthly.
Monitor loose material on public road at site entrances	Daily.

Appendix A

Traffic Management Plan for Supply of Wind Turbines

Appendix B

Approval – Staged Submission of Traffic Management Plan

Resource and Energy Assessments
Contact: Stephen Shoesmith
Phone: 9274 6164
Email: stephen.shoesmith@planning.nsw.gov.au

Mr Tim Mead
Biala Developments
Biala Wind Farm

Via Email to: tim.mead@jncec.com

Dear Mr Mead

Biala Wind Farm (SSD 6039)
Approval – staged submission of traffic management plan

I refer to your letter dated 08 May 2018, seeking the Secretary's approval to stage the submission of the Traffic Management Plan (TMP) for the Biala Wind Farm.

The Department notes that Biala Developments propose to submit the TMP in two stages that align to the project's construction contracts. Stage 1 includes all construction activities (electrical and civil) that are not the construction of Wind Turbine Generators (WTG). Stage 2 will include the construction of WTGs.

The Department does not object to the proposal but notes that the TMPs should be submitted and approved prior to the commencement of activities included in each construction contract and that both versions should be prepared in consultation with RMS and Upper Lachlan Shire Council.

Accordingly, the Secretary approves the staged submission of the TMP, in accordance with Condition 15, Schedule 2 of Development Consent SSD 6039.

If you require further information, please contact Stephen Shoesmith on 9274 6164 or by email to stephen.shoesmith@planning.nsw.gov.au.

Yours sincerely

12/7/18

Steve O'Donoghue
A/Director
Resource and Energy Assessments
as nominee of the Secretary

Appendix C

Survey Results

Street: Site 1: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 1
Speed Limit: 80 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Northbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	76.9	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	91.6	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	84.5	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	93	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	96.7	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	61.5	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	85.8	-
Tue 06/02/18	5:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	65.6	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	109	-
Tue 06/02/18	6:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	79.6	-
Tue 06/02/18	6:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	90	-
Tue 06/02/18	7:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	94.7	-
Tue 06/02/18	7:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	91.7	-
Tue 06/02/18	7:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	7:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	8:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	80.6	-
Tue 06/02/18	8:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	90.1	-
Tue 06/02/18	8:30	3	2	0	0	0	0	0	0	0	1	0	0	0	0	87.5	-
Tue 06/02/18	8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	9:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	85.3	-
Tue 06/02/18	9:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	9:30	2	1	1	0	0	0	0	0	0	0	0	0	0	0	84.3	-
Tue 06/02/18	9:45	2	1	0	0	0	0	0	0	0	1	0	0	0	0	85.9	-
Tue 06/02/18	10:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	60.1	-
Tue 06/02/18	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	10:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	81.5	-
Tue 06/02/18	10:45	4	3	0	0	0	0	0	0	0	1	0	0	0	0	87.5	-
Tue 06/02/18	11:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	82.6	-
Tue 06/02/18	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	12:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.7	-
Tue 06/02/18	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	77.7	-
Tue 06/02/18	12:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	105.4	-
Tue 06/02/18	13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	13:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	78.4	-
Tue 06/02/18	13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	83.3	-
Tue 06/02/18	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	14:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	80.8	-
Tue 06/02/18	15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	85.2	-
Tue 06/02/18	15:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	89.7	-
Tue 06/02/18	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	71.7	-
Tue 06/02/18	16:00	3	2	0	0	0	0	0	0	0	1	0	0	0	0	86.7	-
Tue 06/02/18	16:15	2	1	0	0	1	0	0	0	0	0	0	0	0	0	79.1	-
Tue 06/02/18	16:30	2	1	0	1	0	0	0	0	0	0	0	0	0	0	59.6	-
Tue 06/02/18	16:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	78.3	-
Tue 06/02/18	17:00	2	1	0	0	0	0	0	0	0	1	0	0	0	0	84.6	-
Tue 06/02/18	17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	17:30	2	1	0	0	0	1	0	0	0	0	0	0	0	0	92.1	-
Tue 06/02/18	17:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	86.4	-
Tue 06/02/18	18:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.6	-
Tue 06/02/18	18:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	77.7	-
Tue 06/02/18	18:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	91.2	-
Tue 06/02/18	18:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	83.8	-
Tue 06/02/18	19:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	86.9	-
Tue 06/02/18	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	78.9	-
Tue 06/02/18	20:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	72.6	-
Tue 06/02/18	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.7	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	96	75	2	6	2	1	0	0	0	10	0	0	0	0		

Street: Site 1: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 1
Speed Limit: 80 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Southbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	82.8	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	85	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	62.2	-
Tue 06/02/18	6:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	72.7	-
Tue 06/02/18	6:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	91.2	-
Tue 06/02/18	7:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	86	-
Tue 06/02/18	7:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92	-
Tue 06/02/18	7:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	7:45	2	1	0	0	0	0	0	0	0	1	0	0	0	0	76.2	-
Tue 06/02/18	8:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	69.5	-
Tue 06/02/18	8:15	1	0	0	1	0	0	0	0	0	0	0	0	0	0	81.9	-
Tue 06/02/18	8:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	76	-
Tue 06/02/18	8:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.5	-
Tue 06/02/18	9:00	2	1	0	0	0	0	0	0	0	1	0	0	0	0	82.5	-
Tue 06/02/18	9:15	1	0	0	0	0	0	0	0	0	0	1	0	0	0	66.1	-
Tue 06/02/18	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	9:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	76.1	-
Tue 06/02/18	10:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	83.9	-
Tue 06/02/18	10:15	3	2	0	0	0	0	0	0	0	1	0	0	0	0	87.9	-
Tue 06/02/18	10:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	79.7	-
Tue 06/02/18	10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0	60.1	-
Tue 06/02/18	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	72.1	-
Tue 06/02/18	11:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	63.1	-
Tue 06/02/18	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	13:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	99.4	-
Tue 06/02/18	13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	80	-
Tue 06/02/18	13:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	68.9	-
Tue 06/02/18	14:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	64.3	-
Tue 06/02/18	14:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	67.5	-
Tue 06/02/18	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	66.4	-
Tue 06/02/18	15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87.5	-
Tue 06/02/18	15:30	3	2	0	0	0	0	0	0	0	1	0	0	0	0	88.2	-
Tue 06/02/18	15:45	6	5	0	1	0	0	0	0	0	0	0	0	0	0	77.2	-
Tue 06/02/18	16:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	82.4	-
Tue 06/02/18	16:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	83	-
Tue 06/02/18	16:30	3	2	0	0	0	0	0	0	0	1	0	0	0	0	80.4	-
Tue 06/02/18	16:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	86.9	-
Tue 06/02/18	17:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104.4	-
Tue 06/02/18	17:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	17:30	3	2	0	0	1	0	0	0	0	0	0	0	0	0	77.3	-
Tue 06/02/18	17:45	4	3	0	0	0	0	0	0	0	1	0	0	0	0	78.4	-
Tue 06/02/18	18:00	7	5	2	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	18:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	96.3	-
Tue 06/02/18	18:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	92.1	-
Tue 06/02/18	18:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	102.3	-
Tue 06/02/18	19:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	90.3	-
Tue 06/02/18	19:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	67.2	-
Tue 06/02/18	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	62.5	-
Tue 06/02/18	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	2	0	0	1	0	0	0	0	0	1	0	0	0	0	67.8	-
	Total	96	71	4	5	4	0	0	0	0	11	1	0	0	0		

Street: Site 1: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 1
Speed Limit: 80 km/h
Start Date: Tuesday, February 6, 2018

DAY	Hours Starting	Combined															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	82.8	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	76.9	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	91.6	-
Tue 06/02/18	1:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	85	-
Tue 06/02/18	2:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	84.5	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	93	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	96.7	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	61.5	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	85.8	-
Tue 06/02/18	5:45	2	1	1	0	0	0	0	0	0	0	0	0	0	0	63.9	-
Tue 06/02/18	6:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	72.7	-
Tue 06/02/18	6:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	109	-
Tue 06/02/18	6:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	79.6	-
Tue 06/02/18	6:45	7	7	0	0	0	0	0	0	0	0	0	0	0	0	90.5	-
Tue 06/02/18	7:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	7:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	91.8	-
Tue 06/02/18	7:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	7:45	5	3	0	1	0	0	0	0	0	1	0	0	0	0	83.8	-
Tue 06/02/18	8:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0	76.9	-
Tue 06/02/18	8:15	4	2	0	2	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	8:30	4	3	0	0	0	0	0	0	0	1	0	0	0	0	84.6	-
Tue 06/02/18	8:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.5	-
Tue 06/02/18	9:00	3	1	0	0	1	0	0	0	0	1	0	0	0	0	83.4	-
Tue 06/02/18	9:15	1	0	0	0	0	0	0	0	0	0	1	0	0	0	66.1	-
Tue 06/02/18	9:30	2	1	1	0	0	0	0	0	0	0	0	0	0	0	84.3	-
Tue 06/02/18	9:45	3	2	0	0	0	0	0	0	0	1	0	0	0	0	82.6	-
Tue 06/02/18	10:00	2	1	0	0	1	0	0	0	0	0	0	0	0	0	72	-
Tue 06/02/18	10:15	3	2	0	0	0	0	0	0	0	1	0	0	0	0	87.9	-
Tue 06/02/18	10:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	81.1	-
Tue 06/02/18	10:45	4	3	0	0	0	0	0	0	0	1	0	0	0	0	87.5	-
Tue 06/02/18	11:00	4	3	1	0	0	0	0	0	0	0	0	0	0	0	65.7	-
Tue 06/02/18	11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	72.1	-
Tue 06/02/18	11:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	76	-
Tue 06/02/18	12:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.7	-
Tue 06/02/18	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	77.7	-
Tue 06/02/18	12:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	99.1	-
Tue 06/02/18	13:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	99.4	-
Tue 06/02/18	13:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	13:30	5	5	0	0	0	0	0	0	0	0	0	0	0	0	79	-
Tue 06/02/18	13:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	68.9	-
Tue 06/02/18	14:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	73.8	-
Tue 06/02/18	14:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	67.5	-
Tue 06/02/18	14:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	14:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	76	-
Tue 06/02/18	15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	85.2	-
Tue 06/02/18	15:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	88.2	-
Tue 06/02/18	15:30	3	2	0	0	0	0	0	0	0	1	0	0	0	0	88.2	-
Tue 06/02/18	15:45	9	7	0	2	0	0	0	0	0	0	0	0	0	0	75.4	-
Tue 06/02/18	16:00	6	5	0	0	0	0	0	0	0	1	0	0	0	0	84.5	-
Tue 06/02/18	16:15	5	3	0	1	1	0	0	0	0	0	0	0	0	0	81.4	-
Tue 06/02/18	16:30	5	3	0	1	0	0	0	0	0	1	0	0	0	0	72.1	-
Tue 06/02/18	16:45	5	5	0	0	0	0	0	0	0	0	0	0	0	0	81.7	-
Tue 06/02/18	17:00	4	3	0	0	0	0	0	0	0	1	0	0	0	0	94.5	-
Tue 06/02/18	17:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	17:30	5	3	0	0	1	1	0	0	0	0	0	0	0	0	83.2	-
Tue 06/02/18	17:45	7	6	0	0	0	0	0	0	0	1	0	0	0	0	81.9	-
Tue 06/02/18	18:00	9	7	2	0	0	0	0	0	0	0	0	0	0	0	92.7	-
Tue 06/02/18	18:15	4	3	0	0	0	0	0	0	0	1	0	0	0	0	91.6	-
Tue 06/02/18	18:30	5	5	0	0	0	0	0	0	0	0	0	0	0	0	91.8	-
Tue 06/02/18	18:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	93	-
Tue 06/02/18	19:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0	89.1	-
Tue 06/02/18	19:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	67.2	-
Tue 06/02/18	19:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	78.9	-
Tue 06/02/18	20:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	72.6	-
Tue 06/02/18	21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	62.5	-
Tue 06/02/18	21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.7	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	2	0	0	1	0	0	0	0	0	1	0	0	0	0	67.8	-
	Total	192	146	6	11	6	1	0	0	0	21	1	0	0	0		

Street: Site 2: Grabben Gullen Road
Suburb: Grabben Gullen
Location: 0
Count No.: 2
Speed Limit: 50 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Northbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	67.2	-
Tue 06/02/18	4:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	64.6	-
Tue 06/02/18	4:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	65.8	-
Tue 06/02/18	5:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	82.3	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	54	-
Tue 06/02/18	5:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	59.5	-
Tue 06/02/18	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	57.8	-
Tue 06/02/18	6:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	68.3	-
Tue 06/02/18	6:30	6	5	0	0	0	0	0	0	0	1	0	0	0	0	67.3	-
Tue 06/02/18	6:45	7	7	0	0	0	0	0	0	0	0	0	0	0	0	66.7	-
Tue 06/02/18	7:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	63.7	-
Tue 06/02/18	7:15	9	7	0	1	0	0	0	0	0	1	0	0	0	0	62.5	-
Tue 06/02/18	7:30	8	7	0	1	0	0	0	0	0	0	0	0	0	0	60.5	-
Tue 06/02/18	7:45	13	10	0	2	0	1	0	0	0	0	0	0	0	0	62	70.5
Tue 06/02/18	8:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0	58	-
Tue 06/02/18	8:15	10	7	1	1	0	0	0	1	0	0	0	0	0	0	58.7	-
Tue 06/02/18	8:30	8	5	0	1	1	0	0	0	0	1	0	0	0	0	61.9	-
Tue 06/02/18	8:45	6	5	0	0	0	0	1	0	0	0	0	0	0	0	60.6	-
Tue 06/02/18	9:00	7	4	0	2	1	0	0	0	0	0	0	0	0	0	62.7	-
Tue 06/02/18	9:15	4	3	1	0	0	0	0	0	0	0	0	0	0	0	57.9	-
Tue 06/02/18	9:30	9	6	1	1	0	0	0	0	0	1	0	0	0	0	60.9	-
Tue 06/02/18	9:45	6	5	0	1	0	0	0	0	0	0	0	0	0	0	61.7	-
Tue 06/02/18	10:00	3	1	0	2	0	0	0	0	0	0	0	0	0	0	55.3	-
Tue 06/02/18	10:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	66.7	-
Tue 06/02/18	10:30	5	5	0	0	0	0	0	0	0	0	0	0	0	0	61	-
Tue 06/02/18	10:45	5	4	0	0	0	0	0	0	0	1	0	0	0	0	54.3	-
Tue 06/02/18	11:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	70.2	-
Tue 06/02/18	11:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	55.8	-
Tue 06/02/18	11:30	8	4	1	3	0	0	0	0	0	0	0	0	0	0	55	-
Tue 06/02/18	11:45	3	2	0	0	0	0	0	0	0	1	0	0	0	0	54.1	-
Tue 06/02/18	12:00	3	1	0	2	0	0	0	0	0	0	0	0	0	0	62.2	-
Tue 06/02/18	12:15	5	2	0	2	1	0	0	0	0	0	0	0	0	0	45.1	-
Tue 06/02/18	12:30	8	6	1	1	0	0	0	0	0	0	0	0	0	0	61.4	-
Tue 06/02/18	12:45	6	4	1	0	1	0	0	0	0	0	0	0	0	0	55.4	-
Tue 06/02/18	13:00	6	4	1	1	0	0	0	0	0	0	0	0	0	0	63.5	-
Tue 06/02/18	13:15	6	6	0	0	0	0	0	0	0	0	0	0	0	0	61.8	-
Tue 06/02/18	13:30	7	3	0	2	1	0	0	0	0	1	0	0	0	0	59	-
Tue 06/02/18	13:45	4	3	0	1	0	0	0	0	0	0	0	0	0	0	61.6	-
Tue 06/02/18	14:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	67.6	-
Tue 06/02/18	14:15	4	3	0	1	0	0	0	0	0	0	0	0	0	0	70	-
Tue 06/02/18	14:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	54.5	-
Tue 06/02/18	14:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	51.1	-
Tue 06/02/18	15:00	5	3	0	2	0	0	0	0	0	0	0	0	0	0	62.2	-
Tue 06/02/18	15:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	56.8	-
Tue 06/02/18	15:30	9	7	0	2	0	0	0	0	0	0	0	0	0	0	62.8	-
Tue 06/02/18	15:45	10	6	1	2	0	0	0	0	0	1	0	0	0	0	55.5	-
Tue 06/02/18	16:00	6	5	0	1	0	0	0	0	0	0	0	0	0	0	60.9	-
Tue 06/02/18	16:15	6	5	0	0	1	0	0	0	0	0	0	0	0	0	61	-
Tue 06/02/18	16:30	4	1	0	2	0	0	0	1	0	0	0	0	0	0	47.4	-
Tue 06/02/18	16:45	6	5	0	0	0	0	0	0	0	1	0	0	0	0	59.4	-
Tue 06/02/18	17:00	4	3	0	0	0	0	0	0	0	1	0	0	0	0	62.2	-
Tue 06/02/18	17:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	54.5	-
Tue 06/02/18	17:30	2	1	0	0	1	0	0	0	0	0	0	0	0	0	58.4	-
Tue 06/02/18	17:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	53.6	-
Tue 06/02/18	18:00	4	2	0	0	0	0	0	1	0	1	0	0	0	0	58.8	-
Tue 06/02/18	18:15	2	1	0	1	0	0	0	0	0	0	0	0	0	0	63.6	-
Tue 06/02/18	18:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	55.9	-
Tue 06/02/18	18:45	3	2	0	0	0	0	0	0	1	0	0	0	0	0	39.8	-
Tue 06/02/18	19:00	4	3	1	0	0	0	0	0	0	0	0	0	0	0	66.9	-
Tue 06/02/18	19:15	1	0	1	0	0	0	0	0	0	0	0	0	0	0	47.3	-
Tue 06/02/18	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	60.5	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	51.7	-
Tue 06/02/18	20:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	52.8	-
Tue 06/02/18	21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	57.8	-
Tue 06/02/18	21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	55.7	-
Tue 06/02/18	21:30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	58.3	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	63.1	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	45	-
	Total	301	227	10	39	7	1	1	3	1	12	0	0	0	0		

Street: Site 2: Grabben Gullen Road
Suburb: Grabben Gullen
Location: 0
Count No.: 2
Speed Limit: 50 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Southbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	71.1	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	47.8	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.8	-
Tue 06/02/18	6:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	70	-
Tue 06/02/18	6:45	4	3	0	1	0	0	0	0	0	0	0	0	0	0	59	-
Tue 06/02/18	7:00	3	2	0	0	0	0	0	0	1	0	0	0	0	0	56.7	-
Tue 06/02/18	7:15	4	2	0	1	0	0	0	0	0	1	0	0	0	0	53.4	-
Tue 06/02/18	7:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	50.5	-
Tue 06/02/18	7:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	61.8	-
Tue 06/02/18	8:00	4	3	0	0	0	0	0	0	0	1	0	0	0	0	40.2	-
Tue 06/02/18	8:15	3	2	0	0	1	0	0	0	0	0	0	0	0	0	55.3	-
Tue 06/02/18	8:30	7	6	0	1	0	0	0	0	0	0	0	0	0	0	52.5	-
Tue 06/02/18	8:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	55.9	-
Tue 06/02/18	9:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	47.7	-
Tue 06/02/18	9:15	5	4	0	0	0	0	0	0	0	1	0	0	0	0	46.8	-
Tue 06/02/18	9:30	5	3	0	1	0	0	0	0	0	0	1	0	0	0	58.1	-
Tue 06/02/18	9:45	4	3	0	1	0	0	0	0	0	0	0	0	0	0	55	-
Tue 06/02/18	10:00	3	1	0	1	1	0	0	0	0	0	0	0	0	0	44.2	-
Tue 06/02/18	10:15	6	5	0	0	0	0	0	0	0	1	0	0	0	0	52.2	-
Tue 06/02/18	10:30	5	4	0	0	0	0	0	0	0	0	1	0	0	0	57.2	-
Tue 06/02/18	10:45	4	3	0	1	0	0	0	0	0	0	0	0	0	0	53.6	-
Tue 06/02/18	11:00	5	2	1	1	1	0	0	0	0	0	0	0	0	0	49.6	-
Tue 06/02/18	11:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	66.8	-
Tue 06/02/18	11:30	3	1	0	0	1	0	0	1	0	0	0	0	0	0	56.4	-
Tue 06/02/18	11:45	7	7	0	0	0	0	0	0	0	0	0	0	0	0	52.7	-
Tue 06/02/18	12:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	51.5	-
Tue 06/02/18	12:15	1	0	0	0	0	0	1	0	0	0	0	0	0	0	58.5	-
Tue 06/02/18	12:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	57.8	-
Tue 06/02/18	12:45	6	6	0	0	0	0	0	0	0	0	0	0	0	0	53.1	-
Tue 06/02/18	13:00	3	1	0	2	0	0	0	0	0	0	0	0	0	0	48.1	-
Tue 06/02/18	13:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	56	-
Tue 06/02/18	13:30	4	3	0	1	0	0	0	0	0	0	0	0	0	0	51.4	-
Tue 06/02/18	13:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	54.8	-
Tue 06/02/18	14:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	48.7	-
Tue 06/02/18	14:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	60.9	-
Tue 06/02/18	14:30	6	4	0	1	1	0	0	0	0	0	0	0	0	0	57.6	-
Tue 06/02/18	14:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	53.1	-
Tue 06/02/18	15:00	4	1	1	1	0	0	0	0	0	1	0	0	0	0	56.1	-
Tue 06/02/18	15:15	5	4	0	0	1	0	0	0	0	0	0	0	0	0	55	-
Tue 06/02/18	15:30	7	4	1	1	0	0	0	0	0	1	0	0	0	0	49.9	-
Tue 06/02/18	15:45	8	5	0	3	0	0	0	0	0	0	0	0	0	0	51.2	-
Tue 06/02/18	16:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	58.2	-
Tue 06/02/18	16:15	10	7	0	2	0	0	0	0	1	0	0	0	0	0	58.1	-
Tue 06/02/18	16:30	11	7	1	1	0	1	0	0	0	1	0	0	0	0	52.9	60.4
Tue 06/02/18	16:45	8	8	0	0	0	0	0	0	0	0	0	0	0	0	53.7	-
Tue 06/02/18	17:00	15	10	2	1	0	0	0	0	0	2	0	0	0	0	54.3	66.6
Tue 06/02/18	17:15	7	6	0	1	0	0	0	0	0	0	0	0	0	0	56.3	-
Tue 06/02/18	17:30	9	7	0	1	1	0	0	0	0	0	0	0	0	0	60.8	-
Tue 06/02/18	17:45	13	11	0	0	0	0	0	0	0	2	0	0	0	0	59	75.9
Tue 06/02/18	18:00	9	8	1	0	0	0	0	0	0	0	0	0	0	0	54.9	-
Tue 06/02/18	18:15	12	10	1	1	0	0	0	0	0	0	0	0	0	0	60.1	69.2
Tue 06/02/18	18:30	8	7	0	0	0	0	1	0	0	0	0	0	0	0	58	-
Tue 06/02/18	18:45	5	4	0	0	1	0	0	0	0	0	0	0	0	0	60.5	-
Tue 06/02/18	19:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	58.9	-
Tue 06/02/18	19:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	34.2	-
Tue 06/02/18	19:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	67.4	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	68.2	-
Tue 06/02/18	20:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	67.7	-
Tue 06/02/18	20:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	59.7	-
Tue 06/02/18	21:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	59.5	-
Tue 06/02/18	21:15	2	1	1	0	0	0	0	0	0	0	0	0	0	0	58.6	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	46.8	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	62.2	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	284	216	10	27	10	1	2	1	3	12	2	0	0	0		

Street: Site 2: Grabben Gullen Road
Suburb: Grabben Gullen
Location: 0
Count No.: 2
Speed Limit: 50 km/h
Start Date: Tuesday, February 6, 2018

DAY	Hours Starting	Combined															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	2	0	0	0	2	0	0	0	0	0	0	0	0	0	71.1	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	67.2	-
Tue 06/02/18	4:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	64.6	-
Tue 06/02/18	4:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	65.8	-
Tue 06/02/18	5:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	82.3	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	54	-
Tue 06/02/18	5:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	59.5	-
Tue 06/02/18	5:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	47.8	-
Tue 06/02/18	6:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	57.8	-
Tue 06/02/18	6:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	68.7	-
Tue 06/02/18	6:30	7	6	0	0	0	0	0	0	0	1	0	0	0	0	67.7	-
Tue 06/02/18	6:45	11	10	0	1	0	0	0	0	0	0	0	0	0	0	63.9	82.4
Tue 06/02/18	7:00	4	3	0	0	0	0	0	0	1	0	0	0	0	0	58.5	-
Tue 06/02/18	7:15	13	9	0	2	0	0	0	0	0	2	0	0	0	0	59.7	68.9
Tue 06/02/18	7:30	10	9	0	1	0	0	0	0	0	0	0	0	0	0	58.5	-
Tue 06/02/18	7:45	15	12	0	2	0	1	0	0	0	0	0	0	0	0	62	70.3
Tue 06/02/18	8:00	12	11	0	0	0	0	0	0	0	1	0	0	0	0	52.1	62.4
Tue 06/02/18	8:15	13	9	1	1	1	0	0	1	0	0	0	0	0	0	57.9	71.4
Tue 06/02/18	8:30	15	11	0	2	1	0	0	0	0	1	0	0	0	0	57.5	74.7
Tue 06/02/18	8:45	7	6	0	0	0	0	1	0	0	0	0	0	0	0	59.9	-
Tue 06/02/18	9:00	9	6	0	2	1	0	0	0	0	0	0	0	0	0	59.4	-
Tue 06/02/18	9:15	9	7	1	0	0	0	0	0	0	1	0	0	0	0	51.7	-
Tue 06/02/18	9:30	14	9	1	2	0	0	0	0	0	1	1	0	0	0	59.9	72.6
Tue 06/02/18	9:45	10	8	0	2	0	0	0	0	0	0	0	0	0	0	59	-
Tue 06/02/18	10:00	6	2	0	3	1	0	0	0	0	0	0	0	0	0	49.7	-
Tue 06/02/18	10:15	10	9	0	0	0	0	0	0	0	1	0	0	0	0	58	-
Tue 06/02/18	10:30	10	9	0	0	0	0	0	0	0	0	1	0	0	0	59.1	-
Tue 06/02/18	10:45	9	7	0	1	0	0	0	0	0	1	0	0	0	0	54	-
Tue 06/02/18	11:00	7	3	1	2	1	0	0	0	0	0	0	0	0	0	55.5	-
Tue 06/02/18	11:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	59.5	-
Tue 06/02/18	11:30	11	5	1	3	1	0	0	1	0	0	0	0	0	0	55.4	62.9
Tue 06/02/18	11:45	10	9	0	0	0	0	0	0	0	1	0	0	0	0	53.1	-
Tue 06/02/18	12:00	8	6	0	2	0	0	0	0	0	0	0	0	0	0	55.5	-
Tue 06/02/18	12:15	6	2	0	2	1	0	1	0	0	0	0	0	0	0	47.3	-
Tue 06/02/18	12:30	12	10	1	1	0	0	0	0	0	0	0	0	0	0	60.2	75.1
Tue 06/02/18	12:45	12	10	1	0	1	0	0	0	0	0	0	0	0	0	54.2	60.3
Tue 06/02/18	13:00	9	5	1	3	0	0	0	0	0	0	0	0	0	0	58.4	-
Tue 06/02/18	13:15	8	8	0	0	0	0	0	0	0	0	0	0	0	0	60.4	-
Tue 06/02/18	13:30	11	6	0	3	1	0	0	0	0	1	0	0	0	0	56.2	62.5
Tue 06/02/18	13:45	6	5	0	1	0	0	0	0	0	0	0	0	0	0	59.3	-
Tue 06/02/18	14:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0	59.5	-
Tue 06/02/18	14:15	6	5	0	1	0	0	0	0	0	0	0	0	0	0	66.9	-
Tue 06/02/18	14:30	9	6	0	2	1	0	0	0	0	0	0	0	0	0	56.6	-
Tue 06/02/18	14:45	3	2	0	0	0	0	0	0	0	1	0	0	0	0	52.4	-
Tue 06/02/18	15:00	9	4	1	3	0	0	0	0	0	1	0	0	0	0	59.5	-
Tue 06/02/18	15:15	7	6	0	0	1	0	0	0	0	0	0	0	0	0	55.5	-
Tue 06/02/18	15:30	16	11	1	3	0	0	0	0	0	1	0	0	0	0	57.1	73.6
Tue 06/02/18	15:45	18	11	1	5	0	0	0	0	0	1	0	0	0	0	53.6	61.4
Tue 06/02/18	16:00	12	11	0	1	0	0	0	0	0	0	0	0	0	0	59.5	65.1
Tue 06/02/18	16:15	16	12	0	2	1	0	0	0	1	0	0	0	0	0	59.2	67.7
Tue 06/02/18	16:30	15	8	1	3	0	1	0	1	0	1	0	0	0	0	51.4	61
Tue 06/02/18	16:45	14	13	0	0	0	0	0	0	0	1	0	0	0	0	56.2	64.1
Tue 06/02/18	17:00	19	13	2	1	0	0	0	0	0	3	0	0	0	0	56	68
Tue 06/02/18	17:15	10	8	0	2	0	0	0	0	0	0	0	0	0	0	55.8	-
Tue 06/02/18	17:30	11	8	0	1	2	0	0	0	0	0	0	0	0	0	60.4	74.8
Tue 06/02/18	17:45	17	15	0	0	0	0	0	0	0	2	0	0	0	0	57.7	68.3
Tue 06/02/18	18:00	13	10	1	0	0	0	0	1	0	1	0	0	0	0	56.1	63.8
Tue 06/02/18	18:15	14	11	1	2	0	0	0	0	0	0	0	0	0	0	60.6	69.2
Tue 06/02/18	18:30	11	10	0	0	0	0	1	0	0	0	0	0	0	0	57.4	66.5
Tue 06/02/18	18:45	8	6	0	0	1	0	0	0	1	0	0	0	0	0	52.8	-
Tue 06/02/18	19:00	10	9	1	0	0	0	0	0	0	0	0	0	0	0	62.1	-
Tue 06/02/18	19:15	2	0	1	0	0	0	0	0	0	1	0	0	0	0	40.8	-
Tue 06/02/18	19:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	67.4	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	62.4	-
Tue 06/02/18	20:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	67.7	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	51.7	-
Tue 06/02/18	20:45	5	4	0	1	0	0	0	0	0	0	0	0	0	0	56.9	-
Tue 06/02/18	21:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	58.6	-
Tue 06/02/18	21:15	3	2	1	0	0	0	0	0	0	0	0	0	0	0	57.6	-
Tue 06/02/18	21:30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	58.3	-
Tue 06/02/18	21:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	46.8	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	62.6	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	45	-
	Total	585	443	20	66	17	2	3	4	4	24	2	0	0	0		

Street: Site 3: Kialla Road
Suburb: Grabben Gullen
Location: 0
Count No.: 3
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Northbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94	-
Tue 06/02/18	5:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.3	-
Tue 06/02/18	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	86.2	-
Tue 06/02/18	6:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	89.2	-
Tue 06/02/18	6:30	4	3	0	1	0	0	0	0	0	0	0	0	0	0	77.3	-
Tue 06/02/18	6:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	93.9	-
Tue 06/02/18	7:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.1	-
Tue 06/02/18	7:15	5	2	2	1	0	0	0	0	0	0	0	0	0	0	80.9	-
Tue 06/02/18	7:30	6	6	0	0	0	0	0	0	0	0	0	0	0	0	92.7	-
Tue 06/02/18	7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	8:00	5	4	0	0	1	0	0	0	0	0	0	0	0	0	82.1	-
Tue 06/02/18	8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	8:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	85.3	-
Tue 06/02/18	8:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.9	-
Tue 06/02/18	9:00	4	3	0	1	0	0	0	0	0	0	0	0	0	0	80.3	-
Tue 06/02/18	9:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.9	-
Tue 06/02/18	9:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	9:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	106.9	-
Tue 06/02/18	10:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0	82.8	-
Tue 06/02/18	10:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	81.5	-
Tue 06/02/18	10:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	99.2	-
Tue 06/02/18	10:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	67.1	-
Tue 06/02/18	11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:15	6	5	1	0	0	0	0	0	0	0	0	0	0	0	81.3	-
Tue 06/02/18	11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	97.1	-
Tue 06/02/18	12:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	84	-
Tue 06/02/18	12:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	84.6	-
Tue 06/02/18	12:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	74.1	-
Tue 06/02/18	13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	93.6	-
Tue 06/02/18	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:45	2	1	0	0	1	0	0	0	0	0	0	0	0	0	81.6	-
Tue 06/02/18	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87	-
Tue 06/02/18	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:00	2	1	0	0	0	0	1	0	0	0	0	0	0	0	77.6	-
Tue 06/02/18	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	16:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	87.7	-
Tue 06/02/18	16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	16:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	80.9	-
Tue 06/02/18	17:00	4	3	1	0	0	0	0	0	0	0	0	0	0	0	89.9	-
Tue 06/02/18	17:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	17:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	73.5	-
Tue 06/02/18	17:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87.9	-
Tue 06/02/18	18:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	56.5	-
Tue 06/02/18	18:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	82	-
Tue 06/02/18	18:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	102.3	-
Tue 06/02/18	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.9	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	82.5	-
Tue 06/02/18	20:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.4	-
Tue 06/02/18	21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	65.4	-
Tue 06/02/18	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.3	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	89	76	5	4	3	0	1	0	0	0	0	0	0	0		

Street: Site 3: Kialla Road
Suburb: Grabben Gullen
Location: 0
Count No.: 3
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Southbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	98.7	-
Tue 06/02/18	6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	103.2	-
Tue 06/02/18	7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	7:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	99.2	-
Tue 06/02/18	7:30	3	1	2	0	0	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	7:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.3	-
Tue 06/02/18	8:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	88.2	-
Tue 06/02/18	8:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	106.2	-
Tue 06/02/18	8:30	2	1	0	0	0	0	1	0	0	0	0	0	0	0	93.1	-
Tue 06/02/18	8:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	77.8	-
Tue 06/02/18	9:00	5	4	1	0	0	0	0	0	0	0	0	0	0	0	92.7	-
Tue 06/02/18	9:15	5	4	0	0	1	0	0	0	0	0	0	0	0	0	74.7	-
Tue 06/02/18	9:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	97.6	-
Tue 06/02/18	9:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	91.4	-
Tue 06/02/18	10:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87.6	-
Tue 06/02/18	10:15	2	0	0	2	0	0	0	0	0	0	0	0	0	0	75.2	-
Tue 06/02/18	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	10:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	81.4	-
Tue 06/02/18	11:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	11:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	46.3	-
Tue 06/02/18	11:30	5	1	0	0	0	0	0	0	0	4	0	0	0	0	80.2	-
Tue 06/02/18	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	12:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	101.8	-
Tue 06/02/18	13:00	5	2	0	0	0	0	0	0	0	3	0	0	0	0	79.7	-
Tue 06/02/18	13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	13:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.4	-
Tue 06/02/18	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	69.2	-
Tue 06/02/18	14:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	90.9	-
Tue 06/02/18	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	99.8	-
Tue 06/02/18	15:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.5	-
Tue 06/02/18	15:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	101.3	-
Tue 06/02/18	16:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	98.8	-
Tue 06/02/18	16:15	3	2	0	0	1	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	16:30	4	1	2	1	0	0	0	0	0	0	0	0	0	0	83.3	-
Tue 06/02/18	16:45	2	0	0	2	0	0	0	0	0	0	0	0	0	0	88.7	-
Tue 06/02/18	17:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	86.3	-
Tue 06/02/18	17:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	17:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	104.7	-
Tue 06/02/18	17:45	3	2	0	0	1	0	0	0	0	0	0	0	0	0	83.8	-
Tue 06/02/18	18:00	4	3	0	1	0	0	0	0	0	0	0	0	0	0	88	-
Tue 06/02/18	18:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	95.2	-
Tue 06/02/18	18:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	94.4	-
Tue 06/02/18	18:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	83.6	-
Tue 06/02/18	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	107.3	-
Tue 06/02/18	19:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	106.4	-
Tue 06/02/18	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	79.8	-
Tue 06/02/18	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	56.8	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	99	74	5	8	4	0	1	0	0	7	0	0	0	0		

Street: Site 3: Kialla Road
Suburb: Grabben Gullen
Location: 0
Count No.: 3
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Combined															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94	-
Tue 06/02/18	5:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.3	-
Tue 06/02/18	5:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	86.2	-
Tue 06/02/18	6:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	92.4	-
Tue 06/02/18	6:30	4	3	0	1	0	0	0	0	0	0	0	0	0	0	77.3	-
Tue 06/02/18	6:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	97	-
Tue 06/02/18	7:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.1	-
Tue 06/02/18	7:15	6	3	2	1	0	0	0	0	0	0	0	0	0	0	83.9	-
Tue 06/02/18	7:30	9	7	2	0	0	0	0	0	0	0	0	0	0	0	91.9	-
Tue 06/02/18	7:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.3	-
Tue 06/02/18	8:00	8	6	0	1	1	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	8:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	106.2	-
Tue 06/02/18	8:30	4	3	0	0	0	0	1	0	0	0	0	0	0	0	89.2	-
Tue 06/02/18	8:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	80.6	-
Tue 06/02/18	9:00	9	7	1	1	0	0	0	0	0	0	0	0	0	0	87.2	-
Tue 06/02/18	9:15	6	5	0	0	1	0	0	0	0	0	0	0	0	0	78.1	-
Tue 06/02/18	9:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	97.6	-
Tue 06/02/18	9:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	99.1	-
Tue 06/02/18	10:00	5	4	0	0	1	0	0	0	0	0	0	0	0	0	84.7	-
Tue 06/02/18	10:15	4	2	0	2	0	0	0	0	0	0	0	0	0	0	78.3	-
Tue 06/02/18	10:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	99.2	-
Tue 06/02/18	10:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	76.6	-
Tue 06/02/18	11:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	11:15	7	6	1	0	0	0	0	0	0	0	0	0	0	0	76.3	-
Tue 06/02/18	11:30	5	1	0	0	0	0	0	0	0	4	0	0	0	0	80.2	-
Tue 06/02/18	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	97.1	-
Tue 06/02/18	12:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	84	-
Tue 06/02/18	12:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	85.7	-
Tue 06/02/18	12:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87.9	-
Tue 06/02/18	13:00	5	2	0	0	0	0	0	0	0	3	0	0	0	0	79.7	-
Tue 06/02/18	13:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	93.6	-
Tue 06/02/18	13:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.8	-
Tue 06/02/18	13:45	4	3	0	0	1	0	0	0	0	0	0	0	0	0	87	-
Tue 06/02/18	14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:15	2	1	0	0	1	0	0	0	0	0	0	0	0	0	78.1	-
Tue 06/02/18	14:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	90.9	-
Tue 06/02/18	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:00	2	1	0	0	0	0	1	0	0	0	0	0	0	0	77.6	-
Tue 06/02/18	15:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	99.8	-
Tue 06/02/18	15:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.5	-
Tue 06/02/18	15:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	101.3	-
Tue 06/02/18	16:00	4	3	0	1	0	0	0	0	0	0	0	0	0	0	90.5	-
Tue 06/02/18	16:15	3	2	0	0	1	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	16:30	4	1	2	1	0	0	0	0	0	0	0	0	0	0	83.3	-
Tue 06/02/18	16:45	3	1	0	2	0	0	0	0	0	0	0	0	0	0	86.1	-
Tue 06/02/18	17:00	6	5	1	0	0	0	0	0	0	0	0	0	0	0	88.7	-
Tue 06/02/18	17:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	92	-
Tue 06/02/18	17:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	83.9	-
Tue 06/02/18	17:45	5	4	0	0	1	0	0	0	0	0	0	0	0	0	85.4	-
Tue 06/02/18	18:00	5	3	1	1	0	0	0	0	0	0	0	0	0	0	81.7	-
Tue 06/02/18	18:15	5	5	0	0	0	0	0	0	0	0	0	0	0	0	84.6	-
Tue 06/02/18	18:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	97	-
Tue 06/02/18	18:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	83.6	-
Tue 06/02/18	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	107.3	-
Tue 06/02/18	19:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	106.4	-
Tue 06/02/18	20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.9	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	81.6	-
Tue 06/02/18	20:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.4	-
Tue 06/02/18	21:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	65.4	-
Tue 06/02/18	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.3	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	56.8	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	188	150	10	12	7	0	2	0	0	7	0	0	0	0		

Street: Site 4: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 4
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Northbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	89.6	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	96.2	-
Tue 06/02/18	1:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	94.1	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	100.7	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.6	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	57.2	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	102.9	-
Tue 06/02/18	5:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	99.9	-
Tue 06/02/18	5:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	78.9	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	96.2	-
Tue 06/02/18	6:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	79.1	-
Tue 06/02/18	6:45	6	6	0	0	0	0	0	0	0	0	0	0	0	0	97.9	-
Tue 06/02/18	7:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	96.2	-
Tue 06/02/18	7:15	7	5	2	0	0	0	0	0	0	0	0	0	0	0	91.6	-
Tue 06/02/18	7:30	8	7	0	1	0	0	0	0	0	0	0	0	0	0	87.8	-
Tue 06/02/18	7:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	8:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.2	-
Tue 06/02/18	8:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	92.4	-
Tue 06/02/18	8:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	109.8	-
Tue 06/02/18	8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	9:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	9:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	88.4	-
Tue 06/02/18	9:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	79.3	-
Tue 06/02/18	9:45	1	0	1	0	0	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	10:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	71.5	-
Tue 06/02/18	10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	10:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	91.1	-
Tue 06/02/18	10:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	86.5	-
Tue 06/02/18	11:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	89.8	-
Tue 06/02/18	11:15	7	6	1	0	0	0	0	0	0	0	0	0	0	0	87.4	-
Tue 06/02/18	11:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	74.3	-
Tue 06/02/18	11:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	93.2	-
Tue 06/02/18	12:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.4	-
Tue 06/02/18	12:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	85.7	-
Tue 06/02/18	12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:45	5	5	0	0	0	0	0	0	0	0	0	0	0	0	90.2	-
Tue 06/02/18	13:00	3	2	0	0	1	0	0	0	0	0	0	0	0	0	77.4	-
Tue 06/02/18	13:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	86.7	-
Tue 06/02/18	13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	13:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	92.3	-
Tue 06/02/18	14:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87	-
Tue 06/02/18	14:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	94.5	-
Tue 06/02/18	14:30	2	1	0	1	0	0	0	0	0	0	0	0	0	0	89.3	-
Tue 06/02/18	14:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	71.8	-
Tue 06/02/18	15:00	4	3	0	0	0	0	1	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	16:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	81.2	-
Tue 06/02/18	16:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	93.5	-
Tue 06/02/18	16:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	69.8	-
Tue 06/02/18	16:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	89.8	-
Tue 06/02/18	17:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	95.8	-
Tue 06/02/18	17:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	69.5	-
Tue 06/02/18	17:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	73	-
Tue 06/02/18	17:45	5	5	0	0	0	0	0	0	0	0	0	0	0	0	95.6	-
Tue 06/02/18	18:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	96.6	-
Tue 06/02/18	18:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	81.8	-
Tue 06/02/18	18:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	103.1	-
Tue 06/02/18	18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.2	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	90.8	-
Tue 06/02/18	20:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	91.3	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
	Total	145	127	4	8	2	0	1	0	0	3	0	0	0	0		

Street: Site 4: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 4
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Southbound															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	94.2	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	95.8	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	74.8	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	89.2	-
Tue 06/02/18	6:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	89.8	-
Tue 06/02/18	7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	7:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.9	-
Tue 06/02/18	7:30	10	7	1	0	0	0	0	0	0	1	0	0	0	1	66.3	-
Tue 06/02/18	7:45	7	2	0	0	0	0	0	0	0	5	0	0	0	0	80.5	-
Tue 06/02/18	8:00	2	1	0	0	1	0	0	0	0	0	0	0	0	0	79.7	-
Tue 06/02/18	8:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	88.2	-
Tue 06/02/18	8:30	9	7	0	0	0	0	1	0	0	1	0	0	0	0	82.5	-
Tue 06/02/18	8:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	97.4	-
Tue 06/02/18	9:00	6	5	1	0	0	0	0	0	0	0	0	0	0	0	83.7	-
Tue 06/02/18	9:15	1	0	0	0	0	0	0	0	0	0	1	0	0	0	84	-
Tue 06/02/18	9:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	84.2	-
Tue 06/02/18	9:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	96.9	-
Tue 06/02/18	10:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	86.7	-
Tue 06/02/18	10:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.5	-
Tue 06/02/18	10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	10:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	87	-
Tue 06/02/18	11:00	1	0	1	0	0	0	0	0	0	0	0	0	0	0	86	-
Tue 06/02/18	11:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	80.1	-
Tue 06/02/18	11:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	91.5	-
Tue 06/02/18	11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	12:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	91	-
Tue 06/02/18	12:45	3	2	0	1	0	0	0	0	0	0	0	0	0	0	89.4	-
Tue 06/02/18	13:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	84.8	-
Tue 06/02/18	13:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	87.4	-
Tue 06/02/18	13:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	86	-
Tue 06/02/18	13:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	84.4	-
Tue 06/02/18	14:00	4	3	0	0	1	0	0	0	0	0	0	0	0	0	82.1	-
Tue 06/02/18	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	14:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	98.6	-
Tue 06/02/18	14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	15:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	104.4	-
Tue 06/02/18	15:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	89.1	-
Tue 06/02/18	15:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	80.1	-
Tue 06/02/18	15:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	94.4	-
Tue 06/02/18	16:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	78.7	-
Tue 06/02/18	16:15	3	2	0	1	0	0	0	0	0	0	0	0	0	0	86.3	-
Tue 06/02/18	16:30	4	1	2	1	0	0	0	0	0	0	0	0	0	0	77.2	-
Tue 06/02/18	16:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	96.8	-
Tue 06/02/18	17:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	95.3	-
Tue 06/02/18	17:15	3	2	0	0	1	0	0	0	0	0	0	0	0	0	87.9	-
Tue 06/02/18	17:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	88.3	-
Tue 06/02/18	17:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	97.9	-
Tue 06/02/18	18:00	7	6	0	1	0	0	0	0	0	0	0	0	0	0	98.7	-
Tue 06/02/18	18:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	106.2	-
Tue 06/02/18	18:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	98.1	-
Tue 06/02/18	18:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	98.1	-
Tue 06/02/18	19:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	101.9	-
Tue 06/02/18	19:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	107	-
Tue 06/02/18	19:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	76.8	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.5	-
Tue 06/02/18	20:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	65.2	-
Tue 06/02/18	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	57.5	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	88.2	-
Tue 06/02/18	23:45	1	0	0	1	0	0	0	0	0	0	0	0	0	0	88.5	-
	Total	151	124	5	5	3	0	1	0	0	11	1	0	0	1		

Street: Site 4: Range Road
Suburb: Grabben Gullen
Location: 0
Count No.: 4
Speed Limit: 100 km/h
Start Date: Tuesday, February 6, 2018

Data Audit Systems
TRAFFIC SURVEYS

DAY	Hours Starting	Combined															
		Total	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	MSPD	85%
Tue 06/02/18	0:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	94.2	-
Tue 06/02/18	0:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	0:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:00	1	0	0	0	0	0	0	0	0	1	0	0	0	0	89.6	-
Tue 06/02/18	1:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	1:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	96.2	-
Tue 06/02/18	1:45	1	0	0	0	0	0	0	0	0	1	0	0	0	0	95.8	-
Tue 06/02/18	2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:15	1	0	0	0	0	0	0	0	0	1	0	0	0	0	94.1	-
Tue 06/02/18	2:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	2:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:00	1	0	0	1	0	0	0	0	0	0	0	0	0	0	100.7	-
Tue 06/02/18	3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	3:45	1	1	0	0	0	0	0	0	0	0	0	0	0	0	94.6	-
Tue 06/02/18	4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	4:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	57.2	-
Tue 06/02/18	4:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	5:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	102.9	-
Tue 06/02/18	5:30	1	1	0	0	0	0	0	0	0	0	0	0	0	0	99.9	-
Tue 06/02/18	5:45	3	2	0	0	0	0	0	0	0	1	0	0	0	0	77.6	-
Tue 06/02/18	6:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	6:15	5	5	0	0	0	0	0	0	0	0	0	0	0	0	94.8	-
Tue 06/02/18	6:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	79.1	-
Tue 06/02/18	6:45	7	7	0	0	0	0	0	0	0	0	0	0	0	0	96.8	-
Tue 06/02/18	7:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	96.2	-
Tue 06/02/18	7:15	8	6	2	0	0	0	0	0	0	0	0	0	0	0	88.8	-
Tue 06/02/18	7:30	18	14	1	1	0	0	0	0	0	1	0	0	0	1	75.9	96.4
Tue 06/02/18	7:45	10	4	0	1	0	0	0	0	0	5	0	0	0	0	83.4	-
Tue 06/02/18	8:00	6	5	0	0	1	0	0	0	0	0	0	0	0	0	90	-
Tue 06/02/18	8:15	6	6	0	0	0	0	0	0	0	0	0	0	0	0	90.3	-
Tue 06/02/18	8:30	12	10	0	0	0	0	1	0	0	1	0	0	0	0	89.3	113
Tue 06/02/18	8:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	97.4	-
Tue 06/02/18	9:00	9	7	1	1	0	0	0	0	0	0	0	0	0	0	85.4	-
Tue 06/02/18	9:15	2	1	0	0	0	0	0	0	0	0	1	0	0	0	86.2	-
Tue 06/02/18	9:30	5	5	0	0	0	0	0	0	0	0	0	0	0	0	82.2	-
Tue 06/02/18	9:45	2	1	1	0	0	0	0	0	0	0	0	0	0	0	93.6	-
Tue 06/02/18	10:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	76.5	-
Tue 06/02/18	10:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.5	-
Tue 06/02/18	10:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	91.1	-
Tue 06/02/18	10:45	5	5	0	0	0	0	0	0	0	0	0	0	0	0	86.7	-
Tue 06/02/18	11:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0	88.5	-
Tue 06/02/18	11:15	8	7	1	0	0	0	0	0	0	0	0	0	0	0	86.5	-
Tue 06/02/18	11:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	82.9	-
Tue 06/02/18	11:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	93.2	-
Tue 06/02/18	12:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.4	-
Tue 06/02/18	12:15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	85.7	-
Tue 06/02/18	12:30	2	2	0	0	0	0	0	0	0	0	0	0	0	0	91	-
Tue 06/02/18	12:45	8	7	0	1	0	0	0	0	0	0	0	0	0	0	89.9	-
Tue 06/02/18	13:00	7	6	0	0	1	0	0	0	0	0	0	0	0	0	81.6	-
Tue 06/02/18	13:15	5	5	0	0	0	0	0	0	0	0	0	0	0	0	87.1	-
Tue 06/02/18	13:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	86	-
Tue 06/02/18	13:45	5	5	0	0	0	0	0	0	0	0	0	0	0	0	86	-
Tue 06/02/18	14:00	6	5	0	0	1	0	0	0	0	0	0	0	0	0	83.7	-
Tue 06/02/18	14:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	94.5	-
Tue 06/02/18	14:30	3	2	0	1	0	0	0	0	0	0	0	0	0	0	92.4	-
Tue 06/02/18	14:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	71.8	-
Tue 06/02/18	15:00	5	4	0	0	0	0	1	0	0	0	0	0	0	0	93.2	-
Tue 06/02/18	15:15	2	2	0	0	0	0	0	0	0	0	0	0	0	0	89.1	-
Tue 06/02/18	15:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	80.1	-
Tue 06/02/18	15:45	4	4	0	0	0	0	0	0	0	0	0	0	0	0	94.4	-
Tue 06/02/18	16:00	7	6	0	1	0	0	0	0	0	0	0	0	0	0	79.4	-
Tue 06/02/18	16:15	7	6	0	1	0	0	0	0	0	0	0	0	0	0	90.4	-
Tue 06/02/18	16:30	7	4	2	1	0	0	0	0	0	0	0	0	0	0	74	-
Tue 06/02/18	16:45	6	5	0	1	0	0	0	0	0	0	0	0	0	0	93.3	-
Tue 06/02/18	17:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	95.4	-
Tue 06/02/18	17:15	5	4	0	0	1	0	0	0	0	0	0	0	0	0	80.5	-
Tue 06/02/18	17:30	4	4	0	0	0	0	0	0	0	0	0	0	0	0	84.5	-
Tue 06/02/18	17:45	9	9	0	0	0	0	0	0	0	0	0	0	0	0	96.6	-
Tue 06/02/18	18:00	9	8	0	1	0	0	0	0	0	0	0	0	0	0	98.2	-
Tue 06/02/18	18:15	4	4	0	0	0	0	0	0	0	0	0	0	0	0	94	-
Tue 06/02/18	18:30	7	7	0	0	0	0	0	0	0	0	0	0	0	0	100.2	-
Tue 06/02/18	18:45	3	3	0	0	0	0	0	0	0	0	0	0	0	0	98.1	-
Tue 06/02/18	19:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	101.9	-
Tue 06/02/18	19:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	107	-
Tue 06/02/18	19:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	76.8	-
Tue 06/02/18	19:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.2	-
Tue 06/02/18	20:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	20:30	3	3	0	0	0	0	0	0	0	0	0	0	0	0	92	-
Tue 06/02/18	20:45	2	2	0	0	0	0	0	0	0	0	0	0	0	0	65.2	-
Tue 06/02/18	21:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:15	1	1	0	0	0	0	0	0	0	0	0	0	0	0	91.3	-
Tue 06/02/18	21:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	21:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	57.5	-
Tue 06/02/18	22:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	22:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Tue 06/02/18	23:30	1	0	0	0	0	0	0	0	0	1	0	0	0	0	88.2	-
Tue 06/02/18	23:45	1	0	0	1	0	0	0	0	0	0	0	0	0	0	88.5	-
	Total	296	251	9	13	5	0	2	0	0	14	1	0	0	1		

Appendix D

Consultation records with the owner of H07 relating to stock movements

Consultation with the owner of the residence H07 and Developments Biala commenced in December 2017. Up until May 2018 this has included four face to face meetings as well as phone calls and email exchanges. Developments Biala will continue to consult with the owner of this residence until construction has been completed. The consultation that has occurred to date has informed the drafting of this Traffic Management Plan.

Note that this consultation record has been provided to the owner of H07 but has not been agreed as an accurate record of consultation.

Background for Stock Movements

H07 owns land on both sides of Grabben Gullen road. 750 ewes and 30 rams normally reside on the portion of the property which falls on the western side of Grabben Gullen Road with the main yards and shearing shed on the portion of property on the eastern side. The stock is moved across the road as required for farming operations. Due to the layout of gates and paddocks, in many situations stock is required to move along the road for a distance in order that it can be moved across.

- Movements usually occur early in the morning, when the owner of H07 expects traffic volumes along Grabben Gullen Road to be low. The owner also expects that stock is calmer during early morning movements.
- The stock movements occur up to seven times per year per sheep. Four paddocks of ewes and one of rams have to be moved across and then back, resulting in expected stock movements of up to 96 times per year.
- The sheep are moved in groups of 200 to 400 depending on the quantity of sheep in the paddock and the reason for the stock movement. Each paddock is always moved individually to avoid mixing sheep from different paddocks.
- The sheep normally reside on the western side of Grabben Gullen Road within five paddocks, which can be accessed via two gates.
- The stock travel a worst-case distance of approximately 500 metres along Grabben Gullen Road between gates to cross the road.

Consultations

The following details were discussed with the owner of H07:

- The traffic loading due to the wind farm will be minimal during the operational phase, so emphasis should be placed on mitigation of traffic impact during construction. The mitigation measures will be incorporated into the Traffic Management Plan required under Schedule 3 Condition 28 of the Project Approval.
- Under the Project Approval, all heavy vehicles that are not OSOM load must travel to the site from the south via Gunning and will not pass along the section of Grabben Gullen Road near residence H07 as it is located north of the site.
- Under the Project Approval, all OSOM load vehicles must approach the site from the north via Crookwell and will therefore pass by residence H07.
- The construction of the project is expected to take 12 months. The first 5 months will involve civil and electrical works. There will be few heavy vehicles required for these works, which will predominantly involve transporting of rock for tracks, sand for cable bedding and materials for concrete batching. All of these materials will be transported by heavy vehicles and must approach from the south via Gunning.
- After approximately 5 months, it is planned that wind turbine component deliveries to the site will commence. These will involve OSOM vehicles and must approach site from the north via Crookwell. These deliveries will be subject to a second submission of the

TMP. The deliveries will be undertaken by specialist delivery drivers at agreed times. Special permits will be required for these deliveries.

- During the entire construction period, light vehicles may access the site from the north or the south. Therefore, a portion of light vehicles will pass by the residence H07. These light vehicles would appear to have the greatest potential to impact the Hewitt's stock crossing activities.
- Light vehicle traffic to and from the wind farm will be at its highest frequency in the morning when workers travel to the site and in the afternoon when they leave the site. The times when these peaks will occur will correlate with the beginning and end of the working hours specified in the Project Approval. Stock movements during first daylight and just prior to sunset will not correlate with these times for the majority of the year but will during the winter period.

Details of Stock movements

During Developments Biala's initial two meetings with the owners of H07, the following information was collected.
The stock movements and associated timing and quantity include:

- Culling ewes – February = 8 movements
- Shearing - December = 10 movements
- Weaning lambs – February, March = 8 movements
- Crutching- August = 10 movements
- Drenching - five times a year = 50 movements
- Culling hoggets and moving rams in and out of the flock = 10 movements.

Additional husbandry movements which can occur at any time due to seasonal conditions may include but are not limited to:

- Flystrike
- Worms
- Pink eye
- Foot trimming.

Current traffic management implemented

The owner of Residence H07 have obtained a permit from Council to allow for stock movements along and across Grabben Gullen Road. Local Land Services issue Annual Stock movement permits which are paid annually.

- The stock movements can only occur between sunrise and sunset. However, it is noted that the actual time within sunrise and sunset that the stock is moved varies with the seasons.
- "Stock on Road" signs are placed 250 metres in each direction of Grabben Gullen Road from the crossing location.
- Dedicated persons stand by the side of Grabben Gullen Road to wave at and slow traffic while another person musters the stock onto and along the road.
- Cars react to seeing the stock and don't slow down at the signs, meaning cars are travelling fast while passing stock.
- Stock becomes skittish due to the speed of the traffic, lambs can separate which causes panic within the stock.

Gate Locations

The gate locations along Grabben Gullen Road are summarised as follows and shown in Figure C11:

- Western side of Grabben Gullen Road: Ram Paddock and Red Hill gates
- Eastern side of Grabben Gullen Road: Lucerne Western, Laneway, Wattle Creek and Creek gates.

Figure C1: Stock gates along Grabben Gullen Road

Basemap source: Google Maps

Mitigation Measures Discussed

During consultation with the owners of residence H07, several proposals have been made by Developments Biala to assist in avoiding potential conflicts during construction between development related traffic and stock movements. These include:

- Installing permanent signs for all potential gates (subject to obtaining necessary approvals).
- Installing 'Stock crossing' signs at 300m, potentially with flashing lights that could be triggered by remote control for when the stock are on the road (subject to obtaining necessary approvals).
- Installing a stop sign which could be folded up 20m from the gate and unfolded when stock are on the road (subject to obtaining necessary approvals).
- Providing additional support from the wind farm which may include a person to unfold signs and a car positioned on the side of the road with flashing lights to warn drivers, of crossing stock during wind farm construction hours.
- Installing holding paddocks beside the main gates used.
- Installing parallel fences to allow the stock to travel within the paddock beside the road instead of inside the road corridor. This would allow the stock to cross directly over the road instead of having to walk along it.
- Ensuring all on-site workers are aware of the potential for stock movements by including details in the site induction. This would include requiring all workers to slow to 40km/h when stock crossing signs are on display and be prepared to stop. Adherence to this protocol would be monitored using Vehicle Tracking Management Systems for all on-site vehicles. Such education of on-site workers may help to slow other road users who would normally not slow down for the stock crossing signs.

The owners of H07 have expressed the following in relation to these proposals:

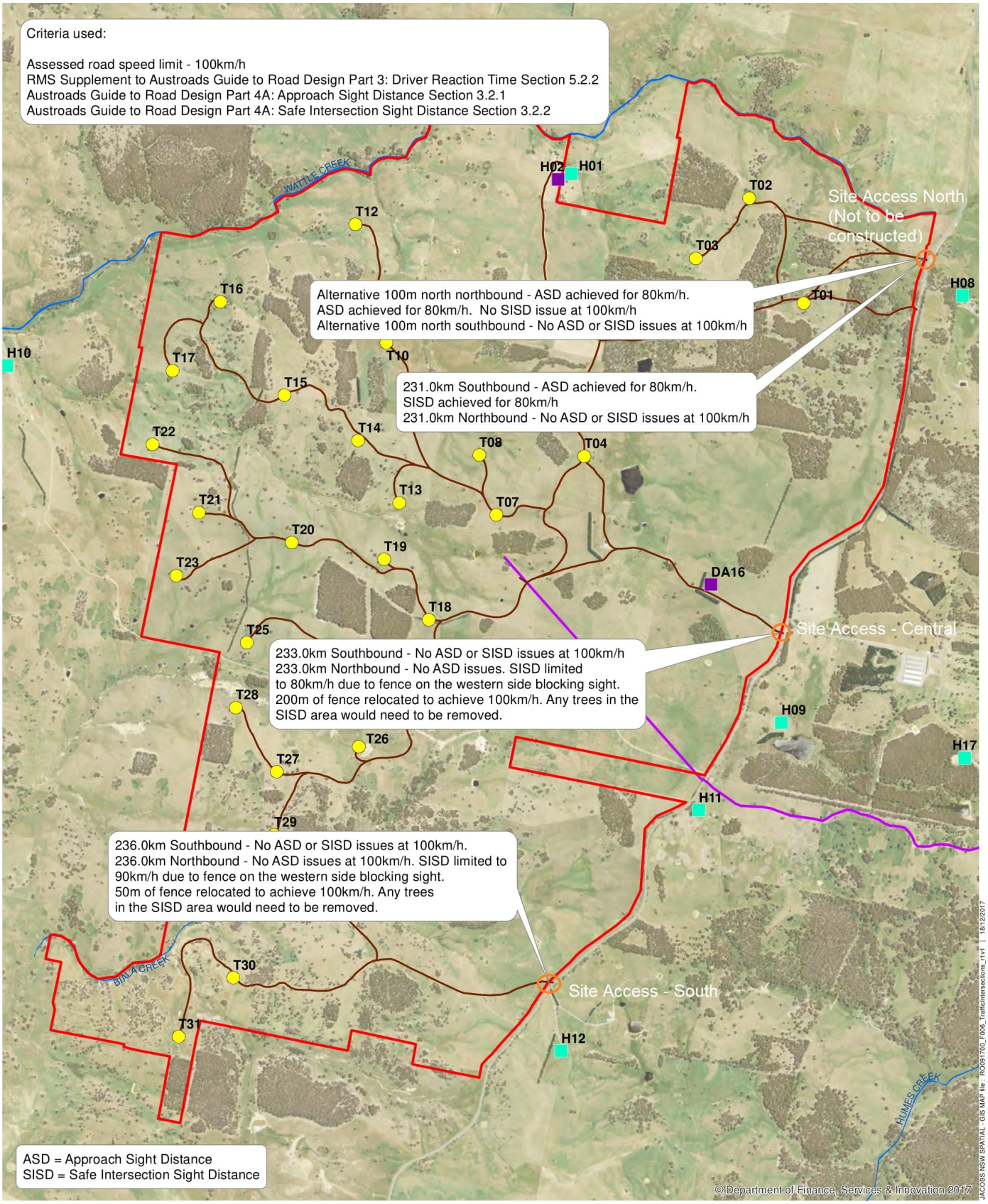
- They do not wish to rely on a wind farm staff person when moving their stock (in relation to the wind farm providing a vehicle with flashing lights to assist with stock movement).
- They do not want to be responsible for road accidents involving permanent signage.
- Stop signs may result in people in the community becoming displeased.
- Parallel fencing would not be possible due to the wetness of the land at certain times of the year.
- Farming is dependent on many external factors, such as the weather, and it is therefore difficult to schedule stock movements accurately.

Mitigation Measures to Implement

After undertaking this consultation with the owners of H07, Developments Biala has developed the mitigation measures detailed in section 2.8 of this report. These measures have been discussed with the owners of H07.

Appendix E

Site Distance Assessment (Jacobs, 2017)



Data sources
Jacobs 2017
LPI 2017
ERM 2017

Appendix F

Swept Path Assessments

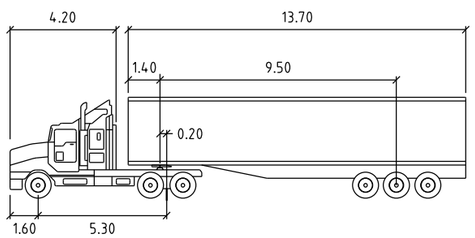
ENTRY

EXIT

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



PM S 19M — metres

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

PLOTTED BY : ChenlongYou ON 25/07/2018 AT 4:25:25 PM

GTA consultants
www.gta.com.au

Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Canberra	02 6243 9400
Adelaide	08 8334 3600
Gold Coast	07 5510 4814
Townsville	07 4722 2765
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

DESIGNED C.YOU	DESIGN CHECK -
APPROVED BY S.H.KONG	DATE ISSUED 25 JULY 2018
SCALE A3	0 5 10 1:500
CAD FILE NO. N142520-02-P1.dgn	

BIALA WIND FARM

SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-03 SHEET 03 OF 06 ISSUE P1

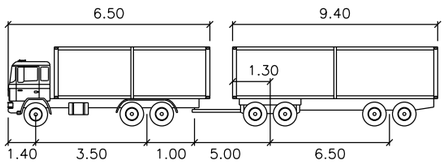
ENTRY

EXIT

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



Truck & Dog 50T

meters

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 18.9
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

PLOTTED BY : ChenlongYou ON 25/07/2018 AT 4:25:32 PM

GTA consultants
www.gta.com.au

Melbourne	03 9851 9600
Sydney	02 8448 1800
Brisbane	07 3113 5000
Canberra	02 6243 9400
Adelaide	08 8334 3600
Gold Coast	07 5510 4814
Townsville	07 4722 2765
Perth	08 6169 1000

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

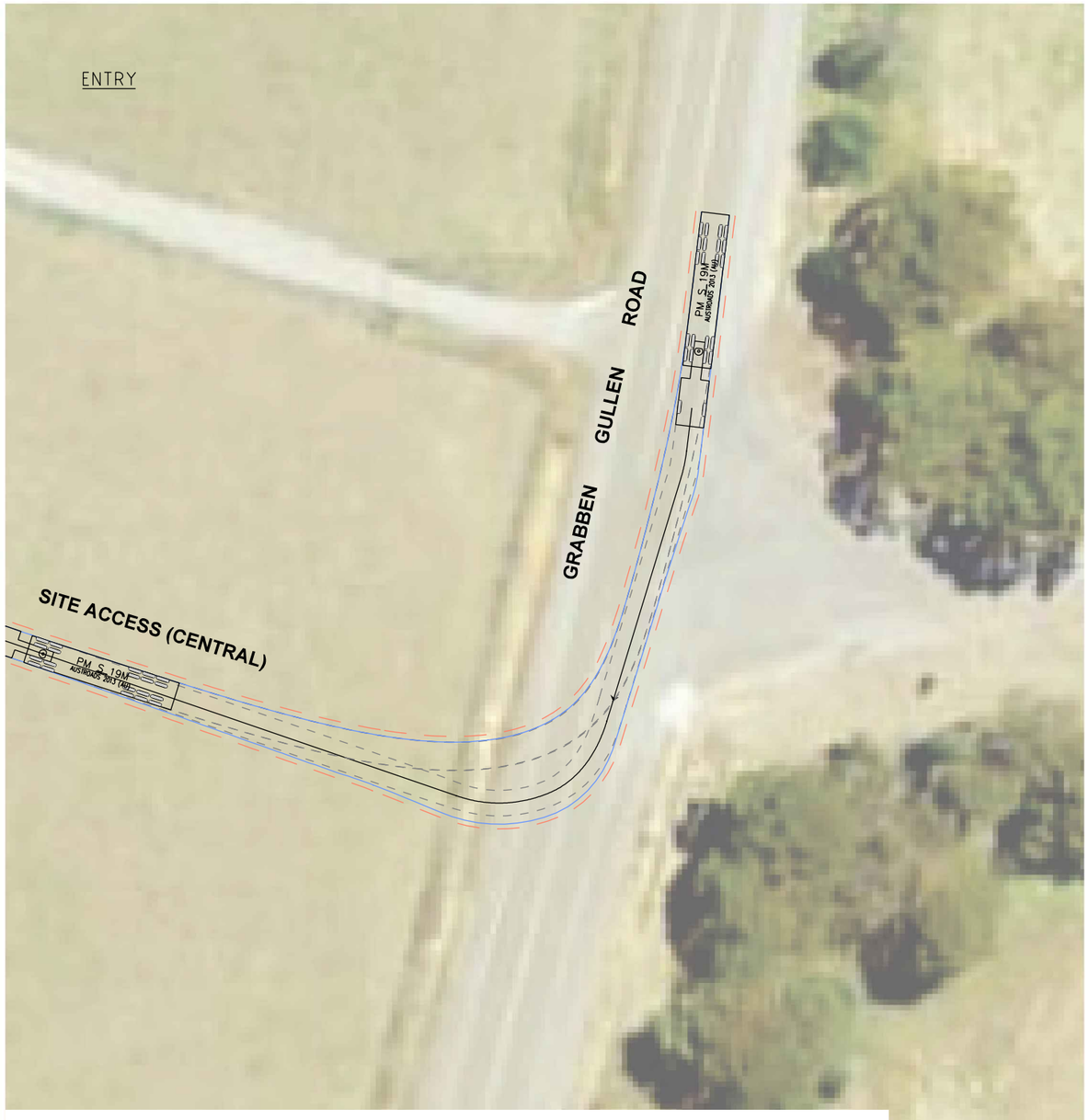
DESIGNED C.YOU	DESIGN CHECK -
APPROVED BY S.H.KONG	DATE ISSUED 25 JULY 2018
SCALE A3	0 5 10 1:500
CAD FILE NO. N142520-02-P1.dgn	

BIALA WIND FARM

SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-04 SHEET 04 OF 06 ISSUE P1

ENTRY

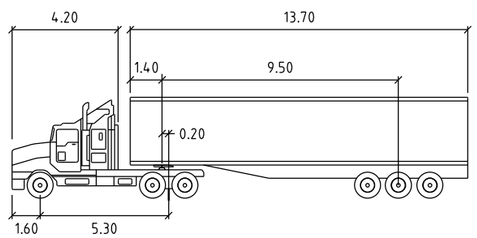


EXIT

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



PM S 19M

metres

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

PLOTTED BY : Chenlong.You ON 2/08/2018 AT 15:38 PM

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Melbourne	03 9851 9600
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Gold Coast	07 5510 4814
Townsville	07 4722 2765
Perth	08 6169 1000

PRELIMINARY PLAN

FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

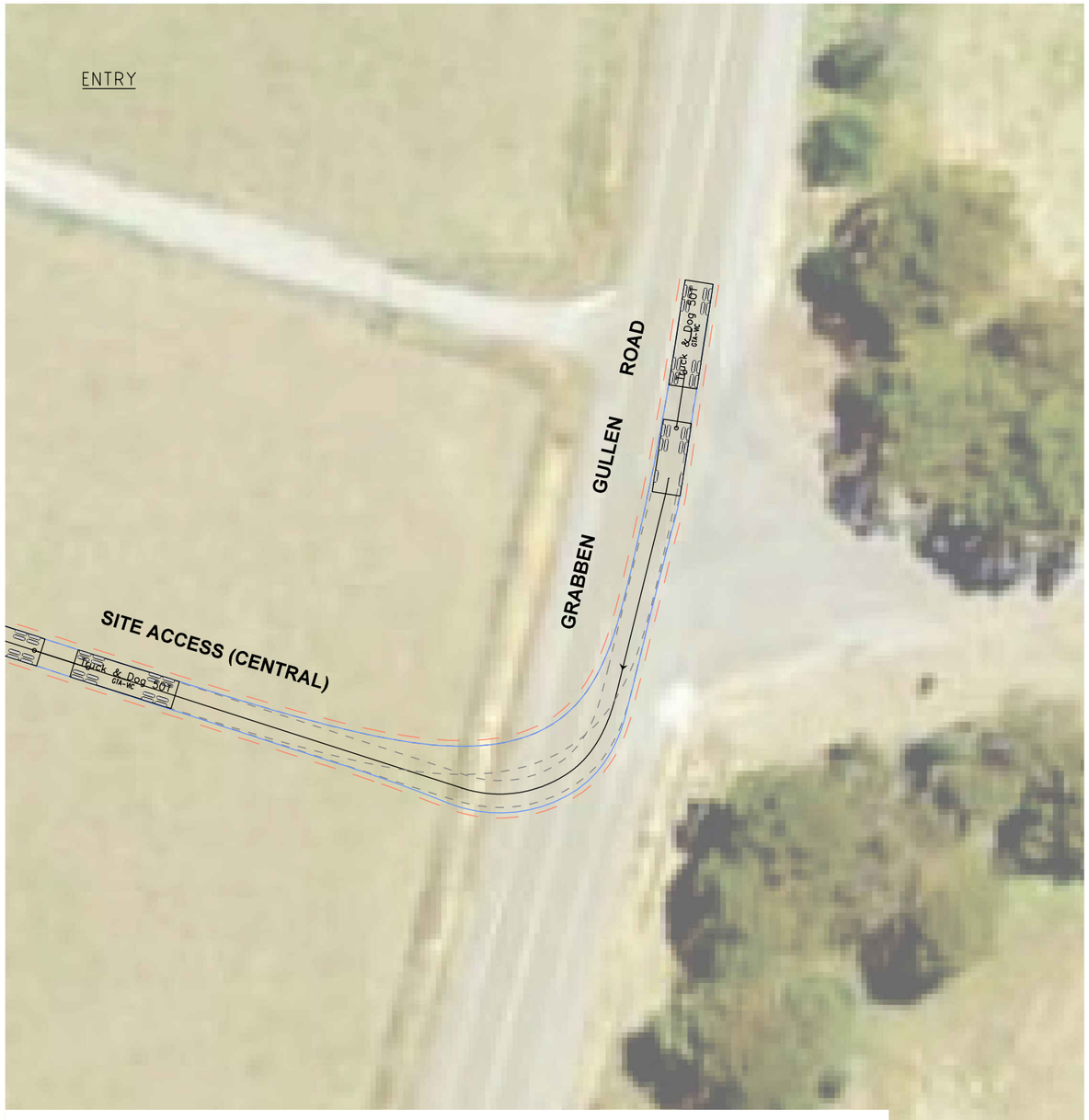
DESIGNED C.YOU	DESIGN CHECK -
APPROVED BY S.H.KONG	DATE ISSUED 2 AUGUST 2018
SCALE A3	0 5 10 1:500
CAD FILE NO. N142520-02-P2.dgn	

BIALA WIND FARM

SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-03 SHEET 03 OF 06 ISSUE P2

ENTRY

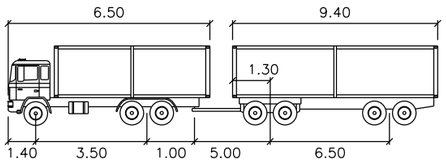


EXIT

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



Truck & Dog 50T

meters

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 18.9
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

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PRELIMINARY PLAN
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BIALA WIND FARM

SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-04 SHEET 04 OF 06 ISSUE P2

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h

PM S 19M — metres

Tractor Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 27.8
Tractor Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

PLOTTED BY : wendy.zheng ON 25/07/2018 AT 6:58:42 PM

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CAD FILE NO. N142520-02-P1 - SK2.dgn

BIALA WIND FARM

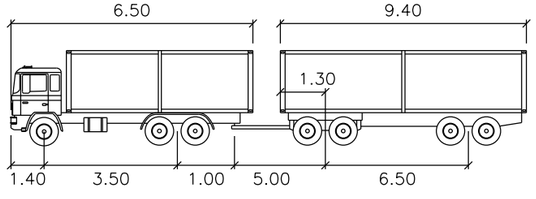
SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-01 SHEET 01 OF 06 ISSUE P2

SWEPT PATH KEY

- VEHICLE CENTRE LINE
- VEHICLE TYRE PATH
- VEHICLE BODY PATH
- 500mm CLEARANCE FROM VEHICLE BODY

ASSUMED SPEED 10km/h



Truck & Dog 50T

meters

First Unit Width	: 2.50	Lock to Lock Time	: 6.0
Trailer Width	: 2.50	Steering Angle	: 18.9
First Unit Track	: 2.50	Articulating Angle	: 70.0
Trailer Track	: 2.50		

N

PLOTTED BY : wendy.zheng ON 25/07/2018 AT 7:45:04 PM

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Townsville	07 4722 2765
Perth	08 6169 1000

PRELIMINARY PLAN
FOR DISCUSSION PURPOSES ONLY SUBJECT TO CHANGE WITHOUT NOTIFICATION

DESIGNED C.YOU	DESIGN CHECK -
APPROVED BY S.H.KONG	DATE ISSUED 25 JULY 2018

SCALE A3 0 5 10 1:500

CAD FILE NO. N142520-02-P1 - SK.dgn

BIALA WIND FARM

SWEPT PATH ASSESSMENT

DRAWING NO. N142520-02-01 SHEET 01 OF 01 ISSUE P2

Appendix G

Traffic Guidance Scheme

TRAFFIC MANAGEMENT NOTES:
1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE RMS "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER 4 (RMS 2010) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
6. THIS TRAFFIC CONTROL PLAN MUST BE SETUP BY A PERSON HOLDING AN "IMPLEMENT TRAFFIC CONTROL PLANS" (YELLOW) TICKET AND THE RMS TRAFFIC CONTROL AT WORK SITES CHECKLIST SHALL BE COMPLETED PRIOR TO IMPLEMENTATION.
7. THE ACCREDITED PERSONNEL SHALL IMPLEMENT THE APPROVED TGS BEFORE ANY PHYSICAL WORK COMMENCES AND ENSURE A COPY OF THE TCP IS KEPT ON-SITE. THE ACCREDITED PERSONNEL SHALL ALSO DRIVE THROUGH THE SITE BEFORE WORKS BEGIN TO ENSURE THAT THE TGS HAS BEEN IMPLEMENTED CORRECTLY AND THAT IT WILL WARN, INSTRUCT AND GUIDE ROAD USERS AS DESIGNED. ANY VARIATIONS MADE TO THE PLAN MUST BE MARKED ON THE PLAN AND INITIALED BY THE ACCREDITED PERSONNEL.
8. IT IS THE RESPONSIBILITY OF AN ACCREDITED PERSONNEL WITH A 'PREPARE TRAFFIC MANAGEMENT PLAN' TICKET TO ENSURE THE FOLLOWING:
- THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
- VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES.
- PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
- AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE.
9. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
10. IF THE WORKSITE IS LEFT UNATTENDED IT IS THE CONTRACTOR'S DUTY TO ENSURE THAT THE APPROPRIATE MEASURES ARE TAKEN TO PROVIDE A SAFE ENVIRONMENT FOR VEHICLES AND PEDESTRIANS TO RELEVANT AUSTRALIAN STANDARDS.
11. TRAFFIC CONTROLLERS ARE NOT REQUIRED AT THE ACCESS FULL TIME. SHOULD CONDITIONS BE MODIFIED AND TRAFFIC CONTROLLERS REQUIRED, THEY ARE TO BE SUITABLY ACCREDITED TO AUSTRALIAN STANDARDS AND RMS ACCREDITATION AS REQUIRED. WHEN REQUIRED, T1-34 AND T1-10 SIGNS ARE TO BE SET UP IN ACCORDANCE TO AUSTRALIAN STANDARDS AND RMS REQUIREMENTS.
12. ALL SIGNAGE IS TO BE CLEAN, CLEARLY VISIBLE AND NOT OBSCURED.
13. ALL SIGNS TO BE COVERED OR REMOVED WHEN WORKERS ARE NOT ON SITE.
14. ALL NIGHT WORK OR DAY/ NIGHT MUST USE RMS STANDARD NIGHT SIGNS AND DEVICES UNLESS OTHERWISE STATED.
15. ALL WORKERS MUST ADHERE TO THE APPLICABLE SAFE WORK DISTANCE AS DESCRIBED IN AS1742.3:2009.
16. ALL DISTANCES BETWEEN SIGNS ARE TO BE IN ACCORDANCE WITH SECTION 2.5.2 OF AS1742.3:2009. HOWEVER, MODIFICATIONS CAN BE MADE TO SUIT SITE CONDITIONS.

LEGEND

- VEHICLE ACCESS
- CENTRAL ACCESS
- SIGNPOST

CERTIFICATION
THE UNDERSIGNED HAS COMPLETED AND OBTAINED:
- PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN

CERTIFICATE NO: 0039450274 (ASHISH MODESSA)

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BIALA WIND FARM
SOUTHERN ACCESS

TRAFFIC GUIDANCE SCHEME

DATE: 02/08/2018
DRAWING NO. N142520-05-P1

TRAFFIC MANAGEMENT NOTES:
1. NOT ALL DIMENSIONS SHOWN ARE TO SCALE.
2. LOCATION OF SIGNS ARE TO BE CONFIRMED ON-SITE TO ENSURE APPROPRIATE VISIBILITY.
3. ALL SIGNS TO BE MINIMUM SIZE A.
4. ALL SIGNS TO BE CLASS 1 REFLECTIVE OR DIAMOND GRADE.
5. ALL TRAFFIC CONTROL PLANS ARE TO BE IMPLEMENTED IN ACCORDANCE WITH THE RMS "TRAFFIC CONTROL AT WORK SITES" MANUAL, VER 4 (RMS 2010) AND AUSTRALIAN STANDARDS AS1742.3:2009 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 3: TRAFFIC CONTROL DEVICES FOR WORKS ON ROADS.
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- THE INTEGRITY OF ALL TRAFFIC CONTROL MEASURES THROUGH TO THE FINAL REMOVAL. THIS INCLUDES DAILY CHECKS OF ALL SIGNS AND DEVICES. THE CORRESPONDING RECORDS OF CHECKS SHALL BE KEPT ON FILE FOR AUDITING PURPOSES.
- VEHICULAR ACCESS AND SERVICING REQUIREMENTS ARE TO BE MAINTAINED AT ALL TIMES TO ADJACENT PROPERTIES AFFECTED BY TRAFFIC CONTROL MEASURES.
- PEDESTRIAN ACCESS AROUND THE WORK AREA TO BE MAINTAINED AT ALL TIMES.
- AT ALL TIMES AN UP-TO-DATE COPY OF "TRAFFIC CONTROL AT WORK SITES" SHOULD BE AVAILABLE FOR REFERENCE AND IMPLEMENTATION AS REQUIRED ON-SITE.
9. ALL WORKERS WILL BE CONFINED TO THE DEDICATED WORKS AREA SHOWN ON THE PLAN.
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11. TRAFFIC CONTROLLERS ARE NOT REQUIRED AT THE ACCESS FULL TIME. SHOULD CONDITIONS BE MODIFIED AND TRAFFIC CONTROLLERS REQUIRED, THEY ARE TO BE SUITABLY ACCREDITED TO AUSTRALIAN STANDARDS AND RMS ACCREDITATION AS REQUIRED. WHEN REQUIRED, T1-34 AND T1-10 SIGNS ARE TO BE SET UP IN ACCORDANCE TO AUSTRALIAN STANDARDS AND RMS REQUIREMENTS.
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LEGEND

VEHICLE ACCESS

SIGNPOST

CERTIFICATION
THE UNDERSIGNED HAS COMPLETED AND OBTAINED:
- PREPARE A WORK ZONE TRAFFIC MANAGEMENT PLAN

CERTIFICATE NO: 0039450274 (ASHISH MODESSA)

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BIALA WIND FARM
SOUTHERN ACCESS

TRAFFIC GUIDANCE SCHEME

DATE: 23/03/2018
DRAWING NO. N142520-05-P1

Appendix H

Driver Fatigue Management Policy

DRAFT

DRIVER FATIGUE AND READINESS FOR DUTY POLICY

Newtricity Developments Biala Pty Ltd (Developments Biala) is committed to the safety of its drivers and all other road users. Developments Biala will ensure all drivers comply with this Developments Biala Driver Fatigue and Readiness for Duty Policy.

- Developments Biala will ensure that all driver rosters and schedules are in accordance with the limits prescribed in legislation and incorporate fatigue management measures.
- The Developments Biala Fatigue Management system is in accordance with the National Transport Commission (NTC) Australia - Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007) (See Attachment 1): https://www.ntc.gov.au/Media/Reports/(276E6278-7517-1B69-9EF0-85C2CA2B91DE).pdf
- The Developments Biala Fatigue Management system is designed to ensure that drivers are not required to drive unreasonable distances within a specified period and without sufficient notice or adequate rest.
- All trip schedules and driver rosters are planned and assigned by the Transport Manager with driving/ rest limits and accounting for the time of day, road conditions, forward planning and time to complete the task safely.
- At no time will the delivery of a load be placed before a driver's safety or health.
- Rosters and workloads will be developed to maximise the opportunity for a driver to recover from the effects or onset of fatigue.
- Scheduling and rostering practices will consider the driver's recent work history, driving ability, welfare and work preferences (where appropriate) as well as the time of day for the transport task to be completed safely.

Readiness for Duty

- Developments Biala will ensure that drivers are in a fit state for work and can perform their work duties safely.
- Developments Biala and its Management team have a legal, moral and social responsibility to ensure that employees do not undertake driving work whilst fatigued.
- Developments Biala will ensure that time off is provided for drivers to recover from or prepare for the fatigue effects of work.
- Drivers will ensure that they consider the impact of activities such as social and recreational activities and personal life on their wellbeing and capacity to work safely.
- Drivers will use their time off responsibly to prepare for, or to recover from, the fatigue effects of work.
- Drivers will complete the National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan as part of the overall fatigue-management system (see Attachment 2): https://www.nhvr.gov.au/files/20150701-0211-ltfms-form-1-safe-driving-plan.doc

Yours sincerely

Tim Mead
Project Manager
Newtricity Developments Biala Pty Ltd 27 July 2018

encl.
Attachment 1 – Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007)
Attachment 2 – National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan

Attachment 1

Guidelines for Managing Heavy Vehicle Driver Fatigue (August 2007)

Guidelines For Managing Heavy Vehicle Driver **Fatigue**

These guidelines have been prepared to assist you to comply with the new road transport heavy vehicle driver fatigue laws that are likely to be implemented around Australia from 2008. They also promote compliance with general obligations to manage driver fatigue under current Occupational Health and Safety laws.

Following public consultation in the third quarter 2006 the draft guidelines and new laws were amended in response to feedback and the final documents were approved by Ministers of the Australian Transport Council (ATC) in February 2007.

NTC AUSTRALIA
National Transport Commission

Acknowledgments

The *Guidelines for Managing Heavy Vehicle Driver Fatigue* are based on the draft Fatigue Code of Practice for Heavy Vehicle Drivers prepared for the National Transport Commission (NTC) between 2003 and 2004. The draft Code of Practice was prepared through extensive consultation and the NTC thanks the many people and organisations from both government and non-government sectors for their efforts in progressing this important initiative.

The NTC wishes to acknowledge the key role of the Australian Trucking Association, Department of Industrial Relations Qld, WorkCover NSW, WorkSafe Victoria, WorkSafe SA, Roads and Traffic Authority NSW, Queensland Transport and VicRoads in the preparation of this edition of the Guidelines for Managing Heavy Vehicle Driver Fatigue.

The NTC also gratefully acknowledges the use of much of the material in Part 2 taken from *Staying Alert at the Wheel,* published by the Government of Western Australia.

Design and editing: Adcore Creative 03 9662 3248

Disclaimer

This document describes the legal obligations of parties in general terms. The reader is advised to read this document in conjunction with the relevant legislation and, if necessary, take legal advice.

Guidelines for Managing Heavy Vehicle Driver Fatigue

Date: August 2007

ISBN: 1 921168 11 0

Title: Guidelines for Managing Heavy Vehicle Driver Fatigue

Address: National Transport Commission
Level 15/628 Bourke Street
MELBOURNE VIC 3000
E-mail: ntc@ntc.gov.au
Website: www.ntc.gov.au

Type of report: Final report

Objectives: To provide guidance to all parties in the supply chain on the effective management of heavy vehicle driver fatigue.

NTC Programs: Fitness for duty, heavy vehicle driver fatigue

Key Milestones: Following public comment, the draft guidelines were revised as necessary, then considered by transport agencies in each State and Territory and the Commonwealth. This final version of these guidelines was approved by Australian transport ministers in February 2007.

Abstract: Heavy vehicle driver fatigue is a safety issue and is to be addressed by the national heavy vehicle driver fatigue reform which seeks to achieve consistency with current occupational health and safety legislation. The Guidelines provide guidance to all parties in the supply chain on the effective management of heavy vehicle driver fatigue

Purpose: Final report

Key words: Heavy vehicles, fatigue guidelines, fatigue, road safety, driver fatigue and fitness for duty

Enquiries to be addressed to:

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National Transport Commission
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Overview

Fatigue can affect a person's health, reduce performance and productivity, and can increase the chance of a workplace accident or road crash. Evidence also suggests that fatigued people are more likely to engage in risk-taking behaviour.

Importantly, fatigue may affect a person's judgment of his or her own state of fatigue. This means the effective management of fatigue should not be the responsibility of the driver alone. Employers, employees and all parties in the supply chain have a role in ensuring that any risks associated with fatigue are eliminated, minimised or controlled through the creation of an effective fatigue-management system. This can comprise a collation of associated fatigue management policies and procedures and may include a driver fatigue-management plan.

These guidelines are intended to assist drivers, employers, operators and schedulers, as well as users and customers of road transport to manage heavy vehicle driver fatigue through the creation of a fatigue-management system.

This will assist parties to meet their general duty to manage heavy vehicle driver fatigue under Occupational Health and Safety (OH&S) laws and the new road transport heavy vehicle driver fatigue laws. These new laws were developed by the National Transport Commission (NTC) in consultation with transport agencies and the road transport industry and unions.

Ministers of the Australian Transport Council (ATC) approved the development of the new laws in 2004. The final laws were approved by the ATC in February 2007, with implementation likely to occur from 2008.

The new laws will apply to trucks of greater than 12 tonnes gross vehicle mass and buses with 12 or more seats (9 seats in NSW) and will be implemented in New South Wales, Northern Territory, Queensland, South Australia, Tasmania and Victoria. This will enable a level of consistency with Western Australia, which already regulates fatigue management under OH&S law.

The new laws will include:

- a general duty in road transport law to manage fatigue, consistent with current OH&S laws;
- Chain of Responsibility provisions extending to parties in the supply chain whose actions, inactions or demands influence conduct on the road including drivers, operators, employers, directors and senior managers, loaders, schedulers, consignors and consignees (receivers), as well as agents of any of these parties;
- a much greater emphasis on opportunities for sleep and rest;
- strengthened record-keeping provisions, including replacement of log books with a new driver work diary;
- risk-based categorisation of offences and a revised range of sanctions;
- enhanced enforcement powers; and
- three fatigue-management options providing alternative drive, work and rest hour requirements with variable levels of flexibility in return for increased fatigue management and compliance responsibilities on operators and drivers.

These guidelines have been drafted to assist all parties to prepare for, and meet, the general duties to manage fatigue both under the new laws and in existing OH&S laws.

These guidelines explain the common factors that lead to fatigue and provide guidance for managing driver fatigue including some risk-management tools for use by different parties in the supply chain. Useful check lists for drivers to manage their fatigue are also provided and these can be used by other parties in the supply chain to meet their obligations.

Under existing OH&S laws, employers and employees are required to take all reasonably practicable steps to ensure safety in the workplace – including managing driver fatigue for employees and contractors. Similarly, the new laws will require all parties in the supply chain to take all 'reasonable steps' to ensure safety on the road by managing heavy vehicle driver fatigue.

Under this approach it will not be enough to just rely on the driver to comply with the law if there are other suitable steps that could be taken. Due to the many different modes of operation in the heavy vehicle industry and the many different factors that can influence how transport tasks are undertaken, it is very difficult to define 'reasonable steps' as it will depend on the options reasonably available to a particular business.

OH&S laws provide a framework for creating a fatigue-management system to assist all employers to meet their obligations for a safe workplace, and includes:

- implementation of a systematic process of hazard identification, risk assessment, risk control and review in the workplace;
- appropriate training, instruction and supervision, including induction and ongoing training for employees (including managers and contractors);
- consultation with employees and their OH&S representatives; and
- adequate record-keeping in relation to OH&S.

This framework is also suitable for use by all parties in the supply chain in order to meet their general duty to manage fatigue under the new laws.

While compliance with these guidelines is voluntary, all parties must take appropriate action to manage the risks of heavy vehicle driver fatigue in order to meet their obligations under both road transport and OH&S laws.

Businesses may use any reasonable method to manage driver fatigue, however, transport and OH&S regulators recommend that the suggestions for managing fatigue in these guidelines be followed by businesses unless better or equally effective methods of managing fatigue are used.

These guidelines may also be used by enforcement agencies and courts in determining whether reasonable steps have been taken to manage heavy vehicle driver fatigue under both the new laws and OH&S laws.

Further information will be available from transport agencies to assist various parties to understand their obligations to manage heavy vehicle driver fatigue. A range of Fact Sheets and Information Bulletins will also be available from the NTC website at www.ntc.gov.au

Industries are encouraged to develop more specific guidance through developing an Industry Codes of Practice tailored to the risks of that industry, in order to further promote compliance with fatigue and other safety-related laws.

Table of contents

Part One Introduction

1.1 PURPOSE OF THESE GUIDELINES

The effective management of fatigue relies on more than just the driver. As such, these guidelines have been prepared to provide guidance to employers, employees and all parties in the supply chain to manage heavy vehicle driver fatigue – and in so doing, to achieve compliance with their specific and general duties in the new road transport heavy vehicle driver fatigue laws and Occupational Health and Safety (OH&S) laws.

Fatigue is a major cause of crashes involving heavy vehicle drivers, and the impact on families and the community is significant.

The new road transport heavy vehicle driver fatigue laws introduce revised drive, work and rest hours and introduce a new 'Chain of Responsibility' in road transport law to require all parties in the supply chain and their agents take all reasonable steps to manage the fatigue of heavy vehicle drivers. These changes will complement the general duty that already exists under OH&S law on all employers, employees and contractors to ensure safety in the workplace by managing fatigue.

Merely adhering to prescribed drive, work and rest hours and completing work diaries/logbooks may not be enough to comply with the general duties under OH&S laws and the new laws. Good fatigue-management practices encompassing a fatigue-management system with a systematic risk-management approach is also essential.

The fatigue-management measures suggested in these guidelines provide a foundation for complying with the general duties, but the steps that need to be taken will depend on the nature of the specific business operations and the level of fatigue risk involved.

The measures may need to be modified in relation to specific circumstances, as these guidelines cannot anticipate all possible situations in which fatigue has to be managed. For example, what a short-haul operator may do to effectively address a certain type and level of risk may not be the most appropriate or effective course of action for a long-haul operator facing similar risks.

1.2 SCOPE OF THESE GUIDELINES

These guidelines provide important information and guidance on:

- fatigue – its effect, its causes, and ways to reduce it;
- creating a fatigue-management system to manage risks – steps and factors to consider;
- meeting Chain of Responsibility obligations under new heavy vehicle driver fatigue laws on all parties in the supply chain whose actions, inactions or demands influence conduct on the road including drivers, operators, prime contractors, employers, directors and senior managers, loaders, schedulers, consignors and consignees (receivers); and
- current obligations under OH&S laws.

These guidelines are designed to assist all parties in the supply chain, including their agents, to create a fatigue-management system to help them comply with their obligations to manage heavy vehicle driver fatigue when using trucks greater than 12 tonnes gross vehicle mass and buses with 12 or more seats (9 seats in NSW).

By managing fatigue you help to protect the safety of workers and all other road users – and ensure compliance with your obligations under road transport and OH&S laws. There are also other major productivity and efficiency benefits that may be achieved by effectively managing fatigue.

It is important to recognise that fatigue may arise because of the actions or inactions of anyone in the supply chain. Figure 1 illustrates some of the points at which actions along the chain can have 'knock-on' effects for other parties.

Further information will be available from transport agencies to assist various parties to understand their obligations to manage heavy vehicle driver fatigue. A range of Fact Sheets and Information Bulletins will also be available from the NTC website at www.ntc.gov.au

Industries are encouraged to develop more specific guidance through developing Industry Codes of Practice, tailored to the risks of that industry, in order to further promote compliance with fatigue and other safety-related laws.

Figure 1: Examples of weak links in the supply chain

Consignor Weak Links
Inflexible pick up and delivery times
Commercial pressures more important than fatigue consequences for specific trips

Consignors need to be aware of their obligations not to make unreasonable or unrealistic demands on operators or drivers.

Operator Weak Links
Poor scheduling/rostering
Poor management practices
Inadequate training
Inappropriate vehicle for the job

Operators need to plan the transport task to minimise fatigue through a regular risk-assessment process.

Driver Weak Links
Not following Fatigue Management Procedures or Trip Plans
Family demands
Use of alcohol and other drugs
Poor fitness for duty

Drivers need to follow fatigue management and trip procedures that have been designed to reduce safety risk associated with fatigue.

Receiver Weak Links
Delays resulting from loading and unloading arrangements
Poor queuing of heavy vehicles
Lack of amenities for waiting drivers

Receivers need to ensure their operations do not create additional fatigue risks by delaying drivers or setting unrealistic delivery times.

This diagram illustrates some examples of weak links in the Chain of Responsibility. All parties in the supply chain should review their role to ensure they are not the 'weak link'.

1.3 STATUS OF THESE GUIDELINES

These guidelines apply to all parties in the supply chain, including their agents, and provide guidance on how these parties can meet their general duty to manage fatigue under current OH&S laws and under the new road transport heavy vehicle driver fatigue laws.

These guidelines explain common hazards and set out a range of processes and practices for managing fatigue. These include methods of identifying, assessing and controlling fatigue risks, and steps to develop and maintain an effective fatigue-management system.

These processes and practices provide a basis for all parties in the supply chain to work out how they might manage fatigue in their business, although the exact measures will depend on their specific situation, as a 'one-size-fits-all' approach is not suitable. Parties should refer to these guidelines unless a better or equally effective method of minimising fatigue can be demonstrated.

While compliance with these guidelines is voluntary, all parties in the Chain of Responsibility must take all reasonable steps to manage the risks of driver fatigue.

These guidelines provide guidance to parties on how to meet their obligations under OH&S laws and the new road transport laws to take all reasonable steps. These guidelines may also be used to assist enforcement agencies and courts in determining whether OH&S and road transport duties have been satisfied.

Ministers of the Australian Transport Council (ATC) approved the new laws in February 2007 and these are likely to be implemented from 2008 in NSW, NT, QLD, SA, TAS and VIC. Western Australia already regulates driver fatigue management, consistent with many of the new laws, under OH&S law. While there may be some minor differences from State to State, anyone seeking to ascertain their legal position should contact their local transport agency for information.

By following these guidelines, parties can prepare for the new laws and in so doing, will meet their duties under OH&S and insurance laws as explained in Section 1.4.

1.4 LEGISLATION

1.4.1 New road transport heavy vehicle driver fatigue laws

The new road transport heavy vehicle driver fatigue laws have four key components outlined below.

(i) A general duty on all parties in the supply chain under the Chain of Responsibility laws to take all reasonable steps to manage driver fatigue, complementing the general duty already in OH&S laws.

(ii) Changes to driving hours place a greater emphasis on opportunities for sleep and rest, the 'body-clock' influences, and the cumulative nature of fatigue.

There are three components:

- a Standard Hours option – a default option prescribing minimum rest and maximum working hours;
- a Basic Fatigue Management option (BFM) – allowing additional working hours while imposing increased fatigue management and compliance responsibilities on operators; and
- an Advanced Fatigue Management option (AFM) – allowing more flexible working hours based on risk management, alternative compliance and quality assurance approaches. Operators will need to adhere to agreed standards and operating limits in return for more flexible working arrangements defined by the regulatory agency according to the operator's specific fatigue risks and fatigue-management system.

(iii) Strengthened record-keeping provisions and replacing logbooks with a new driver work diary.

(iv) Risk-based categorisation of offences, revised range of sanctions, and enforcement powers.

Contact your local road transport agency or your industry association for further details.

1.4.2 New obligations under the Chain of Responsibility

The Chain of Responsibility concept recognises that fatigue may happen because of the actions or inactions of members of the supply chain. These parties include drivers, operators, schedulers, loaders, unloaders, loading managers, prime contractors and consigners including any agents of these parties. Under this concept, parties share responsibility to manage driver fatigue and cooperate and consult with each other to address fatigue risks.

Under the Chain of Responsibility parties in the supply chain must take all reasonable steps to check:

- the fatigue-management option under which the driver is operating;
- the accreditation details of the operator, if applicable;
- that the driver is complying with relevant work, rest and speed limit requirements; and
- that the driver is not impaired, or likely to become impaired by fatigue.

In addition, if a driver breaches their work and rest requirements, under the Chain of Responsibility all other parties in the supply chain can also be held liable unless they can show that they have taken all reasonable steps to prevent the offence. It is irrelevant whether or not they knew about the offence or intended that it occur. Drivers will continue to be held liable even if another party in the supply chain is found guilty.

Under the general duty to manage driver fatigue, all parties must also ensure they do not breach the general duty by their demands, actions or inactions. This includes for example:

- drivers properly managing their work and rest and not driving if fatigued;
- ensuring trip schedules have sufficient flexibility and are reasonable;
- maintaining effective loading practices; and
- ensuring that commercial requirements do not require a driver to break the law (e.g. driving excessive hours or speeding to meet a deadline).

The new law also makes it illegal for any person to make a reckless or negligent demand that they know, or reasonably ought to know, will lead to breach of the law.

Many influences on schedules and rosters flow from the decisions and requirements of other parties in the supply chain. It is unlikely to be enough to simply require in contracts that operators and drivers meet their legal obligations in order to prove that all reasonable steps have been taken where other steps are reasonably available.

All parties in the supply chain should work together to manage fatigue. Parties may adopt practices such as:

- implementing ongoing consultative mechanisms to identify and effectively control fatigue risks;
- developing clear contractual obligations that do not contribute to fatigue;
- providing training and implementing procedures to empower drivers to refuse unreasonable requests; and
- implementing ongoing operational reviews to identify practices that contribute to fatigue, develop improved practices and ensure that relevant parties are advised if existing practices are contributing to fatigue, such as:
  - inflexible delivery times and unloading times;
  - poor management of truck queues; and
  - inadequate equipment and/or resources to load/unload trucks.

1.4.3 Existing obligations under Occupational Health and Safety Law

OH&S laws in all Australian jurisdictions place a general duty on employers to provide a workplace and systems of work that are safe and healthy. OH&S laws require employers to:

1. implement a systematic process of hazard identification, risk assessment, risk control and review in all systems of work (references to "health" includes risks to psychological health)
2. monitor the health of employees
3. ensure that employees, including managers and contractors, receive appropriate training, instruction and supervision, including induction and ongoing training
4. obtain appropriate information to manage risks
5. consult with employees whose work is directly affected by decisions or changes in the workplace, and their OH&S representatives
6. implement and review control measures over time
7. keep adequate records in relation to OH&S.

Under these duties, parties must take all reasonably practicable steps to manage fatigue.

Maintaining a safe workplace is a shared responsibility of employers and employees. For example, heavy vehicle drivers have a legal duty to take reasonable care for their safety at work and cooperate with their employers in meeting their obligations. Employers owe a duty to protect the safety of all employees, including contractors.

These guidelines represent part of the 'state of knowledge' in OH&S law for managing heavy vehicle driver fatigue – assisting parties to comply with their obligations to manage fatigue under OH&S laws as well as road transport laws.

1.4.4 Other obligations and benefits

Effectively managing heavy vehicle driver fatigue may also provide other benefits in addition to compliance with road transport and OH&S laws, including:

- minimising the risk of negligence claims, for example, resulting from unintentional safety breaches that cause a vehicle crash;
- satisfying insurance obligations, for example, the obligation under the *Insurance Contracts Act 1984* that requires disclosure to the insurer of all reasonably foreseeable risks;
- productivity gains, for example, through minimising avoidable losses that may result from driver fatigue; and
- generating commercial opportunities, for example, by showing the ability to manage compliance, thereby reducing exposure of customers and suppliers under the Chain of Responsibility.

Part Two Understanding Fatigue

Fatigue is an acute or ongoing state of tiredness that affects employee performance, safety and health, and requires rest or sleep for recovery.

Key risks resulting in fatigue are poor understanding about the factors leading to fatigue including poor communication and consultation between parties in the supply chain. Managing fatigue is the shared responsibility of all parties in the supply chain and requires commitment from all parties to manage the risks. This requires genuine and open consultation and communication and increased understanding by all parties.

This section (Part 2) provides guidance on what constitutes fatigue, common contributing factors, and details on methods that may be used to control fatigue. This material should be consulted when using the risk-management approach described in Part 3.

2.1 EFFECTS OF FATIGUE

Fatigue is more than falling asleep at the wheel. Fatigue describes the feeling of being tired, drained or exhausted. It causes poor judgment, impaired coordination and slower reactions, and impacts on how well you work. It builds up, leading to a progressive loss of alertness that ultimately ends in sleep and is a major contributing factor in many road crashes. The effects of fatigue include:

- **Loss of Alertness** – when you respond more slowly to things as they arise. Loss of alertness is an early sign of fatigue and may result in less efficient vehicle control (e.g. changing gears, finding it hard to drive inside the lanes, or finding it hard to maintain a constant speed).
- **Poor Judgment** – before drowsiness sets in, fatigue affects the ability to think clearly, which is vital when making safety-related decisions and judgments. Someone who is very fatigued may not realise how fatigued they really are. As a result, fatigued people are unaware that they are not functioning as well or as safely as they would if they were not fatigued.
- **Drowsy Driving** – drowsiness means feeling sleepy, but not actually being asleep. When drowsy, a driver may actually drift in and out of sleep occasionally without knowing it (micro sleep). Drivers have been studied when drowsy and found to be asleep for 3 to 5 seconds – or as long as 15 seconds. Travelling at 100 kilometres per hour can mean 100-300 metres of travel and plenty of time to run off the road.
- **Falling Asleep at the Wheel** – this happens in a number of crashes, typically very severe single vehicle crashes where there has been no attempt by the driver to control the vehicle. Often the driver was completely unaware of events before the crash.
- **Poor Memory** – being fatigued will also affect your memory. For example, drivers may have travelled a significant distance without knowing it. This is directly related to loss of alertness.
- **Mood Change** – being fatigued can also make you irritable, agitated, aggressive and poor company. You start to overreact to things including those that wouldn't normally upset you.

> Driving is a complex mental and physical task requiring sustained levels of concentration and skill to maintain maximum performance. No driver can afford to be fatigued nor can anyone else afford a driver to be fatigued.

2.2 CAUSES OF FATIGUE

2.2.1 Time of day – body-clock factors

The body has natural rhythms that are repeated approximately every 24 hours – this is called the 'body clock' or the circadian rhythm. The body clock regulates sleeping patterns, body temperature, hormone levels, digestion and many other functions, and helps conserve resources. When the body clock is out of 'synch', effects such as jet lag result.

The body clock programs a person to sleep at night and stay awake during the day. Body temperature drops during the night resulting in sleepiness and rises during the day to assist in feeling alert. At night the digestive system slows (because individuals are less likely to be eating) and hormone production rises to repair the body.

The body clock is controlled partly by light and dark and partly by what activities are undertaken. When working normally from 9 am to 5 pm, things that happen as a result of your body clock include:

- morning light tells the body clock to be more alert;
- after lunch (siesta time) the body clock will turn alertness down for a couple of hours;
- alertness is heightened in the late afternoon and early evening;
- darkness at night tells the body clock to turn alertness down again to get ready to sleep; and
- after midnight, body temperature and alertness decrease to their lowest level.

2.2.2 Sleep factors

The optimum amount of required sleep varies. The average daily sleep required for an adult generally varies between 6 to 8 hours. People who have less sleep than necessary will incur a sleep debt. This 'sleep debt' builds up for each day you don't have enough sleep.

The best time for good quality sleep is in the early morning hours (midnight to 6 am). Unless a driver is on night shift, it is best to try to sleep during this period. It is important that all parties in the supply chain recognise that drivers working irregular hours or shift work are routinely exposed to conditions that reduce the amount and quality of their sleep.

It is not necessary to repay every hour of sleep debt immediately. However, if a sleep debt is not properly managed, driving performance could be as poor as if the legal alcohol limit was exceeded.

> Sleep debt is like a bank loan – you have to pay it back.

Every day that sleep is insufficient, a driver is more fatigued and therefore more dangerous. Fatigue will also build if sleep is lost over consecutive days as the effects of fatigue are cumulative.

It is not possible to just sleep and drive, and drive and sleep. Sleep time should not be shortened to fit in daily living activities such as washing, eating and domestic tasks. Drivers and schedulers must take this into account and include adequate time for sleep as well as other domestic and recreational activities.

> Time is needed both for sleep and other domestic activities.

Short-term measures such as taking naps can help compensate for lack of sleep but remember that naps are not a substitute for continuous sleep and that after a nap it can take some time to wake-up completely and get over the sleep inertia.

2.2.3 Health factors

There are some general health tips and lifestyle choices that will ensure safer driving – with many other benefits. However, the following are a number of health factors that can prevent a driver from getting a good long sleep.

Although most people over 50 years snore at night sometimes, for a few it is a serious problem. Sleep apnoea occurs when the windpipe collapses during sleep so that too little air reaches the lungs, resulting in frequent waking due to oxygen starvation. The condition is treatable.

A further problem is falling asleep during the day with no obvious sleep problem at night. This condition is called narcolepsy, and can be treated.

Some people also suffer from restlessness at night that keeps them awake. They find their legs keep moving or twitching. This too is treatable.

Some illnesses such as diabetes, if not controlled, can also result in fatigue. Again, this can be treated.

Being overweight or obese is not usually regarded as an illness. However, obesity can cause sleep problems and strongly contributes to sleep-disordered breathing (apnoea). Also, being overweight does cause other problems including medical sleep problems.

Tiredness and drowsiness after sufficient sleep may indicate a medical problem. It is recommended you seek medical advice.

Ongoing fatigue and stress can also contribute to serious long-term health effects such as cardiovascular disease. It makes sense to have regular health checks so these illnesses and medical problems can be diagnosed before they make drivers unsafe, unable to do their job or worse.

- Effect of alcohol, other drugs and stimulants

The effect of alcohol on people is very similar to fatigue. After consuming alcohol the only way to reduce its effect is to allow time. Large amounts of alcohol before bedtime will reduce the quality and amount of sleep a person can have.

Many drivers smoke cigarettes in the belief that it helps keep them alert, however this increases the risk of many diseases such as heart disease and lung problems.

There is a temptation to take stimulant drugs to manage fatigue but this is not recommended. These drugs have many side effects resulting in increased fatigue and can cause long-term effects on health including problems such as high blood pressure and other cardiac problems.

Caffeine and other related stimulants can have the effect of perking up an individual for a short amount of time. If you have caffeine all the time your body adapts to it so it has less effect. Whether it is coffee, tea, chocolate, cola drinks or perhaps something stronger, caffeine is a stimulant. But too much can be a problem.

Too much caffeine can stop a person from sleeping when they want to, as well as reducing the quality of their sleep. It can also cause digestive, cardiac and other problems, including headaches. Caffeine dehydrates the body, which is a serious problem when driving. And, if you are very fatigued, caffeine won't help you – only sleep will.

- Benefit of diet and exercise

Good health and fitness will assist in addressing issues associated with fatigue.

Exercise and a good diet will help drivers to be fit for work, assisting in alertness and better sleep. Exercising for 30 minutes a day, even in three 10 minute periods, can significantly improve health and reduce weight. Just walking or jogging instead of using the car for short trips is beneficial.

During a break from driving, walking is good exercise. As a driver, the health of your back is vital to your livelihood, so look after it by stretching, flexing regularly and lifting properly.

Unlike some other types of work, driving requires drivers to be alert and attentive all of the time. This depends on the work being done but also on what drivers have done on the days prior to driving. Drivers need to be ready to drive/work at all times when at work. This is commonly called 'fitness for duty'. Drivers need to be aware of the impact some types of activities may have on their fitness for duty such as a second job, recreational activities, sport, insufficient sleep and any stress-related situation.

Employers and all parties in the supply chain also have duties to ensure that drivers are fit for work – and drivers have a similar obligation.

A healthy diet and regular exercise will reduce weight and improve your fitness. Nutritionists recommend the following:

- breads and cereals: (4-5 servings daily) such as rice, pasta, bread and cereals;
- vegetables and fruit: (at least 4-5 servings daily) of fresh, frozen or canned fruits and vegetables;
- meat and meat substitutes: (1-2 servings daily) of lean beef, lamb, veal, chicken or pork (grilled rather than fried)
- milk or dairy products: (3-4 servings daily) of milk, cheese or yoghurt;
- fats: butter and margarine: (maximum of 1 tablespoon daily) of butter or table margarine; and
- fish: (preferably 1 serving daily) minimum of 2 servings per week.

The quantity of food consumed can also affect sleep. It is bad practice to eat a heavy meal before going to bed. Plan to eat no less than 3 hours before going to sleep.

Further detailed guidance on Fitness for Duty matters including sleep disorders can be found in *Assessing Fitness to Drive*, Austroads 2003 available at **www.ntc.gov.au**.

2.2.4 Work factors

In addition to those matters that can be controlled by a driver, actions or inactions by other parties in the supply chain can contribute to driver fatigue. In a recent survey of drivers[1], the key factors that contribute to fatigue are:

- long or excessive hours;
- unreasonable transit times or deadlines; and
- inflexible time slots, problematic loading and distribution.

Long working hours have been cited in driver surveys and in research as a major fatigue risk. While some drivers still drive hours in excess of legal limits, fatigue can still be a problem even within the legal limits, and the risk of long working hours must be properly managed.

Table 1: Check list of warning signs

Most people who have a sleep debt don't realise they are tired, so drowsiness can creep up on them. It is time to pull over for a nap or a break if any of the following is experienced.
trouble keeping your head up
wandering, disconnected thoughts – day dreaming
eyes close for a moment or go out of focus
eyelids droop
inability to stop yawning
inability to remember driving the last few kilometres
drifting over the centre line or onto the gravel at the side of the road
not noticing signs and hazards early enough
missing your exit
missing gear changes
starting to see things that are not there
approaching corners too fast
poor steering or braking too late
changing speed without noticing

1: SA WorkCover, Fitness for Work in the SA Heavy Vehicle Transport Industry, November 2004.

Unreasonable schedules increase the risk of fatigue by failing to allow drivers to take necessary rest breaks or failing to provide for reasonably expected delays. Actions of heavy vehicle customers, such as those regarding delivery deadlines, can place unreasonable demands on drivers and increase driver fatigue. In turn, delays in loading or unloading further increase fatigue risk.

Unsafe and unsuitable workplace conditions are a contributing factor to fatigue. Good vehicle design and depot facilities will assist drivers in reducing the effects of fatigue. Vehicles must comply with Australian Design Rules covering such things as ventilation, seating suspension and sleeper berths. Another factor that can contribute to driver fatigue is the time necessary for a driver to travel to and from work.

It is important that all factors are identified and that parties in the supply chain are reminded of their responsibilities.

2.2.5 Two-up driving

Two-up driving, when managed properly, can be an effective form of driving in long-haul operations. This is because a driver is able to rest when fatigued while the vehicle is still moving.

The safety of two-up driving depends though on whether a driver is able to work well with their driving partner and gain restorative rest.

Issues to consider when scheduling two-up driving include:

- drivers need to be capable of sleeping in a moving vehicle;
- drivers must be confident in the ability of the co-driver or the quality of rest may be lower;
- the sleeper berth needs to be compliant with the standard in the new laws;
- whether a sleeper berth requires better insulation and if it should be fitted with independent air-conditioning;
- allowing drivers to volunteer for two-up driving with the capacity to select their driving partner;
- drivers should share the driving to best fit each other's body clock e.g. is particularly important at night;
- if possible try not to have drivers participate in loading/unloading if they are undertaking ultra long trips; and
- match new two-up drivers with a more experienced driver for a probationary period involving a number of trips as a team. The experienced driver should provide feedback on the new drivers' skills, attitude and 'behaviours' and if the new driver is able to sleep well in a moving vehicle.

2.3 WAYS TO REDUCE FATIGUE

2.3.1 Listen to and plan around the body clock

No matter whether adequate sleep is achieved or not, there are high points of alertness and low points when one feels drowsy, or wants to sleep. Consider the body clock in scheduling breaks for rest or naps. Also explain to families and friends how important sleep is and avoid parties, etc. if occurring at times when you need sleep.

Employers must provide the opportunity for necessary sleep and ensure that drivers get off the road when feeling drowsy. Drivers should ensure they have enough sleep to cancel the debt and don't drive if feeling drowsy.

Most passenger and freight schedules will hinge on pick up and delivery times and dates. All parties in the supply chain equally share the responsibility for trip planning. Plans should include time for sleep, food and rest, including time for naps if needed and take into account possible delays. The driver must have the flexibility to adjust the schedule if circumstances change.

The likelihood of falling asleep when the body clock is set to 'sleep' is very much higher than at other times in the day and the associated risks must be considered by employers and other parties in the supply chain when setting schedules and agreeing to contracts. The risk also increases as sleep debt increases, so schedules need to take this into account.

Develop and maintain a regular routine that provides for sleep, meals, daily living and time off. This will improve sleep quality and alertness when awake.

Learn, plan and use counter-measures to better manage driver fatigue:

- set schedules so that wherever possible, drivers can take a power nap if starting to feel tired;
- take a nap before the start of a shift to help prevent fatigue;
- use rest breaks to maximise the quality of rest;
- combine short rest breaks with exercise;
- drink plenty of water and eat sufficient fresh food including fruit and vegetables; and
- even with adequate sleep, a monotonous trip can make us less alert – mental games and habits can be developed to help keep alert.

If early signs of drowsiness are ignored, micro sleeps may be experienced, resulting in loss of control of the vehicle leading to the vehicle running off the road or into an oncoming vehicle. Once fatigue sets in, the best counter-measure is sleep.

2.3.2 Obtaining good sleep and taking naps

The actual amount of sleep needed by each person varies and this needs to be considered by drivers and all members of the supply chain. Similarly, how to have a good sleep is an important consideration. Avoid stimulants – they are not the answer to fatigue as they only delay sleep.

To obtain good quality sleep and manage the risks associated with the quality of sleep…

- at home, a motel or driver quarters:
  - find the best room temperature to fall asleep (it will probably be between 18 & 22°C);
  - turn down your phone volume (or turn it off); wear earplugs; ask the family to be quiet;
  - if using a motel room, select one away from the road;
  - hang extra thick curtains; wear eye shades; and
  - have sufficient sleep before commencing driving/ working.
- on the road:
  - find a quiet truck bay and use dark curtains and liners to keep out light;
  - make sure your sleeping berth is well-ventilated;
  - take eye shades and earplugs with you;
  - turn off your mobile phone and radios;
  - take time to change out of your work clothes as you would at home; and
  - drink plenty of water.

If you are having trouble sleeping seek medical advice and remember regular health checks are important. It is important that drivers are aware of any sleep disorder or other medical condition that could affect their ability to drive safely.

> The best time to sleep is when you feel the onset of tiredness.

Short breaks are an important means of addressing driver fatigue and in addition to the short breaks specified in the new laws; additional breaks should also be taken when necessary. Naps should not be seen as a weakness as it is good fatigue management. Naps can be very effective in providing short-term relief, but they are only a temporary measure and not a substitute for continuous sleep. When driving, remember to:

- be prepared to take breaks when most needed;
- avoid extreme temperature and take breaks where relief from temperature is available;
- use short breaks to stretch and walk; and
- try and maintain some simple exercise routines between driving shifts.

Naps are a short-term answer to fatigue if it occurs, so those in the supply chain should plan the work and rest so that naps are not usually needed. If fatigue does occur however, a nap can help decrease fatigue.

The effectiveness of naps will depend on the time of day they are taken and how fatigued the driver is. Naps are most effective if taken before a driver is fatigued. However, if experiencing overwhelming sleepiness, stop and obtain adequate sleep as soon as practical. Naps should only be taken as a last resort in these circumstances. Consider the following points when napping;

- a minimum of a 10-minute up to 30-minute nap should be adequate to reduce the effects of fatigue;
- if a longer nap is needed, allow up to 80-90 minutes so that waking should occur during a shallower sleep;
- consider taking a nap before a long drive to help prevent fatigue developing during the drive;

- plan and schedule naps and ideally take advantage of facilities to coincide with natural drowsiness in the afternoon (2-4 pm) or during the hours of midnight to dawn if a night driver;
- sleep occurring when we are designed to be awake (e.g. late morning and the middle of the day) tends to be shorter and more fragmented and therefore less restorative;
- after naps taken during normal sleep hours, particularly the period between midnight and around 6 am, it can be hard to get going again. It may be better to have a nap slightly earlier in the evening; and
- build in a 'wake-up' period to get going again.

For more information on naps you can download the *Guidelines for Using Napping to Prevent Commercial Vehicle Driver Fatigue (2006)* from the NTC website at **www.ntc.gov.au.**

2.3.3 Managing fatigue at work

It is important that all parties in the supply chain cooperate to better manage driver fatigue. Simply adhering to prescribed driving hours and relying on work diaries/logbooks may not be enough to address the risks of driver fatigue. Good fatigue-management practice is also essential.

Part 2 of these guidelines highlights many of the common factors that contribute to driver fatigue. Part 3 sets out a suggested risk-management process, consistent with OH&S requirements, which can be used by all parties in the supply chain to manage the risk of their actions or inactions contributing to driver fatigue.

Managing fatigue requires a systematic fatigue-management system. Central to this is a risk-management approach and this is discussed in Part 3. Also necessary are associated policies and procedures to manage the risks associated with that business and that engenders an organisational commitment to the ongoing management of fatigue. An example of this might include a system involving use of Driver Fatigue Management Plans (DFMP).

See table 2, page 13

Share this information with your family so they can provide support and understand the importance of adequate sleep.

If in doubt – seek medical advice.

Factors to consider when developing policies and procedures include:

- methods to generate a culture of understanding and management of fatigue including good communication and consultation;
- the type of work to be performed and body-clock risks that can contribute to fatigue;
- scheduling and rostering drivers, including length of shift and allowing for necessary rest and recovery during and between shifts;
- availability of rest areas and amenities for drivers;
- consultation on fatigue risks with drivers, their representatives, and other parties in the supply chain;
- reviewing loading and unloading times and delays at pick up and delivery points;
- establishing drivers' capacity and fitness for work;
- contingency planning including providing for reasonably expected delays;
- training and education in fatigue management;
- managing incidents and near misses; and
- establishing and maintaining appropriate workplace conditions and audits.

Some or all of the policies and procedures may exist already in other corporate documents. Fitness for work policies and procedures may be in human resource management manuals and relevant information on training may be in general safety induction manuals. It is not necessary to create documents especially for a fatigue management system, providing that issues can be identified and referenced within existing policies and procedures.

Some policies and procedures that are used for fatigue management, such as policies on drugs and alcohol in the workplace or hazard and incident reporting procedures, may apply to a wide range of circumstances within the one organisation. Where relevant policies and procedures exist, which have been developed in consultation with employees and OH&S representatives, they could be used for fatigue management.

Table 2: Check list for managing fatigue

Here are some tips to help keep alert at the wheel:

Planning:

- Plan trips to provide adequate time for sleep, rest and food, taking into account appropriate places to stop
- Plan rosters so there is enough time to adjust to a change between day and night shift
- Talk to the family well in advance of departure time so that sufficient rest is achieved
- Be realistic about how much sleep is needed to be a safe driver and make sure it is acquired
- Start the journey without sleep debt
- Understand the body clock and be aware of low point of alertness
- Share this information with the family so they can provide support and understand the importance of adequate sleep
- Make sure there are no health problems. If in doubt – seek medical advice.

On the road:

- Take regular power naps (20 to 30 minutes)
- Keep the cab at a comfortable temperature, but not too warm
- Get fresh air into the cab. Smoke and stale air can contribute to drowsiness
- Eat sensibly and exercise regularly
- Drink plenty of water and never drink alcohol when working
- Use caffeine only when needed – it is only a short-term solution to mild fatigue if you don't usually have a lot of caffeine
- Learn to recognise the signs of sleepiness and pull over as soon as possible for a short nap
- Do not take drugs to manage fatigue.

To help manage boredom:

- Listen to music, talkback radio or talking books or chat on the CB radio
- Play mental games, such as calculating distances
- Take regular breaks to stretch, walk and check the vehicle
- Learn to recognise the signs of sleepiness and pull over as soon as possible for a short nap.

Table 3: Guidance on schedules and rosters to minimise fatigue

Here are some tips on designing schedules and rosters to manage driver fatigue:

1	Give a driver sufficient notice to prepare for a working period of 14 hours or more, or if this is not practical, ensure the driver's fitness for duty is assessed.
2	A solo driver needs the opportunity for at least 7 hours of continuous sleep in a 24 hour period.
3	Minimise irregular or unfamiliar work rosters.
4	Operate flexible schedules to allow for Short Break Time or discretionary sleep.
5	Minimise very early departures to give drivers the maximum opportunity to sleep in preparation for the trip.
6	When drivers return from leave, minimise night-time schedules and rosters to give drivers time to adapt to working long hours, especially at night.
7	Give sufficient notice of a change between night and day shift, with enough time to change sleep patterns.

Part Three Managing Fatigue — Risk-Management Approach

A suggested process to create a fatigue-management system that can be used by all parties in the supply chain to eliminate, minimise or control the risk of their contribution to driver fatigue, includes the following steps:

1. **Risk Identification**
2. **Risk Assessment**
3. **Risk Control**
4. **Monitor and Review**

No two operations are the same. Every member of the supply chain should assess the specific factors resulting from their operations and use the risk-management process to manage all resulting risks. Keep records of this process as evidence of the steps that have been considered and taken to manage the risks of driver fatigue. Parties in the supply chain should consult with other parties in the supply chain, and in particular with operators and drivers, in order to control risks of driver fatigue.

A detailed approach to risk management is already required under OH&S law and is the key to effectively managing the risks of heavy vehicle driver fatigue. This section (Part 3) provides guidance on applying the risk-management process. Further guidance is provided in Part 4 in highlighting questions to assist all parties in the supply chain identify, assess and develop controls in order to manage fatigue risks.

For more information on how to use the risk-management approach to meet workplace health and safety obligations, please refer to Australian Standard ASNZ4360 on Risk Management.

STEP ONE: RISK IDENTIFICATION

The first step is to identify factors that may contribute to driver fatigue. Employers and all other parties in the supply chain should develop a list and keep records of all the factors in their business that have the potential to contribute to driver fatigue.

There are many ways to identify workplace factors that contribute to fatigue, including:

- inspecting workplace rosters and work-time records;
- consulting with drivers – ask them about schedules and rosters. Also, ask about any problems they have encountered, or any near misses or unreported injuries;
- consulting with workplace OH&S representatives and committees;
- reviewing loading and unloading times and delays at pick up and delivery points;
- conducting safety audits;
- analysing injury and incident reports;
- undertaking driver surveys;
- reviewing loading and unloading times and delays at pick up and delivery points;
- conducting safety audits;
- keeping records and details of all workplace incidences and near misses;
- recording frequency – how often the situation occurs; and
- recording number of people exposed and duration.

Records should be kept of this process and of decisions made. This information can be useful as a starting point when undertaking regular reviews of risks in the future.

Factors to be considered include:

- length of shifts worked – the length of shifts worked can contribute to fatigue;
- previous hours and days worked – the effects of fatigue are cumulative (drivers may have sleep debt due to the previous hours and days worked, which can contribute to fatigue);
- type of work performed – pay attention to the level of physical and/or mental effort required;
- time of the day when the work is being performed – remember that disrupting the body clock can cause fatigue and also impact on task performance;
- delays loading or unloading at consignors or consignees;
- roster design & scheduling – allow for rest and recovery between shifts;
- work premises – layout and condition;
- work environment – vibration, noise, climate/temperature, etc;
- human factors – capability, skill, experience, age, physical fitness and health status; and
- driver's fitness for duty.

STEP TWO: RISK ASSESSMENT

The second step involves assessing each of the risks identified. That is, assessing the likelihood of the event occurring (e.g. two long shifts, two days in a row) and the expected consequences (loss of alertness). For each of the risks you have identified, assess and record:

- the likelihood of the incident occurring, bearing in mind the existing control measures;
- the consequences of an incident occurring, bearing in mind the existing control measures; and
- the combination of the likelihood and consequences to estimate the rate of risk.

Part 2 of these guidelines provides guidance about common fatigue hazards. Further guidance may be gained by all members of the supply chain by considering the various questions contained in Part 4. This further explains the nature of risks and contains examples of questions that further highlight various risks and consequences.

Example of a Risk Assessment Matrix

Instructions:

A Determine the most likely fatigue consequence of an incident (e.g. falling asleep, drowsiness)

B Select the phrase that best describes the likelihood of the event occurring (e.g. highly likely that a driver will work three night shifts in a row)

C Line up the consequence and likelihood to determine the risk score

All risks should be managed as soon as reasonably practicable. However, if this is not possible, a plan should be put in place to manage the risks as soon as reasonably possible. In this case, greatest priority should be given to risks in the dark blue zone that indicate high-level risks requiring priority action, the mid blue zone indicates medium-level risks that may be given lower priority, and the white zone indicates low-level risks. Remember, however, that this is just a guide.

When assessing the risks, refer to Table 5 that may help you determine what type of activities increase fatigue risks the most.

Records should be kept of this process including details of the assessment process undertaken, who is allocated responsibility to manage each risk and the relevant timeliness for action. Where necessary, this will demonstrate that matters are progressed appropriately and in a timely and efficient manner according to the order of priority.

Step 3 (page 19) provides further guidance on the types of controls that should be used to control risks.

Table 4. Risk Assessment Matrix

MOST LIKELY FATIGUE CONSEQUENCE	LIKELIHOOD			
	Definitely will occur	Likely to occur	Unlikely to occur	Won't occur
High levels of fatigue (e.g. drowsiness, micro sleeps)				
Medium levels of fatigue (e.g. loss of alertness, slowed reactions)				
Low levels of fatigue (e.g. slight tiredness)				
No fatigue				

Table 5. Risk Assessment Guide

Here are some tips on some risks and the seriousness they might have in your business

Lower Fatigue Risk	Some Fatigue Risk	Higher Fatigue Risk
Regular short shifts with little night work	Regular shifts	Unpredictable or long shifts with lots of night work
Schedules build in time for typical delays	Schedules allow some flexibility for delays	Schedules do not allow any time for delays
All trips avoid driving at low alertness periods (i.e. night, early morning)	Some trips during low alertness periods	Most trips during low alertness periods
Rosters ensure at least a week's notice to prepare for upcoming schedules	Rosters allow a few days notice for upcoming schedules	Notice for schedule changes do not allow an opportunity for good quality rest
Short breaks are taken frequently and from early in the shift	Short breaks taken only at end of allowed maximum driving period	Short breaks not always taken
Drivers are able to sleep at night in own bed	Drivers sometimes sleep at night and usually in own bed, or always at night but in vehicle/motel	Drivers rarely sleep at night and usually in vehicle
Drivers almost always get 7-8 hours continuous sleep per night	Drivers sometimes get 7-8 hours sleep	Drivers rarely get 7-8 hours sleep

STEP THREE: RISK CONTROL

The third step involves deciding on control measures to manage exposure to each fatigue risk identified and implementing the controls in a timely manner. Employers and other parties in the supply chain should implement control measures that adequately control exposure to fatigue in their business.

The hierarchy of control outlined in Table 6 provides a method of assessing control measures. Under the hierarchy, the ideal solution when managing fatigue is to completely eliminate factors contributing to fatigue. If this is not reasonably possible there are a number of control options that may be used alone, or in combination, to reduce the risk so far as is reasonably practicable. Measures should be supported by policies, procedures, information and training. Because fatigue is caused by a combination of factors, the most effective way to manage it is by using a combination of risk-control measures.

Table 6: Order of control measures to eliminate or reduce the risk of injury or harm (in some instances a combination if control measures may be appropriate).

1	**Elimination** removing the hazard or hazardous work practice from the workplace. *For example, eliminating schedules that result in undue pressure on drivers or through using effective policies and fatigue-monitoring equipment that ensure a driver stops driving before becoming impaired by fatigue.*	**Most effective control measure**
2	**Substitution** substituting or replacing a hazard or hazardous work practice with a less hazardous one. *For example, substituting an onerous schedule or through providing a changeover driver rather than requiring the one driver to complete a long shift.*	
3	**Isolation** isolating or separating the hazard or hazardous work practice from people involved in the work or people in the general work area. *For example, providing drivers with accommodation for quiet sleep away from the heavy vehicle and from noisy traffic.*	
4	**Engineering controls** if the hazard cannot be eliminated, substituted or isolated, an engineering control is the next preferred measure. *For example, re-engineering a queuing system in order to minimise queuing of heavy vehicles for loading/unloading.*	
5	**Administrative controls** this includes introducing work practices that reduce the risk, such as providing procedures, instruction and training. *For example, providing training to employees on combating fatigue and through supervising and assessing drivers' fitness for duty through a shift.*	
6	**Personal protective clothing and equipment** these should be considered only when other control measures are not practicable or to increase protection. While essential for some work procedures, these should be last in the list of priorities. *For example, through fitting heavy vehicles with safety equipment such as airbags or implementing policies and supervision to ensure drivers wear their seat belt.*	**Least effective control measure**

Control measures

It is important that once controls are developed they are implemented in a timely manner. This includes keeping records of decisions and of who is responsible for implementing the measures and, where appropriate, setting milestones for progress and providing necessary resources in order to complete the task. Further guidance on developing appropriate controls is provided below by referring to the questions contained in Part 4.

Control measures need to be specific to the risks identified and to the particular business. The types of measures may include:

- developing work procedures and/or policies;
- communicating control measures;
- providing training and instruction; and
- supervision.

Table 6 shows the order of priority in seeking to control risk. By following the order of controls, parties will be able to identify what types of controls are best suited to a specific risk. For example, if eliminating a risk is not reasonably possible, consider substituting the risk instead. A lower order control should only be used if the higher order control is not reasonably practicable. When assessing the type of control measure, consider options for their applicability and the interaction between combinations of hazard factors that could influence the level of risk. The order of controls can be used by any party in the supply chain and examples are given to highlight controls that various parties can use for their business.

Specific industries or industry sectors may also wish to consider developing their own tailored Industry Codes of Practice as a further guide to effectively managing driver fatigue.

Developing work policies and procedures

Work policies and procedures need to be developed and implemented to ensure that all reasonable fatigue control measures are in place and effective. This might include developing a driver fatigue-management plan as part of the overall fatigue-management system. A fatigue-management system can consist of a collation of policies and procedures to manage driver fatigue and may include a Driver Fatigue Management Plan (DFMP).

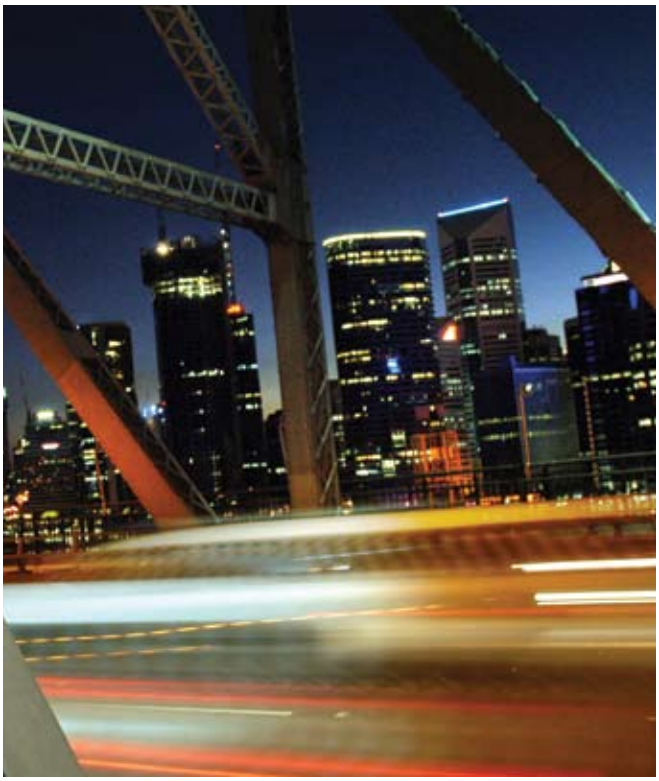
Effective fatigue-control measures should define and communicate responsibilities. For example, employers and persons conducting a business are responsible for providing a roster system that provides staff with sufficient opportunity for rest and recovery. It is a good idea to document and keep records of procedures and the reasons behind them, detailing when and how they must be implemented and who is accountable.

Communicating control measures

Employers and persons conducting a business should consult with drivers about the control measures, both in their development and when they are to be implemented. It is important to clearly communicate that the control measures are being introduced to effectively manage fatigue. When communicating control measures to drivers, it is important to remember that drivers (through their workplace health and safety representatives) are entitled to be consulted about any changes in the workplace that affect, or could affect, their safety.

Consultation may be achieved through the workplace OH&S representatives and should include:

- the possible health and safety impact of changes;
- the benefits and problems associated with the changes;
- measures needed to eliminate or control any adverse impact on health and safety;
- procedures for drivers to notify supervisors of any impairment or potential impairment that may place any person at risk before starting work; and
- clear definition and communication of responsibilities.



Providing training and instruction

Employers and persons conducting a business should provide training and instruction on fatigue for drivers, supervisors, schedulers and any other person whose actions may affect road safety. Specific training requirements are included in the requirements for participation in both the Basic and Advanced Fatigue Management schemes. Minimum information should include:

- common causes of fatigue including shift work, extended working hours, roster patterns, demands placed on drivers and delays in loading and unloading;
- tips to identify signs of fatigue;
- potential health and safety impacts of fatigue;
- how drivers are responsible for making appropriate use of their rest days, and for ensuring they are fit for duty; and
- policies and procedures.

Consideration should be given to the appropriate information and training to be provided to members of the chain, including all drivers. Drivers attending training outside their normal shift should be considered at work and rosters adjusted accordingly.

Supervision

Employers and persons conducting a business should also provide adequate supervision to ensure that control measures are being used correctly. This can include activities such as monitoring fatigue levels of drivers or ensuring compliance with safety procedures. Induction is also relevant to new employees or when new activities are undertaken. For drivers working alone, employers should consider providing a means of communication and a procedure for regular contact.

STEP FOUR: MONITORING AND REVIEW

The fourth step is to monitor and review the effectiveness of fatigue control measures, and revise if necessary. When working through this step it is useful for members of the supply chain to consider:

- have the chosen control measures been implemented as planned?
- are the chosen control measures working?
- are there any new problems that may, for example, have been caused by the control measures?

When answering these questions, employers and persons conducting a business can:

- consult with drivers, supervisors, OH&S representatives, OH&S officers, and safety committees;
- consult with other parties in the supply chain;
- measure exposure to fatigue – are drivers still getting fatigued?; and
- monitor incident reports and assess the likelihood for fatigue contributing to incidents.

If any new hazards have been identified, it is necessary to refer back to Step One and identify and manage risks as part of the ongoing risk-management process. Employers and persons conducting a business should ensure that there is a process for ongoing monitoring and evaluation of workplace fatigue using the risk-management process as this process should be regularly undertaken and reviewed. Once again, records should be kept of this process including steps undertaken and decisions reached.

Part Four | Developing A Road Transport Risk-Management System

IMPLEMENTING FATIGUE RISK MANAGEMENT SYSTEMS

This attachment has been prepared for the information of all parties in the supply chain including:

- road transport operators;
- owner/drivers;
- employee drivers;
- other influencing parties (for example, consignors, consignees and loaders); and
- agents of any of the above parties.

It is very important to note that given the diversity of road transport operations, it is very difficult to prescribe exactly what each duty holder should be doing in terms of fatigue counter-measures. That is, what may be effective for one party may be ineffective for another.

Instead of prescribing exactly what parties should do to address these common fatigue risk factors, questions or prompts that parties should consider are provided against a number of common fatigue risks to assist you in undertaking the risk-management process and formulation of your fatigue-management plan.

The questions provided will have varying degrees of relevance according to individual operating circumstances. Further, the questions should be considered against a background of whether you, or the business, do them 'adequately'.

Remember, it is not necessary to address every risk, but all reasonable risks that are appropriate to your circumstance.

Key points

- All personnel in your business who have an influence on driver fatigue levels should read these guidelines to gain an understanding of fatigue and risk-management theory.
- Using the questions below as prompts, systematically analyse your operations through genuine consultation and communication and begin to work out where the fatigue risks are, how serious they are, and what's the best way to address them. You should accurately record your discussions and steps that you take.
- Begin a process of monitoring and reviewing what you do.

Attachment 1: Questions to consider when developing a Fatigue Management System

Examples of fatigue risk factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Poor understanding, communication, commitment, consultation and review	• Can lead to ineffective fatigue-management practices and systems	**Heavy vehicle operators, including owner/drivers – does my business:** • understand each party's legal obligations in relation to fatigue management? (see Part One) • understand the causes of fatigue and how/where my work systems may create fatigue risks? (see Part Two) • understand how the risk-management process can be used as a means to implement effective fatigue management? (see Part Three) • adequately communicate with all relevant parties in the supply chain including drivers of the importance of effective fatigue management and engender commitment from all parties to improved day-to-day practices? • keep abreast of ongoing fatigue and risk-management information and developments from sources such as industry associations, transport or OH&S agencies? • demonstrate a commitment to effective fatigue management that is supported by management and employees/contractors and backed up by appropriate training resources? • review written and/or verbal instructions from customers to ensure that they are not leading to breaches of fatigue regulations and/or creating unnecessary risks? • assess which customers are likely to promote effective fatigue management and give preference to them? • continually review its risk-management and fatigue management processes and plans to assess their effectiveness via mechanisms such as accreditation and auditing processes? **Consignors, consignees or loaders – does my business:** • understand each party's legal obligations to manage driver fatigue? (see Part One) • understand the causes of fatigue and how/where my work systems may create fatigue risks? (see Part Two) • understand how the risk-management process can be used as a means to implement effective fatigue management? (see Part Three) • keep abreast of ongoing fatigue and risk-management information and developments from sources such as industry associations, transport or OH&S agencies? • adequately consult with all supply chain parties to plan and implement effective fatigue-management practices? • provide adequate training to all relevant staff? • continually review the effectiveness of its risk-management and fatigue-management plans and processes? **Employee drivers – do I:** • understand my legal obligations in relation to fatigue management? (see Part One) • understand the factors that lead to fatigue? (see Part Two) • assist my employer to implement effective fatigue risk-management systems? (see Part Three) • comply with the company's other related policies such as drugs, alcohol and medications? • inform my employer or supervisor when I believe I may be affected by fatigue?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Long work shifts	• Long shifts without adequate breaks can contribute to fatigue – especially if there is a high amount of physical and/or mental exhaustion • Fatigue-related incidents are more likely in circadian low points (e.g. midnight to 6 am) • The effects of fatigue are cumulative so fatigue is more likely to occur towards the end of a shift and the end of the working week • Sleep at night is the most effective way of fixing accumulated sleep debt.	**Heavy vehicle operators – does my business:** • provide adequate information to drivers on short-term measures such as naps and breaks and do all parties understand the limitations of these temporary measures? **Employee drivers, or owner/drivers – do I:** • take the necessary breaks as legally obliged and seek to minimise fatigue by sleeping, where possible, in dark, quiet and comfortable places and preferably at night? • plan shifts and lifestyle generally so that the highest quality breaks and rest periods can be utilised? • utilise check lists such as those in Part Two to keep alert and detect fatigue warning signs? • inform relatives and friends of work schedules and sleep times to avoid unwanted disruptions? • minimise disruptions? (e.g. use an answering machine or turn phone down?) • develop ways of 'unwinding' after a long shift? (e.g. take a walk or watch some television?) • use breaks to stretch and exercise? **Consignors, consignees or loaders – does my business:** • adequately assist drivers in the latter stages of their shift by, where possible, introducing controls and procedures? • consider making allowances in the latter half of shifts or working periods to address the possible heightened fatigue levels of drivers?
Cumulation of a high number of previous hours and days worked without adequate sleep	• 'Sleep debt' accumulated over a period of time can contribute to fatigue • Broken sleep and day sleep may not be as restorative as night time sleep and must be considered.	**Heavy vehicle operators – does my business:** • have adequate flexibility in its work systems and processes to respond to busy times and/or unexpected delays? • consider how work systems such as work flexibility could be implemented? • consider how controls and procedures to assist staff performing hazardous work during high fatigue periods could be implemented? • monitor records such as logbooks, driver diaries, pay slips and output from electronic monitoring devices and other records to confirm that drivers are compliant with regulatory limits? • maintain an awareness of drivers having other employment responsibilities such as a second job? **Employee drivers, or owner/drivers – do I:** • take active steps to assess my fatigue levels and respond accordingly? **Consignors, consignees or loaders – does my business:** • check its work systems to ensure that drivers are compliant with regulatory limits?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
High level of exertion	• Work that is mentally and/or physically demanding can contribute to fatigue • Fatigue can be exacerbated if work completed at circadian low points (e.g. midnight to 6 am).	**Heavy vehicle operators – does my business:** • design and redesign work practices so that levels of physical and/or mental exhaustion are taken into account? **Employee drivers, or owner/drivers – do I:** • understand that high levels of exertion can exacerbate fatigue and make the necessary allowances? • ensure I use my rest times to recuperate as much as possible? **Consignors, consignees or loaders – does my business:** • check its work systems to ensure that they minimise the amount of highly mental and/or physical work that is undertaken by drivers? • communicate to drivers and operators before the task is undertaken of the likely demands involved?
Time of the day when the work is being performed	• Work performed at circadian low points (e.g. midnight to 6 am) can result in fatigue.	**Heavy vehicle operators – does my business:** • design schedules to be as flexible as possible? • provide adequate opportunities to recover from night-time work? **Employee drivers, or owner/drivers – do I:** • understand that working at different times of the day and night can exacerbate fatigue levels? • take adequate steps to minimise these risks? **Consignors, consignees or loaders – does my business:** • provide systems that promote effective and efficient queuing and loading/unloading of heavy vehicles? • provide rest facilities for drivers?
Delays loading or unloading at consignors and consignees	• Delays can extend the length of shifts and can be physically and/or mentally exhausting which can contribute to sleep debt and fatigue.	**Heavy vehicle operators – does my business:** • promote flexibility in its work systems to be able to reschedule pick up and delivery times where possible? • promote flexibility in its work systems to be able to replace a fatigued driver prior to driving hours being in excess of regulations, where possible? • promote a work system to allow drivers to report delays and incidents that in turn allows the investigation of fatigue problems? • consider how contractual obligations with consignors and consignees and other influencing parties could be utilised to encourage effective and efficient loading and unloading practices? **Employee drivers, or owner/drivers – do I:** • have the ability to amend schedules? • communicate with 'base' to amend schedules? • balance longer working time with longer breaks or a longer sleep in the subsequent period? • record delays and all fatigue-related problems so they can be addressed?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
		Consignors, consignees or loaders – does my business: • promote flexibility in its work systems to be able to reschedule pick up and delivery times and/or have greater loading and unloading capacity during busy times or following general delays? • promote a work system to allow all in the supply chain to report incidents? • promote a work system to allow the reporting and investigation of fatigue problems? • promote a work system to allow the implementation, monitoring and review of effective fatigue-management practices and policies?
Poor roster design and scheduling	• Rosters and schedules that do not allow for rest and recovery between and during shifts can contribute to fatigue • Swapping from day to night shifts and vice versa without adequate transition assistance can contribute to fatigue • Drivers may feel fatigued during the latter half of their working week (or working period) • Drivers may feel fatigued at the start of a working week (or working period).	**Heavy vehicle operators – does my business:** • assess fitness for duty of drivers? • take into account the effect of likely non-driving activities (e.g. bus driver attending to passenger needs) and delays when calculating maximum work hours permitted? • take into account drivers' commuting hours as a factor that may contribute to fatigue levels? • plan trips to allow as much sleep at night when operational requirements permit this? • consult with individual drivers where work will require regular and significant changes to work periods? • build in time to assist drivers adjust when returning from a break or from day to night (or night to day) driving where possible? • schedule trips to allow for appropriate rest breaks? • schedule trips allowing also for the impact of likely delays? • have contingencies in place? **Employee drivers, or owner/drivers – do I:** • report any fatigue problems within or between schedules so they can be fixed? • maintain logbooks, driver diaries or other paperwork required for fatigue purposes? • provide input to improve schedules and rosters? • advise when not fit for work? • advise any conditions that may affect my ability to perform tasks legally and safely? **Consignors, consignees or loaders – does my business:** • check contracts to ensure no undue pressure? • seek other forms of assurance that systems are not placing undue demands on parties? • audit its processes regularly to ensure safe work systems? • manage the flow-on effects to operators and drivers if changes to work systems occur? • when awarding work, consider factors other than financial?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Poor work environment	• Excessive vibration, noise, climate/ temperature, etc. can contribute to mental and/or physical exertion that can contribute to fatigue • Work premises – poor layout and condition • Poor ergonomics and poor facilities can contribute to mental and/or physical exertion that can contribute to fatigue.	**Heavy vehicle operators – does my business:** • provide amenities to assist drivers take high-quality rest (possibly including lunch rooms, sleeping accommodation, sleeper cabs, etc.) that are appropriate to the operation? • monitor the quality of amenities? • maintain vehicles to meet roadworthiness standards and fatigue-related standards (e.g. ADR 42 on sleeper berths and 42.18 on ventilation)? • consider cabin comfort, including vibration characteristics, particularly of vehicles used in long-haul operations? • make scheduling allowances for adverse weather and road conditions (e.g. heat, snow, roads under repair, etc.)? **Employee driver, or owner/driver – do I:** • advise managers where the work premises may be poor in terms of encouraging high-quality rest? • keep the cab well-ventilated and at a comfortable temperature? • adhere to equipment maintenance schedules? • report equipment faults? • undertake timely and accurate pre-trip, during trip and post-trip inspections? **Consignor, consignee or loader – does my business:** • provide amenities to assist drivers take high-quality rest? • monitor the quality of amenities? • design loading/unloading and queuing areas and monitor practices to minimise working hours as much as reasonably practicable? • accommodation for full vehicle combinations i.e. B-double, B-triple, etc.? • provide a working environment that will not exacerbate a driver's fatigue levels? **Other parties/governments – do we:** • provide appropriately maintained roads, rest areas and traffic systems? • provide amenities to assist drivers take appropriate rest? • monitor the quality of amenities?

Examples of Fatigue Risk Factors	Why is this factor a fatigue risk?	Questions that should be considered by parties to assist when determining what specific controls are appropriate and when/how should they be implemented
Inadequate/Poor human factors	• Capability, skill, experience, age, physical fitness and health status all influence a driver's ability to mange his or her own fatigue	**Heavy vehicle operators – does my business:** • encourage regular medical assessments? • assist drivers undertake their medical assessments when required and are the driver's medical certificates current? • assess the ability of drivers to safely perform the tasks requested of them? **Employee driver, or owner/driver – do I:** • disclose any matter that may affect my fitness for duty? • take active steps to ensure that I am fit for duty? (see Part One) **Consignor, consignee or loader – does my business:** • observe the wellbeing of drivers and actively intervene if behaviour and appearance of the driver is not normal?

Common terms used in these Guidelines

Minimum continuous break in a 24 hour period for a solo driver	*7 hours in the Standard Hours option, 7 hour continuous break or 8 hours in 2 parts (is limited) in the Basic Fatigue Management option, 6 hour continuous break or 8 hours in 2 parts (subject to conditions).*
Night sleep	*At least seven hours continuous rest between 10pm and 8am.*
Shift	*The period of driving and work time between two periods of continuous sleep opportunity. A shift is deemed to have started at the end of the last continuous sleep opportunity and finishes at the beginning of the next continuous sleep opportunity.*
Short rest break	*Any rest break that is 15 minutes or more in duration, but less than seven hours. Means time at work provided for rest and meals after a continuous period of active work and does not include non-driving work time or time not working. Short rest is recorded in minimum 15 minute periods (i.e. any non-work less than 15 minutes does not count towards rest, any period of non-work of 15 minutes but less than 30 minutes is counted as 15 minutes rest etc.).*
Night work	*Any driving or work undertaken between midnight and 6 am.*
Hazard	*A source or situation with a potential to cause injury, illness or disease.*
Hazard identification	*Process of recognising that a hazard exists.*
Risk	*The likelihood of an injury, illness or disease occurring and the severity of any injury, illness or disease that results from exposure to a hazard.*
Risk assessment	*Process of working out how big a risk is present and what risk factors are causing the problem.*
Risk control	*The process of applying appropriate prevention measures to eliminate or minimise any risks.*
Circadian rhythm	*Circadian rhythms or the body clock regulates physiological and behavioural functions on a 24 hour basis. Sleep and wakefulness are programmed and sleepiness is greatest between midnight to 6 a.m. and to a lesser extent between 2-4 p.m.*
ADR	*Australian Design Rules.*
Fatigue	*Fatigue can be described as a progressive loss of alertness that ultimately ends in sleep*
Sleep debt	*Failure to have a normal sleep results in sleep debt that accumulates and can only be paid back by undisturbed, restorative sleep.*
Schedule	*The pattern of driving and work covering one or more trips. For operators with rostered drivers a schedule might operate over a week or a month. For less regular or predictable situations a schedule may refer to a single trip.*

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Attachment 2

National Heavy Vehicle Regulator (NHVR) - Driver Fatigue Management Plan

Form 1 – Safe Driving Plan

Use this document as a template for your fatigue risk management system.

This form can be replaced with one from your current system if it is equivalent in the key areas and meets the standards and outcomes.

The key areas in this model document are:

- Section 4 Questions 1-4

Instructions

To be completed by the Scheduler at least once a day (prior to driver's being allocated a task) with reference to Form 2.

1. Retrieve the relevant Form 2 for the driver from [file location 3].
2. Complete all sections of the form in blue/black ink.
3. Advise the customer of the proposed plan.
4. Advise the driver of the proposed plan.
5. Have the Driver sign the form.
6. Sign the form.
7. Copy the form and hand it to the Driver.
8. Place the completed form in [file location 2]

Form 1 – Safe Driving Plan (complete as per instructions overleaf)

Section 1 – Company and Supply Chain Details

Name	Address	Role
[Transport Company Name]		**Transport Operator**
		Freight Customer

Section 2 – Driver/Vehicle Details

Date:		Driver Name:	
Person completing form:			
Rego. Number/s:			
Tick vehicle type:	Truck / Trailer: ☐	B-Double: ☐	Road Train: ☐
Tick Driving Hours Scheme:	STDH: ☐	BFM: ☐	AFM: ☐

Section 3 – Proposed Trip Plan

From	To	Estimated Start Time	Working Time	Rest Time	Total Time

NOTE: The driver is to use discretion and rest where or when required provided that regulated driving hours are not exceeded.

Section 4 – Fitness for Duty / Fatigue Checklist (Completed by Scheduler)

1. Has the driver had a reset rest break in the preceding 14 days		Yes / No
2. If the driver has worked in the preceding 24 hours: • Does the shift keep a similar work pattern? (night / day work) • Has a minimum of 7 hours continuous rest?		Yes / No Yes / No
3. Does the driver have sufficient work hours remaining to comply with legal limits?		Yes / No
4. Does the plan provide opportunity for the minimum required rest breaks?		Yes / No
Changes to driving plan made by:	Scheduler (Initials)	
	Customer (Initials)	
	Driver (Initials)	
Driver notified of relevant scheduled changes if any?	Yes / No	Date: _____ Time: _____

Form 1 – Safe Driving Plan (complete as per instructions overleaf)

Section 5 – General Risk Assessment

Are there any other risks associated with this trip?

1. Vehicle issues:	Yes / No
2. Speed issues or restrictions:	Yes / No
3. Communication or remoteness:	Yes / No
4. Fauna or vegetation:	Yes / No
5. Weather or visibility:	Yes / No
6. Other (Specify):	Yes / No

Section 6 – Special Instructions/Contingencies

DRIVERS MUST NOT DRIVE WHILST IMPAIRED BY FATIGUE

Drivers may modify this **Safe Driving Plan** providing work hour / rest requirements are met and notification of any changes is provided to the Scheduler as soon as possible by telephone.

Specific fatigue management instructions for this trip are:

Section 7 - Declarations

Driver acknowledgement

I understand that I am working under [Transport Company Name]'s AFM accreditation and have had the necessary training to do so.

I agree with the work and rest times allowed for this trip and agree to advise the Scheduler of any changes to this trip plan.

I have inspected the named vehicle/s and have rectified any defects likely to affect its safe operation.

Driver's Signature: _____

Scheduler acknowledgement

I certify that this plan has been discussed with the driver and customer.

Scheduler's Signature: _____

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Appendix C

Survey Results

Appendix D

Consultation records with the owner of H07 relating to stock movements

Consultation with the owner of the residence H07 and Developments Biala commenced in December 2017. Up until May 2018 this has included four face to face meetings as well as phone calls and email exchanges. Developments Biala will continue to consult with the owner of this residence until construction has been completed. The consultation that has occurred to date has informed the drafting of this Traffic Management Plan.

Note that this consultation record has been provided to the owner of H07 but has not been agreed as an accurate record of consultation.

Background for Stock Movements

H07 owns land on both sides of Grabben Gullen road. 750 ewes and 30 rams normally reside on the portion of the property which falls on the western side of Grabben Gullen Road with the main yards and shearing shed on the portion of property on the eastern side. The stock is moved across the road as required for farming operations. Due to the layout of gates and paddocks, in many situations stock is required to move along the road for a distance in order that it can be moved across.

- Movements usually occur early in the morning, when the owner of H07 expects traffic volumes along Grabben Gullen Road to be low. The owner also expects that stock is calmer during early morning movements.
- The stock movements occur up to seven times per year per sheep. Four paddocks of ewes and one of rams have to be moved across and then back, resulting in expected stock movements of up to 96 times per year.
- The sheep are moved in groups of 200 to 400 depending on the quantity of sheep in the paddock and the reason for the stock movement. Each paddock is always moved individually to avoid mixing sheep from different paddocks.
- The sheep normally reside on the western side of Grabben Gullen Road within five paddocks, which can be accessed via two gates.
- The stock travel a worst-case distance of approximately 500 metres along Grabben Gullen Road between gates to cross the road.

Consultations

The following details were discussed with the owner of H07:

- The traffic loading due to the wind farm will be minimal during the operational phase, so emphasis should be placed on mitigation of traffic impact during construction. The mitigation measures will be incorporated into the Traffic Management Plan required under Schedule 3 Condition 28 of the Project Approval.
- Under the Project Approval, all heavy vehicles that are not OSOM load must travel to the site from the south via Gunning and will not pass along the section of Grabben Gullen Road near residence H07 as it is located north of the site.
- Under the Project Approval, all OSOM load vehicles must approach the site from the north via Crookwell and will therefore pass by residence H07.
- The construction of the project is expected to take 12 months. The first 5 months will involve civil and electrical works. There will be few heavy vehicles required for these works, which will predominantly involve transporting of rock for tracks, sand for cable bedding and materials for concrete batching. All of these materials will be transported by heavy vehicles and must approach from the south via Gunning.
- After approximately 5 months, it is planned that wind turbine component deliveries to the site will commence. These will involve OSOM vehicles and must approach site from the north via Crookwell. These deliveries will be subject to a second submission of the

TMP. The deliveries will be undertaken by specialist delivery drivers at agreed times. Special permits will be required for these deliveries.

- During the entire construction period, light vehicles may access the site from the north or the south. Therefore, a portion of light vehicles will pass by the residence H07. These light vehicles would appear to have the greatest potential to impact the Hewitt's stock crossing activities.
- Light vehicle traffic to and from the wind farm will be at its highest frequency in the morning when workers travel to the site and in the afternoon when they leave the site. The times when these peaks will occur will correlate with the beginning and end of the working hours specified in the Project Approval. Stock movements during first daylight and just prior to sunset will not correlate with these times for the majority of the year but will during the winter period.

Details of Stock movements

During Developments Biala's initial two meetings with the owners of H07, the following information was collected.
The stock movements and associated timing and quantity include:

- Culling ewes – February = 8 movements
- Shearing - December = 10 movements
- Weaning lambs – February, March = 8 movements
- Crutching- August = 10 movements
- Drenching - five times a year = 50 movements
- Culling hoggets and moving rams in and out of the flock = 10 movements.

Additional husbandry movements which can occur at any time due to seasonal conditions may include but are not limited to:

- Flystrike
- Worms
- Pink eye
- Foot trimming.

Current traffic management implemented

The owner of Residence H07 have obtained a permit from Council to allow for stock movements along and across Grabben Gullen Road. Local Land Services issue Annual Stock movement permits which are paid annually.

- The stock movements can only occur between sunrise and sunset. However, it is noted that the actual time within sunrise and sunset that the stock is moved varies with the seasons.
- "Stock on Road" signs are placed 250 metres in each direction of Grabben Gullen Road from the crossing location.
- Dedicated persons stand by the side of Grabben Gullen Road to wave at and slow traffic while another person musters the stock onto and along the road.
- Cars react to seeing the stock and don't slow down at the signs, meaning cars are travelling fast while passing stock.
- Stock becomes skittish due to the speed of the traffic, lambs can separate which causes panic within the stock.

Gate Locations

The gate locations along Grabben Gullen Road are summarised as follows and shown in Figure C11:

- Western side of Grabben Gullen Road: Ram Paddock and Red Hill gates
- Eastern side of Grabben Gullen Road: Lucerne Western, Laneway, Wattle Creek and Creek gates.

Figure C1: Stock gates along Grabben Gullen Road

Basemap source: Google Maps

Mitigation Measures Discussed

During consultation with the owners of residence H07, several proposals have been made by Developments Biala to assist in avoiding potential conflicts during construction between development related traffic and stock movements. These include:

- Installing permanent signs for all potential gates (subject to obtaining necessary approvals).
- Installing 'Stock crossing' signs at 300m, potentially with flashing lights that could be triggered by remote control for when the stock are on the road (subject to obtaining necessary approvals).
- Installing a stop sign which could be folded up 20m from the gate and unfolded when stock are on the road (subject to obtaining necessary approvals).
- Providing additional support from the wind farm which may include a person to unfold signs and a car positioned on the side of the road with flashing lights to warn drivers, of crossing stock during wind farm construction hours.
- Installing holding paddocks beside the main gates used.
- Installing parallel fences to allow the stock to travel within the paddock beside the road instead of inside the road corridor. This would allow the stock to cross directly over the road instead of having to walk along it.
- Ensuring all on-site workers are aware of the potential for stock movements by including details in the site induction. This would include requiring all workers to slow to 40km/h when stock crossing signs are on display and be prepared to stop. Adherence to this protocol would be monitored using Vehicle Tracking Management Systems for all on-site vehicles. Such education of on-site workers may help to slow other road users who would normally not slow down for the stock crossing signs.

The owners of H07 have expressed the following in relation to these proposals:

- They do not wish to rely on a wind farm staff person when moving their stock (in relation to the wind farm providing a vehicle with flashing lights to assist with stock movement).
- They do not want to be responsible for road accidents involving permanent signage.
- Stop signs may result in people in the community becoming displeased.
- Parallel fencing would not be possible due to the wetness of the land at certain times of the year.
- Farming is dependent on many external factors, such as the weather, and it is therefore difficult to schedule stock movements accurately.

Mitigation Measures to Implement

After undertaking this consultation with the owners of H07, Developments Biala has developed the mitigation measures detailed in section 2.8 of this report. These measures have been discussed with the owners of H07.

Appendix I

Roads and Maritime Services Letter

Transport
Roads & Maritime
Services

Our ref: STH13/00123/09
Contact: Melissa Steep 4221 2771
Your ref: Biala Wind Farm TMP

17 September 2018

Dora Choi
GTA Consultants
Dora.choi@gta.com.au

Cc: information@planning.nsw.gov.au

BIALA WIND FARM TRAFFIC MANAGEMENT PLAN

Dear Dora,

Roads and Maritime Services (RMS) refers to your correspondence dated 5 September 2018 regarding the subject Traffic Management Plan. RMS notes that the requirement to prepare a Traffic Management Plan, in consultation with RMS and Council, is a condition of consent for the Biala Wind Farm development.

RMS has reviewed and the subject Traffic Management Plan and has no further comment to provide, except to reiterate the following requirements:

- The developer must apply for, and obtain a Road Occupancy Licence (ROL) from the RMS Traffic Operations Unit (TOU) prior to commencing roadworks on a State Road or any other works that impact a travel lane of a State Road or impact the operation of traffic signals on any road. The application will require a Traffic Management Plan (TMP) to be prepared by a person who is certified to prepare Traffic Control Plans. Should the TMP require a reduction of the speed limit, a Speed Zone Authorisation will also be required from the TOU. The developer must submit the ROL application 10 business days prior to commencing work. It should be noted that receiving an approval for the ROL within this 10 business day period is dependant upon RMS receiving an accurate and compliant TMP.
  Notes: An approved ROL does not constitute an approval to commence works until an authorisation letter for the works has been issued by RMS Project Manager.

- Prior to transporting any oversized or over mass loads, the applicant shall obtain a permit for an oversized and over mass load from the RMS Special Permits Unit in Glen Innes. The contact number is 1300 656 371.

  It should be noted that the issue of a Special Permit may be subject to route and bridge assessment/s if deemed necessary by the RMS Special Permits Unit. While the TIS has considered the length, width, height and turning radius requirements for over dimensional loads/vehicles, no

details have been given as to the expected weight of loads or axle loadings for the over dimensional movements. The maximum weight of loads associated with the subject development to be moved should be specified in the TIS.

If you have any questions please contact Melissa Steep on 4221 2771.

Please ensure that any further email correspondence is sent to development.southern@rms.nsw.gov.au.

Yours faithfully,

Chris Millet
Manager Land Use
Southern Region

Appendix J

Council Correspondence

Dora Choi

From: Mursaleen Shah <MShah@upperlachlan.nsw.gov.au>
Sent: Thursday, 13 September 2018 12:18 PM
To: Tim Mead
Cc: Craig Smart
Subject: RE: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Hi Tim

Council have reviewed the plan and it is approved without further comments.

Regards

Mursaleen Shah
Director of Works & Operations
Upper Lachlan Shire Council
M: PO Box 42, Gunning, NSW, 2581
P: (02) 4830 1063
F: (02) 4832 1055
E: mshah@upperlachlan.nsw.gov.au
www.upperlachlan.nsw.gov.au

From: Tim Mead [mailto:tim.mead@jncec.com]
Sent: Thursday, 30 August 2018 10:03 AM
To: Upper Lachlan Shire Council <council@upperlachlan.nsw.gov.au>
Subject: FW: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Mursaleen, Susan,

See link below to download the Biala TMP for review (now sent to council mailbox). This document is very urgent for us. We can not submit this plan to DPE for approval until ULSC has reviewed and provided any comments you may have. Please provide feedback on this document by Friday September 7th 2018.

I am happy to discuss this plan with you if needed. Please give me a call.

Regards,
Tim

Beijing Jingneng Clean Energy (Australia)
Suite 3, Level 21, 1 York Street, Sydney NSW 2000 Australia
Mobile : 0429 290 673
Email: tim.mead@jncec.com
www.jncec.com

From: Tim Mead <tim.mead@jncec.com>
Sent: Tuesday, 28 August 2018 5:32 PM
To: 'Susan Ducksbury' <SDucksbury@upperlachlan.nsw.gov.au>
Subject: RE: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Hi Susan,

Try this link: https://www.dropbox.com/s/sgz00nim7epth3r/180824rep-N142520%20Biala%20Wind%20Farm%20Balance%20of%20Plant%20CTMP-FINAL_C.pdf?dl=0

Can you please confirm receipt, and also the timeframe and appropriate contact at Council? Sorry for the urgency but your review comments are critical in order for us to progress the project.

Thanks!
Tim

Beijing Jingneng Clean Energy (Australia)
Suite 3, Level 21, 1 York Street, Sydney NSW 2000 Australia
Mobile : 0429 290 673
Email: tim.mead@jncec.com
www.jncec.com

From: Susan Ducksbury <SDucksbury@upperlachlan.nsw.gov.au>
Sent: Tuesday, 28 August 2018 5:05 PM
To: Tim Mead <tim.mead@jncec.com>
Subject: RE: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Hi Tim

I don't seem to have received the email you referred to and I can't see it in a quick look in the Records System.

Regards

Susan Ducksbury
Executive Assistant
Works & Operations
Upper Lachlan Shire Council
M: PO Box 42, Gunning, NSW, 2581
P: (02) 4830 1053
F: (02) 4832 1055
E: sducksbury@upperlachlan.nsw.gov.au
www.upperlachlan.nsw.gov.au

From: Tim Mead [mailto:tim.mead@jncec.com]
Sent: Tuesday, 28 August 2018 4:58 PM
To: Upper Lachlan Shire Council <council@upperlachlan.nsw.gov.au>; Susan Ducksbury <SDucksbury@upperlachlan.nsw.gov.au>
Cc: 'Brett Maynard' <brett.maynard@gta.com.au>; 'Dora Choi' <Dora.Choi@gta.com.au>
Subject: RE: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Hi Mursaleen and Susan,

I wanted to confirm you received the below email with the Biala WF TMP attached, sent yesterday?

Can you please confirm who is the best person at Council to discuss the plan with?

Regards,
Tim

Beijing Jingneng Clean Energy (Australia)
Suite 3, Level 21, 1 York Street, Sydney NSW 2000 Australia
Mobile : 0429 290 673
Email: tim.mead@jncec.com
www.jncec.com

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From: Dora Choi <Dora.Choi@gta.com.au>
Sent: Monday, 27 August 2018 2:25 PM
To: council@upperlachlan.nsw.gov.au

Cc: sducksbury@upperlachlan.nsw.gov.au; Brett Maynard <brett.maynard@gta.com.au>
Subject: Biala Wind Farm TMP - Attention Mursaleen and Susan Ducksbury

Dear Mursaleen,

Please find attached the Biala Wind Farm Balance of Plant CTMP for your review.

Siew Hwee Kong of our office have previously spoken to Susan Ducksbury of your office and was advised to forward the CTMP report via e-mail once finalised.

Feel free to contact me should you require any further information.

Regards,

Dora Choi
Associate Director
GTA Consultants
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Level 16, 207 Kent Street, Sydney, NSW 2000
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