VOLUME 2 APPENDICES JULY 2011

AGL Dalton Power Project Environmental Assessment

MP10-0035

Appendix F

Transport Impact Assessment

URS

AGL

Switched on Business.

Report

AGL Power Generation Environmental Assessment - Traffic Impact Assessment

3 MARCH 2011

Prepared for

AGL Energy

101 Miller Street
North Sydney
NSW 2060

43167714

URS

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Introduction

1.1 Background

AGL Energy (AGL) is proposing to develop a gas turbine power generating facility in Dalton, NSW (referred herein as the "Project").

URS Australia Pty Ltd (URS) was commissioned by AGL to prepare a Traffic Impact Assessment for the proposed Dalton gas turbine facility to support the Part 3A Environmental Assessment.

1.2 Project Overview

The development of the Project would encompass a footprint of approximately 15 hectares and comprise the following elements:

- Gas turbine facility including ancillary equipment, process control system and administration facilities;
- Associated infrastructure, such as connection to the electricity transmission line, connection to the gas inlet receiver, internal roads and water storage.

The facility would generate a maximum of 1500 MW and would consist of two stages:

- The Dalton Power Station Project will be constructed in two stages. The first stage would include the installation of gas turbine generators with a maximum generating capacity of 750 megawatts. These turbines would either consist of between two to four "E" class turbines, with capacity between 125 megawatts run in open cycle mode, or two to three "F" class machines with a generation capacity of between 200 megawatts and 250 megawatts.
- The second stage would result in the construction of additional "E" or "F" class turbines up to a maximum of 1500MW.

1.3 Site Location

The Dalton site is located to the east of Walshs Road, Dalton, approximately 12 kilometres north west of Gunning. The property details are:

- "The Elms", Lots 115, 249, 252, 253, 305 and 307 in DP 754111;
- "Holmes", Lot 14, 183,184,187,200,283,306 in DP 754111; and Lots 1 & 2, DP 126122; and
- "Riverview", Lot 116, 321, 322, 162, 317, 318 in DP754111.

The site is approximately 18.1 km from the Hume Highway. The regional site location is illustrated in **Figure 1-1**. The site location in a local context and the indicative site layout are illustrated in **Figures 1-2** and **1-3** respectively.

1.4 Report Structure

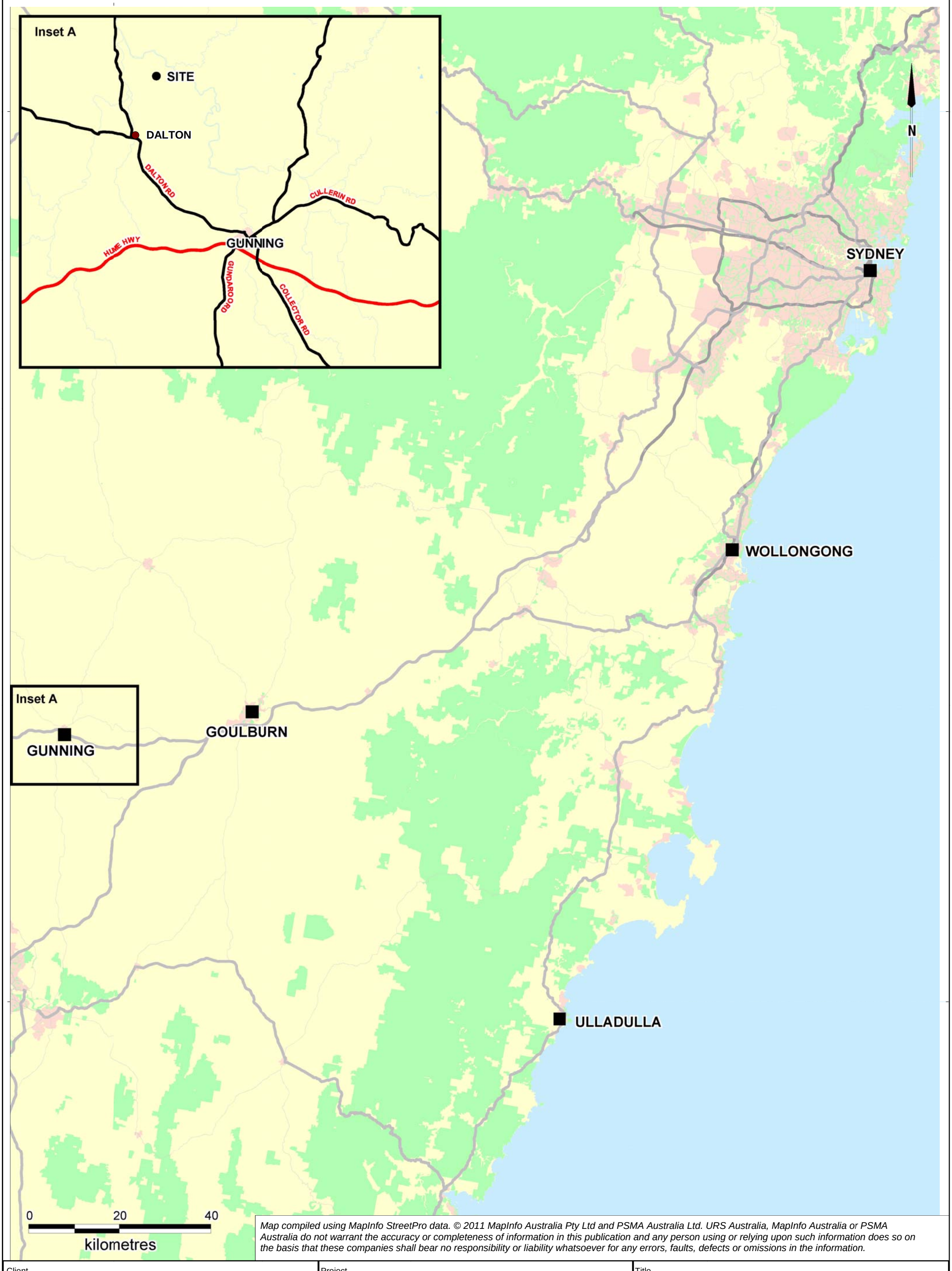
The remainder of this report is structured as follows:

- **Section 2** details the existing conditions of the transport network surrounding the site;
- **Section 3** summarises the traffic generation associated with the transportation of the gas turbine equipment, which includes over-mass and over-dimension loads;
- **Section 4** calculates the traffic generated by the Project during the construction and operational phases;
- **Section 5** identifies the impacts of the traffic generated by the Project; and

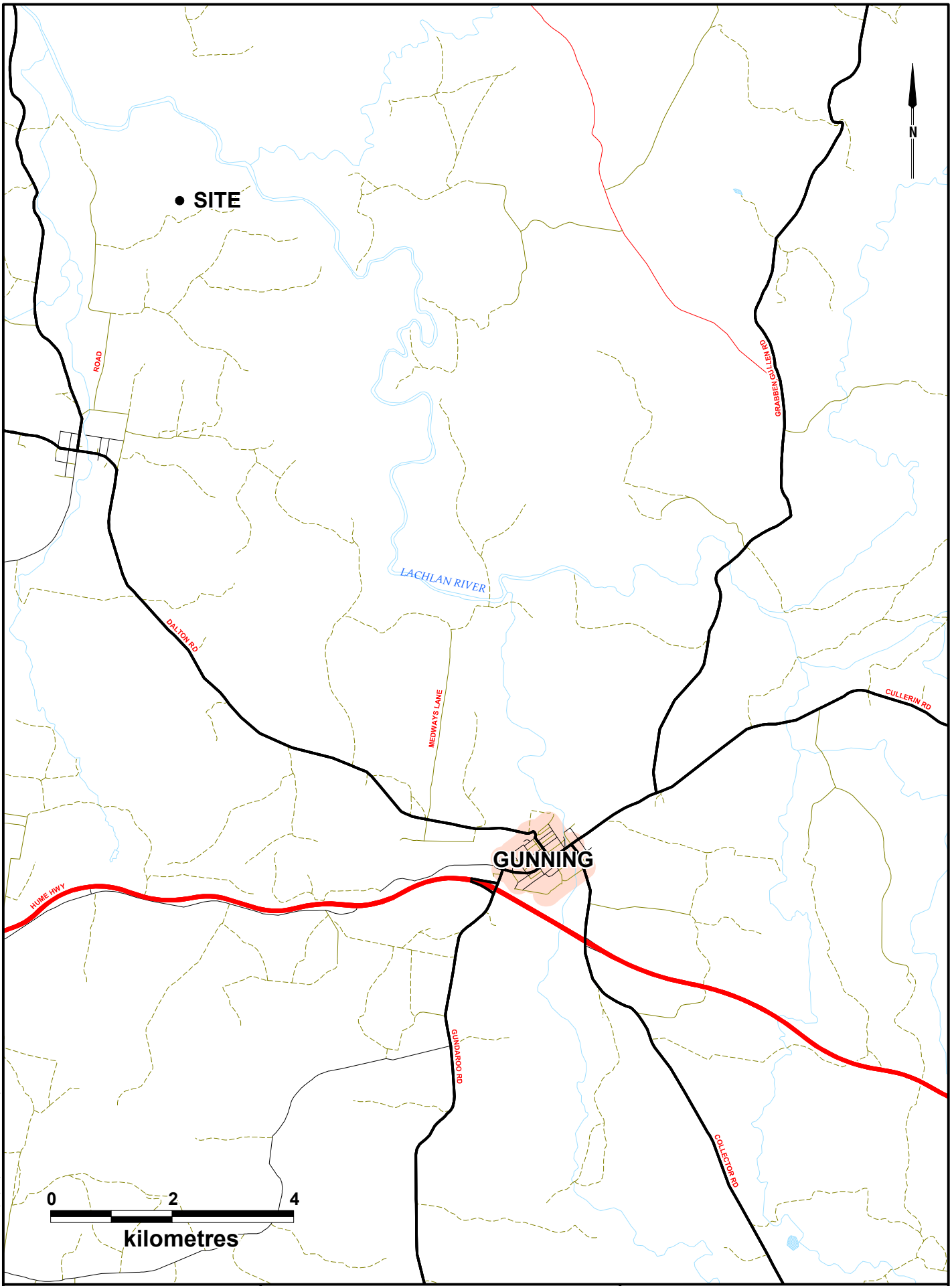
1 Introduction

- **Section 6** provides the mitigation and management measures to be implemented to minimise the impacts identified in Section 5.

It is noted that this assessment has used vehicle movements throughout. For example one visit to the Site equates to two vehicle movements, one to the Site and one from the Site.



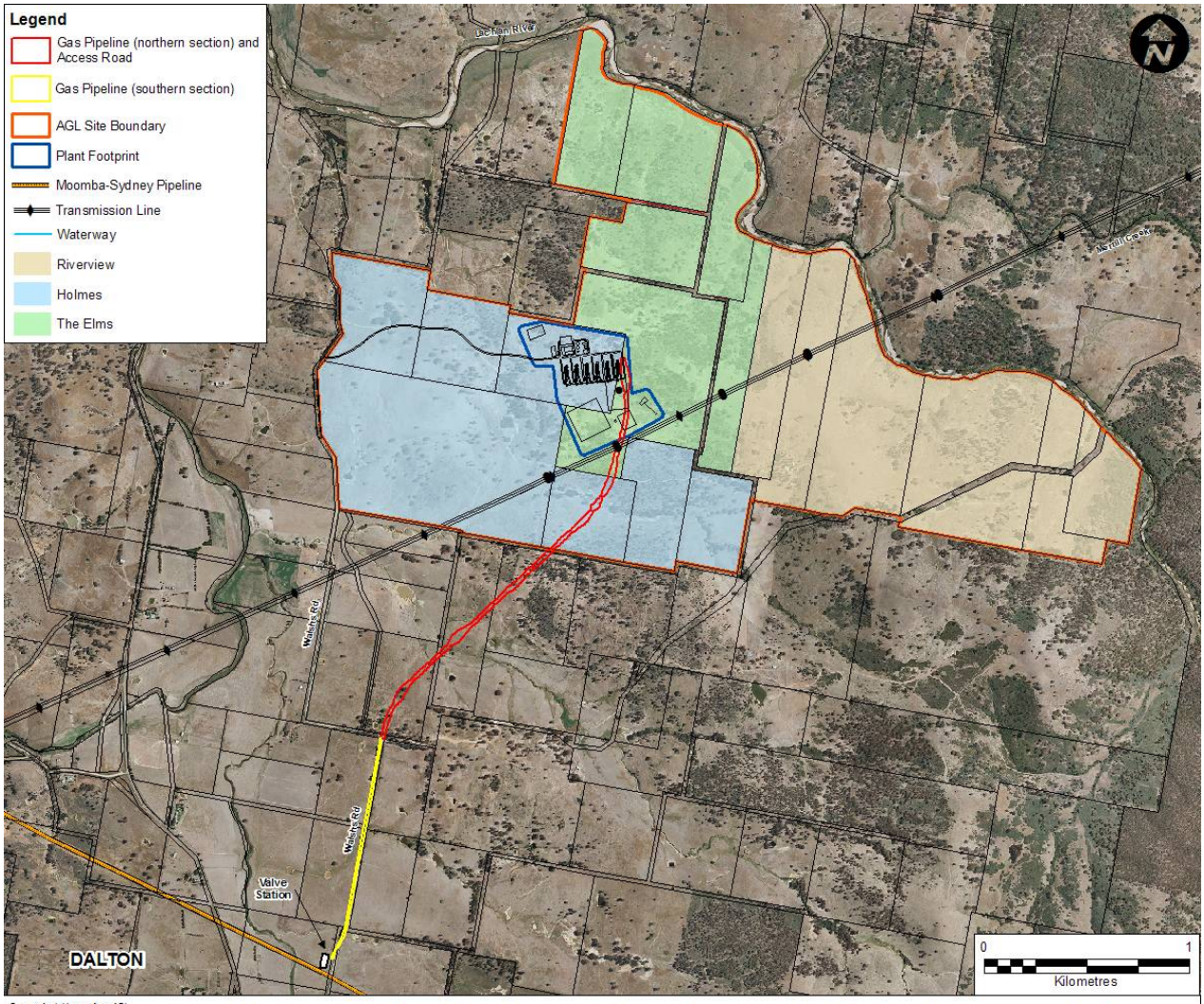
Client: AGL POWER GENERATION (NSW)	Project: AGL DALTON POWER PROJECT		Title: **PROPOSED SITE**
URS	Drawn: SB/AY	Approved: KT	Date: 22/02/2011
	Job No: **43177661**	File No: 43177661.048.wor	Figure: **1-1**
			Rev: A
			A4



Client: AGL	Project: DALTON POWER PROJECT	Title: **LOCAL CONTEXT OF SITE**
	Drawn: AJW | Approved: KC | Date: 27/08/2009	Figure: **1-2**
	Job No: **43177661** | File No: 43177661-003.wor	

1 Introduction

Figure 1-3 Site Layout



Source: Aerial Image from AGL

2

Existing Conditions

2.1 General

The regional road network is dominated by the Hume Highway (State Highway 31), which provides a connection between Sydney and Melbourne. Dalton is approximately 205 kilometres (by road / travelling distance) south west of Sydney and 48 kilometres from Goulburn, which is the nearest regional centre. The Project site would be accessed from the Hume Highway via Collector Road, Yass Street, Warrataw Street, Dalton Road, and Walshs Road. From Gunning, Dalton Road travels in a north-west direction. Approximately 3.4 kilometres along Dalton Road, Walshs Road intersects Dalton Road travelling in a northern direction.

The preferred route for transport equipment and construction materials would be via the Hume Highway, Dalton Road and Walshs Road. During the initial operation of the Project, this is also likely to be the access road to the site.

A preliminary route survey report for the haulage of oversized equipment associated with the power plant indicated that the preferred route to the site is via the Hume Highway, Hume Street, Grovenor Street and Dalton Road.

The following subsections describe the existing conditions of the road network surrounding the site and the roads proposed for access from the Hume Highway to the site.

2.2 Level of Service

Rural Roads - Two-Lane, Two-Way

In accordance with the *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (AUSTROADS, 1999), the Levels of Service relevant to rural local roads are summarised in **Table 2-1**. The threshold volumes for the vehicles per day (vpd) associated with each Level of Service, are based on the combined counts for both directions. These traffic volumes account for total vehicle movements.

Table 2-1 Levels of Service Rural Two-Way, Two-Lane Roads

Level of Service	Traffic Volume Threshold (Rolling Terrain)	Traffic Volume Threshold (Level Terrain)	Definition
A	700 vpd	1,600 vpd	Free-flow conditions with a high degree of freedom for motorists to select speed and manoeuvre within traffic flow
B	1,800 vpd	3,200 vpd	Stable flow conditions, reasonable freedom to select speed and manoeuvre within traffic flow
C	3,500 vpd	5,300 vpd	Stable flow conditions, restricted freedom to select speed and manoeuvre within traffic flow
D	5,300 vpd	9,000 vpd	Approaching unstable flow conditions, severely restricted to select speed and manoeuvre within traffic flow
E	9,900 vpd	15,200 vpd	Close to capacity, virtually no freedom to select speed and manoeuvre within traffic flow. Small increases in traffic volume would generally cause operational problems.

Roads operating at a Level of Service of C or better are generally considered to have acceptable flow conditions.

2.3 Gas Turbine Facility Locality

Traffic counts were conducted at the following locations during the week commencing May 4 2009:

- Tube count locations:
  - Walshs Road (south) (also known locally as Cowper Street), north of Dalton;
  - Dalton Road, east of Medways Lane; and
  - Collector Road, south of Lerida Street.
- Intersection turning counts were conducted at the following locations on Tuesday 27 April, 2009 during the AM peak period (0700 to 0900):
  - Warrataw Street / Grovenor Street / Dalton Road, Gunning;
  - Warrataw Street / Yass Street, Gunning; and
  - Gundaroo Street / Yass Street, Gunning.

Traffic count survey data sheets for each of the aforementioned sites are included in **Appendix A** of this report.

2.3.1 Road Characteristics

Walshs Road

Walshs Road is a two-way unsealed access road, with a width of approximately six metres along the majority of its length. Walshs Road has a posted speed limit of 50 kilometres per hour. A truck warning sign is posted near the point where the road makes a 90-degree turn to the west. . The condition of the gravel is poor in some locations with potholing near this bend, adjacent to Bushs Lane and in close proximity to the entrance of Lot 040. There are a number of large trees within the clearzone of the trafficable lanes along the length of Walshs Road. **Plate 2-1** illustrates the general width and surface of Walshs Road.

2 Existing Conditions

Plate 2-1 Walshs Road South of Site Access

Source: URS, 15 April 2009.

There is a culvert located approximately 80 metres east of the access to the “Wilmont” property (Lot 343). A flood / causeway across Walshs Road, consists of relatively steep grades on both approaches and the carriageway narrows at this location. **Plate 2-2** illustrates the floodway at this location.

2 Existing Conditions

Plate 2-2 Floodway on Walshs Road

Source: URS, 15 April 2009.

The southern portion of Walshs Road which is signposted as Loop Road, is a two-way unsealed access road, with a width of approximately six metres along the majority of its length. This is also locally known as Cowper Street, but for consistency, this assessment refers to it as Walshs Road (south). This section of Walshs Road has similar characteristics to the northern section of Walshs Road.

There are two 90-degree bends in this road.

Traffic counters were installed on the southern portion of Walshs Road, north of Dalton Road for a period of one week starting Tuesday 28 April 2009. **Table 2-2** summarises the outputs for the traffic counts at this location.

Table 2-2 Walshs Road Traffic Count Data (Two-Way Traffic Volumes)

Location	Period	Weekday Average	Weekly Average	Maximum
Walshs Road South (Cowper Street), North of Dalton Road	AM Peak (vehicles per hour)	5		8
	PM Peak (vehicles per hour)	4		12
	Daily Traffic (vehicles per day)	23	22	31
	Total for Week			152

Source: TTM Group, 28 April to 5 May 2009.

2 Existing Conditions

Based on the traffic surveys conducted for the sample week commencing 28 April 2009, Walshs Road is currently operating at Level of Service A.

Dalton Road

Dalton Road is a two-lane, two-way configuration approximately 6.5 to seven metres in width, with a shoulder along its entire length of between 0.5 and one metre. The posted speed limit is 100 kilometres per hour. There are overtaking opportunities for both directions for the majority of its length.

Dalton Road consists of an undulating terrain and is tree-lined, with some large trees within the clear zone (to be checked by haulage contractor). There are a limited number of accesses to rural properties from Dalton Road.

Table 2-3 Dalton Road Traffic Count Data (Two-Way Traffic Volumes)

Location	Period	Weekday Average	Weekly Average	Maximum
Dalton Road, East of Medways Lane	AM Peak (vehicles per hour)	28		31
	PM Peak (vehicles per hour)	25		30
	Daily Traffic (vehicles per day)	287	313	427
	Total for Week			2,192

Source: TTM Group, 28 April to 5 May 2009.

Based on the traffic surveys conducted for the sample week commencing 28 April 2009, Dalton Road is currently operating at Level of Service A.

Warrataw Street

Warrataw Street consists of a two-lane, two-way configuration, with a posted speed limit of 50 kilometres per hour. The railway overpass on Warrataw Street is very narrow, with tight bends and poor sight distances for opposing vehicles and traffic turning from Grovenor Street.

Based on traffic counts conducted for the intersection of Warrataw Street / Grovenor Street / Dalton Road and Grovenor Street / Hume Street, the AM peak traffic volumes summarised in **Table 2-4** have been derived for Warrataw Street.

Table 2-4 Warrataw Street Traffic Count Data (Two-Way Traffic Volumes)

Location	Period	Weekday Average	Average Daily Traffic Estimate[1]
Warrataw Street, West of Dalton Road	AM Peak (vehicles per hour)	23	230

Source: TTM Group, 28 April 2009.

Note:
1. Average Daily Traffic calculated based on the assumption that the AM peak hour is approximately ten percent of the daily traffic volume.

Based on the traffic surveys conducted for Tuesday 28 April 2009, Warrataw Street is currently operating at Level of Service A.

2 Existing Conditions

Hume Street (Yass Street)

Hume Street is a two-lane, two-way configuration, with a wide carriageway and approximately two-metre shoulder along the majority of its length. There are a number of overhead powerlines located across Hume Street. A school zone and pedestrian crossing is located on Hume Street, southwest of its intersection with Warrataw Street.

Based on the counts conducted for the Hume Street / Gundaroo intersection on Tuesday 28 April 2009, **Table 2-5** summarises the average daily traffic volumes for Hume Street.

Table 2-5 Hume Street Traffic Count Data (Two-Way Traffic Volumes)

Location	Period	Weekday Average	Average Daily Traffic Estimate[1]
Hume Street, East of Gundaroo Road	AM Peak (vehicles per hour)	71	710

Source: TTM Group, 28 April 2009.

Note: Average Daily Traffic calculated based on the assumption that the AM peak hour is approximately ten percent of the daily traffic volume.

Based on the traffic surveys conducted for Tuesday 28 April 2009, Hume Street is currently operating at Level of Service A.

Collector Road

Collector Road is a two-lane, two-way configuration, with lane widths of approximately 3.5 metres. Collector Road provides access to the on and off-ramps for the Hume Highway.

Table 2-6 Collector Road Traffic Count Data (Two-Way Traffic Volumes)

Location	Period	Weekday Average	Weekly Average	Maximum
Collector Road, South of Lerida Street	AM Peak (vehicles per hour)	42		46
	PM Peak (vehicles per hour)	44		62
	Daily Traffic (vehicles per day)	543	607	809
	Total for Week			4,250

Source: TTM Group, 28 April to 5 May 2009.

Based on the traffic surveys conducted for the sample week commencing 28 April 2009, Collector Road is currently operating at Level of Service A.

Hume Highway

The Hume Highway is classified National Highway 31 and State Highway 2. The Hume Highway is part of the Auslink National Network and is a vital link for road freight transport between Sydney and Melbourne. For approximately 92 percent of its length in NSW and in close proximity to Gunning, the Hume Highway consists of a dual carriageway (two lanes in each direction) with a posted speed limit of 110 kilometres per hour.

2 Existing Conditions

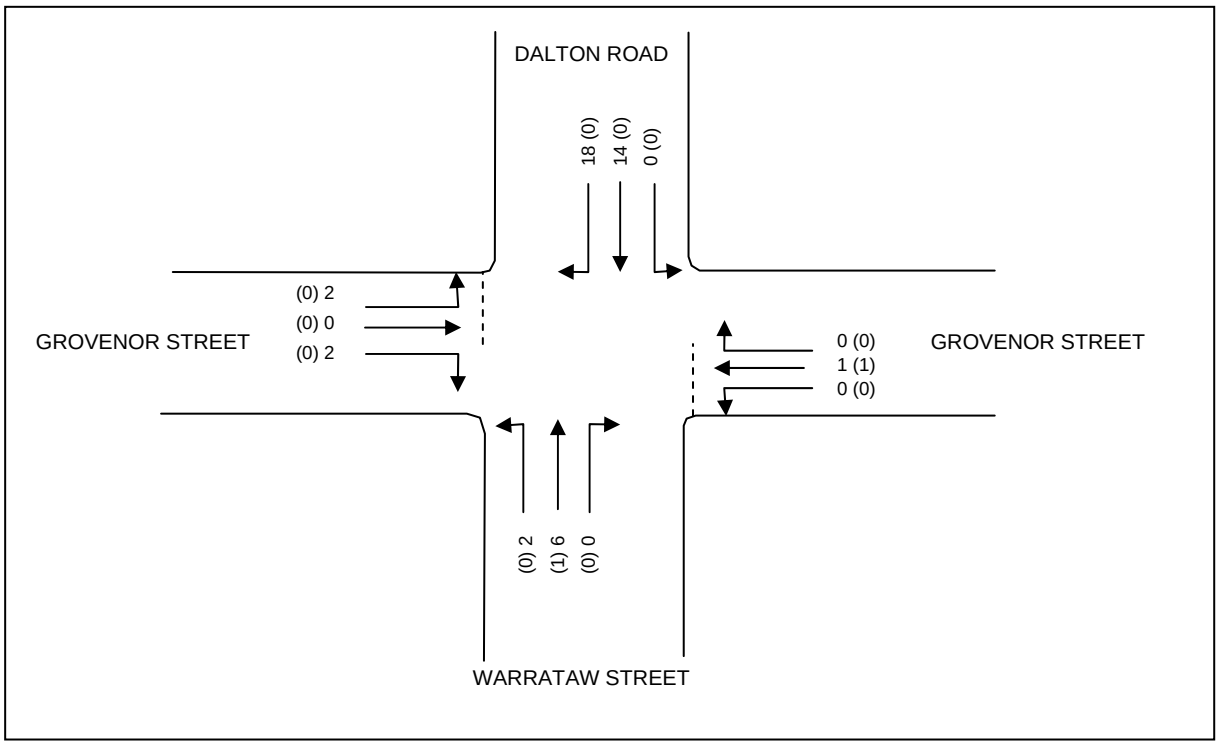
The RTA sample count station nearest to the Project site, one kilometre west of Gundaroo Road (MR52), records the latest Annual Average Daily Traffic (AADT) two-way volume of 13,094 vehicles per day (RTA, 2006).

2.3.2 Key Intersections

Warrataw Street / Grovenor Street / Dalton Road, Gunning

The Warrataw Street, Grovenor Street and Dalton Road intersection is give-way controlled.

Figure 2-1 Existing AM Peak Traffic Volumes, Warrataw Street / Grovenor Street / Dalton Road



Source: TTM Group, 28 April 2009.

SIDRA Intersection, version 3.2 was used to analyse the existing operation of the Warrataw Street, Grovenor Street and Dalton Road intersection, based on the turning movements illustrated in **Figure 2-1**. The results of the analysis are summarised in **Table 2-7**.

Table 2-7 Warrataw Street, Grovenor Street and Dalton Road Intersection Analysis, Existing 2009 AM Peak

	Degree of Saturation (vehicle / capacity)	Average Delay (seconds)	Level of Service	95% Back of Queue Length (metres)
Warrataw Street, Grovenor Street and Dalton Road Intersection	0.02	4	A	1

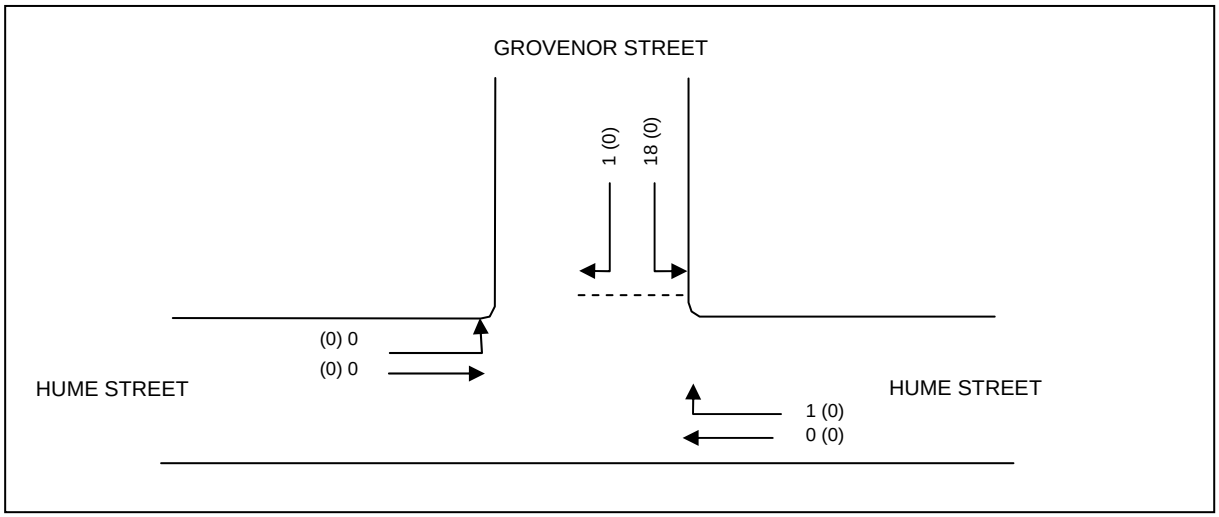
Source: URS, September 2009, using SIDRA Intersection, version 3.2.

2 Existing Conditions

Grovenor Street / Hume Street, Gunning

The Grovenor Street and Hume Street intersection is give-way controlled.

Figure 2-2 Existing AM Peak Traffic Volumes, Grovenor Street / Hume Street



Source: TTM Group, 28 April 2009.

SIDRA Intersection, version 3.2 was used to analyse the existing operation of the Grovenor Street and Hume Street intersection, based on the turning movements illustrated in **Figure 2-2**. The results of the analysis are summarised in **Table 2-8**.

Table 2-8 Grovenor Street and Hume Street Intersection Analysis, Existing 2009 AM Peak

	Degree of Saturation (vehicle / capacity)	Average Delay (seconds)	Level of Service	95% Back of Queue Length (metres)
Grovenor Street and Hume Street Intersection	0.02	8	A	1

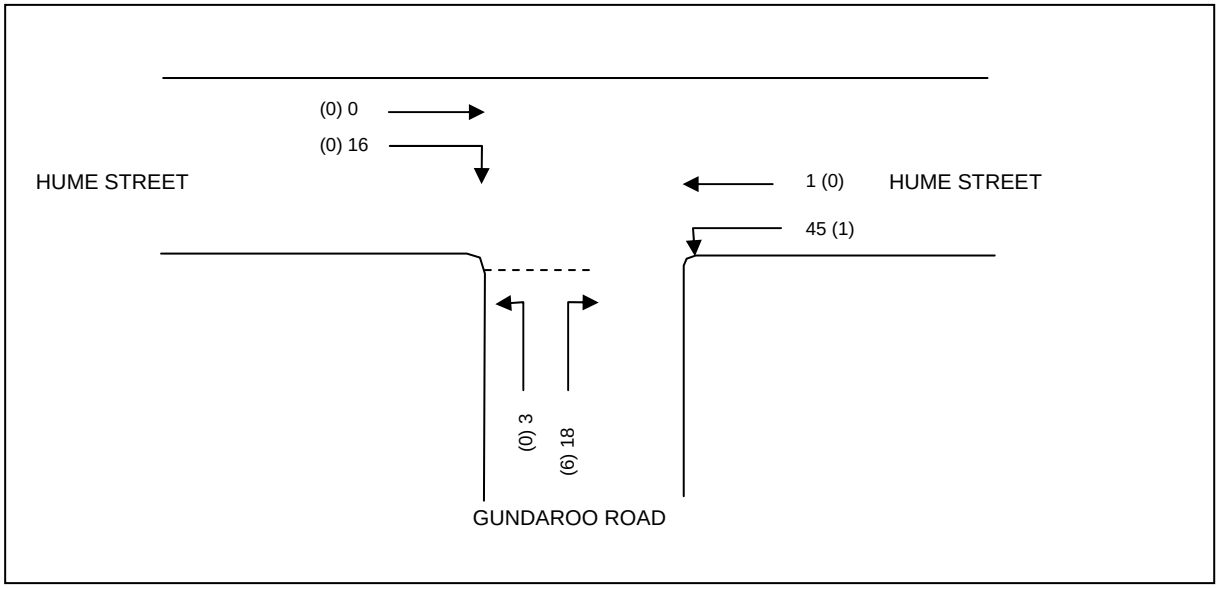
Source: URS, September 2009, using SIDRA Intersection, version 3.2.

Gundaroo Street / Hume Street, Gunning

The Gundaroo Street and Hume Street intersection is give-way controlled.

2 Existing Conditions

Figure 2-3 Existing AM Peak Traffic Volumes, Gundaroo Street / Hume Street



Source: TTM Group, 28 April 2009.

SIDRA Intersection, version 3.2 was used to analyse the existing operation of the Gundaroo Street and Hume Street intersection, based on the turning movements illustrated in **Figure 2-3**. The results of the analysis are summarised in **Table 2-9**.

Table 2-9 Gundaroo Street and Hume Street Intersection Analysis, Existing 2009 AM Peak

	Degree of Saturation (vehicle / capacity)	Average Delay (seconds)	Level of Service	95% Back of Queue Length (metres)
Gundaroo Street and Hume Street Intersection	0.03	8	A	0

Source: URS, September 2009, using SIDRA Intersection, version 3.2.

3

Equipment Transportation

3.1 Introduction

The main components, being the gas turbine, generator and transformers, would be assembled overseas and delivered using special haulage vehicles known as Class 1 Restricted Access Vehicles. These vehicles require special permits and escorts, temporarily disrupting normal traffic flows at defined times approved by relevant authorities. The transport trailer size used for the basis of the equipment transportation component of this Traffic Impact Assessment is:

- Length 122,800 millimetres;
- Width 6,664 millimetres to the outside of beams;
- Height 5,200 millimetres; and
- Weight 542.64 metric tonnes.

A preliminary route survey by a haulage contractor was commissioned by AGL to determine the preferred route for the haulage of equipment.

3.2 Route Selection

It is anticipated that the large plant items would be transported from the Sydney or Wollongong metropolitan area along the Hume Highway during the construction phase.

For the purpose of this study, Port Kembla has been adopted as the port considered most suitable for the importation of these over-mass, over-sized components for the following reasons:

- Port Botany is restricted to containers and short-stay duration before collection (around two to three days).
- Sydney Ports is not necessarily restricted to containers only and, subject to availability of space, has a slightly longer duration of stay of up to one to two weeks. Dockside storage charges can be substantial.
- Port Kembla can usually accommodate long-term storage at a lesser charge.

When assessing the route for equipment transportation, the following elements are considered:

- grade along each route;
- width of cross-section;
- degree of works required to accommodate over-mass, over-dimension vehicles;
- cost; and
- directness of route.

It is anticipated that detailed condition surveys would be undertaken of all local roads prior to the transportation of gas turbine components and other ancillary equipment and following the completion of construction. The condition assessment would determine potential impact to the road corridors as a result of the Project. The condition surveys would meet the requirements of RTA and Upper Lachlan Shire Council.

Potential works to accommodate haulage

No improvements or temporary upgrades of the state road network is envisaged at this time between Port Kembla and Gunning. The preliminary haulage study identified the following potential constraints and requirements:

3 Equipment Transportation

- Hume Highway crossing of Paddy's River at Marulan: bridge constraints require a temporary alternate low level crossing over River at this point;
- Gunning Rail Bridge: bridge constraints require either replacement of the bridge or identifying alternate route via a temporary low level crossing;
- Walshs Road (south, as known locally as Cowper St), Dalton: 90 degree corners and floodway constrain access potentially requiring upgrades.

Further assessment and planning is required during the detailed design phase to identify and cater for any necessary temporary remedial treatments to facilitate passage once the actual weight and dimensions of the proposed plant equipment is known.

Management by experienced haulage contractors and liaison with the permit section of the RTA, NSW Police and local governments would be undertaken to ensure the safety and amenity of the greater community.

AGL would continue liaison and engagement with the appropriate regulatory authorities and support the temporary remedial treatments required through financial contribution pending project approval.

4

Traffic Generation

4.1 Equipment Transportation

A total of 24 over-dimensional and / or over-mass escorted truck convoys of pre-assembled gas turbine, generator and transformer units would occur for the gas turbine facility. These over-dimensional and / or over-mass deliveries assumes six convoys of up to four over-mass / over-size vehicles towing one multi-wheel transport unit as the maximum for either Stage 1 or 2. The cumulative total does not need to be considered as construction for Stage 1 would not coincide with Stage 2.

The Project would also encompass the construction of one or two additional transmission structures to be located at the southern end of the facility footprint within the existing transmission line easement, and a communication tower to be constructed approximately 1.5km to the east of the power station. The tower components would be prefabricated sections delivered to site on flat bottom semi-trailers, ready for assembly on site. The estimated number of semi-trailer deliveries to site would be around 9 truck movements for the one or two transmission towers, as well as the communications tower required for the Project.

An estimate of the number of vehicles required to deliver the gas turbine, communications tower components and equipment is summarised in **Table 4-1**. The traffic generated by equipment transportation is assumed to occur during site establishment in off-peak periods. These estimates have not been considered in the estimates associated with construction traffic generation.

Table 4-1 Turbine Components and Equipment Delivery Traffic Estimates

Component	Purpose	Traffic Generation		
		Semi-Trailer	Over-Size	Over-Mass
Cranes	Assembling fabricated building items and positioning plant equipment	9		
Bulldozers	Clearing of vegetation, removal of topsoil, development of internal roads and drainage swales		1	
Scrapers	Removal of topsoil, development of internal roads and drainage swales and basins		2	
Graders	Site levelling		2	
Excavators	Excavation of soil, grading and levelling the site		5	
Backhoe Excavators	Trenching		3	
Compactor, Rollers	Earth, road base, foundation and pad compaction		5	
Turbine Components	Facility			24[1]
Tower Components	Transmission line connection and Communications Tower	9		
Total		**18**	**18**	**24**

Notes:

1. Assumed six convoys of up to four over-mass / over-size vehicles towing one multi-wheel transport unit.

4.2 Construction Traffic

The estimated duration of construction is 18 to 24 months although activity on-site may only be evident for 18 months. This assessment assumed an 18-month duration for construction traffic generation.

It is anticipated that construction would occur on weekdays from 07:00 to 18:00 during weekdays and 08:00 to 13:00 on Saturdays.

Construction activities are likely to involve:

- typical workforce of 45 construction staff;
- peak workforce of 140 construction for a period of up to two months;
- approximately 4,600 truck deliveries of construction equipment and materials. Construction equipment would be sourced locally (where available) and once delivered, would stay on-site for the duration of construction;
- between two and 20 truck deliveries per day of construction materials;
- the majority of the workforce to be sourced from the local region where possible, otherwise staff would be from either Sydney or Wollongong;
- typical peak hourly construction workforce traffic generation of 70 vehicle trips per hour; and
- peak workforce hourly construction workforce traffic generation of 140 vehicle trips per hour.

Construction equipment types, estimated volume and their purpose are summarised in **Table 4-2.**

Table 4-2 Construction Equipment Estimates and Purpose

Equipment Type	Activity	Estimated Number per Day
Water Trucks	Moisture and dust control	1
Trucks	Haulage of excavated material, gravel, steel, and reinforcement, etc	3
Concrete Trucks	Delivery and pouring of concrete	7
Fuel and maintenance trucks		1

The construction equipment required for the Project is summarised in **Table 4-3**. The construction traffic generation is based on usual construction practices and activities and the anticipated number of construction staff expected for the development of the two gas turbines.

Table 4-3 Average Construction Traffic Generation

Stage	Duration	Per Month		Per Week		Per Day	
	(Months)	Heavy	Light	Heavy	Light	Heavy	Light
Construction	18	271	694	68	173	12	28

4.3 Operation and Maintenance Traffic

Operational Staff

The Dalton Power Project would be available to operate 24 hours a day, 7 days a week and could be operated remotely by AGL staff with contractors used for maintenance.

4 Traffic Generation

During the operational phase of the development, staff numbers are expected to average seven full-time staff per day, which equates to twelve to fourteen vehicle trips per day with four to five vehicle trips during the peak hours.

Major Maintenance Period

Major maintenance is likely to occur once every three years and would be conducted over a period of four to six weeks. Major maintenance is expected to require up to 100 contractors on-site, generating approximately 90 vehicle trips during the peak hour, equating to 180 vehicle trips per day.

Water Supply

AGL is considering a number of options for water supply to the Facility during operation. One of the options considered is truck delivery of water to the Site from a suitable location. Other options include potential on-site sources.

The water supply requirement for the Facility is in the order of 12.5 ML per annum, assuming tankered potable water, for a 750 MW nominal capacity (Stage 1) and would be approximately double this for the potential maximum 1500 MW capacity. Of the 12.5 ML, approximately 10.9 ML would be required to supply the deionisation plant to produce process water. This demand would predominately be in summer, and therefore water deliveries of approximately 3.8ML / month are required in each of the summer months, and approximately 0.13 ML / month for the remainder of the year. Using the peak summer requirement is a worst case scenario as detailed design may identify mechanisms to reduce this peak requirement such as progressively treating and storing throughout the year and reducing draw-down during summer.

Assuming a standard tanker of 20 kL, and that water is supplied on 20 days per summer month (ie week days), the Facility would require approximately 190 kL/d or 9.5 truck deliveries per day for Stage 1. For the purposes of this assessment, it is assumed that 10 truck deliveries per day are required in the peak summer months. Therefore for a maximum 1500 MW capacity, 20 truck deliveries per day are required in the summer months. This equates to 40 vehicle movements per day of which it is assumed that 10% of these movements would occur during the AM Peak Hour. It is noted that this requirement is a worst case scenario based on peak summer demand and noting that the water supply by truck delivery is one of three options being considered.

5

Impact Assessment of Traffic Generation

5.1 Access Arrangements

Access to the Site would be via a new access road to be developed from Walshs Road where the road takes a 90 degree turn to the west. The 1.9 km access road would extend from Walshs Road in a north east direction to the Site, and would be a shared easement with the northern portion of the proposed gas pipeline. The road would be a sealed carriageway 6 m in width, with 1 m shoulder either side, total 8 m in width.

5.2 Impacts on Existing Transport Network

Based on the existing conditions and the traffic generation estimated for the Project, the impacts on the local road network, relative to their Levels of Service, are summarised in the following subsections.

Construction Phase

The main impacts from construction traffic are likely to occur:

- during the morning peak between 7:00 am and 9:00 am when construction staff and early delivery vehicles coincide with the peak periods on the surrounding road network;
- through regular daily traffic generated by delivery trucks for equipment, plant and materials with intermittent peaks associated with concrete pours; and
- occasionally outside of peak periods, through the delivery of large equipment (turbines, generators and transformers) from Port to the site.

The impact of construction traffic has been reviewed with respect to:

- traffic capacity on the roads surrounding the site;
- safety; and
- access for over-mass and over-dimension vehicles.

Operational Phase

The operational phase is likely to generate up to five vehicle trips within the peak hour periods. This traffic volume is significantly lower than the traffic generated by the construction phase. Although this would double the existing traffic volume on Walshs Road, it is anticipated that the operational traffic would be readily accepted by the surrounding road network.

It is assumed that parking would be provided on-site for facility employees and business vehicles in accordance with RTA and Council requirements.

Water Supply

A worst case scenario of 40 vehicle movements per day has been assumed in this assessment for water supply to the Facility during operation. It is noted that this requirement is a worst case scenario based on peak summer demand and noting that water supply by truck delivery is one of three options being considered.

Major Maintenance Facility

Major maintenance is expected to generate additional traffic of up to 90 vehicle trips during the peak hour. Such activities would occur relatively infrequently, that is every three years for a period of up to six weeks. For traffic analysis purposes a peak daily value of 180 vehicle movements per day has been adopted.

5.3 Gas Turbine Facility Locality

Walshs Road South

The impact on Walshs Road with respect to increased traffic volumes is summarised in **Table 5-1**. All traffic volumes account for total vehicle movements.

Table 5-1 Estimated Weekday Traffic Flow Impacts - Walshs Road (south)

Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)	Average Daily Traffic (Major Maintenance)
No Development			
Traffic Flow	23	23	23
Level of Service	A	A	A
With Development			
Construction Traffic (Peak Construction)	160	0	0
Major Maintenance	0	0	180
Water Supply for Operation of Facility[4]		40	
Operational Traffic	0	10	10
Total Traffic Flow	183[1]	73[2]	213[3]
Percentage Change (from No Development)	+696%	+217%	+826%
Midblock Level of Service	A	A	A

Notes:

1. Approximately 11 percent heavy vehicle component;
2. Approximately 55 percent heavy vehicle component;
3. Less than one percent heavy vehicle component; and
4. Worst case assuming water supply is by truck delivery and peak summer requirement for Stage 2 (1500 MW).

Analysis of **Table 5-1** for the Project indicates the following key elements:

- Peak traffic during construction would be approximately 696 percent higher than current traffic volumes. Despite this significant increase in daily traffic volumes, the Level of Service for Walshs Road (south) remains unchanged at Level of Service A.
- Peak traffic during normal operation of the Project would be approximately 217 percent higher than current traffic volumes.
- Peak traffic during periods of major facility maintenance (expected to occur every three years for a period of up to six weeks) is approximately 826 percent higher than existing traffic volumes. Despite this significant increase in traffic volumes, the Level of Service for Walshs Road (south) remains unchanged at Level of Service A.

5 Impact Assessment of Traffic Generation

In the peak traffic periods the Level of Service is maintained at Level of Service A, which is acceptable for Walshs Road (south) during the periods indicated.

Dalton Road

The impact on Dalton Road with respect to increased traffic volumes is summarised in **Table 5-2**. All traffic volumes account for total vehicle movements.

Table 5-2 Estimated Weekday Traffic Flow Impacts - Dalton Road

Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)	Average Daily Traffic (Major Maintenance)
No Development			
Traffic Flow	287	287	287
Level of Service	A	A	A
With Development			
Construction Traffic (Peak Construction)	160	0	0
Major Maintenance	0	0	180
Operational Traffic	0	10	10
Water Supply for Operation of Facility[4]		40	
Total Traffic Flow	447[1]	337[2]	477[3]
Percentage Change (from No Development)	+56%	+17%	+66%
Midblock Level of Service	A	A	A

Notes:

1. Approximately four percent heavy vehicle component;
2. Approximately 12 percent heavy vehicle component;
3. Less than one percent heavy vehicle component; and
4. Worst case assuming water supply is by truck delivery and peak summer requirement for Stage 2 (1500 MW).

Analysis of **Table 5-2** for the Project indicates the following key elements:

- Peak traffic during construction would be approximately 56 percent higher than current traffic volumes. The Level of Service for Dalton Road remains unchanged at Level of Service A.
- Peak traffic during normal operation of the Project would be approximately 17 percent higher than current traffic volumes.
- Peak traffic during periods of major facility maintenance (expected to occur every three years for a period of up to six weeks) is approximately 66 percent higher than existing traffic volumes. Despite this significant increase in traffic volumes, the Level of Service for Dalton Road remains unchanged at Level of Service A.

In the peak traffic periods the Level of Service is maintained at Level of Service A, which is acceptable for Dalton Road during the periods indicated.

Warrataw Street

The impact on Warrataw Street with respect to increased traffic volumes is summarised in **Table 5-3**. All traffic volumes account for total vehicle movements.

5 Impact Assessment of Traffic Generation

Table 5-3 Estimated Weekday Traffic Flow Impacts - Warrataw Street

Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)	Average Daily Traffic (Major Maintenance)
No Development			
Traffic Flow	230	230	230
Level of Service	A	A	A
With Development			
Construction Traffic (Peak Construction)	160	0	0
Major Maintenance	0	0	180
Operational Traffic	0	10	10
Water Supply for Operation of Facility[4]		40	
Total Traffic Flow	390[1]	280[2]	420[3]
Percentage Change (from No Development)	+70%	+22%	+83%
Midblock Level of Service	A	A	A

Notes:

1. Approximately five percent heavy vehicle component;
2. Approximately 14 percent heavy vehicle component;
3. Less than one percent heavy vehicle component and
4. Worst case assuming water supply is by truck delivery and peak summer requirement for Stage 2 (1500 MW).

Analysis of **Table 5-3** for the Project indicates the following key elements:

- Peak traffic during construction would be approximately 70 percent higher than current traffic volumes. Despite this significant increase in daily traffic volumes, the Level of Service for Warrataw Street remains unchanged at Level of Service A.
- Peak traffic during normal operation of the Project would be approximately 22 percent higher than current traffic volumes.
- Peak traffic during periods of major facility maintenance (expected to occur every three years for a period of up to six weeks) is approximately 83 percent higher than existing traffic volumes. Despite this significant increase in traffic volumes, the Level of Service for Warrataw Street remains unchanged at Level of Service A.

In the peak traffic periods the Level of Service is maintained at Level of Service A, which is acceptable for Warrataw Street during the periods indicated.

Hume Street

The impact on Hume Street with respect to increased traffic volumes is summarised in **Table 5-4**. All traffic volumes account for total vehicle movements.

5 Impact Assessment of Traffic Generation

Table 5-4 Estimated Weekday Traffic Flow Impacts - Hume Street

Activity	Average Daily Traffic (Construction)	Average Daily Traffic (Operation)	Average Daily Traffic (Major Maintenance)
No Development			
Traffic Flow	710	710	710
Level of Service	A	A	A
With Development			
Construction Traffic (Peak Construction)	160	0	0
Major Maintenance	0	0	180
Operational Traffic	0	10	10
Water Supply for Operation of Facility[4]		40	
Total Traffic Flow	870[1]	760[2]	900[3]
Percentage Change (from No Development)	+23%	+7%	+27%
Midblock Level of Service	A	A	A

Notes:

1. Approximately two percent heavy vehicle component;
2. Approximately five percent heavy vehicle component;
3. Less than one percent heavy vehicle component;
4. Worst case assuming water supply is by truck delivery and peak summer requirement for Stage 2 (1500 MW).

Analysis of **Table 5-4** for the Project indicates the following key elements:

- Peak traffic during construction would be approximately 23 percent higher than current traffic volumes.
- Peak traffic during normal operation of the Project would be approximately 7 percent higher than current traffic volumes.
- Peak traffic during periods of major facility maintenance (expected to occur every three years for a period of up to six weeks) is approximately 27 percent higher than existing traffic volumes.

In the peak traffic periods the Level of Service is maintained at Level of Service A, which is acceptable for Hume Street during the periods indicated.

Key Intersections

The key intersections have been analysed for impacts associated with construction traffic. **Table 5-5** summarises the results of this analysis.

Table 5-5 Analysis of Key Intersections - Peak Construction Traffic (AM Peak Hour)

Intersection	Scenario	Degree of Saturation (vehicle / capacity)	Average Delay (seconds)	Level of Service	95% Back of Queue Length (metres)
Dalton Road / Grovenor Road / Warrataw Street	No Development	0.02	4	A	1
	With Development	0.67	6	A	2
Grovenor Road / Hume Street	No Development	0.02	8	A	1
	With Development	0.53	7	A	2

5 Impact Assessment of Traffic Generation

Intersection	Scenario	Degree of Saturation (vehicle / capacity)	Average Delay (seconds)	Level of Service	95% Back of Queue Length (metres)
Gundaroo Road / Hume Street	No Development	0.03	8	A	0
	With Development	0.56	8	A	0

Source: URS, September 2009, using SIDRA Intersection, version 3.2

Operational traffic is not likely to have a significant impact on the key intersections as the total number of vehicles generated during the operational phase peak hours is less than those experienced in the construction phase peak hours. The intersection analysis for the construction phase AM Peak Hour indicates no impact in each intersection's Level of Service and therefore this will also apply to the operation phase AM peak hour.

Major maintenance is expected to occur relatively infrequently, approximately every six years or more and is therefore not expected to have a significant impact on the surrounding road network.

6

Mitigation and Management Measures

6.1 Equipment Transportation

The civil contractor would be responsible for developing the Transport Plan as part of obtaining approvals from the RTA and Local Councils. Preliminary mitigation measures proposed for minimising impacts associated with the transportation of turbine components and equipment include:

- Commissioning a licensed haulage contractor, with the experience and equipment required to transport over-mass, over-dimension loads. The contractor would have a working knowledge of the approvals process and an established relationship with the relevant road authorities. The civil contractor would be responsible for:
  - applying for and obtaining the relevant approvals for the haulage of all turbine components and associated equipment;
  - the final route selection and provision of a detailed Transport Plan, including mode of transport, schedule for transport and requirements for modifications to existing infrastructure;
  - compliance with approvals and permits obtained from the relevant road authorities;
  - meeting the requirements of construction schedules, including on-time delivery of turbine components and equipment, whilst complying with the requirements of the permits and approvals;
  - conduct a detailed road survey and conditions assessment before haulage and after haulage; and
  - meet the requirements of the Traffic Management Plan, such the implementation of warning signage at key location along the haulage route.
- A Traffic Management Plan would be developed to ensure impacts are minimised during haulage and safety principles are maintained throughout the activities. This would include the development of a community consultation plan.
- Design of access points to the Site to comply with requirements of the RTA and Upper Lachlan Shire Council, ensuring safety is maintained and vehicle access is appropriate for the design vehicles.
- The design and construction of the internal road access is suitable for over-mass, over-dimension vehicle access.

Along the route between Gunning and Dalton a number of works will be required to enable passage of over-mass, over-dimension vehicles. Further assessment and planning is required during the detailed design phase to identify and cater for any necessary temporary remedial treatments to facilitate passage once the actual weight and dimensions of the proposed plant equipment is known.

Management by experienced haulage contractors and liaison with the permit section of the RTA, NSW Police and local governments will be mandatory in ensuring the safety and amenity of the greater community.

AGL would continue liaison and engagement with the appropriate regulatory authorities and support the temporary remedial treatments required through financial contribution pending project approval.

6.2 Construction Traffic

A detailed Traffic Management Plan would be developed for the construction phase of the project in accordance with *Traffic Control at Worksites*, Version 3.1 (RTA, April 2006). Traffic Management Plan would include:

- Hours of haulage, which do not impose on peak periods and school pick-up and drop-off times, limiting the number of trips per day.
- Haulage routes, including the source locations and their access points as well as access points for the site.
- Design and construction of access from Walshs Road in accordance with RTA and Council requirements.
- Design and construction of site access roads to allow safe movement within the site.
- A community consultation plan to ensure the local residents are informed prior to and during haulage activities. This would include the provision of a dedicated telephone contact line for community issues to be registered and addressed.
- The design of temporary works required to accommodate the haulage vehicles along Walshs Road, including intersection treatments, speed zoning, traffic control devices such as signage and linemarking and modifications to street furniture and structures.
- Deviation of traffic, pedestrians and cyclists during haulage at sensitive or busy locations.
- Designated areas within the site for truck turning movements, parking, loading and unloading.
- Sequence for implementing traffic works and traffic management devices.
- Safety principles for haulage activities, such as speed limits around the site and procedures for activities.
- Procedures for inspections and record keeping for maintaining traffic control measures.

6.3 Operational Traffic

Operational traffic is likely to have no significant impact on the existing road network given that the total number of vehicles generated during the peak hours is less than the traffic generated during the construction phase.

At the commencement of the operational phase, the mitigation measures identified for the equipment transportation and construction traffic would be completed. An additional mitigation measure associated with operational traffic involves the development of a detailed Traffic Management Plan for the operational phase, which would detail the procedures for moving around the site, transportation of water from the preferred source, unloading facilities for water trucks and parking provision for delivery vehicles, employees and maintenance vehicles.

6.4 Summary of Mitigation Measures

Table 6-1 summarises the mitigation and management measures to minimise the impacts of traffic generated by the Project.

6 Mitigation and Management Measures

Table 6-1 Summary of Mitigation and Management Measures

Mitigation Measure	Implementation		
	Design	Construction	Operation
AGL would continue liaison with the relevant regulatory authorities about over-mass, over-dimension transport requirements throughout the detailed design phase.	✓		
Once details are confirmed about widening and re-grading works required to facilitate the movement of over-mass, over-dimension vehicles, AGL commits to the financial contribution towards these temporary improvements, pending project approval.	✓	✓	
Development of detailed Transport Plan (including obtaining approvals) for the transportation of turbine and tower components and equipment.	✓	✓	
Development of detailed Traffic Management Plan for the construction phase.	✓		
Development of a Traffic Management Plan for the operational phase if required.			✓
Transport of over-mass and over- dimensional loads to be undertaken under RTA and NSW Police permit conditions and approved routes.		✓	
AGL would continue liaison with the relevant regulatory authorities throughout the detailed design phase.	✓		
Once details are confirmed about widening and re-grading works required to facilitate the movement of over-mass, over-dimension vehicles, AGL commits to the financial contribution towards these temporary improvements, pending project approval.	✓	✓	

7

References

AUSTROADS, *Guide to Traffic Engineering Practice, Part 2: Roadway Capacity* (1999)

BLIS Equipment Hire Pty Ltd, *Route Survey Report for AGL* March 2009

NSW Roads and Traffic Authority, *Guide to Traffic Generating Developments*, version 2.2 (October 2002)

URS Australia Pty Ltd, *Traffic and Transport Assessment, AGL Leafs Gully Power Project* (July 2006)

8

Limitations

URS Australia Pty Ltd (URS) has prepared this report in accordance with the usual care and thoroughness of the consulting profession for the use of AGL Energy and only those third parties who have been authorised in writing by URS to rely on the report. It is based on generally accepted practices and standards at the time it was prepared. No other warranty, expressed or implied, is made as to the professional advice included in this report. It is prepared in accordance with the scope of work and for the purpose outlined in the Proposal dated 16 January 2009.

The methodology adopted and sources of information used by URS are outlined in this report. URS has made no independent verification of this information beyond the agreed scope of works and URS assumes no responsibility for any inaccuracies or omissions. No indications were found during our investigations that information contained in this report as provided to URS was false.

This report was prepared between 16 March 2009 and 2 October 2009 and is based on the conditions encountered and information reviewed at the time of preparation. URS disclaims responsibility for any changes that may have occurred after this time.

This report should be read in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

A

Appendix A Traffic Survey Data Sheets

80385

Dalton Rd, East of Medways Ln
Eastbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	1	1	0	1	0	**0**	**0**
0100-0200	0	0	0	1	0	0	0	**0**	**0**
0200-0300	0	0	0	0	0	0	0	**0**	**0**
0300-0400	0	0	0	0	0	0	0	**0**	**0**
0400-0500	1	1	2	0	0	0	0	**1**	**1**
0500-0600	3	2	3	0	3	0	3	**2**	**2**
0600-0700	12	7	9	4	0	0	7	**8**	**6**
0700-0800	25	26	24	20	4	4	21	**23**	**18**
0800-0900	16	19	10	16	7	16	16	**15**	**14**
0900-1000	15	9	15	13	19	24	10	**12**	**15**
1000-1100	8	6	10	13	12	15	7	**9**	**10**
1100-1200	6	6	16	11	11	13	7	**9**	**10**
1200-1300	10	3	11	9	19	17	4	**7**	**10**
1300-1400	12	9	6	4	13	13	6	**7**	**9**
1400-1500	9	8	6	7	23	15	13	**9**	**12**
1500-1600	8	6	8	14	20	13	18	**11**	**12**
1600-1700	9	10	10	9	46	15	11	**10**	**16**
1700-1800	4	5	8	7	16	13	6	**6**	**8**
1800-1900	7	3	6	7	8	7	6	**6**	**6**
1900-2000	5	7	2	1	2	3	4	**4**	**3**
2000-2100	1	1	3	1	2	1	0	**1**	**1**
2100-2200	2	1	1	3	3	2	0	**1**	**2**
2200-2300	0	0	1	1	1	1	0	**0**	**1**
2300-2400	0	0	0	1	0	1	2	**1**	**1**
Totals	**153**	**129**	**152**	**143**	**209**	**174**	**141**	**144**	**157**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	1								
0500-0600	2								
0600-0700	9								
0700-0800	21								
0800-0900	17								
0900-1000	17								
1000-1100	7								
1100-1200	6								
1200-1300	7								
1300-1400	17								
1400-1500	7								
1500-1600	12								
1600-1700	13								
1700-1800	12								
1800-1900	12								
1900-2000	3								
2000-2100	3								
2100-2200	2								
2200-2300	0								
2300-2400	0								
Totals	**168**								

80385

Dalton Rd, East of Medways Ln
Westbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	1	1	0	2	0	**0**	**1**
0100-0200	0	0	0	0	1	0	1	**0**	**0**
0200-0300	0	0	0	0	0	0	0	**0**	**0**
0300-0400	0	0	0	0	0	0	0	**0**	**0**
0400-0500	0	0	0	0	0	0	0	**0**	**0**
0500-0600	2	0	0	2	0	0	0	**1**	**1**
0600-0700	1	2	2	2	0	0	2	**2**	**1**
0700-0800	5	5	4	3	4	2	7	**5**	**4**
0800-0900	9	9	8	12	6	7	10	**10**	**9**
0900-1000	10	7	7	9	14	17	9	**8**	**10**
1000-1100	4	6	15	4	16	16	4	**7**	**9**
1100-1200	10	7	9	9	18	18	4	**8**	**11**
1200-1300	10	10	13	11	47	16	2	**9**	**16**
1300-1400	18	7	8	12	28	12	14	**12**	**14**
1400-1500	8	11	11	12	27	16	8	**10**	**13**
1500-1600	8	7	13	12	13	12	12	**10**	**11**
1600-1700	17	20	14	11	13	12	13	**15**	**14**
1700-1800	13	15	15	20	15	9	18	**16**	**15**
1800-1900	11	12	7	6	8	8	11	**9**	**9**
1900-2000	7	4	10	9	0	6	6	**7**	**6**
2000-2100	3	2	1	9	0	3	6	**4**	**3**
2100-2200	8	4	7	3	3	1	2	**5**	**4**
2200-2300	4	2	6	5	3	1	1	**4**	**3**
2300-2400	1	0	0	1	2	0	2	**1**	**1**
Totals	**149**	**130**	**151**	**153**	**218**	**158**	**132**	**143**	**156**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	0								
0500-0600	0								
0600-0700	2								
0700-0800	10								
0800-0900	13								
0900-1000	17								
1000-1100	11								
1100-1200	10								
1200-1300	3								
1300-1400	7								
1400-1500	10								
1500-1600	8								
1600-1700	12								
1700-1800	17								
1800-1900	12								
1900-2000	11								
2000-2100	9								
2100-2200	5								
2200-2300	4								
2300-2400	0								
Totals	**161**								

80385

Dalton Rd, East of Medways Ln
Combined

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	2	2	0	3	0	**1**	**1**
0100-0200	0	0	0	1	1	0	1	**0**	**0**
0200-0300	0	0	0	0	0	0	0	**0**	**0**
0300-0400	0	0	0	0	0	0	0	**0**	**0**
0400-0500	1	1	2	0	0	0	0	**1**	**1**
0500-0600	5	2	3	2	3	0	3	**3**	**3**
0600-0700	13	9	11	6	0	0	9	**10**	**7**
0700-0800	30	31	28	23	8	6	28	**28**	**22**
0800-0900	25	28	18	28	13	23	26	**25**	**23**
0900-1000	25	16	22	22	33	41	19	**21**	**25**
1000-1100	12	12	25	17	28	31	11	**15**	**19**
1100-1200	16	13	25	20	29	31	11	**17**	**21**
1200-1300	20	13	24	20	66	33	6	**17**	**26**
1300-1400	30	16	14	16	41	25	20	**19**	**23**
1400-1500	17	19	17	19	50	31	21	**19**	**25**
1500-1600	16	13	21	26	33	25	30	**21**	**23**
1600-1700	26	30	24	20	59	27	24	**25**	**30**
1700-1800	17	20	23	27	31	22	24	**22**	**23**
1800-1900	18	15	13	13	16	15	17	**15**	**15**
1900-2000	12	11	12	10	2	9	10	**11**	**9**
2000-2100	4	3	4	10	2	4	6	**5**	**5**
2100-2200	10	5	8	6	6	3	2	**6**	**6**
2200-2300	4	2	7	6	4	2	1	**4**	**4**
2300-2400	1	0	0	2	2	1	4	**1**	**1**
Totals	**302**	**259**	**303**	**296**	**427**	**332**	**273**	**287**	**313**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	1								
0500-0600	2								
0600-0700	11								
0700-0800	31								
0800-0900	30								
0900-1000	34								
1000-1100	18								
1100-1200	16								
1200-1300	10								
1300-1400	24								
1400-1500	17								
1500-1600	20								
1600-1700	25								
1700-1800	29								
1800-1900	24								
1900-2000	14								
2000-2100	12								
2100-2200	7								
2200-2300	4								
2300-2400	0								
Totals	**329**								

80385

Cowper St, North of Dalton Rd
Northbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	0	0	0	0	0	0	0
0100-0200	0	0	0	0	0	0	0	0	0
0200-0300	0	0	0	0	0	0	0	0	0
0300-0400	0	0	0	0	0	0	0	0	0
0400-0500	0	0	0	0	0	0	0	0	0
0500-0600	0	0	0	0	0	0	0	0	0
0600-0700	0	0	0	0	0	0	0	0	0
0700-0800	0	2	0	0	0	0	0	0	0
0800-0900	1	2	4	6	1	0	2	3	2
0900-1000	2	2	1	3	1	2	3	2	2
1000-1100	0	1	1	0	0	5	3	1	1
1100-1200	0	1	0	1	2	0	2	1	1
1200-1300	1	4	1	0	1	3	1	1	2
1300-1400	2	1	0	0	1	0	3	1	1
1400-1500	1	1	0	0	0	1	0	0	0
1500-1600	0	0	2	4	0	0	1	1	1
1600-1700	0	0	0	0	0	1	0	0	0
1700-1800	0	2	0	0	0	0	0	0	0
1800-1900	0	0	0	0	0	0	0	0	0
1900-2000	0	0	0	0	0	0	0	0	0
2000-2100	0	0	0	0	0	0	0	0	0
2100-2200	0	0	0	0	0	0	0	0	0
2200-2300	0	0	0	0	0	0	0	0	0
2300-2400	0	0	0	0	0	0	0	0	0
Totals	7	16	9	14	6	12	15	12	11

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	0								
0500-0600	0								
0600-0700	0								
0700-0800	0								
0800-0900	3								
0900-1000	0								
1000-1100	0								
1100-1200	0								
1200-1300	1								
1300-1400	0								
1400-1500	1								
1500-1600	0								
1600-1700	0								
1700-1800	2								
1800-1900	1								
1900-2000	0								
2000-2100	1								
2100-2200	0								
2200-2300	0								
2300-2400	0								
Totals	9								

80385

Cowper St, North of Dalton Rd
Southbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	0	0	0	0	0	0	0
0100-0200	0	0	0	0	0	0	0	0	0
0200-0300	0	0	0	0	0	0	0	0	0
0300-0400	0	0	0	0	0	0	0	0	0
0400-0500	0	0	0	0	0	0	0	0	0
0500-0600	0	0	0	0	0	0	0	0	0
0600-0700	0	0	0	0	0	0	0	0	0
0700-0800	1	3	0	0	0	0	0	1	1
0800-0900	1	0	4	1	1	0	2	2	1
0900-1000	0	2	0	1	1	2	1	1	1
1000-1100	0	0	1	1	0	2	2	1	1
1100-1200	0	0	0	1	1	2	1	0	1
1200-1300	1	3	0	0	1	1	1	1	1
1300-1400	1	1	1	1	1	0	2	1	1
1400-1500	0	1	0	0	0	0	2	1	0
1500-1600	2	2	1	8	2	0	2	3	2
1600-1700	0	0	1	0	0	1	1	0	0
1700-1800	0	1	0	0	0	2	0	0	0
1800-1900	0	1	0	0	0	0	0	0	0
1900-2000	0	1	0	0	0	0	0	0	0
2000-2100	0	0	0	0	0	0	0	0	0
2100-2200	0	0	0	0	0	0	0	0	0
2200-2300	0	0	0	0	0	0	0	0	0
2300-2400	0	0	0	0	0	0	0	0	0
Totals	6	15	8	13	7	10	14	11	10

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	0								
0500-0600	0								
0600-0700	0								
0700-0800	1								
0800-0900	1								
0900-1000	0								
1000-1100	0								
1100-1200	0								
1200-1300	1								
1300-1400	0								
1400-1500	2								
1500-1600	0								
1600-1700	0								
1700-1800	2								
1800-1900	1								
1900-2000	0								
2000-2100	1								
2100-2200	0								
2200-2300	0								
2300-2400	0								
Totals	9								

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Cowper St, North of Dalton Rd
Combined

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	0	0	0	0	0	0	0	0	0
0100-0200	0	0	0	0	0	0	0	0	0
0200-0300	0	0	0	0	0	0	0	0	0
0300-0400	0	0	0	0	0	0	0	0	0
0400-0500	0	0	0	0	0	0	0	0	0
0500-0600	0	0	0	0	0	0	0	0	0
0600-0700	0	0	0	0	0	0	0	0	0
0700-0800	1	5	0	0	0	0	0	1	1
0800-0900	2	2	8	7	2	0	4	5	4
0900-1000	2	4	1	4	2	4	4	3	3
1000-1100	0	1	2	1	0	7	5	2	2
1100-1200	0	1	0	2	3	2	3	1	2
1200-1300	2	7	1	0	2	4	2	2	3
1300-1400	3	2	1	1	2	0	5	2	2
1400-1500	1	2	0	0	0	1	2	1	1
1500-1600	2	2	3	12	2	0	3	4	3
1600-1700	0	0	1	0	0	2	1	0	1
1700-1800	0	3	0	0	0	2	0	1	1
1800-1900	0	1	0	0	0	0	0	0	0
1900-2000	0	1	0	0	0	0	0	0	0
2000-2100	0	0	0	0	0	0	0	0	0
2100-2200	0	0	0	0	0	0	0	0	0
2200-2300	0	0	0	0	0	0	0	0	0
2300-2400	0	0	0	0	0	0	0	0	0
Totals	13	31	17	27	13	22	29	23	22

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	0								
0300-0400	0								
0400-0500	0								
0500-0600	0								
0600-0700	0								
0700-0800	1								
0800-0900	4								
0900-1000	0								
1000-1100	0								
1100-1200	0								
1200-1300	2								
1300-1400	0								
1400-1500	3								
1500-1600	0								
1600-1700	0								
1700-1800	4								
1800-1900	2								
1900-2000	0								
2000-2100	2								
2100-2200	0								
2200-2300	0								
2300-2400	0								
Totals	18								

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Collector Rd, South of Lerida St
Northbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	4	1	1	1	1	4	1	**2**	**2**
0100-0200	0	0	0	8	1	0	1	**2**	**2**
0200-0300	1	2	2	2	3	0	0	**1**	**1**
0300-0400	0	0	0	4	0	0	0	**1**	**1**
0400-0500	2	3	0	12	1	0	0	**3**	**3**
0500-0600	0	2	2	4	2	2	3	**2**	**2**
0600-0700	3	2	3	6	3	5	9	**4**	**4**
0700-0800	10	5	11	8	10	4	10	**9**	**8**
0800-0900	18	21	12	14	14	14	10	**15**	**15**
0900-1000	14	18	14	23	21	16	23	**18**	**18**
1000-1100	19	11	16	16	20	28	23	**17**	**19**
1100-1200	12	15	18	17	24	20	22	**17**	**18**
1200-1300	12	17	19	21	14	27	18	**18**	**18**
1300-1400	17	23	14	19	29	33	16	**18**	**22**
1400-1500	20	24	28	22	19	27	19	**23**	**23**
1500-1600	15	21	18	26	17	23	21	**20**	**20**
1600-1700	21	25	20	23	16	20	17	**21**	**20**
1700-1800	21	26	21	23	14	20	21	**22**	**21**
1800-1900	18	16	23	12	12	12	9	**16**	**15**
1900-2000	5	8	13	8	6	7	7	**8**	**8**
2000-2100	2	3	9	9	7	7	3	**5**	**6**
2100-2200	2	5	4	5	7	2	2	**4**	**4**
2200-2300	2	2	4	2	3	3	2	**2**	**3**
2300-2400	0	0	1	4	2	1	1	**1**	**1**
Totals	**218**	**250**	**253**	**290**	**247**	**276**	**241**	**250**	**254**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	0								
0200-0300	1								
0300-0400	0								
0400-0500	3								
0500-0600	8								
0600-0700	6								
0700-0800	19								
0800-0900	17								
0900-1000	20								
1000-1100	16								
1100-1200	16								
1200-1300	24								
1300-1400	17								
1400-1500	16								
1500-1600	38								
1600-1700	29								
1700-1800	25								
1800-1900	13								
1900-2000	9								
2000-2100	7								
2100-2200	6								
2200-2300	3								
2300-2400	0								
Totals	**293**								

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Collector Rd, South of Lerida St
Southbound

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	1	1	2	3	4	7	2	**2**	**3**
0100-0200	1	3	4	3	2	0	3	**3**	**2**
0200-0300	3	1	0	1	5	0	0	**1**	**1**
0300-0400	1	1	2	2	0	0	1	**1**	**1**
0400-0500	3	3	2	1	3	0	0	**2**	**2**
0500-0600	6	7	5	1	2	4	4	**5**	**4**
0600-0700	11	9	9	1	6	8	13	**9**	**8**
0700-0800	14	24	14	7	13	6	19	**16**	**14**
0800-0900	16	25	24	11	26	25	22	**20**	**21**
0900-1000	16	20	16	22	35	28	46	**24**	**26**
1000-1100	23	15	23	11	42	48	48	**24**	**30**
1100-1200	23	21	23	15	50	36	45	**25**	**30**
1200-1300	17	9	14	26	28	58	34	**20**	**27**
1300-1400	16	21	14	12	62	72	34	**19**	**33**
1400-1500	21	15	21	21	36	58	31	**22**	**29**
1500-1600	11	18	14	28	36	49	40	**22**	**28**
1600-1700	13	22	15	27	31	43	35	**22**	**27**
1700-1800	15	6	14	33	31	33	39	**21**	**24**
1800-1900	9	8	12	12	26	22	21	**12**	**16**
1900-2000	6	6	6	7	8	14	12	**7**	**8**
2000-2100	1	7	3	12	12	9	8	**6**	**7**
2100-2200	1	3	7	4	11	5	6	**4**	**5**
2200-2300	0	3	2	0	5	6	3	**2**	**3**
2300-2400	0	0	3	2	5	2	4	**2**	**2**
Totals	**228**	**248**	**249**	**262**	**480**	**534**	**473**	**292**	**354**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	1								
0200-0300	2								
0300-0400	0								
0400-0500	4								
0500-0600	9								
0600-0700	11								
0700-0800	35								
0800-0900	29								
0900-1000	29								
1000-1100	28								
1100-1200	36								
1200-1300	46								
1300-1400	38								
1400-1500	29								
1500-1600	70								
1600-1700	49								
1700-1800	50								
1800-1900	36								
1900-2000	16								
2000-2100	10								
2100-2200	12								
2200-2300	4								
2300-2400	0								
Totals	**544**								

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Collector Rd, South of Lerida St
Combined

Time	Week 1							Averages	
	Tue 28	Wed 29	Thu 30	Fri 01	Sat 02	Sun 03	Mon 04	Weekday	7-day
0000-0100	5	2	3	4	6	11	3	**3**	**5**
0100-0200	1	3	4	11	4	0	5	**5**	**4**
0200-0300	4	3	2	3	8	0	1	**3**	**3**
0300-0400	1	1	2	6	0	0	2	**2**	**2**
0400-0500	5	6	2	13	4	0	0	**5**	**4**
0500-0600	6	9	7	5	5	7	8	**7**	**7**
0600-0700	14	11	12	7	10	13	21	**13**	**13**
0700-0800	24	29	25	15	22	10	29	**24**	**22**
0800-0900	34	46	36	25	40	39	32	**35**	**36**
0900-1000	30	38	30	45	57	43	69	**42**	**45**
1000-1100	42	26	39	27	63	75	72	**41**	**49**
1100-1200	35	36	41	32	74	56	68	**42**	**49**
1200-1300	29	26	33	47	42	85	52	**38**	**45**
1300-1400	33	44	28	31	91	106	49	**37**	**55**
1400-1500	41	39	49	43	55	84	50	**44**	**52**
1500-1600	26	39	32	54	53	73	62	**43**	**48**
1600-1700	34	47	35	50	47	64	52	**44**	**47**
1700-1800	36	32	35	56	45	53	61	**44**	**45**
1800-1900	27	24	35	24	38	35	30	**28**	**30**
1900-2000	11	14	19	15	14	20	18	**15**	**16**
2000-2100	3	10	12	21	18	16	11	**11**	**13**
2100-2200	3	8	11	9	17	7	9	**8**	**9**
2200-2300	2	5	6	2	9	9	6	**4**	**5**
2300-2400	0	0	4	6	7	4	6	**3**	**4**
Totals	**446**	**498**	**502**	**552**	**728**	**809**	**715**	**543**	**607**

Time	Week 2							Averages	
	Tue 05							Weekday	7-day
0000-0100	0								
0100-0200	2								
0200-0300	3								
0300-0400	0								
0400-0500	8								
0500-0600	16								
0600-0700	17								
0700-0800	54								
0800-0900	46								
0900-1000	49								
1000-1100	43								
1100-1200	51								
1200-1300	70								
1300-1400	55								
1400-1500	45								
1500-1600	107								
1600-1700	78								
1700-1800	75								
1800-1900	50								
1900-2000	24								
2000-2100	17								
2100-2200	18								
2200-2300	8								
2300-2400	0								
Totals	**837**								

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