Environmental Statement: Volume III

Appendix 7A: Transport Assessment

VPI Immingham OCGT Project

Document Ref: 6.4.5
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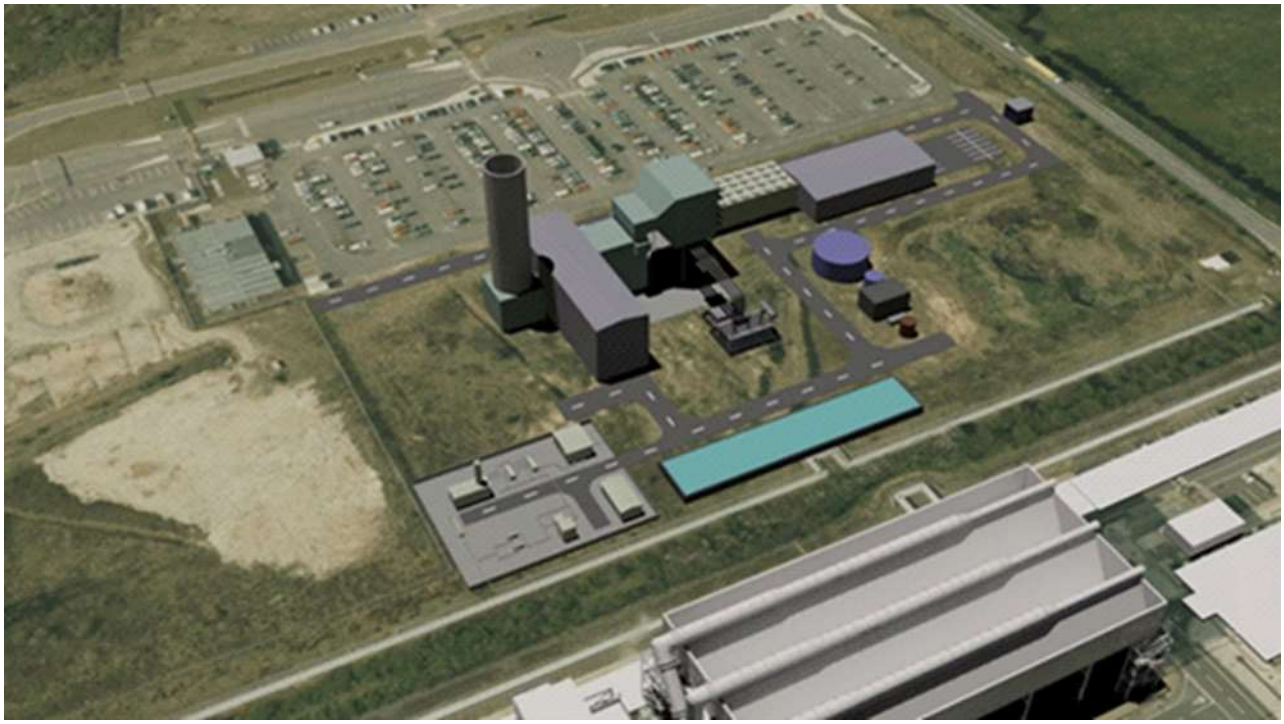
The Immingham Open Cycle Gas Turbine Order

Land to the north of and in the vicinity of the VPI Immingham Power Station, Rosper Road, South Killingholme, Lincolnshire, DN40 3DZ

Environmental Statement Volume III
Appendix 7A: Transport Assessment

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(q)



Applicant: VPI Immingham B Ltd

Date: April 2019

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GLOSSARY

Abbreviation	Description
AADT	Average Annual Daily Traffic
AAWT	Annual Average Weekday Traffic
AMEP	Able Marine Energy Park
ATC	Automatic Traffic Counts
CCGT	Combined Cycle Gas Turbine
CEMP	Construction Environmental Management Plan
CIHT	Chartered Institution of Highways and Transportation
CHP	Combined Heat and Power
DCO	Development Consent Order
DfT	Department for Transport
DPD	Development Plan Documents
ES	Environmental Statement
ha	Hectare
HE	Highways England
HGV	Heavy Goods Vehicle
IEMA	Institute of Environmental Management and Assessment
km	Kilometre
LDF	Local Development Framework
LPA	Local Planning Authority
m	metres
MCC	Manual Classified Counts
MW	Megawatts
NPPF	National Planning Policy Framework
NELC	North East Lincolnshire Council
NLC	North Lincolnshire Council
NPPF	National Planning Policy Framework
NPPG	National Planning Policy Guidance
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NTEM	National Trip End Model
OCGT	Open Cycle Gas Turbine
OS	Ordnance Survey
PEI	Preliminary Environmental Information
PIA	Personal Injury Accident
PINS	Planning Inspectorate
PPE	Personal Protective Equipment
PPG	Planning Practice Guidance
RFC	Reference Flow/Capacity
SoS	Secretary of State

Abbreviation	Description
TA	Transport Assessment
TS	Transport Statement

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FIGURES

1.0 INTRODUCTION

1.1 Legislation and Planning Policy Context

1.1.1 This Transport Assessment has been prepared on behalf of VPI Immingham B Ltd ('the Applicant'), in relation to a proposed application ('the Application') pursuant to the Planning Act 2008 (the 2008 Act). This application is seeking an 'Order' granting development consent (a Development Consent Order, or DCO) for the construction, operation (including maintenance) and decommissioning of a gas-fired power station, specifically an Open Cycle Gas Turbine (OCGT) power station.

1.1.2 This power station is proposed to be constructed on the land to the north of the existing VPI Immingham Power Station Combined Heat and Power (CHP) plant on Rosper Road, South Killingholme, Immingham, DN40 3DZ, and is referred to in this ES as the 'Proposed Development' or 'VPI Immingham OCGT power station'.

1.1.3 The DCO would provide the necessary authorisations and consents for the construction, operation and maintenance of the Proposed Development, specifically a new gas-fired power station of up to 299 Megawatts (MW) gross electrical output and associated development. The main components of the Proposed Development are summarised below, as set out in the draft DCO (Application Document Ref: 2.1):

1.2 Background

1.2.1 The main components of the Proposed Development are summarised below, as set out in the draft DCO (Application Document Ref: 2.1):

- Work No. 1 – an OCGT power station (the 'OCGT Power Station') with a gross capacity of up to 299MW;
- Work No. 2 – access works (the 'Access'), comprising access to the OCGT Power Station Site and access to Work Nos. 3, 4, 5 and 6;
- Work No. 3 – temporary construction and laydown area ('Temporary Construction and Laydown') comprising hard standing, laydown and open storage areas, contractor compounds and staff welfare facilities, vehicle parking, roadways and haul routes, security fencing and gates, gatehouses, external lighting and lighting columns;
- Work No. 4 – gas supply connection works (the 'Gas Connection') comprising an underground and/or overground gas pipeline of up to 600 millimetres (nominal internal diameter) and approximately 800 m in length for the transport of natural gas from the Existing Gas Pipeline to Work No. 1;
- Work No. 5 – an electrical connection (the 'Electrical Connection') of up to 400 kilovolts and associated controls systems; and
- Work No 6 – utilities and services connections (the 'Utilities and Services Connections').

1.2.2 More detail on the elements of the Proposed Development is included in Chapter 4: The Proposed Development (ES Volume I).

1.2.3 In addition to the elements of the Proposed Development listed above, an Existing Gas Pipeline is included within the proposed DCO limits. The Applicant is seeking rights to

use and maintain this pipeline as part of the operation of the Proposed Development and it is therefore included within the DCO 'Order land' (the area over which powers of compulsory acquisition or temporary possession are sought). No consent for works is sought in the DCO, and therefore the Existing Gas Pipeline is excluded from the 'Order limits' (the area in which works are proposed, covered by various Work Numbers set out in Schedule 1 to the Draft DCO). As the Existing Gas Pipeline does not represent new infrastructure to be constructed, this assessment is focused on the Proposed Development.

1.3 Scope of Services

1.3.1 This report considers the transport and traffic related issues relevant to the Proposed Development.

1.3.2 This report assesses the transport implications of the Proposed Development in order to support an application for Development Consent for the Proposed Development. A separate environmental assessment of the traffic effects is included in Chapter 7: Traffic and Transportation (ES Volume I), based on the Institute of Environmental Management and Assessment (IEMA) 'Guidelines for the Environmental Assessment of Road Traffic'.

1.3.3 Scoping of this report, in addition to scoping of the ES, has taken place with the relevant highway authorities through email correspondence in October 2018 as well as all relevant Stage 1 and Stage 2 consultation responses to the DCO. This included North Lincolnshire Council (NLC), North East Lincolnshire Council (NELC) and Highways England (HE).

1.3.4 Following this brief introduction, Section 2 describes the site location and provides a review of the existing highway network. Section 3 then describes the development proposals. Section 4 considers the transport planning issues with an assessment of the accessibility of the site by non-car modes. Section 5 provides an assessment of the Traffic Impact of the Proposed Development within the local highway network. Section 6 provides an assessment of committed developments and a network capacity assessment. A summary and conclusions are set out in Section 7.

2.0 SITE DESCRIPTION AND EXISTING CONDITIONS

2.1 Highway Network

2.1.1 Figure 1 shows the location of the Proposed Development and the study area.

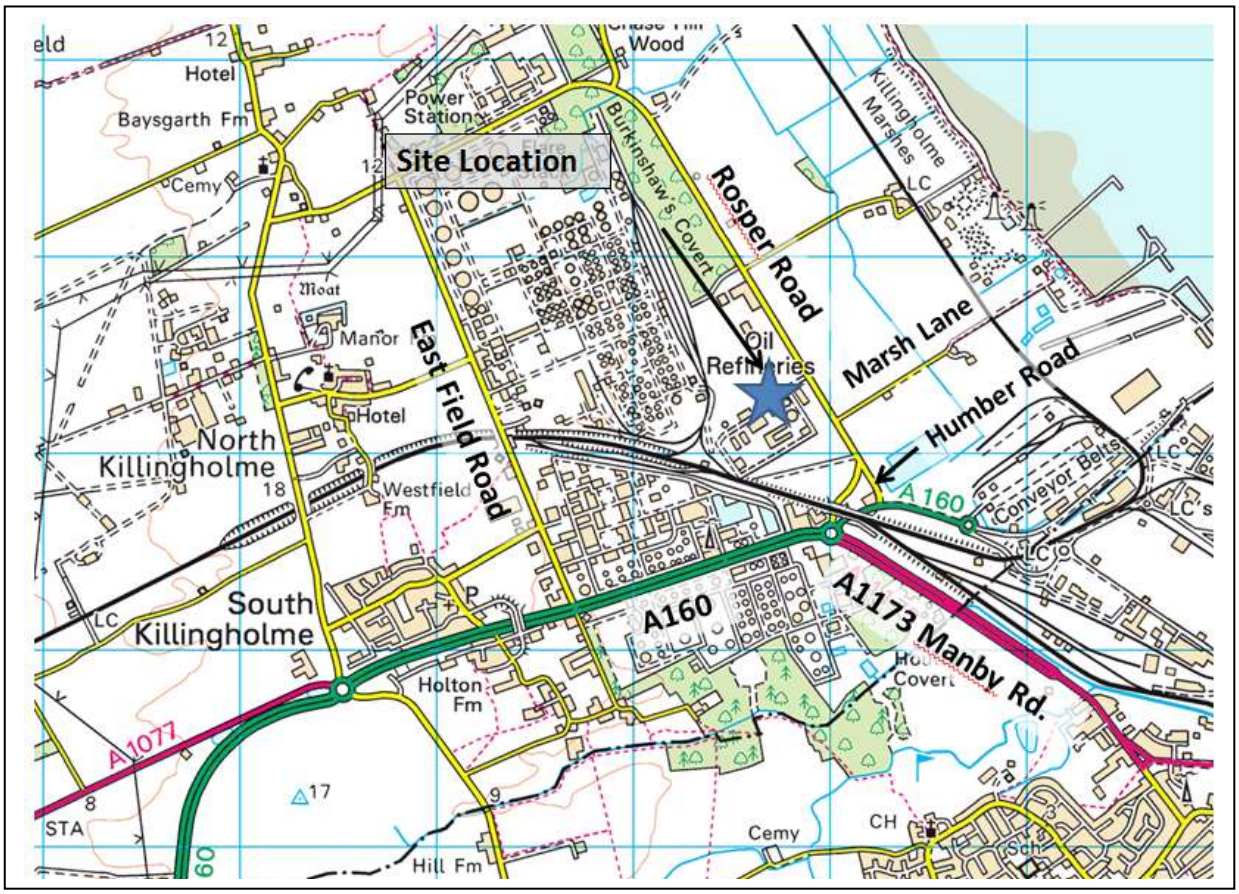
Rosper Road

2.1.2 Rosper Road is a single carriageway road running in a northerly direction from its junction with the A160. It serves the South Humber Bank development area which is bounded by East Field Road, Chase Hill Road and Rosper Road.

2.1.3 Adjacent to the site Rosper Road has the following characteristics:-

- Single carriageway, generally flat and straight;
- Footway along the eastern side, between Marsh Road and Humber Road;
- No street lighting;
- National Speed Limit (60mph); and
- No cycle facilities.

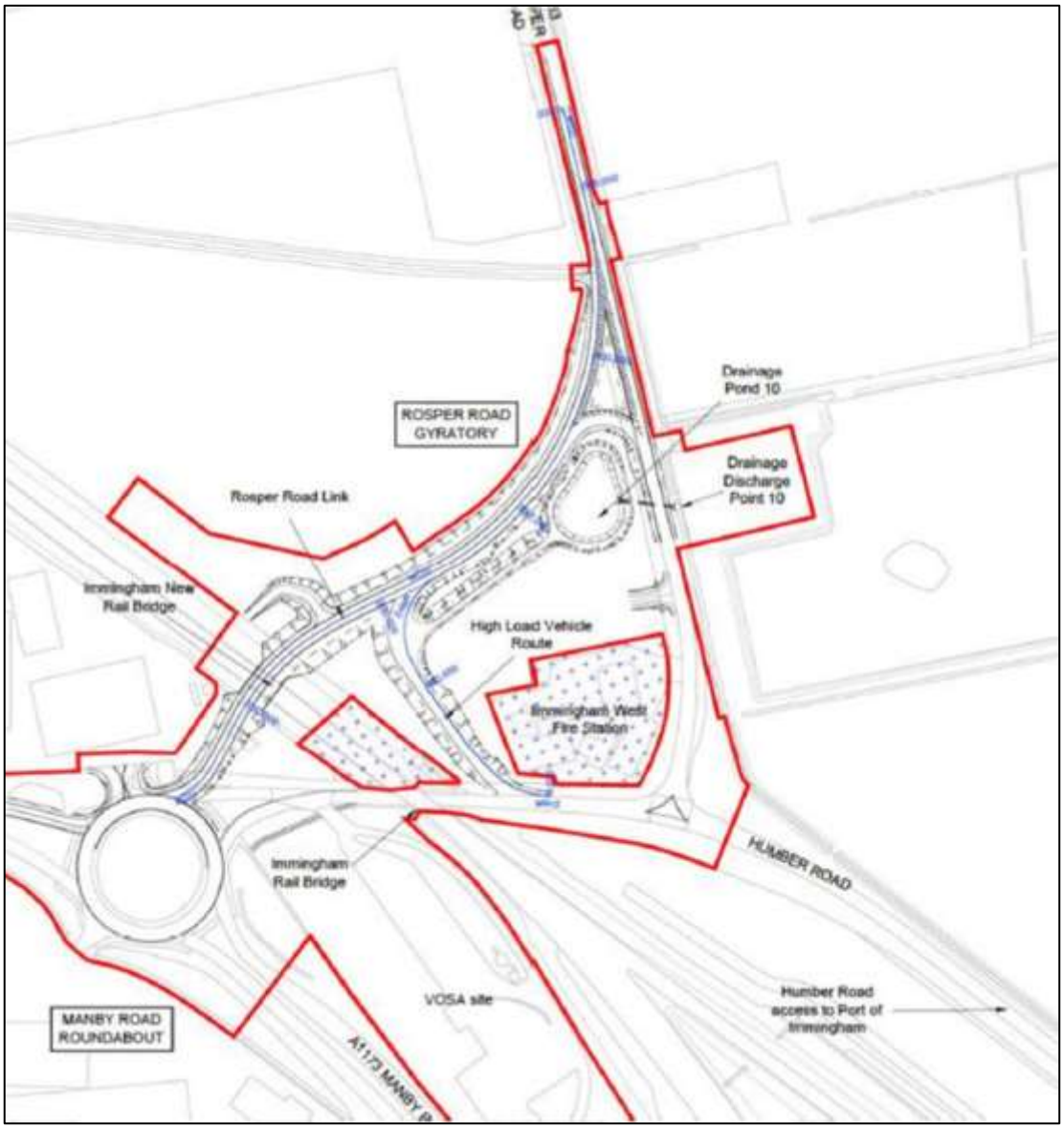
Figure 1: Study Area



Rosper Road / Humber Road / A160 / A1173 Manby Road Junction

2.1.4 Rosper Road joins the A160 approximately 700m south of the Site at a newly improved gyratory system linked to the existing (and recently improved) roundabout (the Manby Road roundabout) at the eastern terminus of the dual carriageway section of the A160. The improvement scheme introduced a one way system around a gyratory layout which provides significantly more capacity for vehicles turning into and out of Rosper Road / Humber Road.

Figure 2: A160 / Rosper Road / Humber Road Junction Improvements



2.1.5 The junction improvement scheme was implemented recently by Highways England and the Traffic Forecasting Report produced by the Highways Agency (now Highways England) for the scheme allows for significant growth and development up to 2041. The junction improvements have therefore been designed to accommodate high traffic growth as well as new development over the next 23 years.

A1173 Manby Road

2.1.6 Running south-eastwards from Manby roundabout, A1173 Manby Road is a dual carriageway for around 1.5km with a central reserve and street lighting present. There are no pedestrian footways or cycle facilities and very little frontage development. The A1173 links Manby roundabout in the north with the A180 to the south. After the first 1.5km Manby Road narrows to a single carriageway road with general industrial and business frontages and a 40mph speed limit. It is a bus route and footways are provided along the single carriageway section.

A160 Humber Road West

2.1.7 The A160 west of Rosper Road links the South Humber Gateway to the strategic road network and is a primary freight route. From the Manby Road roundabout, the A160 runs westwards for 4.3km before joining the A180 at a grade separated junction. The A160 has recently been improved as part of a Highways England corridor improvement scheme which included widening to dual carriageway, a new Habrough Road roundabout junction with a new link to the north. The A160 along this section has the following characteristics:

- Dual carriageway with a metre hardstrip;
- Recent new roundabout improvement scheme at the Habrough Road Junction.
- Streetlighting present;
- No footways to either side;
- National Speed Limit (70mph); and
- No pedestrian or cycle facilities.

A160 Humber Road East

2.1.8 The A160 east of the Rosper Road junction is called Humber Road and leads to Immingham Docks and other developments in the area. This section of the A160 has the following characteristics.

- Single Carriageway Road;
- Streetlighting present;
- No footways to either side;
- National Speed Limit (60mph); and
- No pedestrian or cycle facilities.

A180 and A180 / A160 Interchange

2.1.9 The A180 links the M180 to the west with Grimsby to the east. The A160 joins the A180 at a grade separated Brocklesby Interchange about halfway along the A180 and runs northwards and then north-eastwards towards Killingholme and Immingham. The A180 has the following characteristics:

- Dual Carriageway Road;
- No Streetlighting present;

- No footways to either side;
- National Speed Limit (70mph); and
- No pedestrian or cycle facilities.

2.2 Base Year Traffic Counts

2.2.1 Traffic Counts were undertaken in September 2018 at the following locations to provide up to date traffic flow information on the surrounding roads and junctions

- Rosper Road (south of Marsh Lane) (Automatic Traffic Counts (ATC));
- Humber Road (ATC);
- Rosper Road / Marsh Lane T-Junction (Manual Classified Counts (MCC)); and
- A160 Humber Road / Manby Road Roundabout (MCC).

2.2.2 In addition to the above counts previous traffic flows were available on:

- Rosper Road north and south of Marsh Lane from July 2016 ATC data; and
- A160 and A180 from 2018 ATC data from Highways England's WebTRIS database at several locations.

2.2.3 A summary of the results of the traffic counts are given below in Tables 7A.1 to 7A.5 below.

Table 7A-1- Rosper Road (North of Marsh Lane) 2016 Baseline Flows – single c/w

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
7 day mean	5,010	83.0%	1,533	30.6%
5 day AAWT	6,038	100.0%	1,815	30.1%
AM Peak	636	10.5%	112	17.6%
PM Peak	546	9.0%	139	25.5%
12 Hour	4,698	77.8%	1,496	31.8%

Table 7A.2 - Rosper Road (South of Marsh Lane) 2016 Baseline Flows – single c/w

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
7 day mean	5,145	83.3%	1,510	29.35%
5 day AAWT	6,178	100.0%	1,880	30.43%
AM Peak	639	10.3%	120	18.78%

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
PM Peak	567	9.2%	129	22.75%
12 Hour	4,836	78.3%	1,543	31.91%

Table 7A.3 - Rosper Road (South of Marsh Lane) 2018 Baseline Flows – single c/w

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
7 day mean	4,597	79.2%	1,428	31.05%
5 day AAWT	5,808	100.0%	1,835	31.59%
AM Peak	617	10.6%	124	20.18%
PM Peak	510	8.8%	126	24.69%
12 Hour	4,589	79.0%	1,539	33.54%

2.2.4 The results from the September 2018 ATC count (Table 7A.3) show comparable but slightly lower traffic flows than July 2016 ATC counts (Table 7A.2). For the purpose of this traffic assessment the higher 2016 traffic flows were used for subsequent analysis, representing the most robust traffic flows and therefore the worst case scenario.

2.2.5 Average Annual Daily Traffic (AADT) flows include both weekends and weekdays. Average Annual Weekday Traffic (AAWT) includes only working week days (Monday to Friday) and is generally slightly higher than AADT flows.

Table 7A.4 A160 dual c/w Humber Road (just west of Manby Roundabout) - 2018 Baseline Flows

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
7 day mean	10,348	81.96%	4,441	42.9%
5 day AAWT	12,626	100.00%	5,671	44.9%
AM Peak	1,086	8.60%	487	44.8%
PM Peak	1,073	8.50%	483	45.0%
12 Hour	7,931	62.81%	3,331	42.0%

Table 7A.5 A180 dual c/w (just west of A15/A18 Interchange) - 2018 Baseline Flows

Count	Two-Way Traffic Flow			
	No. of Total Vehicles	% of 5 Day AAWT	No. of HGV's	% HGV's
7 day mean	31,322	86.9%	8,952	28.6%
5 day AAWT	36,025	100.0%	11,491	31.9%
AM Peak	3,340	9.3%	1,045	31.3%
PM Peak	3,061	8.5%	971	31.7%
12 Hour	25,209	70.0%	6,891	27.3%

2.2.6 It has been established from these counts that the weekday morning and evening peak are 0715–0815 hours and 1600–1700 hours respectively. Figures 7A.1 and 7A.2 in Annex 3 show the surveyed traffic flows for the 2018 base morning and evening peak periods respectively.

2.3 Road Capacities

2.3.1 Typical capacities for a variety of road types are provided within the Department for Transport's (DfT) Technical Advice Note (TA) 79/99 "Determination of Urban Road Capacity" (Ref. 7A.13). The assumed capacities, which are quoted in the TA as one-way flows, are typically between 1,110 to 1,470 vehicles per hour in each direction (depending on road width and road type). This is equivalent to between 1850 and 2450 vehicles two-way per hour based on the 60/40 directional split used in TA 79/99. Scaling this up for 12 hours per day in two directions for single carriageway roads gives a theoretical range of between 22,200 and 29,400 vehicles for single carriageway roads.

2.3.2 For dual carriageways (i.e. the A160 and A180) the road class is slightly higher due to less side roads, no waiting or parking and the capacities are correspondingly higher. The hourly capacity in TA 79/99 (Ref 7A-15) for the A160 and A180 would be around 3,600 vehicles per hour in each direction which is equivalent to 7,200 veh/hr two-way (no 60/40 directional split is used for dual carriageway). The corresponding theoretical 12-hour two-way capacity is therefore 86,400 vehicles.

2.3.3 By comparing the recorded hourly and daily flows with the capacity limits indicated above, it is apparent that the roads within the Study Area re operating below the TA 79/99 capacity limits, even at peak times. This would indicate that there is a low degree of sensitivity of the study area, in terms of traffic flow capacities, to changes in the traffic flows resulting from the Proposed Development.

2.4 Road Safety

2.4.1 The Personal Injury Accident (PIA) record Road safety collision statistics have been obtained from the Crashmap website (Ref 7A.11). The data obtained relates to those collisions that resulted in a personal injury and which were reported to the police. This data (known as STATS19 statistics) are generally recognised to be the most complete record of road collisions occurring on the local highway network. For the avoidance of

doubt, as is normal practice STATS19 statistics do not include collisions resulting in "damage-only" to vehicles.

2.4.2 Each collision resulting in a personal injury is classed as either 'Slight', 'Serious' or 'Fatal' by the police depending on the most serious injury resulting from the collision (i.e. a collision resulting in two 'Slight' injuries and one 'Serious' injury would be classed as a 'Serious' collision).

2.4.3 A summary of the recorded accidents within the study area is provided below in Table 7A.6. The data covers the five year period from 1st January 2014 to 31 December 2018. Accidents on the links and at the junctions have been summarised separately.

Figure 3: A160 / Rosper Road / Humber Road Junction Improvements

Table 7A.6 – Personal Injury Accident Record

Link / Junction	Slight	Serious	Fatal	Total
Links				
Rosper Road	0	0	0	***0***
Eastfield Road	1	0	0	***1***
Chase Hill Road	0	0	0	***0***
A160 between Manby	1	0	0	***1***

Link / Junction	Slight	Serious	Fatal	Total
Roundabout and Eastfield Road				
TOTAL	***2***	***0***	***0***	***2***
AVERAGE per YEAR (Links)	***0.4***	***0.0***	***0.0***	***0.4***
Junctions				
A160 / A1173 Manby Road / Humber Road Roundabout	2	1	0	***3***
A160 / Eastfield Road	1	0	0	***1***
TOTAL	***3***	***1***	***0***	***4***
AVERAGE per YEAR (Junctions)	***0.6***	***0.2***	***0.0***	***0.8***
AVERAGE per YEAR (Links and Junctions combined)	***1***	***0.2***	***0***	***1.2***

Source: www.crashmap.co.uk

2.4.4 The accident record shows that there have been no recorded personal injury accidents on the length of Rosper Road adjacent to the Site.

2.4.5 It should be noted that the accident record in Table 7A.6 pre-dates the A160 / Rosper Road junction improvement scheme which was opened in Spring 2017. It is likely that the improvement scheme will have improved road safety at the Humber Road / A160 junction where two slight accidents occurred in 2013.

2.4.6 In summary there have been no recorded PIAs along Rosper Road and there are no accident blackspots identified on the surrounding roads that give cause for concern.

2.5 Recent Road Improvements – A160/A180 Port of Immingham Improvement Scheme

2.5.1 Highways England have recently completed (in Spring 2017) a major improvement scheme along the A160 corridor between the A180 in the west and the Manby roundabout and Rosper Road junctions in the east. The improvement scheme has significantly increased capacity along the route with the following improvements:

- New Rosper Road gyratory junction, including a new link road and railway bridge. The layout provides free flowing traffic around the gyratory into and out of Rosper Road;
- upgrading Brocklesby (A180/A160) interchange to an oval two bridge roundabout layout, including a dedicated left turn lane for vehicles travelling from the eastbound A180 to the A160;
- relocating Habrough roundabout to the west of its current position, with new link roads provided from the A160 to Ulceby Road, Top Road and Habrough Road;
- closing the central reserve gap at the junction with Town Street and partially closing the gap at the entrance to the oil refinery;

- provision of a new road bridge at Town Street to provide vehicle and pedestrian access between the two parts of South Killingholme; and
- A160 widened to dual carriageway between South Killingholme and the A180 Brocklesby interchange.

3.0 THE PROPOSED DEVELOPMENT

3.1 The Proposed Development

3.1.1 The main components of the Proposed Development are summarised below, as set out in the draft DCO (Application Document Ref: 2.1):

- Work No. 1 – an OCGT power station (the 'OCGT Power Station') with a gross capacity of up to 299MW;
- Work No. 2 – access works (the 'Access'), comprising access to the OCGT Power Station Site and access to Work Nos. 3, 4, 5 and 6;
- Work No. 3 – temporary construction and laydown area ('Temporary Construction and Laydown') comprising hard standing, laydown and open storage areas, contractor compounds and staff welfare facilities, vehicle parking, roadways and haul routes, security fencing and gates, gatehouses, external lighting and lighting columns;
- Work No. 4 – gas supply connection works (the 'Gas Connection') comprising an underground and/or overground gas pipeline of up to 600 millimetres (nominal internal diameter) and approximately 800 m in length for the transport of natural gas from the Existing Gas Pipeline to Work No. 1;
- Work No. 5 – an electrical connection (the 'Electrical Connection') of up to 400 kilovolts and associated controls systems; and
- Work No 6 – utilities and services connections (the 'Utilities and Services Connections').

3.2 Access Site

3.2.1 The Site benefits from two existing vehicular accesses along its eastern boundary, with each providing a direct entrance/exit onto Rosper Road. The points of access onto Rosper Road are shown in Figure 3.2 in Appendix 2, Chapter 3 – Site Description (Application Document Ref: 6.3.3). The northern access was originally constructed for and is used by TLOR. The southern was constructed for and is used by the Existing VPI CHP Plant. The accesses are designed to accommodate HGVs and are therefore considered fit for purpose.

3.2.2 The Proposed Development would share the highway accesses with TLOR and the Existing VPI CHP Plant in the following manner:

- During construction, a new internal access road would be constructed to link the different parts of the Site to the highway accesses onto Rosper Road. It is envisaged that the northern access would primarily be used to access the OCGT Power Station Site, with the remaining parts of the Site primarily accessed using the southern access; and
- During operation, vehicles would utilise the northern access only as a means to enter/exit the Site.

3.3 Construction and Laydown Site

3.3.1 The contractor would provide temporary site facilities within the designated parts of the Site. Due to the current nature of ground conditions in these areas, it is envisaged that minimal work would be needed to create a usable surface that can accommodate storage of non-hazardous materials and placement of contractor cabins.

3.4 Travel Plan Proposals

3.4.1 The Applicant is committed to the implementation of sustainable transport solutions for the Proposed Development. During the construction phase, the Applicant will apply the following mitigation measures in respect of the local highways:

- Pedestrian and cycle access routes to/from the Site will be identified and communicated to employees during construction. Appropriate facilities will be provided on the site for the safe storage of cycles;
- Local bus connections to the Site will be identified and communicated to all construction employees;
- The Applicant will liaise with construction personnel to consider the potential to implement staff minibuses and car sharing options;
- The Contractor will be required to prepare a Construction Traffic Management Plan (CMTP) to identify appropriate and safe routes to and from site including the options listed above such as pedestrian and cycle access. A framework CTMP is included in Appendix 7C (ES Volume III); and
- A Construction Worker Travel Plan aimed at reducing the volume of construction staff trips to the Site, especially during peak hours, will be implemented (a Framework CWTPis included in Appendix 7B (ES Volume IIII).

3.4.2 With regard to HGV movements and construction traffic, all construction vehicles will be required to use only the approved access routes to the Site in accordance with the CTMP.

4.0 TRANSPORT PLANNING CONSIDERATIONS

4.1 Background

4.1.1 In order to assess the proposals and develop a transportation access strategy for the Proposed Development it is necessary to review both national and local transport related planning policies together with the emerging policies and related planning guidance.

4.1.2 The following sections outline the relevant planning policies in respect of the Proposed Development.

4.2 National Policy Statement for Energy

National Policy Statement for Energy (NPS EN-1)

4.2.1 Section 5.13 of NPS EN1 (Ref 7A-1) outlines the planning policy for Traffic and Transport. The relevant paragraphs for transport assessment are contained in Paras 5.13.2 to 5.13.4 which state:

> *'5.13.2 The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS.*
>
> *5.13.3 If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG139 methodology stipulated in Department for Transport guidance140, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation.*
>
> *5.13.4 Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts*.'

4.2.2 In terms of the Secretary of State's (SoS) decision making, section 5.13 of the NPS EN-1 states that the IPC (now the SoS) should ensure that the applicant has sought to mitigate the impacts on the surrounding road infrastructure that may occur as a result of a new energy NSIP. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the SoS should consider requirements to mitigate the adverse impacts on transport networks arising from the development and could include:

- Demand management measures;
- Water-borne or rail transport, where cost effective; and
- Attaching conditions to a planning consent where there is likely to be substantial HGV traffic.

National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (NPS EN-2)

4.2.3 Section 2.2 of NPS EN-2 (Ref 7A-2) outlines the planning policy for traffic and transport specifically in respect of fossil fuel generating stations such as the Proposed Development. The relevant paragraphs for the transport assessment are 2.2.5 and 2.2.6 which state:

> *"2.2.5 New fossil generating stations need to be accessible for the delivery and removal of construction materials, fuel, waste and equipment, and for employees.*
>
> *2.2.6 Government policy encourages multi-modal transport and materials (fuel and residues) may be transported by water or rail routes where possible. Applicants should locate new fossil generating stations in the vicinity of existing transport routes wherever possible. Although there may in some instances be environmental advantages to rail or water transport, whether or not such methods are viable is likely to be determined by the economics of the scheme. Road transport may be required to connect the site to the rail network, waterway or port. Any application should therefore incorporate suitable access leading off from the main highway network. If the existing access is inadequate and the applicant has proposed new infrastructure, the IPC should satisfy itself that the impacts of the new infrastructure are acceptable as set out in Section 5.13 of EN-1."*

4.3 National Planning Policy Framework

4.3.1 In July 2018, the Government published an update to the National Planning Policy Framework (NPPF) (Ref 7A-3). The NPPF sets out the Government's planning policies for England.

4.3.2 The NPPF refers explicitly to the five guiding principles of sustainable development in the Government's document 'Securing the Future':

- Living within the planet's environmental limits;
- Ensuring a strong, healthy and just society;
- Achieving a sustainable economy;
- Promoting good governance; and
- Using sound science responsibly.

4.3.3 The NPPF (paragraphs 102–111) states that the transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice about how to travel. The policy states that local authorities should support a pattern of development, which, where reasonable to do so, facilitates the use of sustainable modes of transport. Plans and decisions should ensure that developments that generate significant movement are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.

4.3.4 The NPPF recommends that a Transport Statement (TS) or Transport Assessment (TA) should support all developments that generate significant amounts of movement and that development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe.

4.3.5 The Proposed Development complies with the aims and objectives of NPPF through the promotion of more sustainable transport modes.

4.4 Local Planning Policy

North Lincolnshire Council Core Strategy

4.4.1 NLC adopted its Core Strategy on 29th June 2011 which sets out the long term vision for North Lincolnshire. The Core Strategy is part of the development plan for North Lincolnshire and is a matter which the SoS is likely to consider *"important and relevant"* in determining the application for a DCO.

4.4.2 Chapter 9 of the Core Strategy 'Delivering Greater Economic Success in North Lincolnshire' comments that:

> *Paragraph 9.46:*
>
> *"Investment interest in the South Humber Bank Strategic Employment Site is key to the delivery of the site. To emphasise the importance of investment it should be noted that South Humber Gateway investment indications regarding freight ferry, ports and logistics and rail from 2005 to 2008 amounted to £420 million. Projected investment indications from 2008 to 2013 amount to just over £2 billion in relation to power and energy generation from biomass and gas firing, enhanced freight ferries, manufacturing, petro-chemicals, ports and logistics, as well as improved rail and road access."*

4.4.3 Chapter 15 'Transport and Communication – Connecting North Lincolnshire' comments that:

> *"The Northern Way Growth Strategy also recognizes that the South Humber ports and the undeveloped South Humber Bank strategic employment sites are served by motorways with surplus capacity. In ensuring the future development of the ports, access by rail and road via the A160 will need to be improved to accommodate additional growth."*

Policy CS12: South Humber Bank Strategic Employment Site – A Broad Location

> *The South Humber Bank Strategic Employment Site (SHBSES) will be reserved for B1, B2 and B8 port related activities to take special advantage of its location, flat topography and adjacent a deep water channel of the River Humber as an extension to Immingham Port and the Humber Sea Terminal.*
>
> *The delivery of the SHBSES will be achieved through the following Plans, Boards and Delivery Groups:*

- South Humber Bank Master Plan (2004);
- Individual South Humber Bank Infrastructure, Economic and Environmental Studies that up date the South Humber Bank Master Plan where relevant
- South Humber Bank Gateway Board (formed May 2009)
- South Humber Bank Gateway Delivery Group and its South Humber Bank Ecology Sub-Group

North East Lincolnshire Local Plan 2013 to 2032 (Ref. 7A.12)

4.4.4 The Local Plan was adopted by North East Lincolnshire Council in March 2018 and sets out the vision and objectives for the authority, allocates sites for housing, employment and other forms of development and sets out policies.

4.4.5 Key transport related policies relevant to the Proposed Development that form part of the Local Plan are as follows.

Policy 36: Promoting Sustainable Transport

4.4.6 The policy states that "to reduce congestion, improve environmental quality and encourage more active and healthy lifestyles, the Council will support measures that promote more sustainable transport choices." The policy states that where appropriate, policies should seek to:

- Focus development which generates significant movements in locations where the need to travel will be minimised;
- Prioritise pedestrian and cycle access to and within the site;
- Make appropriate provision for access to public transport and other alternative means of transport to the car, adopting a 400m walk to bus stop standard;
- Make suitable provision to accommodate the efficient delivery of goods and supplies; and
- Make suitable provision for electric vehicle charging, car clubs and car sharing when considering car park provision.

4.4.7 The policy goes on to state that "planning permission will be granted where any development that is expected to have significant transport implications delivers necessary and cost effective mitigation measures to ensure that development has an acceptable impact on the network's functioning and safety."

4.4.8 The policy also states that "where appropriate, Transport Statements, Transport Assessments and/or Travel Plans should be submitted with applications with the precise form being dependent on the scale and nature of development and agreed through early discussion with the Council"

Other Guidance

Planning Practice Guidance (PPG)

4.4.9 Planning Practice Guidance titled 'Travel plans, transport assessments and statements in decision-taking' was published in March 2014 (Ref 7A-10) on the Government planning guidance planning portal and has been used to inform the transport assessment. The PPG will be updated in due course to reflect any policy changes in the 2018 updated NPPF. If the PPG transport advice is updated prior to determination of the DCO, this section will be updated to reflect that.

Guidelines for the Environmental Assessment of Road Traffic

4.4.10 The Guidelines for the Environmental Assessment of Road Traffic (Ref 7A-5) were published in 1993 by the Institute of Environmental Assessment (now the Institute of Environmental Management & Assessment (IEMA)). The guidelines provide a basis for a

comprehensive and consistent approach to the appraisal of traffic and transport impacts. Extensive reference has been made to these guidelines throughout the preparation of this chapter.

Department for Transport Circular 02/2013: The Strategic Road Network and the Delivery of Sustainable Development

4.4.11 Circular 02/2013 was published in September 2013 by the Department for Transport (Ref 7A-6) which sets out the way in which Highways England will engage with the development industry to deliver sustainable development and, thus, economic growth, whilst safeguarding the primary function and purpose of the strategic road network and has been used to inform the transport assessment.

4.4.12 The circular states that development proposals are likely to be acceptable if they can be accommodated within the existing capacity of a section (link or junction) of the strategic road network, or they do not increase demand for use of a section that is already operating at over-capacity levels, taking account of any travel plan, traffic management and/or capacity enhancement measures that may be agreed. However, development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are severe

The Strategic Road Network: Planning for the Future

4.4.13 The Strategic Road Network: Planning for the Future 'A guide to working with Highways England on Planning Matters' published by Highways England in September 2015 (Ref 7A-7) offers advice and information regarding the information it expects to see within a planning proposal and has been used to inform the transport assessment.

4.5 Access to the Proposed Development by Choice of Transport Modes

Pedestrians

4.5.1 The average length of a walking journey in Great Britain is 0.6miles (1km) according to the National Travel Survey done by Department for Transport. The distance that people will be prepared to walk will however vary between different age groups etc.

4.5.2 PPG13 stated that, at the local level, walking is the most important mode of transport and offers the greatest potential to replace short car trips, particularly under 2km.

4.5.3 The Chartered Institution of Highways and Transportation (CIHT) document "Providing for Journeys on Foot (2000)" (Ref. 7A.9) suggests that walking is a "desirable" mode for journeys up to 400m and "acceptable" for journeys up to 800m with a preferred maximum of 1200m. For commuting and educational purposes these distances are increased, so that 1000m is "acceptable" and 2000m is the "preferred maximum". These distances are illustrated in Table 7A.7 below.

Table 7A.7 – CIHT Advice on Walking Distance

Description	Town Centres (m)	Commuting / Education (m)	Elsewhere (m)
Desirable	200	500	400
Acceptable	400	1000	800

Description	Town Centres (m)	Commuting / Education (m)	Elsewhere (m)
Preferred Maximum	800	2000	1200

4.5.4 There are a limited opportunities for travelling to the Proposed Development on foot as it is located further than 2km from any significant residential areas. However a new footway has recently been constructed along the eastern side of Rosper Road between Humber Road and Marsh Lane. There is no street lighting however along Rosper Road.

Cycle Facilities

4.5.5 Department for Communities and Local Government publication (2011) Planning Policy Guidance (PPG) 13: Transport, stated that the bicycle is the ideal mode of transport for journeys under 8km. PPG13 also stated that cycling "has a clear potential to substitute for short car trips, particularly those under five kilometres, and to form part of a longer journey by public transport.". Whilst PPG 13 has now been superseded by the National Planning Policy Framework (NPPF) it is still recognised as providing good guidance.

4.5.6 The Statistical release by the Department of Transportation: Walking and Cycling Statistics, England: 2016, dated January 2018; states that the average length of a cycle journey is 3.5 miles (5.6km).

4.5.7 The roads surrounding the site are generally flat and there are no significant obstacles for cyclists. Within the 5km and 8km recommended cycle distances from the Site centre are the following key origins / destinations :-

- South Killingholme;
- North Killingholme;
- East Halton;
- Immingham;
- Habrough;
- Habrough Rail Station; and
- Ulceby Rail Station.

4.5.8 In summary the Proposed Development is located in a reasonably accessible location for cyclists.

Bus Facilities

4.5.9 There are limited opportunities for travelling to the Site via bus. Rosper Road is not a bus route and the nearest bus stops are 2.7km away in South Killingholme (Town Street) and 2.6km away in Immingham (Manby Road).

Rail Facilities

4.5.10 Rail Stations are located at Habrough (6.1km away) and Ulceby (6km away). Both stations operate regular services to:

- Grimsby Town eastbound;
- Barton-on-Humber (Northern) westbound;
- Newark North Gate (East Midlands Trains); and
- Doncaster and Manchester Airport (First TransPennine Express).

5.0 TRAFFIC EFFECTS

5.1 Introduction

5.1.1 This section of the report considers the traffic effects of the Proposed Development on the local and strategic highway network. The assessment looks at the construction phase, the operational phase and the decommissioning phase.

5.1.2 The primary aim of this section is to evaluate whether the traffic increases at the site would have any material impact within the local highway network during the typical morning and evening peak periods, as well as the magnitude of environmental effects based on daily traffic flows.

5.2 Traffic Growth

5.2.1 Traffic flow data available for the local roads is limited to the surveys previously detailed. Historic flow data may not be relevant due to recent highway improvements along the A160 and A180 interchange.

5.2.2 In the absence of any reliable long-term data, traffic growth has been calculated using TEMPRO V7.2 and the National Traffic Model dataset (NTM AF15) for North Lincolnshire District.

5.2.3 Appropriate growth factors to be applied to the baseline traffic year (i.e. 2016 and 2018) and the estimated peak construction year of 2021 and opening year of 2022 are indicated in Table 7A.8. These growth factors have been taken into account when comparing the baseline and future traffic scenarios.

Table 7A.8 – TEMPRO v7.2 Traffic Growth Factors (NLC)

Year	Vehicle Type	Growth Factors		
		All Day	AM Peak	PM Peak
2016–2021 Peak of Construction	All	1.0809	1.0807	1.0784
2018-2021 Peak of Construction	All	1.0475	1.0474	1.0461
2016-2022 Start of Operation	All	1.0997	1.0991	1.0966
2018-2022 Start of Operation	All	1.0657	1.0652	1.0637

Source : TEMPRO v7.2, NLC District, NTM AAF15 data set, O/D trips, all road types, car driver.

5.3 Construction Phase

5.3.1 The entire site preparation and construction programme is anticipated to take approximately 21 months from commencement to the start of commissioning. Table 7A.9 gives an indicative construction programme.

Table 7A.9 – Indicative Construction Programme

	2021				2022			
	1	2	3	4	1	2	3	4
OCGT Site Preparation								
Main civil works								
Plant installation								
Gas and electrical connections								
Commissioning								

5.3.2 Transportation of construction material to and from the Proposed Development will be via the existing trunk and local networks. The following major roads will be utilised:

- Rosper Road (to the south of the Site Access);
- A160 Humber Road;
- A180; and
- A1173 Manby Road.

5.3.3 A Framework Construction Traffic Management Plan (CTMP) included as Appendix 7C (ES Volume III). It is assumed that all HGV movements will ultimately arrive and depart by these routes in accordance with the CTMP.

5.3.4 Anticipated normal construction hours would be Monday–Friday 07:00–19:00 and Saturday 08:00 – 18:00. Should on-site construction works be required outside of these normal construction working hours, they would comply with any restrictions agreed with the planning authorities through the DCO process, and in particular regarding control of noise and traffic.

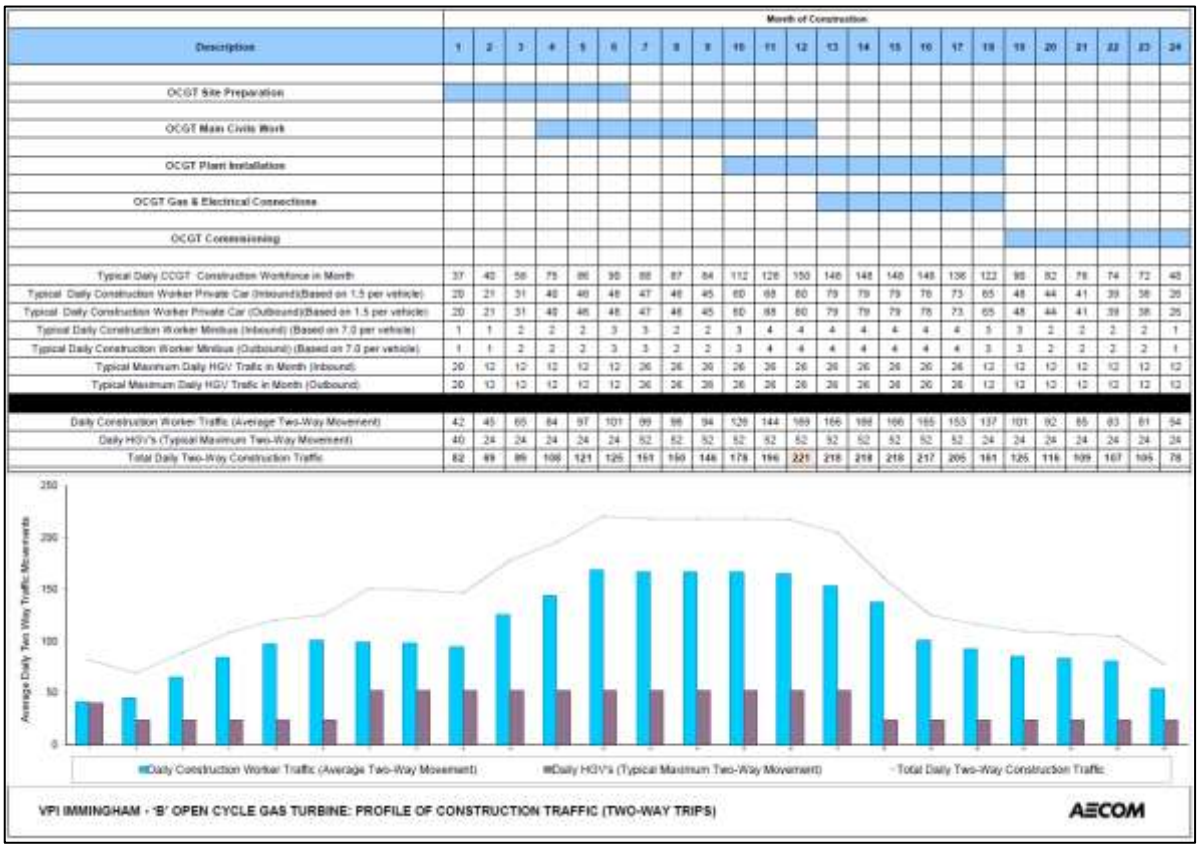
5.3.5 Annex 2 summarises the construction phase peak traffic levels. At the peak of construction in late 2021 based on a Q1 2021 start date, it is forecast that a maximum of around 150 construction personnel would be on the construction site in any one day. The total number of contracted staff may be higher than this, but due to shift times and phases, days off etc. they would not all be on site at the same time. Twenty six HGV trips per day are forecast during the peak construction months. It should be noted that the majority of construction workers would arrive between 0600-0700 hours and depart between 1800-2000 hours for the shift start/end times.

5.3.6 Construction staff numbers required for an OCGT are much lower than a CCGT power station, as there are significantly less civil works required. The numbers used in this TA have been provided by gas turbine original equipment manufacturers (OEMs) and are similar to those used for two other similar, recently consented DCO OCGT schemes.

5.3.7 Private car and contractor minibuses are likely to be the main means of transport to the Site for construction staff and the following trips have been calculated for the peak of construction. During the peak construction months there will be a greater opportunity to transport employees from local areas by minibus as staff numbers are at their highest.

5.3.8 Although the site is within reasonable cycling distance of Immingham and South Killingholme, the need to carry equipment, Personal Protective Equipment (PPE) and the physical nature of the work, is likely to deter construction staff from walking / cycling to the site.

Figure 4– Construction Staff Monthly Profile



5.3.9 As a conservative assumption (based on implementation of basic CWTP measures), the following trips have been assumed in relation to car and minibus travel:

- 150 Construction Staff per any one day during the peak months;
- 80 car trips per day assuming car occupancy rate of around 1.50; and
- 4/5 minibus trips per day (30 staff, assuming an average of 7 staff per minibus).

5.3.10 These numbers are considered to represent a worst case scenario. With the proposed CWTP measures in place it is likely that car sharing and minibus use can be increased, with a resultant higher car occupancy rate than the 1.50 used.

Table 7A.10 - Peak Period Construction Traffic Flows

Hour beginning	HGV Arrivals	HGV Departures	Staff Arrivals (Cars / LGVs)	Staff Departures (Cars / LGVs)	Tot 2-way flow (veh./hr
500	0	0	0	0	0
600	0	0	24	1	25
700	3	1	21	1	26
800	2	2	7	2	13
900	3	2	5	2	12
1000	3	3	5	4	15
1100	2	3	4	5	14
1200	3	2	4	4	13
1300	3	3	3	3	12
1400	2	3	5	7	17
1500	2	2	1	7	12
1600	2	2	2	11	17
1700	1	2	2	12	17
1800	0	1	2	22	25
1900	0	0	0	2	2
2000	0	0	0	1	1
2100	0	0	0	1	1
2200	0	0	0	0	0
2300	0	0	0	0	0
2400	0	0	0	0	0
Total	26	26	85	85	222

5.3.11 Highways England uses a threshold of 30 two-way peak hour vehicle trips for determining if further traffic assessment is required. As can be seen in Table 7A.10 above the proposed development construction phase is unlikely to generate vehicle trips above this threshold during the peak hours, or any other hour, particularly with the proposed shift times and implementation of CWTP measures.

5.3.12 Further assessment of traffic impact on the surrounding roads is included in Table 7A.11 below and also in Section 6 of this report.

Distribution of Construction Staff & HGVs

5.3.13 The distribution of construction staff vehicles (cars and minibuses) to and from the site has been based on 2011 Census Data of surrounding populations and compared with other similar, approved local development TA Reports to ensure consistency. Table

7A.11 below shows the forecast distribution of construction staff vehicular trips and delivery HGVs.

Table 7A.11 – Distribution Of Construction Staff & HGV trips

Approach direction – Construction Staff	Percentage distribution
From Rosper Road North	15.0%
From A160 West via A180/M180 with 10% dropping off along Habrough Road towards Brocklesby and Caistor.	36.0%
From NE Lincolnshire via Manby Road South	49.0%
Approach Direction – HGV Trips	**Percentage distribution**
From Manby Road South	40%
From A160 West via A180/M180	60%

5.3.14 The distribution of HGV trips was based on previously agreed distribution for construction trips to other similar developments.

Construction Traffic Impact

5.3.15 Using the distribution above, Tables 7A.12 to 7A.13 show traffic impact along the roads surrounding the Site as a result of the temporary construction traffic from the Proposed Development. The impact is based on the peak construction months anticipated to occur in 2021. The cumulative traffic effect of other committed developments is covered in Section 6 below.

Table 7A.12 – AM Peak Hour Traffic Impact (0715-0815) - 2021 Construction Phase

Link description	2021 Base AM Peak (Tot)	2021 Base HGVs (HGV)	2021 With OCGT Const. Traffic (Tot)	2021 With OCGT Const. Traffic HGV	Diff. Total Veh.	% Impact Total Veh.	Diff HGV	% Impact HGV
Rosper Road North of Site Access	665	120	668	120	3	0.51%	0	0.00%
Rosper Road between N & S Site accesses	666	120	692	128	27	3.99%	8	6.67%
Rosper Road North of Marsh Lane	666	120	688	124	23	3.39%	4	3.33%
Rosper Road South of Marsh Lane	669	120	692	124	23	3.38%	4	3.33%

Link description	2021 Base AM Peak (Tot)	2021 Base HGVs (HGV)	2021 With OCGT Const. Traffic (Tot)	2021 With OCGT Const. Traffic HGV	Diff. Total Veh.	% Impact Total Veh.	Diff HGV	% Impact HGV
Marsh Lane	30	0	30	0	0	0.00%	0	0.00%
A160 just West of Manby Roundabout	1,139	472	1,149	475	10	0.90%	3	0.59%
A180 - west of A160 Interchange	3,498	1,095	3,508	1,098	10	0.29%	3	0.26%
Manby Road - SE of Manby Roundabout	999	183	1,012	185	13	1.26%	2	0.87%

Table 7A.13 – PM Peak Hour Traffic Impact (1600-1700) - 2021 Construction Phase

Link description	2021 Base PM Peak (Tot)	2021 Base HGVs (HGV)	2021 With OCGT Const. Traffic (Tot)	2021 With OCGT Const. Traffic HGV	Diff. Total Veh.	% Impact Total Veh.	Diff HGV	% Impact HGV
Rosper Road North of Site Access	571	134	573	134	2	0.38%	0	0.00%
Rosper Road between N & S Site accesses	571	134	591	142	20	3.47%	8	5.98%
Rosper Road North of Marsh Lane	571	134	587	138	16	2.77%	4	2.99%
Rosper Road South of Marsh Lane	593	134	609	138	16	2.67%	4	2.99%
Marsh Lane	26	0	26	0	0	0.00%	0	0.00%
A160 just West of Manby Roundabout	976	347	983	349	7	0.76%	2	0.58%
A180 - west of A160 Interchange	3,202	1,016	3,210	1,018	7	0.23%	2	0.20%

Link description	2021 Base PM Peak (Tot)	2021 Base HGVs (HGV)	2021 With OCGT Const. Traffic (Tot)	2021 With OCGT Const. Traffic HGV	Diff. Total Veh.	% Impact Total Veh.	Diff HGV	% Impact HGV
Manby Road - SE of Manby Roundabout	1,033	159	1,041	161	8	0.81%	2	1.01%

5.3.16 The tables show that the impact of construction traffic on all road sections fall below the threshold advised by Highways England of 30 veh/hr two-way. During the AM peak the highest additional 2-way traffic flow during the AM peak hour is 27 vehicles on Rosper Road (just south of the Site entrance) which then splits further at the Manby roundabout with 13 veh./hr to & from Manby Road (2-way) and 10 vehicles to/from the A160/A180 (2-way). Further assessment of the impact of the temporary construction traffic is therefore not justified.

Abnormal Loads

5.3.17 It is envisaged that there will be a small number of abnormal loads when the main plant items are delivered to the Site. Where possible, all abnormal loads from overseas will be brought in via the local ports. These deliveries would be timed to minimise disruption to other road users following consultation with the relevant local authorities.

5.3.18 A CTMP will be developed by the contractor, to route abnormal road traffic and the Highways England and Police will be consulted in its development.

5.3.19 Due to the location of the Site and its ease of access from local ports and from the main trunk roads and motorway network, it is considered that abnormal loads movements would not have an impact on highway network operations.

5.4 Operational Phase

5.4.1 Once operational there will be a maximum of approximately 15 permanent staff roles. Depending on the degree of integration with the Existing VPI CHP Plant, these may be new jobs or roles undertaken by personnel from the Existing VPI CHP Plant. Conservatively, assuming a car occupancy of 1, and all arriving by car, this equates to 15 cars per day (or 30 two-way vehicle movements spread over the whole day).

5.4.2 In addition, there will be a small amount of HGV traffic generated by deliveries of operational and maintenance plant and equipment. However this is expected to equate to a maximum of 3 HGVs per day. Fuel for the new power station will be natural gas imported to the Site via pipeline and there will be no vehicular movements associated directly with the transport of gas to the Site. Small quantities of back-up diesel would be delivered by road if refilling of storage tanks was required.

5.4.3 During planned outages for servicing and maintenance, additional specialist staff may be required to travel to the site for a period of up to a few months. However the numbers would be significantly less than the construction staff numbers.

5.4.4 Due to the very low traffic flows which result once the Proposed Development is first operational in 2022, the vehicle numbers generated will be significantly lower than experienced during the construction period and be well under the threshold of 30 2-way trips/hr. on any links. The overall effects during operation, maintenance and planned outages are therefore considered to be negligible and no further assessment would be justified.

5.5 Decommissioning Phase

5.5.1 The activities involved in the decommissioning process are not yet known in detail but in outline are presented in Chapter 4: The Proposed Development (ES Volume I). There would be expected to be some traffic movements associated with the removal (and recycling, as appropriate) of material arising from demolition and the import of materials for land restoration and re-instatement. However, vehicle numbers are not expected to be any higher than experienced during the construction period.

5.5.2 Current baseline data collected for the purposes of this assessment will not be valid at the year of decommissioning, which is currently unknown. The Proposed Development has a design life of 40 years and an expected operational life of at least 40 years. As it is unlikely that baseline traffic figures on local roads will reduce appreciably over the next forty years or so, it is considered that the percentage increase in traffic due to decommissioning would be negligible, and that overall the effects of decommissioning traffic would be no greater than that of the construction traffic detailed above. From a road capacity perspective the change from operational traffic to decommissioning traffic would not be anticipated to lead to any effect on road capacity.

6.0 HIGHWAY NETWORK ASSESSMENT

6.1 Assessment Framework

6.1.1 The section above has assessed the additional traffic resulting from the construction, operational and decommissioning phases of the Proposed Development. The section concluded that the additional traffic would not have a significant effect on the capacity of the surrounding links or junctions. Due to the relatively low number of additional vehicles from the Proposed Development that are anticipated during the AM and PM peak hour (less than 30 vehicles/hour 2-way), further junction assessment would not be justified. Nevertheless, for completeness, three junctions have been assessed to check that specific turning movements at the junctions would not be significantly affected and that the operation and capacity of the junctions remain acceptable. These three junctions are:

- Site accesses on Rosper Road (T-junctions); and
- Manby Roundabout.

6.1.2 The junctions are the closest key junctions affected by the temporary construction traffic and were suggested by NEL as requiring modelling in their initial scoping response. Subsequent traffic assessment has shown that the traffic increases at the Manby Road junction are below the thresholds usually adopted for further traffic assessment.

6.1.3 The PICADY and ARCADY programmes are industry standard tools for predicting capacities, queues and delays at major/minor priority and roundabout junctions respectively. These programmes were used to assess the site accesses (Site Accesses / Rosper Road T-junction) and the Manby Roundabout junction for the AM and PM peak hours. For the purpose of traffic flows at each site access the worst case of all construction traffic using both accesses was assumed.

6.1.4 The years assessed were the peak of construction (2021). Given the very low operation flows (from only 15 staff), further future year scenarios are not considered justified beyond 2021.

6.2 Committed Developments

6.2.1 There are three committed developments identified along Rosper Road which are likely to affect traffic flows on Rosper Road. These are :-

- Marsh Lane Car Storage and Distribution Facility (Able Humber Ports Ltd.);
- The North Killingholme Power Project (C.GEN Killingholme Limited); and
- Able Marine Energy Park (AMEP).

6.2.2 By 2021 the car storage development is likely to be operational and the operational traffic flows forecast for the development have therefore been used in this assessment.

6.2.3 The worst case for the North Killingholme Power Project would be that the peak of construction overlaps the peak of construction for the Proposed Development.

6.2.4 Construction of the Able Marine Energy Park has not started yet and the timescales for construction are unknown. However, based on the consultation advice of NLC it is assumed that there could be an overlap between the construction of the Able Marine

Energy Park and construction of the Proposed Development. This is what has been assumed in this Traffic Assessment.

6.2.5 The forecast traffic flows and distribution for the above scenarios have been obtained from the relevant submitted Transport Assessment Reports and ES Reports which supported the applications. The resulting committed development traffic flows for the AM and PM peak hours are provided in Figures 7A.5 to 7A.6 in Annex 3.

6.3 Future Network Performance

6.3.1 In order to factor the base 2016 and 2018 traffic flows to 2021 and 2022, traffic growth factors have been calculated using the National Trip End Model (NTEM) for North Lincolnshire Council (NLC) district and adjusting the local factors determined from TEMPRO v7.2 using NLC district v7.2 dataset. Growth projections were based on "all" road types. The TEMPRO factors were provided in Section 5 above in Table 7A.8.

6.3.2 By 2021 a number of committed developments are likely to be operational and these committed traffic flows have also been added to produce the worst case (highest traffic flows) for the junction modelling work.

6.3.3 The resultant traffic flows are shown in Figures 7A.1 to 7A.10 in Annex 3 at the end of this report. Full PICADY and ARCADY outputs are included in Annex 4 and Annex 5.

6.4 Site Accesses / Rosper Road Junction Assessment

6.4.1 The existing Site Access junctions serve the existing TLOR facility (northern access) and the Existing VPI CHP Plant (southern site access) which is located just north of the Marsh Lane. The junctions have been assessed for the following scenarios :

- 2021 Base Flows + Committed Development (worst case) – AM PEAK
- 2021 Base Flows + Committed Development (worst case) – PM PEAK
- 2021 Base Flows + Committed Development (worst case) + OCGT Peak Construction traffic – AM PEAK
- 2021 Base Flows + Committed Development (worst case) + OCGT Peak Construction traffic – PM PEAK

6.4.2 The existing junctions have a good accident record with no recorded accidents within the 5 year accident period discussed earlier. The main movements into and out of the junctions are the left turn in and the right turn out. This pattern of traffic flows would continue for OCGT traffic using the junctions to service the Proposed Development.

6.4.3 Tables 7A.14 and 7A.15 show that the Site Access junctions would operate well within capacity even after allowing for all committed development traffic. Queues and delays at the junction would be negligible for all scenarios – AM and PM peak.

Table 7A.14 PICADY Results 2021, Rosper Road / Site Accesses with Committed Development

	AM		PM	
	Max RFC	Max Queue	Max RFC	Max Queue
Site Access (Left & Right Turn Out)	0.000	0.0	0.040	0.0
Rosper Road South (S)	0.000	0.0	0.000	0.0
Rosper Road North (N)	0.010	0.0	0.000	0.0

Table 7A.15 PICADY Results 2021, Rosper Road / Site Accesses with Committed Development and OCGT Construction Traffic

	AM		PM	
	Max RFC	Max Queue	Max RFC	Max Queue
Site Access (Left & Right Turn Out)	0.030	0.0	0.100	0.1
Rosper Road South (S)	0.000	0.0	0.000	0.0
Rosper Road North (N)	0.020	0.0	0.000	0.0

Manby Roundabout

6.4.4 Observations at the existing junction during the AM and PM peak showed that the junction operates within capacity with minimum queues and delays on all approaches. Any intermittent short queues are of very short duration and clear within a minute or two which indicates that the junction is operating under capacity.

6.4.5 Tables 7A.16 to 7A.17 show the results of the ARCADY assessments for the recently improved roundabout junction for 2021 with and without construction traffic from the Proposed Development. The assessment allows for the worst case of committed developments and the results indicate that the additional construction traffic will not have a material impact on the junction operation or capacity.

Table 7A.16 – ARCADY Results 2021 – Manby Roundabout with Committed Developments

Arm	AM		PM	
	Max RFC	Max Queue	Max RFC	Max Queue
A160 (E)	0.400	0.70	0.640	1.80
A1173 Manby Road	0.500	1.00	0.280	0.40
A160 (W)	0.630	1.70	0.480	0.90

Table 7A.17 - ARCADY Results 2021 – Manby Roundabout with Committed Developments and Temporary OCGT Construction Traffic

Arm	AM		PM	
	Max RFC	Max Queue	Max RFC	Max Queue
A160 (E)	0.400	0.70	0.650	1.80
A1173 Manby Road	0.500	1.00	0.290	0.40
A160 (W)	0.640	1.80	0.490	0.90

6.4.6 In summary, the ARCADY results show that the additional traffic associated with the construction phase of the Proposed Development would have a negligible effect on the turning movements. Comparing the findings in Tables 7A.16 (without Proposed Development) and 7A.17 (with construction phase of Proposed Development) it can be seen that additional queues are all forecast to be less than 1 vehicle. In summary the junction would continue to operate well within capacity for the AM and PM Peak hours through the worst case future scenarios in 2021. Once the Proposed Development is operational traffic flows would be even lower.

6.4.7 For the decommissioning phase the associated traffic flows are not expected to be any higher than those experienced during the construction period. Current baseline data collected for the purposes of this assessment will not be valid at the year of decommissioning, which is currently unknown. However, as it is unlikely that baseline traffic figures on local roads will reduce over the next 40 years or more, it is considered that the percentage increase in traffic due to decommissioning would be no more than for construction.

7.0 SUMMARY AND CONCLUSIONS

7.1 Summary

7.1.1 AECOM Infrastructure and Environment Ltd (AECOM) has been commissioned by VPI Immingham B Limited ('VPIB' or 'the Applicant') to prepare this Transport Assessment (TA) to accompany a Development Consent Order (DCO) for a new gas-fired power station on land to the north of the existing VPI Immingham Power Station, Rosper Road, South Killingholme, North Lincolnshire, DN40 3DZ.

7.1.2 VPIB is seeking development consent for the construction, operation and maintenance of a new gas-fired electricity generating station with a gross output capacity of up to 299 megawatts ('MW'), including electrical and gas supply connections, and other associated development (the 'Proposed Development').The construction programme is forecast to be 21 months (24 months including commissioning) with peak construction traffic flows occurring in Q1 of 2021.

7.1.3 Access to the Site would be by way of the existing access into the Lindsey Oil Refinery site from Rosper Road. Access is also required from Rosper Road into the Existing VPI CHP Plant Site utilising an existing access.

7.1.4 The additional traffic flows resulting from the Proposed Development have been calculated for the peak construction months based on construction staff numbers provided by OEMs that are also consistent with other similar recent OCGT development proposals.

7.1.5 The additional construction traffic has been assessed for the peak construction year of 2021 by using 2021 baseline traffic flows which have allowed for both background traffic growth (using TEMPRO 7.2 growth factors) and the additional traffic flows resulting from other known committed developments. The worst case scenario for committed development traffic was used which assumed peak construction traffic for the North Killingholme Power Project (C.GEN Killingholme Limited) committed development.

7.1.6 Based on advice by HE, the Proposed Development would not generate vehicle trips above the HE threshold of 30 veh./hr (2-way) on any of the surrounding roads during the AM and PM peak hours, or any other hours.

7.1.7 The environmental effects of the additional traffic from the Proposed Development have been assessed based on the IEMA guidelines in the Chapter 7: Traffic and Transport (ES Volume I). All road links were found to experience negligible significance.

7.1.8 The Applicant is committed to implementing a Construction Worker Travel Plan (CWTP) and a Construction Traffic Management Plan (CTMP). The package of measures associated with the construction and operation of the development will encourage journeys to / from the site to be made by alternatives to the private car, and the development of the CWTP will ensure that staff and visitors have access to car sharing and minibus opportunities, that are reflective of their travel requirements. A Framework Construction Worker Travel Plan is included as Appendix 7B (ES Volume III).

7.2 Conclusion

7.2.1 It is concluded that the Proposed Development is acceptable in highways and transportation terms. There are no highways or transportation related reasons upon

which a refusal of the application for DCO for the Proposed Development would be justified.

8.0 REFERENCES

Ref 7A-1 Department for Energy and Climate Change (2011) *National Policy Statement for Energy (EN-1)*

Ref 7A-2 Department for Energy and Climate Change (2011) *National Policy Statement for Fossil Fuel Electricity Generating Infrastructure (EN-2).*

Ref 7A-3 Ministry of Housing, Communities and Local Government (2018) *National Planning Policy Framework*

Ref 7A-4 Ministry of Housing, Communities and Local Government (2014) Planning Practice Guidance, (2014) *Travel Plans, Transport Assessment and Statements.* [Available at: https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements accessed October 2018]

Ref 7A-5 Institute of Environmental Management & Assessment (IEMA) (1993) *Guidelines for the Environmental Assessment of Road Traffic.*

Ref 7A-6 Department for Transport (2013) *Circular 02/2013 – The Strategic Road Network and the Delivery of Sustainable Development*

Ref 7A-7 Highways England (2015) *The Strategic Road Network: Planning for the Future – A guide to working with Highways England on Planning Matters*

Ref 7A-8 Department for Communities and Local Government (2011) *Planning Policy Guidance 13: Transport*

Ref 7A-9 Chartered Institute of Highways and Transportation (2000) Providing for Journeys on Foot

Ref 7A-10 Planning Practice Guidance (2014) *Travel Plans, Transport Assessment and Statements in decision-taking*

Ref 7A-11 Crashmap website *(www.crashmap.co.uk)*

Ref 7A-12 North East Lincolnshire Council (2018) Local Plan North East Lincolnshire 2013 to 2032

Ref 7A-13 Department for Transport (DfT) Technical Advice Note 79/99 Determination of Urban Road Capacity

ANNEX 1 LOCATION PLAN AND ROAD NETWORK

THIS DRAWING IS TO BE USED ONLY FOR THE PURPOSE OF ISSUE THAT IT WAS ISSUED FOR AND IS SUBJECT TO AMENDMENT

LEGEND

Order Limits

Purpose of Issue
ENVIRONMENTAL STATEMENT

Client
VPI IMMINGHAM B LTD

Project Title
THE VPI IMMINGHAM OCGT PROJECT

Drawing Title
ROAD NETWORK

Drawn	Checked	Approved	Date
JW	DH	MS	05/04/2019

AECOM Internal Project No.	Scale @ A3	Inset Map
60547702	1:30,000	/ 1:200,000

AECOM
Midpoint
Alencon Link, Basingstoke
Hampshire, RG21 7PP
Telephone (01256) 310200
Fax (01256) 310201
www.aecom.com

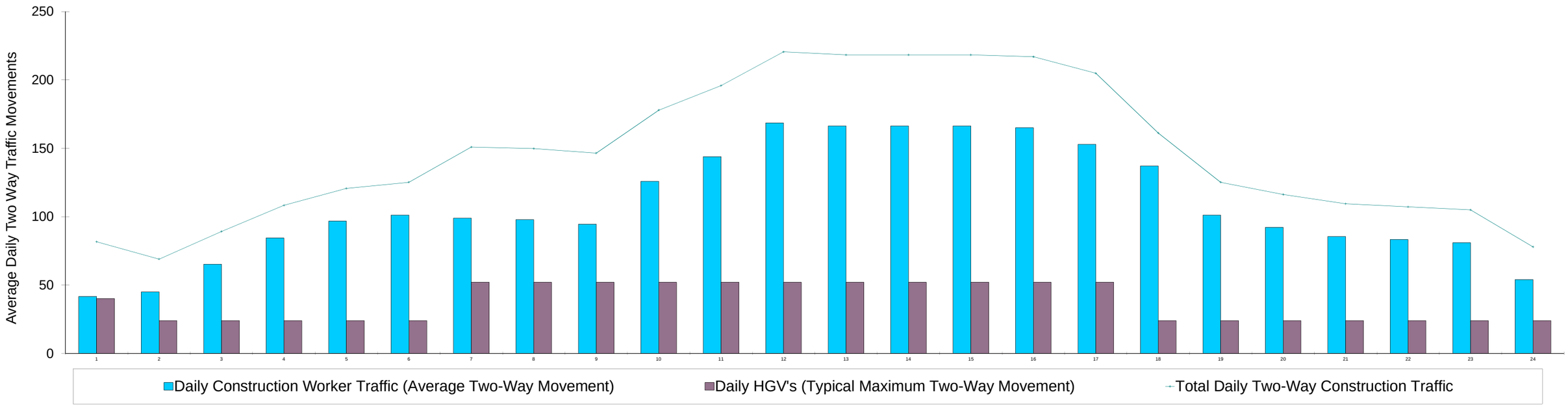
DCO Document Ref:
6.3.5

Rev

File Name:K:\5004 - Information Systems\60547702 Immingham Gas Pipeline\02_Maps\Power Plant Site\OCGT Full ES 2019\Traffic and Transport\Figure 7.1 Road Network.mxd

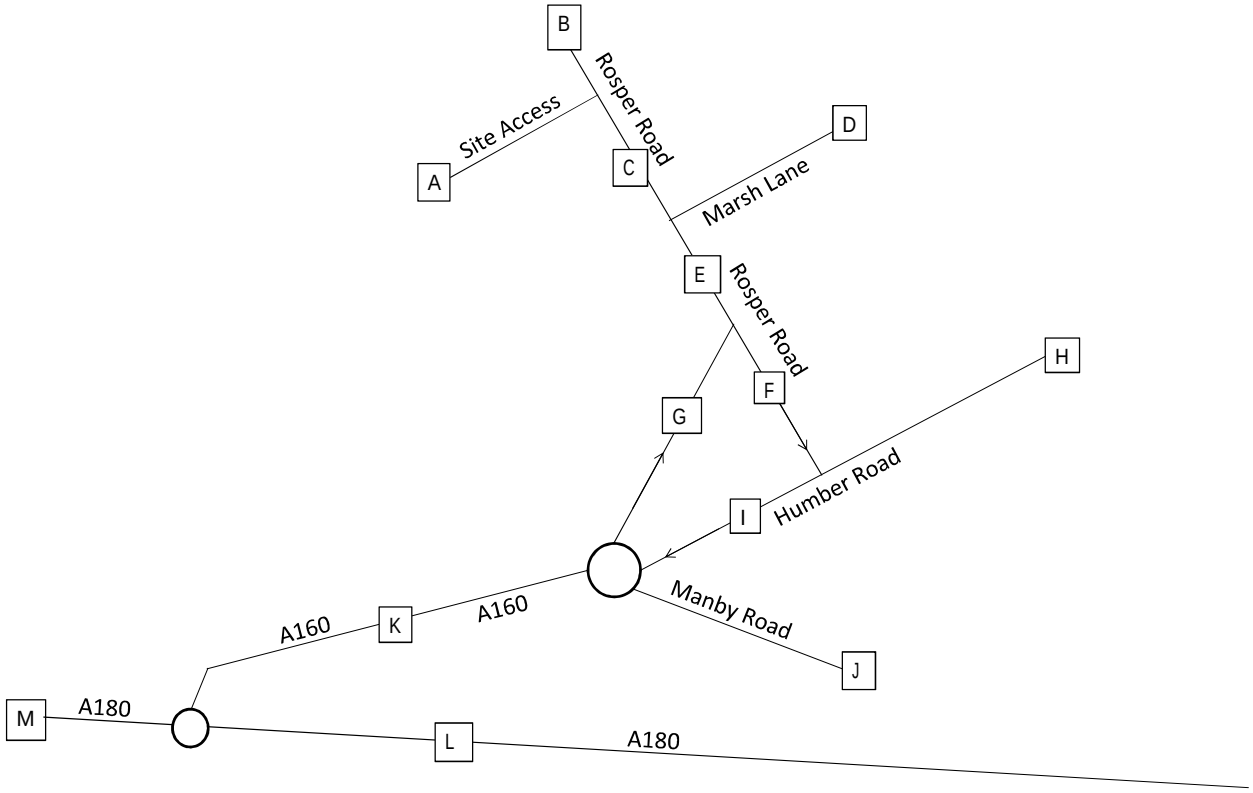
ANNEX 2: PROFILE OF CONSTRUCTION TRAFFIC

Description	Month of Construction																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
OCGT Site Preparation																								
OCGT Main Civils Work																								
OCGT Plant Installation																								
OCGT Gas & Electrical Connections																								
OCGT Commisioning																								
Typical Daily CCGT Construction Workforce in Month	37	40	58	75	86	90	88	87	84	112	128	150	148	148	148	146	136	122	90	82	76	74	72	48
Typical Daily Construction Worker Private Car (Inbound)(Based on 1.5 per vehicle)	20	21	31	40	46	48	47	46	45	60	68	80	79	79	79	78	73	65	48	44	41	39	38	26
Typical Daily Construction Worker Private Car (Outbound)(Based on 1.5 per vehicle)	20	21	31	40	46	48	47	46	45	60	68	80	79	79	79	78	73	65	48	44	41	39	38	26
Typical Daily Construction Worker Minibus (Inbound) (Based on 7.0 per vehicle)	1	1	2	2	2	3	3	2	2	3	4	4	4	4	4	4	4	3	3	2	2	2	2	1
Typical Daily Construction Worker Minibus (Outbound) (Based on 7.0 per vehicle)	1	1	2	2	2	3	3	2	2	3	4	4	4	4	4	4	4	3	3	2	2	2	2	1
Typical Maximum Daily HGV Trafic in Month (Inbound)	20	12	12	12	12	12	26	26	26	26	26	26	26	26	26	26	26	12	12	12	12	12	12	12
Typical Maximum Daily HGV Trafic in Month (Outbound)	20	12	12	12	12	12	26	26	26	26	26	26	26	26	26	26	26	12	12	12	12	12	12	12
Daily Construction Worker Traffic (Average Two-Way Movement)	42	45	65	84	97	101	99	98	94	126	144	169	166	166	166	165	153	137	101	92	85	83	81	54
Daily HGV's (Typical Maximum Two-Way Movement)	40	24	24	24	24	24	52	52	52	52	52	52	52	52	52	52	52	24	24	24	24	24	24	24
Total Daily Two-Way Construction Traffic	**82**	**69**	**89**	**108**	**121**	**125**	**151**	**150**	**146**	**178**	**196**	**221**	**218**	**218**	**218**	**217**	**205**	**161**	**125**	**116**	**109**	**107**	**105**	**78**



VPI IMMINGHAM - 'B' OPEN CYCLE GAS TURBINE: PROFILE OF CONSTRUCTION TRAFFIC (TWO-WAY TRIPS)

ANNEX 3: TRAFFIC FLOW DIAGRAMS



2018 AM Peak Base Year - Total Vehicles (0715-0815)

	A	B	C	Tot
A	0	2	0	2
B	2	0	230	232
C	11	395	0	406
Tot	13	397	230	640

	C	D	E	Tot
C	0	6	224	230
D	7	0	8	15
E	399	8	0	407
Tot	406	14	232	652

	E	F	G	Tot
E	0	232	0	232
F	0	0	0	0
G	407	302	0	709
Tot	407	534	0	941

	F	H	I	Tot
F	0	325	209	534
H	0	0	89	89
I	0	0	0	0
Tot	0	325	298	623

	K	L	M	Tot
K	0	68	496	564
L	375	0	877	1251
M	591	1376	0	1967
Tot	966	1444	1373	3782

	G	I	J	K	Tot
G	0	0	0	0	0
I	23	0	59	216	298
J	370	0	2	263	635
K	316	0	258	17	591
Tot	709	0	319	496	1524

2018 AM Peak Base Year - HGVs (0715-0815)

	A	B	C	Tot
A	0	0	0	0
B	0	0	54	54
C	0	66	0	66
Tot	0	66	54	120

	C	D	E	Tot
C	0	0	54	54
D	0	0	0	0
E	66	0	0	66
Tot	66	0	54	120

	E	F	G	Tot
E	0	54	0	54
F	0	0	0	0
G	66	176	0	242
Tot	66	231	0	296

	F	H	I	Tot
F	0	194	36	230.81
H	0	0	207	207
I	0	0	0	0
Tot	0	194	243	437

	K	L	M	Tot
K	0	6	255	261
L	32	0	190	221
M	347	254	0	601
Tot	379	254	445	1077

	G	I	J	K	Tot
G	0	0	0	0	0
I	18	0	32	193	243
J	64	0	0	46	110
K	160	0	41	16	217
Tot	242	0	73	255	570

2018 AM Peak Base Year - % HGVs

	A	B	C	Tot
A	-	0%	0%	0%
B	0%	-	24%	23%
C	0%	17%	-	16%
Tot	0%	17%	24%	19%

	C	D	E	Tot
C	-	0%	24%	24%
D	0%	-	0%	0%
E	16%	0%	-	16%
Tot	16%	0%	23%	18%

	E	F	G	Tot
E	-	23%	0%	23%
F	0%	-	0%	0%
G	16%	58%	-	34%
Tot	16%	43%	0%	32%

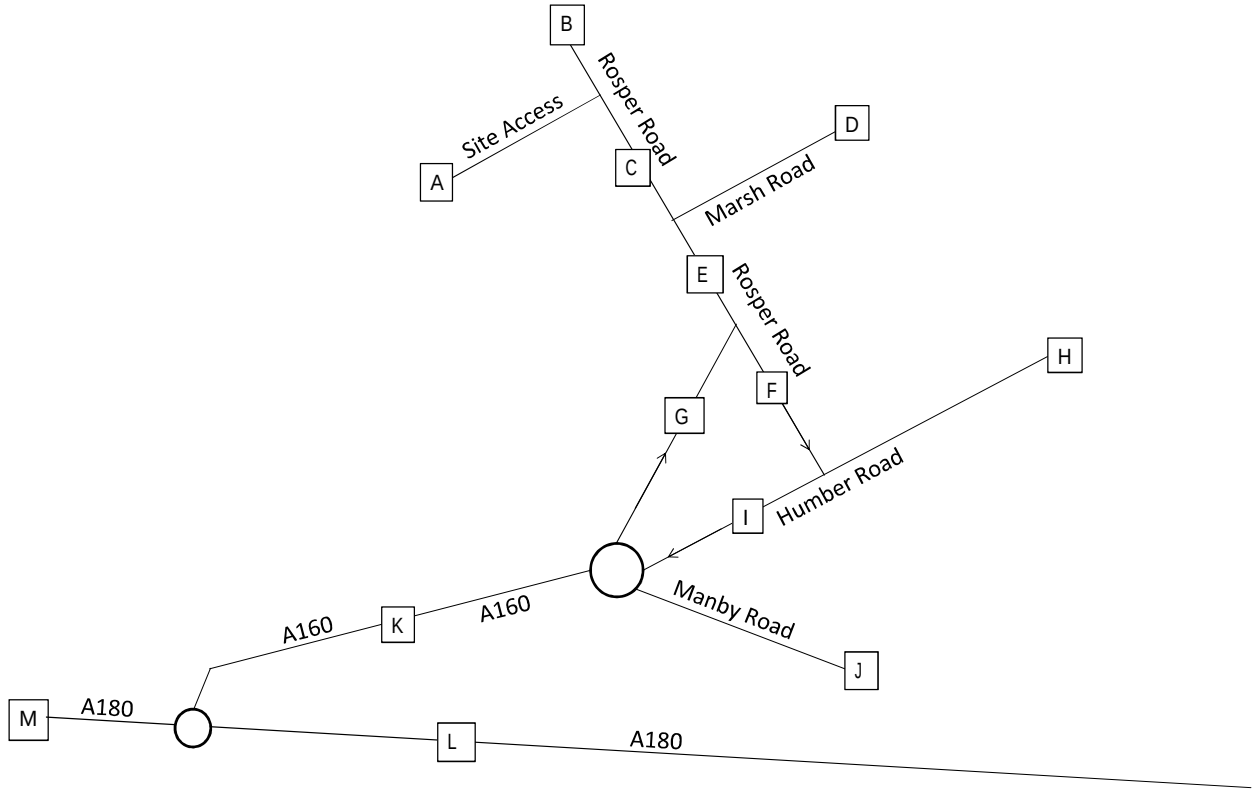
	F	H	I	Tot
F	-	60%	17%	43%
H	0%	-	231%	231%
I	0%	0%	-	0%
Tot	0%	60%	82%	70%

	K	L	M	Tot
K	0%	9%	51%	46%
L	9%	0%	22%	18%
M	59%	18%	0%	31%
Tot	39%	18%	32%	28%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	78%	0%	54%	89%	82%
J	17%	0%	0%	17%	17%
K	51%	0%	16%	94%	37%
Tot	34%	0%	23%	51%	37%

Figure 7A.1 - 2018 AM Base Peak Hour

Key : 347 - Estimated Turning Flow from ATC Data



2018 PM Peak Base Year - Total Vehicles (1600-1700)

	A	B	C	Tot
A	0	2	12	14
B	0	0	350	350
C	2	182	0	184
Tot	2	184	362	548

	C	D	E	Tot
C	0	1	361	362
D	1	0	11	12
E	183	12	0	195
Tot	184	13	372	569

	E	F	G	Tot
E	0	372	0	372
F	0	0	0	0
G	195	107	0	302
Tot	195	479	0	674

	F	H	I	Tot
F	0	133	346	479
H	0	0	262	262
I	0	0	0	0
Tot	0	133	608	741

	K	L	M	Tot
K	0	225	527	752
L	142	0	1209	1351
M	406	919	0	1325
Tot	548	1145	1736	3429

	G	I	J	K	Tot
G	0	0	0	0	0
I	26	0	330	252	608
J	118	0	17	266	401
K	158	0	239	9	406
Tot	302	0	586	527	1415

2018 PM Peak Base Year - HGVs (1600-1700)

	A	B	P	Tot
A	0	0	0	0
B	0	0	68	68
P	0	66	0	66
Tot	0	66	68	134

	C	D	E	Tot
C	0	0	68	68
D	0	0	0	0
E	66	0	0	66
Tot	66	0	68	134

	E	F	G	Tot
E	0	68	0	68
F	0	0	0	0
G	66	101	0	167
Tot	66	169	0	235

	F	H	I	Tot
F	0	116	53	168.68
H	0	0	160	160
I	0	0	0	0
Tot	0	116	213	329

	K	L	M	Tot
K	0	11	318	329
L	11	0	228	239
M	235	190	0	425
Tot	246	201	546	994

	G	I	J	K	Tot
G	0	0	0	0	0
I	15	0	63	135	213
J	24	0	1	33	58
K	128	0	37	7	172
Tot	167	0	101	175	443

2018 PM Peak Base Year - % HGVs

	A	B	P	Tot
A	-	0%	0%	0%
B	0%	-	19%	19%
P	0%	36%	-	36%
Tot	0%	36%	19%	24%

	C	D	E	Tot
C	-	0%	19%	19%
D	0%	-	0%	0%
E	36%	0%	-	34%
Tot	36%	0%	18%	23%

	E	F	G	Tot
E	-	18%	0%	18%
F	0%	-	0%	0%
G	34%	94%	-	55%
Tot	34%	35%	0%	35%

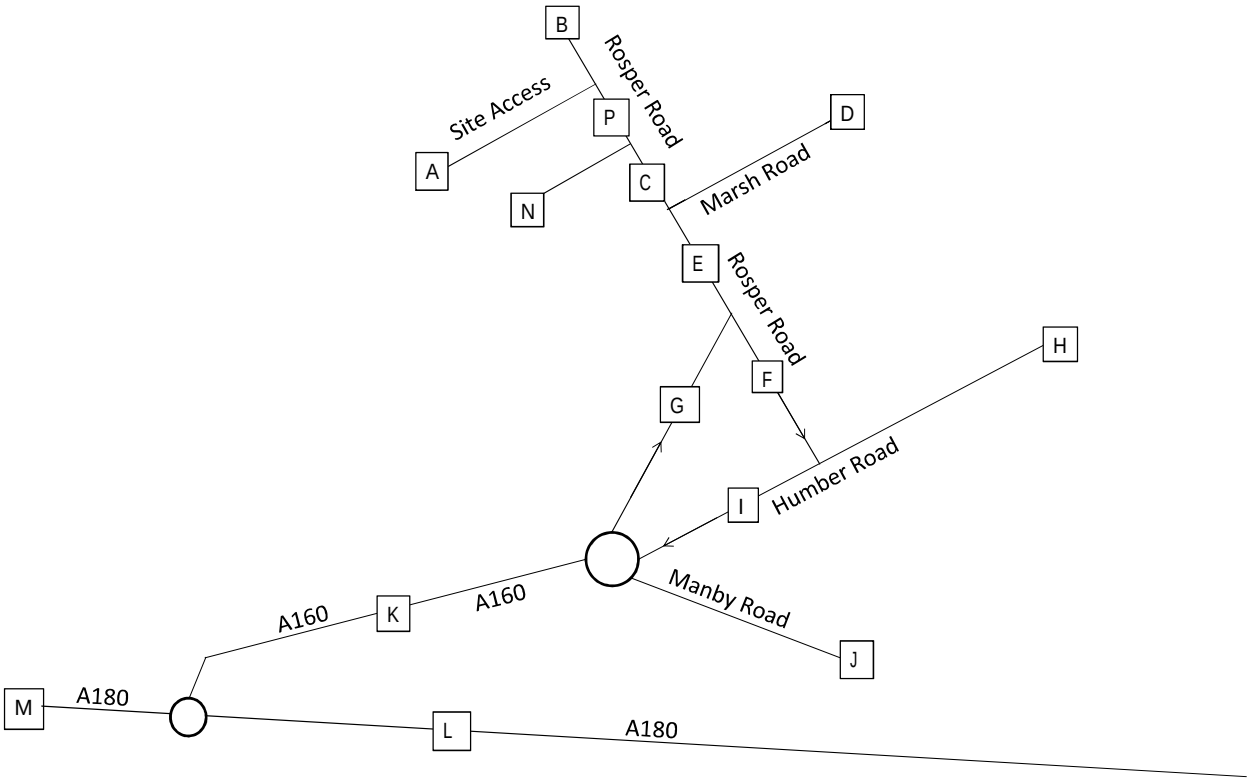
	F	H	I	Tot
F	-	87%	15%	35%
H	0%	-	61%	61%
I	0%	0%	-	0%
Tot	0%	87%	35%	44%

	K	L	M	Tot
K	0%	0%	60%	44%
L	0%	0%	0%	0%
M	58%	0%	0%	32%
Tot	45%	0%	31%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	58%	0%	19%	54%	35%
J	20%	0%	6%	12%	14%
K	81%	0%	15%	78%	42%
Tot	55%	0%	17%	33%	31%

Figure 7A.2 - 2018 PM Base Peak Hour

Key : 347 - Estimated Turning Flow from ATC Data



2021 AM Peak Base Year - Total Vehicles (0715-0815)

	A	B	P	Tot
A	0	2	0	2
B	2	0	241	243
P	12	414	0	425
Tot	14	416	241	670

	C	D	E	Tot
C	0	6	234	241
D	7	0	8	16
E	418	8	0	426
Tot	425	15	243	683

	E	F	G	Tot
E	0	243	0	243
F	0	0	0	0
G	426	316	0	743
Tot	426	559	0	985

	F	H	I	Tot
F	0	340	219	559
H	0	0	94	94
I	0	0	0	0
Tot	0	340	312	653

	K	L	M	Tot
K	0	71	520	591
L	392	0	918	1311
M	619	1441	0	2060
Tot	1011	1512	1438	3961

	G	I	J	K	Tot
G	0	0	0	0	0
I	24	0	62	226	312
J	388	0	2	275	665
K	331	0	270	18	619
Tot	743	0	334	520	1596

	C	N	P	Tot
C	0	0	425	425
N	0	0	0	0
P	241	0	0	241
Tot	241	0	425	666

2021 AM Peak Base Year - HGVs (0715-0815)

	A	B	P	Tot
A	0	0	0	0
B	0	0	54	54
P	0	66	0	66
Tot	0	66	54	120

	C	D	E	Tot
C	0	0	54	54
D	0	0	0	0
E	66	0	0	66
Tot	66	0	54	120

	E	F	G	Tot
E	0	54	0	54
F	0	0	0	0
G	66	176	0	242
Tot	66	231	0	296

	F	H	I	Tot
F	0	194	36	230.81
H	0	0	207	207
I	0	0	0	0
Tot	0	194	243	437

	K	L	M	Tot
K	0	6	267	273
L	33	0	199	232
M	363	266	0	629
Tot	397	272	466	1135

	G	I	J	K	Tot
G	0	0	0	0	0
I	18	0	32	193	243
J	64	0	0	46	110
K	160	0	41	16	217
Tot	242	0	73	255	570

	C	N	P	Tot
C	0	0	66	66
N	0	0	0	0
P	54	0	0	54
Tot	54	0	66	120

2021 AM Peak Base Year - % HGVs

	A	B	P	Tot
A	-	0%	0%	0%
B	0%	-	23%	22%
P	0%	16%	-	15%
Tot	0%	16%	23%	18%

	C	D	E	Tot
C	-	0%	23%	23%
D	0%	-	0%	0%
E	16%	0%	-	15%
Tot	15%	0%	22%	18%

	E	F	G	Tot
E	-	22%	0%	22%
F	0%	-	0%	0%
G	15%	56%	-	33%
Tot	15%	41%	0%	30%

	F	H	I	Tot
F	-	57%	17%	41%
H	0%	-	221%	221%
I	0%	0%	-	0%
Tot	0%	57%	78%	67%

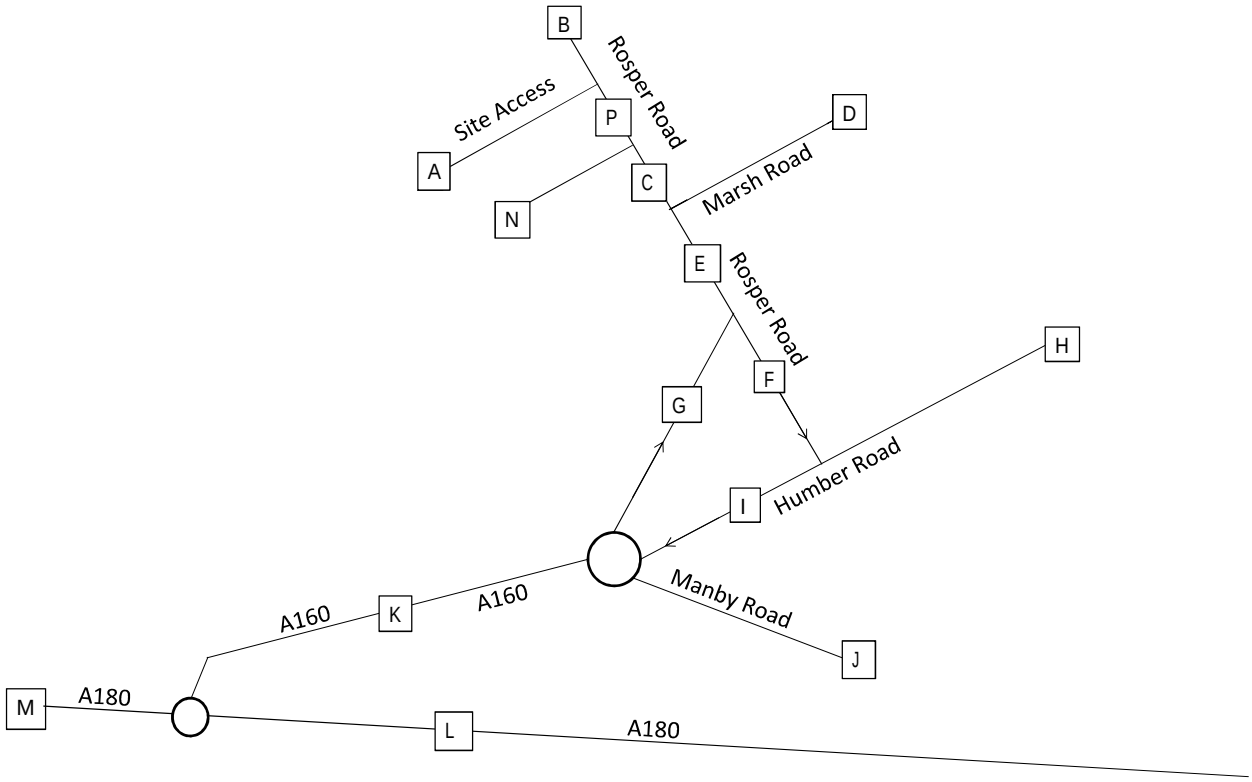
	K	L	M	Tot
K	0%	9%	51%	46%
L	9%	0%	22%	18%
M	59%	18%	0%	31%
Tot	39%	18%	32%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	75%	0%	52%	85%	78%
J	17%	0%	0%	17%	17%
K	48%	0%	15%	90%	35%
Tot	33%	0%	22%	49%	36%

	C	N	P	Tot
C	0%	0%	15%	15%
N	0%	0%	0%	0%
P	23%	0%	0%	23%
Tot	23%	0%	15%	18%

Figure 7A.3 - 2021 AM Base Peak Hour

Key : 347 - Estimated Turning Flow from ATC Data



2021 PM Peak Base Year - Total Vehicles (1600-1700)

	A	B	P	Tot
A	0	2	13	15
B	0	0	366	366
P	2	190	0	192
Tot	2	192	379	573

	C	D	E	Tot
C	0	1	378	379
D	1	0	12	13
E	191	13	0	204
Tot	192	14	389	595

	E	F	G	Tot
E	0	389	0	389
F	0	0	0	0
G	204	112	0	316
Tot	204	501	0	705

	F	H	I	Tot
F	0	139	362	501
H	0	0	274	274
I	0	0	0	0
Tot	0	139	636	775

	K	L	M	Tot
K	0	236	551	787
L	149	0	1265	1413
M	425	962	0	1386
Tot	573	1197	1816	3587

	G	I	J	K	Tot
G	0	0	0	0	0
I	27	0	345	264	636
J	123	0	18	278	419
K	165	0	250	9	425
Tot	316	0	613	551	1480

	C	N	P	Tot
C	0	0	192	192
N	0	0	0	0
P	379	0	0	379
Tot	379	0	192	571

2021 PM Peak Base Year - HGVs (1600-1700)

	A	B	P	Tot
A	0	0	0	0
B	0	0	68	68
P	0	66	0	66
Tot	0	66	68	134

	C	D	E	Tot
C	0	0	68	68
D	0	0	0	0
E	66	0	0	66
Tot	66	0	68	134

	E	F	G	Tot
E	0	68	0	68
F	0	0	0	0
G	66	101	0	167
Tot	66	169	0	235

	F	H	I	Tot
F	0	116	53	168.68
H	0	0	160	160
I	0	0	0	0
Tot	0	116	213	329

	K	L	M	Tot
K	0	12	332	344
L	12	0	239	250
M	246	199	0	445
Tot	257	211	571	1039

	G	I	J	K	Tot
G	0	0	0	0	0
I	15	0	63	135	213
J	24	0	1	33	58
K	128	0	37	7	172
Tot	167	0	101	175	443

	C	N	P	Tot
C	0	0	66	66
N	0	0	0	0
P	68	0	0	68
Tot	68	0	66	134

2021 PM Peak Base Year - % HGVs

	A	B	P	Tot
A	-	0%	0%	0%
B	0%	-	18%	18%
P	0%	35%	-	34%
Tot	0%	34%	18%	23%

	C	D	E	Tot
C	-	0%	18%	18%
D	0%	-	0%	0%
E	34%	0%	-	32%
Tot	34%	0%	17%	22%

	E	F	G	Tot
E	-	17%	0%	17%
F	0%	-	0%	0%
G	32%	90%	-	53%
Tot	32%	34%	0%	33%

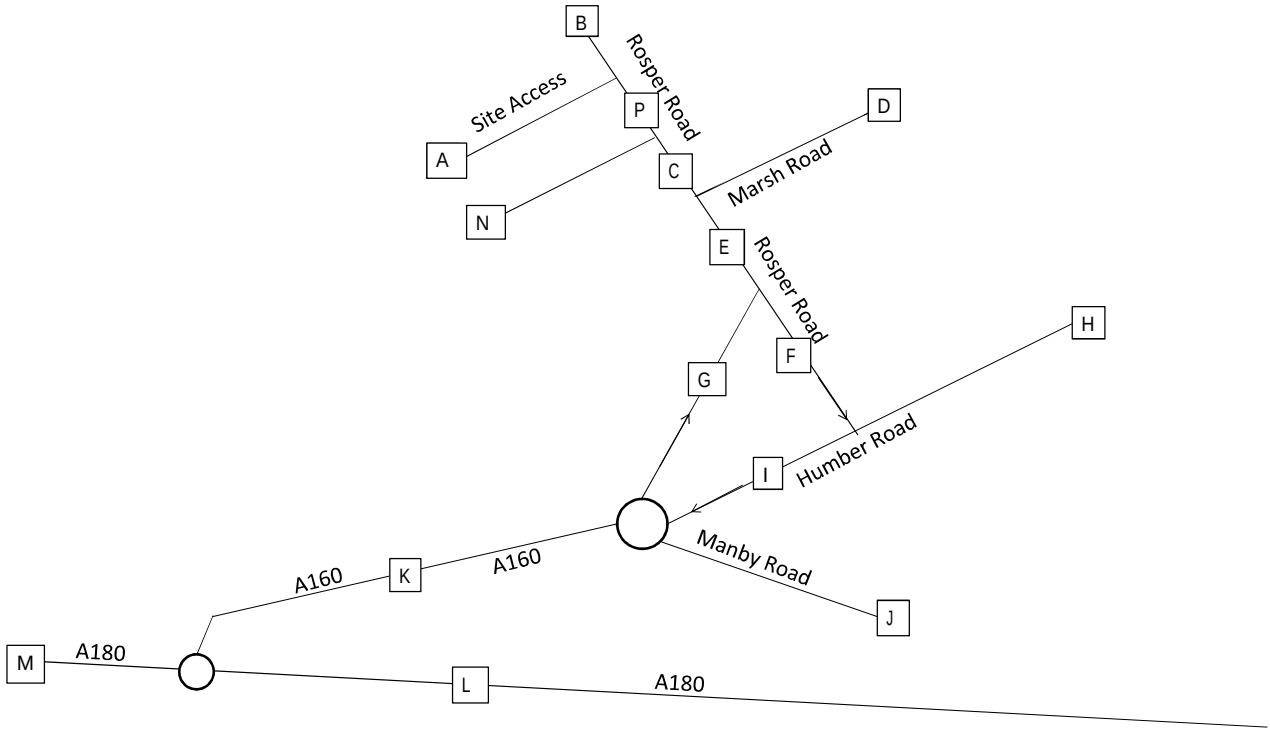
	F	H	I	Tot
F	-	83%	15%	34%
H	0%	-	59%	59%
I	0%	0%	-	0%
Tot	0%	83%	33%	42%

	K	L	M	Tot
K	0%	5%	60%	44%
L	8%	0%	19%	18%
L	58%	21%	0%	32%
Tot	45%	18%	31%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	55%	0%	18%	51%	33%
J	19%	0%	6%	12%	14%
K	77%	0%	15%	74%	40%
Tot	53%	0%	16%	32%	30%

Figure 7A.4 - 2021 PM Base Peak Hour

Key : 347 - Estimated Turning Flow from ATC Data



AM Total Committed Dev Trips

	A	B	P	Tot
A	0	1	0	1
B	4	0	98	102
P	1	69	0	70
Tot	5	70	98	173

	C	D	E	Tot
C	0	78	20	98
D	7	0	9	16
E	63	81	0	144
Tot	70	159	29	258

	E	F	G	Tot
E	0	29	0	29
F	0	0	0	0
G	144	0	0	144
Tot	144	29	0	173

	F	H	I	Tot
F	0	6	23	29
H	0	0	78	78
I	0	0	0	0
Tot	0	6	101	107

	K	L	M	Tot
K	0	0	23	23
L	0	0	0	0
M	254	0	0	254
Tot	254	0	23	277

	G	I	J	K	Tot
G	0	0	0	0	0
I	78	0	0	23	101
J	21	0	0	108	129
K	45	0	1	0	46
Tot	144	0	1	131	276

	C	N	P	Tot
C	0	0	70	70
N	0	0	0	0
P	98	0	0	98
Tot	98	0	70	168

AM Total Committed Devs - HGV Trips

	A	B	P	Tot
A	0	0	0	0
B	0	0	20	20
P	1	62	0	63
Tot	1	62	20	83

	C	D	E	Tot
C	0	0	20	20
D	0	0	2	2
E	63	2	0	65
Tot	63	2	22	87

	E	F	G	Tot
E	0	22	0	22
F	0	0	0	0
G	65	0	0	65
Tot	65	22	0	87

	F	H	I	Tot
F	0	0	22	22
H	0	0	0	0
I	0	0	0	0
Tot	0	0	22	22

	K	L	M	Tot
K	0	0	22	22
L	0	0	0	0
M	44	0	0	44
Tot	44	0	22	66

	G	I	J	K	Tot
G	0	0	0	0	0
I	0	0	0	22	22
J	21	0	0	0	21
K	44	0	0	0	44
Tot	65	0	0	22	87

	C	N	P	Tot
C	0	0	63	63
N	0	0	0	0
P	20	0	0	20
Tot	20	0	63	83

AM Total Comm Devs - % HGVs

	A	B	P	Tot
A	0%	0%	0%	0%
B	0%	0%	20%	20%
P	0%	90%	0%	90%
Tot	0%	89%	20%	48%

	C	D	E	Tot
C	0%	0%	100%	20%
D	0%	0%	22%	13%
E	100%	2%	0%	45%
Tot	90%	1%	76%	34%

	E	F	G	Tot
E	0%	76%	0%	76%
F	0%	0%	0%	0%
G	45%	0%	0%	45%
Tot	45%	76%	0%	50%

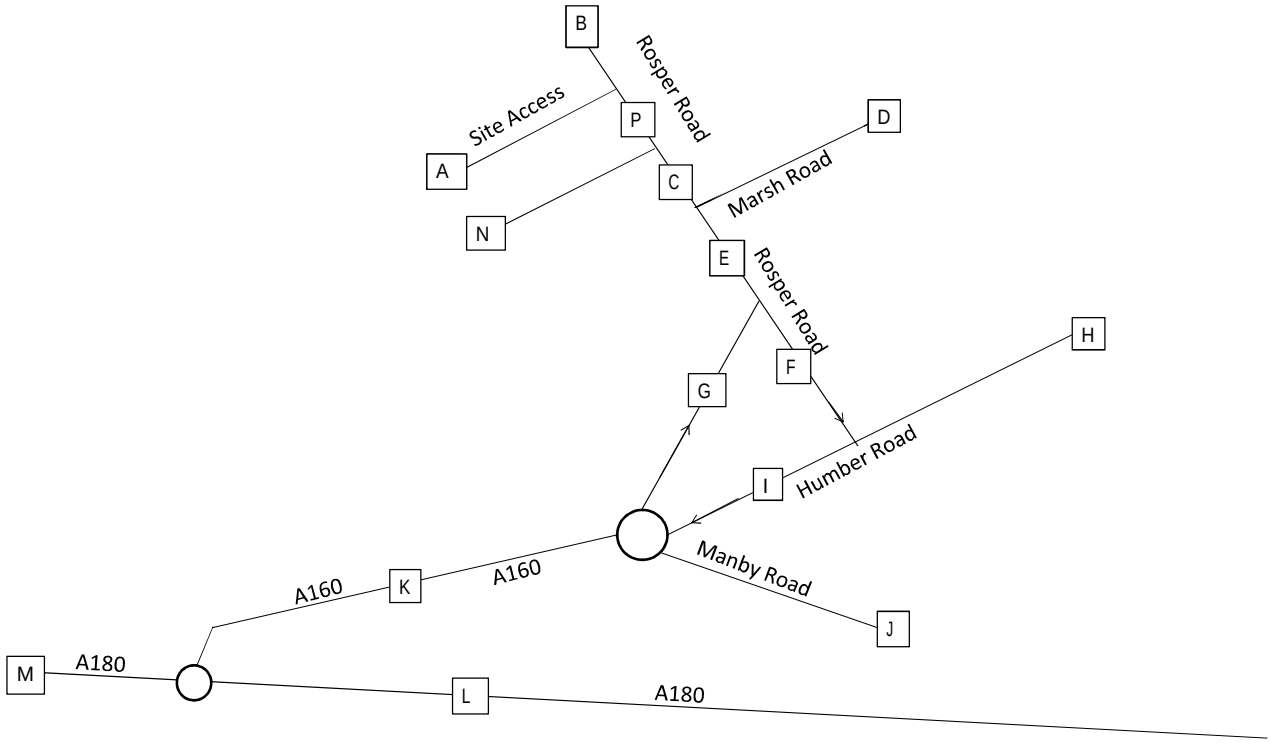
	F	H	I	Tot
F	0%	0%	96%	76%
H	0%	0%	0%	0%
I	0%	0%	0%	0%
Tot	0%	0%	22%	21%

	K	L	M	Tot
K	0%	0%	96%	96%
L	0%	0%	0%	0%
L	17%	0%	0%	17%
Tot	17%	0%	96%	24%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	0%	0%	0%	96%	22%
J	100%	0%	0%	0%	16%
K	98%	0%	0%	0%	96%
Tot	45%	0%	0%	17%	32%

	C	N	P	Tot
C	0%	0%	90%	90%
N	0%	0%	0%	0%
P	20%	0%	0%	20%
Tot	20%	0%	90%	49%

Figure 7A.5 - Total Committed Development - AM Peak Hour



PM Total Committed Dev Trips

	A	B	P	Tot
A	0	4	1	5
B	1	0	140	141
P	0	69	0	69
Tot	1	73	141	215

	C	D	E	Tot
C	0	78	63	141
D	7	0	9	16
E	62	81	0	143
Tot	69	159	72	300

	E	F	G	Tot
E	0	72	0	72
F	0	0	0	0
G	143	0	0	143
Tot	143	72	0	215

	F	H	I	Tot
F	0	6	66	72
H	0	0	78	78
I	0	0	0	0
Tot	0	6	144	150

	K	L	M	Tot
K	0	0	248	248
L	0	0	0	0
M	51	0	0	51
Tot	51	0	248	298

	G	I	J	K	Tot
G	0	0	0	0	0
I	78	0	21	45	144
J	21	0	0	8	29
K	44	0	104	0	148
Tot	143	0	125	53	321

	C	N	P	Tot
C	0	0	69	69
N	0	0	0	0
P	141	0	0	141
Tot	141	0	69	210

PM Total Committed Devs - HGV Trips

	A	B	P	Tot
A	0	0	1	1
B	0	0	62	62
P	0	62	0	62
Tot	0	62	63	125

	C	D	E	Tot
C	0	0	63	63
D	0	0	2	2
E	62	2	0	64
Tot	62	2	65	129

	E	F	G	Tot
E	0	65	0	65
F	0	0	0	0
G	64	0	0	64
Tot	64	65	0	129

	F	H	I	Tot
F	0	0	65	65
H	0	0	0	0
I	0	0	0	0
Tot	0	0	65	65

	K	L	M	Tot
K	0	0	44	44
L	0	0	0	0
M	43	0	0	43
Tot	43	0	44	87

	G	I	J	K	Tot
G	0	0	0	0	0
I	0	0	21	44	65
J	21	0	0	0	21
K	43	0	0	0	43
Tot	64	0	21	44	129

	C	N	P	Tot
C	0	0	62	62
N	0	0	0	0
P	63	0	0	63
Tot	63	0	62	125

PM Total Comm Devs - % HGVs

	A	B	P	Tot
A	0%	0%	100%	20%
B	0%	0%	44%	44%
P	0%	90%	0%	90%
Tot	0%	85%	45%	58%

	C	D	E	Tot
C	0%	0%	100%	45%
D	0%	0%	22%	13%
E	100%	2%	0%	45%
Tot	90%	1%	90%	43%

	E	F	G	Tot
E	0%	90%	0%	90%
F	0%	0%	0%	0%
G	45%	0%	0%	45%
Tot	45%	90%	0%	60%

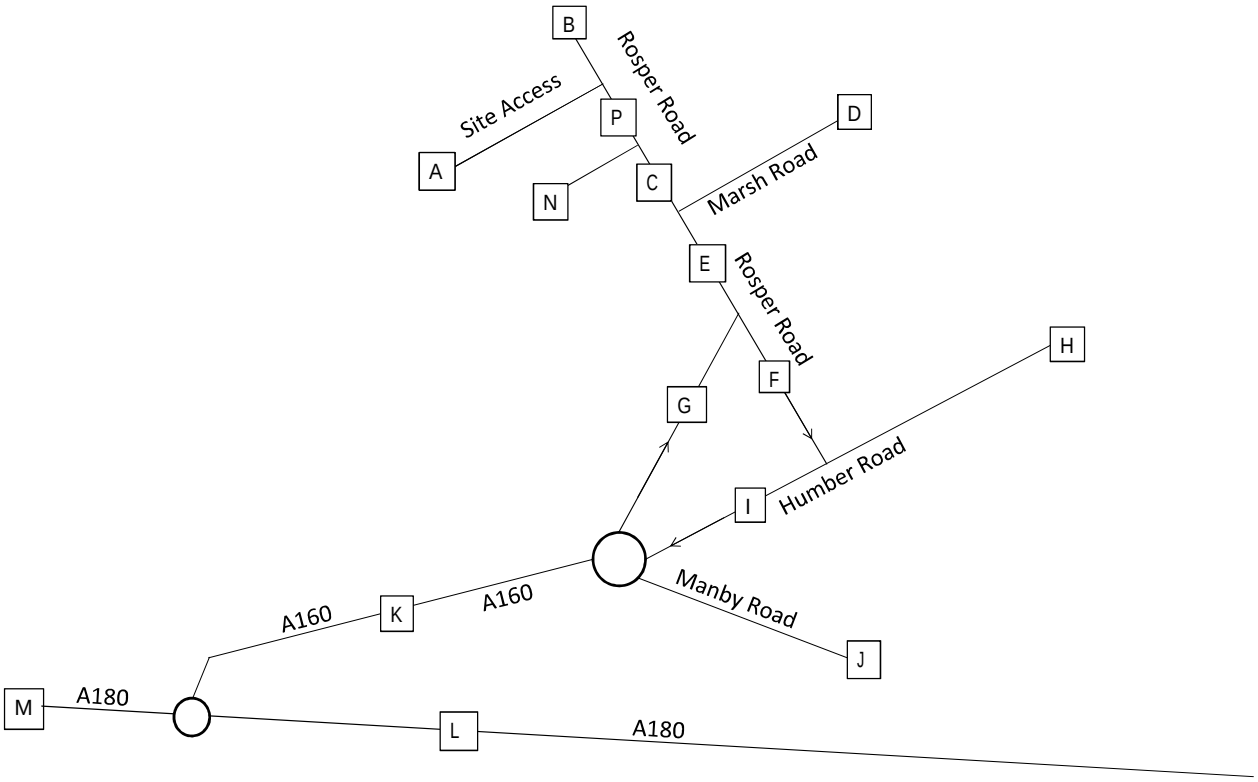
	F	H	I	Tot
F	0%	0%	98%	90%
H	0%	0%	0%	0%
I	0%	0%	0%	0%
Tot	0%	0%	45%	43%

	K	L	M	Tot
K	0%	0%	18%	18%
L	0%	0%	0%	0%
L	85%	0%	0%	85%
Tot	85%	0%	18%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	0%	0%	100%	98%	45%
J	100%	0%	0%	0%	72%
K	98%	0%	0%	0%	29%
Tot	45%	0%	17%	83%	40%

	C	N	P	Tot
C	0%	0%	90%	90%
N	0%	0%	0%	0%
P	45%	0%	0%	45%
Tot	45%	0%	90%	60%

Figure 7A.6 - Total Committed Development - PM Peak Hour



2021 AM Peak Base Year + Committed Devs- Total Vehicles (0715-0815)

	A	B	P	Tot
A	0	3	0	3
B	6	0	339	345
P	13	483	0	495
Tot	19	486	339	843

	C	D	E	Tot
C	0	84	254	339
D	14	0	17	32
E	481	89	0	570
Tot	495	174	272	941

	E	F	G	Tot
E	0	272	0	272
F	0	0	0	0
G	570	316	0	887
Tot	570	588	0	1158

	F	H	I	Tot
F	0	346	242	588
H	0	0	172	172
I	0	0	0	0
Tot	0	346	413	760

	K	L	M	Tot
K	0	71	543	614
L	392	0	918	1311
M	873	1441	0	2314
Tot	1266	1512	1461	4238

	G	I	J	K	Tot
G	0	0	0	0	0
I	102	0	62	249	413
J	409	0	2	383	794
K	376	0	271	18	665
Tot	887	0	335	650	1872

	C	N	P	Tot
C	0	0	495	495
N	0	0	0	0
P	339	0	0	339
Tot	339	0	495	834

2021 AM Peak Base Year + Committed Devs - HGVs (0715-0815)

	A	B	P	Tot
A	0	0	0	0
B	0	0	74	74
P	1	128	0	129
Tot	1	128	74	203

	C	D	E	Tot
C	0	0	74	74
D	0	0	2	2
E	129	2	0	131
Tot	129	2	76	207

	E	F	G	Tot
E	0	76	0	76
F	0	0	0	0
G	131	176	0	307
Tot	131	253	0	383

	F	H	I	Tot
F	0	194	58	252.81
H	0	0	207	207
I	0	0	0	0
Tot	0	194	265	459

	K	L	M	Tot
K	0	6	289	295
L	33	0	199	232
M	407	266	0	673
Tot	441	272	488	1201

	G	I	J	K	Tot
G	0	0	0	0	0
I	18	0	32	215	265
J	85	0	0	46	131
K	204	0	41	16	261
Tot	307	0	73	277	657

	C	N	P	Tot
C	0	0	129	129
N	0	0	0	0
P	74	0	0	74
Tot	74	0	129	203

2021 AM Peak Base Year + Committed Devs - % HGVs

	A	B	P	Tot
A	-	0%	0%	0%
B	0%	-	22%	22%
P	0%	26%	-	26%
Tot	5%	26%	22%	24%

	C	D	E	Tot
C	-	0%	29%	22%
D	0%	-	12%	6%
E	27%	2%	-	23%
Tot	26%	1%	28%	22%

	E	F	G	Tot
E	-	28%	0%	28%
F	0%	-	0%	0%
G	23%	56%	-	35%
Tot	23%	43%	0%	33%

	F	H	I	Tot
F	-	56%	24%	43%
H	0%	-	120%	120%
I	0%	0%	-	0%
Tot	0%	56%	64%	60%

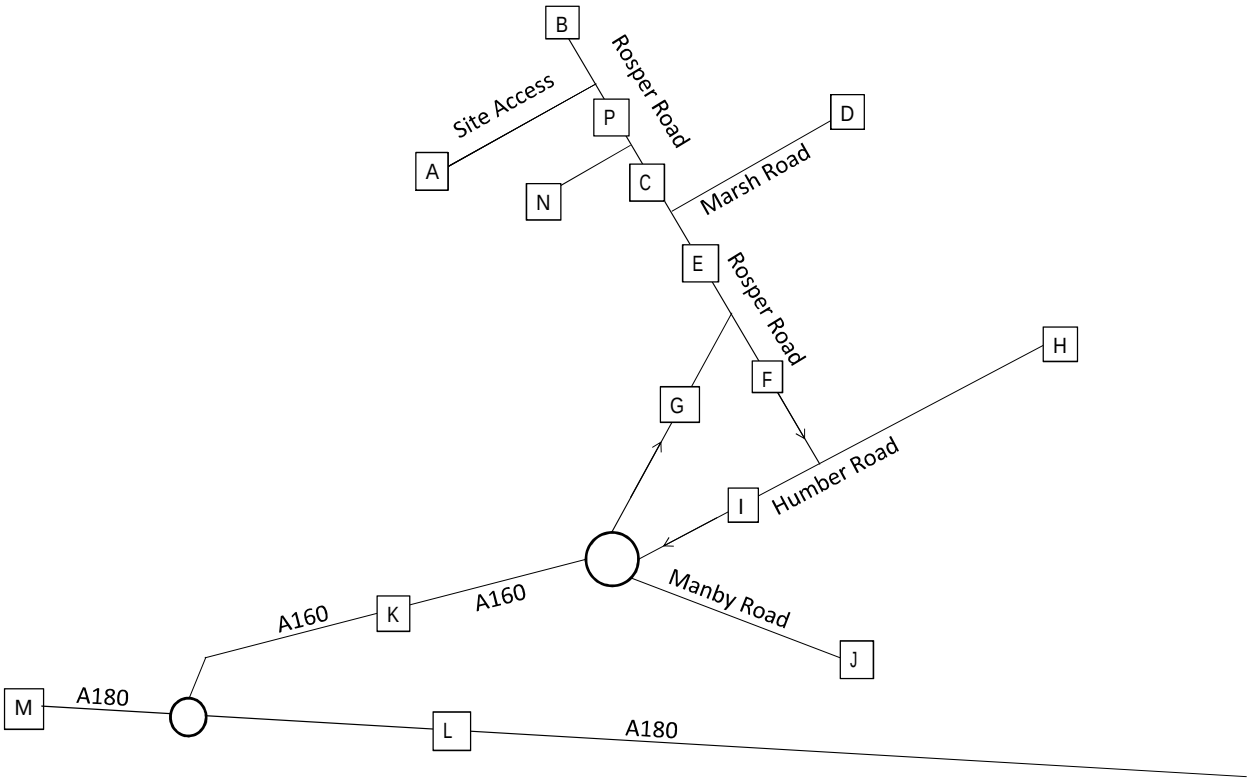
	K	L	M	Tot
K	0%	9%	53%	48%
L	9%	0%	22%	18%
M	47%	18%	0%	29%
Tot	35%	18%	33%	28%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	18%	0%	52%	86%	64%
J	21%	0%	0%	12%	17%
K	54%	0%	15%	90%	39%
Tot	35%	0%	22%	43%	35%

	C	N	P	Tot
C	0%	0%	26%	26%
N	0%	0%	0%	0%
P	22%	0%	0%	22%
Tot	22%	0%	26%	24%

Key : 347 - Estimated Turning Flow from ATC Data

Figure 7A.7 - 2021 Base + Committed Development - AM Peak Hour



2021 PM Peak Base Year + Committed Devs - Total Vehicles (1600-1700)

	A	B	P	Tot
A	0	6	14	20
B	1	0	506	507
P	2	259	0	261
Tot	3	265	520	788

	C	D	E	Tot
C	0	79	441	520
D	8	0	21	29
E	253	94	0	347
Tot	261	173	461	895

	E	F	G	Tot
E	0	461	0	461
F	0	0	0	0
G	347	112	0	459
Tot	347	573	0	920

	F	H	I	Tot
F	0	145	428	573
H	0	0	352	352
I	0	0	0	0
Tot	0	145	780	925

	K	L	M	Tot
K	0	236	799	1035
L	149	0	1265	1413
M	475	962	0	1437
Tot	624	1197	2064	3885

	G	I	J	K	Tot
G	0	0	0	0	0
I	105	0	366	309	780
J	144	0	18	286	448
K	209	0	354	9	573
Tot	459	0	738	604	1802

	C	N	P	Tot
C	0	0	261	261
N	0	0	0	0
P	520	0	0	520
Tot	520	0	261	781

2021 PM Peak Base Year + Committed Devs - HGVs (1600-1700)

	A	B	P	Tot
A	0	0	1	1
B	0	0	130	130
P	0	128	0	128
Tot	0	128	131	259

	C	D	E	Tot
C	0	0	131	131
D	0	0	2	2
E	128	2	0	130
Tot	128	2	133	263

	E	F	G	Tot
E	0	133	0	133
F	0	0	0	0
G	130	101	0	231
Tot	130	234	0	364

	F	H	I	Tot
F	0	116	118	233.68
H	0	0	160	160
I	0	0	0	0
Tot	0	116	278	394

	K	L	M	Tot
K	0	12	376	388
L	12	0	239	250
M	289	199	0	488
Tot	300	211	615	1126

	G	I	J	K	Tot
G	0	0	0	0	0
I	15	0	84	179	278
J	45	0	1	33	79
K	171	0	37	7	215
Tot	231	0	122	219	572

	C	N	P	Tot
C	0	0	128	128
N	0	0	0	0
P	131	0	0	131
Tot	131	0	128	259

2021 PM Peak Base Year + Committed Devs - % HGVs

	A	B	P	Tot
A	-	0%	0%	0%
B	0%	-	26%	26%
P	0%	49%	-	49%
Tot	0%	48%	25%	33%

	C	D	E	Tot
C	-	0%	30%	25%
D	0%	-	10%	7%
E	51%	2%	-	37%
Tot	49%	1%	29%	29%

	E	F	G	Tot
E	-	29%	0%	29%
F	0%	-	0%	0%
G	37%	90%	-	50%
Tot	37%	41%	0%	40%

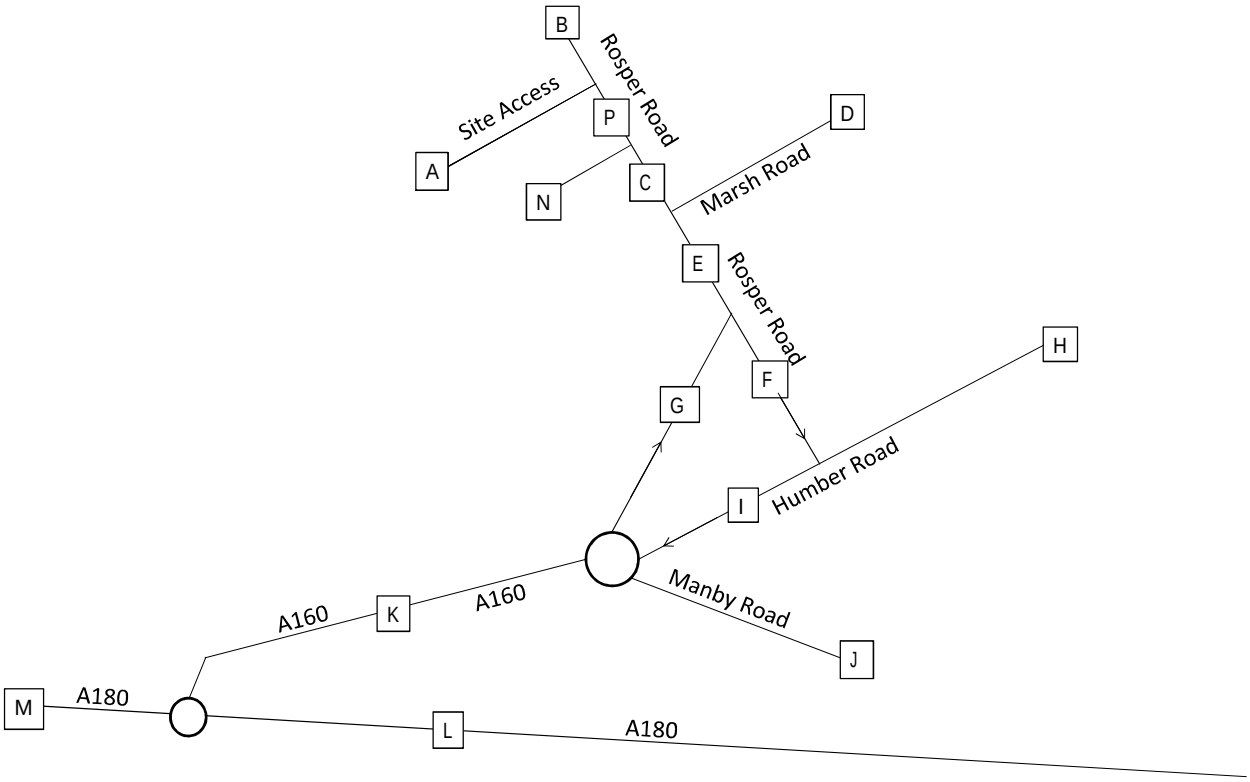
	F	H	I	Tot
F	-	80%	27%	41%
H	0%	-	46%	46%
I	0%	0%	-	0%
Tot	0%	80%	36%	43%

	K	L	M	Tot
K	0%	5%	47%	38%
L	8%	0%	19%	18%
M	61%	21%	0%	34%
Tot	48%	18%	30%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	14%	0%	23%	58%	36%
J	31%	0%	6%	12%	18%
K	82%	0%	10%	74%	38%
Tot	50%	0%	17%	36%	32%

	C	N	P	Tot
C	0%	0%	49%	49%
N	0%	0%	0%	0%
P	25%	0%	0%	25%
Tot	25%	0%	49%	33%

Figure 7A.8 - 2021 Base + Committed Development - PM Peak Hour



2021 AM Base Year+ Construction + Committed Devs - Total Vehicles (0715-0815)

	A	B	P	Tot
A	0	3	5	8
B	9	0	339	348
P	36	483	0	519
Tot	46	486	343	875

	C	D	E	Tot
C	0	84	256	340
D	14	0	17	32
E	502	89	0	591
Tot	516	174	274	963

	E	F	G	Tot
E	0	274	0	274
F	0	0	0	0
G	591	316	0	907
Tot	591	590	0	1181

	F	H	I	Tot
F	0	346	243	590
H	0	0	172	172
I	0	0	0	0
Tot	0	346	415	761

	K	L	M	Tot
K	0	71	543	615
L	392	0	918	1311
M	883	1441	0	2323
Tot	1275	1512	1462	4249

	G	I	J	K	Tot
G	0	0	0	0	0
I	102	0	63	250	415
J	420	0	2	383	806
K	385	0	271	18	674
Tot	908	0	336	651	1895

	C	N	P	Tot
C	0	0	516	516
N	0	0	1	1
P	340	3	0	343
Tot	340	3	517	860

2021 AM Base Year+ Construction + Committed Devs - HGVs (0715-0815)

	A	B	P	Tot
A	0	0	4	4
B	0	0	74	74
P	5	128	0	133
Tot	5	128	78	211

	C	D	E	Tot
C	0	0	75	75
D	0	0	2	2
E	132	2	0	134
Tot	132	2	77	211

	E	F	G	Tot
E	0	77	0	77
F	0	0	0	0
G	134	176	0	310
Tot	134	254	0	387

	F	H	I	Tot
F	0	194	59	254
H	0	0	207	207
I	0	0	0	0
Tot	0	194	266	460

	K	L	M	Tot
K	0	6	290	296.37
L	33	0	199	232
L	409	266	0	675
Tot	443	254	489	1204

	G	I	J	K	Tot
G	0	0	0	0	0
I	18	0	32	216	266
J	86	0	0	46	132
K	206	0	41	16	263
Tot	310	0	73	278	661

	C	N	P	Tot
C	0	0	132	132
N	0	0	1	1
P	75	3	0	78
Tot	75	3	133	211

2021 AM Base Year+ Construction + Committed Devs - % HGVs

	A	B	P	Tot
A	-	0%	83%	49%
B	0%	-	22%	21%
P	14%	26%	-	26%
Tot	11%	26%	23%	24%

	C	D	E	Tot
C	0%	0%	29%	22%
D	0%	0%	12%	6%
E	26%	2%	0%	23%
Tot	26%	1%	28%	22%

	E	F	G	Tot
E	0%	28%	0%	28%
F	0%	0%	0%	0%
G	23%	56%	0%	34%
Tot	23%	43%	0%	33%

	F	H	I	Tot
F	0%	56%	24%	43%
H	0%	-	120%	120%
I	0%	0%	-	0%
Tot	0%	56%	64%	60%

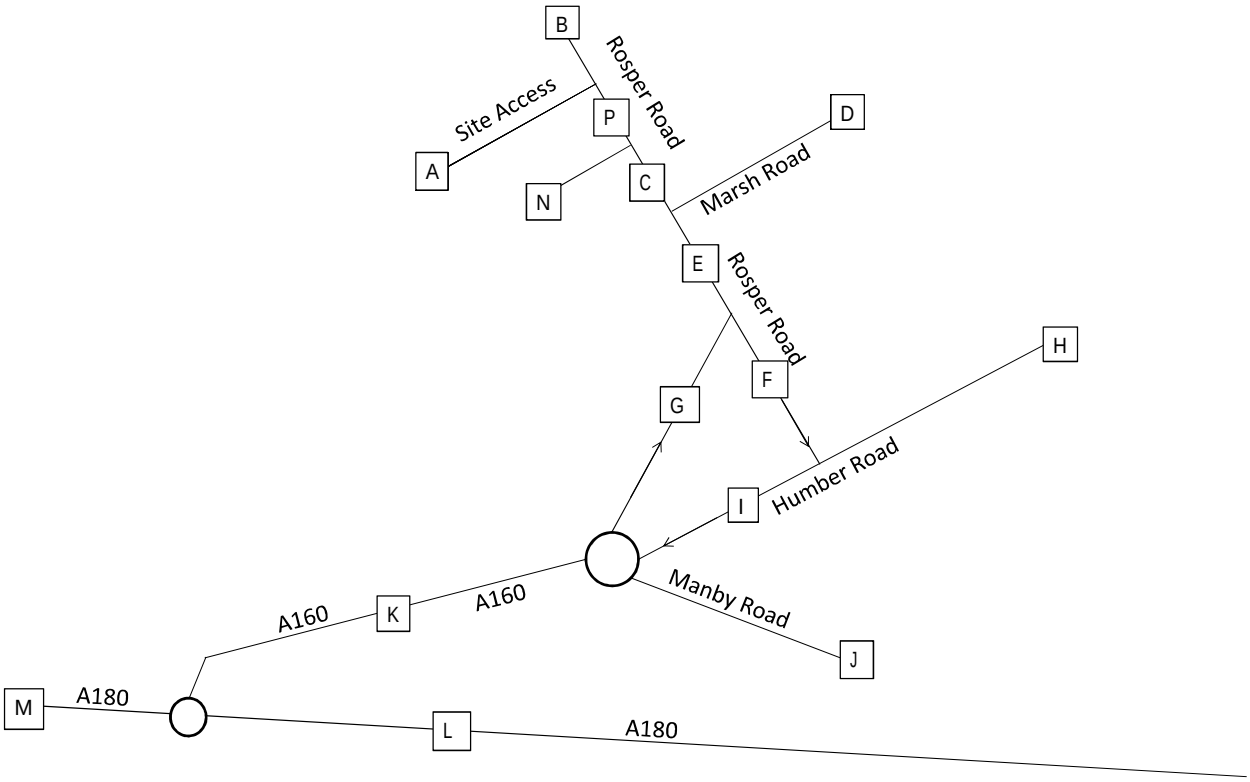
	K	L	M	Tot
K	0%	9%	53%	48%
L	9%	0%	22%	18%
M	46%	18%	0%	29%
Tot	35%	17%	33%	28%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	18%	0%	52%	86%	64%
J	21%	0%	0%	12%	16%
K	53%	0%	15%	90%	39%
Tot	34%	0%	22%	43%	35%

	C	N	P	Tot
C	0%	0%	26%	26%
N	0%	0%	100%	100%
P	22%	100%	0%	23%
Tot	22%	100%	26%	25%

Key : 347 - Estimated Turning Flow from ATC Data

Figure 7A.9 - 2021 Base + Committed Development + Construction - AM Peak Hour



2021 PM Base Year + Construction + Committed Devs - Total Vehicles (1600-1700)

	A	B	P	Tot
A	0	8	28	36
B	1	0	506	508
P	8	259	0	267
Tot	9	267	534	810

	C	D	E	Tot
C	0	79	453	532
D	8	0	21	29
E	257	94	0	351
Tot	265	173	473	911

	E	F	G	Tot
E	0	473	0	473
F	0	0	0	0
G	351	112	0	463
Tot	351	585	0	936

	F	H	I	Tot
F	0	145	440	585
H	0	0	352	352
I	0	0	0	0
Tot	0	145	792	937

	K	L	M	Tot
K	0	236	804	1040
L	149	0	1265	1413
M	477	962	0	1439
Tot	626	1197	2069	3893

	G	I	J	K	Tot
G	0	0	0	0	0
I	105	0	373	314	792
J	146	0	18	286	450
K	211	0	354	9	575
Tot	463	0	745	610	1817

	C	N	P	Tot
C	0	0	265	265
N	0	0	2	2
P	532	2	0	534
Tot	532	2	267	801

2021 PM Base Year + Construction + Committed Devs - HGVs (1600-1700)

	A	B	P	Tot
A	0	0	5	5
B	0	0	130	130
P	4	128	0	132
Tot	4	128	135	267

	C	D	E	Tot
C	0	0	133	133
D	0	0	2	2
E	130	2	0	132
Tot	130	2	135	267

	E	F	G	Tot
E	0	135	0	135
F	0	0	0	0
G	132	101	0	233
Tot	132	236	0	368

	F	H	I	Tot
F	0	116	120	236
H	0	0	160	160
I	0	0	0	0
Tot	0	116	280	396

	K	L	M	Tot
K	0	12	377	389.25
L	12	0	239	250
L	290	199	0	489
Tot	302	236	616	1128

	G	I	J	K	Tot
G	0	0	0	0	0
I	15	0	85	180	280
J	46	0	1	33	80
K	172	0	37	7	216
Tot	233	0	123	220	576

	C	N	P	Tot
C	0	0	130	130
N	0	0	2	2
P	133	2	0	135
Tot	133	2	132	267

2021 PM Base Year+ Construction + Committed Devs - % HGVs

	A	B	P	Tot
A	-	0%	18%	14%
B	0%	-	26%	26%
P	51%	49%	-	49%
Tot	44%	48%	25%	33%

	C	D	E	Tot
C	0%	0%	29%	25%
D	0%	0%	10%	7%
E	51%	2%	0%	38%
Tot	49%	1%	28%	29%

	E	F	G	Tot
E	0%	28%	0%	28%
F	0%	0%	0%	0%
G	38%	90%	0%	50%
Tot	38%	40%	0%	39%

	F	H	I	Tot
F	0%	80%	27%	40%
H	0%	-	46%	46%
I	0%	0%	-	0%
Tot	0%	80%	35%	42%

	K	L	M	Tot
K	0%	5%	47%	37%
L	8%	0%	19%	18%
M	61%	21%	0%	34%
Tot	48%	20%	30%	29%

	G	I	J	K	Tot
G	0%	0%	0%	0%	0%
I	14%	0%	23%	57%	35%
J	31%	0%	6%	12%	18%
K	82%	0%	10%	74%	38%
Tot	50%	0%	16%	36%	32%

	C	N	P	Tot
C	0%	0%	49%	49%
N	0%	0%	100%	100%
P	25%	100%	0%	25%
Tot	25%	100%	49%	33%

Key : 347 - Estimated Turning Flow from ATC Data

Figure 7A.10 - 2021 Base + Committed Development + Construction - PM Peak Hour

ANNEX 4: PICADY RESULTS: ROSPER ROAD

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.0.1.4646 []

For sales and distribution information, program advice and maintenance, contact TRL:
Tel: +44 (0)1344 770758 email: software@trl.co.uk Web: http://www.trlsoftware.co.uk

Filename: Import of Rosper Road_Site Access March 2019.j9
Path: E:\Junction Assessments\Access with Rosper Road
Report generation date: 22/03/2019 16:22:33

Summary of junction performance

	PM				AM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	Scenario 1							
Stream B-C	0.0	5.85	0.00	A	0.0	0.00	0.00	A
Stream B-A	0.0	8.15	0.03	A	0.0	0.00	0.00	A
Stream C-B	0.0	0.00	0.00	A	0.0	6.78	0.00	A
	Scenario 2							
Stream B-C	0.0	6.28	0.01	A	0.0	0.00	0.00	A
Stream B-A	0.0	10.75	0.04	B	0.0	0.00	0.00	A
Stream C-B	0.0	0.00	0.00	A	0.0	7.30	0.01	A
	Scenario 3							
Stream B-C	0.0	6.50	0.02	A	0.0	7.00	0.01	A
Stream B-A	0.1	12.72	0.10	B	0.0	19.46	0.03	C
Stream C-B	0.0	0.00	0.00	A	0.0	7.44	0.02	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

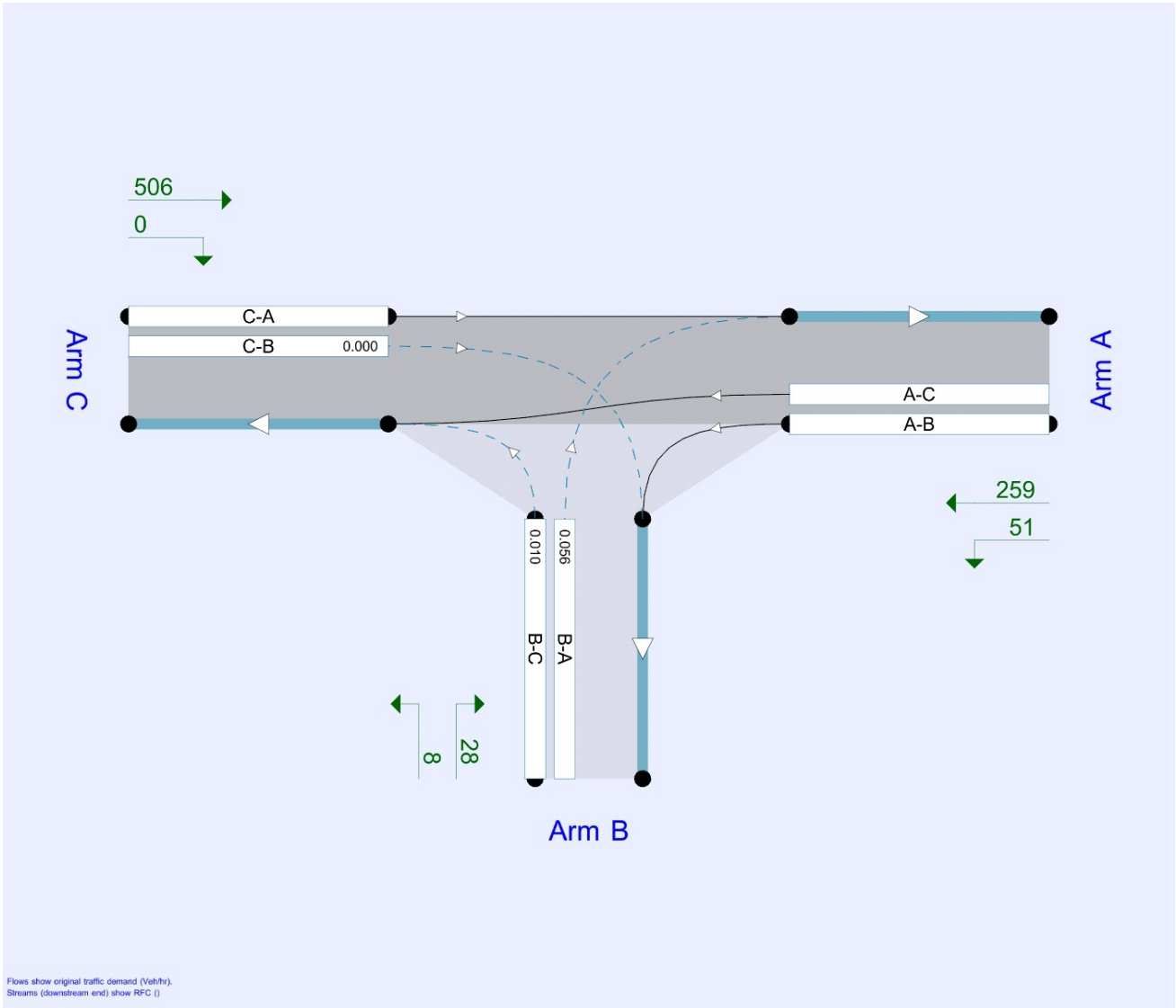
File summary

File Description

Title	Rosper Road / Site Access
Location	Immingham
Site number	
Date	17/10/2018
Version	
Status	
Identifier	
Client	
Jobnumber	
Enumerator	macklinka [UKLDS2LT42234]
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	s	-Min	perMin



The junction diagram reflects the last run of Junctions.

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	Scenario 1	PM	2021 PM Base	ONE HOUR	15:45	17:15	15	✓
D2	Scenario 1	AM	2021 AM Base	ONE HOUR	06:45	08:15	15	✓
D3	Scenario 2	AM	2021 AM Base + Comm Dev	ONE HOUR	06:45	08:15	15	✓
D4	Scenario 2	PM	2021 PM Base + Comm Dev	ONE HOUR	15:45	17:15	15	✓
D5	Scenario 3	AM	2021 AM Base + Comm Dev + OCGT Construction	ONE HOUR	06:45	08:15	15	✓
D6	Scenario 3	PM	2021 PM Base + Comm Dev + OCGT Construction	ONE HOUR	15:45	17:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

Scenario 1, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.16	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Rosper Road (S)		Major
B	Arm Site Access		Minor
C	Rosper Road (N)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.00		✓	2.60	100.0		-

Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	6.90	4.21	4.07	3.98		1.00	46	56

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	596	0.099	0.250	0.158	0.358
1	B-C	689	0.096	0.244	-	-
1	C-B	659	0.233	0.233	-	-

The slopes and intercepts shown above do NOT include any corrections or adjustments.

Streams may be combined, in which case capacity will be adjusted.

Values are shown for the first time segment only; they may differ for subsequent time segments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D1	Scenario 1	PM	2021 PM Base	ONE HOUR	15:45	17:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	184	100.000
B		ONE HOUR	✓	14	100.000
C		ONE HOUR	✓	350	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	2	182
	B	12	0	2
	C	350	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	36
	B	0	0	0
	C	19	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.00	5.85	0.0	A	2	3
B-A	0.03	8.15	0.0	A	11	17
C-A					321	482
C-B	0.00	0.00	0.0	A	0	0
A-B					2	3
A-C					167	251

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.38	640	0.002	1	0.0	0.0	5.633	A
B-A	9	2	500	0.018	9	0.0	0.0	7.338	A
C-A	263	66			263				
C-B	0	0	616	0.000	0	0.0	0.0	0.000	A
A-B	2	0.38			2				
A-C	137	34			137				

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.45	631	0.003	2	0.0	0.0	5.721	A
B-A	11	3	481	0.022	11	0.0	0.0	7.656	A
C-A	315	79			315				
C-B	0	0	607	0.000	0	0.0	0.0	0.000	A
A-B	2	0.45			2				
A-C	164	41			164				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.55	618	0.004	2	0.0	0.0	5.848	A
B-A	13	3	455	0.029	13	0.0	0.0	8.147	A
C-A	385	96			385				
C-B	0	0	595	0.000	0	0.0	0.0	0.000	A
A-B	2	0.55			2				
A-C	200	50			200				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.55	618	0.004	2	0.0	0.0	5.848	A
B-A	13	3	455	0.029	13	0.0	0.0	8.147	A
C-A	385	96			385				
C-B	0	0	595	0.000	0	0.0	0.0	0.000	A
A-B	2	0.55			2				
A-C	200	50			200				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.45	631	0.003	2	0.0	0.0	5.724	A
B-A	11	3	481	0.022	11	0.0	0.0	7.660	A
C-A	315	79			315				
C-B	0	0	607	0.000	0	0.0	0.0	0.000	A
A-B	2	0.45			2				
A-C	164	41			164				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.38	640	0.002	2	0.0	0.0	5.636	A
B-A	9	2	500	0.018	9	0.0	0.0	7.341	A
C-A	263	66			263				
C-B	0	0	616	0.000	0	0.0	0.0	0.000	A
A-B	2	0.38			2				
A-C	137	34			137				

Scenario 1, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D2	Scenario 1	AM	2021 AM Base	ONE HOUR	06:45	08:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	426	100.000
B		ONE HOUR	✓	2	100.000
C		ONE HOUR	✓	243	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	12	414
	B	0	0	2
	C	241	2	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	16
	B	0	0	0
	C	23	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.00	0.00	0.0	A	0	0
B-A	0.00	0.00	0.0	A	0	0
C-A					221	332
C-B	0.00	6.78	0.0	A	2	3
A-B					11	17
A-C					380	570

Main Results for each time segment

06:45 - 07:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	644	0.000	0	0.0	0.0	0.000	A
B-A	0	0	459	0.000	0	0.0	0.0	0.000	A
C-A	181	45			181				
C-B	2	0.38	573	0.003	1	0.0	0.0	6.299	A
A-B	9	2			9				
A-C	312	78			312				

07:00 - 07:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	626	0.000	0	0.0	0.0	0.000	A
B-A	0	0	435	0.000	0	0.0	0.0	0.000	A
C-A	217	54			217				
C-B	2	0.45	556	0.003	2	0.0	0.0	6.493	A
A-B	11	3			11				
A-C	372	93			372				

07:15 - 07:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	600	0.000	0	0.0	0.0	0.000	A
B-A	0	0	402	0.000	0	0.0	0.0	0.000	A
C-A	265	66			265				
C-B	2	0.55	533	0.004	2	0.0	0.0	6.781	A
A-B	13	3			13				
A-C	456	114			456				

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	600	0.000	0	0.0	0.0	0.000	A
B-A	0	0	402	0.000	0	0.0	0.0	0.000	A
C-A	265	66			265				
C-B	2	0.55	533	0.004	2	0.0	0.0	6.781	A
A-B	13	3			13				
A-C	456	114			456				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	626	0.000	0	0.0	0.0	0.000	A
B-A	0	0	435	0.000	0	0.0	0.0	0.000	A
C-A	217	54			217				
C-B	2	0.45	556	0.003	2	0.0	0.0	6.493	A
A-B	11	3			11				
A-C	372	93			372				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	644	0.000	0	0.0	0.0	0.000	A
B-A	0	0	459	0.000	0	0.0	0.0	0.000	A
C-A	181	45			181				
C-B	2	0.38	573	0.003	2	0.0	0.0	6.301	A
A-B	9	2			9				
A-C	312	78			312				

Scenario 2, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.04	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D3	Scenario 2	AM	2021 AM Base + Comm Dev	ONE HOUR	06:45	08:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	496	100.000
B		ONE HOUR	✓	3	100.000
C		ONE HOUR	✓	345	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	13	483
	B	0	0	3
	C	339	6	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	26
	B	0	0	0
	C	22	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.00	0.00	0.0	A	0	0
B-A	0.00	0.00	0.0	A	0	0
C-A					311	467
C-B	0.01	7.30	0.0	A	6	8
A-B					12	18
A-C					443	665

Main Results for each time segment

06:45 - 07:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	619	0.000	0	0.0	0.0	0.000	A
B-A	0	0	421	0.000	0	0.0	0.0	0.000	A
C-A	255	64			255				
C-B	5	1	550	0.008	4	0.0	0.0	6.596	A
A-B	10	2			10				
A-C	364	91			364				

07:00 - 07:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	596	0.000	0	0.0	0.0	0.000	A
B-A	0	0	389	0.000	0	0.0	0.0	0.000	A
C-A	305	76			305				
C-B	5	1	529	0.010	5	0.0	0.0	6.873	A
A-B	12	3			12				
A-C	434	109			434				

07:15 - 07:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	563	0.000	0	0.0	0.0	0.000	A
B-A	0	0	345	0.000	0	0.0	0.0	0.000	A
C-A	373	93			373				
C-B	7	2	500	0.013	7	0.0	0.0	7.299	A
A-B	14	4			14				
A-C	532	133			532				

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	563	0.000	0	0.0	0.0	0.000	A
B-A	0	0	345	0.000	0	0.0	0.0	0.000	A
C-A	373	93			373				
C-B	7	2	500	0.013	7	0.0	0.0	7.299	A
A-B	14	4			14				
A-C	532	133			532				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	596	0.000	0	0.0	0.0	0.000	A
B-A	0	0	389	0.000	0	0.0	0.0	0.000	A
C-A	305	76			305				
C-B	5	1	529	0.010	5	0.0	0.0	6.874	A
A-B	12	3			12				
A-C	434	109			434				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	0	0	619	0.000	0	0.0	0.0	0.000	A
B-A	0	0	421	0.000	0	0.0	0.0	0.000	A
C-A	255	64			255				
C-B	5	1	550	0.008	5	0.0	0.0	6.596	A
A-B	10	2			10				
A-C	364	91			364				

Scenario 2, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.19	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D4	Scenario 2	PM	2021 PM Base + Comm Dev	ONE HOUR	15:45	17:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	261	100.000
B		ONE HOUR	✓	20	100.000
C		ONE HOUR	✓	506	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	2	259
	B	14	0	6
	C	506	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	49
	B	8	0	0
	C	26	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.01	6.28	0.0	A	6	8
B-A	0.04	10.75	0.0	B	13	19
C-A					464	696
C-B	0.00	0.00	0.0	A	0	0
A-B					2	3
A-C					238	356

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	5	1	616	0.007	4	0.0	0.0	5.888	A
B-A	11	3	414	0.025	10	0.0	0.0	8.925	A
C-A	381	95			381				
C-B	0	0	591	0.000	0	0.0	0.0	0.000	A
A-B	2	0.38			2				
A-C	195	49			195				

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	5	1	601	0.009	5	0.0	0.0	6.045	A
B-A	13	3	387	0.033	13	0.0	0.0	9.613	A
C-A	455	114			455				
C-B	0	0	578	0.000	0	0.0	0.0	0.000	A
A-B	2	0.45			2				
A-C	233	58			233				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	7	2	580	0.011	7	0.0	0.0	6.276	A
B-A	15	4	350	0.044	15	0.0	0.0	10.750	B
C-A	557	139			557				
C-B	0	0	560	0.000	0	0.0	0.0	0.000	A
A-B	2	0.55			2				
A-C	285	71			285				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	7	2	580	0.011	7	0.0	0.0	6.277	A
B-A	15	4	350	0.044	15	0.0	0.0	10.752	B
C-A	557	139			557				
C-B	0	0	560	0.000	0	0.0	0.0	0.000	A
A-B	2	0.55			2				
A-C	285	71			285				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	5	1	601	0.009	5	0.0	0.0	6.047	A
B-A	13	3	387	0.033	13	0.0	0.0	9.616	A
C-A	455	114			455				
C-B	0	0	578	0.000	0	0.0	0.0	0.000	A
A-B	2	0.45			2				
A-C	233	58			233				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	5	1	616	0.007	5	0.0	0.0	5.893	A
B-A	11	3	414	0.025	11	0.0	0.0	8.929	A
C-A	381	95			381				
C-B	0	0	591	0.000	0	0.0	0.0	0.000	A
A-B	2	0.38			2				
A-C	195	49			195				

Scenario 3, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D5	Scenario 3	AM	2021 AM Base + Comm Dev + OCGT Construction	ONE HOUR	06:45	08:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	519	100.000
B		ONE HOUR	✓	8	100.000
C		ONE HOUR	✓	348	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	36	483
	B	5	0	3
	C	339	9	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	3	26
	B	83	0	0
	C	22	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.01	7.00	0.0	A	3	4
B-A	0.03	19.46	0.0	C	5	7
C-A					311	467
C-B	0.02	7.44	0.0	A	8	12
A-B					33	50
A-C					443	665

Main Results for each time segment

06:45 - 07:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.56	572	0.004	2	0.0	0.0	6.315	A
B-A	4	1	233	0.016	4	0.0	0.0	15.680	C
C-A	255	64			255				
C-B	7	2	546	0.012	7	0.0	0.0	6.675	A
A-B	27	7			27				
A-C	364	91			364				

07:00 - 07:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	3	0.67	549	0.005	3	0.0	0.0	6.583	A
B-A	4	1	215	0.021	4	0.0	0.0	17.076	C
C-A	305	76			305				
C-B	8	2	524	0.015	8	0.0	0.0	6.977	A
A-B	32	8			32				
A-C	434	109			434				

07:15 - 07:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	3	0.83	518	0.006	3	0.0	0.0	6.995	A
B-A	6	1	191	0.029	5	0.0	0.0	19.452	C
C-A	373	93			373				
C-B	10	2	494	0.020	10	0.0	0.0	7.442	A
A-B	40	10			40				
A-C	532	133			532				

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	3	0.83	518	0.006	3	0.0	0.0	6.996	A
B-A	6	1	191	0.029	6	0.0	0.0	19.458	C
C-A	373	93			373				
C-B	10	2	494	0.020	10	0.0	0.0	7.442	A
A-B	40	10			40				
A-C	532	133			532				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	3	0.67	549	0.005	3	0.0	0.0	6.586	A
B-A	4	1	215	0.021	5	0.0	0.0	17.084	C
C-A	305	76			305				
C-B	8	2	524	0.015	8	0.0	0.0	6.977	A
A-B	32	8			32				
A-C	434	109			434				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	2	0.56	572	0.004	2	0.0	0.0	6.318	A
B-A	4	1	233	0.016	4	0.0	0.0	15.693	C
C-A	255	64			255				
C-B	7	2	546	0.012	7	0.0	0.0	6.678	A
A-B	27	7			27				
A-C	364	91			364				

Scenario 3, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction Type	Major road direction	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way	0.41	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Description	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)	Run automatically
D6	Scenario 3	PM	2021 PM Base + Comm Dev + OCGT Construction	ONE HOUR	15:45	17:15	15	✓

Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	310	100.000
B		ONE HOUR	✓	36	100.000
C		ONE HOUR	✓	506	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	51	259
	B	28	0	8
	C	506	0	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	51	49
	B	18	0	0
	C	26	0	0

Results

Results Summary for whole modelled period

Stream	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-C	0.02	6.50	0.0	A	7	11
B-A	0.10	12.72	0.1	B	26	39
C-A					464	696
C-B	0.00	0.00	0.0	A	0	0
A-B					47	70
A-C					238	356

Main Results for each time segment

15:45 - 16:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	6	2	604	0.010	6	0.0	0.0	6.021	A
B-A	21	5	374	0.056	21	0.0	0.1	10.179	B
C-A	381	95			381				
C-B	0	0	578	0.000	0	0.0	0.0	0.000	A
A-B	38	10			38				
A-C	195	49			195				

16:00 - 16:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	7	2	587	0.012	7	0.0	0.0	6.212	A
B-A	25	6	349	0.072	25	0.1	0.1	11.114	B
C-A	455	114			455				
C-B	0	0	562	0.000	0	0.0	0.0	0.000	A
A-B	46	11			46				
A-C	233	58			233				

16:15 - 16:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	9	2	562	0.016	9	0.0	0.0	6.502	A
B-A	31	8	314	0.098	31	0.1	0.1	12.707	B
C-A	557	139			557				
C-B	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	56	14			56				
A-C	285	71			285				

16:30 - 16:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	9	2	562	0.016	9	0.0	0.0	6.503	A
B-A	31	8	314	0.098	31	0.1	0.1	12.717	B
C-A	557	139			557				
C-B	0	0	540	0.000	0	0.0	0.0	0.000	A
A-B	56	14			56				
A-C	285	71			285				

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	7	2	587	0.012	7	0.0	0.0	6.216	A
B-A	25	6	349	0.072	25	0.1	0.1	11.128	B
C-A	455	114			455				
C-B	0	0	562	0.000	0	0.0	0.0	0.000	A
A-B	46	11			46				
A-C	233	58			233				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	LOS
B-C	6	2	604	0.010	6	0.0	0.0	6.025	A
B-A	21	5	374	0.056	21	0.1	0.1	10.196	B
C-A	381	95			381				
C-B	0	0	578	0.000	0	0.0	0.0	0.000	A
A-B	38	10			38				
A-C	195	49			195				

ANNEX 5: ARCADY RESULTS – MANBY ROUNDABOUT

Junctions 9

ARCADY 9 - Roundabout Module

Filename: A160 Humber Road_A1173 Roundabout.j9
Path: E:\Junction Assessments\Manby Roundabout
Report generation date: 22/03/2019 17:09:00

»(Default Analysis Set) - 2021 AM Base, AM
»(Default Analysis Set) - 2021 PM Base, PM
»(Default Analysis Set) - 2021 AM Base + Com Dev, AM
»(Default Analysis Set) - 2021 PM Base + Com Dev, PM
»(Default Analysis Set) - 2021 AM Base + Com Dev + CCGT Construction, AM
»(Default Analysis Set) - 2021 PM Base + Com Dev + CCGT Construction, PM

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	A1 - 2021 AM Base							
Arm A160E	0.5	5.09	0.33	A				
Arm A1173	0.7	3.28	0.40	A				
Arm A160W	1.2	6.33	0.55	A				
	A1 - 2021 PM Base							
Arm A160E					1.0	5.05	0.50	A
Arm A1173					0.3	2.50	0.24	A
Arm A160W					0.5	4.20	0.35	A
	A1 - 2021 AM Base + Com Dev							
Arm A160E	0.7	5.27	0.40	A				
Arm A1173	1.0	4.06	0.50	A				
Arm A160W	1.7	8.38	0.63	A				
	A1 - 2021 PM Base + Com Dev							
Arm A160E					1.8	7.46	0.64	A
Arm A1173					0.4	2.89	0.28	A
Arm A160W					0.9	5.36	0.48	A
	A1 - 2021 AM Base + Com Dev + CCGT Construction							
Arm A160E	0.7	5.29	0.40	A				
Arm A1173	1.0	4.13	0.50	A				
Arm A160W	1.8	8.63	0.64	A				
	A1 - 2021 PM Base + Com Dev + CCGT Construction							
Arm A160E					1.8	7.61	0.65	A
Arm A1173					0.4	2.90	0.29	A
Arm A160W					0.9	5.40	0.49	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

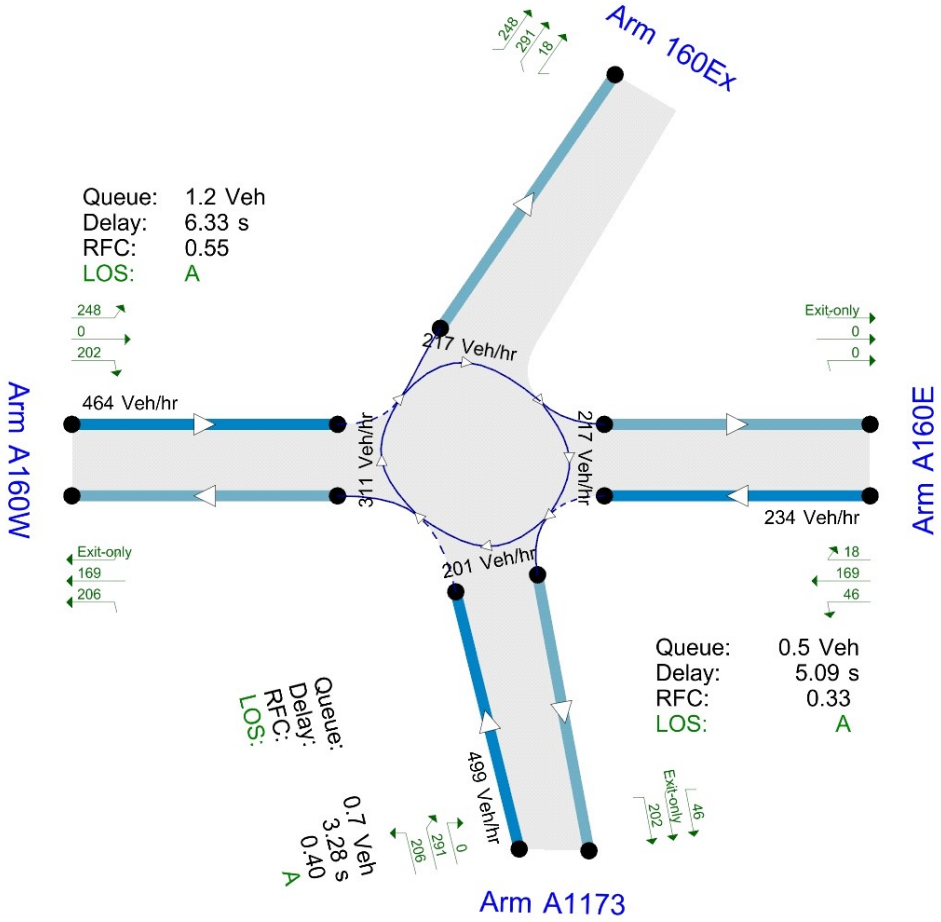
File summary

File Description

Title	(untitled)
Location	
Site number	
Date	18/10/2018
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	macklinka
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	mph	Veh	Veh	perHour	s	-Min	perMin



Flows show modelled flow through junction (Veh/hr).
Time Segment: 06:45-07:00

The junction diagram reflects the last run of Junctions.

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021 AM Base	AM	ONE HOUR	06:45	08:15	15
D2	2021 PM Base	PM	ONE HOUR	15:45	17:15	15
D3	2021 AM Base + Com Dev	AM	ONE HOUR	06:45	08:15	15
D4	2021 PM Base + Com Dev	PM	ONE HOUR	15:45	17:15	15
D5	2021 AM Base + Com Dev + CCGT Construction	AM	ONE HOUR	06:45	08:15	15
D6	2021 PM Base + Com Dev + CCGT Construction	PM	ONE HOUR	15:45	17:15	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	(Default Analysis Set)	100.000

(Default Analysis Set) - 2021 AM Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	4.92	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A160E	(untitled)	
A1173	(untitled)	
A160W	(untitled)	
160Ex	A160 Exit	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A160E	6.60	6.80	1.0	29.0	72.0	28.0	
A1173	6.40	8.20	23.0	44.0	72.0	25.0	
A160W	6.50	6.70	1.0	19.0	72.0	33.0	
160Ex							✓

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A160E	0.561	2082
A1173	0.628	2480
A160W	0.538	1980
160Ex		

The slope and intercept shown above include any corrections and adjustments.

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2021 AM Base	AM	ONE HOUR	06:45	08:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	312	100.000
A1173		✓	665	100.000
A160W		✓	619	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	62	226	24
	A1173	0	2	275	388
	A160W	0	270	18	331
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	52	85	75
	A1173	0	0	17	17
	A160W	0	15	90	48
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.33	5.09	0.5	A
A1173	0.40	3.28	0.7	A
A160W	0.55	6.33	1.2	A
160Ex				

Main Results for each time segment

06:45 - 07:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	235	217	1090	0.216	234	0.3	4.201	A
A1173	501	201	1922	0.261	499	0.4	2.529	A
A160W	466	311	1320	0.353	464	0.5	4.196	A
160Ex		217						

07:00 - 07:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	280	260	1073	0.261	280	0.4	4.536	A
A1173	598	241	1882	0.318	597	0.5	2.802	A
A160W	556	372	1291	0.431	556	0.8	4.894	A
160Ex		260						

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	344	318	1051	0.327	343	0.5	5.079	A
A1173	732	295	1829	0.400	731	0.7	3.279	A
A160W	682	455	1251	0.545	680	1.2	6.289	A
160Ex		318						

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	344	319	1051	0.327	344	0.5	5.087	A
A1173	732	295	1828	0.400	732	0.7	3.283	A
A160W	682	456	1250	0.545	681	1.2	6.329	A
160Ex		319						

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	280	261	1073	0.261	281	0.4	4.550	A
A1173	598	241	1881	0.318	599	0.5	2.807	A
A160W	556	373	1290	0.431	558	0.8	4.931	A
160Ex		261						

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	235	219	1089	0.216	235	0.3	4.219	A
A1173	501	202	1920	0.261	501	0.4	2.538	A
A160W	466	312	1319	0.353	467	0.6	4.229	A
160Ex		219						

(Default Analysis Set) - 2021 PM Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	4.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2021 PM Base	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	636	100.000
A1173		✓	419	100.000
A160W		✓	424	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	345	264	27
	A1173	0	18	278	123
	A160W	0	250	9	165
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	18	51	55
	A1173	0	6	12	19
	A160W	0	15	74	77
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.50	5.05	1.0	A
A1173	0.24	2.50	0.3	A
A160W	0.35	4.20	0.5	A
160Ex				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	479	208	1460	0.328	477	0.5	3.652	A
A1173	315	225	1990	0.158	315	0.2	2.147	A
A160W	319	126	1351	0.236	318	0.3	3.479	A
160Ex		208						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	572	249	1440	0.397	571	0.7	4.136	A
A1173	377	269	1953	0.193	376	0.2	2.283	A
A160W	381	151	1339	0.285	381	0.4	3.755	A
160Ex		249						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	700	305	1413	0.496	699	1.0	5.033	A
A1173	461	330	1903	0.242	461	0.3	2.497	A
A160W	467	185	1323	0.353	466	0.5	4.197	A
160Ex		305						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	700	305	1413	0.496	700	1.0	5.052	A
A1173	461	330	1902	0.243	461	0.3	2.498	A
A160W	467	185	1323	0.353	467	0.5	4.202	A
160Ex		305						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	572	249	1440	0.397	573	0.7	4.158	A
A1173	377	270	1952	0.193	377	0.2	2.285	A
A160W	381	151	1339	0.285	382	0.4	3.760	A
160Ex		249						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	479	209	1460	0.328	480	0.5	3.676	A
A1173	315	226	1989	0.159	316	0.2	2.150	A
A160W	319	127	1351	0.236	320	0.3	3.493	A
160Ex		209						

(Default Analysis Set) - 2021 AM Base + Com Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	5.97	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2021 AM Base + Com Dev	AM	ONE HOUR	06:45	08:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	413	100.000
A1173		✓	794	100.000
A160W		✓	665	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	62	249	102
	A1173	0	2	383	409
	A160W	0	271	18	376
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	52	86	18
	A1173	0	0	12	21
	A160W	0	15	90	54
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.40	5.27	0.7	A
A1173	0.50	4.06	1.0	A
A160W	0.63	8.38	1.7	A
160Ex				

Main Results for each time segment

06:45 - 07:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	311	218	1179	0.264	310	0.4	4.131	A
A1173	598	277	1877	0.318	596	0.5	2.806	A
A160W	501	385	1245	0.402	498	0.7	4.802	A
160Ex		218						

07:00 - 07:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	371	261	1162	0.320	371	0.5	4.549	A
A1173	714	331	1828	0.390	713	0.6	3.227	A
A160W	598	461	1210	0.494	597	1.0	5.860	A
160Ex		261						

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	455	319	1138	0.400	454	0.7	5.257	A
A1173	874	406	1761	0.496	873	1.0	4.047	A
A160W	732	564	1162	0.630	729	1.7	8.273	A
160Ex		319						

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	455	320	1138	0.400	455	0.7	5.271	A
A1173	874	406	1760	0.497	874	1.0	4.061	A
A160W	732	565	1161	0.631	732	1.7	8.384	A
160Ex		320						

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	371	263	1161	0.320	372	0.5	4.566	A
A1173	714	332	1827	0.391	715	0.6	3.241	A
A160W	598	462	1209	0.494	601	1.0	5.942	A
160Ex		263						

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	311	220	1179	0.264	311	0.4	4.153	A
A1173	598	278	1876	0.319	598	0.5	2.819	A
A160W	501	387	1244	0.402	502	0.7	4.860	A
160Ex		220						

(Default Analysis Set) - 2021 PM Base + Com Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	5.75	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D4	2021 PM Base + Com Dev	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	780	100.000
A1173		✓	448	100.000
A160W		✓	572	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	366	309	105
	A1173	0	18	286	144
	A160W	0	354	9	209
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	23	58	14
	A1173	0	6	12	31
	A160W	0	10	74	82
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.64	7.46	1.8	A
A1173	0.28	2.89	0.4	A
A160W	0.48	5.36	0.9	A
160Ex				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	587	286	1403	0.419	584	0.7	4.383	A
A1173	337	317	1855	0.182	336	0.2	2.369	A
A160W	431	200	1346	0.320	429	0.5	3.916	A
160Ex		286						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	701	342	1377	0.509	700	1.0	5.307	A
A1173	403	380	1806	0.223	402	0.3	2.565	A
A160W	514	240	1327	0.387	514	0.6	4.421	A
160Ex		342						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	859	419	1342	0.640	856	1.7	7.366	A
A1173	493	464	1739	0.284	493	0.4	2.888	A
A160W	630	293	1301	0.484	629	0.9	5.341	A
160Ex		419						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	859	419	1341	0.640	859	1.8	7.456	A
A1173	493	466	1738	0.284	493	0.4	2.891	A
A160W	630	294	1301	0.484	630	0.9	5.361	A
160Ex		419						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	701	343	1376	0.509	704	1.1	5.375	A
A1173	403	382	1804	0.223	403	0.3	2.570	A
A160W	514	241	1327	0.388	515	0.6	4.443	A
160Ex		343						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	587	287	1402	0.419	589	0.7	4.430	A
A1173	337	319	1853	0.182	338	0.2	2.376	A
A160W	431	201	1346	0.320	431	0.5	3.941	A
160Ex		287						

(Default Analysis Set) - 2021 AM Base + Com Dev + CCGT Construction, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	6.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D5	2021 AM Base + Com Dev + CCGT Construction	AM	ONE HOUR	06:45	08:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	415	100.000
A1173		✓	805	100.000
A160W		✓	674	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	63	250	102
	A1173	0	2	383	420
	A160W	0	271	18	385
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	52	86	18
	A1173	0	0	12	21
	A160W	0	15	90	53
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.40	5.29	0.7	A
A1173	0.50	4.13	1.0	A
A160W	0.64	8.63	1.8	A
160Ex				

Main Results for each time segment

06:45 - 07:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	312	218	1179	0.265	311	0.4	4.139	A
A1173	606	277	1876	0.323	604	0.5	2.828	A
A160W	507	393	1244	0.408	505	0.7	4.850	A
160Ex		218						

07:00 - 07:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	373	261	1162	0.321	373	0.5	4.561	A
A1173	724	332	1826	0.396	723	0.7	3.262	A
A160W	606	471	1208	0.501	605	1.0	5.952	A
160Ex		261						

07:15 - 07:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	457	319	1138	0.402	456	0.7	5.275	A
A1173	886	407	1759	0.504	885	1.0	4.111	A
A160W	742	576	1159	0.640	739	1.7	8.510	A
160Ex		319						

07:30 - 07:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	457	320	1137	0.402	457	0.7	5.289	A
A1173	886	407	1758	0.504	886	1.0	4.127	A
A160W	742	577	1159	0.640	742	1.8	8.634	A
160Ex		320						

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	373	263	1161	0.321	374	0.5	4.577	A
A1173	724	333	1825	0.397	725	0.7	3.278	A
A160W	606	472	1208	0.502	609	1.0	6.043	A
160Ex		263						

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	312	220	1179	0.265	313	0.4	4.160	A
A1173	606	279	1874	0.323	607	0.5	2.843	A
A160W	507	395	1244	0.408	509	0.7	4.909	A
160Ex		220						

(Default Analysis Set) - 2021 PM Base + Com Dev + CCGT Construction, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Demand Sets	D1 - 2021 AM Base, AM	Demand Set 1: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D2 - 2021 PM Base, PM	Demand Set 2: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D3 - 2021 AM Base + Com Dev, AM	Demand Set 3: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D4 - 2021 PM Base + Com Dev, PM	Demand Set 4: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?
Warning	Demand Sets	D5 - 2021 AM Base + Com Dev + CCGT Construction, AM	Demand Set 5: Scenario Name includes Time Period Name ('AM'). Are you sure this is correct?
Warning	Demand Sets	D6 - 2021 PM Base + Com Dev + CCGT Construction, PM	Demand Set 6: Scenario Name includes Time Period Name ('PM'). Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction Type	Junction Delay (s)	Junction LOS
1	(untitled)	Standard Roundabout	5.83	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D6	2021 PM Base + Com Dev + CCGT Construction	PM	ONE HOUR	15:45	17:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A160E		✓	792	100.000
A1173		✓	450	100.000
A160W		✓	574	100.000
160Ex				

Origin-Destination Data

Demand (Veh/hr)

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	373	314	105
	A1173	0	18	286	146
	A160W	0	354	9	211
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A160E	A1173	A160W	160Ex
From	A160E	0	23	57	14
	A1173	0	6	12	31
	A160W	0	10	74	82
	160Ex	Exit-only	Exit-only	Exit-only	Exit-only

Results

Results Summary for whole modelled period

Arm	Max RFC	Max delay (s)	Max Queue (Veh)	Max LOS
A160E	0.65	7.61	1.8	A
A1173	0.29	2.90	0.4	A
A160W	0.49	5.40	0.9	A
160Ex				

Main Results for each time segment

15:45 - 16:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	596	286	1407	0.424	593	0.7	4.409	A
A1173	339	321	1852	0.183	338	0.2	2.376	A
A160W	432	202	1344	0.322	430	0.5	3.933	A
160Ex		286						

16:00 - 16:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	712	342	1381	0.516	711	1.1	5.364	A
A1173	405	384	1803	0.224	404	0.3	2.574	A
A160W	516	242	1325	0.390	515	0.6	4.444	A
160Ex		342						

16:15 - 16:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	872	419	1345	0.648	869	1.8	7.509	A
A1173	495	470	1736	0.285	495	0.4	2.901	A
A160W	632	296	1299	0.487	631	0.9	5.379	A
160Ex		419						

16:30 - 16:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	872	419	1345	0.648	872	1.8	7.607	A
A1173	495	471	1735	0.286	495	0.4	2.904	A
A160W	632	296	1299	0.487	632	0.9	5.400	A
160Ex		419						

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	712	343	1380	0.516	715	1.1	5.437	A
A1173	405	386	1801	0.225	405	0.3	2.579	A
A160W	516	242	1324	0.390	517	0.6	4.466	A
160Ex		343						

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	LOS
A160E	596	287	1406	0.424	598	0.7	4.461	A
A1173	339	323	1850	0.183	339	0.2	2.381	A
A160W	432	203	1343	0.322	433	0.5	3.958	A
160Ex		287						