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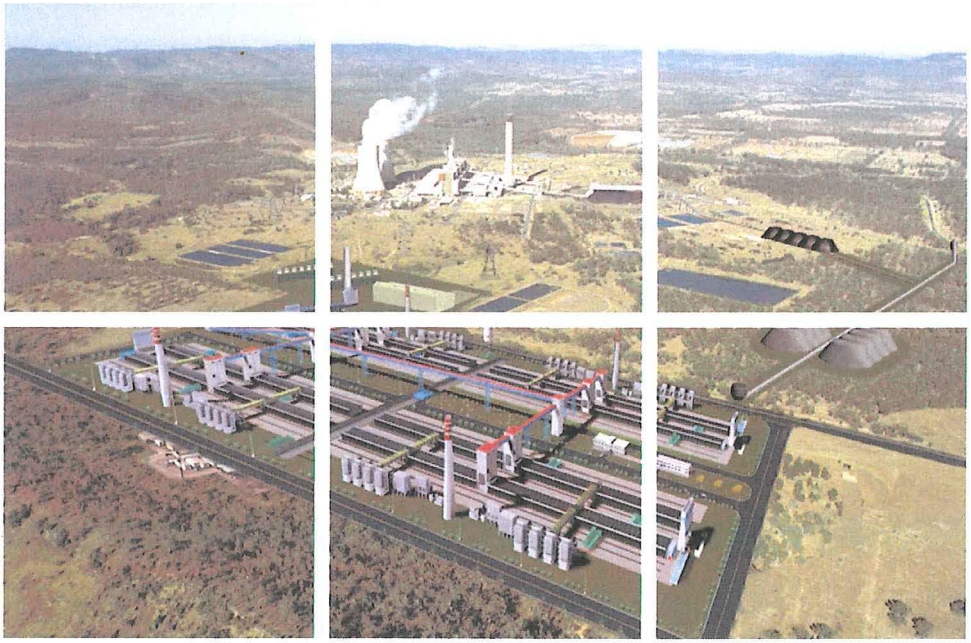
Appendix E

Road Impact and Assessment Study



URS

QUEENSLAND COKE & ENERGY

STANWELL CORPORATION LIMITED

Brisbane Office
243 Riverside Drive
PO Box 3873
South Brisbane Q 4101
Tel: (07) 3846 3600
Fax: (07) 3846 3611

Gold Coast Office
Suite 2/20 Nerang Street
PO Box 391
Nerang Q 4211
Tel: (07) 5502 1585
Fax: (07) 5502 1586

Sydney Office
910 Pacific Highway
Gordon NSW 2072
Tel: (02) 9496 7700
Fax: (02) 9499 3902

Wollongong Office
PO Box 420
Wollongong NSW 2520
Tel: 0402 965 929

Cardno Eppell Olsen

Queensland Coke and Power Plant Project

Prepared for URS Australia Pty Ltd

June 2006

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1.0 INTRODUCTION

1.1 Project Background

Cardno Eppell Olsen has been commissioned by URS Australia Pty Ltd to undertake a Road Impact Assessment Study (RIAS) as part of the Environmental Impact Assessment (EIA) for the proposed Queensland Coke and Power Plant Project to be constructed in the Stanwell Energy Park located on land approximately 20km south-west of Rockhampton. The site is located on Power Station Road and will be accessed via the existing single access road to the site.

This report supersedes the previous report dated October 2005. The revisions respond to issues raised in information responses prepared by Department of Main Roads and other agencies.

1.2 Study Methodology

This study has been prepared generally in accordance with the "*Guidelines for Assessment of Road Impacts of Development Proposals*" (Department of Main Roads (DMR) Queensland, 2006). These guidelines identify the procedures for assessment of traffic related impacts of major projects. The objective of this assessment is to evaluate the traffic impacts of the Queensland Coke and Power Plant Project on the adjacent road network. Traffic impacts considered include any effects on intersection and link operations along the extent of the haulage and private vehicle traffic routes. To address these impacts, the following tasks have been undertaken and are discussed in detail in the following sections of this report:

- inspection of the site and surrounding road network between Rockhampton and the Stanwell Energy Park;
- review of existing operation of the study network including measurement of existing traffic demand;
- estimation of the likely traffic generation of the plant and distribution of this additional traffic to the surrounding road network;
- consideration of historic growth patterns within the study area;
- estimation of future traffic levels with and without the proposal;
- analysis of intersection operation for each of the design scenarios identified;
- identification of any road network improvements or works necessary to improve network performance or conditions with and without the proposal.

1.3 Study Scope

The scope of the traffic impact assessment was agreed with DMR in March 2005 prior to the commencement of the initial traffic analysis. The agreed scope did not extend south beyond the Capricorn Highway/Bruce Highway intersection.

In discussions with Department of Main Roads in March 2005 the following intersections were agreed as the scope of intersection impact assessment:

- Gladstone Road/Lower Dawson Road/Port Curtis Road;
- Lower Dawson Road/Jellicoe Street;
- Bruce Highway/Capricorn Highway;
- Capricorn Highway/Gavial-Gracemere Road;
- Old Capricorn Highway/Gavial-Gracemere Road/Lawrie Street/O'Shanesy Street;
- Capricorn Highway/Power Station Road.

A number of other assumptions have been agreed with Department of Main Roads as part of the assessment. These are discussed throughout this report.

2.0 EXISTING SITUATION

2.1 Existing Road Network

The proposed Queensland Coke and Power Plant Project is to be constructed in the existing Stanwell Energy Park. This location has been chosen to make use of the existing services and resources such as water, rail and road infrastructure. The Stanwell Energy Park is located approximately 20km south-west of Rockhampton (west of Gracemere and south-west of Stanwell) and access to the site is via a single access road for private vehicles on Power Station Road and a number of secondary access locations for truck and heavy vehicle movements. All vehicular access to the project site for the duration of the project will occur from Power Station Road via the interchange at Capricorn Highway.

The proposed plant will primarily generate private vehicle traffic during the operational phases of the facility (i.e. personnel private vehicles), along with low volumes of heavy vehicle traffic at the operational stage.

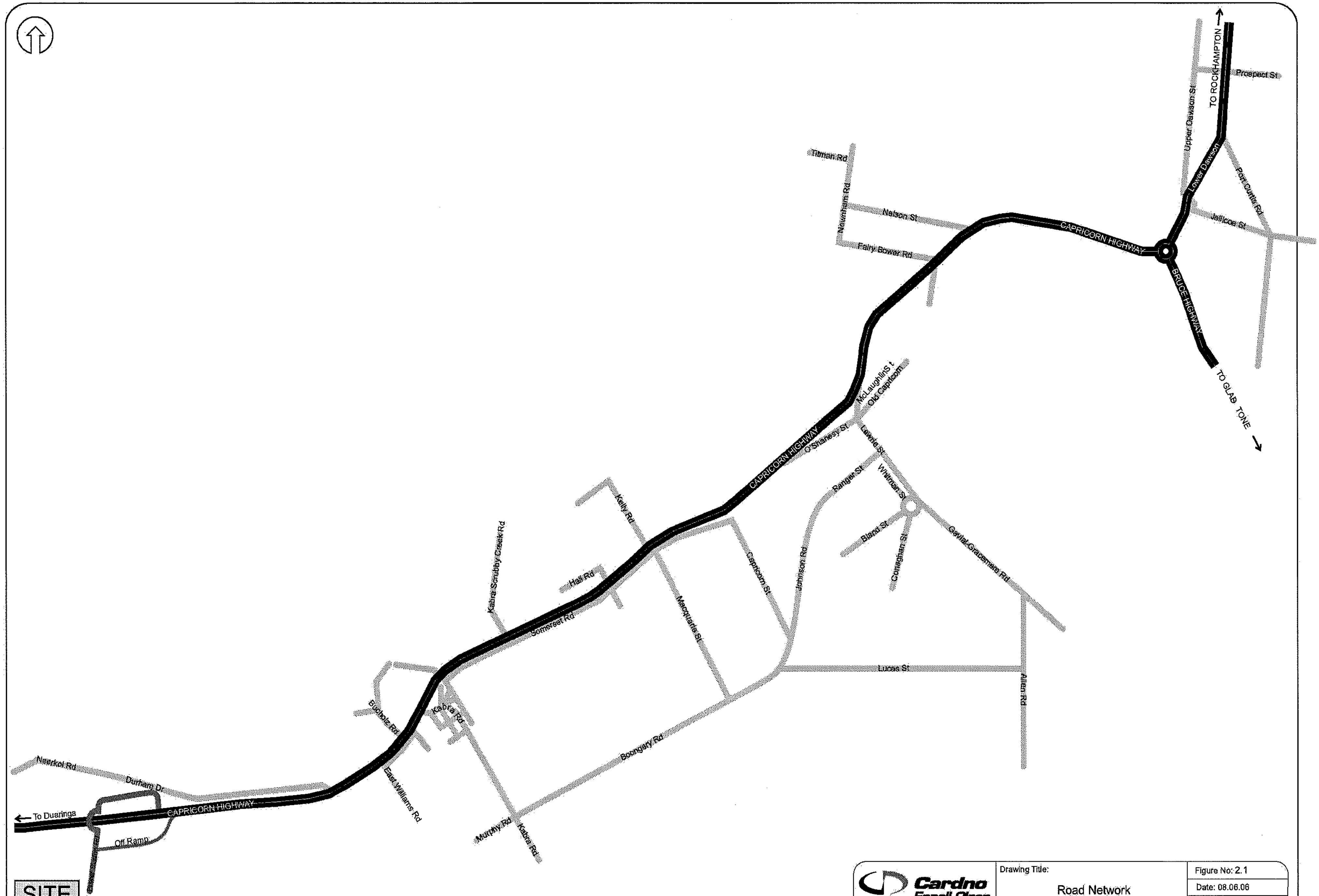
At the operational stage, large volume resources to the process will be transported to the site via rail (e.g. coking coal from the Bowen Basin) and outputs will be transported from the site via rail to dock facilities at Gladstone.

During the construction phases, traffic will comprise of a combination of construction personnel private vehicles, heavy vehicles carrying construction materials and buses that will transport construction personnel to and from the worksite from residences in Rockhampton and Gracemere.

The majority of project related traffic is anticipated to travel to and from the east and hence this route provides the major focus of this assessment. The study area, which includes Power Station Road, the Capricorn Highway east to the Bruce Highway, Gavial–Gracemere Road (through Gracemere) and the Bruce Highway between Capricorn Highway and Port Curtis Road, is shown on Figure 2.1.

The key sections of the study road network are described in the following paragraphs.

Power Station Road is a sealed, 6.5m wide undivided roadway posted at 80km/h at the access to the Stanwell Energy Park. It connects to the Capricorn Highway via a grade separated interchange.



Cardno Eppell Olsen

Drawing Title: Road Network

Figure No: 2.1

Date: 08.06.06

Project No: CE105038

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The Capricorn Highway forms part of the State controlled road network and extends east to the Bruce Highway, and west to smaller communities and further afield, to Central Queensland. For the most part, the Capricorn Highway is a two lane, undivided roadway, with several overtaking lane sections provided along the study section. The section is generally posted with a speed limit of 100km/h, however some sections are posted at 80km/h.

The Bruce Highway forms part of the National Highway system and where it meets the Capricorn Highway, is a sealed, two lane roadway posted at 60km/h. The Bruce Highway connects Gladstone to the south and feeds directly to the Rockhampton CBD to the north.

2.2 Safety Audit

It has been agreed previously with DMR that a full safety audit would not be undertaken over the entire study network. A safety audit has been undertaken for the Capricorn Highway/Power Station Road interchange, with details shown in Section 5.2

2.3 Planned Road Infrastructure Improvements

Information contained in the Department of Main Roads' "*Roads Implementation Program 2004-2005 to 2008-2009"* (2004) indicates that there are some improvements scheduled for the next five financial year periods along the route to the east or west of the project site.

The works scheduled that are located on the study network are located within the Fitzroy Shire. The only project located on the study network is project number 54/16A/34 and is located at the Capricorn Highway crossing of Scrubby Creek in Gracemere.

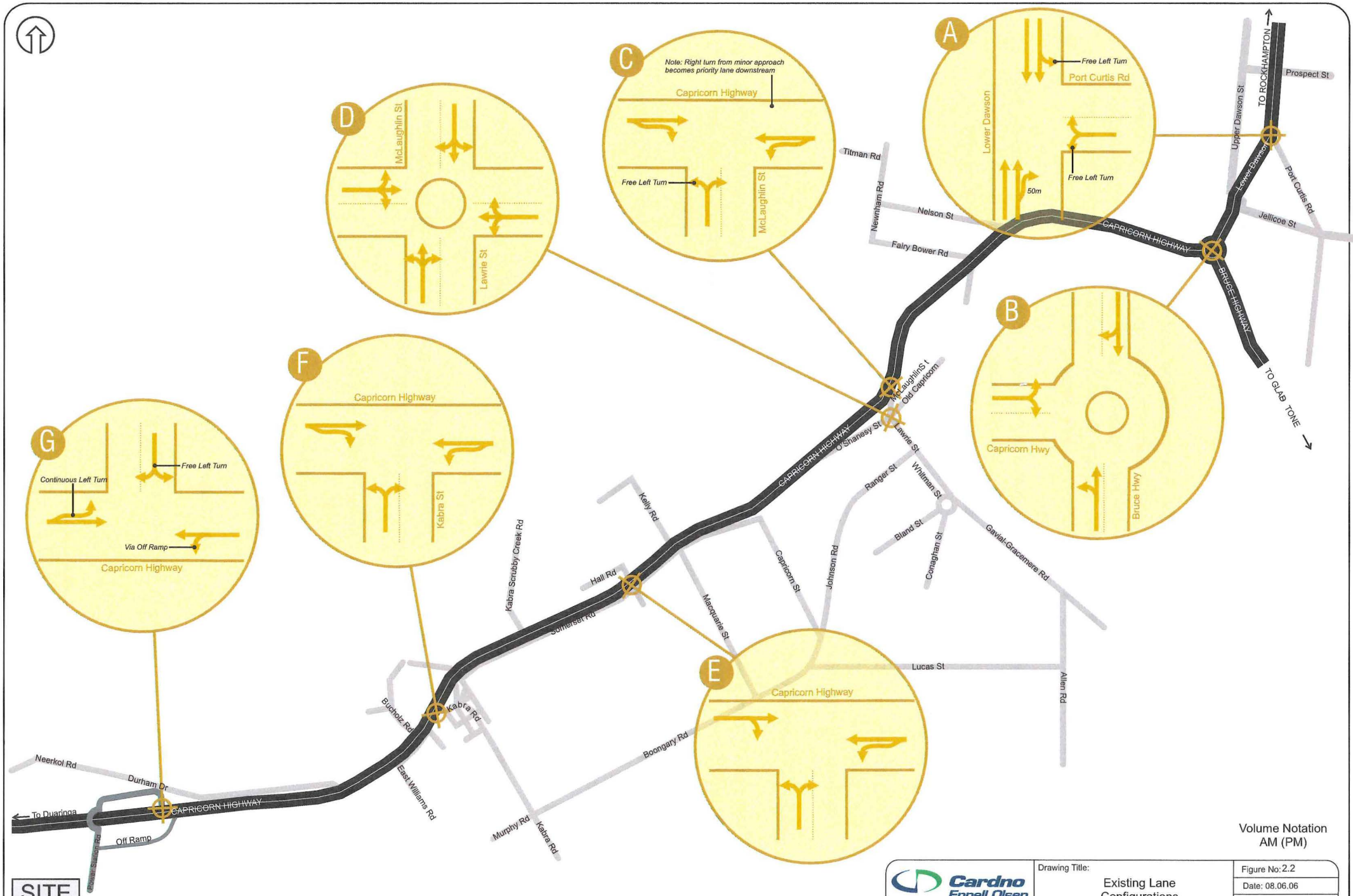
2.4 Intersection Geometry

The scope of the assessment is generally limited to the routes identified in Section 2.1 of this report.

With respect to traffic operations, a number of key intersections between Rockhampton and the proposed project site have been included in this assessment:

- Gladstone Road/Lower Dawson Road/Port Curtis Road;
- Lower Dawson/Jellicoe Street;
- Bruce Highway/Capricorn Highway;
- Capricorn Highway/Gavial – Gracemere Road;
- Old Capricorn Highway/Gavial – Gracemere Road/Lawrie Street/O'Shanesy Street;
- Capricorn Highway/Power Station Road.

Existing lane configurations for these intersections are shown on Figure 2.2.



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- Capricorn Highway/Gavial – Gracemere Road;
- Old Capricorn Highway/Gavial – Gracemere Road/Lawrie Street/O'Shanesy Street;
- Capricorn Highway/Power Station Road.

Existing lane configurations for these intersections are shown on Figure 2.2.

2.4.1 Gladstone Road/Lower Dawson Road/Port Curtis Road

The intersection of the Bruce Highway and Port Curtis Road is located to the south of the Rockhampton CBD in the suburb of Allenstown. The intersection comprises an unsignalised T-intersection with Gladstone Road (Bruce Highway) - Lower Dawson Road forming the priority north-south leg of the intersection.

Gladstone Road - Lower Dawson Road is a four lane carriageway with median separation at the intersection with Port Curtis Road. Turning movements into Port Curtis Road are provided with a 50m right turn lane on the southern leg and a free left turn lane on the northern approach. The Port Curtis Road leg of the intersection comprises of a right turn lane and a free left turn lane with capacity to store a number of vehicles without blocking the right turn lane. (Shown as Intersection A on Figure 2.2)

2.4.2 Lower Dawson Road/Jellicoe Street

This intersection is an unsignalised four way intersection with priority on Lower Dawson Road. The latter includes two lanes each way plus protected right turn lanes. There is a wide median on Lower Dawson Road allowing vehicles from the side street legs (Jellicoe Street) to store whilst making a two stage movement for right turn lanes and cross movements.

2.3.3 Bruce Highway/Capricorn Highway

The Bruce Highway/Capricorn Highway intersection is constructed as a three leg, single lane roundabout. The Bruce Highway forms the north-east (towards Rockhampton) and south-east (towards Gladstone) legs with the western approach leg being the Capricorn Highway (towards Gracemere and Stanwell).

The roundabout island is in the order of 80m in diameter. (Shown as Intersection B on Figure 2.2)

2.3.4 Capricorn Highway/Gavial - Gracemere Road

The intersection is a high speed seagull intersection that provides priority to through movements along the Capricorn Highway, which has a posted speed limit of 80km/h at the intersection. The seagull form of the intersection provides a right turn deceleration lane into Gavial–Gracemere Road, and an acceleration lane for the right turn movement out of the latter. A left turn deceleration lane is provided for westbound traffic entering Gavial–Gracemere Road. (Shown as Intersection C on Figure 2.2)

2.3.5 Old Capricorn Highway/Gavial - Gracemere Road/Lawrie Street/O'Shanesy Street

The intersection is constructed as a four leg, single lane roundabout with a circulating island diameter of approximately 20m and provides an entry to the township of Gracemere. (Shown as Intersection D on Figure 2.2)

2.3.6 Capricorn Highway/Somerset Road

This intersection is located just east of where Hall Road meets the Capricorn Highway, it is a priority controlled T-intersection with the Capricorn Highway forming the major east-west through legs with the minor leg being the southern approach (towards Somerset Road). For right turning traffic on the western leg of the intersection, there is no dedicated right turn treatment (Type A), while left turns from the eastern leg of the intersection are able to diverge from the main traffic stream into a Type C (i.e. auxillary) left turn lane. The southern leg comprises a single shared left and right turn lane and a single departure lane. (Shown as Intersection E on Figure 2.2)

2.3.7 Capricorn Highway/Kabra Road

The intersection of the Capricorn Highway and Kabra Road, Kabra (Shown as Intersection F on Figure 2.2), is a priority controlled T-intersection with east-west traffic along the Capricorn Highway being the major movement. The western leg of the intersection comprises a continuous through lane and a Type C (auxillary lane) right turn treatment. The eastern leg of the intersection comprises a continuous through lane and a Type C (auxillary) left turn lane. The southern leg of the intersection comprises a single lane approach with shared left and right turns.

2.3.8 Capricorn Highway/Power Station Road

Access to Power Station Road from the Capricorn Highway is partially grade separated via a flyover ramp. Westbound left turning vehicles are provided with an off ramp with sufficient deceleration length prior to an unsignalised T-intersection. Vehicles turning into Power Station Road from the west first turn left at the unsignalised Capricorn Highway/Power Station Road T-intersection and then travel via the overpass to a stop control with the westbound left turn vehicles (i.e. vehicles leaving the Capricorn Highway via the off ramp).

Eastbound traffic from Power Station Road uses the overpass and then a left turn acceleration lane onto Capricorn Highway. Outbound westbound traffic turns right out of Power Station Road onto the Capricorn Highway. Site observations showed that there were a number of large road vehicles (i.e. greater than 12 axles) travelling to and from the west entering Power Station Road (i.e. existing traffic).

The Capricorn Highway in this section is posted at 100km/h and consists of a two lane, 6.5m wide undivided carriageway with 1.8m to 2.3m wide sealed shoulders. (Shown as Intersection G on Figure 2.2)

2.4 Existing Traffic Demand

2.4.1 Intersection Turning Movements

Peak hour traffic volumes at the subject intersections were sourced from the following:

- turning movement counts collected by Australasian Traffic Surveys on Thursday 4 April 2005;
- previous turning movement counts conducted by the Department of Main Roads on Wednesday 9 March 2005 (Capricorn Highway/Power Station Road and Capricorn Highway/Gavial–Gracemere Road intersections).

A summary of existing peak traffic volumes at each of the study intersections is provided on Figure 2.3.

2.4.2 Link Volumes

Average Annual Daily Traffic (AADT) link volumes for various sections of the study road network have been obtained from DMR traffic counts collected in 2003/2004. These results are summarised in Table 2.1.

Table 2.1 ***2003 AADT Link Volumes***

Link	Road	Point 1	Point 2	AADT*
1	Lower Dawson Road	Capricorn Highway	Port Curtis Road	15,909
2	Capricorn Highway	Bruce Highway	Gavial–Gracemere Road	10,969
3	Capricorn Highway	Gavial–Gracemere Road	Kabra Road	3,586
4	Capricorn Highway	Kabra Road	Power Station Road	3,137
5#	Bruce Highway	Capricorn Highway	Burnett Highway	6,504

* AADT measured in vehicles per day (vpd).
# 2004 Data Shown

Table 2.2 presents the existing (2003/2004) breakdown by vehicle type for the road sections along the haulage in Table 2.1 (using the same link information as in Table 2.1).

2005 Base Vehicle Counts

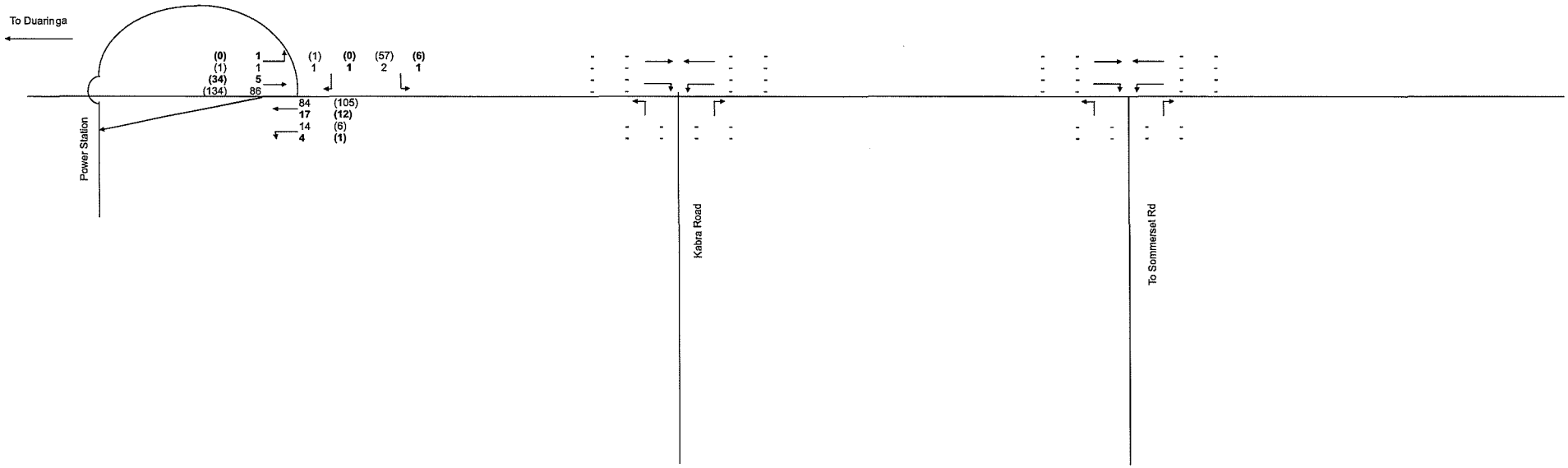
Base Year 2005

AM Peak (Hour Ending 8:45
PM Peak (Hour Ending) 5:30

Legend

AM Heavy	AM Light
(PM Heavy)	(PM Light)

- Denotes No Count Volume



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		Date: 16.06.06
		Project No: CE105038

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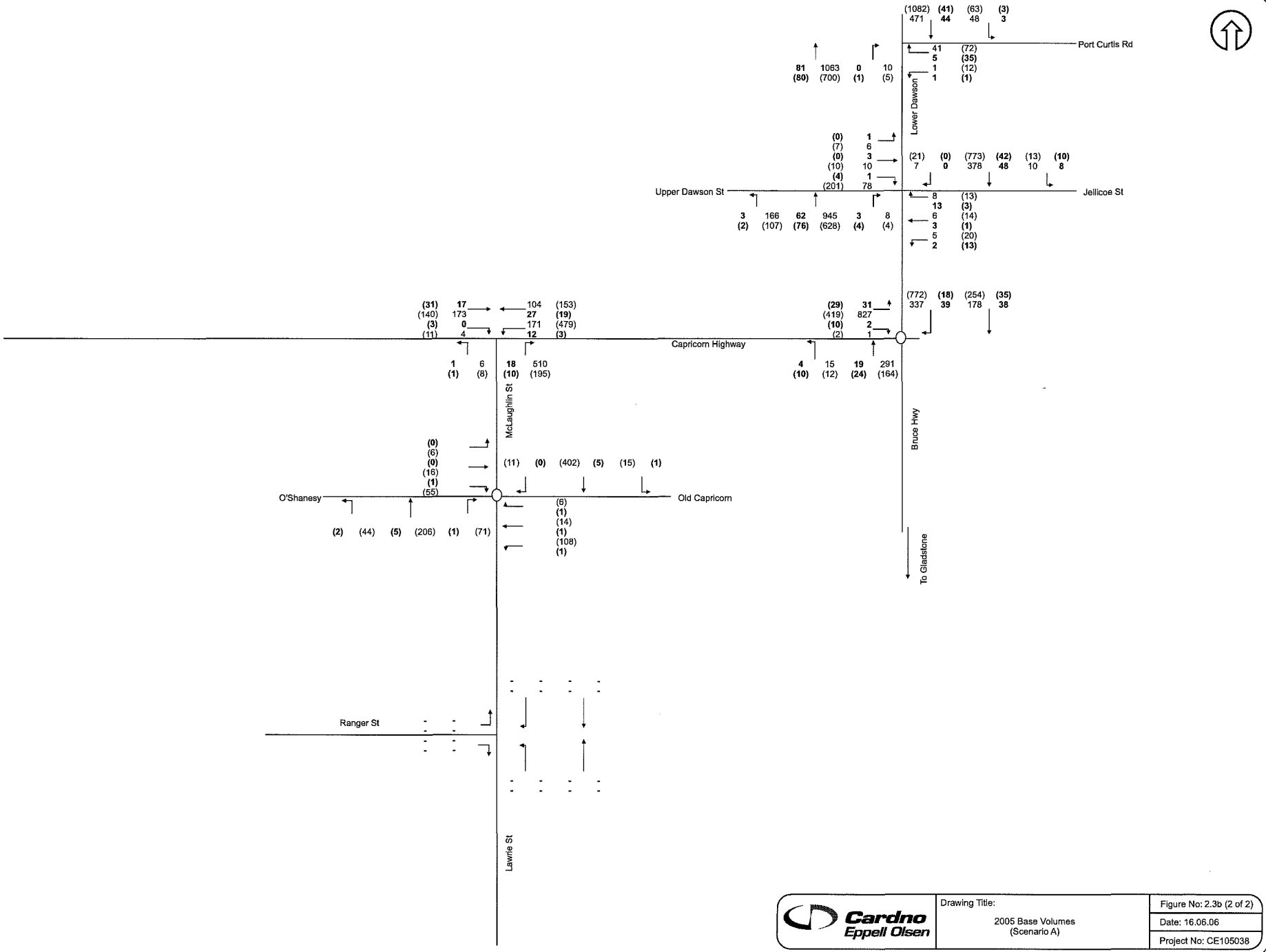

Cardno Eppell Olsen

Drawing Title:
2005 Base Volumes
(Scenario A)

Figure No: 2.3b (2 of 2)
Date: 16.06.06
Project No: CE105038

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Table 2.2 *2003 AADT Vehicle Classification Along Haulage Route*

Link	Classified Vehicle Volumes (vpd)					
	Light	Rigid Truck	Articulated	B Doubles	Heavy Vehicle Percentage (%)	Total
1	14,205	876	625	202	10.7	15,909
2	10,064	516	265	122	8.3	10,969
3	3,062	244	174	105	14.6	3,586
4	2,615	224	181	116	16.6	3,137
5#	5,471	1,033	458	233	15.9	6,504

2.5 Crash History

A review of the crash history of the study road network has been conducted based on information provided by Queensland Transport summarising crash location, type and severity for incidents recorded between the four-year period 2000 – 2004. This data, as well as a description of Queensland Transport's crash type coding, is included at Appendix A.

All crash locations are plotted on Figure 2.4 and a tabulation of crash type, severity, and frequency is provided for locations recording high crash frequencies (i.e. more than 3 crashes).

Six crashes were observed during the period at the Capricorn Highway/Gavial–Gracemere Road intersection that involved a right turning vehicle being struck by the adjacent through movement. The incident descriptions provided are not detailed enough to identify if these occurrences are related to a pattern in approach, time of day, etc.

The Bruce Highway/Capricorn Highway intersection recorded nine crashes involving vehicles mounting the traffic island (i.e. vehicles driving off the designated carriageway and into traffic island areas). The incident descriptions provided are not detailed enough to identify any consistency in approach, time of day, weather conditions, etc to determine if there is an existing deficiency at the intersection contributing to this crash type.

All other locations shown on Figure 2.4 show no consistent pattern in crash types and have therefore not been reviewed further herein.

Although high crash frequency has not been recorded during the past five years, a review of the Capricorn Highway/Fairy Bower Road intersection was undertaken during a site visit in May 2005. The intersection is an unsignalised four way intersection, however adequate sight distance and appropriate speed limits have been provided at the intersection. It is thought that the design of this intersection is adequate for current and anticipated (with the addition of project related vehicles) traffic levels.

1 Capricorn Highway/Malchi Nine Mile Road

Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
303			1		1	2
308	1					1

2 Capricorn Highway/O'Shanesy Street

Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
104	1					1
303			1			1
506		1				1

3 Capricorn Highway/Old Capricorn Highway

Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
104		1	1	1		3

4 Capricorn Highway/Gavial Gracemere Road

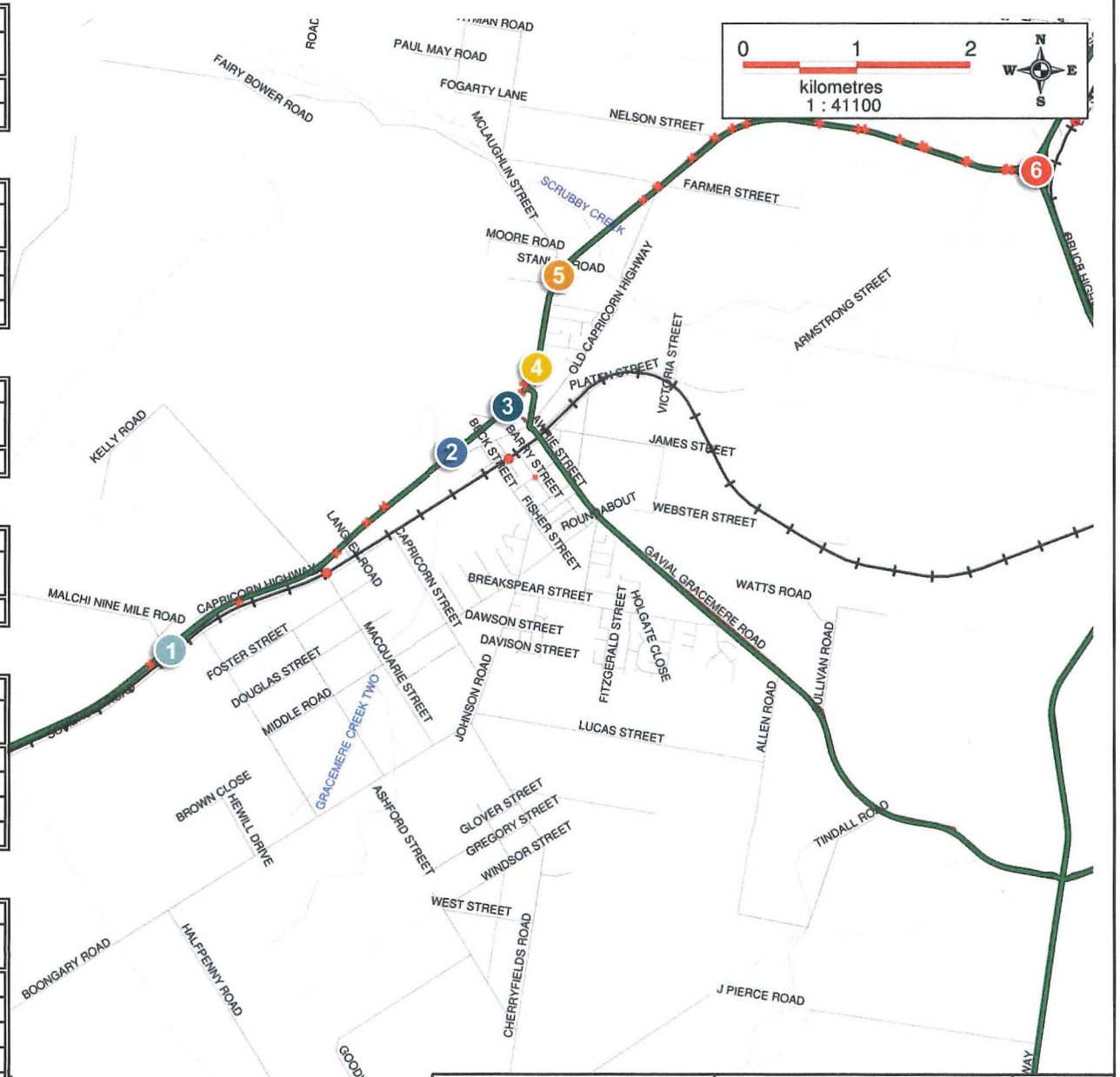
Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
104	2	1		3		6

5 Capricorn Highway/Mclaughlin Street

Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
104	1					1
105	1					1
202				1		1
308				1		1

6 Bruce Highway/Capricorn Highway

Type	Severity					
	PDO	Minor injury	Medical treatment	Hospitalisation	Fatal	Total
301	1		1			2
600	1					1
702		1				1
704	1					1
706			1			1
708	7			2		9
801	1					1
805				1		1



Cardno Eppell Olsen

DRAWING TITLE:
Crash Data Matrices
Capricorn Highway
(Bruce Hwy - Meteor Park Rd)

FIGURE No: 2.4
PROJECT No: 5038
DATE: 26.05.05

3.0 PROPOSED DEVELOPMENT

3.1 Queensland Coke and Power Plant Proposal

The site of the proposed Queensland Coke and Power Plant Project is located within the existing Stanwell Energy Park, approximately 20km south-west of Rockhampton. The intent of the project is to "employ modern heat recovery coke making technology to produce a superior quality blast furnace coke for the export market" (Macarthur Coal Limited 2004). Surplus heat from the process will be captured for use in the generation of electricity.

The process will result in a more refined coking coal product that will be transported by rail to a purpose built export facility at Fisherman's Landing, Gladstone. Some by-product and waste materials will result from the refining process. Waste coal fines output by the plant are to be utilised by the adjacent Stanwell power station located within the Stanwell Energy Park.

The major input to the process is raw coking coal. This will be delivered to the site via rail from the Bowen Basin and will not result in any significant vehicle trips on the road network. Other inputs are likely to be minor and will represent very few vehicle trips.

No ramp up period following the commencement of operation has been assumed for the purposes of our assessment. As such, maximum traffic generation for construction and operation stages of the coke and power plant have been considered.

3.2 Project Staging and Assessment Scenarios

For the impact assessment, the project has been divided into three scenarios with each scenario corresponding to various stages of the project. The scenarios are as follows:

- Scenario 1: Construction of Stage 1 of the Coke Plant and Materials Handling Facility (Approx 2006 Commencement);
- Scenario 2: Construction of Stage 2 Coke Plant, Construction of up to 250MW Power Plant, Operation of Stage 1 Coke Plant (Approx 2008 Commencement);
- Scenario 3: Operation of Stages 1 and 2 of Coke Plant, and operation of up to 250MW Power Plant (Approx 2010 Commencement).

Each scenario has been assessed with vehicle volumes based on anticipated material volumes, number of estimated truck trips to the site or in the case of personnel movements the capacity of vehicles and the number of staff utilised for each of the scenarios. These trips have been distributed to the study network according to likely origins.

The adopted vehicle volumes and distribution for each scenario are described in detail in the following sections. Note that the assumptions made for construction quantities, staff numbers, project timing, vehicle origin/destination, vehicle routes are based on advice provided by URS Australia and QCE (the project proponent).

3.3 Assessment Scenario Adopted Volumes and Distribution

For each scenario the number of project related vehicles on the network for the peak hour has been calculated and distributed to the network on a per scenario basis.

Route names for various heavy vehicle construction inputs and wastes, construction personnel and operational personnel are discussed herein and shown on Figures 3.1, 3.2 and 3.3 respectively.

The anticipated location of the personnel camp in Gracemere is near the corner of Lucas Street and Johnson Road.

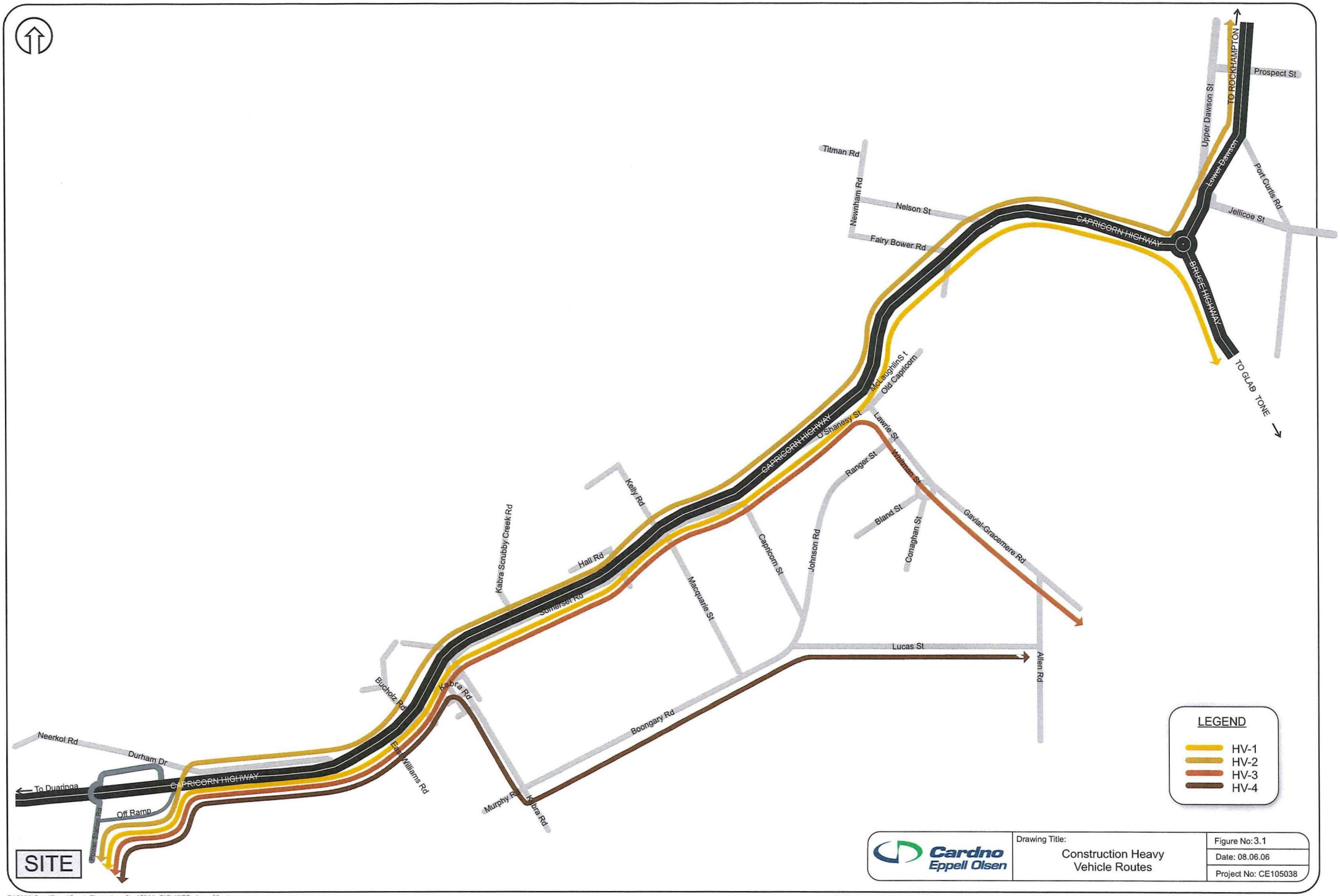
Detailed tables showing the assumptions used for the analysis are at Appendix D.

The distribution, mode split and vehicle occupancy has been previously agreed with the Queensland Department of Main Roads (DMR) during discussions in March 2006. These assumptions have been revised from our initial assessment at the specific request of DMR.

The assumptions in the following sections regarding distribution and volume of construction and operational personnel have been used for the calculation of both peak hour impact as well as pavement impacts.

The assumptions regarding distribution and volumes for construction materials heavy vehicles have been used only for pavement impact assessment. In order to estimate the peak hour volume of heavy vehicles for intersection capacity analysis, the average weekly volume of trucks travelling to the worksite for various components of the project has been assumed to be evenly spread across the working hours. The adopted hourly volume was then distributed over the study network, in approximately the same final distribution pattern that would result at the end of the scenario.

Information provided for the assessment of this development, and information listed below regarding heavy vehicle volumes assumes the use of B-double vehicles, with volumes being one way unless otherwise noted. It has been noted that the availability of this type of vehicle in the region may be limited and the use of conventional semi-trailers may be required. It is unknown what proportion of deliveries will be made by semi-trailer or B-Double.



Cardno Eppell Olsen

Drawing Title: Construction Heavy Vehicle Routes

Figure No: 3.1

Date: 08.06.06

Project No: CE105038

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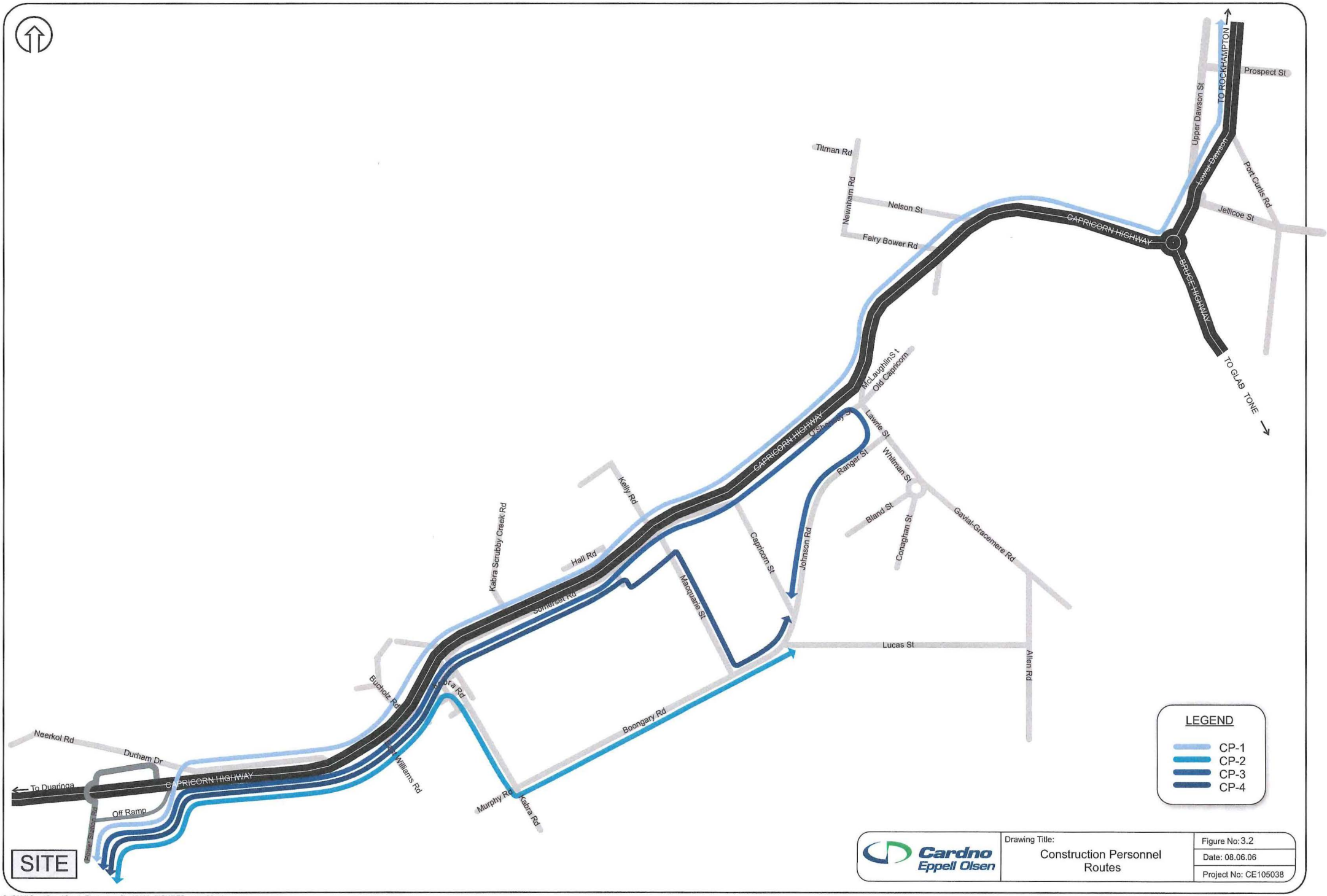

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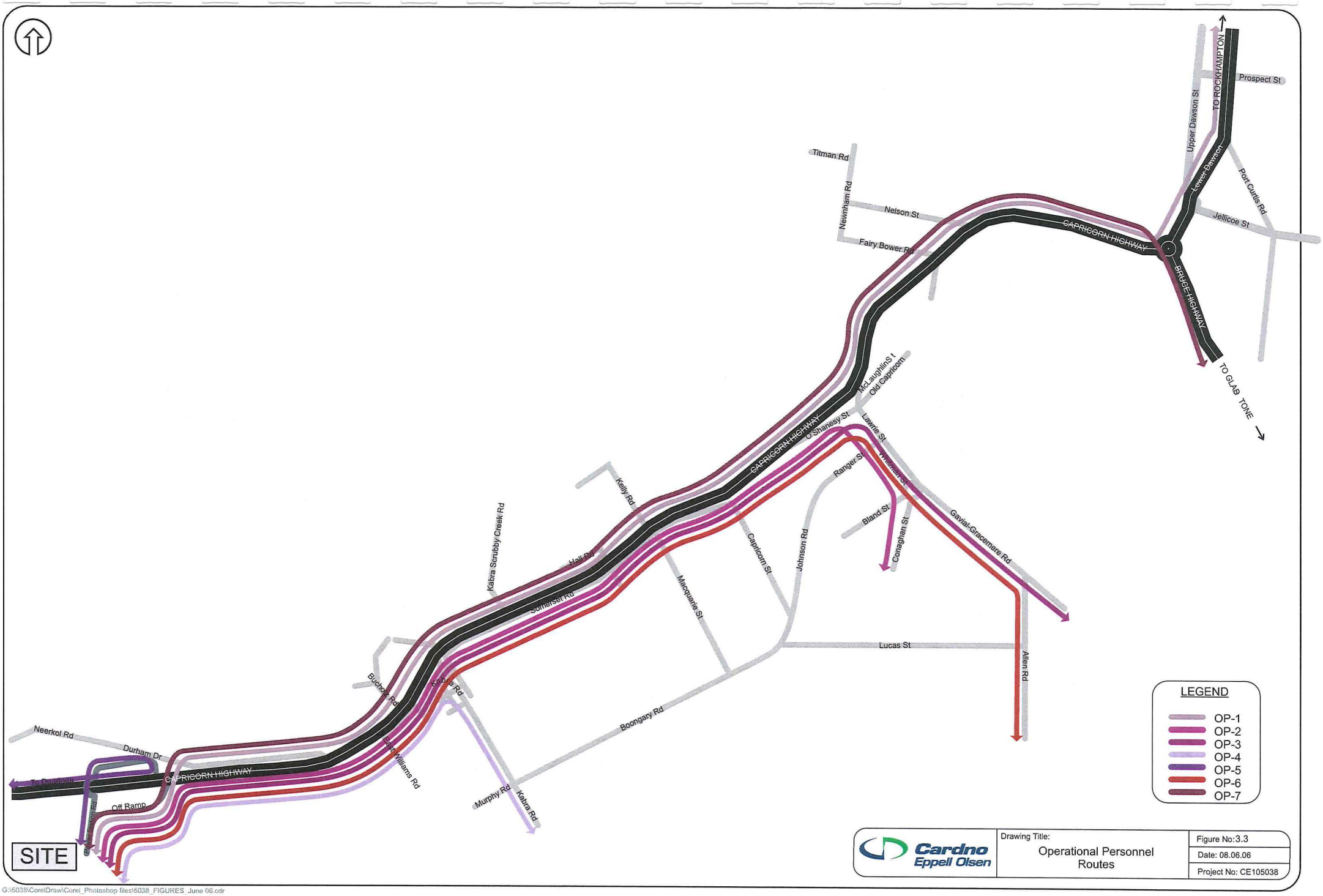

Cardno Eppell Olsen

Drawing Title: Operational Personnel Routes

Figure No: 3.3

Date: 08.06.06

Project No: CE105038

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3.3.1 Scenario 1

Scenario 1 traffic comprises a combination of heavy vehicles relating to the transport of construction materials and waste to and from the site in addition to construction personnel private vehicles and buses which will transport personnel who choose to travel by bus to and from the worksite to locations in Gracemere and Rockhampton. Traffic volumes relating to the construction personnel and heavy vehicle traffic are described in detail below.

The coke plant construction is anticipated to generate in the order of 250 truck movements per week, whilst the materials handling facility is expected to generate in the order of 30 truck movements a week. For the peak hour analysis, this results in an peak hour heavy vehicle volume of 12vph (6 in/6 out) for both the AM and PM Peak analysis periods. The assumptions represents a 5 day working week and a 10 hour working day. It is therefore conservative.

Construction Personnel

Construction personnel involved with Scenario 1 works will be housed either at a camp in Gracemere or within individual residences within the Rockhampton area. Transport for the personnel is either by 45 Passenger bus provided by the proponent, or by private vehicle.

Private Vehicles used for commuting between the work site and residences are assumed to have an occupancy of 2 persons/vehicle. The distribution and mode splits assumptions are reported in Table 3.1. These assumptions have been agreed by DMR.

Table 3.1 ***Construction Personnel Residence and Mode Split***

	% age of workers resident	Mode Split	
		Bus	Car
Rockhampton Area	40%	40%	60%
Gracemere Camp	60%	70%	30%

In terms of the number of construction personnel required for Stage 1, a peak workforce of 1,650 personnel is expected for a short period during construction, with a "peak average" of 1,200 personnel. As the peak of 1,650 personnel is only expected for a short period towards the end of the construction phase the "peak average" of 1,200 personnel has been used to assess the impact of construction personnel movements on the surrounding road network.

The work start times have been assumed to be staggered over a 2 hour period with half hour starts. Therefore it is assumed that half of the construction personnel will be in transit during the analysis hour. It has been conservatively assumed that during the two hour starting period, the hourly road peak will occur within the starting period.

The above assumptions result in the following volumes for the analysis hour:

- Rockhampton Vehicle Volumes
  - Buses: AM Peak Hour (4 in/4 Out), PM Peak Hour (4 in/4 Out);
  - Private Vehicles: AM Peak Hour (120 in/0 out), PM Peak (0 in/120 Out);
- Gracemere Vehicle Volumes
  - Buses: AM Peak Hour (6 in/6 Out), PM Peak Hour (6 in/6 Out);
  - Private Vehicles: AM Peak Hour (90 in/0 out), PM Peak (0 in/90 Out).

Personnel located within the Rockhampton environs who choose to use private transport are assumed to be split between Rockhampton and the greater area (such as Yeppoon) and Allenstown. It is assumed 20% of the personnel will be located in Allenstown with the remaining 80% located in the greater area.

Construction personnel located in the personnel camp in Gracemere are assumed to access the Capricorn Highway by one of three access points (see Figure 3.2):

- 30% of vehicles are assumed to access the Capricorn Highway via the Capricorn Highway/McLaughlin Street intersection (Route CP-3);
- 30% via the Capricorn Highway/Somerset Road access point (Route CP-4);
- 40% of the traffic is assumed to travel to Kabra and access the Capricorn Highway via Kabra Road (Route CP-2).

Buses from Rockhampton will travel along route CP-1, with buses from Gracemere travelling along route CP-2.

The above characteristics have been used for the assessment of both intersection capacity and pavement impacts.

Stage 1 Coke Plant - Construction Materials Input

Heavy vehicles carrying materials for the construction of the Stage 1 Coke Plant are anticipated to travel to and from the worksite from one of three locations (see Figure 3.1):

- from Gladstone using route HV-1;
- from Rockhampton using Route HV-2;
- from Gracemere using Route HV-3.

The adopted inputs, distribution and total number of vehicles over the life of the scenario for the Stage 1 Coke Plant construction are reported in Table 3.2.

Table 3.2 ***Stage 1 Coke Plant Heavy Vehicle Volumes and Distribution***

	Distribution			Adopted Total Number of Vehicles	Approx Average Weekly Volume (One Way)
	Rockhampton (Route HV-2)	Gracemere (Route HV-3)	Gladstone (Route HV-1)		
Aggregate	0%	100%	0%	1,373	13
Cement	50%	0%	50%	645	6
Reinforcing Steel	50%	0%	50%	1,121	11
Refractory Bricks	0%	0%	100%	5,714	55
Structural Steel	50%	0%	50%	857	8
Conveyor Units	50%	0%	50%	83	<1
Cabling	50%	0%	50%	10	<1

The above volumes and distribution have been used for the assessment of pavement impacts, for the scenario. It should be noted that the above volumes assume the use of only b-double type vehicles, therefore for intersection capacity analysis, a broader assumption of 250 heavy vehicles per week (which is greater then the volume shown in the table above) for the stage 1 coke plant has been adopted. The adopted 250 vehicle movements a week to the site has then been assumed to be evenly distributed over the working week (i.e. over 5 days, with a 10 hour workday). The adopted hourly volume was then distributed over the study network, in approximately the same final distribution pattern that would result at the end of the scenario.

Construction Materials Input – Operational Materials Handling Equipment

Heavy vehicles carrying materials for the operational materials handling equipment are anticipated to arrive to site from the same origins as materials for the Stage 1 coke plant construction and utilise the same routes.

The adopted inputs, distribution and total number of vehicles over the life of the scenario for the operational materials handling equipment are shown below.

Table 3.3 ***Materials Handling Heavy Vehicle Distribution and Volumes***

	Distribution			Adopted Total Number of Vehicles	Approx Average Weekly Volume (One Way)
	Rockhampton (Route HV-2)	Gracemere (Route HV-3)	Gladstone (Route HV-1)		
Aggregate	0%	100%	0%	358	4
Cement	50%	0%	50%	192	2
Structural Steel Product	50%	0%	50%	175	1
Fabricated Steel	0%	0%	100%	75	<1
Procured Items	50%	0%	50%	250	2

The above volumes have been utilised in the calculation of pavement impacts for the scenario. As with the Stage 1 Coke Plant, the above volumes assume the use of b-double type vehicles, thus for intersection capacity analysis a broader assumption of a weekly volume of 30 vehicles (which is greater then what is shown in the above table) to the site has been assumed for this scenario. Again this adopted weekly volume has been distributed approximately as per the distribution pattern that would result at the end of the scenario.

Construction Wastes Output

For the purposes of assessment a nominal amount of traffic has been assumed in order to represent any waste output during the construction phase. It is anticipated that these waste vehicles will originate and terminate at the Gracemere Landfill (Route HV-4) (see Figure 3.1).

Table 3.4 ***Waste Vehicle Distribution and Volume***

	Distribution			Adopted Total Number of Vehicles	Approx Average Weekly Volume (One Way)
	Rockhampton (Route HV-2)	Gracemere (Route HV-4)	Gladstone (Route HV-1)		
Wastes	0%	100%	0%	520	5

General Construction Materials – Fill

Scenario 1 comprises of the movement of approximately 100,000 tonnes of fill material to the worksite. Whilst the majority of fill is anticipated to be sourced from areas in close proximity to the worksite, and therefore the majority of traffic transporting fill will not feature on major highways or roads, for this analysis a portion of the fill has been conservatively assumed to be sourced from further afield. For pavement impacts, it has been assumed that 35% of the fill material may be sourced from Gracemere, with the volume and distribution shown in Table 3.5.

Table 3.5 ***Fill Vehicle Distribution and Volume***

	Distribution			Adopted Total Number of Vehicles	Approx Average Weekly Volume (One Way)
	Rockhampton (Route HV-2)	Gracemere (Route HV-3)	Gladstone (Route HV-1)		
Fill Material	0%	35%	0%	1750	103

The fill is anticipated to be hauled over a period of approximately 4 months, and therefore a higher weekly volume for haulage of fill vehicles for this four month period results. The above volumes have been used for the calculation of pavement impacts for the scenario.

3.3.2 Scenario 2

Scenario 2 comprises of a greater mix of vehicles with construction and operational traffic being generated. In addition to the vehicle types generated in Scenario 1, Scenario 2 will also involve private vehicles related to personnel operating the Stage 1 Coke Plant. Construction personnel travel patterns are similar to Scenario 1 with only a decrease in personnel numbers being the notable difference between the two scenarios in terms of construction personnel.

The construction of the Stage 2 Coke plant is anticipated to generate in the order of 250 vehicle movements to the site a week, with the construction of the Power Plant resulting in the order of 135 vehicle movements to the site a week. For the peak hour analysis, this results in a peak hour heavy vehicle volume of 16vph (8 in/8 out) for both the AM and PM Peak analysis periods.

Construction Personnel

For Scenario 2 the only change to the construction personnel characteristics is the number of construction personnel. For Scenario 2 a "Peak Average" personnel number of 1,080 has been adopted.

The above construction personnel characteristics result in the following volumes for the analysis hour:

- Rockhampton Vehicle Volumes
  - Buses: AM Peak Hour (2 in/2 Out), PM Peak Hour (2 in/2 Out);
  - Private Vehicles: AM Peak Hour (108 in/0 out), PM Peak (0 in/108 Out);
- Gracemere Vehicle Volumes
  - Buses: AM Peak Hour (6 in/6 Out), PM Peak Hour (6 in/6 Out);
  - Private Vehicles: AM Peak Hour (81 in/0 out), PM Peak (0 in/81 Out).

The above information coupled with the construction personnel distribution and mode split assumptions shown in Scenario 1 have been used for intersection analysis and pavement impacts.

Stage 2 Coke Plant - Construction Materials Input

As the Stage 2 Coke Plant construction is primarily the duplication of the Stage 1 Coke Plant, the volumes and distribution of heavy vehicles related to this component of the project has not been altered. Therefore the impacts of this component will be similar to the Stage 1 Coke Plant construction.

Power Plant - Construction Materials Input

Vehicles carrying materials related to the construction of the Power Plant are anticipated to travel to site from origins similar to materials for the construction of the Coke Plant. The volumes adopted for this component of the project are shown in Table 3.6.

Table 3.6 ***Power Plant Heavy Vehicle Distribution and Volumes***

	Distribution			Adopted Total Number of Vehicles	Approx Average Weekly Volume (One Way)
	Rockhampton (Route HV-2)	Gracemere (Route HV-3)	Gladstone (Route HV-1)		
Plant and Construction Materials	50%	0%	50%	4,000	38
Sundry Plant	50%	0%	50%	2,500	24
Operational Supplies	50%	0%	50%	1,500	14
Aggregate	0%	100%	0%	3,600	35
Cement	50%	0%	50%	1,800	17
Reinforcing Steel	50%	0%	50%	600	6
HRSG Units	0%	0%	100%	32	<1

The above volumes and distribution have been adopted for the pavement impact assessment for the applicable scenario. The above volume has also been distributed over the study network in a pattern similar to the assumed distribution pattern that would result at the end of the scenario.

Stage 1 Coke Plant - Operational Personnel

As scenario 2 involves the operation of the Stage 1 Coke Plant, plant operational personnel are required and have been assumed to reside in close proximity to the Rockhampton and Gracemere environs. The number of personnel required for the operation of this component has been assumed to be 80, with all assumed to be travelling via private transport. A vehicle occupancy of 1.2 passengers per vehicle has been adopted, as well as the assumption that a complete operation personnel change over is undertaken within an hour (i.e. all operation personnel are replaced within a hour). The above assumptions are very conservative and result in the following traffic characteristics:

- Operations Personnel Vehicle Volumes
  - AM Peak Hour (67 in/67 Out);
  - PM Peak (67 in/67 Out).

The above generated traffic has then been distributed to the network according to the distribution in Table 3.7 (see Figure 3.3).

Table 3.7 ***Operational Personnel Volume Distribution***

	%age of traffic	Route
West of Site (Towards Duaringa)	5%	OP-5
Mount Morgan (Via Kabra)	5%	OP-4
Rockhampton	65%	OP-1
Gracemere	20%	OP-2
Gladstone (Via Gracemere)	5%	OP-3

The above volumes have been used in the analysis of intersection capacity for intersections within the study network.

Stage 1 Coke Plant – Visitors

A nominal amount of visitor trips has also been adopted, with visitor trips assumed to represent an additional 5% of personnel trips. This represents an additional six vehicles (3in/3out) during both the peak AM and PM periods. All visitor trips are assumed to originate from Rockhampton, and utilise route OP-1.

Stage 1 Coke Plant – Input and Waste Output Heavy Vehicles

As the main input raw material and final finished product will be transported to the plant via rail, minimal heavy vehicle traffic will be generated during the operations of the various components of the project. A nominal amount has been adopted for the purposes of this assessment.

The operations of the stage 1 coke plant have been assumed to generate 4vph (2in/2out) for operational inputs during the operations, with 2vph (1in/1out) adopted for operations outputs (e.g. general wastes). An assumed 50% of the operations input vehicles are to originate from Rockhampton (using route OP-1), with the remaining 50% originating from Gladstone (using Route OP-7). All operations outputs vehicles (such as waste) are assumed to originate from Gracemere using route HV-4.

The total daily input and output heavy vehicles are assumed to all travel to site during only the AM Peak. The above assumptions have been used for both intersection capacity and pavement impacts.

General Construction Materials – Fill

Scenario 2 also comprises of the movement of approximately 100,000 tonnes of fill material to the worksite. Similar to Scenario 1, the fill is anticipated to be sourced from areas in close proximity to the worksite, and therefore the majority of traffic transporting fill will not feature on major highways or roads. The volume and route assumptions for fill vehicles for this scenario are similar to the assumptions adopted in Scenario 1.

3.3.3 Scenario 3

Scenario 3 comprises only operations personnel private vehicles, and a nominal amount of heavy vehicle traffic relating to the operation of all components of the project.

Scenario 3 - Operational Personnel

Traffic characteristics for operational personnel for Scenario 3 are have been assumed to be similar to the traffic characteristics of the stage 1 coke plant operations personnel, with the only alteration being an increase in the number of personnel. For scenario 3 the number of operations personnel required to operate the facility has been assumed to be 125. The total personnel numbers results in the following projected volumes:

- Scenario 3 Operations Personnel Vehicle Volumes
  - AM Peak Hour (104 in/104 Out);
  - PM Peak (104 in/104 Out).

Distribution, routes and occupancy have been assumed to be similar to the operations of the Stage 1 Coke Plant.

Scenario 3 – Visitors

In line with the increase in the number of operations personnel, the number of visitors to the plant has been increased. A total of 10vph (5in/5out) has been applied to both the AM and PM Peaks. All visitor trips are assumed to originate from Rockhampton using route OP-1.

Scenario 3 – Input and Waste Output Heavy Vehicles

Nominal heavy vehicle trips for inputs and outputs has been increased in line with the increase in production at the plant. Input vehicles have been assumed to represent 8vph (4in/4out) and output vehicles 4vph (2in/2out). Vehicle distribution is similar to the Stage 1 Coke Plant Operations.

3.4 Impact on Existing School Bus Services

Discussions with Young's Coaches representatives have indicated that there are school bus services that run between Rockhampton and Gracemere along the Capricorn Highway. These services operate between 7:15am and 8:15am in the morning, and 3:00pm and 4:15pm during afternoon. Additional school services are provided by other operators, and generally operate within approximately the same time frame.

As construction is scheduled to proceed from 6:00am to 6:00pm six days a week, the transport of construction workers to and from the site is unlikely to coincide with the operation of school bus services.

4.0 FUTURE TRAFFIC VOLUMES

4.1 Background Traffic Growth (No Development)

Historic traffic patterns have been reviewed from AADT data provided by the Department of Main Roads (DMR). Over the last ten years, background traffic growth on the Capricorn Highway has been recorded as approximately 5 - 6%p.a. between the Bruce Highway and Gracemere, approximately 4% along the Bruce Highway and approximately 2%p.a. west of Stanwell.

Historic growth on the section of the Capricorn Highway between the Bruce Highway and Gracemere is likely a result to have occurred as a combined result of the major development traffic at Stanwell Energy Park in addition to increased development activity in Gracemere.

In line with specific requests from DMR the following annual growth rates have been applied to key links within the Study Network:

- Capricorn Highway (east Stanwell): 6%;
- Capricorn Highway (west Stanwell): 3%;
- Bruce Highway: 4%;
- Gavial-Gracemere Road: 5%.

Application of these growth rates has been applied to all design years (2006, 2008, 2010 and 2020). It should be noted that the application of a growth rate greater then 3% per annum for an extended period of time is considered unsustainable, though has been adopted in this assessment specifically at the request of DMR.

For the purposes of this assessment a linear traffic growth rate has been applied to all movements at study intersections throughout the various design horizons.

4.2 Traffic Scenarios

The following traffic scenarios have been formulated based on available staging information:

- **Scenario A** – 2005 Existing traffic volumes;
- **Scenario B** – 2006 Base traffic volumes;
- **Scenario C** – 2006 Base + Scenario 1;
- **Scenario D** – 2008 Base traffic volumes;
- **Scenario E** – 2008 Base + Scenario 2;
- **Scenario F** – 2010 Base traffic volumes;
- **Scenario G** – 2010 Base + Scenario 3;
- **Scenario H** – 2020 Base traffic volumes;
- **Scenario I** – 2020 Base + Scenario 3.

Traffic volumes for each of the above scenarios are documented at Appendix B.

It should be noted that the intersection analysis has not been undertaken for all of these scenarios. Where the analysis results clearly show no need to analyse a particular scenario, this has been omitted.

5.0 NETWORK OPERATION

The identified study intersections (as outlined in Section 2.3 of this report) have been assessed for the relevant design traffic scenarios (as discussed in Section 4.2 of this report). Note that some scenarios have been omitted where the analysis results are not considered to be relevant to the conclusions drawn herein.

The worst case scenario in terms of development impact on the surrounding road network is Scenario E which combines the construction traffic from both the Stage 2 coke plant and power plant, along with the operations traffic from the Stage 1 Coke Plant (Scenario 2) with the 2008 background traffic. Where the capacity analysis for this scenario shows acceptable operation under the existing intersection layout, the other "with project" scenarios have not been analysed.

Intersection operation has been assessed using the aaSIDRA modelling software for all intersections. Analysis results for the AM and PM peak periods are summarised in Tables 5.1 and 5.2.

For all intersections the a theoretical maximum DOS (Degree Of Saturation) of 1.0 is applied with desirable maximum DOS values of 0.90, 0.85 and 0.8 for signalised, roundabout and priority intersections respectively, which have been adopted for this assessment in accordance with AUSTROADS practice guidelines. Where traffic volumes create performance levels above these thresholds, improvements have been considered to maintain acceptable safety and operational conditions.

5.1 Intersection Capacity Analysis

The results shown in Tables 5.1 and 5.2 represent traffic operations for the existing intersection configurations, unless otherwise noted.

Table 5.1 *AM Peak Network Operation*

Intersection	Deficiency DOS	Intersection Degree of Saturation (DOS)								
		Scenario A (2005 Base)	Scenario B (2006 Base)	Scenario C	Scenario D (2008 Base)	Scenario E	Scenario F (2010 Base)	Scenario G	Scenario H (2020 Base)	Scenario I
Gladstone Road/Lower Dawson Road/Port Curtis Road	0.80	0.96	1.0		>1.0	>1.0 0.48[1]	>1.0		>1.0 0.66[1]	0.68[1]
Lower Dawson/Jellicoe Street	0.80					0.38	0.35	0.38	0.76	0.68[4]
Bruce Highway/Capricorn Highway	0.85	0.61	0.65		0.74	0.80 0.39[2]	0.84	0.91	>1.0 0.71[2]	>1.0 0.75[2]
Capricorn Highway/ Gavial - Gracemere Road	0.80	0.82	0.92		>1.0	>1.0 0.49[3]	>1.0	>1.0	>1.0 0.75[3]	>1.0 0.79[3]
Old Capricorn Highway/ Gavial - Gracemere Road/ Lawrie Street/ O'Shanesy Street	0.85	n/a*	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Capricorn Highway/ Power Station Road	0.80	0.06	0.06		0.07	0.11	0.08		0.12	0.14

[1] DOS for an upgraded signalised intersection
[2] DOS for a two lane upgraded roundabout
[3] DOS for a two lane roundabout
[4] DOS for a signalised intersection with geometry similar to existing intersection
* Count data not available for this intersection

Table 5.2 **PM Peak Network Operation**

Intersection	Deficiency DOS	Intersection Degree of Saturation (DOS)								
		Scenario A (2005 Base)	Scenario B (2006 Base)	Scenario C	Scenario D (2008 Base)	Scenario E	Scenario F (2010 Base)	Scenario G	Scenario H (2020 Base)	Scenario I
Gladstone Road/Lower Dawson Road/Port Curtis Road	0.80	0.95	>1.0		>1.0	>1.0 0.55[1]	>1.0		>1.0 0.77[1]	0.79[1]
Lower Dawson/Jellicoe Street	0.80					0.73	0.80	0.85	>1.0	0.75[4]
Bruce Highway/Capricorn Highway	0.85	0.60	0.63		0.70	0.73 0.41[2]	0.76	0.80	>1.0 0.59[2]	>1.0 0.61[2]
Capricorn Highway/Gavial-Gracemere Road	0.80	0.48	0.51		0.59	0.67 0.36[3]	0.72	0.83	>1.0 0.54[3]	>1.0 0.57[3]
Old Capricorn Highway/ Gavial-Gracemere Road/ Lawrie street/ O'Shanesy Street	0.85	0.35	0.37		0.41	0.44	0.45		0.67	0.69
Capricorn Highway/Power Station Road	0.80	0.09	0.11		0.12	0.39	0.13		0.20	0.30

[1] DOS for an upgraded signalised intersection
[2] DOS for a two lane upgraded roundabout
[3] DOS for a two lane roundabout
[4] DOS for a signalised intersection with geometry similar to existing intersection

The results summarised in Tables 5.1 and 5.2 show that the intersections of Lower Dawson Road/Port Curtis Road and Capricorn Highway/Gavial-Gracemere Road currently exceed desirable DOS limits (Scenario A). All intersections with the exception of Gavial-Gracemere Road/Lawrie Street and Capricorn Highway/Power Station Road have exceeded their theoretical capacity in advance of the ultimate design horizon of 2020 irrespective of the proposed development.

The intersection at which capacity failure is projected to occur are each discussed below.

Lower Dawson Road/Port Curtis Road

For both the AM and PM peak periods, the degree of saturation at the Gladstone Road/Lower Dawson Road/Port Curtis Road intersection is approaching or exceeding the theoretical capacity (i.e. DOS = 1.0) and requires upgrade irrespective of the presence of project related traffic. The critical movement at the intersection is the right turn out of Port Curtis Road, which is opposed by through movements along Gladstone Road in the order of 1,650vph and 1,900vph during the AM and PM peak hours respectively.

At the base year of 2006, the intersection has already exceeded the desirable DOS of 0.80, and therefore the intersection's operation is already deficient. The intersection has been assessed as a signalised intersection with a geometry similar to what is currently in situ. At the ultimate design horizon of 2020 + Coke Plant operations, as well as at the 2008 base year + Scenario 2 the intersection operation is acceptable with the DOS being well below 0.90.

It is clear that the development impact is very minor at this intersection and it is clear that upgrading is required irrespective of the development.

Lower Dawson Road/Jellicoe Street

The critical peak experienced at the intersection is the PM Peak when existing right turning volumes from the side streets are the highest. The intersection operates at the desirable maximum DOS of 0.80 at the Base 2010 Year without development. The addition of development traffic increases the DOS to 0.85 at the 2010 design year.

The intersection has then been assessed as a signalised intersection at the ultimate design scenario of 2020 background traffic plus development traffic. The geometry adopted in the analysis is similar to the existing intersection geometry. The intersection is able to operate acceptably under both the AM and PM peaks at the ultimate design horizon.

Capacity failure occurs irrespective of the development traffic. The signalisation of this intersection is the recommended treatment for this deficiency.

Bruce Highway/Capricorn Highway

The existing Bruce Highway/Capricorn Highway roundabout will reach its maximum desirable capacity (0.85) at approximately 2011 under background traffic volumes alone. The critical movements at the intersection are Capricorn Highway (west) to Bruce Highway (north), inbound during the AM peak and outbound during the PM peak. With the project traffic, the intersection capacity (0.85) is exceeded at approximately 2009.

The intersection has been assessed as a two lane roundabout, with two circulating lanes and two lane approaches on each leg. With the adopted geometry the intersection operates acceptably at the ultimate design horizon of 2020.

It would appear that the high background growth assumptions are a key cause of the capacity failure. Nonetheless, the impact of the development is to initiate "failure" approximately two years earlier than otherwise expected.

Capricorn Highway/Gavial-Gracemere Road

The intersection currently exceeds the desirable DOS of 0.80 for a priority controlled intersection, and therefore the intersection operation deficiency is existing. The strong right turn movement out of Gavial-Gracemere Road combined with the opposing volumes from the eastern approach result in a high DOS for the intersection.

The intersection has been tested as a single lane roundabout at the design horizon of 2020, and was not able to function acceptably. The intersection was subsequently tested as a two lane roundabout with two circulating lanes and two lane approaches on each leg. With this geometry the intersection is able to function acceptably under the design volumes.

It is clear that the high background growth assumptions (6%p.a. on Capricorn Highway) are a significant contributor to the future capacity upgrade needs. Development traffic is also a contributor to the latter. It is important to note that capacity failure has occurred under existing traffic irrespective of the development. On this basis, the road authority (DMR) should be responsible for the upgrading works.

5.2 Additional Intersection Consideration

A road safety assessment was undertaken for the road network generally between the site and key destinations/origins within the broad scope of the traffic network as agreed with DMR in March 2005. In subsequent discussions with DMR (March 2006) it was agreed that a raod safety assessment should particularly look at the Power Station Road/Capricorn Highway interchange and auxiliary turn lane requirements at intersections along the Capricorn Highway. In these discussions it was agreed that a full road safety audit was not required. This road safety assessment was undertaken in May 2006.

Other more intersections (including more minor intersections) present on the network have also been considered from a safety and operations perspective. Potential issues regarding these intersections are discussed below.

Capricorn Highway/O'Shanesy Street

The intersection of the Capricorn Highway and O'Shanesy Street is a potential secondary access to Lawrie Street in Gracemere and allows for traffic between Stanwell and Gracemere to bypass the Capricorn Highway/Gavial-Gracemere Road intersection. A primary school is located on O'Shanesy Street in Gracemere and as such it would be inappropriate to encourage additional traffic past the school to give access to Capricorn Highway. For this reason, no development traffic has been assigned to this route.

This is an existing deficiency irrespective of the development. It is suggested that consideration be given to closing O'Shanesy Street at the intersection with Capricorn Highway or installing a median on Capricorn Highway to prevent right turns.

Capricorn Highway/Somerset Road (West of Kelly Road)

With the projected volumes of traffic turning right into Somserset Road from the Capricorn Highway, the existing Type A right turn treatment is not suitable under the AUSTROADS or DMR turn treatment warrants. Therefore it is recommended that a Type C channelised right turn treatment be provided at this particular intersection.

Capricorn Highway/Hall Road

At this intersection, Type C turn lanes already exist on Capricorn Highway. No development traffic has been assigned to make turns at this intersection. Nonetheless, no upgrading of turns is required.

Capricorn Highway/Kabra Road

At this intersection, development traffic will contribute to turning movements to/from the Capricorn Highway. The existing volumes and additional development traffic are not so significant that capacity analysis is required. The intersection currently incorporates Type C (auxillary) turn lanes on Capricorn Highway. As such, no intersection upgrading is considered necessary.

Capricorn Highway/Power Station Road

The existing interchange at Capricorn Highway/Power Station Road was built especially to service the Stanwell Energy Park and the heavy vehicles that are generated by the development therein. The existing form accommodates the existing and projected volumes adequately beyond the 2020 horizon.

A preliminary safety assessment has been undertaken of the interchange and the only significant issue identified is that the acceleration lane for eastbound traffic from the Power Station Road overpass onto the Capricorn Highway is considered to be too short. The current form has a 220m acceleration lane (including taper). To conform with the Department of Main Roads (DMR) Road Planning and Design Manual (RPDM) it is suggested that the acceleration lane be extended by approximately 200m.

This issue represents an existing deficiency irrespective of the proposed development.

5.3 Traffic Volumes to Gladstone along Bruce Highway

The volumes anticipated to travel to and from Gladstone are minimal and only during the construction phase will there be any heavy vehicles travelling from Gladstone to the worksite in any notable volume. As part of the project all heavy vehicles with an origin or destination of Gladstone are to travel to the site via the Bruce Highway/Capricorn Highway roundabout and not along Gavial-Gracemere Road. No light vehicles relating to construction are anticipated to travel from Gladstone. For each of the construction scenarios (1, 2 and 3), the estimated volumes travelling along the Bruce Highway to and from Gladstone are listed below.

Scenario 1

- Approx Average Weekly Volume – 142 trucks per week (71 in and 71 out);
- Approx Average Daily Volume – 28 trucks per day (14 in and 14 out);
- Peak hour volume
  - AM Peak 6vph (3 in and 3 out);
  - PM Peak 6vph (3 in and 3 out);

Scenario 2

- Approx Average Weekly Volume – 236 trucks per week (118 in and 118 out);
- Approx Average Daily Volume – 48 trucks per day (24 in and 24 out);
- Peak hour volume
  - AM Peak 8vph (4 in and 4 out);
  - PM Peak 8vph (4 in and 4 out);

Scenario 3

- Approx Average Weekly Volume – 20 trucks per week (10 in and 10 out);
- Approx Average Daily Volume – 4 trucks per day (2 in and 2 out);
- Peak hour volume
  - AM Peak 4vph (2 in and 2 out);
  - PM Peak 0vph;

The volumes shown above do not represent considerable increases in vehicular traffic and therefore unlikely to be of detriment to the road network. It is considered therefore that no further assessment of the impacts is warranted.

6.0 PAVEMENT IMPACT ASSESSMENT

An assessment of the development heavy vehicle traffic on the state controlled road network has been completed in accordance with procedures documented in the Department of Main Roads 'Guidelines for Assessment of Road Impacts of Development' (Road Impact Assessment Guidelines).

The assessment procedure involves determining the development impacts on the timing of pavement rehabilitation works. Key inputs to the analysis include equivalent standard axle (ESA) loadings (both existing and development related) and the pavement roughness. The following sections describe the assessment methodology and findings.

Table 1 at Appendix C documents the baseline analysis of ESA loadings. For each road section assessed, the existing annual ESA loading has been determined from vehicle volume and classification information provided by DMR, and average ESA loadings for each of the vehicle classifications. Importantly, this analysis assumes that 50% of all heavy vehicles on each section are loaded and the remaining 50% unloaded. An ESA factor is depicted in Table 1 which is a representative factor applicable to each heavy vehicle currently using the road section.

The Road Impact Assessment Guidelines define that a detailed assessment of pavement (or operational) performance is only required where a development contributes 5% or greater to existing demands. Tables 2a, 2b and 2c at Appendix C present this assessment for the proposed development. Table 2a presents the annual development ESA loading for stage 1 construction, Table 2b – Stage 2 construction and Table 2c – Stage 3 construction/operation. These tables demonstrate that the development contributes greater than 5% of existing demands on all sections during construction but the demands significantly reduce in the operation stages. The assessment specifically considers each side of the pavement (with gazettal and against gazettal directions) given that development traffic impacts are different by direction associated with the loaded or unloaded movements.

Based upon the above calculations, pavement impact assessment (and potential project contribution to pavement works) is required for the Stage 1 and Stage 2 construction over the following road sections:

- Bruce Highway – Burnett Highway to Capricorn Highway;
- Capricorn Highway – Bruce Highway to Gracemere;
- Capricorn Highway – Gracemere to Kabra;
- Capricorn Highway – Kabra to Power Station Road;
- Lawrie Street – Capricorn Highway to Ranger Street;
- Lawrie Street – Ranger Street to Bland Street Roundabout.

Table 3 at Appendix C outlines detailed characteristics of the assessed portions of the study network with Table 6.1 outlining the pavement impacts and bring forward time periods for sections that have a bring forward of one year or greater caused by the construction of the proposed coke and power plant project.

Table 3 at Appendix C summarises the deficiency calculations for each road section. Based upon the existing roughness measurements, the ESA loading threshold and timing is calculated for the no development case assuming a deterioration rate of 3 counts per annum. Using this ESA loading as the threshold and adding the development ESA increases, the bring forward time can then be calculated. In accordance with the road impact assessment guidelines the impact is only significant when the acceleration is equal to or greater than one year. Roughness has been utilised as the performance measure given that the pavement age in some cases will exceed 30 years (normal design life). This is considered to be conservative in that it assumes that some of the existing deficiencies will be overcome using developer contributions.

Table 6.1 ***Bring Forward for Selected Links***

Road	Section	Direction	Bring Forward (years)
Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	1.00
Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	3.40
Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	1.30
Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	2.30
Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St Roundabout	Northbound (G)	1.90

7.0 CONCLUSION

This traffic impact assessment has been undertaken to identify the traffic impacts of the proposed Coke Plant and Power Plant at Stanwell. The assessment has investigated a number of stages of construction of the plants and its ultimate operational stage.

Traffic generation of the project has been conservatively estimated from the information provided as part of the project proposal regarding the expected operation of the facility. Light vehicle traffic has been assumed to be proportional to anticipated operational staff numbers at the facility and has been distributed and assigned to the network in accordance to the probable residence of plant employees.

The impacts of the project on the surrounding road network are only of significance during the construction phases of the project. Of the two construction scenarios considered (Scenario 1 and Scenario 2), Scenario 2 has the highest impact on the network with the construction of both the Stage 2 Coke Plant and power plant combined with the operation of the Stage 1 Coke Plant creating the highest amount of traffic in this analysis.

During the construction of Scenario 1, there will be a peak employment rate of approximately 1,600 personnel with a maximum average of approximately 1,200 personnel. Scenario 2 construction comprises the doubling of the plant capacity for coke production and the construction of a power plant with a capacity up to 250MW with the number of construction personnel expected to be approximately 90% of the Scenario 1 personnel numbers.

Heavy Vehicles related to the construction phases of the project have been assumed to arrive consistently over a given workday, which results in an average of 12 heavy vehicles per hour (6in/6out) for Scenario 1 and 16 heavy vehicles per hour for Scenario 2 (8in/8Out). These vehicles are then distributed over the network according to the assumed distribution pattern that would result at the end of each scenario.

Although the impacts experienced during the construction phases are appreciable, as a result of the conservative assumptions adopted for this study, these impacts are unlikely to be of significant detriment to the operation of the road network. The impacts mainly relate to the bringing forward of works required at intersections and pavement quality.

During production, the impact on the surrounding network is minimal as the main input to the plant will be coking coal from the Bowen Basin and will be delivered to the site by rail. The main coke output will also be transported to the Gladstone Shipping Terminals by rail. With this transport arrangement there is minimal heavy vehicle traffic during the operational phases of the plant. The most significant impact during operation would be the movement of personnel related private vehicles to and from the plant.

At the future horizon, with development traffic the following works are required:

- Bruce Highway/Capricorn Highway – upgrading to a two lane roundabout;
- Lower Dawson Road/Jellicoe Street – signalisation of the intersection;
- Capricorn Highway/Gavial-Gracemere Road – upgrade to a two lane roundabout;
- Capricorn Highway/Somerset Road – construction of a Type C (auxiliary) right turn lane into Somerset Road from Capricorn Highway west;
- Capricorn Highway/Power Station Road – extension of the eastbound acceleration lane;
- Bruce Highway (Capricorn Highway – Burnett Highway) northbound pavement – bring forward cost of pavement rehabilitation by 1.0 year;
- Capricorn Highway (Gracemere to Kabra) westbound pavement – bring forward cost of pavement rehabilitation by 3.4 years;
- Capricorn Highway (Gracemere to Kabra) eastbound pavement – bring forward cost of pavement rehabilitation by 1.3 years;
- Capricorn Highway (Kabra to Power Station Road) westbound pavement – bring forward cost of pavement rehabilitation by 2.3 years;
- Gavial-Gracemere Road (Ranger Street to Bland Street) northbound pavement – bring forward cost of pavement rehabilitation by 1.9 years.

Appendix A

Crash Data

DEFINITIONS FOR CODING ACCIDENTS

NOTE :- **1 = Key vehicle direction.** **ie; The direction in which the key vehicle was travelling as it approached the crash location.**

	00..	10..	20..	30..	40..	50..	60..	70..	80..	90..
	PEDESTRIAN onfootorintoy/pram	INTERSECTION vehiclesfrom adjacentapproaches	VEHICLES from opposingdirections	VEHICLES from onedirection	MANOEUVRING	OVERTAKING	ONPATH	OFFPATH ONSTRAIGHT	OFFPATH ONCURVE	PASSENGERS& MISCELLANEOUS
1	NEARSIDE 001	THRU-THRU 101	HEAD-ON 201	REAREND 301	LEAVINGPARKING 401	HEAD-ON 501	PARKED 601	OFFCARRIAGEWAY TOLEFT 701	OFFCARRIAGEWAY RIGHTBEND 801	FELLIN/FROM VEHICLE 901
2	EMERGING 002	RIGHT-THRU 102	THRU-RIGHT 202	LEFTREAR 302	PARKING 402	OUTOFCONTROL 502	DOUBLEPARKED 602	OFFCARRIAGEWAY TORIGHT 702	OFFCARRIAGEWAY LEFTBEND 802	
3	FARSIDE 003	LEFT-THRU 103	RIGHT-LEFT 203	RIGHTREAR 303	PARKINGVEHICLES ONLY 403	PULLINGOUT 503		LEFTOFFCARRIAGEWAY INTOOBJECT 703	OFFRIGHTBEND INTOOBJECT 803	STRUCKTRAIN 903
4	PLAYING,WORKING, LYING,STANDING ONCARRIAGEWAY 004	THRU-RIGHT 104	RIGHT-RIGHT 204	U TURN 304	REVERSINGIN TRAFFIC 404	CUTTINGIN 504	CARDOOR 604	RIGHTOFFCARRIAGEWAY INTOOBJECT 704	OFFLEFTBEND INTOOBJECT 804	STRUCKRAILWAY X-INGFURNITURE 904
5	WALKING WITHTRAFFIC 005	RIGHT-RIGHT 105	THRU-LEFT 205	LANESIDESWIPE 305	REVERSINGINTO FIXEDOBJECT 405	PULLINGOUT REAREND 505	PERMANENT OBSTRUCTION 605	OUTOFCONTROL ONCARRIAGEWAY 705	OUTOFCONTROL ONCARRIAGEWAY 805	HITANIMALOFF CARRIAGEWAY 905
6	FACINGTRAFFIC 006	LEFT-RIGHT 106	LEFT-LEFT 206	LANECHANGERIGHT 306	LEAVINGDRIVEWAY 406	OVERTAKING RIGHTTURN 506	TEMPORARY ROADWORKS 606	LEFTTURN 706	LEFTTURN 806	PARKEDCAR RANAWAY 906
7	DRIVEWAY 007	THRU-LEFT 107	UTURN 207	LANECHANGELEFT 307	FROMLOADINGBAY 407		TEMPORARYOBJECT ONCARRIAGEWAY 607	RIGHTTURN 707	RIGHTTURN 807	VEHICLEMOVEMENTS NOTKNOWN 907
8	ONFOOTWAY 008	RIGHT-LEFT 108		RIGHTTURNSIDESWIPE308	FROMFOOTWAY 408		ACCIDENTOR BROKENDOWN 608	MOUNTS TRAFFICISLAND 708	MOUNTS TRAFFICISLAND 808	
9	STRUCKWHILEBOARDING ORALIGHTING 009	LEFT-LEFT 109		LEFTTURNSIDESWIPE309			ANIMAL 609			
0	OTHER 000	OTHER 100	OTHER 200	PULLINGOUT 310	OTHER 400	OTHER 500	LOADHITS VEHICLE 610	OTHER 700	OTHER 800	OTHER 900

April1999

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Record	Year	Month	Day	Time	Severity	Num Units	Car	Rigid Truck	Artic Truck	Road Train /Bdouble /Triple	Bus	Motorcycle	Special Purpose Vehicle (eg. Tractor)	Towed Device	Bicycle	Pedestrian	Animal	Railway Unit	Other	DCA	DCA Code Description	Street
1	2000	April	Saturday	10am	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
2	2000	April	Sunday	3pm	Hospitalisation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
3	2000	April	Tuesday	11am	Hospitalisation	1	0	0	1	0	0	0	0	0	0	0	0	0	0	805	OFF PATH-CURVE: OUT OF CONTROL ON CWAY	BRUCE HWY
4	2000	June	Friday	9am	Minor injury	2	1	0	0	0	0	1	0	0	0	0	0	0	0	506	VEH'S OVERTAKING: OVERTAKE-RIGHT TURN	CAPRICORN HWY
5	2000	August	Monday	6am	Hospitalisation	1	1	0	0	0	0	0	0	0	0	0	0	0	0	904	PASS & MISC: HIT RAILWAY XING FURNITURE	CAPRICORN HWY
6	2000	August	Saturday	4am	Hospitalisation	3	1	0	0	1	0	0	0	0	0	0	1	0	0	609	PASS & MISC: HIT ANIMAL	CAPRICORN HWY
7	2000	September	Thursday	6am	Property damage	2	1	0	1	0	0	0	0	0	0	0	0	0	0	201	VEH'S OPPOSITE APPROACH: HEAD ON	CAPRICORN HWY
8	2000	September	Wednesday	7pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	308	VEH'S SAME DIRECTION: RIGHT TURN S/SWIPE	CAPRICORN HWY
9	2000	October	Friday	7am	Medical treatment	1	0	1	0	0	0	0	0	0	0	0	0	0	0	706	OFF PATH-STRAIGHT: LEFT TURN	BRUCE HWY
10	2000	November	Friday	8am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	704	OFF PATH-STRAIGHT:RIGHT OFF CWAY HIT OBJ	BRUCE HWY
11	2000	November	Thursday	7am	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	207	VEH'S OPPOSITE APPROACH: U-TURN	CAPRICORN HWY
12	2001	January	Friday	4pm	Hospitalisation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	202	VEH'S OPPOSITE APPROACH: THRU-RIGHT	CAPRICORN HWY
13	2001	January	Sunday	10am	Fatal	3	2	1	0	0	0	0	0	0	0	0	0	0	0	303	VEH'S SAME DIRECTION: RIGHT REAR	CAPRICORN HWY
14	2001	February	Wednesday	Noon	Property damage	1	0	0	0	1	0	0	0	0	0	0	0	0	0	600	VEH'S ON PATH: OTHER	BRUCE HWY
15	2001	March	Thursday	8am	Property damage	3	3	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
16	2001	April	Thursday	7am	Hospitalisation	1	1	0	0	0	0	0	0	0	0	0	0	0	0	704	OFF PATH-STRAIGHT:RIGHT OFF CWAY HIT OBJ	CAPRICORN HWY
17	2001	April	Tuesday	6pm	Hospitalisation	2	1	0	0	0	0	0	0	0	0	1	0	0	0	5	PED'N: HIT WALKING WITH TRAFFIC	CAPRICORN HWY
18	2001	July	Friday	9am	Minor injury	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
19	2001	July	Saturday	11pm	Property damage	2	1	0	0	0	0	0	0	0	0	0	1	0	0	609	PASS & MISC: HIT ANIMAL	CAPRICORN HWY
20	2001	August	Saturday	4am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
21	2001	August	Tuesday	9am	Medical treatment	3	1	1	0	1	0	0	0	0	0	0	0	0	0	610	PASS & MISC: LOAD HIT VEHICLE	CAPRICORN HWY
22	2001	September	Sunday	1am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
23	2001	October	Saturday	8am	Minor injury	1	0	0	0	1	0	0	0	0	0	0	0	0	0	702	OFF PATH-STRAIGHT: RIGHT OFF CWAY	BRUCE HWY
24	2001	October	Saturday	Noon	Medical treatment	3	3	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
25	2001	October	Wednesday	8pm	Property damage	3	2	0	0	0	0	0	0	0	0	0	1	0	0	609	PASS & MISC: HIT ANIMAL	CAPRICORN HWY
26	2001	November	Saturday	5pm	Medical treatment	1	1	0	0	0	0	0	0	0	0	0	0	0	0	702	OFF PATH-STRAIGHT: RIGHT OFF CWAY	CAPRICORN HWY
27	2001	November	Thursday	4pm	Medical treatment	2	2	0	0	0	0	0	0	0	0	0	0	0	0	303	VEH'S SAME DIRECTION: RIGHT REAR	CAPRICORN HWY
28	2001	November	Thursday	4pm	Property damage	3	3	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
29	2001	November	Wednesday	2pm	Property damage	1	0	0	0	0	0	1	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
30	2001	November	Wednesday	9am	Hospitalisation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
31	2002	January	Thursday	2pm	Medical treatment	2	1	1	0	0	0	0	0	0	0	0	0	0	0	303	VEH'S SAME DIRECTION: RIGHT REAR	CAPRICORN HWY
32	2002	February	Tuesday	7pm	Minor injury	2	0	0	0	0	0	1	0	0	0	0	1	0	0	609	PASS & MISC: HIT ANIMAL	CAPRICORN HWY
33	2002	March	Tuesday	9am	Medical treatment	2	2	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	BRUCE HWY
34	2002	May	Tuesday	6pm	Hospitalisation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
35	2002	June	Saturday	5am	Medical treatment	1	1	0	0	0	0	0	0	0	0	0	0	0	0	702	OFF PATH-STRAIGHT: RIGHT OFF CWAY	CAPRICORN HWY
36	2002	June	Thursday	2pm	Medical treatment	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
37	2002	June	Tuesday	3pm	Hospitalisation	2	1	0	0	0	0	1	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
38	2002	August	Wednesday	4pm	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	400	VEH'S MANOEUVRING: OTHER	CAPRICORN HWY
39	2002	October	Saturday	Midnight	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
40	2002	November	Friday	1am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
41	2002	November	Monday	5pm	Property damage	2	0	2	0	0	0	0	0	0	0	0	0	0	0	506	VEH'S OVERTAKING: OVERTAKE-RIGHT TURN	CAPRICORN HWY
42	2002	November	Thursday	Noon	Hospitalisation	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
43	2002	December	Thursday	6am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
44	2003	March	Tuesday	5am	Hospitalisation	2	1	0	0	0	0	1	0	0	0	0	0	0	0	308	VEH'S SAME DIRECTION: RIGHT TURN S/SWIPE	CAPRICORN HWY
45	2003	April	Friday	2pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	105	VEH'S ADJACENT APPROACH: RIGHT-RIGHT	CAPRICORN HWY
46	2003	April	Thursday	Midnight	Property damage	1	0	0	1	0	0	0	0	0	0	0	0	0	0	702	OFF PATH-STRAIGHT: RIGHT OFF CWAY	CAPRICORN HWY
47	2003	May	Friday	11am	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
48	2003	May	Thursday	2pm	Minor injury	1	1	0	0	0	0	0	0	0	0	0	0	0	0	700	OFF PATH-STRAIGHT: OTHER	CAPRICORN HWY
49	2003	June	Saturday	6am	Hospitalisation	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
50	2003	August	Friday	8pm	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
51	2003	August	Thursday	1pm	Minor injury	1	1	0	0	0	0	0	0	0	0	0	0	0	0	703	OFF PATH-STRAIGHT: LEFT OFF CWAY HIT OBJ	CAPRICORN HWY
52	2003	September	Sunday	10am	Property damage	2	1	0	0	0	0	0	1	0	0	0	0	0	0	305	VEH'S SAME DIRECTION: LANE SIDE SWIPE	CAPRICORN HWY
53	2003	September	Thursday	5pm	Hospitalisation	2	1	0	1	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
54	2003	September	Tuesday	5pm	Hospitalisation	3	2	0	0	0	1	0	0	0	0	0	0	0	0	501	VEH'S OVERTAKING: HEAD ON	CAPRICORN HWY
55	2004	January	Saturday	7pm	Hospitalisation	1	1	0	0	0	0	0	0	0	0	0	0	0	0	701	OFF PATH-STRAIGHT: LEFT OFF CWAY	CAPRICORN HWY
56	2004	January	Wednesday	3pm	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	800	OFF PATH-CURVE: OTHER	CAPRICORN HWY
57	2004	February	Wednesday	Midnight	Property damage	1	0	1	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
58	2004	March	Friday	4pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
59	2004	March	Sunday	5am	Fatal	2	1	0	0	0	0	0	0	0	0	1	0	0	0	6	PED'N: HIT FACING TRAFFIC	CAPRICORN HWY
60	2004	March	Thursday	4am	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	703	OFF PATH-STRAIGHT: LEFT OFF CWAY HIT OBJ	CAPRICORN HWY
61	2004	April	Monday	5pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
62	2004	April	Thursday	8am	Medical treatment	1	1	0	0	0	0	0	0	0	0	0	0	0	0	800	OFF PATH-CURVE: OTHER	CAPRICORN HWY
63	2004	July	Thursday	5pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	BRUCE HWY
64	2004	August	Thursday	7am	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
65	2004	August	Tuesday	10pm	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	801	OFF PATH-CURVE: OFF CWAY RIGHT BEND	BRUCE HWY
66	2004	September	Thursday	1pm	Property damage	2	2	0	0	0	0	0	0	0	0	0	0	0	0	301	VEH'S SAME DIRECTION: REAR END	CAPRICORN HWY
67	2004	September	Tuesday	3pm	Property damage	1	1	0	0	0	0	0	0	0	0	0	0	0	0	703	OFF PATH-STRAIGHT: LEFT OFF CWAY HIT OBJ	CAPRICORN HWY
68	2004	September	Wednesday	5pm	Hospitalisation	1	1	0	0	0	0	0	0	0	0	0	0	0	0	708	OFF PATH-STRAIGHT: MOUNTS TRAFFIC ISLAND	BRUCE HWY
69	2004	October	Sunday	4am	Property damage	2	1	0	0	1	0	0	0	0	0	0	0	0	0	608	VEH'S ON PATH: ACCIDENT OR BROKEN DOWN	CAPRICORN HWY
70	2004	November	Friday	3pm	Minor injury	2	2	0	0	0	0	0	0	0	0	0	0	0	0	104	VEH'S ADJACENT APPROACH: THRU-RIGHT	CAPRICORN HWY
71	2004	November	Thursday	2pm	Fatal	2	1	0	0	0	1	0	0	0	0	0	0	0	0	201	VEH'S OPPOSITE APPROACH: HEAD ON	CAPRICORN HWY

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Record	Intersecting street	Dist	Unit	Dir		Landmark	Area
1	Mclaughlin St		M				GRACEMERE
2	Gavial - Gracemere Rd		M				GRACEMERE
3	Capricorn Hwy		M				ROCKHAMPTON
4	O'Shanesy St		M				GRACEMERE
5		100	M	East	of	SALEYARDS ROAD	GRACEMERE
6		100	M	West	of	HALL ROAD (2 KM W GRACEMERE)	GRACEMERE
7	Somerset Rd		M				KABRA
8	Malchi Nine Mile Rd		M				GRACEMERE
9	Capricorn Hwy		M				ROCKHAMPTON
10	Capricorn Hwy		M				ROCKHAMPTON
11		200	M	North	of	BUCHOLZ ROAD	KABRA
12	Mclaughlin St		M				GRACEMERE
13	Malchi Nine Mile Rd		M				GRACEMERE
14	Capricorn Hwy		M				ROCKHAMPTON
15		20	M	West	of	NELSON ST	GRACEMERE
16		40	M	East	of	KABRA-SCRUBBY CREEK ROAD	KABRA
17		500	M	West	of	BRUCE HWY ROUNDABOUT	ROCKHAMPTON
18	Old Capricorn Hwy		M				GRACEMERE
19		1.5	KM	West	of	BRUCE HWY	ROCKHAMPTON
20	Capricorn Hwy		M				ROCKHAMPTON
21		1600	M	East	of	POWER STATION ROAD	STANWELL
22	Capricorn Hwy		M				ROCKHAMPTON
23	Capricorn Hwy		M				ROCKHAMPTON
24		1	KM	West	of	BRUCE HIGHWAY	ROCKHAMPTON
25		200	M	West	of	MCLAUGHLIN STREET	GRACEMERE
26		200	M	West	of	WIGGINGTON ROAD	KABRA
27	O'Shanesy St		M				GRACEMERE
28		15	M	West	of	BRUCE HWY	ROCKHAMPTON
29	Capricorn Hwy		M				ROCKHAMPTON
30	Gavial - Gracemere Rd		M				GRACEMERE
31	Malchi Nine Mile Rd		M				GRACEMERE
32		1	KM	West	of	YEPPEN ROUNDABOUT	ROCKHAMPTON
33	Capricorn Hwy		M				ROCKHAMPTON
34		2	KM	West	of	BRUCE HIGHWAY	GRACEMERE
35		100	M	North	of	MCLAUGHLIN STREET	GRACEMERE
36	Old Capricorn Hwy		M				GRACEMERE
37		60	M	West	of	MILSON STREET	GRACEMERE
38		2	KM	West	of	YEPPEN ROUNDABOUT	ROCKHAMPTON
39	Saleyards Rd		M				GRACEMERE
40	Capricorn Hwy		M				ROCKHAMPTON
41		40	M	West	of	POWER STATION RD	STANWELL
42	Capricorn Hwy		M				ROCKHAMPTON
43	Capricorn Hwy		M				ROCKHAMPTON
44	Mclaughlin St		M				GRACEMERE
45	Mclaughlin St		M				GRACEMERE
46		1	KM	East	of	WIGGINGTON STREET	KABRA
47	Gavial - Gracemere Rd		M				GRACEMERE
48		200	M	West	of	MALCHI-NINE MILE ROAD	KABRA
49	Old Capricorn Hwy		M				GRACEMERE
50	Capricorn Hwy		M				ROCKHAMPTON
51		400	M	East	of	OLD CAPRICORN HIGHWAY	GRACEMERE
52		30	M	East	of	ENTRANCE TO KABRA HOTEL	KABRA
53	Gavial - Gracemere Rd		M				GRACEMERE
54		100	M	West	of	HALL ROAD	GRACEMERE
55		200	M	South	of	OLD CAPRICORN HIGHWAY	GRACEMERE
56		20	M	South	of	FAIRYBOWER ROAD	GRACEMERE
57	Capricorn Hwy		M				ROCKHAMPTON
58		800	M	West	of	BRUCE HIGHWAY	GRACEMERE
59		1400	M	West	of	BRUCE HWY	GRACEMERE
60		0	M	West	of	524 PROPERTY NUMBER 524	GRACEMERE
61	O'Shanesy St						GRACEMERE
62		400	M	West	of	R/BOUT I/SECTION WITH BRUCE HWAY	GRACEMERE
63	Capricorn Hwy						ROCKHAMPTON
64	Gavial - Gracemere Rd						GRACEMERE
65	Capricorn Hwy						ROCKHAMPTON
66		200	M	North	of	MCLAGHLIN STREET	GRACEMERE
67		5	KM	West	of	GRACEMERE	GRACEMERE
68	Capricorn Hwy						ROCKHAMPTON
69		100	M	East	of	TURNER ROAD	GRACEMERE
70	Gavial - Gracemere Rd						GRACEMERE
71		300	M	East	of	NELSON ST	GRACEMERE

Appendix B

Volume Data

2006 Base Vehicle Counts

Assesment Year 2006

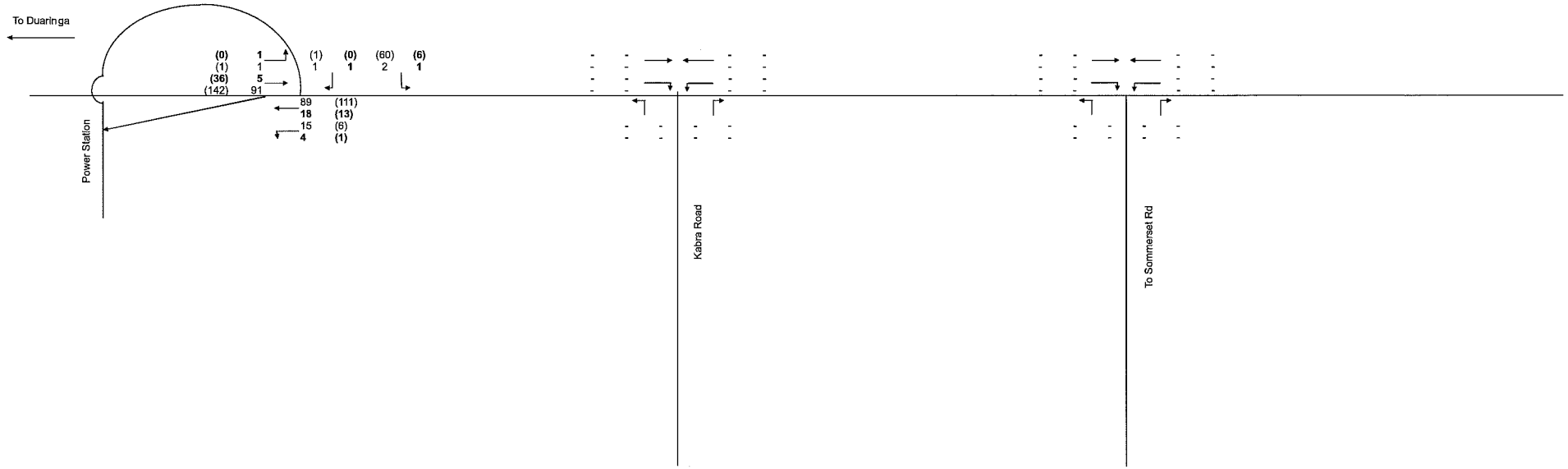
Growth

Capricorn Highway (E Stanwell)	6%
Capricorn Highway (W Stanwell)	3%
Bruce Highway	4%
Gracemere	5%

Legend

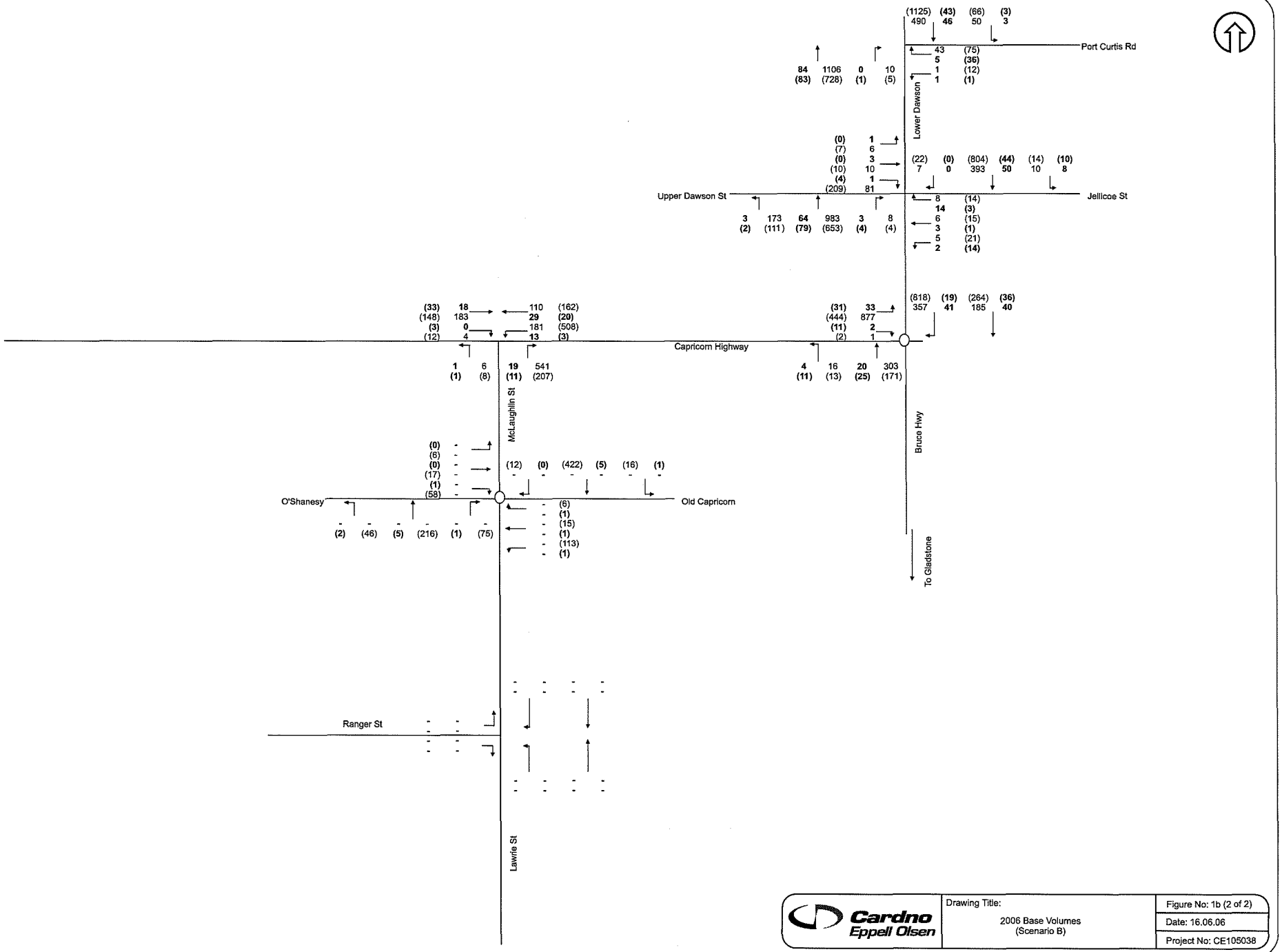
AM Heavy	AM Light
(PM Heavy)	(PM Light)

\- Denotes No Count Volume



Cardno Eppell Olsen	Drawing Title: 2006 Base Volumes (Scenario B)	Figure No: 1a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen	Drawing Title: 2006 Base Volumes (Scenario B)	Figure No: 1b (2 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

Scenario 1 + 2006 Base Counts

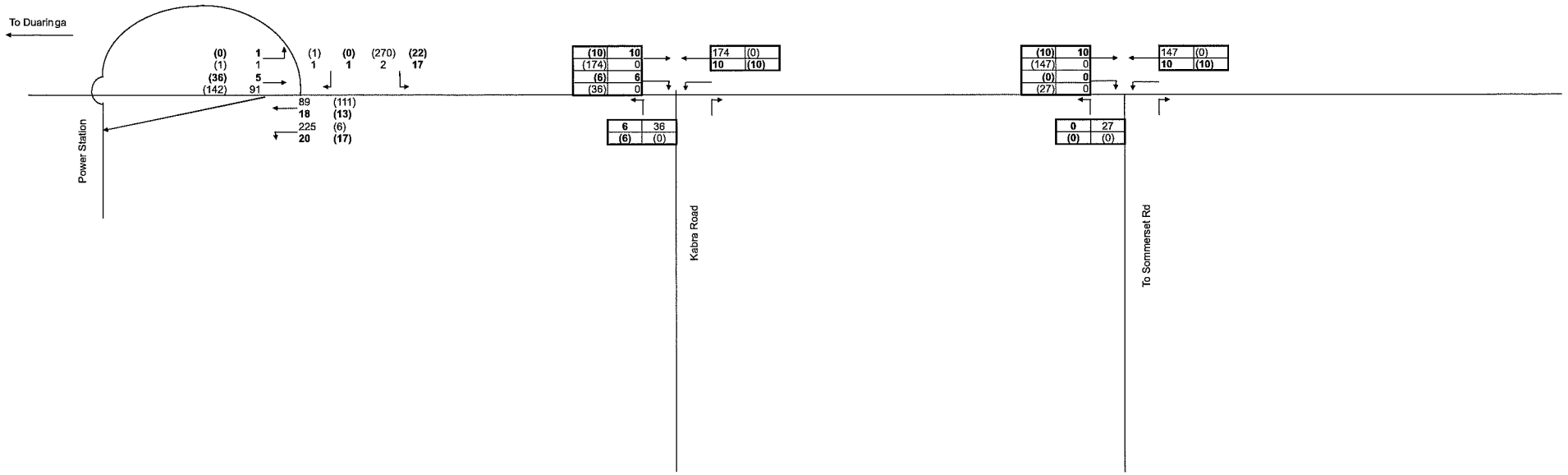
Legend

AM Heavy	AM Light
(PM Heavy)	(PM Light)

Note:

##	##
(##)	##

Denotes DEVELOPMENT VOLUMES ONLY
without background traffic



Cardno Eppell Olsen	Drawing Title: 2006 Base + Project Volumes (Scenario C)	Figure No: 2a (1 of 2)
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		Project No: CE105038

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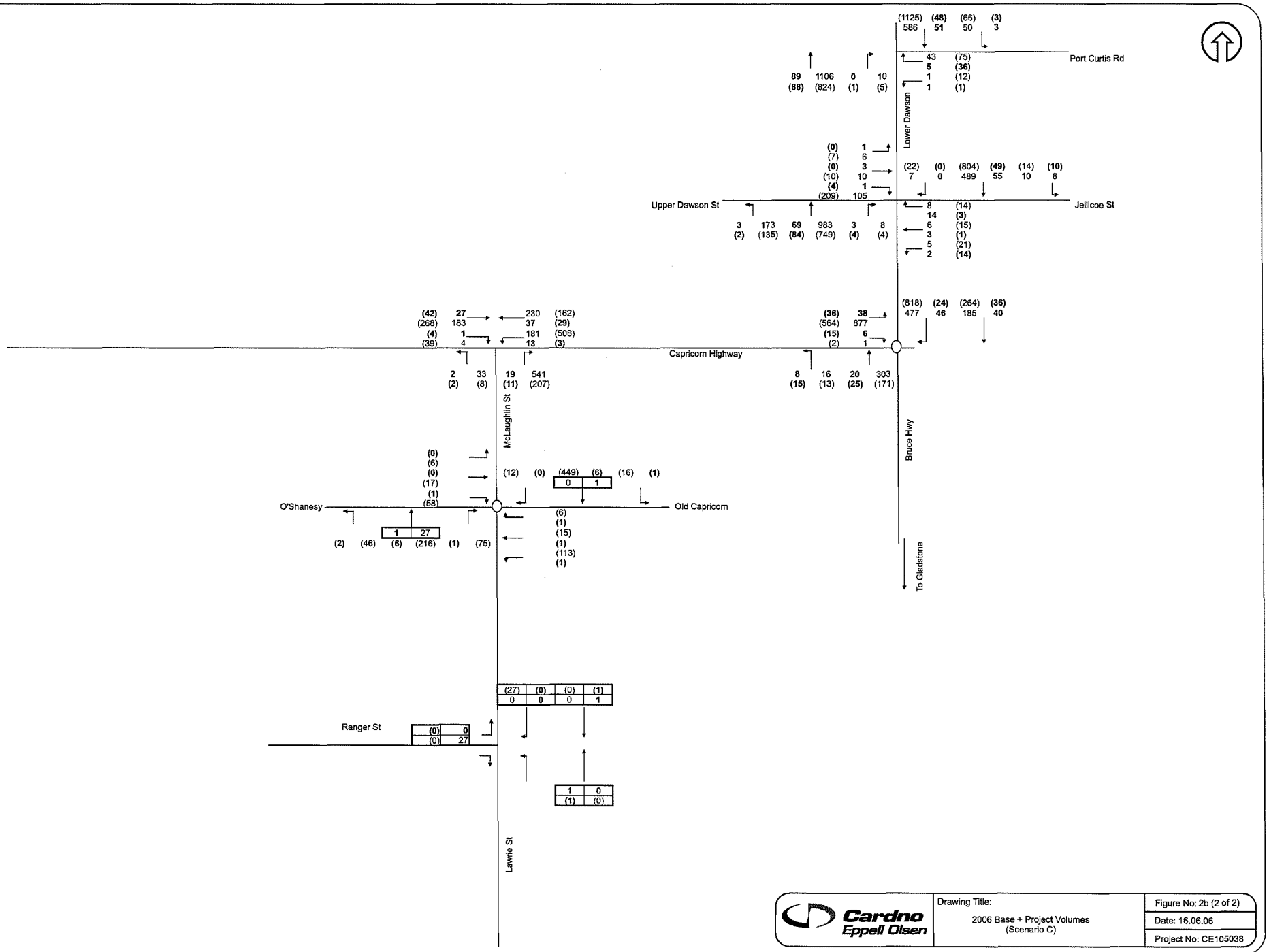


Cardno Eppell Olsen	Drawing Title: 2006 Base + Project Volumes (Scenario C)	Figure No: 2b (2 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

2008 Base Vehicle Counts

Assesment Year 2008

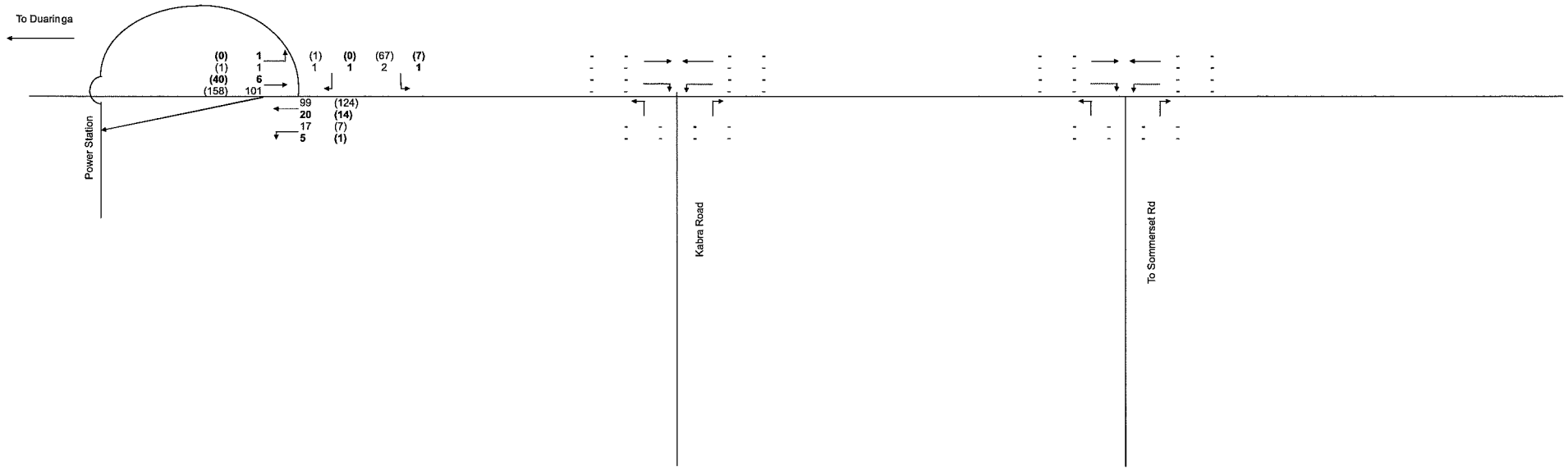
Growth

Capricorn Highway (E Stanwell)	6%
Capricorn Highway (W Stanwell)	3%
Bruce Highway	4%
Gracemere	5%

Legend

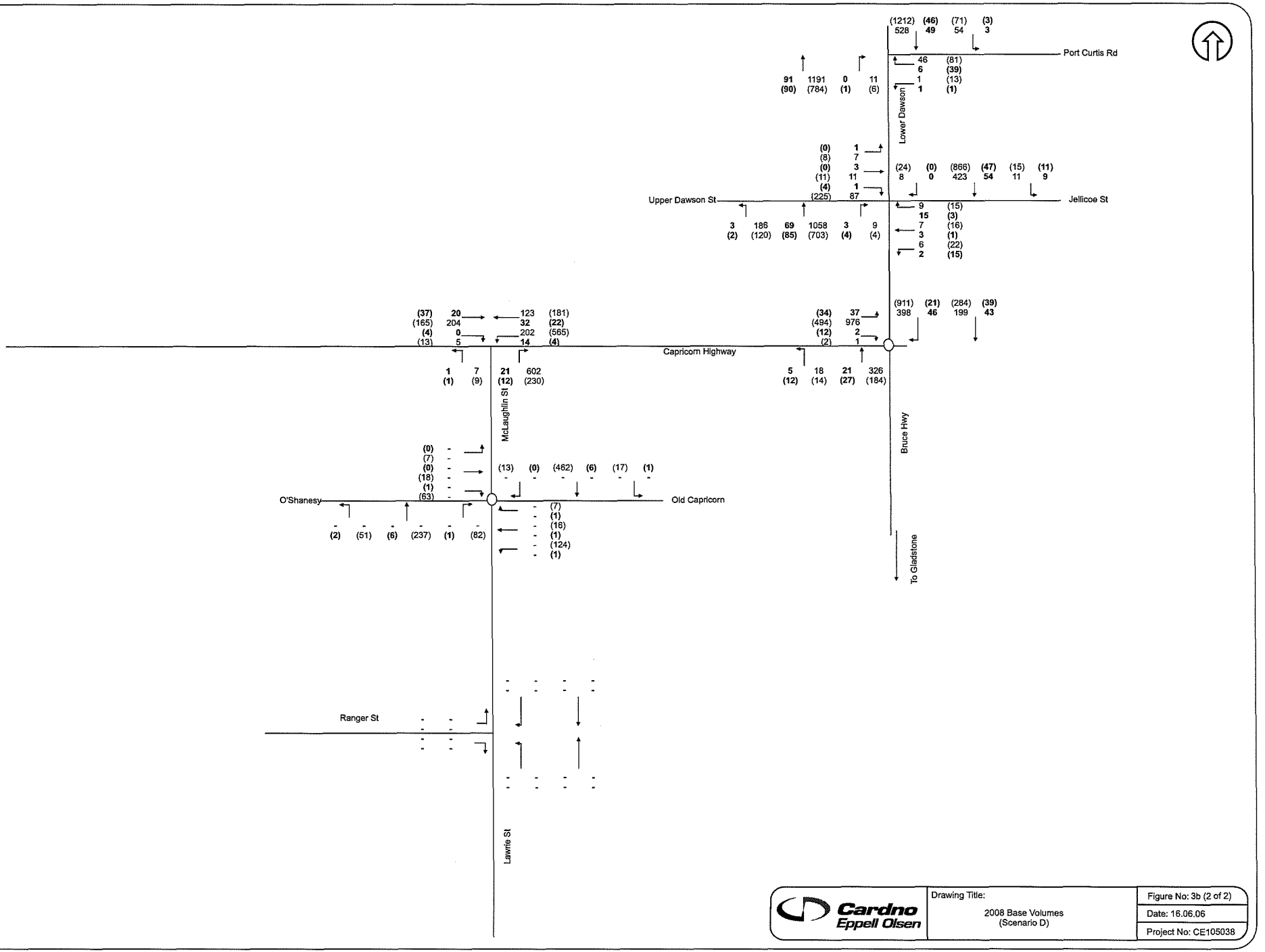
AM Heavy	AM Light
(PM Heavy)	(PM Light)

- Denotes No Count Volume



Cardno Eppell Olsen	Drawing Title: 2008 Base Volumes (Scenario D)	Figure No: 3a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen

Drawing Title:
2008 Base Volumes
(Scenario D)

Figure No: 3b (2 of 2)
Date: 16.06.06
Project No: CE105038

Scenario 2 + 2008 Base Counts

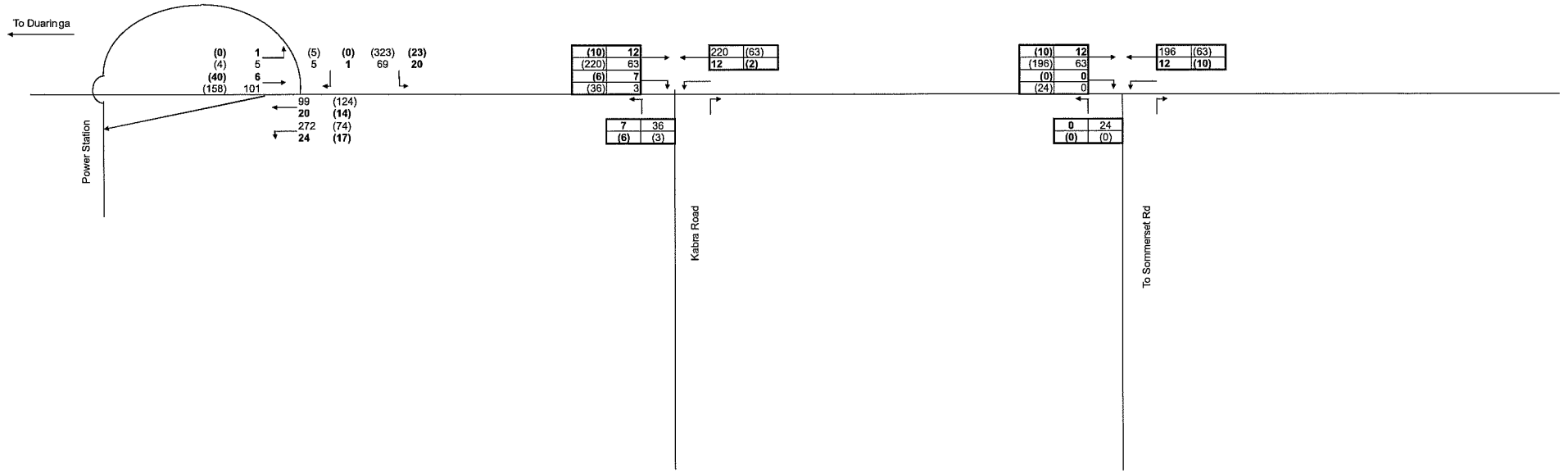
Legend

AM Heavy	AM Light
(PM Heavy)	(PM Light)

Note:

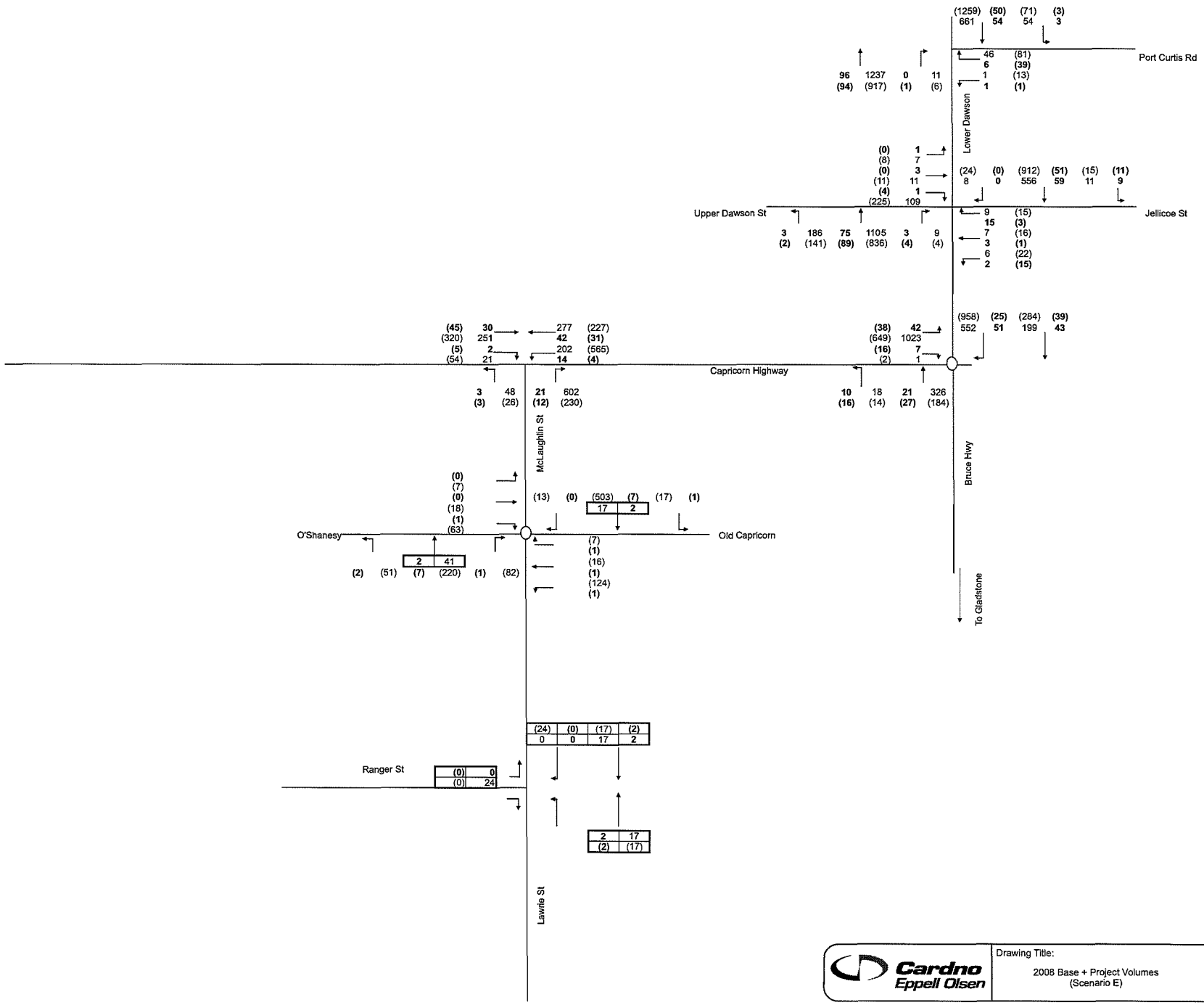
##	##
(##)	##

Denotes DEVELOPMENT VOLUMES ONLY
without background traffic



Cardno Eppell Olsen	Drawing Title: 2008 Base + Project Volumes (Scenario E)	Figure No: 4a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen

Drawing Title:
2008 Base + Project Volumes
(Scenario E)

Figure No: 4b (2 of 2)
Date: 16.06.06
Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

2010 Base Vehicle Counts

Assesment Year 2010

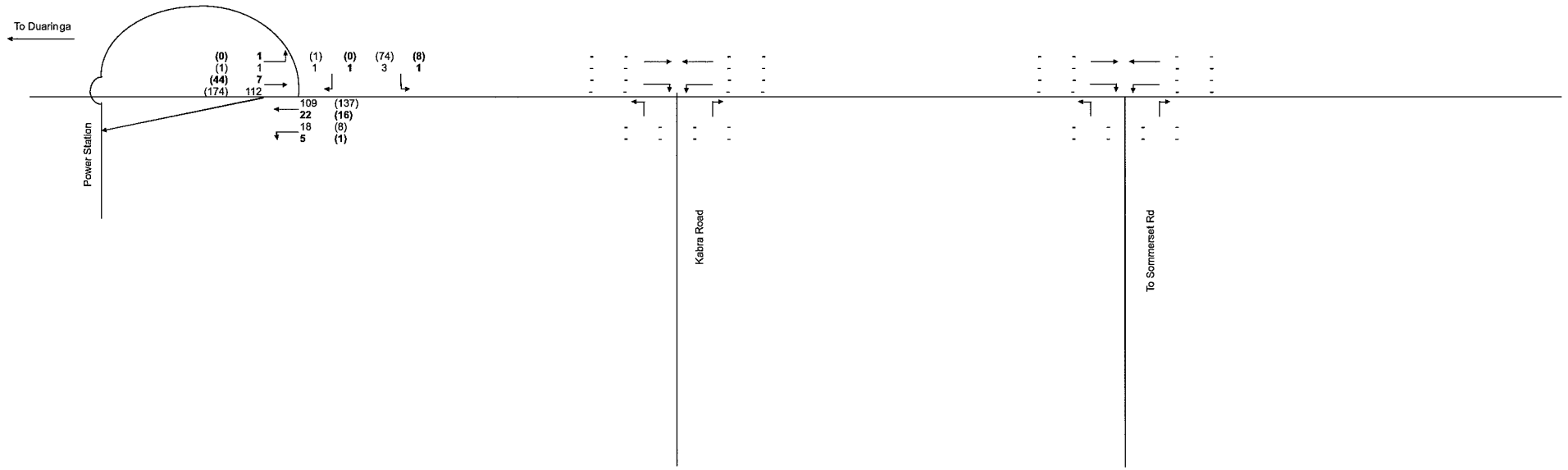
Growth

Capricorn Highway (E Stanwell)	6%
Capricorn Highway (W Stanwell)	3%
Bruce Highway	4%
Gracemere	5%

Legend

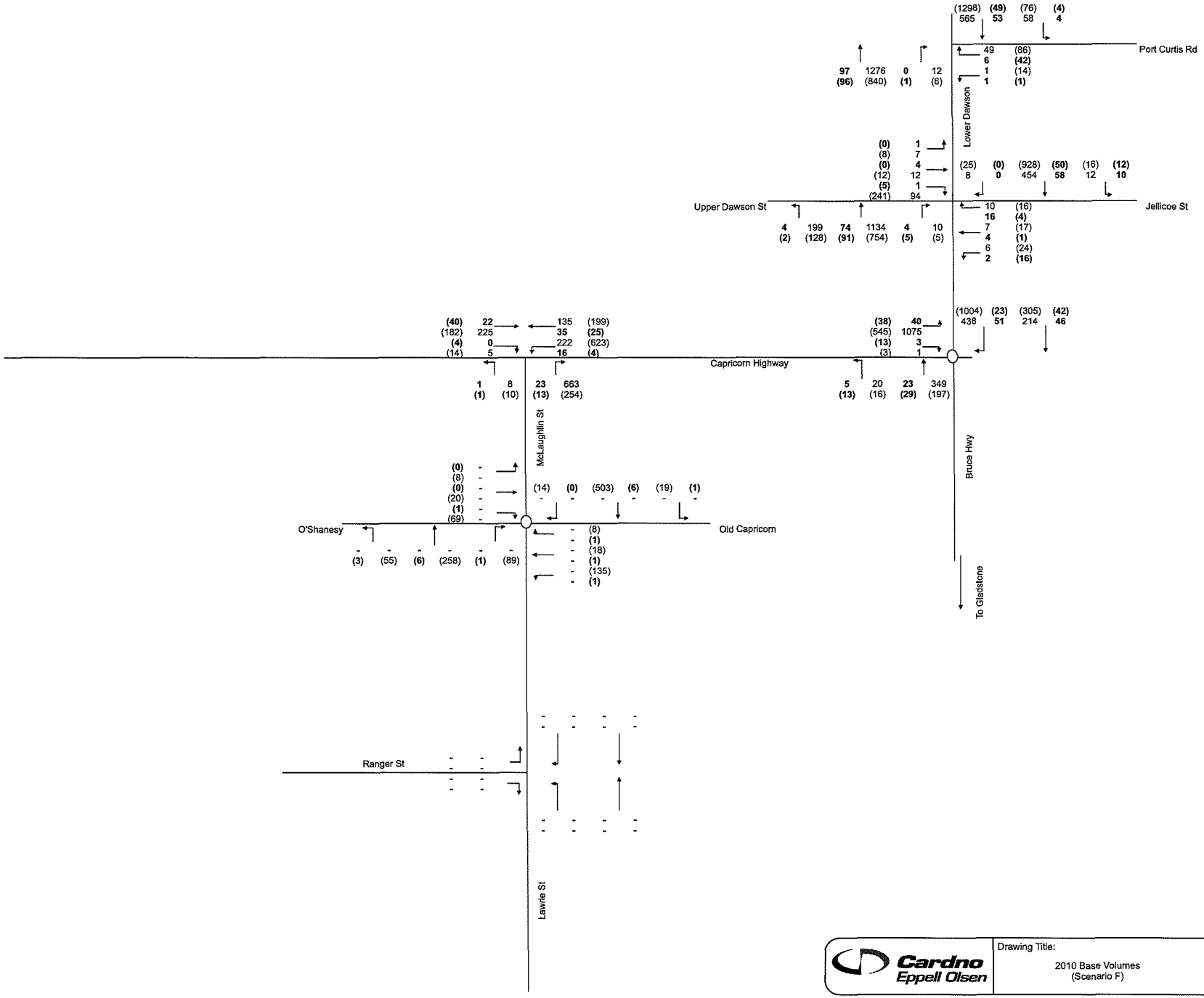
AM Heavy	AM Light
(PM Heavy)	(PM Light)

\- Denotes No Count Volume



Cardno Eppell Olsen	Drawing Title: 2010 Base Volumes (Scenario F)	Figure No: 5a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen

Drawing Title: 2010 Base Volumes (Scenario F)

Figure No: 5b (2 of 2)

Date: 16.06.06

Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

Scenario 3 + 2010 Base Counts

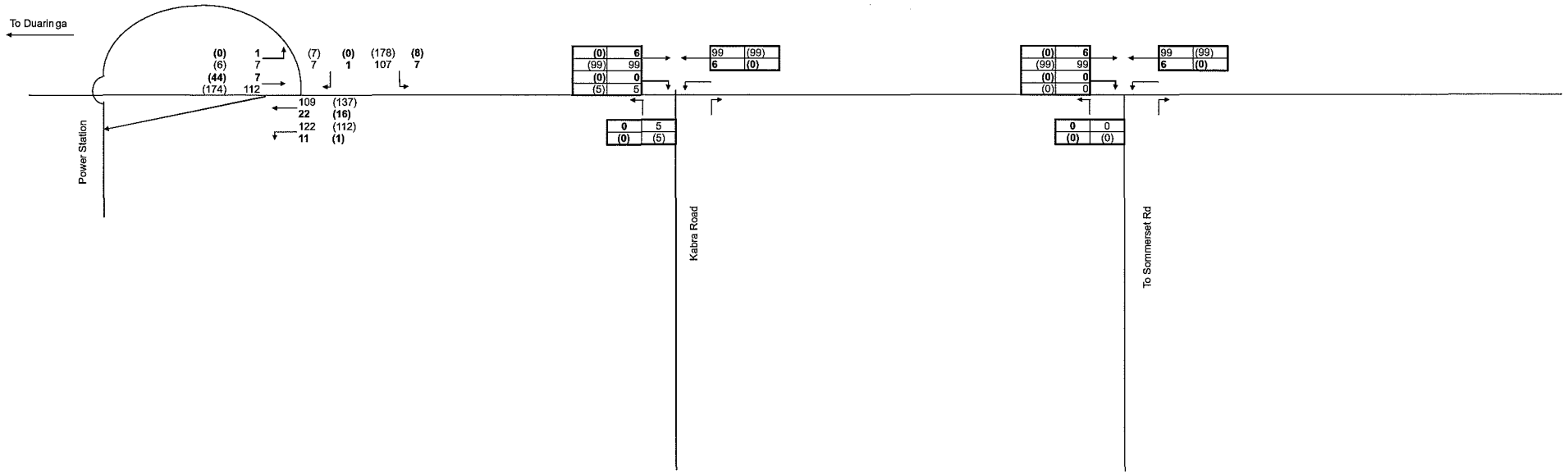
Legend

AM Heavy	AM Light
(PM Heavy)	(PM Light)

Note:

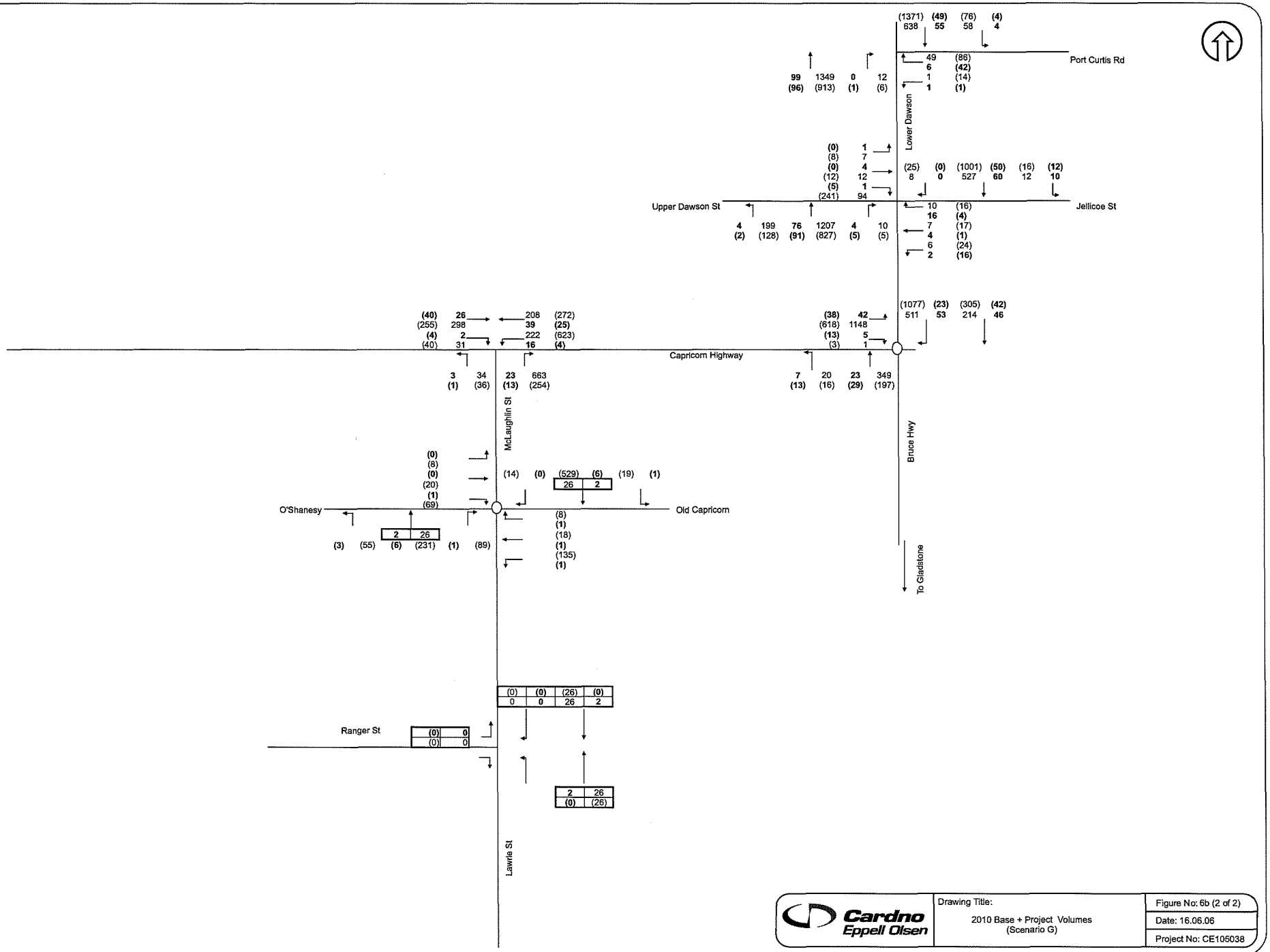
##	##
(##)	##

Denotes DEVELOPMENT VOLUMES ONLY
without background traffic



Cardno Eppell Olsen	Drawing Title: 2010 Base + Project Volumes (Scenario G)	Figure No: 6a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen	Drawing Title: 2010 Base + Project Volumes (Scenario G)	Figure No: 6b (2 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

2020 Base Vehicle Counts

Assesment Year 2020

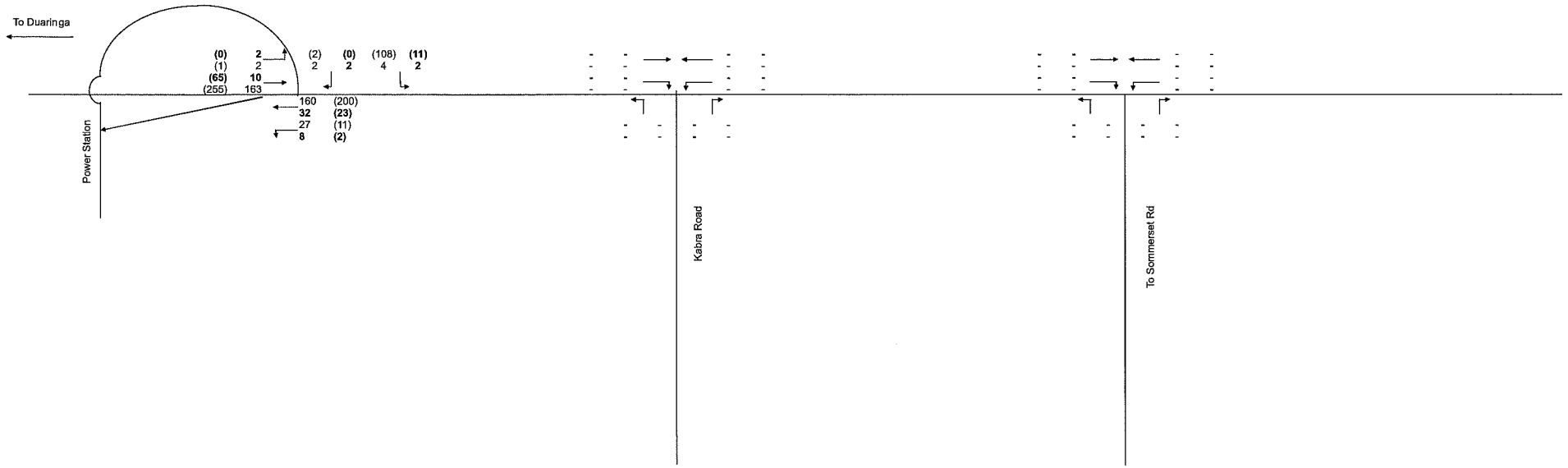
Growth

Capricorn Highway (E Stanwell)	6%
Capricorn Highway (W Stanwell)	3%
Bruce Highway	4%
Gracemere	5%

Legend

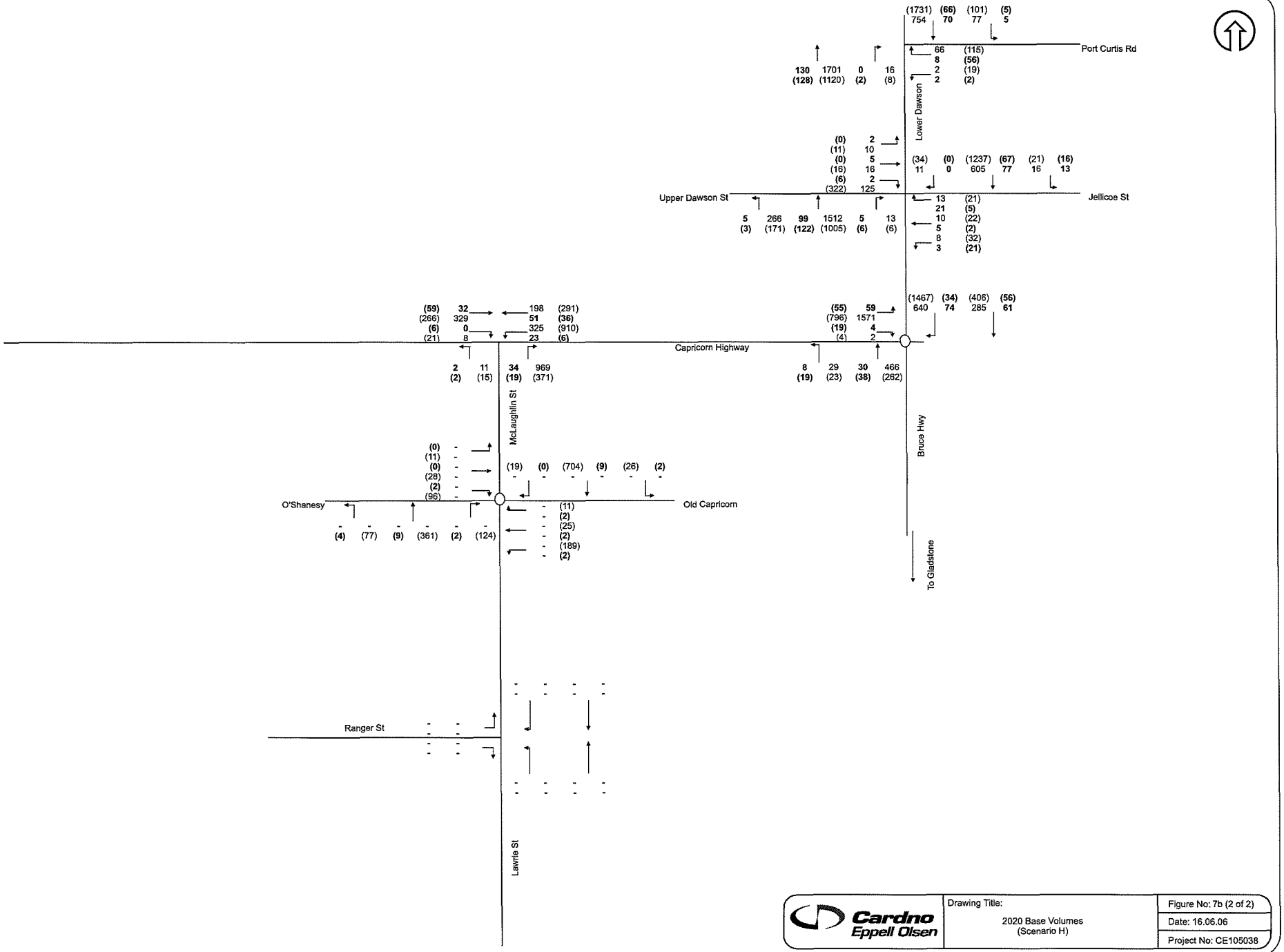
AM Heavy	AM Light
(PM Heavy)	(PM Light)

\- Denotes No Count Volume



Cardno Eppell Olsen	Drawing Title: 2020 Base Volumes (Scenario H)	Figure No: 7a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen	Drawing Title: 2020 Base Volumes (Scenario H)	Figure No: 7b (2 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

Scenario 3 + 2020 Base Counts

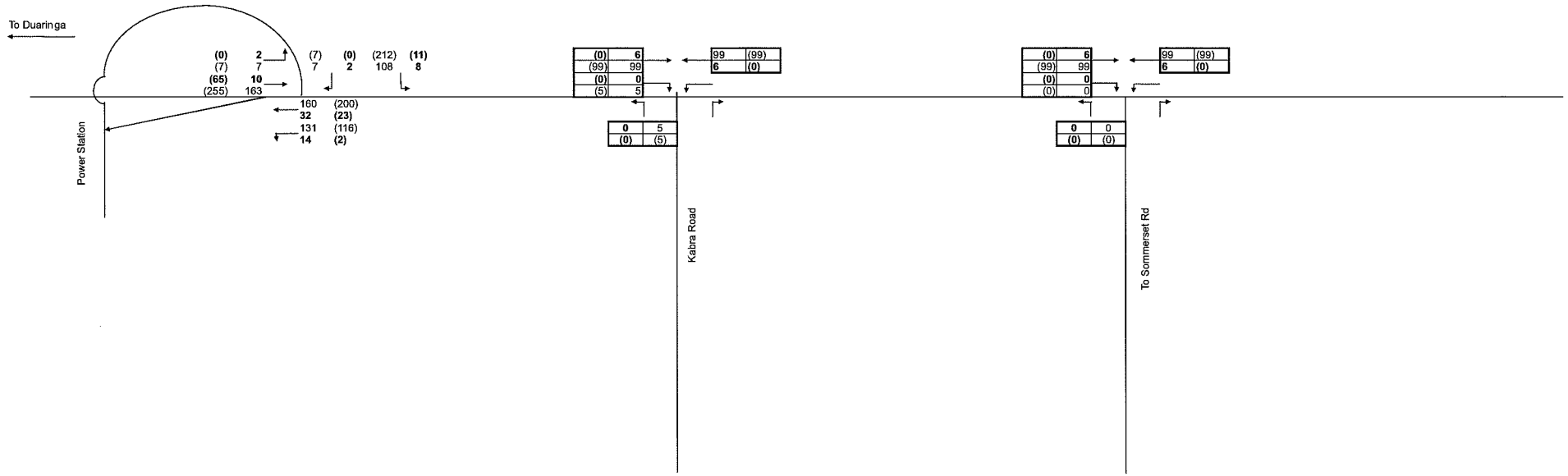
Legend

AM Heavy	AM Light
(PM Heavy)	(PM Light)

Note:

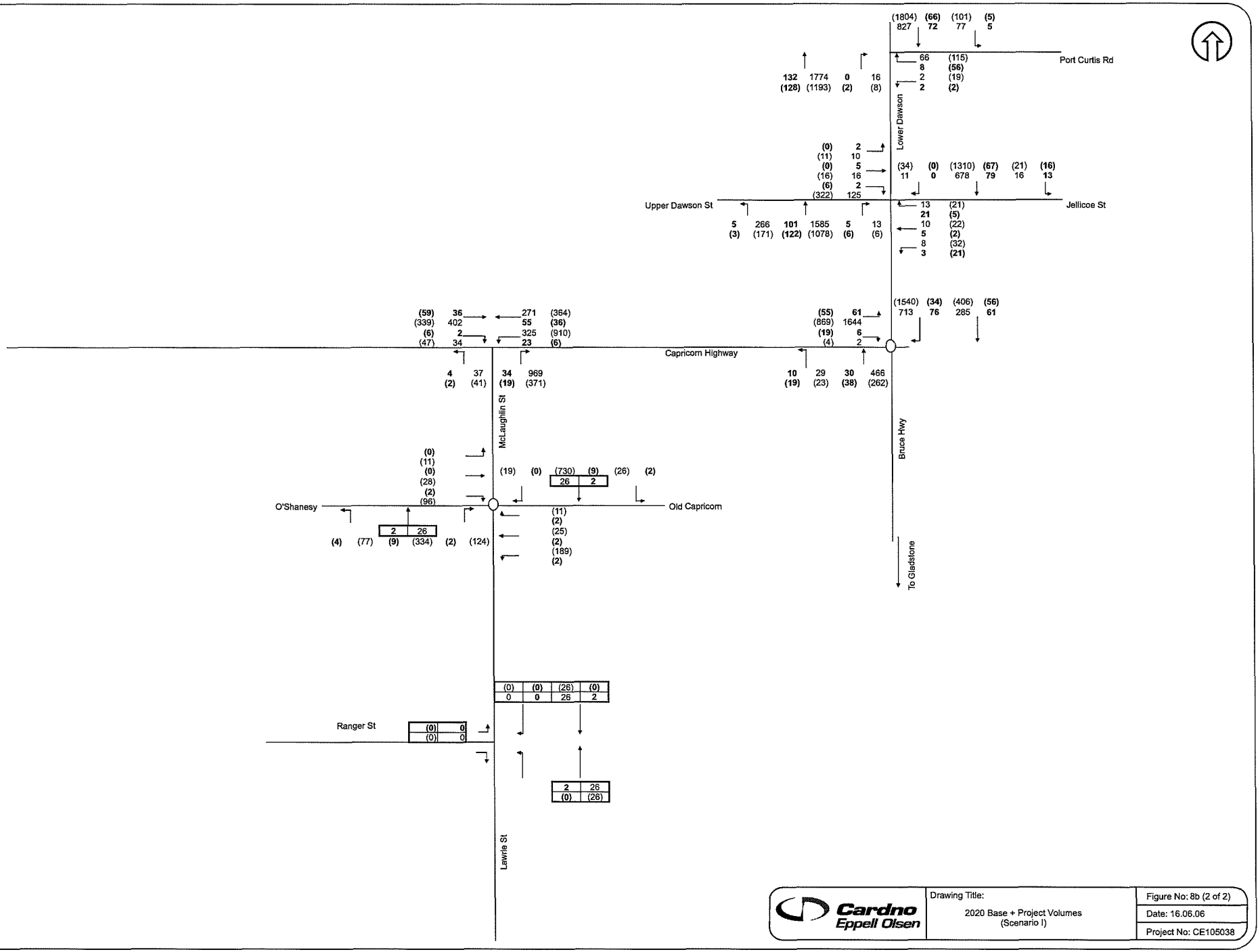
##	##
(##)	##

Denotes DEVELOPMENT VOLUMES ONLY
without background traffic



Cardno Eppell Olsen	Drawing Title: 2020 Base + Project Volumes (Scenario I)	Figure No: 8a (1 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr



Cardno Eppell Olsen	Drawing Title: 2020 Base + Project Volumes (Scenario I)	Figure No: 8b (2 of 2)
		Date: 16.06.06
		Project No: CE105038

G:\Folder_Server Location\Document Name.cdr

Appendix C

Pavement Impact

Cardno Eppell Olsen

ESA Weighting Calculations

Table 1

Project: *Queensland Coke and Power Plant Project*

Link	Section	Direction	Count Year	Total Volume (vpd)	Annual Growth	Base Year	Growth Type	Total Volume 2006 (vpd)	Classification									Equivalent Standard Axles (ESA)				ESA/Heavy Vehicle Ratio
									Light Vehicle %	Light Vehicle Volume	Truck/Bus %	Truck/Bus Volume	Articulated %	Articulated Volume	B-Double %	B-Double Volume	TOTAL HEAVY	*Truck/Bus*	*Articulated*	*B-Double*	*TOTAL ESAs*	
1 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Northbound (G)	2003	8,278	4.00%	2006	Linear	9,271	89.50%	8,298	5.43%	503	3.85%	357	1.22%	113	973	*1,137*	*1,145*	*394*	*2,676*	2.75
2 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Southbound (A)	2003	7,631	4.00%	2006	Linear	8,547	89.06%	7,612	5.59%	478	4.02%	344	1.33%	114	935	*1,079*	*1,102*	*396*	*2,577*	2.76
3 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	2004	3,252	1.00%	2006	Linear	3,317	84.11%	2,790	5.26%	174	7.04%	234	3.59%	119	527	*394*	*749*	*415*	*1,558*	2.96
4 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Southbound (A)	2004	3,252	1.00%	2006	Linear	3,317	84.11%	2,790	5.26%	174	7.04%	234	3.59%	119	527	*394*	*749*	*415*	*1,558*	2.96
5 Capricorn Highway (16A)	Bruce Highway to Gracemere	Westbound (G)	2003	5,498	6.00%	2006	Linear	6,488	91.70%	5,949	4.70%	305	2.48%	161	1.12%	73	538	*688*	*516*	*253*	*1,458*	2.71
6 Capricorn Highway (16A)	Bruce Highway to Gracemere	Eastbound (A)	2003	5,471	6.00%	2006	Linear	6,456	91.81%	5,927	4.72%	305	2.35%	152	1.12%	72	529	*688*	*487*	*252*	*1,426*	2.70
7 Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	2003	1,789	6.00%	2006	Linear	2,111	85.33%	1,801	6.70%	141	5.05%	107	2.92%	62	310	*319*	*342*	*215*	*876*	2.83
8 Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	2003	1,797	6.00%	2006	Linear	2,120	85.46%	1,812	6.93%	147	4.66%	99	2.95%	63	308	*332*	*317*	*218*	*867*	2.81
9 Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	2003	1,583	6.00%	2006	Linear	1,868	83.26%	1,555	7.18%	134	5.95%	111	3.61%	67	313	*303*	*357*	*235*	*894*	2.86
10 Capricorn Highway (16A)	Kabra to Power Station Road	Eastbound (A)	2003	1,554	6.00%	2006	Linear	1,834	83.46%	1,530	7.12%	131	5.61%	103	3.81%	70	303	*295*	*330*	*243*	*868*	2.86
11 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Northbound (G)	2003	4,463	5.00%	2006	Linear	5,132	95.98%	4,926	3.36%	172	0.64%	33	0.02%	1	206	*389*	*105*	*4*	*498*	2.42
12 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Southbound (A)	2003	4,364	5.00%	2006	Linear	5,019	95.84%	4,810	3.46%	174	0.66%	33	0.04%	2	209	*392*	*106*	*7*	*505*	2.42
13 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Northbound (G)	2003	1,985	5.00%	2006	Linear	2,283	96.00%	2,191	3.18%	73	0.77%	18	0.05%	1	91	*164*	*56*	*4*	*224*	2.46
14 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Southbound (A)	2003	1,937	5.00%	2006	Linear	2,228	96.18%	2,142	3.21%	72	0.57%	13	0.04%	1	85	*161*	*41*	*3*	*205*	2.41
15								0		0		0		0		0	0	*0*	*0*	*0*	*0*	0.00
Average ESA/Heavy Vehicle Ratio																						**2.71**

Average ESA Weightings	Loaded	Unloaded	Average
Truck/Bus Class			
Two Axle Truck (Single Unit)	3.000	0.965	
Three Axle Truck (Single Unit)	3.700	0.499	
Four Axle Truck (Single Unit)	4.400	0.982	
Average	3.700	0.815	2.258
Articulated Class			
Five Axle Semi Trailer	5.900	0.517	3.208
B-Double Class			
Nine Axle B-Double	6.400	0.564	3.482

Notes:

1 *The AADT and Vehicle classification percentages have been obtained from TARS for the appropriate links*

Cardno Eppell Olsen

Pavement Assessment Scoping ***Table 2a***

Project: *Queensland Coke and Power Plant Project*

Scenario: *Scenario 1*

	Road	Section	Direction	Existing Daily Volume 2006		ESA Factor (No. of ESAs per Heavy Vehicle)	Existing Annual ESA Load (No Development)	Two Axle Trucks (Loaded)		Two Axle Truck (Unloaded)		Three Axle Truck (Loaded)		Three Axle Truck (unloaded)		Four Axle Truck (Loaded)		Four Axle Truck (Unloaded)		Five Axle Articulated Vehicle (Loaded)		Five Axle Articulated Vehicle (Unloaded)		Nine Axle B-Double (Loaded)		Percentage Change
				Total	Heavy			Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	
1	Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Northbound (G)	9,271	(973)	2.75	976,605	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.9%
2	Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Southbound (A)	8,547	(935)	2.76	940,506	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(852)	6.40	1.5%
3	Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(3710)	6.40	4.2%
4	Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Southbound (A)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.4%
5	Capricorn Highway (16A)	Bruce Highway to Gracemere	Westbound (G)	6,488	(538)	2.71	532,025	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(4562)	6.40	7.1%
6	Capricorn Highway (16A)	Bruce Highway to Gracemere	Eastbound (A)	6,456	(529)	2.70	520,648	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	2.2%
7	Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	2,111	(310)	2.83	319,733	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(7177)	6.40	17.1%
8	Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	2,120	(308)	2.81	316,306	(0)	3.00	(0)	0.96	(2080)	3.70	(2080)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	4.0%
9	Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	1,868	(313)	2.86	326,373	(0)	3.00	(0)	0.96	(5200)	3.70	(5200)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(7177)	6.40	20.8%
10	Capricorn Highway (16A)	Kabra to Power Station Road	Eastbound (A)	1,834	(303)	2.86	316,847	(0)	3.00	(0)	0.96	(5200)	3.70	(5200)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(260)	6.40	8.7%
11	Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Northbound (G)	5,132	(206)	2.42	181,875	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(2615)	6.40	9.2%
12	Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Southbound (A)	5,019	(209)	2.42	184,428	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.8%
13	Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Northbound (G)	2,283	(91)	2.46	81,852	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(2615)	6.40	20.4%
14	Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Southbound (A)	2,228	(85)	2.41	74,923	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	2.0%
15	0	0		0	(0)	0.00	0	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.0%

Notes:

1 All three axle trucks represent the buses used for the transportation of personnel to site.

2 All heavy vehciles travelling to site are assumed to be B-Doubles.

Cardno Eppell Olsen

Pavement Assessment Scoping ***Table 2b***

Project: *Queensland Coke and Power Plant Project*

Scenario: *Scenario 2*

Road	Section	Direction	Existing Daily Volume 2006		ESA Factor (No. of ESAs per Heavy Vehicle)	Existing Annual ESA Load (No Development)	Two Axle Trucks (Loaded)		Two Axle Truck (Unloaded)		Three Axle Truck (Loaded)		Three Axle Truck (unloaded)		Four Axle Truck (Loaded)		Four Axle Truck (Unloaded)		Five Axle Articulated Vehicle (Loaded)		Five Axle Articulated Vehicle (Unloaded)		Nine Axle B Double (Loaded)		Percentage Change
			Total	Heavy			Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	
1 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Northbound (G)	9,271	(973)	2.75	976,605	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.7%
2 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Southbound (A)	8,547	(935)	2.76	940,506	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(3590)	6.40	2.9%
3 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(6412)	6.40	7.2%
4 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Southbound (A)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.6%
5 Capricorn Highway (16A)	Bruce Highway to Gracemere	Westbound (G)	6,488	(538)	2.71	532,025	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(9952)	6.40	12.8%
6 Capricorn Highway (16A)	Bruce Highway to Gracemere	Eastbound (A)	6,456	(529)	2.70	520,648	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	1.9%
7 Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	2,111	(310)	2.83	319,733	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(14188)	6.40	29.8%
8 Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	2,120	(308)	2.81	316,306	(0)	3.00	(0)	0.96	(1040)	3.70	(1040)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	3.9%
9 Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	1,868	(313)	2.86	326,373	(0)	3.00	(0)	0.96	(4115)	3.70	(4115)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(14188)	6.40	33.2%
10 Capricorn Highway (16A)	Kabra to Power Station Road	Eastbound (A)	1,834	(303)	2.86	316,847	(0)	3.00	(0)	0.96	(4115)	3.70	(4115)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	9.0%
11 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Northbound (G)	5,132	(206)	2.42	181,875	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(4237)	6.40	14.9%
12 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Southbound (A)	5,019	(209)	2.42	184,428	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	1.3%
13 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Northbound (G)	2,283	(91)	2.46	81,852	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(4237)	6.40	33.1%
14 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Southbound (A)	2,228	(85)	2.41	74,923	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	3.2%
15 0	0		0	(0)	0.00	0	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.0%

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Pavement Assessment Scoping ***Table 2c***

Project: *Queensland Coke and Power Plant Project*

Scenario: *Scenario 3*

Road	Section	Direction	Existing Daily Volume 2006		ESA Factor (No. of ESAs per Heavy Vehicle)	Existing Annual ESA Load (No Development)	Two Axle Trucks (Loaded)		Two Axle Truck (Unloaded)		Three Axle Truck (Loaded)		Three Axle Truck (unloaded)		Four Axle Truck (Loaded)		Four Axle Truck (Unloaded)		Five Axle Articulated Vehicle (Loaded)		Five Axle Articulated Vehicle (Unloaded)		Nine Axle B-Double (Loaded)		Percentage Change
			Total	Heavy			Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	Volume	ESA	
1 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Northbound (G)	9,271	(973)	2.75	976,605	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.0%
2 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Southbound (A)	8,547	(935)	2.76	940,506	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	0.4%
3 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	0.6%
4 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Southbound (A)	3,317	(527)	2.96	568,581	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.1%
5 Capricorn Highway (16A)	Bruce Highway to Gracemere	Westbound (G)	6,488	(538)	2.71	532,025	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(1040)	6.40	1.3%
6 Capricorn Highway (16A)	Bruce Highway to Gracemere	Eastbound (A)	6,456	(529)	2.70	520,648	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.1%
7 Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	2,111	(310)	2.83	319,733	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(1040)	6.40	2.2%
8 Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	2,120	(308)	2.81	316,306	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	1.2%
9 Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	1,868	(313)	2.86	326,373	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(1040)	6.40	2.1%
10 Capricorn Highway (16A)	Kabra to Power Station Road	Eastbound (A)	1,834	(303)	2.86	316,847	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	1.2%
11 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Northbound (G)	5,132	(206)	2.42	181,875	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.2%
12 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Southbound (A)	5,019	(209)	2.42	184,428	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	1.8%
13 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Northbound (G)	2,283	(91)	2.46	81,852	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.4%
14 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Southbound (A)	2,228	(85)	2.41	74,923	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(520)	6.40	4.4%
15 0	0		0	(0)	0.00	0	(0)	3.00	(0)	0.96	(0)	3.70	(0)	0.50	(0)	4.40	(0)	0.98	(0)	5.90	(0)	0.52	(0)	6.40	0.0%

Notes:

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Detailed Pavement Impact Assessment

Table 3

Project: Queensland Coke and Power Plant Project

Scenario: All Scenarios Combined

Road	Section	Direction	Length (KM)	% Growth Per Annum	Pavement Age (Years)	Existing Daily Volume (vpd)	Existing Heavy Vehicle Daily Volume (vpd)	Existing Annual ESA	Base Roughness	Base Year	Roughness Count Deficiency	Roughness Deterioration Rate	Rehabilitation Year (No Development)				ESA Breakpoint (No Development)	Breakpoint Year (With Development)	Bring Forward Time Period (Years)	Bring Forward (%)
													Roughness Deficiency	30 Year Life	Upgrade Trigger	Rehabilitation Year				
1 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Northbound (G)	2.78	4.00%	0.00	9,271	973	976,605	0.0	0	110.0	3.0	36.7	30.0	Rough	36.7	#N/A	#N/A	#N/A	#N/A
2 Lower Dawson Road (10E)	Port Curtis Road to Capricorn Highway	Southbound (A)	2.78	4.00%	0.00	8,547	935	940,506	0.0	0	110.0	3.0	36.7	30.0	Rough	36.7	#N/A	#N/A	#N/A	#N/A
3 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Northbound (G)	2.56	1.00%	20.40	3,317	527	568,581	57.4	2005	110.0	3.0	2022.6	2014.6	Rough	2022.6	10,838,288	2,021.6	1.00	2.2%
4 Bruce Highway (10E)	Capricorn Highway to Burnett Highway	Southbound (A)	2.56	1.00%	20.40	3,317	527	568,581	57.4	2005	110.0	3.0	2022.6	2014.6	Rough	2022.6	10,838,288	2,022.6	0.00	0.0%
5 Capricorn Highway (16A)	Bruce Highway to Gracemere	Westbound (G)	5.69	6.00%	18.80	6,488	538	532,025	75.2	2004	120.0	3.0	2019.0	2015.2	Rough	2019.0	10,353,199	2,018.1	0.90	2.2%
6 Capricorn Highway (16A)	Bruce Highway to Gracemere	Eastbound (A)	5.69	6.00%	18.80	6,456	529	520,648	75.2	2004	120.0	3.0	2019.0	2015.2	Rough	2019.0	10,131,806	2,018.9	0.10	0.2%
7 Capricorn Highway (16A)	Gracemere to Kabra	Westbound (G)	7.68	6.00%	20.20	2,111	310	319,733	51.1	2004	120.0	3.0	2027.0	2013.8	Rough	2027.0	10,743,035	2,023.6	3.40	5.7%
8 Capricorn Highway (16A)	Gracemere to Kabra	Eastbound (A)	7.68	6.00%	20.20	2,120	308	316,306	51.1	2004	120.0	3.0	2027.0	2013.8	Rough	2027.0	10,627,879	2,025.7	1.30	2.1%
9 Capricorn Highway (16A)	Kabra to Power Station Road	Westbound (G)	4.44	6.00%	28.00	1,868	313	326,373	71.3	2004	120.0	3.0	2020.3	2006.0	Rough	2020.3	7,137,768	2,018.0	2.30	5.5%
10 Capricorn Highway (16A)	Kabra to Power Station Road	Eastbound (A)	4.44	6.00%	28.00	1,834	303	316,847	71.3	2004	120.0	3.0	2020.3	2006.0	Rough	2020.3	6,929,440	2,019.6	0.70	1.6%
11 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Northbound (G)	1	5.00%	19.30	5,132	206	181,875	84.5	2004	120.0	3.0	2015.9	2014.7	Rough	2015.9	2,473,507	2,015.0	0.90	2.7%
12 Gavial Gracemere Road (450)	Capricorn Highway to Ranger Street	Southbound (A)	1	5.00%	19.30	5,019	209	184,428	84.5	2004	120.0	3.0	2015.9	2014.7	Rough	2015.9	2,508,215	2,015.9	0.00	0.0%
13 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Northbound (G)	0.4	5.00%	40.60	2,283	91	81,852	84.5	2004	120.0	3.0	2015.9	1993.4	Rough	2015.9	1,113,188	2,014.0	1.90	5.9%
14 Gavial Gracemere Road (450)	Ranger Street to Bland St and Conaghan St 'Rbt	Southbound (A)	0.4	5.00%	40.60	2,228	85	74,923	84.5	2004	120.0	3.0	2015.9	1993.4	Rough	2015.9	1,018,955	2,015.7	0.20	0.6%
15 0	0		0	0.00%	0.00	0	0	0	0.0	0	0.0	0.0	0.0	30.0	Rough	0.0	0	0.0	0.00	0.0%
TOTAL																				

Notes:

1. *Existing pavement age advised by DMR*
2. *Existing pavement roughness advised by DMR*
3. *Rehabilitation years calculated by determining the year at which the pavement roughness will reach the deficiency limit assuming a constant deterioration rate of 3 counts per annum or when the pavement reaches 30 years old.*
4. *ESA Breakpoint (No development) is the anticipated ESA loading at the time of rehabilitation assuming appropriate background traffic growth in ESAs for the life of the pavement.*
5. *The Rehabilitation year with development identifies the year at which the ESA breakpoint (no development) is reached with the additional ESA loading generated by the development*
6. *Bring forward percentage is the difference in net present value percentage between the 2 rehabilitation years identified (with and without development)*

Appendix D

Assumption Tables

Scenario 1 - Construct Stage 1 Coke, Construct Operational Materials Handling (2 Years)

Construction Personnel

peak staff	for ? Weeks only	1650
peak staff	on average	1200
therefore assumed peak staff for analysis		1200

start/finish times staggered over 2 hour period
therefore half the staff travel in the peak one hour
assume this peak coincides with road peak - conservative

			bus	Car
from Rockhampton	residents	40%	40%	60%
from Gracemere	camp	60%	70%	30%
			45 people per bus	2 people per car

for car travel from Gracemere assume	30%	use Gavial-Gracemere Road to Capricorn Hwy
	30%	use Somerset Road intersection highway access
	40%	use Kabra Road to access highway

Rockhampton Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	120	120 in	0 out	0 in	120 out
Buses	8	4 in	4 out	4 in	4 out

Gracemere Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	90	90 in	0 out	0 in	90 out
Buses	12	6 in	6 out	6 in	6 out

Stage 1 Coke Plant - Construction - Materials Input
all vehicles are B Double - 35t payload

reinforced concrete		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
aggregate	30000 cu.m (assumed)	0%	100%	0%	1373
cement	15000 cu.m (assumed)	50%	0%	50%	645
reinforcing steel	5000 cu.m (assumed)	50%	0%	50%	1121
refractory bricks	200,000t	0%	0%	100%	5714
structural steel	30,000t	50%	0%	50%	857
conveyor units assume 4 x 15m units (60m) per truck	5,000m	50%	0%	50%	83
cabling assume 30000m per truck	300,000m	50%	0%	50%	10

For the Stage 1 Coke Plant construction, under prior agreement an average of 250 vehicles per week travelling to the site was adopted. The figure of 250 vehicles per week is used to derive the peak hour volumes for intersection capacity analysis. This will be distributed to the network in the same proportions as what will have occurred at the end of the construction of the Stage 1 Coke plant. The assumptions to the left (regarding weight and mass) are used for pavement impact assessment.

Operational Materials Handling Equipment - Construction - Materials Input
all vehicles are B Double - 35t payload
"Trucks" refers to number of trucks travelling to site (i.e. does not include return trip)

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
aggregate	65% of 550 trucks	0%	100%	0%	358
cement	35% of 550 trucks	50%	0%	50%	193
structural steel product	175 trucks	50%	0%	50%	175
fabricated steel	75 trucks	50%	0%	50%	75
procured items	250 trucks	50%	0%	50%	250

For the Materials Handling facility construction, under prior agreement an average of 30 vehicles per week travelling to the site was adopted. The figure of 30 vehicles per week is used to derive the peak hour volumes for intersection capacity analysis. This will be distributed to the network in the same proportions as what will have occurred at the end of the construction of the Materials Handling facility plant. The assumptions to the left (regarding weight and mass) are used for pavement impact assessment.

Construction Waste Outputs
all vehicles are B Double - 35t payload

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
general construction waste	1 truck per day	0%	100%	0%	520

General Construction Inputs		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
General Fill	100000 t	0%	35%	0%	1750

Scenario 2 - Construct Stage 2 Coke, Construct up to 250MW power plant - Operate Stage 1 Coke

Construction Personnel

peak staff	for ? Weeks only	90% of 1650	same as stage 1 - except 10% less staff
peak staff	on average	90% of 1200	
therefore assumed peak staff for analysis		90% of 1200	
start/finish times staggered over 2 hour period			
therefore half the staff travel in the peak one hour			
assume this peak coincides with road peak - conservative			

			bus	Car
from Rockhampton	residents	40%	40%	60%
from Gracemere	camp	60%	70%	30%
			45 people per bus	2 people per car

for car travel from Gracemere assume	30%	use Gavial-Gracemere Road to Capricorn Hwy
	30%	use Somerset Road intersection highway access
	40%	use Kabra Road to access highway

Rockhampton Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	108	108 in	0 out	0 in	108 out
Buses	4	2 in	2 out	2 in	2 out

Gracemere Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	81	80 in	0 out	0 in	81 out
Buses	12	6 in	6 out	6 in	6 out

Stage 2 Coke Plant - Construction - Materials Input
all vehicles are B Double - 35t payload

reinforced concrete		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
aggregate	30000 cu.m (assumed)	0%	100%	0%	1373
cement	15000 cu.m (assumed)	50%	0%	50%	645
reinforcing steel	5000 cu.m (assumed)	50%	0%	50%	1121
refractory bricks	200,000t	0%	0%	100%	5714
structural steel	40,000t	50%	0%	50%	857
conveyor units assume 4 x 15m units (60m) per truck	2,500m	50%	0%	50%	83
cabling assume 30000m per truck	300,000m	50%	0%	50%	10

For the Stage 2 Coke Plant construction, an average of 250 vehicles per week travelling to site will be adopted. The figure of 250 vehicles per week is used to derive the peak hour volumes for intersection capacity analysis. This will be distributed to the network in the same proportions as what will have occurred at the end of the construction of the Stage 2 Coke plant. The assumptions to the left (regarding weight and mass) are used for pavement impact assessment.

Power Generation Plant - Construction - Materials Input
all vehicles are B Double - 35t payload
"Loads" refers to number of trucks travelling to site (i.e. does not include return trip)

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
plant and construction materials	4000 loads	50%	0%	50%	4000
sundry plant	2500 loads	50%	0%	50%	2500
operational supplies	1500 loads	50%	0%	50%	1500
aggregate	3600 loads (assumed)	0%	100%	0%	3600
cement	1800 loads (assumed)	50%	0%	50%	1800
reinforcing steel	600 loads (assumed)	50%	0%	50%	600
HRSG units assume 1 unit per truck	32 units	0%	0%	100%	32

For the Power Station construction, an average of 135 vehicles per week travelling to the site will be adopted. The figure of 135 vehicles per week is used to derive the peak hour volumes for intersection capacity analysis. This will be distributed to the network in the same proportions as what will have occurred at the end of the construction of the Power Station. The assumptions to the left (regarding weight and mass) are used for pavement impact assessment.

Construction Waste Outputs
all vehicles are B Double - 35t payload

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
general construction waste	2 trucks per day	0%	100%	0%	520

Stage 1 Coke Plant - Operational Personnel

operational staff required	80
assume all staff arrivals/departures coincide with road peak - conservative	
assume all via private vehicles - 1.2 people per car	
west of site (towards Duaringa)	5%
Mount Morgan (via Kabra)	5%
Rockhampton	65%
Gracemere	20%
Gladstone (via Gracemere)	5%

visitor trips assumed to be 5% of staff trips
all visitors assumed via Rockhampton - by car

Operations Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	134	67 in	67 out	67 in	67 out

Stage 1 Coke Plant - Operations - Inputs and Waste
minimal road traffic as all material via rail
nominal assumptions for assessment
all assumed in road peak hour
all vehicles are B Double - 35t payload

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
process related inputs	4vph (2 in, 2 out)	50%	0%	50%	1040
process related outputs	2vph (1 in, 1 out)	0%	100%	0%	520

General Construction Inputs		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
General Fill	100000 t	0%	35%	0%	1750

Cardno Eppell Olsen

June 2006 - Assumptions CE105038

Scenario 3 - Operate Stage 1 and 2 Coke, Operate Power Plant

Stage 1 & 2 Coke Plant & Power Plant - Operational Personnel

peak staff	125
assume all staff arrivals/departures coincide with road peak - conservative	
assume all via private vehicles - 1.2 people per car	
west of site (towards Duaringa)	5%
Mount Morgan (via Kabra)	5%
Rockhampton	65%
Gracemere	20%
Gladstone (via Gracemere)	5%

visitor trips assumed to be 5% of staff trips
all visitors assumed via Rockhampton - by car

Operations Volumes (Vehicles Per Hour)

	Hour Total	AM		PM	
Cars	208	104 in	104 out	104 in	104 out

Stage 1 & 2 Coke Plant & Power Plant - Operations - Inputs and Waste

minimal road traffic as all material via rail
nominal assumptions for assessment
all assumed in road peak hour
all vehicles are B Double - 35t payload

		Rockhampton	Gracemere	Gladstone (via Bruce Hwy)	Number of Trucks Adopted
process related inputs	8vph (4 in, 4 out)	50%	0%	50%	2080
process related outputs	4vph (2 in, 2 out)	0%	100%	0%	1040

URS Australia Pty Ltd
ABN 46 000 691 690
Level 14, 240 Queen Street
Brisbane, QLD 4000 Australia
GPO Box 302, Queensland 4001
Tel: 61 7 3243 2111 • Fax: 61 7 3243 2199

URS

QUEENSLAND
COKE &
ENERGY

STANWELL
CORPORATION LIMITED