EP UK Investments

South Humber Bank Energy Centre Project

Planning Inspectorate Reference: EN010107

South Marsh Road, Stallingborough, DN41 8BZ

The South Humber Bank Energy Centre Order

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The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended)

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GLOSSARY

Abbreviation	Description
AM	Morning
ATC	Automatic Traffic Count
CIHT	Chartered Institution of Highways and Transportation
DCLG	Department for Communities and Local Government
DCO	Development Consent Order
DECC	Department for Energy and Climate Change
EB	eastbound
EfW	Energy from waste
EIA	Environmental Impact Assessment
ES	Environmental Statement
HE	Highways England
HGV	Heavy Goods Vehicle
IPC	Infrastructure Planning Committee
km	kilometre
LOS	Level of Service
m	metre
MCC	Manual Classified Count
mph	miles per hour
MW	Megawatt
NELC	North East Lincolnshire Council
NPPF	National Planning Policy Framework
NPS	National Policy Statement
PCU	Passenger Car Unit
PIA	Personal Injury Accident
PM	afternoon
Q	Quarter
RDF	Refuse Derived Fuel
RFC	Ratio of Flow to Capacity
SHBPS	South Humber Bank Power Station
TA	Transport Assessment
TS	Transport Statement
WB	westbound

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1.0 INTRODUCTION

1.1 Overview

1.1.1 This Transport Assessment (TA) has been prepared by AECOM on behalf of EP Waste Management Limited ('the Applicant') to support an application ('the Application') to be made to the Secretary of State seeking development consent for the construction and operation (including maintenance) of the proposed up to 95 Megawatt (MW) South Humber Bank Energy Centre ('the Proposed Development'), an energy from waste facility to be built on land located within the boundary of the South Humber Bank Power Station, South Marsh Road, Stallingborough, North East Lincolnshire. Planning permission for a 49.9 MW South Humber Bank Energy Centre ('the Consented Development') was previously granted by North East Lincolnshire Council (NELC) in April 2019 (Planning Ref: DM/1070/18/FUL).

1.1.2 The maximum fuel throughput of the Proposed Development is theoretically 753,500 tonnes per annum if only fuel with a NCV of 9 MJ/kg were used and based on the expected plant annual running hours. This is the same maximum fuel throughput as was assessed for the Consented Development.

1.1.3 A TA scoping exercise was undertaken with NELC and Highways England (HE) via email to agree the parameters of the TA for the Consented Development. A copy of the scoping correspondence received from NELC and HE officers is included in Annex 1. This is still considered to be relevant because the traffic generation and proposed HGV traffic routing for the Proposed Development will be the same as that for the Consented Development. Nonetheless a further scoping exercise was undertaken with NELC and HE via email to agree the parameters of the TA for the Proposed Development. A copy of the scoping correspondence received from NELC and HE officers is also included in Annex 1.

1.1.4 Following the TA scoping exercise, this assessment includes for the opening of the South Humber Bank Link Road which is due to open in late 2020 and assigns some construction and operational staff vehicle traffic to the Link Road.

1.1.5 The structure of the TA is as follows:

- Section 2 provides a review of national and local planning policy;
- Section 3 provides a description of the Site location and existing highway conditions in the Site vicinity (where 'the Site' refers to the Application boundary);
- Section 4 provides a review of access to the Site by sustainable transport modes;
- Section 5 provides an analysis of personal injury accident data within the vicinity of the Site over a five year period;
- Section 6 provides a review of the Proposed Development;
- Section 7 provides a review of the estimated traffic to be generated by the Proposed Development and the local network assignment of this traffic;

- Section 8 outlines the growth factors to be applied to the baseline counts;
- Section 9 identifies the committed developments that have been taken account of as part of the assessment;
- Section 10 provides an assessment of the anticipated operational impact of the development on the immediate local highway network through a review of local link impact and junction capacity assessments;
- Section 11 assesses the anticipated construction impact of the Proposed Development on the immediate local highway network through a review of local link impact and junction capacity assessments; and
- Section 12 provides the TA conclusions.

2.0 POLICY CONTEXT

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

2.2 National Policy Statements

Overarching National Policy Statement for Energy (NPS EN-1)

2.2.1 The National Policy Statement (NPS) EN-1 (Department for Energy and Climate Change (DECC), 2011a) was published in 2011. Section 5.13 outlines the planning policy for traffic and transport, including guidance on the carrying out of the relevant parts of the Environmental Impact Assessment (EIA) (which has been taken into account in producing this Environmental Statement (ES). The most relevant paragraphs for the TA are 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 guidance, 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."*

2.2.2 In terms of the Secretary of State's decision making, Section 5.13 of the NPS states that the Infrastructure Planning Committee (IPC) (now Secretary of State) 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 Nationally Significant Infrastructure Project. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable levels, the Secretary of State 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 Renewable Energy Infrastructure (NPS EN-3)

2.2.3 The NPS EN-3 (DECC, 2011b) was published in 2011. The most relevant paragraphs for the TA are paragraphs 2.5.24 to 2.5.25 which state:

"2.5.24 Biomass or EfW generating stations are likely to generate considerable transport movements. For example, a biomass *or EfW plant that uses 500,000 tonnes of fuel per annum might require a large number of heavy goods vehicle (HGV) movements per day to import the fuel. There will also be residues which will need to be regularly transported off site.*

2.5.25 Government policy encourages multi-modal transport and the IPC should expect materials (fuel and residues) to be transported by water or rail routes where possible. Applicants should locate new biomass or waste combustion 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 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. Therefore, any application should 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 will need to be satisfied that the impacts of the new infrastructure are acceptable as set out in Section 5.13 of EN-1."*

2.3 National Planning Policy Framework

2.3.1 The National Planning Policy Framework (NPPF) (Department for Communities and Local Government (DCLG), 2019) sets out the Government's planning policies for England.

2.3.2 The NPPF 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 NPPF 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 movements are located where the need to travel will be minimised and the use of sustainable transport modes can be maximised.

2.3.3 The NPPF recommends that a Transport Statement (TS) or 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.

2.4 North East Lincolnshire Local Plan 2013 – 2032 (adopted 2018)

2.4.1 The Local Plan was adopted by NELC 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.

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

<u>Policy 36: Promoting Sustainable Transport</u>

2.4.3 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 400 m 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."*

2.4.4 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*."

2.4.5 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"*.

Policy 38: Parking

2.4.6 The policy states that "*Development proposals that generate additional parking demand should ensure that appropriate vehicle, powered two-wheeler and cycle parking provision is made. The form and scale of off-street parking required will be assessed against the following:*

- *the accessibility of the development;*
- *the type, mix and use of the development;*
- *the availability and frequency of public transport services; and*
- *local car ownership levels*."

2.4.7 The policy states that developers should consider and incorporate measures to minimise parking provision without causing a detrimental impact to the functioning of the local highway network.

2.4.8 The policy goes on to state that at least 5% of parking bays should be allocated for people with mobility impairments.

2.5 North East Lincolnshire Local Transport Plan (2016 – 2032)

2.5.1 North East Lincolnshire's Local Transport Plan sets out a programme for a wide range of improvements to local transport over the period 2016 to 2032. The objectives of the plan include:

- enable sustainable growth through effective transport provision;
- improve journey times and reliability by reducing congestion;
- support regeneration and employment by connecting people to education, training and jobs;

- enable disadvantaged groups or people living in disadvantaged areas to connect with employment, healthcare, social and leisure opportunities;
- improve the health of individuals by encouraging and enabling more physically active travel;
- provide safe access and reduce the risk of loss, death or injury due to transport collisions or crime;
- improve the journey experience on the local transport network; and
- ensuring that transport contributes to environmental excellence, including managing air quality and reducing transport-related greenhouse gas emissions.

2.5.2 Major local highways and transport improvement schemes within the immediate area to the application Site include the South Humber Bank Link Road which received planning permission in September 2018.

3.0 EXISTING SITE CONDITIONS

3.1 Site Location

3.1.1 The Site for the Proposed Development is located off South Marsh Road, Stallingborough, North East Lincolnshire, approximately 5 km south-east of Immingham. The Site location is shown in Figure 3.1 below.

3.1.2 The Proposed Development will be located on vacant land to the east of the existing South Humber Bank Power Station (SHBPS). The Site and Main Development Area boundaries are shown in Annex 6, where the Site is defined by the proposed Application boundary (red line), which includes the majority of the SHBPS site and part of South Marsh Road.

3.1.3 South Marsh Road provides highway access to SHBPS and also to Synthomer (UK) Limited, the NEWLINCS Integrated Waste Management Facility and Environment Agency access to sections of the Humber Estuary flood defence, located north of the Site.

Figure 3.1: Site Location

3.2 Existing Highway Network

South Marsh Road (East of Hobson Way)

3.2.1 South Marsh Road is a 6.75 m wide single carriageway road which is street lit and is subject to a 40 mph speed limit. As described above, the road provides

access to SHBPS and a number of other industrial units. South Marsh Road meets Hobson Way at a large priority junction.

South Marsh Road (West of Hobson Way)

3.2.2 South Marsh Road is a 4.0 m wide single carriageway road connecting Hobson Way with North Moss Lane, a distance of approximately 1.0 km. Passing places are provided along its length. There are no pedestrian footways or street lighting present. A railway crossing is located on South Marsh Road approximately 400 m west of the junction with Hobson Way.

Hobson Way

3.2.3 Hobson Way is a 7.3 m wide single carriageway road which is street lit and is subject to a 40 mph speed limit. A pedestrian footway is provided along the western side of the carriageway between South Marsh Road and Kiln Lane. Hobson Way meets Kiln Lane at a four arm standard roundabout junction.

Kiln Lane

3.2.4 Kiln Lane is a 7.3 m wide single carriageway road which is street lit and is subject to a 40 mph speed limit. A railway level crossing is located on Kiln Lane approximately 200 m east of Hobson Way. Kiln Lane provides access to a number of industrial units which are located along its frontage. Kiln Lane meets the A1173 at a standard four arm roundabout.

A1173

3.2.5 The A1173 is a 7.3 m wide single carriageway road and is subject to the 60 mph national speed limit for single carriageway roads providing access to Immingham and Immingham Docks. There are no footways along its length between the A1173 and the Kiln Lane roundabout. The A1173 continues towards the A180 forming a grade separated junction where it meets the A180. The junction is also known as the Stallingborough Interchange.

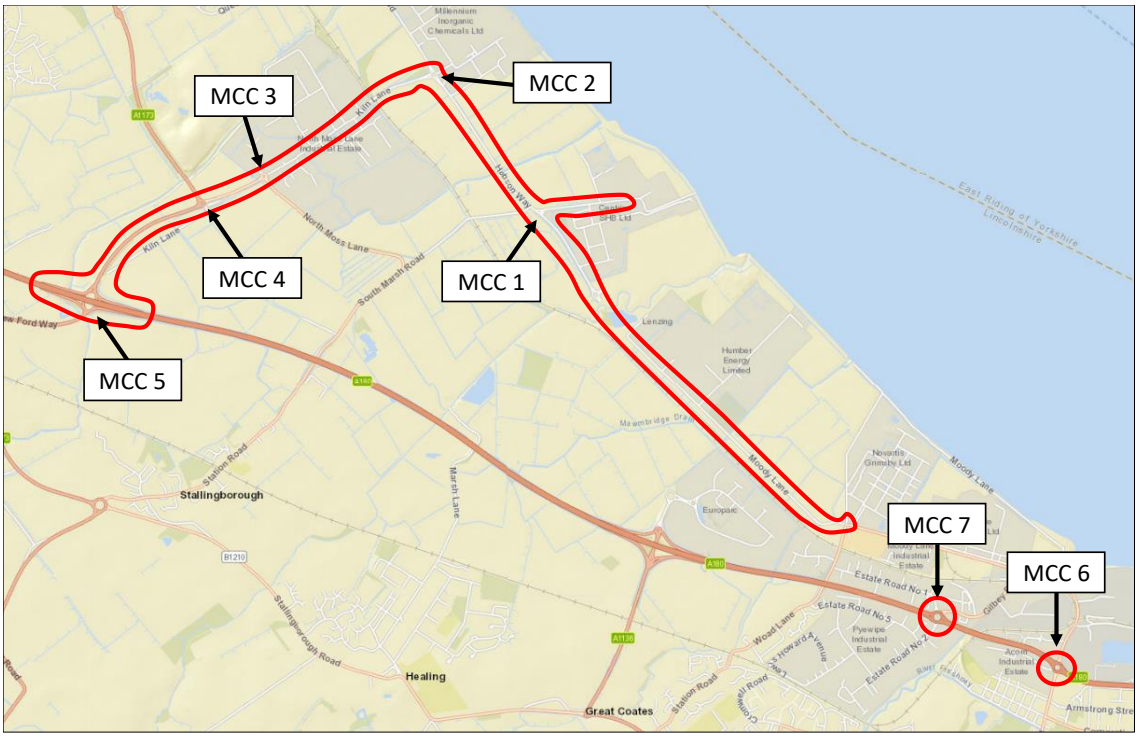
A180

3.2.6 The A180 is a dual carriageway providing access to Grimsby to the south-east and the M180 to the west. The A180 is subject to the 70 mph national speed limit for dual carriageways and is part of HE's core network.

3.3 Baseline Traffic Flows

3.3.1 The Study Area for assessment as agreed with NELC and HE during TA scoping is shown in Figure 3.2 below. The Study Area has been defined based on the sensitivity of the route and the percentage impact that development traffic adds to baseline flows with reference made to the 'Guidelines for Environmental Assessment of Road Traffic' (IEA, 1993). The Study Area has been extended since the Consented Development TA at the request of NELC to include the new South Humber Bank Link Road and the A180/ Estate Road/ Gilbey Road junction (Pyewipe Roundabout).

Figure 3.2: Study Area



3.3.2 Baseline traffic flows for the immediate local highway network have been established through peak hour classified junction counts at the following locations as agreed with NELC and HE during TA scoping for the Proposed Development. The traffic counts were undertaken to inform the TA for the Consented Development and remain valid for the purposes of the Proposed Development TA as they are less than three years old. This has been agreed with NELC and HE during TA scoping. These comprise:

- Manual Classified Count (MCC) 1: South Marsh Road/ Hobson Way;
- MCC 2: Hobson Way/ Laporte Road/ Kiln Lane;
- MCC 3: Kiln Lane/ North Moss Lane/ Trondheim Way;
- MCC 4: A1173/ Kiln Lane;
- MCC 5: A1173/ A180 Stallingborough Interchange;
- MCC 6: A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout);
- MCC 7: A180/ Estate Road/ Gilbey Road (Pyewipe Roundabout).

3.3.3 MCCs 1, 2 and 4 were undertaken on Thursday 7th June 2018, MCC 5 was undertaken on Wednesday 5th July 2017, MCC 7 was undertaken on Thursday 6th July 2017 and MCCs 3 and 6 were undertaken on Thursday 11th October 2018. The raw traffic data is provided in Annex 2.

3.3.4 In order to establish the peak hours for assessment, the total flows arriving at each individual junction have been calculated as total vehicles. The total vehicle

flows arriving at each of the seven junctions across the network have then been combined in order to identify the base peak hours for assessment.

3.3.5 Table 3.1 below summarises the total flows into each junction and identifies the time period 07:00 – 08:00 as the weekday morning (AM) Peak hour and 16:00 – 17:00 as the afternoon (PM) Peak hour.

Table 3.1: Establishing the 2018 Baseline Weekday Peak Hours

Peak Hours	MCC 1	MCC 2	MCC 3	MCC 4	MCC 5	MCC 6	MCC 7	TOTAL
07:00 – 08:00	176	438	795	1,740	1,981	3,846	3,734	**12,710**
08:00 – 09:00	80	349	808	1,342	1,611	4,131	3,773	**12,094**
09:00 – 10:00	64	206	501	889	1,044	3,112	3,209	**9,025**
16:00 – 17:00	91	430	1,034	1,802	2,031	4,504	4,083	**13,975**
17:00 – 18:00	158	308	725	1,606	1,791	4,304	3,753	**12,645**
18:00 – 19:00	101	205	417	980	1,131	3,061	2,448	**8,343**

3.3.6 The 2018 baseline data for the identified AM (07:00 – 08:00) and PM (16:00 – 17:00) Peak hours at the key junctions is shown in Annex 3. The data is presented as follows:

- Total Vehicles;
- Heavy Goods Vehicles (HGV) (Over 3.5 tonnes including buses); and
- Passenger Car Units (PCU).

3.3.7 All junctions have been modelled using the TRL Software package Junctions 9. The results generated indicate the maximum Ratio of Flow to Capacity (RFC) value on each arm and the maximum queue generated. RFC values below 0.85 indicate the junction is operating without any issues. Values between 0.85 and 1.0 indicate the junction is operating above its design capacity but still operating within its theoretical capacity. RFC values in excess of 1.0 represent congested conditions and the junction begins to fail.

3.3.8 The modelling has been undertaken based on PCUs in order to best reflect any operational effects associated with HGV traffic. A PCU is a measure used primarily to assess highway capacity for modelling purposes. A car has a value of 1 PCU; smaller vehicles (i.e. motorcycles, pedal cycles) will have smaller values and larger vehicles (i.e. HGVs, buses) will have higher values.

3.3.9 A summary of the junction capacity assessments at each individual junction for the 2018 Baseline Scenario are set out below.

Hobson Way/ South Marsh Road (East of Hobson Way) T-Junction

2018 Base Scenario

3.3.10 The modelling outputs suggest that the existing junction operates well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.08 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 3.2 below. The full outputs of these assessments are attached as Annex 4.

Table 3.2: 2018 Base Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.02	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.08	0.1
Hobson Way (Right Turn)	0.00	0.0

Hobson Way/ South Marsh Road (West of Hobson Way) T-Junction

2018 Base Scenario

3.3.11 The modelling outputs suggest that the existing junction operates well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.16 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 3.3 below. The full outputs of these assessments are attached in Annex 4.

Table 3.3: 2018 Base Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.11	0.1
South Marsh Road (Right Turn)	0.10	0.1
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.16	0.2

Laporte Road/ Hobson Way/ Kiln Lane Roundabout

2018 Base Scenario

3.3.12 The modelling outputs suggest that the existing junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 3.4 below. The full outputs of these assessments are attached as Annex 4.

Table 3.4: 2018 Base Modelling Outputs (Laporte Rd/ Kiln Ln/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.04	0.0
Kiln Lane EB Approach	0.16	0.2
Laporte Road SB Approach	0.04	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.03	0.0
Kiln Lane EB Approach	0.05	0.1
Laporte Road SB Approach	0.19	0.3
Unnamed Access	0.00	0.0

Kiln Lane/ North Moss Lane/ Trondheim Way Roundabout

2018 Base Scenario

3.3.13 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.43 being forecast on the Kiln Lane arm during the PM Peak as summarised in Table 3.5 below. The full outputs of these assessments are attached as Annex 4.

Table 3.5: 2018 Base Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.12	0.2
North Moss Lane	0.09	0.1
A1173	0.37	0.6
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.43	0.8
North Moss Lane	0.07	0.1
A1173	0.23	0.4
Trondheim Way	0.05	0.1

A1173/ Kiln Lane Roundabout

2018 Base Scenario

3.3.14 The modelling outputs suggest that the existing junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.86 being forecast on the A1173 eastbound approach arm during the AM Peak as summarised in Table 3.6 below. The full outputs of these assessments are attached as Annex 4.

Table 3.6: 2018 Base Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.86	6.0
A1173 SB Approach	0.45	1.0
Kiln Lane WB Approach	0.22	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.33	0.6
A1173 SB Approach	0.82	4.3
Kiln Lane WB Approach	0.72	2.7

A180/ A1173 Stallingborough Interchange

3.3.15 This junction has been modelled using the 'Lane Simulation' mode within Junctions 9 and allows lane specific movements for each approach to be considered resulting in Level of Service (LOS) based on delay and queue. The transportation LOS system uses the letters A to F, with the definitions below being typical:

- A = Free flow
- B = Reasonably free flow
- C = Stable flow
- D = Approaching unstable flow
- E = Unstable flow
- F = Forced or breakdown flow

2018 Base Scenario

3.3.16 The modelling outputs suggest the existing junction operates within free flow conditions (LOS = A) during the AM and PM peak periods as summarised in Table 3.7 below. The full outputs of these assessments are attached as Annex 4.

Table 3.7: 2018 Base Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.6
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	2.9
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	0.3
A180 EB Off-Slip	A	0.3
A1173 SB Approach	A	2.1
A180 WB Off-Slip	A	0.6

A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout)

2018 Base Scenario

3.3.17 The modelling outputs suggest the junction operates just above its theoretical capacity on the A180 Eastern arm during the AM Peak with a queue of 44.1 PCUs and the A180 Western arm and Moody Lane during the PM peak with queues of 200.0 PCUs and 19.3 PCUs respectively. However, it should be noted that with RFC values exceeding 1.0, the junction model can become unstable resulting in spurious queue lengths being generated. The full modelling outputs are attached as Annex 4.

3.3.18 The performance of this junction is already acknowledged in the Local Transport Plan which seeks to address congestion associated with peak hour traffic at this junction.

Table 3.8: 2018 Base Modelling Outputs (A180 Westgate Roundabout)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A180 East	1.02	44.1
Pyewipe Rd	0.87	5.8
Birchin Way	0.85	4.0
A180 West	0.70	2.6
Moody Lane	0.32	0.6
PM Peak (16:00 – 17:00)		
A180 East	0.75	3.1
Pyewipe Rd	0.57	1.3
Birchin Way	0.63	1.7
A180 West	1.19	200.0
Moody Lane	1.07	19.3

A180/ Estate Road/ Gilbey Road (Pyewipe Roundabout)

2018 Base Scenario

3.3.19 The modelling outputs suggest the junction operates above its theoretical capacity on the A180 Eastern arm during the AM Peak with a queue of 55.7 PCUs. However, it should be noted that with RFC values exceeding 1.0, the junction model can become unstable resulting in spurious queue lengths being generated. The full modelling outputs are attached as Annex 4.

Table 3.9: 2018 Base Modelling Outputs (A180 Pyewipe Roundabout)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Estate Road 1	0.07	0.1
Gilbey Road	0.15	0.2
A180 East	1.03	55.7
Estate Road 2	0.22	0.4
A180 West	0.67	2.3
PM Peak (16:00 – 17:00)		
Estate Road 1	0.35	0.6
Gilbey Road	0.39	0.7
A180 East	0.74	3.0
Estate Road 2	0.39	0.7
A180 West	0.82	4.7

3.3.20 In addition, a series of Automatic Traffic Counts (ATCs) have been undertaken in June and September 2018 at the following locations within the Study Area:

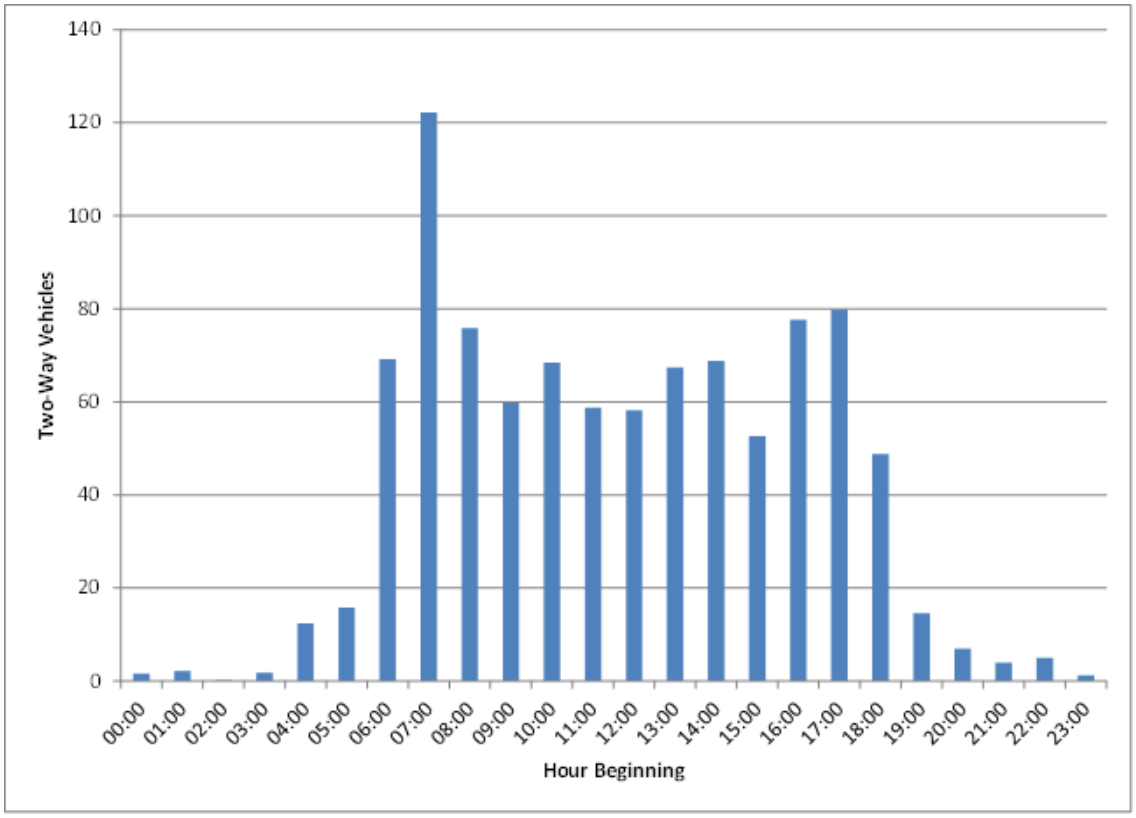
- South Marsh Road (East of Hobson Way);
- South Marsh Road (West of Hobson Way);
- Hobson Way (North of South Marsh Road);
- Kiln Lane (West of Hobson Way);
- A1173 (West of North Moss Lane);
- A1173 (North of A180); and
- A180 Westgate (East of Westgate Roundabout).

3.3.21 From this data, the following typical traffic flows are evident on each link:

South Marsh Road (East of Hobson Way)

- Average Weekday Morning Peak (two-way): 122 vehicles;
- Average Weekday Evening Peak (two-way): 80 vehicles; and
- Annual Average Weekday Traffic (two-way): 973 vehicles.

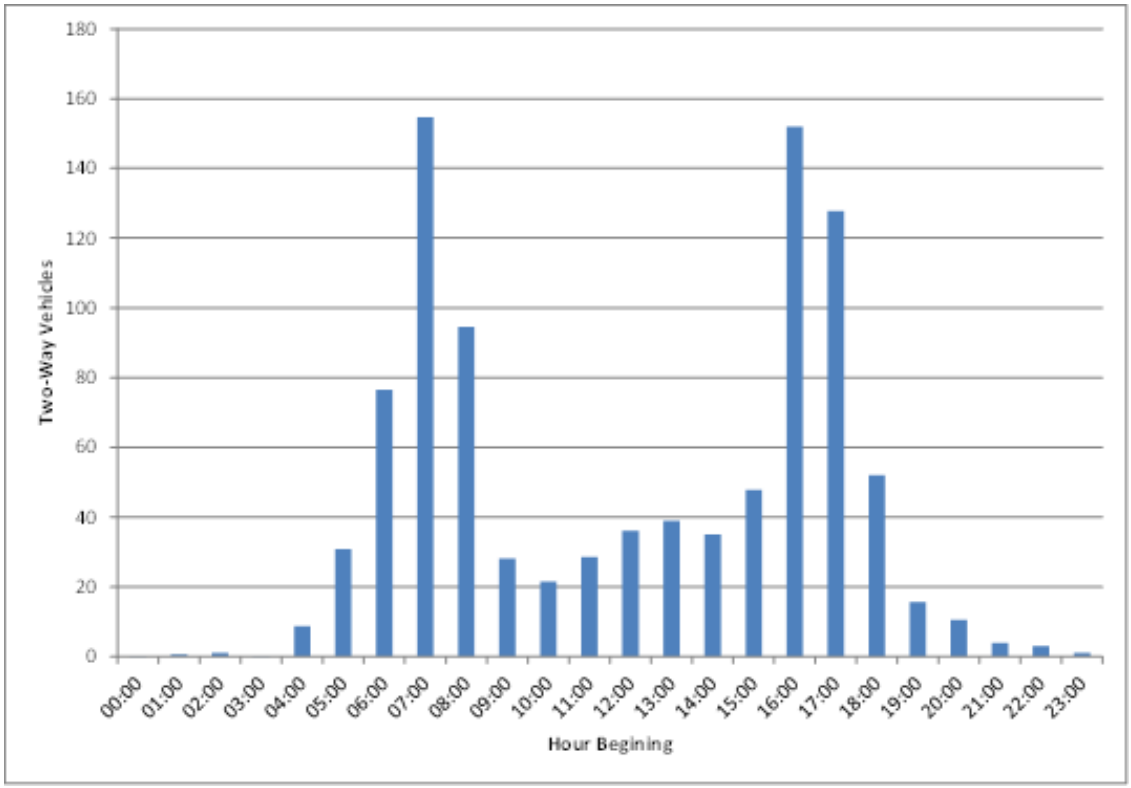
Figure 3.3: South Marsh Road (East of Hobson Way) Average Weekday Profile



South Marsh Road (West of Hobson Way)

- Average Weekday Morning Peak (two-way):155 vehicles;
- Average Weekday Evening Peak (two-way): 152 vehicles; and
- Annual Average Weekday Traffic (two-way): 970 vehicles.

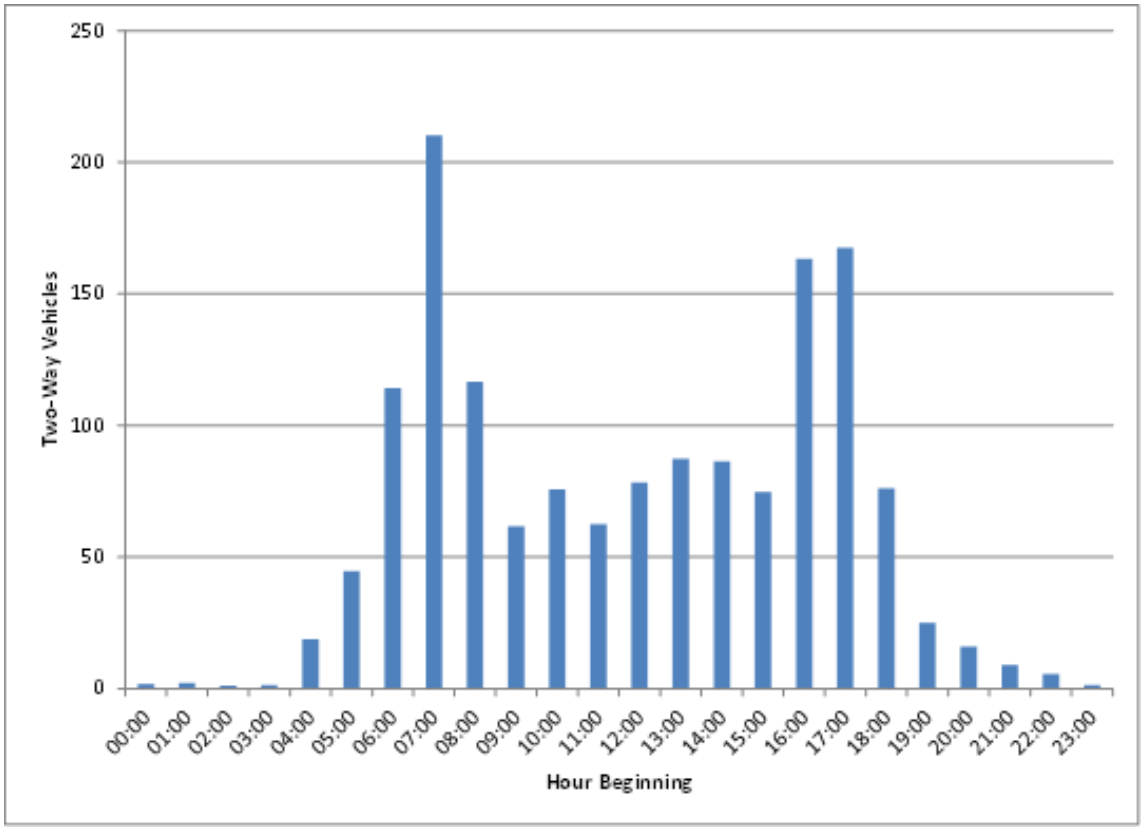
Figure 3.4: South Marsh Road (West of Hobson Way) Average Weekday Profile



Hobson Way (North of South Marsh Road)

- Average Weekday Morning Peak (two-way): 210 vehicles;
- Average Weekday Evening Peak (two-way): 168 vehicles; and
- Annual Average Weekday Traffic (two-way): 1,501 vehicles.

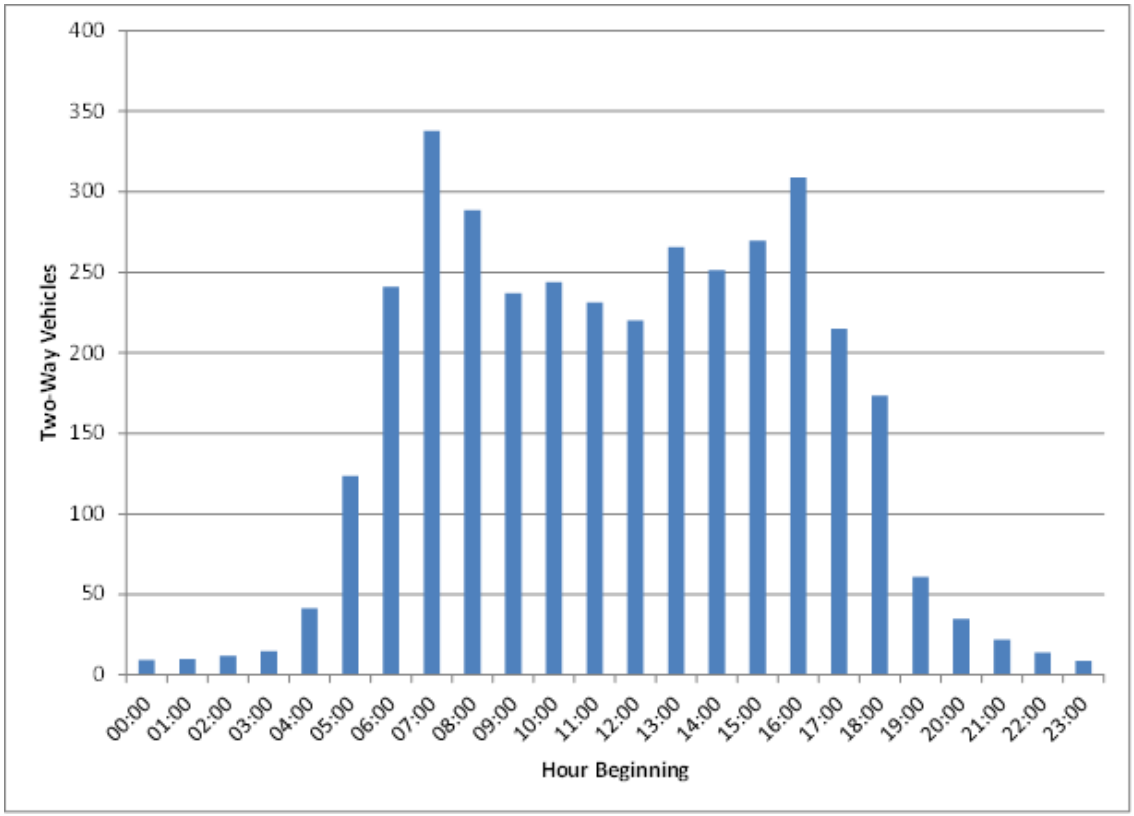
Figure 3.5: Hobson Way (North of South Marsh Rd) Average Weekday Profile



Kiln Lane (West of Hobson Way)

- Average Weekday Morning Peak (two-way): 338 vehicles;
- Average Weekday Evening Peak (two-way): 309 vehicles; and
- Annual Average Weekday Traffic (two-way): 3,635 vehicles.

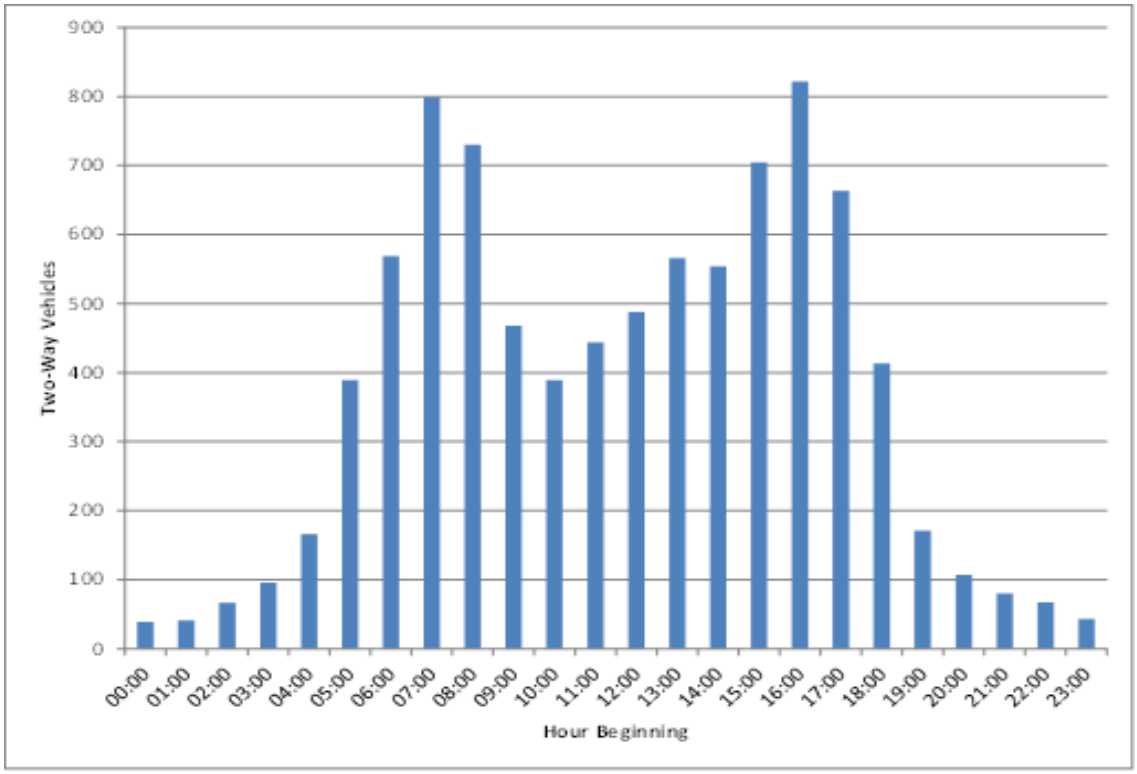
Figure 3.6: Kiln Lane Average Weekday Profile



A1173 (West of North Moss Lane)

- Average Weekday Morning Peak (two-way): 799 vehicles;
- Average Weekday Evening Peak (two-way): 822 vehicles; and
- Annual Average Weekday Traffic (two-way): 8,875 vehicles.

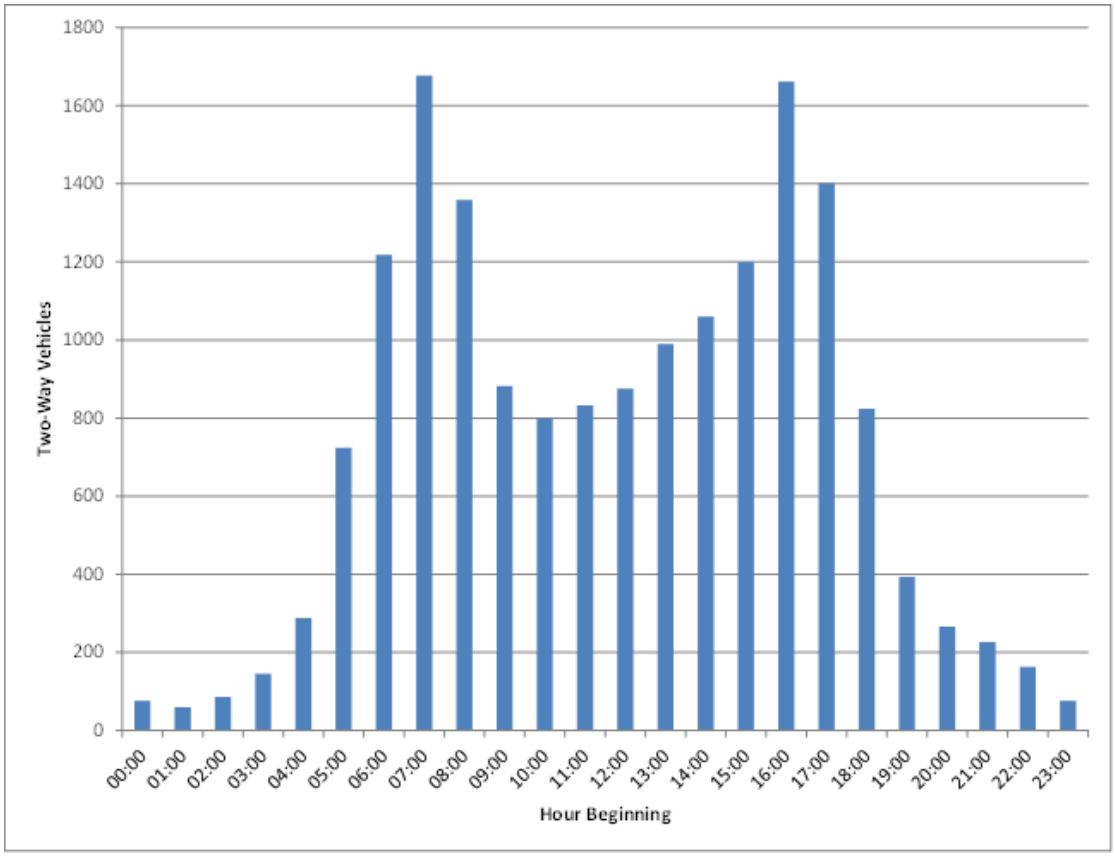
Figure 3.7: A1173 (West of North Moss Lane) Average Weekday Profile



A1173 (North of A180)

- Average Weekday Morning Peak (two-way): 1,677 vehicles;
- Average Weekday Evening Peak (two-way): 1,662 vehicles; and
- Annual Average Weekday Traffic (two-way): 17,281 vehicles.

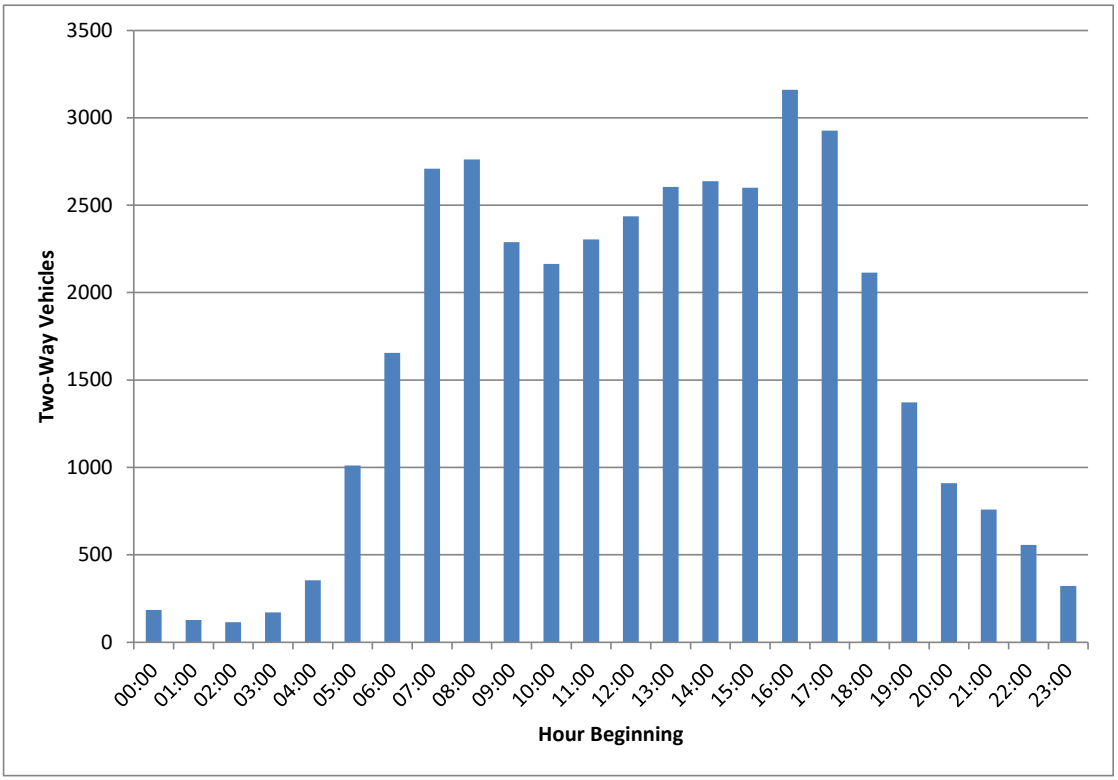
Figure 3.8: A1173 (North of A180) Average Weekday Profile



A180 Westgate (East of Westgate Roundabout)

- Average Weekday Morning Peak (two-way): 2,762 vehicles;
- Average Weekday Evening Peak (two-way): 3,160 vehicles; and
- Annual Average Weekday Traffic (two-way): 38,240 vehicles.

Figure 3.9: A180 Westgate (East of Westgate Roundabout) Average Weekday Profile



4.0 REVIEW OF ACCESS BY SUSTAINABLE TRANSPORT MODES

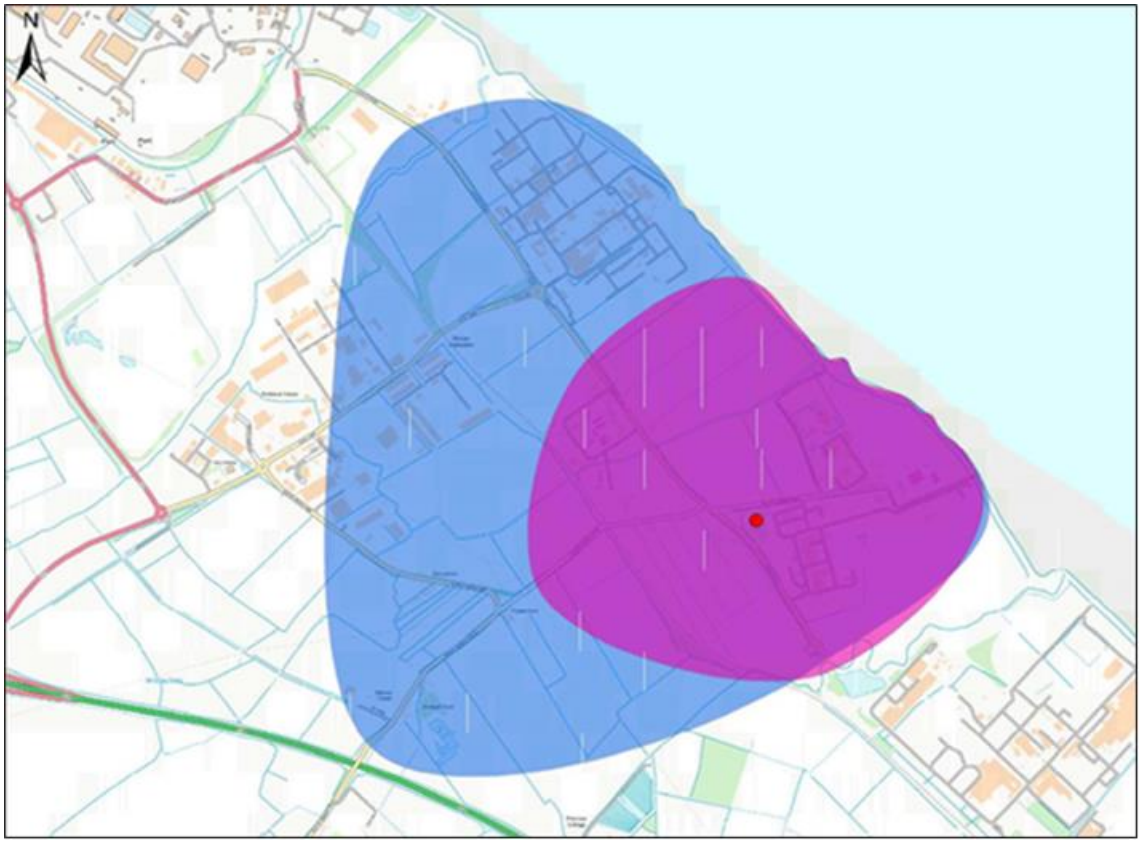
4.1 Overview

4.1.1 The Proposed Development is located in a remote semi-rural/ industrial area located some distance away from any major residential areas. Given its remote location and the proposed shift patterns to be worked by operational staff, opportunities to walk, cycle or use public transport to access the Site are likely to be limited. In any case, this section of the report considers the sustainable access modes available.

4.2 Walking

4.2.1 The Chartered Institution of Highways and Transportation (CIHT) document 'Providing for Journeys on Foot' (2000) suggests a maximum walking distance of 2 km. Figure 4.1 below shows a 1 km and 2 km walking catchment area from the Proposed Development.

Figure 4.1: 1 km/ 2 km Walking Catchment Area



4.2.2 Figure 4.1 shows that apart from some properties located off South Marsh Road to the north of the A180 there are no major residential areas within a 2 km walking distance of the Site. In terms of pedestrian facilities in the vicinity of the Site, a footway approximately 2 m wide is provided along the western kerbline of Hobson Way.

4.2.3 It is not therefore anticipated that walking trips would likely represent a practical travel mode for staff or visitors.

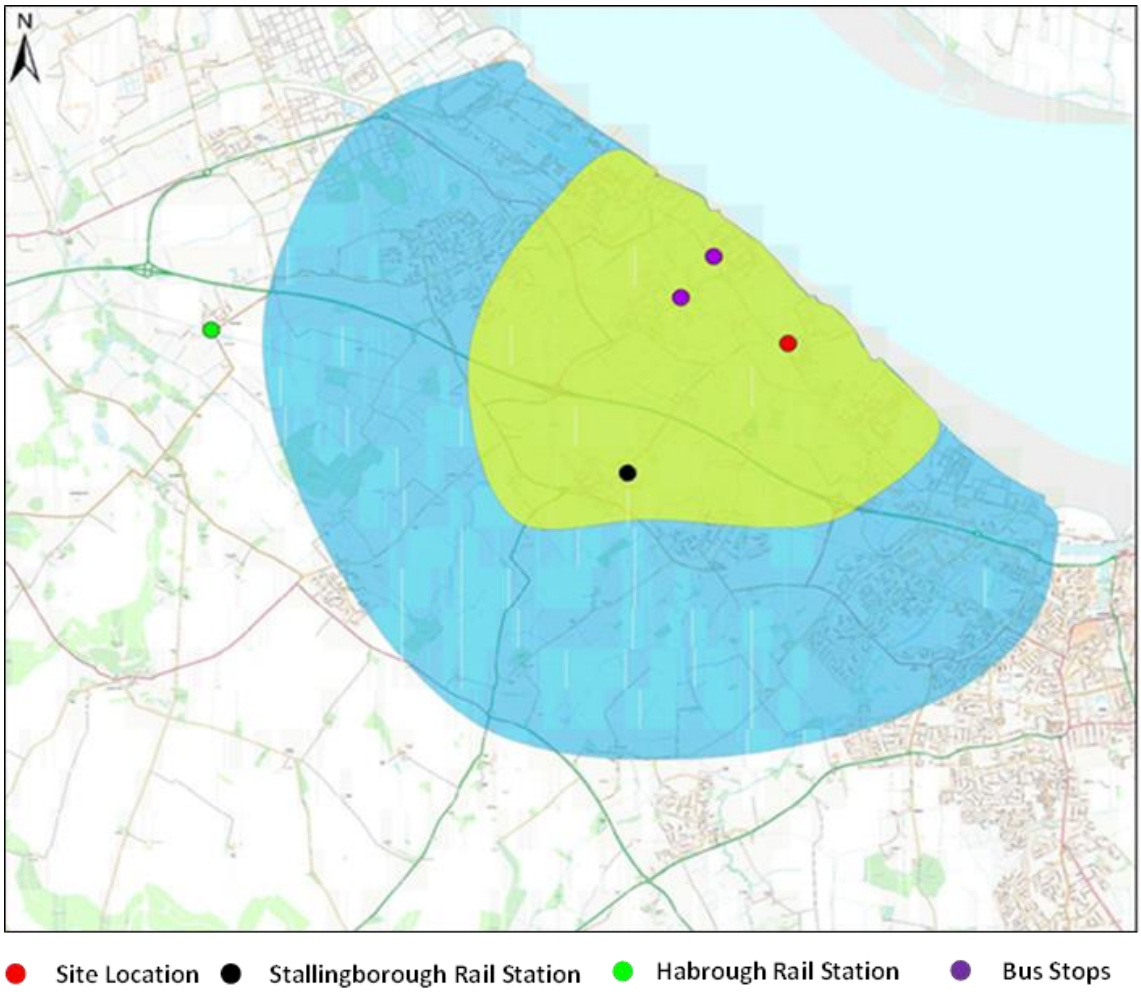
4.3 Cycling

4.3.1 Cycling is considered to be a viable alternative to that of the private car for journeys up to 8 km from the Site, providing a healthy and environmentally friendly form of transport.

4.3.2 In respect of acceptable cycle distances, 'Local Transport Note 2/08: Cycling Infrastructure Design', published by the Department for Transport states that many utility cycle trips are less than 3 miles (approximately 5 km), but for commuter journeys a distance of over 5 miles (approximately 8 km) is not uncommon.

4.3.3 Taking this into account, a plan illustrating the indicative 5 km and 8 km cycle catchment area from the Proposed Development is shown in Figure 4.2.

Figure 4.2: 5 km/ 8 km Cycling Catchment Area



4.3.4 Figure 4.2 shows Healing, Great Coates, Stallingborough, and Immingham are within an 8 km cycle distance of the Site.

4.3.5 Within the vicinity of the Site there are no dedicated traffic-free cycle routes. However, NELC does promote a leisure cycle route known as the Fishermen & Ships. This is a 12 km circular route which starts and finishes at Grimsby Leisure Centre and heads north-east to the coast before heading north to South Marsh

Road and then routing west along South Marsh Road past the SHBPS to Stallingborough before heading south-east back along Great Coates Road.

4.3.6 Whilst the lack of dedicated traffic-free cycle routes is not considered to be an issue for experienced cyclists, the surrounding road network is regularly used by HGVs given its industrial nature and therefore may not represent an attractive option for less experienced cyclists.

4.4 Public Transport

4.4.1 The CIHT guidance document 'Planning for Public Transport in Developments' recommends that 400 m is the desirable walking distance to a bus stop from a new development. The nearest bus stop to the Site is located approximately 1.9 km to the north of the Site on Laporte Road. A further bus stop is located along Europa Way off Kiln Lane approximately 2 km from the Site.

4.4.2 These bus stops are served by the 5M bus service. The frequency of this service is shown in Table 4.1.

Table 4.1: Bus Service Frequency

SERVICE	ROUTE	FREQUENCY		
		Mon - Fri	Sat	SUN
5M	Immingham - Grimsby	06:49, 07:49, 16:15, 17:10	No Service	No Service

4.4.3 In summary these bus stops are located outside of the acceptable walking distance to a bus stop and given the low frequency of service represents an unattractive option for staff and visitors.

5.0 PERSONAL INJURY ACCIDENT DATA

5.1 Overview

5.1.1 Accident data has been taken into consideration in line with Planning Practice Guidance titled 'Travel plans, transport assessments and statements in decision taking' published in March 2014 which requires analysis of any road traffic incidents which have occurred within the most recent five year Study Period within the locality of the Site.

5.1.2 Personal Injury Accident (PIA) data has been obtained from the Crashmap website (www.crashmap.co.uk) for the five year Study Period 1st January 2014 to 31st December 2018 for the areas of consideration which includes the area incorporating the A180/ A1173 interchange, A1173, Kiln Lane, Hobson Way and South Marsh Road and the area incorporating the A180 Westgate Roundabout and A180 Pyewipe Roundabout. The Accident Study Area and sites are shown in Figures 5.1 to 5.3.

Figure 5.1: Accident Study Area and Accident Sites

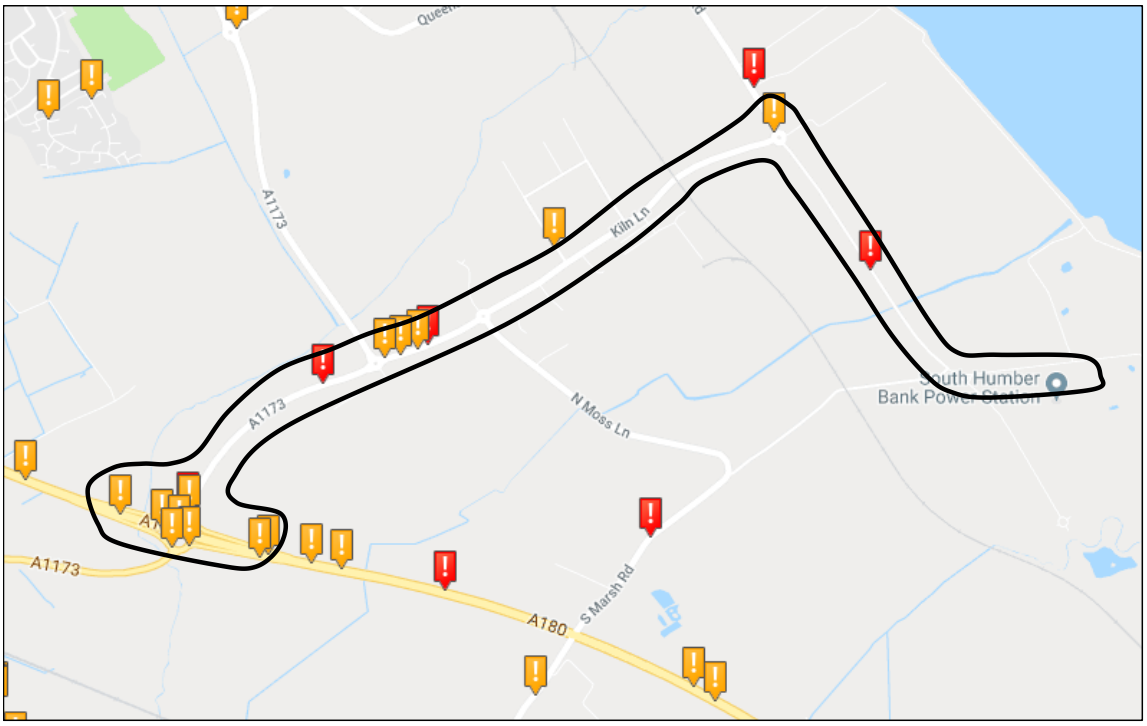


Figure 5.2: Westgate Roundabout Accident Study Area and Accident Sites

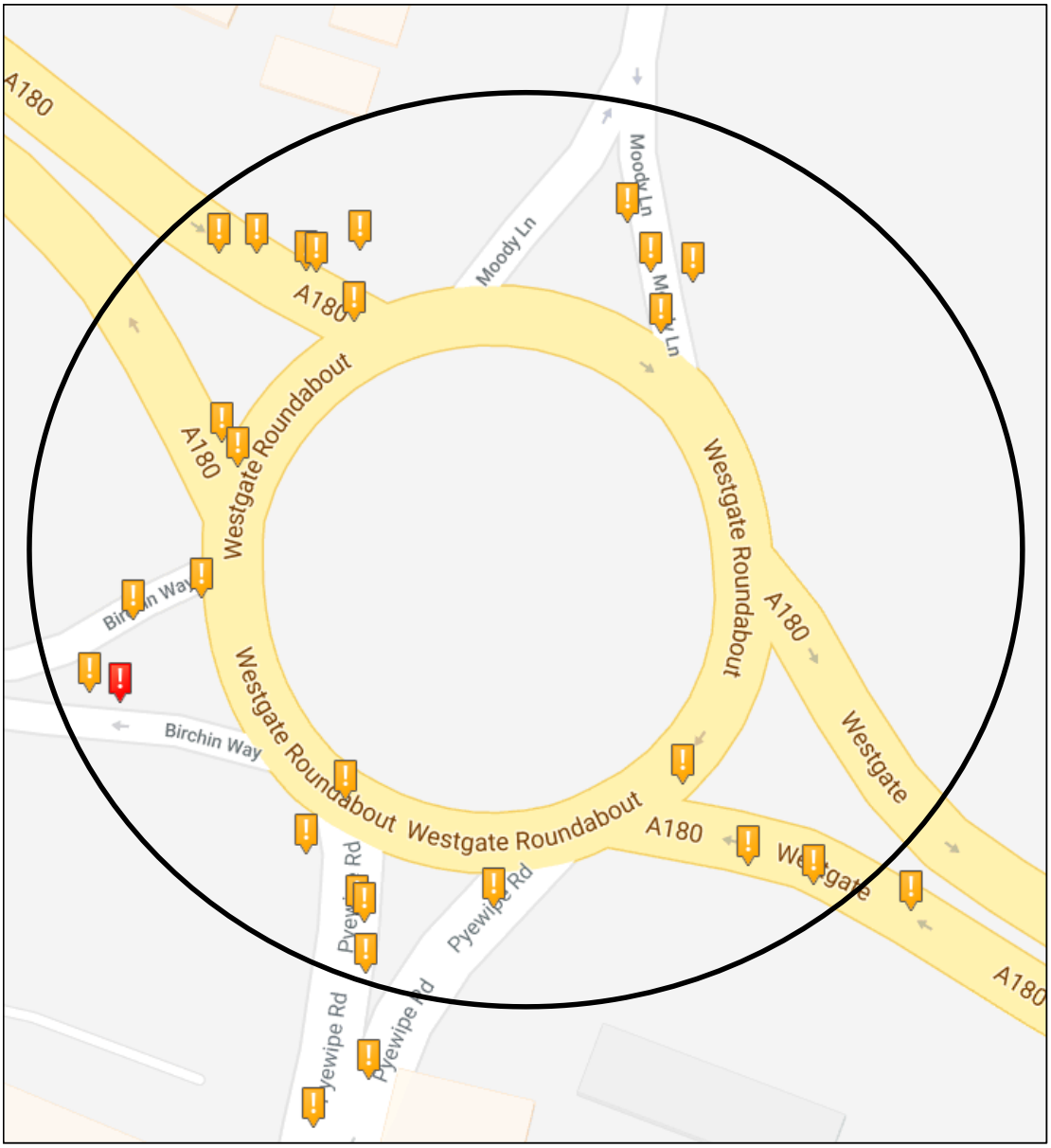
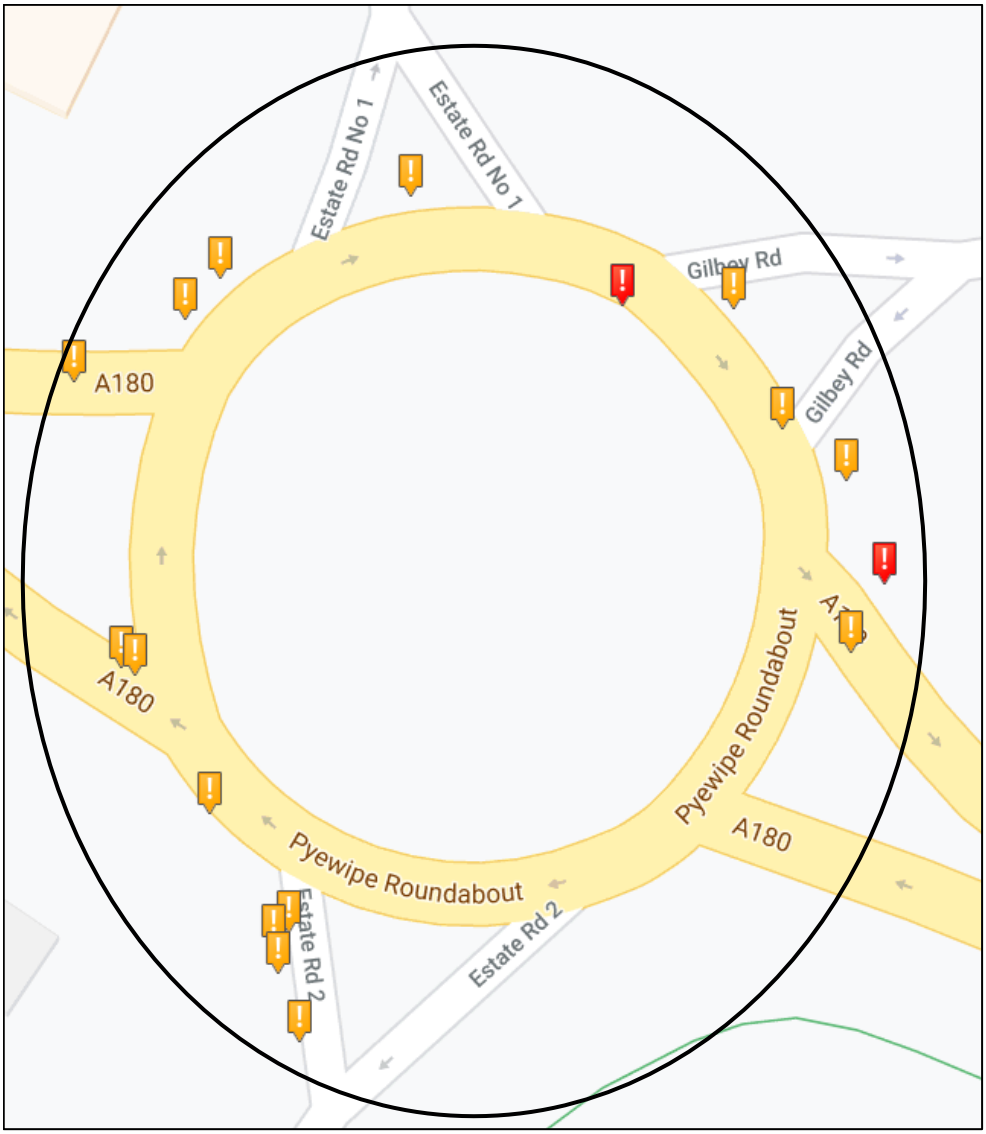


Figure 5.3: Pyewipe Roundabout Accident Study Area and Accident Sites



5.1.3 The Accident Study Area shown in Figure 5.1 identified a total of 12 reported accidents over the past five years of which eight were classed as slight in severity and four serious severity. A breakdown of severity of the accidents over the five year Study Period has been provided in Table 5.1 below.

Table 5.1: Accident Summary

YEAR	TOTAL ACCIDENTS	SEVERITY		
		Slight	Serious	Fatal
2014	1	1	0	0
2015	5	3	2	0
2016	5	3	2	0
2017	1	1	0	0
2018	0	0	0	0
TOTAL	**12**	**8**	**4**	**0**

5.1.4 The Accident Study Area shown in Figure 5.2 incorporating the A180 Westgate Roundabout identified a total of 25 reported accidents over the past five years of which 24 were classed as slight in severity and one serious severity. A breakdown of severity of the accidents over the five year Study Period has been provided in Table 5.2.

Table 5.2: A180 Westgate Roundabout Accident Summary

YEAR	TOTAL ACCIDENTS	SEVERITY		
		Slight	Serious	Fatal
2014	9	9	0	0
2015	6	6	0	0
2016	6	6	0	0
2017	4	3	1	0
2018	0	0	0	0
TOTAL	**25**	**24**	**1**	**0**

5.1.5 The Accident Study Area shown in Figure 5.3 incorporating the A180 Pyewipe Roundabout identified a total of 16 reported accidents over the past five years of which 14 were classed as slight in severity and 2 were of serious severity. A breakdown of severity of the accidents over the five year Study Period has been provided in Table 5.3.

Table 5.3: A180 Pyewipe Roundabout Accident Summary

YEAR	TOTAL ACCIDENTS	SEVERITY		
		Slight	Serious	Fatal
2014	4	4	0	0
2015	1	1	0	0
2016	3	2	1	0
2017	6	6	0	0
2018	2	1	1	0
TOTAL	**16**	**14**	**2**	**0**

5.1.6 Further detailed analysis is provided below. Full accidents reports are provided within Annex 5.

5.2 A180/ A1173 Interchange

5.2.1 Over the five year Study Period a total of five accidents occurred, three located at the junction and two along the A180 northbound off slip approach.

5.2.2 Of the five accidents, four were of slight severity and one serious severity. Analysis of the accident reports have identified that the incidents were due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accidents are provided within Table 5.4 below.

Table 5.4: A180/ A1173 Interchange

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
Gyratory (vicinity of A1173 South Approach)	15.05.15	Slight	2	Collision
A1173 (Northern Approach)	22.02.16	Serious	1	Collision
	06.08.16	Slight	2	Rear End Shunt
A180 Northbound Off-Slip	30.06.15	Slight	2	Rear End Shunt
	06.12.16	Slight	2	Rear End Shunt

5.3 A1173 Corridor

5.3.1 Over the five year Study Period one accident of serious severity occurred along the A1173 corridor approximately 200 m west from its junction with the Kiln Lane roundabout. Analysis of the incident report has identified that the incident was due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accident are provided within Table 5.5 below.

Table 5.5: A1173 Corridor

DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
16.10.15	Serious	2	Rear End Shunt

5.4 A1173/ Kiln Lane Roundabout

5.4.1 Over the five year study Study Period one accident occurred at this junction which was classed as slight in severity. Analysis of the accident report has identified that the incident was due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accident are provided within Table 5.6 below.

Table 5.6: A1173/ Kiln Lane Roundabout

DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
25.07.14	Slight	2	Rear End Shunt

5.5 Kiln Lane Corridor

5.5.1 Over the five year Study Period a total of three accidents were recorded along the Kiln Lane corridor between its junctions with the A1173 to the west and Hobson Way/ Laporte Road to the east. Of the three accidents that were reported two were classified as slight in severity and one serious.

5.5.2 Analysis of the accident reports have identified that the accidents were due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accidents are provided within Table 5.7 below.

Table 5.7: Kiln Lane Corridor

DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
22.05.15	Serious	2	Collision – due to vehicle undertaking a U turn manoeuvre
29.12.15	Slight	2	Collision
21.04.16	Slight	3	Rear End Shunt

5.6 Kiln Lane/ Hobson Way/ Laporte Road Junction

5.6.1 Over the five year Study Period one accident was reported at the four arm roundabout, which was classed as slight in severity.

5.6.2 Analysis of the accident report has identified that the incident was due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accident are provided within Table 5.8 below.

Table 5.8: Kiln Lane/ Hobson Way/ Laporte Road Roundabout

DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
03.01.17	Slight	2	Collision – vehicle struck a bollard

5.7 Hobson Way Corridor

5.7.1 Over the five year Study Period one accident occurred along the Hobson Way corridor approximately 580 m south of the Kiln Lane roundabout and was classed as serious in severity.

5.7.2 Analysis of the accident report has identified that the accident was due to driver error as opposed to any physical alignments on the highway infrastructure. Details of the accident are provided within Table 5.9 below.

Table 5.9: Hobson Way Corridor

DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
14.07.16	Serious	1	Driver Loss of Control

5.7.3 Given the small number of accidents identified within the Accident Study Area between the Site and the A180, it is considered there are no highway safety concerns in the vicinity of the Site.

5.8 A180 Westgate Roundabout

5.8.1 Over the five year Study Period, twenty-five accidents were recorded at this junction of which twenty-four were of slight severity and one was of serious severity. A breakdown of severity of the accidents over the five year Study Period has been provided in Table 5.2 and shows the yearly number of accidents occurring at the junction has reduced over the last five years.

5.8.2 Analysis of the accident reports have identified that the incidents were due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accidents are provided within Table 5.10 below.

Table 5.10: A180 Westgate Roundabout

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
A180 Eastern Arm	18/06/16	Slight	2	Vehicle proceeding normally along the carriageway collides with a slowing/ stopping vehicle
	22/10/16	Slight	2	Rear end shunt with vehicle colliding into a slowing/ stopping vehicle. Light conditions are dark but street lighting is present and lit
	23/10/16	Slight	1	Driver loss of control
	22/09/17	Slight	2	Two vehicles on entering the roundabout collide
A180 Western Arm	24/02/14	Slight	2	Goods vehicle (7.5 tonnes mgw and over) changing lanes to the right collides with nearside of vehicle proceeding normally along the carriageway
	14/04/14	Slight	2	Broadside (T-Bone) collision with two vehicles proceeding normally along the carriageway
	28/04/14	Slight	2	Broadside (T-Bone) collision with motorcycle (125cc-500cc) in the act of

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
				turning left collides with vehicle (offside) proceeding normally along the carriageway. Light conditions are dark but street lighting is present and lit
	22/10/14	Slight	2	Rear end shunt with two vehicles proceeding normally along the carriageway
	09/02/15	Slight	2	Broadside (T-Bone) collision with vehicle proceeding normally along the carriageway colliding with a pedal cycle
	20/03/15	Slight	2	Rear end shunt with goods vehicle (7.5 tonnes mgw and over) colliding with rear of a vehicle waiting to proceed normally but is held up. Road conditions: Wet or Damp
	13/07/16	Slight	2	Rear end shunt with vehicle slowing down or stopping colliding with the rear of a vehicle moving off
Pyewipe Rd	11/02/14	Slight	2	Vehicle passing a stationary vehicle on its offside collides with vehicle waiting to turn right
	20/07/14	Slight	2	Rear end shunt with vehicle in the act of turning left and vehicle waiting to turn left
	28/10/14	Slight	2	Vehicle is waiting to proceed but is held up. Rear end shunt

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
				from vehicle proceeding normally
	10/11/15	Slight	2	Two motorcycles (over 50cc and up to 125cc; and over 500cc) proceeding normally along the carriageway. Light conditions are dark but street lighting is present and lit
	18/07/16	Slight	2	Rear end shunt with vehicle proceeding normally along the carriageway colliding with a slowing or stopping vehicle
	12/07/17	Slight	2	Collision between a van/ goods vehicle (3.5 tonnes mgw and under) proceeding normally and vehicle changing lane to the right
	18/09/17	Slight	1	Minibus (8-16 passenger seats) in the act of turning right collides with kerb and lamp post
Birchin Way	04/01/14	Slight	2	Collision between vehicle moving off (nearside) and vehicle proceeding normally along the carriageway (offside). Road surface is wet/ damp and light conditions are dark with street lighting present and lit
	02/08/15	Slight	2	Rear end shunt with vehicle proceeding normally along the carriageway colliding into vehicle moving off

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
	17/10/16	Slight	2	Vehicle is waiting to proceed but is held up. Rear end shunt from vehicle proceeding normally
	20/09/17	Serious	2	Collision between vehicle in the act of turning left and a pedal cycle proceeding normally along the carriageway. Light conditions are dark but street lighting is present and lit
Moody Lane	25/04/14	Slight	2	Rear end shunt with pedal cycle colliding into the rear of vehicle proceeding normally along the carriageway. Road condition: Wet or Damp
	20/07/15	Slight	2	Two vehicles in the act of turning right collide
	17/11/15	Slight	2	Rear end shunt with van/goods vehicle (3.5 tonnes mgw and under) moving off colliding into vehicle in the act of turning right

5.9 A180 Pyewipe Roundabout

5.9.1 Over the five year Study Period, sixteen accidents were recorded at this roundabout of which fourteen were of slight severity and two were of serious severity. A breakdown of severity of the accidents over the five year Study Period has been provided in Table 5.3.

5.9.2 Analysis of the accident reports have again identified that the incidents were due to driver error due to lack of awareness of their surrounding and poor judgment as opposed to any physical alignments on the highway infrastructure. Details of the accidents are provided within Table 5.11 below.

Table 5.11: A180 Pyewipe Roundabout

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
Estate Rd No. 1	28/11/2017	Slight	2	Collision between a vehicle proceeding normally and vehicle changing lane (offside)
Gilbey Rd	04/10/2018	Serious	1	Vehicle proceeding normally along the carriageway collides with the kerb and a road sign/ traffic signal
	19/06/2017	Slight	3	Two vehicles waiting to proceed but are held up. Rear end shunt from vehicle proceeding normally
	22/09/2017	Slight	2	Collision between vehicle moving off and vehicle proceeding normally along the carriageway
	08/05/2014	Slight	2	Motorcycle (over 500cc) proceeding normally impacts vehicle turning left (offside)
A180 Eastbound Exit Arm	09/07/2016	Serious	1	Motorcycle (over 50cc and up to 125cc) crashes when turning left
	15/05/2014	Slight	2	Incursion with van/goods vehicle (3.5 tonnes and under 7.5 tonnes mgw) moving off with vehicle in the act of turning right, although no collision between the two
Estate Rd No. 2	03/07/2014	Slight	2	Rear end shunt with vehicle proceeding normally along the carriageway colliding

LOCATION	DATE OF INCIDENT	SEVERITY	NO. OF VEHICLES	CAUSATION
				into vehicle moving off
	24/01/2017	Slight	2	Rear end shunt with vehicle proceeding normally along the carriageway colliding into vehicle slowing down
	29/11/2016	Slight	2	Rear end shunt with vehicle waiting to normally along the carriageway colliding into vehicle also waiting to proceed
	21/06/2017	Slight	2	Rear end shunt with vehicle proceeding normally along the carriageway colliding with another vehicle proceeding normally
A180 Westbound Exit Arm	28/08/2014	Slight	2	Collision between a van / goods vehicle (3.5 tonnes mgw and under) proceeding normally and vehicle turning left
	22/09/2015	Slight	2	Vehicle proceeding normally impacted on nearside by vehicle in the act of turning left
A180 Eastbound Entry Arm	15/11/2016	Slight	2	Collision between a van / goods vehicle (3.5 tonnes mgw and under) waiting to turn right and vehicle turning left
	31/10/2017	Slight	2	Vehicle proceeding normally impacted on nearside by another vehicle proceeding normally
	19/04/2018	Slight	2	Vehicle proceeding normally impacted on nearside by another vehicle proceeding normally

6.0 PROPOSED DEVELOPMENT

6.1.1 The Proposed Development comprises an energy from waste power station which will generate electricity through the controlled combustion of RDF and would have a gross electrical output of up to 95 MW.

6.1.2 The nominal design capacity of the facility is 616,500 tonnes per annum (tpa) of RDF based on a design net calorific value (NCV) of 11 MJ/kg and the expected plant annual running hours. The plant is capable of maintaining the maximum electrical output while combusting fuel in a range of NCVs between 9 and 14 MJ/kg. The maximum fuel throughput of the Proposed Development is theoretically 753,500 tpa if fuel with a NCV of 9 MJ/kg were only to be used based on the expected plant annual running hours.

6.1.3 To ensure a robust assessment, the TA considers the traffic associated with the lowest NCV fuel, which would equate to approximately 753,500 tpa.

6.1.4 Whilst the Development Consent Order (DCO) is being sought, the Applicant is likely to progress the Consented Development in accordance with the Planning Permission. Approximately a three year construction programme is anticipated for the Consented Development, with construction expected to commence in Quarter 2 (Q2) 2020. Following grant of a DCO for the Proposed Development (which would be anticipated around Q3 2021, approximately half way through the three year construction programme for the Consented Development), the additional works that would be required (in addition to those which benefit from the Planning Permission) would then be constructed, and the Proposed Development would commence operation in 2023.

6.1.5 Whilst this is the most likely construction programme scenario for the Proposed Development, two other potential construction programme scenarios are also being considered in order that a robust assessment of environmental effects is undertaken. The alternative scenarios relate to the potential for the Proposed Development to be constructed and operated pursuant to only the DCO and commencing either in Q3 2021 (when the DCO would be granted) or Q3 2026 (just before the DCO would expire). In these two alternative scenarios the Proposed Development would commence operation in 2024 or 2029 respectively.

6.1.6 For the purposes of the TA (in terms of highway/ junction capacity) the worst case scenario would be the latest construction start date (2026) because baseline traffic flows would be higher. However, for the purposes of this assessment all three scenarios have been assessed for completeness.

6.1.7 The assessment scenarios are therefore:

- Construction – assuming for TA purposes that construction starts in either Q2 2020, Q3 2021 or Q3 2026; and
- Opening (start of Operation) – assuming for TA purposes that operation commences in either Q2 2023, Q3 2024 or Q3 2029.

6.1.8 During construction, the Proposed Development would require a maximum of around 750 workers per day at the peak of construction. Once operational, the Proposed Development would create around 56 new permanent full time jobs.

6.1.9 It is expected that each year the Proposed Development will be taken offline for approximately three weeks to allow for invasive maintenance activities such as internal inspection of the boiler. Approximately every five to six years the facility will be taken offline for a major outage for substantial maintenance activities such as replacement sections of the boiler. Such a major outage is likely to last approximately five weeks where it could be expected that up to 200 staff could be on Site on any one day.

6.1.10 The activities involved in the decommissioning process for the Proposed Development are not yet known in detail, as it has a design life of approximately 30 years. There would be expected to be some traffic movements associated with the removal (and recycling, as appropriate) of material arising from demolition and potentially the import of materials for land restoration and re-instatement. However, vehicle numbers are not expected to be higher than those experienced during the construction or operational period.

6.2 Site Access and Car Parking

Vehicle Access

6.2.1 Access to the Proposed Development will be provided via a new access at the eastern end of the adopted section of South Marsh Road. A layout plan showing the proposed access is provided in Annex 6.

6.2.2 Incoming HGVs will enter the Site and proceed to the two incoming weighbridges. Should both weighbridges be occupied, a HGV holding area is to be provided accommodating up to six HGVs to prevent HGV stacking on the access road.

6.2.3 After weighing the HGVs will proceed to the tipping hall where they will be directed to a vacant tipping bay. On completion of the tipping operation, the vehicles will leave the tipping hall via a separate exit. A designated route for all vehicles on Site will reduce the risk of congestion and collisions.

6.2.4 The weight of outgoing vehicles will be recorded at the outgoing weighbridges as they leave the Site.

6.2.5 The layout also includes a separate lane to either side of the incoming and outgoing weighbridges for use by staff and visitor vehicles.

6.2.6 A Delivery and Servicing Plan demonstrating how deliveries and servicing will be managed is included within Annex 26.

Car Parking

6.2.7 It is proposed that 57 parking spaces will be provided on Site to accommodate proposed staffing levels at the Site. This level of car parking has been identified as being suitable to accommodate proposed staffing levels for the Proposed Development including a requirement for additional spaces during shift change over periods, visitor provision and a level of site flexibility. Review of anticipated staffing levels identifies a regular parking demand of up to 42 spaces during shift change periods (see Table 7.2 below). It is proposed that 5% of the total spaces will be disabled spaces in accordance with Policy 38 (Parking) of the North East Lincolnshire Local Plan 2013 – 2032 (adopted 2018).

6.3 Proposed Site Operating Hours and Staffing Levels

Site Operation and Delivery Periods

6.3.1 The Proposed Development will operate twenty four hours a day, seven days a week, with occasional offline periods for maintenance.

6.3.2 Deliveries of consumables, and removal of bottom ash and flue gas treatment residues off Site are proposed to occur between the hours of 06:00 and 18:00. Fuel deliveries are proposed to take place 24 hours per day, seven days per week (including Bank Holidays but excluding Christmas Day, Boxing Day and New Year's Day). However, for the purposes of the TA, as a 'worst case' it is assumed that all deliveries (consumables and fuel) and collections (bottom ash and flue gas treatment residues) will take place between 06:00 and 18:00.

6.3.3 Although the timings allow for deliveries every day of the week, it is likely that the majority of fuel deliveries will be Monday to Friday. For the purposes of the TA and to ensure a robust assessment it is assumed that all deliveries will occur Monday to Friday.

6.3.4 Rail transport of fuel directly to the Site is not considered to be feasible for the Proposed Development as the Site is not rail connected. In addition, fuel contracts have not yet been agreed and it is not known whether the suppliers will be rail connected. The Site is well connected by road but opportunities to use nearby rail facilities will be considered where appropriate during fuel contract negotiations.

Proposed Staffing Levels

6.3.5 It is estimated that around 56 staff will be required on a shift basis to be spread over a 24 hour period. Site operation is likely to be undertaken via three 8 hr shifts (06:00 – 14:00, 14:00 – 22:00, and 22:00 – 06:00).

6.3.6 It is anticipated there will be a maximum of 14 staff per shift, with an additional 14 day/ management staff being employed at the Proposed Development.

6.3.7 Staff will be encouraged to use sustainable modes of travel to access the Site where possible through the implementation of a Travel Plan promoting measures such as Car Sharing and Cycling. A Framework Operational Travel Plan is included in Annex 7.

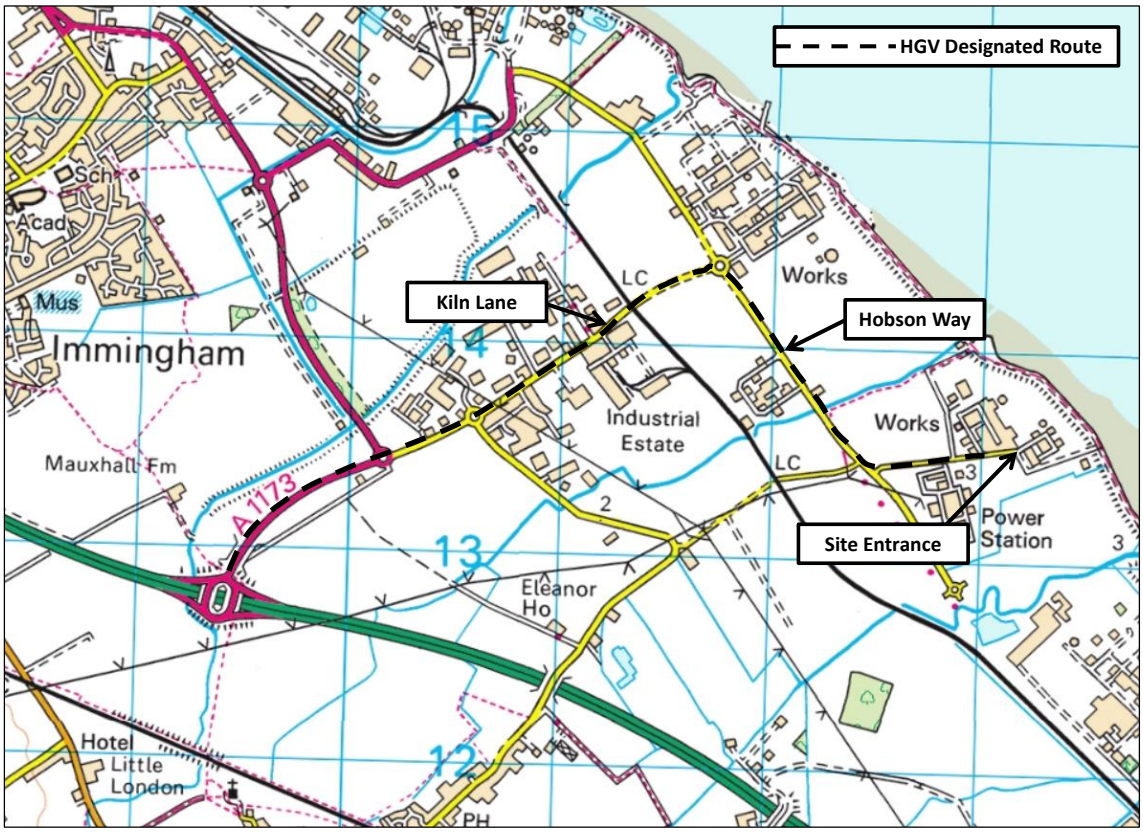
6.4 Operational HGV Routing

6.4.1 It is proposed that all operational HGV traffic to/ from the Proposed Development will be required to route to/ from the A180 via the A1173, Kiln Lane, Hobson Way and South Marsh Road (see Figure 6.1) which was agreed with NELC for the Consented Development. This designated route ensures all HGVs keep to the strategic and principal road network and avoid the use of minor local roads. This will be formalised by a routing agreement and will be rigorously enforced by the Proposed Development operator. Further details on the HGV routing agreement are set out in the Delivery and Servicing Plan (Annex 26).

6.4.2 The Proposed Development operator will encourage the public to report any incidents regarding any breaches of the routing agreement to the Site Manager together with information on the location of the HGV, direction of travel and its

number plate/ operator. This information will allow the Site Manager to take appropriate action to avoid any future incidents. Further details are set out in the Delivery and Servicing Plan (Annex 26).

Figure 6.1: Designated Operational HGV Route



7.0 DEVELOPMENT TRIP GENERATION AND ASSIGNMENT

7.1 Operational HGV Traffic Levels

7.1.1 As set out in Section 6 above, deliveries of consumables, and removal of bottom ash and flue gas treatment residues off-site are proposed to occur between the hours of 06:00 and 18:00 and fuel deliveries are proposed to take place 24 hours per day, seven days per week (including Bank Holidays but excluding Christmas Day, Boxing Day and New Year's Day). However, for the purposes of the TA, as a 'worst case' it is assumed that all deliveries (consumables and fuel) and collections (bottom ash and flue gas treatment residues) will take place between 06:00 and 18:00.

7.1.2 Calculation of the number of average fuel deliveries per day is set out below and is likely be in the region of 202 HGVs per day based on deliveries occurring Monday to Friday (as a worst case scenario).

Calculation of Fuel Deliveries

- Fuel Tonnes per Annum: 753,500 tpa
- Average HGV Payload: 16 tonnes
- Fuel Deliveries per Year: 753,500 tpa/ 16 t = 47,094 Fuel Deliveries per Year
- Assuming all Deliveries occur Monday to Friday between 06:00 and 18:00 = 260 Delivery Days per Year, but allowing for outages this is expected to be reduced to c.233 Delivery Days per Year
- Fuel Deliveries per Day: 47,094/ 233 Days = 202 Average Fuel Deliveries per Day (one-way)
- Fuel Deliveries per Hour: 202 Deliveries per Day/ 12 Hours = 17 Average Fuel Deliveries per Hour (one-way).

7.1.3 To estimate the peak daily and hourly traffic flow, the following variables have been applied to ensure a robust assessment.

- Daily variation of fuel deliveries will occur due to sourcing and fuel suppliers. As an approximation, it is estimated that daily traffic flows might vary by +/- 20%. This imposes a 20% increase on the average daily flows.
- Hourly flows are difficult to control, depending on HGV drivers and loading times at other facilities. It is estimated that the hourly peak flow during a day is likely to be about twice that of the average hourly flow.

7.1.4 Based on the above variables, peak daily and hourly fuel deliveries are as follows:

- Daily Peak Fuel Deliveries: 242 HGVs (one-way); and
- Hourly Peak Fuel Deliveries: 34 HGVs (one-way).

7.1.5 In addition, there would be a maximum of 5 HGV consumable deliveries per day (5 in + 5 out) or 1 in 1 out during the hourly peak. There would also be HGV movements associated with bottom ash and flue gas treatment residues with a maximum of 65 HGVs per day (65 in + 65 out) or 9 in and 9 out during the hourly peak.

7.1.6 Total HGV movements at the Site would therefore be 312 in and 312 out per day and a maximum of 44 deliveries during the hourly peak.

7.2 Predicted Operational HGV Arrival/ Departure Profile

7.2.1 For the purposes of the TA, as a 'worst case' it is assumed that all deliveries will take place between the hours of 06:00 and 18:00. To arrive at a daily profile over the working day, weighbridge records for a similar energy from waste facility known as Ferrybridge Multifuel 1 operated by SSE, near Wakefield have been analysed for the month September 2016.

7.2.2 Table 7.1 provides the anticipated hourly profile of HGV movements at the Proposed Development and demonstrates that peak hour development HGV demand is predicted to occur during the period 06:00 – 07:00 when 87 HGV movements (in and out) could be expected to take place.

Table 7.1: Operational HGV Hourly Profile

HOUR BEGINNING	ARRIVALS	DEPARTURES	TOTAL
06:00	44	43	87
07:00	33	33	66
08:00	36	33	69
09:00	36	34	70
10:00	26	31	57
11:00	29	27	56
12:00	29	27	56
13:00	26	25	51
14:00	20	20	40
15:00	16	18	34
16:00	13	14	27
17:00	4	5	9
18:00	0	2	2
Total	**312**	**312**	**624**

7.3 Predicted Staff Traffic Demand

7.3.1 It is estimated that around 56 staff will be employed at the Proposed Development. Given the 24 hour operation of the facility a staff shift system will be in operation and is likely to be undertaken via three 8 hour shifts (06:00 – 14:00, 14:00 – 22:00, 22:00 – 06:00).

7.3.2 It is anticipated there will be a maximum of 14 staff per shift, with an additional 14 day/ management staff being employed at the Site.

7.3.3 Given the remote location of the Site and the nature of the shift system, it is anticipated that the majority of staff would travel to the Site by car. To ensure a robust assessment, vehicle occupancy of one staff member per vehicle has been applied. The anticipated arrival/ departure profile over the working day is shown in Table 7.2 below.

Table 7.2: Staff Arrival/ Departure

HOUR BEGINNING	ARRIVALS	DEPARTURES	CAR PARK OCCUPANCY
05:00	14		28
06:00		14	14
07:00	14		28
08:00			28
09:00			28
10:00			28
11:00			28
12:00			28
13:00	14		42
14:00		14	28
15:00			28
16:00			28
17:00		14	14
18:00			14
19:00			14
20:00			14
21:00	14		28
22:00		14	14
23:00			14
00:00			14

7.4 Predicted Total Traffic Demand

7.4.1 Combining the above staff car trip demand and the predicted operational HGV traffic levels, the overall daily vehicle demand to/ from the Proposed Development is set out in Table 7.3 below.

Table 7.3: Total Daily Operational Vehicle Traffic Profile

HOUR BEGINNING	STAFF ARRIVAL	STAFF DEPART	HGV ARRIVAL	HGV DEPART	TOTAL ARRIVAL	TOTAL DEPART
05:00	14	0	0	0	14	0
06:00	0	14	44	43	44	57
07:00	14	0	33	33	47	33
08:00	0	0	36	33	36	33
09:00	0	0	36	34	36	34
10:00	0	0	26	31	26	31
11:00	0	0	29	27	29	27
12:00	0	0	29	27	29	27
13:00	14	0	26	25	40	25
14:00	0	14	20	20	20	34
15:00	0	0	16	18	16	18
16:00	0	0	13	14	13	14
17:00	0	14	4	5	4	19
18:00	0	0	0	2	0	2
19:00	0	0	0	0	0	0
20:00	0	0	0	0	0	0
21:00	14	0	0	0	14	0
22:00	0	14	0	0	0	14
23:00	0	0	0	0	0	0
00:00	0	0	0	0	0	0
00:00 – 24:00	**56**	**56**	**312**	**312**	**368**	**368**

7.5 Assignment of Operational Development Traffic

Operational HGV Traffic Assignment

7.5.1 Operational HGV movements to/ from the Proposed Development will be to/ from the A180 via the A1173, Kiln Lane, Hobson Way and South Marsh Road. HGV assignment at the A180 Stallingborough Interchange has been undertaken on the basis of a 50/ 50 A180 eastbound/ A180 westbound split. The HGV assignment is provided in Annex 8.

7.5.2 The predicted level of operational HGVs during the AM (07:00 – 08:00) and PM (16:00 – 17:00) network peak hours is provided in Annex 9.

Staff Assignment

7.5.3 Staff trips have been assigned to the network based on the 2011 Journey to Work Census data (www.nomisweb.co.uk) and is based on those people who currently work within the super output area in which the Proposed Development is located. The staff assignment is provided in Annex 10.

7.5.4 The predicted level of operational staff vehicle movements during the AM (07:00 – 08:00) and PM (16:00 – 17:00) network peak hours is provided in Annex 11.

Combined Traffic Demand

7.5.5 The combined HGV and staff traffic demand for the AM (07:00 – 08:00) and PM (16:00 – 17:00) network peak hours is provided in Annex 12.

7.5.6 Construction generations and assignments are described in Section 11.

8.0 GROWTH FACTORS AND NETWORK CHANGES

8.1.1 The Proposed Development is anticipated to be fully operational at the earliest in 2023, 2024 or the latest in 2029 and these have therefore been identified as the assessment years for this TA. Following scoping discussions with HE for the Consented Development, a future operational year of 2030 has been assessed and is compliant with Circular 02/2013.

8.1.2 Traffic growth factors for the North East Lincolnshire District have been obtained from TEMPRO Version 7.2 software. The use of TEMPRO software is generally recognised as the industry standard tool for determining traffic growth factors to apply to base flows in order to estimate future year traffic flows.

8.1.3 The TEMPRO software provides a local adjustment to the National Trip End Model to provide localised growth factors for geographical areas.

8.1.4 The local growth factors to be applied to the 2018 Base Flows for a principal road within a rural area are shown in Table 8.1.

Table 8.1: Total Daily Operational Vehicle Traffic Profile

ROAD TYPE	DATE RANGE	AM PEAK	PM PEAK
Principal	2018 - 2023	1.0686	1.0661
Principal	2018 - 2024	1.0820	1.0793
Principal	2018 - 2029	1.1262	1.1222
Principal	2018 - 2030	1.1339	1.1297

8.1.5 It is noted that an application for a new Link Road to the south of the Proposed Development connecting Hobson Way with Moody Lane was approved in September 2018 and is currently under construction. The proposed Link Road is due to open in September 2020 and will result in the re-distribution of existing traffic flows within the Study Area.

8.1.6 The proposed changes to link and junction flows within the Study Area have been obtained from Appendix D of the South Humber Bank Link Road TA prepared by Atkins in January 2018. The changes in traffic flows within the study area during the AM and PM peak hours as a result of the Link Road opening are shown in Annex 13 and have been applied to the future baseline flows.

8.1.7 The future 2023, 2024, 2029 and 2030 AM and PM network peak flows accounting for link flow adjustments associated with the South Humber Bank Link Road are shown in Annex 14.

9.0 COMMITTED DEVELOPMENT

9.1.1 The following committed or likely developments have been identified and incorporated into the future baseline and future year assessment. The list of committed developments has been reviewed and updated where required since the preparation of the PEI Report.

North Beck Energy Centre (Ref: DM/0026/18/FUL)

9.1.2 A full planning application for the development of an energy recovery facility on land south of Queens Road, Immingham was granted in October 2018.

9.1.3 The planning application was supported by a TA and included an estimate of vehicle trips for the AM and PM peak periods. Assignment of development flows to the local road network are shown in Annex 15.

9.1.4 Table 9.1 below summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period.

Table 9.1: North Beck Energy Centre Trip Generation

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	24	0	7	3
16:00 – 17:00 PM Peak	1	9	0	0
00:00 – 24:00 24 Hour	49	49	126	126

Stallingborough Employment Site, Kiln Lane, Stallingborough (Ref: DM/0105/18/FUL)

9.1.5 A hybrid application seeking outline consent for the development of up to 120,176 sqm of B1 (Business), B2 (Industrial) and B8 (Storage and Distribution) and a full application for the creation of a new roundabout, new access roads, associated highway works, substations, pumping stations, drainage and landscaping was submitted in March 2018.

9.1.6 It is proposed that the development will be built out in three phases over a period of 14 years between 2018 and 2032:

- Phase 1A: 2018 – 2022
- Phase 1B: 2020 – 2024
- Phase 2: 2023 – 2032

9.1.7 For assessment purposes, it has been assumed that for 2023 opening year, all of Phase 1A is fully built out and 50% of Phase 1B. For the assessment years 2024, 2029 and 2030 it is assumed all of Phase 1A and Phase 1B is built out and 50% of Phase 2.

9.1.8 Tables 9.2 and 9.3 below summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour

period for the three assessment years. Assignment of development flows to the local road network for future years 2023, 2024 2029 and 2030 are shown in Annex 15.

Table 9.2: Stallingborough Employment Site Trip Generation (2023)

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	97	33	9	15
16:00 – 17:00 PM Peak	38	95	18	12
00:00 – 24:00 24 Hour	772	772	257	257

Table 9.3: Stallingborough Employment Site Trip Generation (2024/ 2029/ 2030)

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	148	52	18	31
16:00 – 17:00 PM Peak	63	153	39	25
00:00 – 24:00 24 Hour	1,206	1,206	539	539

End-of-life Tyre Pyrolysis Plant, Scandinavian Way, Stallingborough (Ref: DM/0333/17/FUL)

9.1.9 Full planning permission was granted in December 2017 to construct a waste tyre to energy pyrolysis plant at the disused Immingham Railfreight Terminal. The application was supported by a TS prepared by Distributed Energy Project Service (March 2017). This document identified that the facility would be expected to generate 20 two-way HGV trips over a 24 hour period. Assignment of development flows to the local road network for the AM and PM peak periods are shown in Annex 15.

9.1.10 Table 9.4 below summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period.

Table 9.4: End of life Tyre Pyrolysis Plant Trip Generation

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	5	0	2	2
16:00 – 17:00 PM Peak	0	5	2	2
00:00 – 24:00 24 Hour	5	5	20	20

Paragon/ Kia Development, Kiln Lane Stallingborough (Ref: DM/0147/16/FUL)

9.1.11 Full planning permission was granted in June 2016 for an extension to the established vehicle processing business run by Paragon to meet Kia's requirements. The development proposals would see the change of use of agricultural land to additional external vehicle storage. The planning application was supported by a TA. Assignment of development flows to the network for the AM and PM peak periods are shown in Annex 15.

9.1.12 Table 9.5 below summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period.

Table 9.5: Paragon/ Kia Development Trip Generation

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	41	2	1	1
16:00 – 17:00 PM Peak	41	2	1	1
00:00 – 24:00 24 Hour	259	259	22	22

Renewable Power Facility, Kiln Lane (Ref: DM/0848/14/FUL)

9.1.13 Full planning permission was granted in April 2016 for the development of a renewable power facility for the production of electricity using pre-treated fuel feedstocks including tyres and carpets. The planning application was supported by a TS prepared by Les Henry Associates (July 2014). This document identified that up to one HGV trip per hour could be expected with a maximum of 10 HGVs per day. Assignment of development flows to the local road network for the AM and PM peak periods are shown in Annex 15.

9.1.14 Table 9.6 summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period.

Table 9.6: Renewable Power Facility Trip Generation

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	16	0	1	1
16:00 – 17:00 PM Peak	0	16	1	1
00:00 – 24:00 24 Hour	16	16	10	10

9.1.15 It is noted that a more recent planning permission has been granted for the same site on Kiln Lane, but as the traffic generated by the earlier planning permission is greater than that reported for the later planning permission, the consented development has been included in this assessment.

Development of a Sustainable Transport Fuels Facility (Ref: DM/0664/19/FUL)

9.1.16 A full planning application for the development of a sustainable transport fuels facility on Hobson Way was submitted in August 2019 and is awaiting a planning decision. The planning application was supported by a TA prepared by Enzygo Ltd (July 2019).

9.1.17 Tables 9.7 and 9.8 summarise the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period for the three assessment years. Assignment of development flows to the local road network for future years 2023, 2029 and 2030 are shown in Annex 15.

Table 9.7: Sustainable Transport Fuels Facility Trip Generation (2023)

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	18	0	14	14
16:00 – 17:00 PM Peak	0	0	14	14
00:00 – 24:00 24 Hour	374	374	168	168

Table 9.8: Sustainable Transport Fuels Facility Trip Generation (2024/ 2029/ 2030)

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	18	0	14	14
16:00 – 17:00 PM Peak	0	0	14	14
00:00 – 24:00 24 Hour	74	74	168	168

525 Unit Residential Development, Stallingborough Road, Immingham (Ref: DM/0728/18/OUT)

9.1.18 An outline planning application for the development of up to 525 residential dwellings together with an extra care facility for the elderly with up to 80 units was submitted in September 2018 and is currently awaiting a planning decision.

9.1.19 The planning application was supported by a TA and included an estimate of vehicle trips for the AM and PM peak periods. Assignment of development flows to the local road network are shown in Annex 15.

9.1.20 Table 9.9 below summarises the estimated trip generation associated with the development for the AM and PM network peak periods and the 24 hour period.

Table 9.9: 525 Unit Residential Development Trip Generation

	Car/ LGV		HGV	
	Arr	**Dep**	**Arr**	**Dep**
07:00 – 08:00 AM Peak	50	210	0	0
16:00 – 17:00 PM Peak	204	122	0	0
00:00 – 24:00 24 Hour	1,214	1,229	0	0

Stallingborough Link Road (Ref: DM/0094/18/FUL)

9.1.21 A new Link Road with shared cycle/ footway provision connecting Moody Lane/ Woad Lane junction (to the south-east) to Hobson Way Roundabout (to the north-west) was approved in September 2018. The Link Road is currently under construction and is due to open in September 2020.

Habitat Mitigation Area for Special Protection Area Birds, Land adjacent Poplar Farm, South Marsh Road, Stallingborough (Ref: DM/0099/18/FUL)

9.1.22 Full planning permission was granted in August 2018 to provide a quality habitat area for Special Protection Area birds with associated works including two water storage lagoons, shallow scrapes and ponds, bunding, a bird hide, footpaths, car parking, cattle and timber fencing, culverts and bridges. Construction was

completed in early 2019. A review of the planning application documents shows no TS was submitted. However, any development traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Hornsea Project One Offshore Wind Farm, Keelby Road, Stallingborough (Ref: DM/1146/17/FUL)

9.1.23 A full planning application was submitted in April 2018 as part of the Hornsea Project One Offshore Wind Farm for additional land for temporary dewatering areas including creation of bunding around the lagoon and the installation of a separate settlement tank and pump. A review of the planning application documents shows no TS has been submitted. However, any development traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Selvic Shipping Ltd, Netherlands Way, Stallingborough (Ref: DM/0449/17/FUL)

9.1.24 Full planning permission was granted in August 2017 for the installation of four CHP boilers. A review of the planning application documents shows no TS has been submitted. Any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Block 3, Worldwide Way, Kiln Lane Trading Estate (Ref: DM/1050/16/FUL)

9.1.25 Full planning permission was granted in March 2017 for change of use of the site to allow business (Use Class B1) and/ or general industrial (Use Class B2) and/ or storage and distribution (Use Class B8) across the site and reconfiguration of car parking. A review of the Planning Statement submitted as part of the application reveals there will be no additional vehicle trips generated.

Construction of Access Road, Kiln Lane, Stallingborough (Ref: DM/0717/16/FUL)

9.1.26 Full planning permission was granted in October 2016 for the construction of an access road, electricity sub-station and foul water pumping compound, including installation of surface water drainage and service ducts. A review of the planning application documents shows no TS has been submitted. Any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Great Coates Renewable Energy Centre, Park Way, Grimsby (Ref: DM/0195/17/FUL)

9.1.27 Full planning permission was granted in August 2017 for the construction of a renewable energy centre. The TS states the development would generate 60 two-way HGV movements per day and 40 two-way car trips. No information has been provided on the distribution of trips to the network however the report concludes that the trip generation is unlikely to give rise to any operational concern on the road network. The only potential shared route for this development traffic would be the A180 however any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Temporary Construction Windfarm Compound, Grimsby Road, Laceby (Ref: DM/0153/17/FUL)

9.1.28 Full planning permission was granted in May 2017 for an additional area to be added to the temporary site construction compound to support the onshore cable installation and HDD for Hornsea Project One. A review of the planning application documents shows no TS has been submitted. However, any development traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Construction of 9 Lagoons, South Killingholme (Ref: PA/2018/155)

9.1.29 Full planning permission was granted in March 2018 for the construction of 9 lagoons for the storage of surface water associated with the dewatering of cable trenches for the Hornsea Project One Offshore Windfarm Project. A review of the planning application documents shows no TS has been submitted. However, any development traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

VPI Immingham Energy Park 'A', Rosper Road South Killingholme (Ref: PA/2018/918)

9.1.30 A full planning application was submitted in May 2018 for a gas fired power station and is awaiting a decision. A review of the TS prepared to support the application states that the development would create six operational roles generating an insignificant number of additional vehicular trips. However, any development traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

VPI Immingham OCGT (Ref: PA/SCO/2017/155)

9.1.31 A DCO application has been submitted for an OCGT power station at South Killingholme, Immingham. The facility will create up to 15 operational roles therefore generating an insignificant number of vehicle trips. Any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

River Humber Gas Pipeline Replacement Project (Ref: EN060004)

9.1.32 Development consent was granted in August 2016 for this project. However, the project is considered to fall outside the area of influence for the Proposed Development. Any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

A180 Port of Immingham Improvement (Ref: TWA 8/1/13)

9.1.33 Development consent was granted in February 2015 for this scheme. However, the project is considered to fall outside the area of influence for the Proposed Development. Any traffic associated with the development would be incorporated within background growth applied to the 2018 baseline flows.

Total Committed Development Flows

9.1.34 Total committed development flows assigned to the local network for the AM and PM Peak periods are shown in Annex 15.

10.0 TRAFFIC IMPACT ASSESSMENT

10.1 Link Flow Impact Assessment

10.1.1 The percentage impact of development traffic has been carried out on key links of the vehicle routing corridor to serve the Proposed Development. The links assessed include:

- South Marsh Road (East of Hobson Way);
- South Marsh Road (West of Hobson Way);
- South Humber Bank Link Road (South of South Marsh Road);
- Hobson Way (North of South Marsh Road);
- Kiln Lane (West of Hobson Way);
- A1173 (West of North Moss Lane); and
- A1173 (North of A180).

10.1.2 Table 10.1 below demonstrates the predicted changes to the future 2023, 2024, 2029 and 2030 Baseline (including committed development and with the Link Road open) two-way link flows following the addition of development traffic associated with the Proposed Development. The analysis is based on the increase in vehicles.

Table 10.1: Operational Link Impact Assessment

South Marsh Road (East of Hobson Way)

2023 YEAR OF OPENING	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	80	129	209	62.0%
16:00 – 17:00 PM Peak	27	76	103	35.5%
24 Hour	736	844	1,580	87.2%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	80	131	211	61.1%
16:00 – 17:00 PM Peak	27	77	104	35.1%
24 Hour	736	855	1,591	86.1%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	80	137	217	58.4%

16:00 – 17:00 PM Peak	27	79	106	34.2%
24 Hour	736	891	1,627	82.6%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	80	137	217	58.4%
16:00 – 17:00 PM Peak	27	79	106	34.2%
24 Hour	736	898	1,634	82.0%

South Marsh Road (West of Hobson Way)

2023 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	3	163	166	1.8%
16:00 – 17:00 PM Peak	0	171	171	0.0%
24 Hour	27	834	861	3.2%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	3	165	168	1.8%
16:00 – 17:00 PM Peak	0	173	173	0.0%
24 Hour	27	845	872	3.2%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	3	173	176	1.7%
16:00 – 17:00 PM Peak	0	180	180	0.0%
24 Hour	27	881	908	3.1%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	3	173	176	1.7%

16:00 – 17:00 PM Peak	0	183	183	0.0%
24 Hour	27	887	914	3.0%

South Humber Bank Link Road (South of South Marsh Road)

2023 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	8	828	836	1.0%
16:00 – 17:00 PM Peak	0	670	670	0.0%
24 Hour	64	2,844	2,908	2.3%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	8	829	837	1.0%
16:00 – 17:00 PM Peak	0	670	670	0.0%
24 Hour	64	2,571	2,581	2.5%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	8	832	840	1.0%
16:00 – 17:00 PM Peak	0	670	670	0.0%
24 Hour	64	2,665	2,729	2.4%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	8	833	841	1.0%
16:00 – 17:00 PM Peak	0	671	671	0.0%
24 Hour	64	2,679	2,743	2.4%

Hobson Way (North of South Marsh Road)

2023 YEAR OF OPENING	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	69	987	1,056	7.0%
16:00 – 17:00 PM Peak	27	827	854	3.3%
Weekday 24 Hour	645	4,895	5,540	13.2%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	989	1,058	7.0%
16:00 – 17:00 PM Peak	27	829	856	3.3%
Weekday 24 Hour	645	4,649	5,294	13.9%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	999	1,068	6.9%
16:00 – 17:00 PM Peak	27	836	863	3.2%
Weekday 24 Hour	645	4,830	5,475	13.4%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	1,000	1,069	6.9%
16:00 – 17:00 PM Peak	27	839	866	3.2%
24 Hour	645	4,861	5,506	13.3%

Kiln Lane (West of Hobson Way)

2023 YEAR OF OPENING	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	69	735	804	9.4%
16:00 – 17:00 PM Peak	27	683	710	4.0%

24 Hour	645	6,158	6,803	10.5%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	739	808	9.3%
16:00 – 17:00 PM Peak	27	686	713	3.9%
24 Hour	645	5,917	6,562	10.9%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	755	824	9.1%
16:00 – 17:00 PM Peak	27	699	726	3.9%
24 Hour	645	6,113	6,758	10.5%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	758	827	9.1%
16:00 – 17:00 PM Peak	27	702	729	3.8%
24 Hour	645	6,147	6,792	10.5%

A1173 (West of North Moss Lane)

2023 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	685	754	10.1%
16:00 – 17:00 PM Peak	27	654	681	4.1%
24 Hour	645	7,683	8,328	8.4%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	702	771	9.8%
16:00 – 17:00 PM Peak	27	671	698	4.0%
24 Hour	645	7,574	8,219	8.5%

2029 YEAR OF OPENING	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	69	740	809	9.3%
16:00 – 17:00 PM Peak	27	707	734	3.8%
24 Hour	645	7,842	8,487	8.2%
2030 FUTURE OPERATION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	746	815	9.3%
16:00 – 17:00 PM Peak	27	714	741	3.8%
24 Hour	645	7,889	8,534	8.2%

A1173 (North of A180)

2023 YEAR OF OPENING	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	69	1,404	1,473	4.9%
16:00 – 17:00 PM Peak	27	1,628	1,655	1.7%
24 Hour	643	14,966	15,609	4.3%
2024 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	1,500	1,569	4.6%
16:00 – 17:00 PM Peak	27	1,747	1,774	1.5%
24 Hour	643	15,955	16,598	4.0%
2029 YEAR OF OPENING	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	69	1,570	1,639	4.4%
16:00 – 17:00 PM Peak	27	1,817	1,844	1.5%
24 Hour	643	16,465	17,108	3.9%

2030 FUTURE OPERATION	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	69	1,584	1,653	4.4%
16:00 – 17:00 PM Peak	27	1,832	1,859	1.5%
24 Hour	643	16,554	17,197	3.9%

10.1.3 The generally accepted threshold of materiality is 10% on un-congested networks. The above tables show the greatest impact of operational traffic is on immediate routes in close proximity to the Site including South Marsh Road. At this location, base flows are low thus the calculated percentage impact appears high.

10.2 Junction Capacity Assessment

10.2.1 This section describes the junction capacity assessments carried out at selected junctions within the Study Area in order to determine the level of impact during operation. The selected key junctions include:

- Hobson Way/ South Marsh Road (East of Hobson Way) T-Junction;
- Hobson Way/ South Marsh Road (West of Hobson Way) T-Junction;
- Laporte Road/ Kiln Lane/ Hobson Way Roundabout;
- Kiln Lane/ North Moss Lane/ Trondheim Way Roundabout;
- A1173/ Kiln Lane Roundabout;
- A1173/ SHIIP Access;
- A180 Stallingborough Interchange;
- A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout); and
- A180/ Estate Road/ Gilbey Road (Pyewipe Roundabout).

10.2.2 All junctions have been modelled using the TRL Software package Junctions 9. The results generated indicate the maximum RFC value on each arm and the maximum queue generated. RFC values below 0.85 indicate the junction is operating without any issues. Values between 0.85 and 1.0 indicate the junction is operating above its design capacity but still operating within its theoretical capacity. RFC values in excess of 1.0 represent congested conditions and the junction begins to fail.

10.2.3 The modelling has been undertaken based on passenger car unit values (PCUs) in order to best reflect any operational effects associated with HGV traffic.

10.2.4 Junction capacity assessments have been undertaken for the following scenarios shown below. Junction modelling has not been undertaken for the 2029 assessment year scenario as baseline flows would be lower than the 2030

assessment year scenario and therefore does not represent the worst case in terms of junction capacity assessment.

- 2023 Base + Committed;
- 2023 Base + Committed + Development;
- 2024 Base + Committed;
- 2024 Base + Committed + Development;
- 2030 Base + Committed; and
- 2030 Base + Committed + Development.

Hobson Way/ South Marsh Road (East of Hobson Way) T-Junction

2023 Base + Committed Development Scenario

10.2.5 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.12 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 10.2 below. The full outputs of these assessments are attached as Annex 16.

Table 10.2: 2023 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.12	0.1
Hobson Way (Right Turn)	0.00	0.0

2023 Base + Committed + Development Scenario

10.2.6 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.17 being forecast on South Marsh Road arm as summarised in Table 10.3 below. The full outputs of these assessments are attached as Annex 16.

Table 10.3: 2023 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.17	0.3
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.00	0.0

2024 Base + Committed Development Scenario

10.2.7 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.12 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 10.4 below. The full outputs of these assessments are attached as Annex 16.

Table 10.4: 2024 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.12	0.1
Hobson Way (Right Turn)	0.00	0.0

2024 Base + Committed + Development Scenario

10.2.8 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on South Marsh Road arm as summarised in Table 10.5 below. The full outputs of these assessments are attached as Annex 16.

Table 10.5: 2024 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.19	0.4
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.00	0.0

2030 Base + Committed Development Scenario

10.2.9 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.12 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 10.6 below. The full outputs of these assessments are attached as Annex 16.

Table 10.6: 2030 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.12	0.1
Hobson Way (Right Turn)	0.00	0.0

2030 Base + Committed + Development Scenario

10.2.10 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.18 being forecast on South Marsh Road arm as summarised in Table 10.7 below. The full outputs of these assessments are attached as Annex 16.

Table 10.7: 2030 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.17	0.3
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.18	0.3
Hobson Way (Right Turn)	0.00	0.0

Hobson Way/ South Marsh Road (West of Hobson Way) T-Junction

2023 Base + Committed Development Scenario

10.2.11 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.8 below. The full outputs of these assessments are attached in Annex 17.

Table 10.8: 2023 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.15	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2023 Base + Committed + Development Scenario

10.2.12 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.9 below. The full outputs of these assessments are attached in Annex 17.

Table 10.9: 2023 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2024 Base + Committed Development Scenario

10.2.13 The modelling outputs suggest outputs that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.10 below. The full outputs of these assessments are attached in Annex 17.

Table 10.10: 2024 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.15	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2024 Base + Committed + Development Scenario

10.2.14 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.11 below. The full outputs of these assessments are attached in Annex 17.

Table 10.11: 2024 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.16	0.2
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2030 Base + Committed Development Scenario

10.2.15 The modelling outputs suggest outputs that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.20 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.12 below. The full outputs of these assessments are attached in Annex 17.

Table 10.12: 2030 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.16	0.2
South Marsh Road (Right Turn)	0.16	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.20	0.2

2030 Base + Committed + Development Scenario

10.2.16 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.20 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 10.13 below. The full outputs of these assessments are attached in Annex 17.

Table 10.13: 2030 Base + Committed + Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.17	0.2
South Marsh Road (Right Turn)	0.18	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.20	0.2

Laporte Road/ Hobson Way/ Kiln Lane Roundabout

2023 Base + Committed Development Scenario

10.2.17 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.40 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.14 below. The full outputs of these assessments are attached as Annex 18.

Table 10.14: 2023 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.33	0.5
Laporte Road SB Approach	0.11	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.16	0.2
Kiln Lane EB Approach	0.08	0.1
Laporte Road SB Approach	0.40	0.7
Unnamed Access	0.00	0.0

2023 Base + Committed + Development Scenario

10.2.18 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.15 below. The full outputs of these assessments are attached as Annex 18.

Table 10.15: 2023 Base + Committed + Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.31	0.5
Kiln Lane EB Approach	0.37	0.7
Laporte Road SB Approach	0.12	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.17	0.2
Kiln Lane EB Approach	0.10	0.1
Laporte Road SB Approach	0.41	0.7
Unnamed Access	0.00	0.0

2024 Base + Committed Development Scenario

10.2.19 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.40 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.16 below. The full outputs of these assessments are attached as Annex 18.

Table 10.16: 2024 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.33	0.6
Laporte Road SB Approach	0.11	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.16	0.2
Kiln Lane EB Approach	0.08	0.1
Laporte Road SB Approach	0.40	0.7
Unnamed Access	0.00	0.0

2024 Base + Committed + Development Scenario

10.2.20 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.17 below. The full outputs of these assessments are attached as Annex 18.

Table 10.17: 2024 Base + Committed + Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.31	0.5
Kiln Lane EB Approach	0.37	0.7
Laporte Road SB Approach	0.12	0.2
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.17	0.2
Kiln Lane EB Approach	0.10	0.1
Laporte Road SB Approach	0.41	0.7
Unnamed Access	0.00	0.0

2030 Base + Committed Development Scenario

10.2.21 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.18 below. The full outputs of these assessments are attached as Annex 18.

Table 10.18: 2030 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.29	0.4
Kiln Lane EB Approach	0.34	0.6
Laporte Road SB Approach	0.12	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.16	0.2
Kiln Lane EB Approach	0.09	0.1
Laporte Road SB Approach	0.41	0.8
Unnamed Access	0.00	0.0

2030 Base + Committed + Development Scenario

10.2.22 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.42 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 10.19 below. The full outputs of these assessments are attached as Annex 18.

Table 10.19: 2030 Base + Committed + Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.32	0.5
Kiln Lane EB Approach	0.38	0.7
Laporte Road SB Approach	0.12	0.2
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.18	0.2
Kiln Lane EB Approach	0.10	0.1
Laporte Road SB Approach	0.42	0.8
Unnamed Access	0.00	0.0

Kiln Lane/ North Moss Lane/ Trondheim Way Roundabout

2023 Base + Committed Development Scenario

10.2.23 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.29 being forecast on the A1173 arm during the PM Peak generating a maximum queue of 0.5 PCUs as summarised in Table 10.20 below. The full outputs of these assessments are attached as Annex 19.

Table 10.20: 2023 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.15	0.3
North Moss Lane	0.10	0.1
A1173	0.27	0.4
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.24	0.4
North Moss Lane	0.07	0.1
A1173	0.29	0.5
Trondheim Way	0.05	0.1

2023 Base + Committed + Development Scenario

10.2.24 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.31 being forecast on the A1173 arm during the AM and PM Peaks generating a maximum queue of 0.6 PCUs as summarised in Table 10.21 below. The full outputs of these assessments are attached as Annex 19.

Table 10.21: 2023 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.20	0.4
North Moss Lane	0.10	0.1
A1173	0.31	0.6
Trondheim Way	0.03	0.1
PM Peak (16:00 – 17:00)		
Kiln Lane	0.26	0.4
North Moss Lane	0.07	0.1
A1173	0.31	0.6
Trondheim Way	0.05	0.1

2024 Base + Committed Development Scenario

10.2.25 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.29 being forecast on the A1173 arm during the PM Peak generating a maximum queue of 0.6 pcu as summarised in Table 10.22 below. The full outputs of these assessments are attached as Annex 19.

Table 10.22: 2024 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.15	0.3
North Moss Lane	0.10	0.1
A1173	0.27	0.5
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.25	0.4
North Moss Lane	0.08	0.1
A1173	0.29	0.6
Trondheim Way	0.05	0.1

2024 Base + Committed + Development Scenario

10.2.26 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.32 being forecast on the A1173 arm during the AM Peak generating a maximum queue of 0.6 PCUs as summarised in Table 10.23 below. The full outputs of these assessments are attached as Annex 19.

Table 10.23: 2024 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.20	0.4
North Moss Lane	0.11	0.1
A1173	0.32	0.6
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.27	0.5
North Moss Lane	0.08	0.1
A1173	0.31	0.6
Trondheim Way	0.05	0.1

2030 Base + Committed Development Scenario

10.2.27 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.31 being forecast on the A1173 arm during the PM Peak generating a maximum queue of 0.6 PCUs as summarised in Table 10.24 below. The full outputs of these assessments are attached as Annex 19.

Table 10.24: 2030 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.16	0.3
North Moss Lane	0.11	0.1
A1173	0.29	0.5
Trondheim Way	0.06	0.1
PM Peak (16:00 – 17:00)		
Kiln Lane	0.27	0.5
North Moss Lane	0.08	0.1
A1173	0.31	0.6
Trondheim Way	0.06	0.1

2030 Base + Committed + Development Scenario

10.2.28 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.34 being forecast on the A1173 arm during the AM Peak generating a maximum queue of 0.7 PCUs as summarised in Table 10.25 below. The full outputs of these assessments are attached as Annex 19.

Table 10.25: 2030 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.21	0.4
North Moss Lane	0.11	0.1
A1173	0.34	0.7
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.29	0.5
North Moss Lane	0.08	0.1
A1173	0.32	0.6
Trondheim Way	0.06	0.1

A1173/ Kiln Lane Roundabout

10.2.29 It is noted that as part of the Stallingborough Employment Site development, a number of improvements to the roundabout are proposed including:

- an improved southern arm onto the roundabout and formalise the Site access arrangement;
- marginal widening of the A1173 northern arm into the roundabout to increase the flare length on the approach whilst maintaining a two-lane entry; and
- marginal widening of the A1173 western arm into the roundabout to increase the flare length on the approach whilst maintaining a two-lane entry.

10.2.30 This junction has therefore been modelled with these improvements in place for the remaining scenarios.

2023 Base + Committed Development Scenario

10.2.31 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.82 being forecast on the A1173 southbound approach arm during the PM Peak generating a maximum queue of 4.6 PCUs as summarised in Table 10.26 below. The full outputs of these assessments are attached as Annex 20.

Table 10.26: 2023 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.67	2.2
A1173 SB Approach	0.40	0.8
Kiln Lane WB Approach	0.18	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.33	0.6
A1173 SB Approach	0.82	4.6
Kiln Lane WB Approach	0.31	0.6

2023 Base + Committed + Development Scenario

10.2.32 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.83 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 4.9 PCUs as summarised in Table 10.27 below. The full outputs of these assessments are attached as Annex 20.

Table 10.27: 2023 Base + Committed + Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.70	2.6
A1173 SB Approach	0.41	0.8
Kiln Lane WB Approach	0.21	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.34	0.7
A1173 SB Approach	0.83	4.9
Kiln Lane WB Approach	0.32	0.6

2024 Base + Committed Development Scenario

10.2.33 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.85 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 5.5 PCUs as summarised in Table 10.28 below. The full outputs of these assessments are attached as Annex 20.

Table 10.28: 2024 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.03	0.1
A1173 EB Approach	0.70	2.5
A1173 SB Approach	0.42	0.8
Kiln Lane WB Approach	0.19	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.09	0.1
A1173 EB Approach	0.35	0.7
A1173 SB Approach	0.85	5.5
Kiln Lane WB Approach	0.32	0.6

2024 Base + Committed + Development Scenario

10.2.34 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.87 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 6.0 PCUs as summarised in Table 10.29 below. The full outputs of these assessments are attached as Annex 20.

Table 10.29: 2024 Base + Committed + Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.04	0.1
A1173 EB Approach	0.73	3.0
A1173 SB Approach	0.43	0.9
Kiln Lane WB Approach	0.22	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.09	0.2
A1173 EB Approach	0.37	0.7
A1173 SB Approach	0.87	6.0
Kiln Lane WB Approach	0.34	0.7

2030 Base + Committed Development Scenario

10.2.35 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.90 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 7.6 PCUs as summarised in Table 10.30 below. The full outputs of these assessments are attached as Annex 20.

Table 10.30: 2030 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.03	0.1
A1173 EB Approach	0.73	3.0
A1173 SB Approach	0.44	0.9
Kiln Lane WB Approach	0.20	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.10	0.2
A1173 EB Approach	0.36	0.7
A1173 SB Approach	0.90	7.6
Kiln Lane WB Approach	0.35	0.7

2030 Base + Committed + Development Scenario

10.2.36 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.91 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 8.4 PCUs as summarised in Table 10.31 below. The full outputs of these assessments are attached as Annex 20.

Table 10.31: 2030 Base + Committed + Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.04	0.1
A1173 EB Approach	0.77	3.6
A1173 SB Approach	0.46	1.0
Kiln Lane WB Approach	0.23	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.10	0.2
A1173 EB Approach	0.38	0.8
A1173 SB Approach	0.91	8.4
Kiln Lane WB Approach	0.37	0.8

A1173/ SHIIP Site Access

2023 Base + Committed Development Scenario

10.2.37 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.51 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.32: 2023 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.51	1.2
Site Access North	0.03	0.0
A1173 (WB Approach)	0.21	0.3
PM Peak (16:00 – 17:00)		
Site Access South	0.09	0.1
A1173 (EB Approach)	0.24	0.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.42	0.8

2023 Base + Committed + Development Scenario

10.2.38 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.53 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.33: 2023 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.53	1.3
Site Access North	0.03	0.0
A1173 (WB Approach)	0.23	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.09	0.1
A1173 (EB Approach)	0.25	0.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.43	0.8

2024 Base + Committed Development Scenario

10.2.39 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.54 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.34: 2024 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.54	1.3
Site Access North	0.03	0.0
A1173 (WB Approach)	0.22	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.16	0.2
A1173 (EB Approach)	0.27	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.44	0.9

2024 Base + Committed + Development Scenario

10.2.40 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.56 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.35: 2024 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.56	1.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.25	0.5
PM Peak (16:00 – 17:00)		
Site Access South	0.16	0.2
A1173 (EB Approach)	0.28	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.45	0.9

2030 Base + Committed Development Scenario

10.2.41 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.56 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.36: 2030 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.56	1.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.23	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.17	0.2
A1173 (EB Approach)	0.28	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.47	1.0

2030 Base + Committed + Development Scenario

10.2.42 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.59 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 10.37: 2030 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.59	1.6
Site Access North	0.03	0.0
A1173 (WB Approach)	0.26	0.5
PM Peak (16:00 – 17:00)		
Site Access South	0.17	0.2
A1173 (EB Approach)	0.29	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.48	1.0

A180/ A1173 Stallingborough Interchange

10.2.43 This junction has been modelled using the 'Lane Simulation' mode within Junctions 9 and allows lane specific movements for each approach to be considered resulting in Level of Service (LOS) based on delay and queue. The transportation LOS system uses the letters A to F, with the definitions below being typical:

- A = Free flow
- B = Reasonably free flow
- C = Stable flow
- D = Approaching unstable flow
- E = Unstable flow
- F = Forced or breakdown flow

10.2.44 It is noted that as part of the Stallingborough Employment Site development, it is proposed to marginally widen the northern arm (A1173) into the roundabout to increase the flare length on the approach whilst maintaining a two lane entry. The junction has therefore been modelled with this improvement in place for the remaining scenarios.

2023 Base + Committed Development Scenario

10.2.45 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUs as summarised

in Table 10.38 below. The full outputs of these assessments are attached as Annex 22.

Table 10.38: 2023 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.9
A180 EB Off-Slip	A	0.8
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	2.0
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.2
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	1.8
A180 WB Off-Slip	A	0.5

2023 Base + Committed + Development Scenario

10.2.46 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUsas summarised in Table 10.39 below. The full outputs of these assessments are attached as Annex 22.

Table 10.39: 2023 Base + Committed + Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.9
A180 EB Off-Slip	A	0.6
A1173 SB Approach	A	0.5
A180 WB Off-Slip	A	2.5
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.2
A180 EB Off-Slip	A	0.7
A1173 SB Approach	A	1.9
A180 WB Off-Slip	A	0.6

2024 Base + Committed Development Scenario

10.2.47 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms as summarised in Table 10.40 below. The full outputs of these assessments are attached as Annex 22.

Table 10.40: 2024 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.2
A180 EB Off-Slip	A	0.9
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	1.7
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.3
A180 EB Off-Slip	A	0.6
A1173 SB Approach	A	2.3
A180 WB Off-Slip	A	0.7

2024 Base + Committed + Development Scenario

10.2.48 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms as summarised in Table 10.41 below. The full outputs of these assessments are attached as Annex 22.

Table 10.41: 2024 Base + Committed + Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.2
A180 EB Off-Slip	A	0.9
A1173 SB Approach	A	0.5
A180 WB Off-Slip	A	2.4
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.2
A180 EB Off-Slip	A	0.8
A1173 SB Approach	A	2.0
A180 WB Off-Slip	A	0.6

2030 Base + Committed Development Scenario

10.2.49 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUs as summarised in Table 10.42 below. The full outputs of these assessments are attached as Annex 22.

Table 10.42: 2030 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.1
A180 EB Off-Slip	A	0.7
A1173 SB Approach	A	0.5
A180 WB Off-Slip	A	2.5
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.4
A180 EB Off-Slip	A	0.7
A1173 SB Approach	A	2.1
A180 WB Off-Slip	A	0.5

2030 Base + Committed + Development Scenario

10.2.50 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM peak on all arms apart from the A1173 NB Approach which will operate within Reasonably Free Flow conditions (LOS = B). During the PM peak all arms operate within free flow conditions (LOS = A) PCUs as summarised in Table 10.43 below. The full outputs of these assessments are attached as Annex 22.

Table 10.43: 2030 Base + Committed + Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	B	1.2
A180 EB Off-Slip	A	1.0
A1173 SB Approach	A	0.5
A180 WB Off-Slip	A	2.6
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.5
A180 EB Off-Slip	A	0.7
A1173 SB Approach	A	2.9
A180 WB Off-Slip	A	0.5

A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout)

2018 Base Scenario

10.2.51 As set out in Section 3 and Table 3.8, the modelling outputs suggest the junction already operates above its theoretical capacity on the A180 Eastern arm during the AM Peak with a queue of 44.1 PCUs and the A180 Western arm and Moody Lane during the PM peak with queues of 200.0 PCUs and 19.3 PCUs respectively. However, it should be noted that with RFC values exceeding 1.0, the junction model can become unstable resulting in spurious queue lengths being generated. By 2023, 2024 and 2030, the junction would continue to operate above theoretical capacity largely due to the increase in background traffic flows.

10.2.52 The performance of this junction is already acknowledged in the Local Transport Plan which seeks to address congestion associated with peak hour traffic at this junction.

10.2.53 To understand the impact development traffic has on this junction, Tables 10.44 to 10.49 summarise the AM and PM forecast development flows as a proportion of the total flows at Westgate Roundabout including revised flows associated with the Link Road for the future years 2023, 2024 and 2030 (i.e. when the Proposed Development is forecast to be fully operational). Figures 10.1 to 10.6 illustrate the information graphically.

Table 10.44: 2023 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,238	286	1,951	736	157	4,368
Committed	79	2	80	20	2	183
Development	32	0	29	11	0	72
Total Flows	1,349	288	2,060	767	159	4,623
Development Flow as % of Total	*2.37%*	*0.0%*	*1.41%*	*1.43%*	*0.0%*	*1.56%*

Figure 10.1: 2023 AM Assessed Traffic Flows at Westgate Roundabout

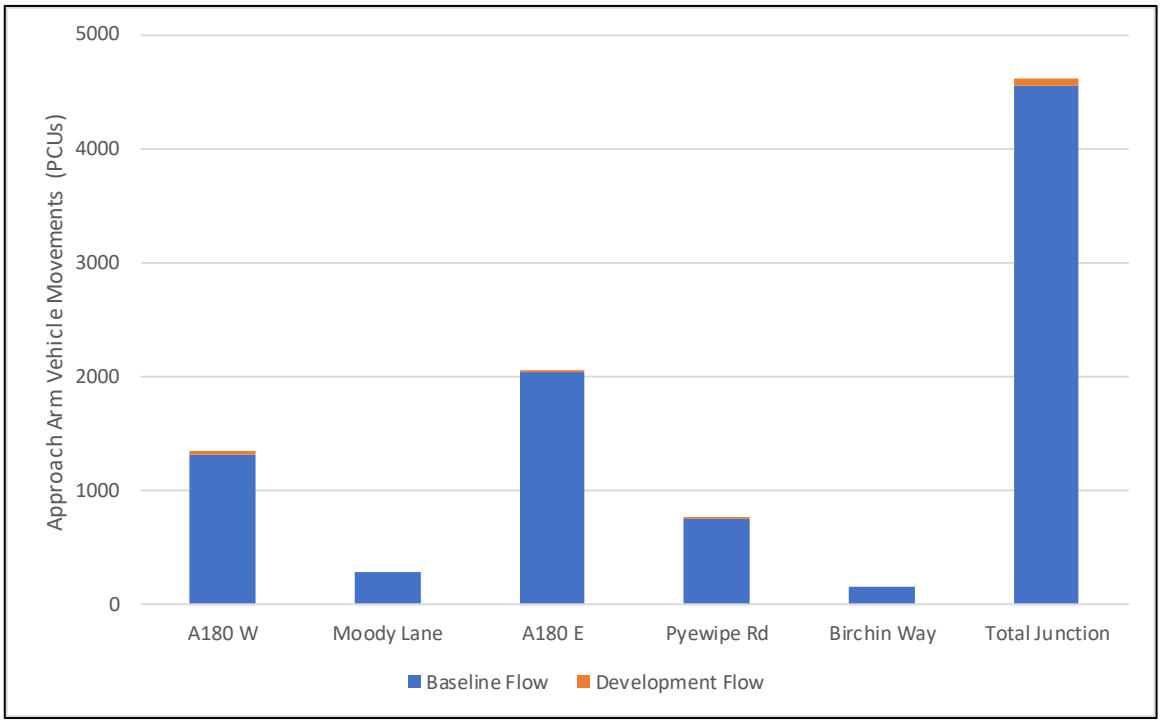


Table 10.45: 2023 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,191	427	1,360	719	320	5,017
Committed	105	0	69	7	2	183
Development	14	0	10	2	0	26
Total Flows	2,310	427	1,439	728	322	5,226
Development Flow as % of Total	*0.61%*	*0.0%*	*0.69%*	*0.27%*	*0.0%*	*0.50%*

Figure 10.2: 2023 PM Assessed Traffic Flows at Westgate Roundabout

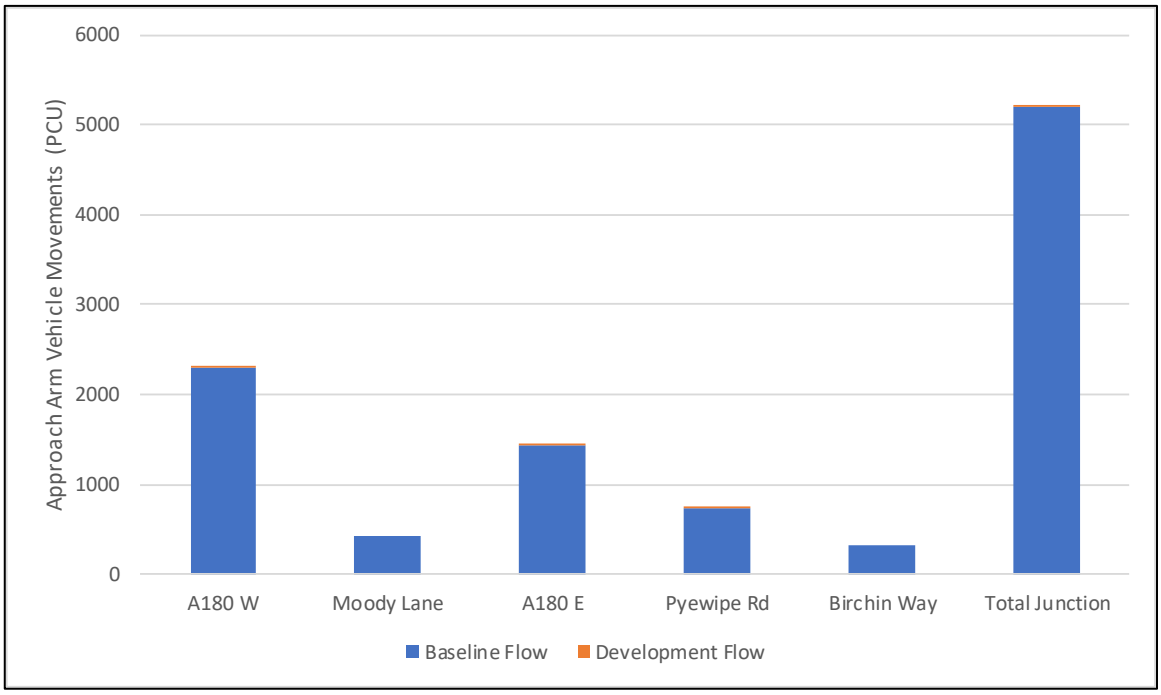


Table 10.46: 2024 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,256	288	1,975	745	161	4,425
Committed	92	2	101	26	3	224
Development	32	0	29	11	0	72
Total Flows	1,380	290	2,105	782	164	4,721
Development Flow as % of Total	*2.32%*	*0.0%*	*1.38%*	*1.41%*	*0.0%*	*1.53%*

Figure 10.3: 2024 AM Assessed Traffic Flows at Westgate Roundabout

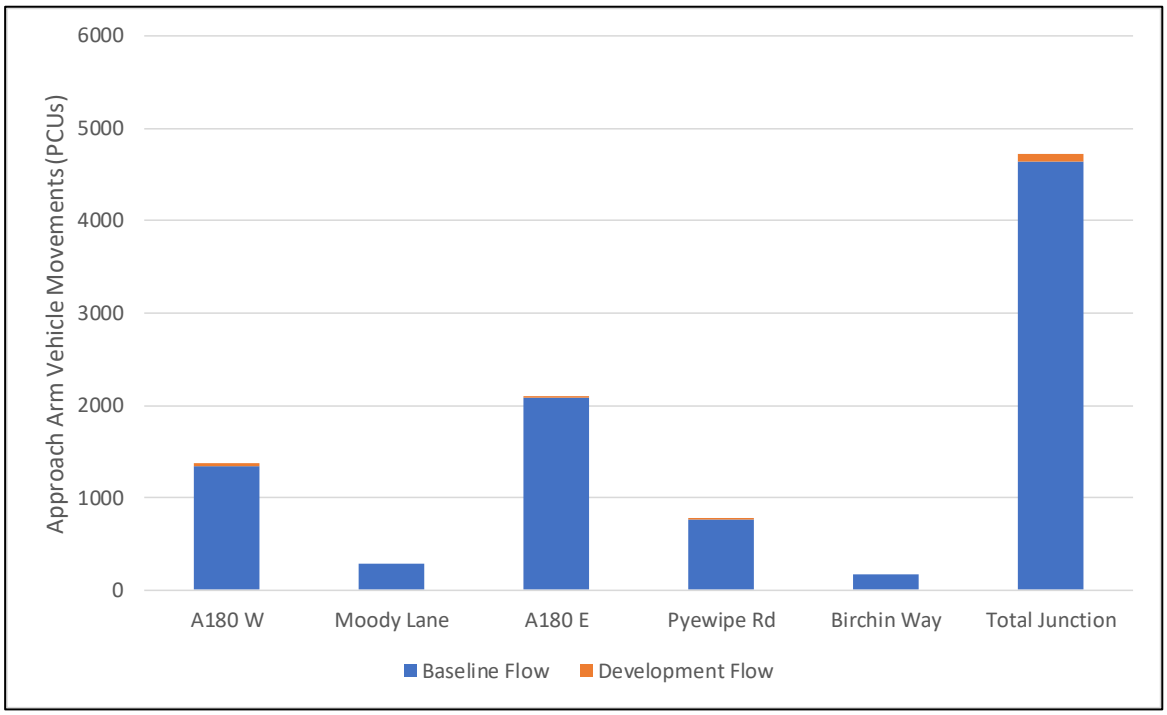


Table 10.47: 2024 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,218	432	1,377	727	324	5,078
Committed	139	1	80	12	3	235
Development	14	0	10	2	0	26
Total Flows	2,371	433	1,467	741	327	5,339
Development Flow as % of Total	*0.59%*	*0.0%*	*0.68%*	*0.27%*	*0.0%*	*0.49%*

Figure 10.4: 2024 PM Assessed Traffic Flows at Westgate Roundabout

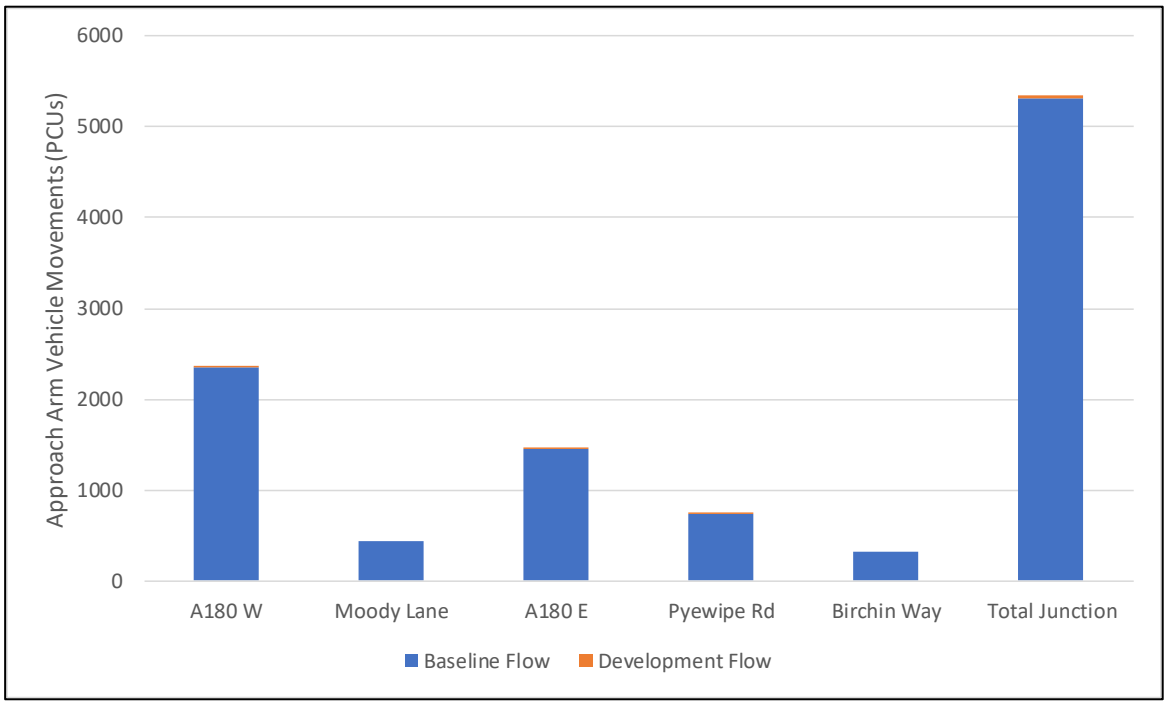


Table 10.48: 2030 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,320	298	2,072	778	167	4,635
Committed	92	2	101	26	3	224
Development	32	0	29	11	0	72
Total Flows	1,444	300	2,202	815	170	4,931
Development Flow as % of Total	*2.22%*	*0.0%*	*1.32%*	*1.35%*	*0.0%*	*1.46%*

Figure 10.5: 2030 AM Assessed Traffic Flows at Westgate Roundabout

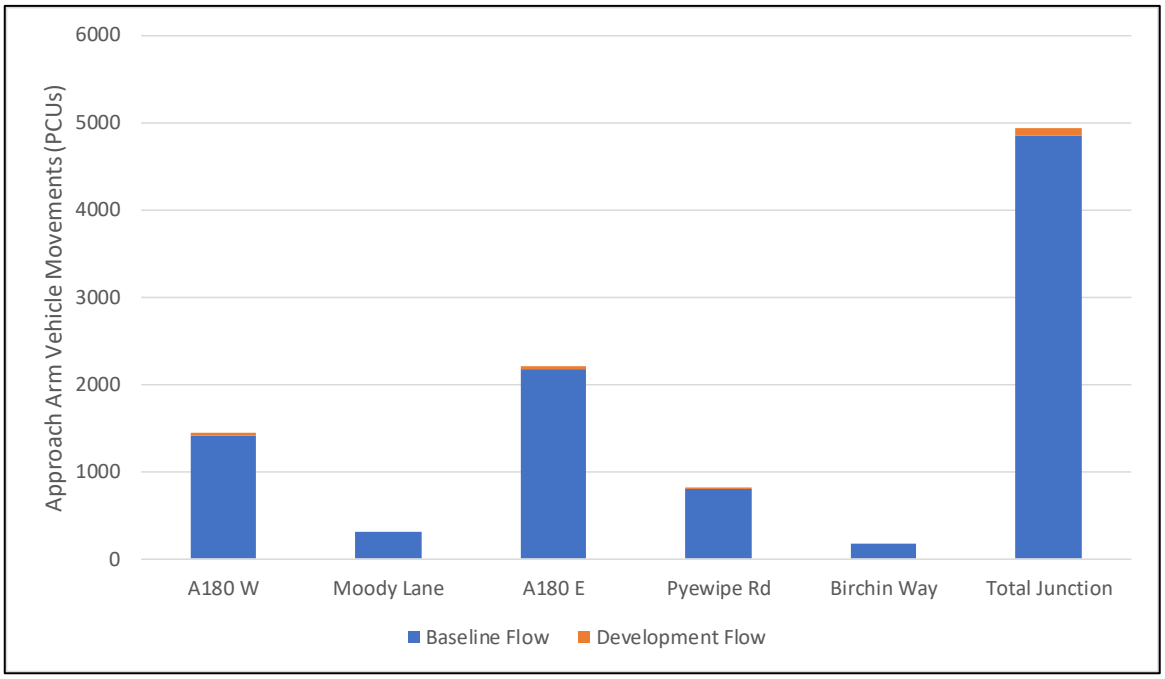
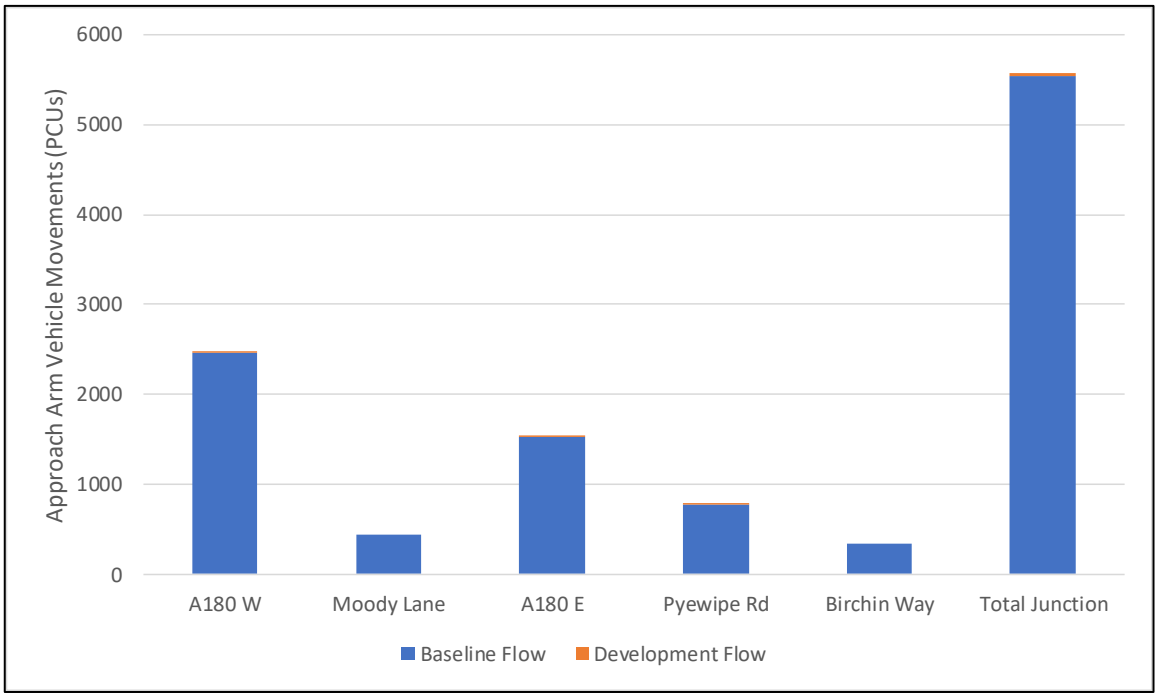


Table 10.49: 2030 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,325	446	1,443	759	340	5,313
Committed	139	1	80	12	3	235
Development	14	0	10	2	0	26
Total Flows	2,478	447	1,533	773	343	5,574
Development Flow as % of Total	*0.56%*	*0.0%*	*0.65 %*	*0.26%*	*0.0%*	*0.47%*

Figure 10.6: 2030 PM Assessed Traffic Flows at Westgate Roundabout



10.2.54 The analysis above shows the development traffic as a percentage of total traffic at this location is likely to be in the order of 1.5% - 1.6% in the AM Peak hour and 0.5% during the PM Peak hour in future years.

10.2.55 Considering the small percentage that development flows are adding to the junction, it is reasonable to consider that mitigation at this junction would be disproportionate to the marginal impact on the junction's performance. Therefore, no mitigation is proposed at this junction.

A180/ Moody Lane/ Pyewipe Road (Pyewipe Roundabout)

2018 Base Scenario

10.2.56 As set out in Section 3 and Table 3.9, the modelling outputs suggest the junction already operates above its theoretical capacity on the A180 Eastern arm during the AM Peak with a queue of 55.7 PCUs. It should be noted that with RFC values exceeding 1.0, the junction model can become unstable resulting in spurious queue lengths being generated. By 2023, 2024 and 2030, the junction would continue to operate above theoretical capacity largely due to the increase in background traffic flows.

10.2.57 To understand the impact development traffic has on this junction, Tables 10.50 to 10.56 summarise the AM and PM forecast development flows as a proportion of the total flows at Pyewipe Roundabout including revised flows associated with the Link Road for the future years 2023, 2024 and 2030 (i.e. when the Proposed Development is forecast to be fully operational). Figures 10.7 to 10.12 illustrate the information graphically.

Table 10.50: 2023 AM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	250	1,393	252	2,337	147	4,379
Committed	8	97	0	104	17	226
Development	0	32	0	40	0	72
Total Flows	258	1,522	252	2,481	164	4,677
Development Flow as % of Total	*0.0%*	*2.1%*	*0.0%*	*1.6%*	*0.0%*	*1.5%*

Figure 10.7: 2023 AM Assessed Traffic Flows at Pyewipe Roundabout

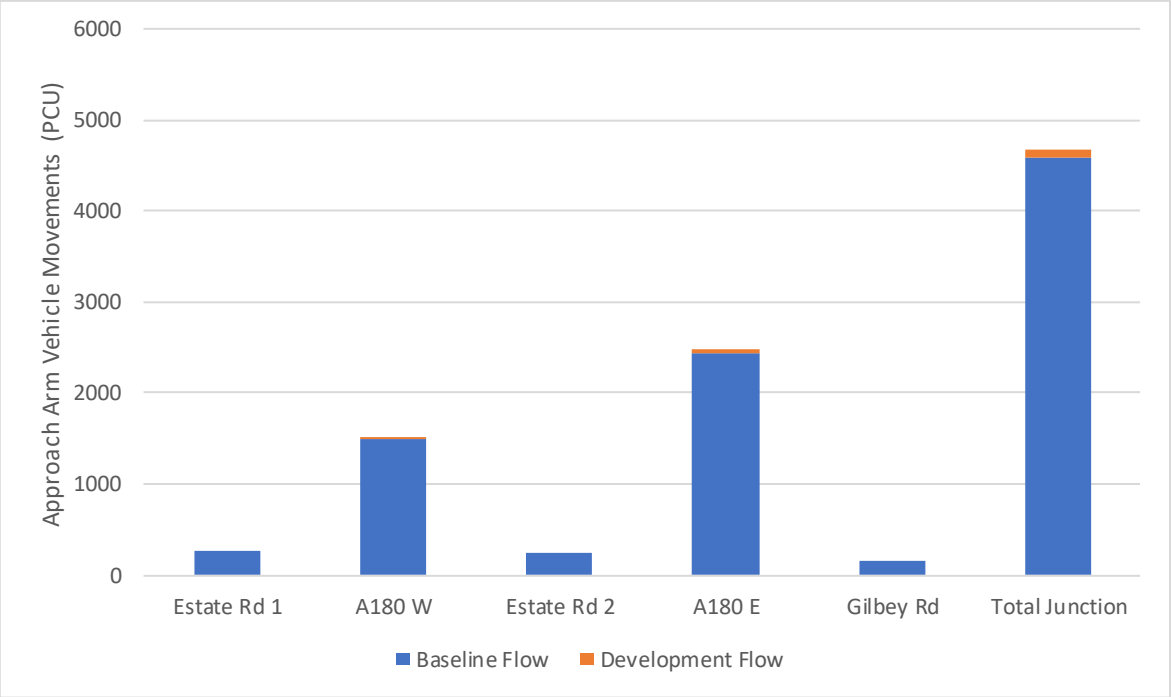


Table 10.51: 2023 PM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	630	1,506	543	1,654	228	4,561
Committed	15	117	0	78	15	225
Development	0	14	0	12	0	26
Total Flows	645	1,637	543	1,744	243	4,812
Development Flow as % of Total	*0.0%*	*0.9%*	*0.0%*	*0.7%*	*0.0%*	*0.5%*

Figure 10.8: 2023 PM Assessed Traffic Flows at Pyewipe Roundabout

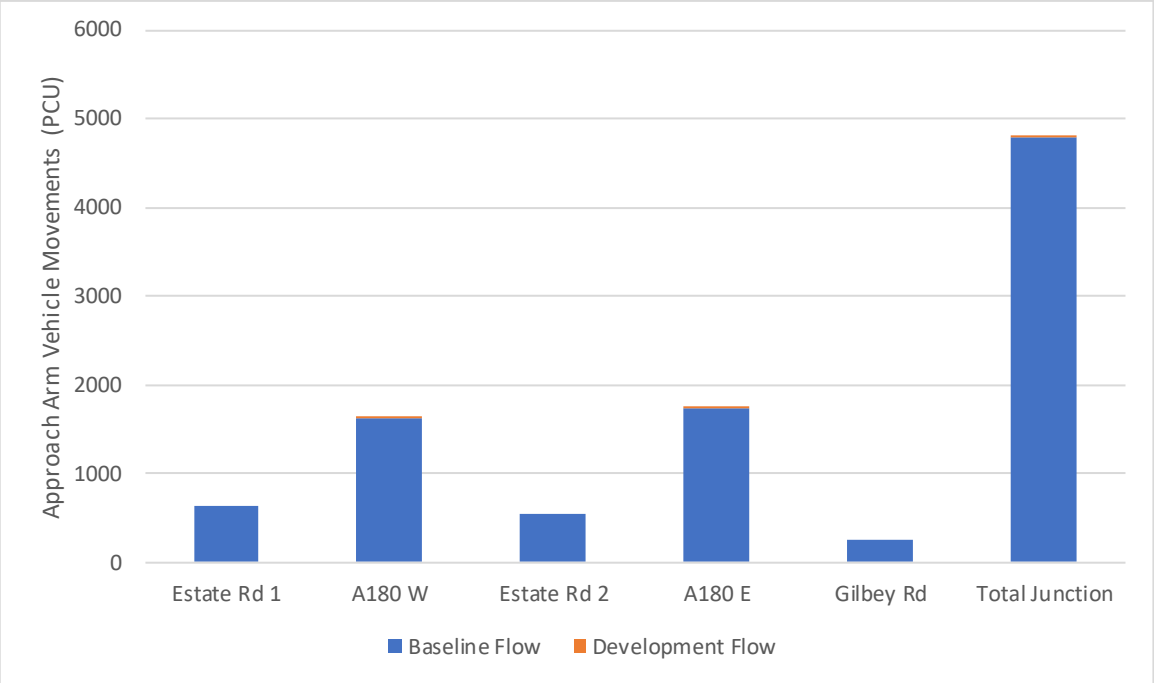


Table 10.52: 2024 AM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	250	1,413	255	2,357	149	4,424
Committed	8	110	0	132	17	267
Development	0	32	0	40	0	72
Total Flows	258	1,555	255	2,529	166	4,763
Development Flow as % of Total	*0.0%*	*2.1%*	*0.0%*	*1.6%*	*0.0%*	*1.5%*

Figure 10.9: 2024 AM Assessed Traffic Flows at Pyewipe Roundabout

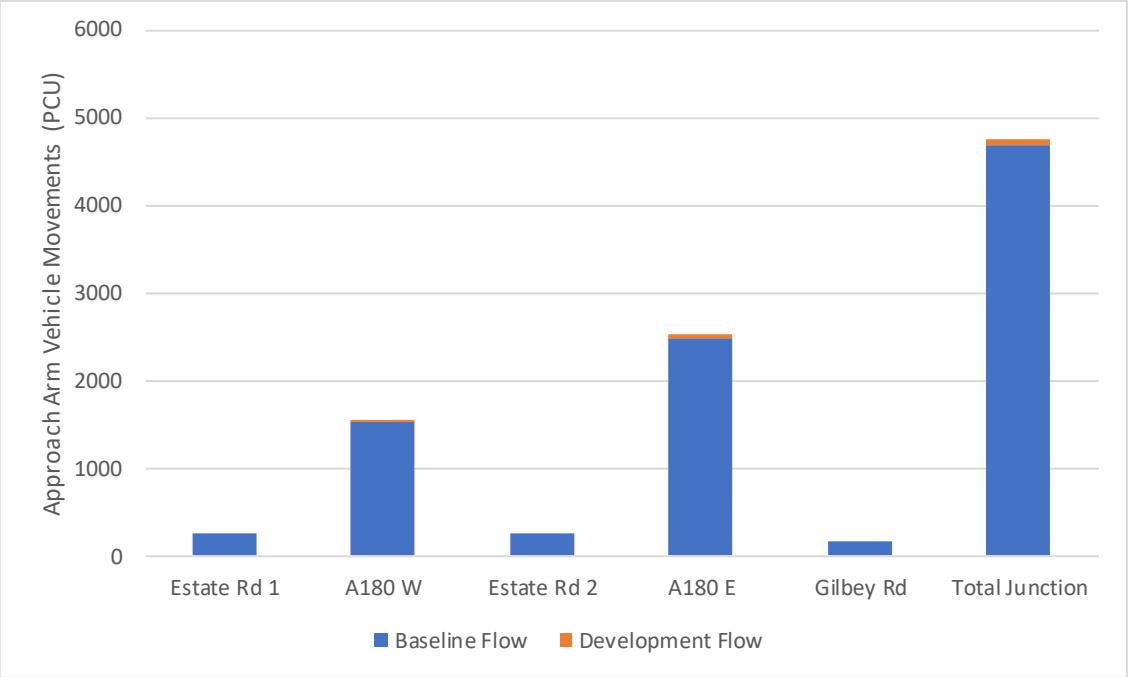


Table 10.53: 2024 PM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	634	1,529	549	1,675	230	4,617
Committed	15	151	0	96	15	277
Development	0	14	0	12	0	26
Total Flows	649	1,694	549	1,783	245	4,920
Development Flow as % of Total	*0.0%*	*0.8%*	*0.0%*	*0.7%*	*0.0%*	*0.5%*

Figure 10.10: 2024 PM Assessed Traffic Flows at Pyewipe Roundabout

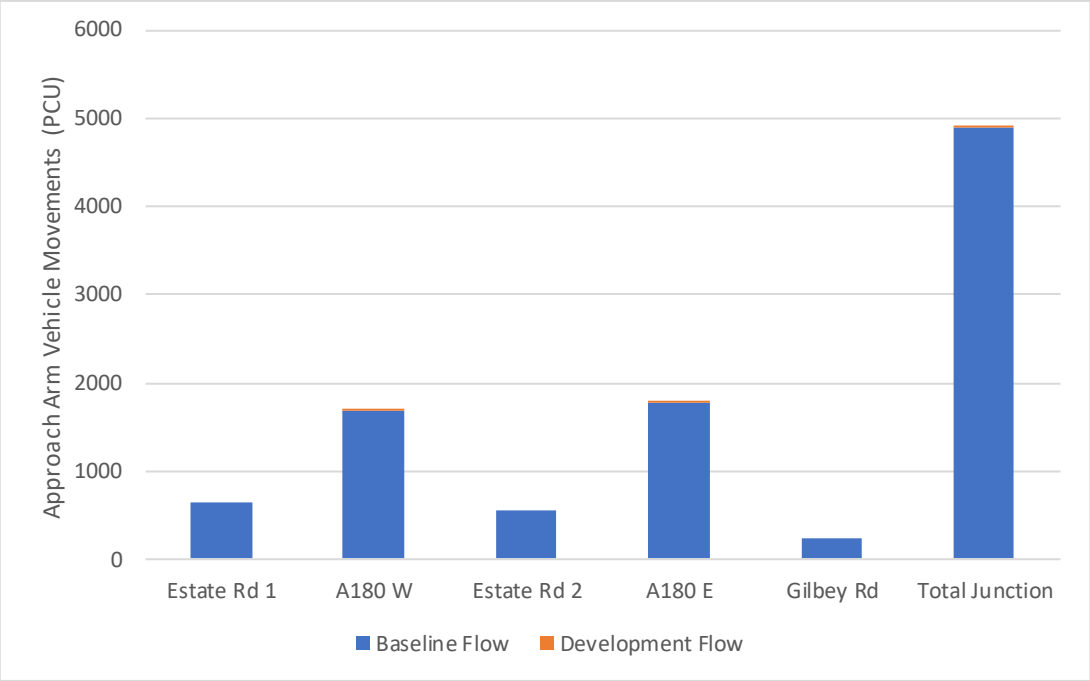


Table 10.54: 2030 AM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	255	1,489	267	2,471	157	4,639
Committed	8	110	0	132	17	267
Development	0	32	0	40	0	72
Total Flows	263	1,631	267	2,643	174	4,978
Development Flow as % of Total	*0.0%*	*2.0%*	*0.0%*	*1.5%*	*0.0%*	*1.4%*

Figure 10.11: 2030 AM Assessed Traffic Flows at Pyewipe Roundabout

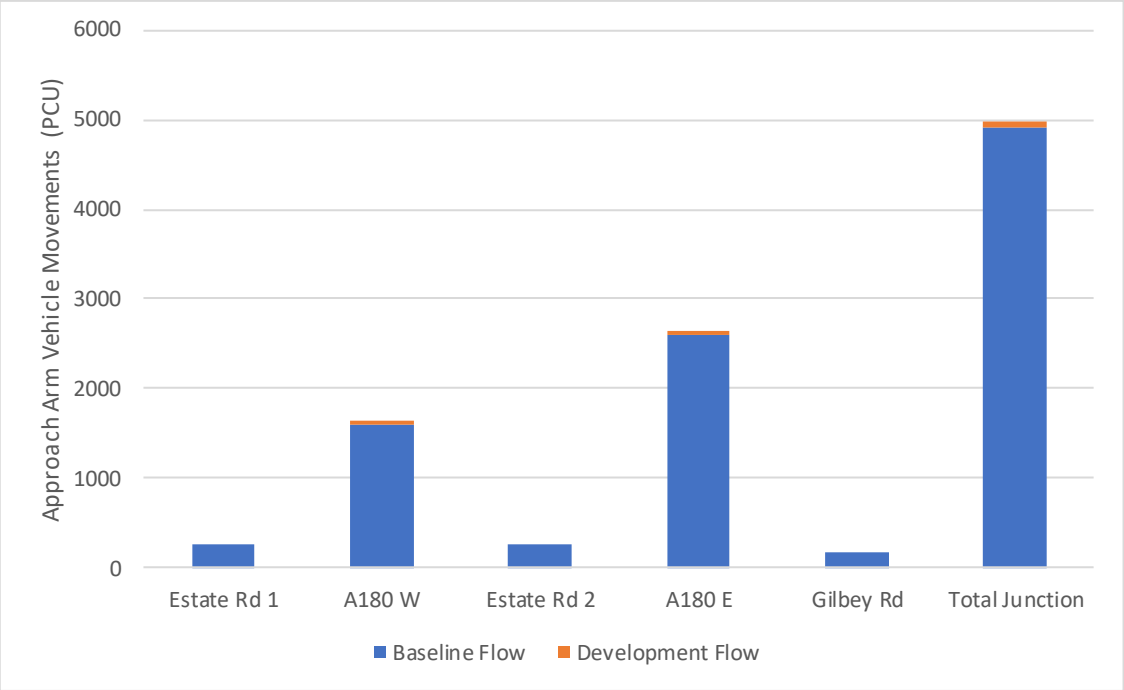
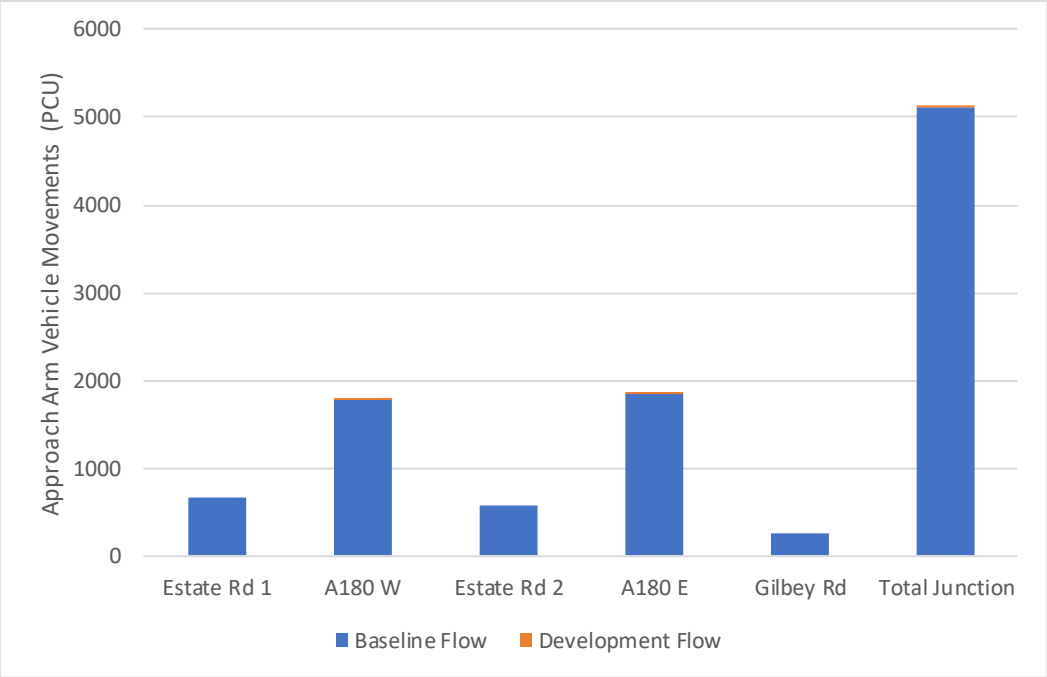


Table 10.55: 2030 PM Assessed Traffic Flows at Pyewipe Roundabout

APPROACH FLOWS (PCUS)	ESTATE RD 1	A180 WEST	ESTATE RD 2	A180 EAST	GILBEY RD	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	647	1,617	576	1,753	242	4,835
Committed	15	151	0	96	15	277
Development	0	14	0	12	0	26
Total Flows	662	1,782	576	1,861	257	5,138
Development Flow as % of Total	*0.0%*	*0.8%*	*0.0%*	*0.6%*	*0.0%*	*0.5%*

Figure 10.12: 2030 PM Assessed Traffic Flows at Pyewipe Roundabout



10.2.58 The analysis above shows the development traffic as a percentage of total traffic at this location is likely to be in the order of 1.5% in the AM Peak hour and 0.5% during the PM Peak hour in future years.

10.2.59 Considering the small percentage that development flows are adding to the junction, it is reasonable to consider that mitigation at this junction would be disproportionate to the marginal impact on the junction's performance. Therefore, no mitigation is proposed at this junction.

10.3 Assessment of Impact on the Operational Railway and Level Crossing

10.3.1 Following comments received from Network Rail within Section 4 of the EIA Scoping Opinion (dated October 2019), an assessment has been undertaken of the impact on the operational railway and level crossings on Kiln Lane and South Marsh Road.

10.3.2 Tables 10.56 to 10.58 set out the percentage increase in traffic that the Proposed Development adds to the total traffic using the Kiln Lane and South Marsh Road railway crossings for the future opening years 2023, 2024 and 2030.

10.3.3 The analysis below suggests the Proposed Development will increase traffic flows by circa 9% on Kiln Lane and circa 2.6% on South Marsh Road. The Consented Development impact would be the same.

Table 10.56: 2023 Opening Year - Railway Crossing Impact Assessment

	BASE + COMMITTED (AAWT)	BASE + COMMITTED + DEVELOPMENT (AAWT)	PERCENTAGE INCREASE
Kiln Lane	7,418	8,064	8.7%
South Marsh Road	1,036	1,063	2.6%

Table 10.57: 2024 Opening Year - Railway Crossing Impact Assessment

	BASE + COMMITTED (AAWT)	BASE + COMMITTED + DEVELOPMENT (AAWT)	PERCENTAGE INCREASE
Kiln Lane	7,194	7,839	9.0%
South Marsh Road	1,049	1,076	2.6%

Table 10.58: 2030 Opening Year - Railway Crossing Impact Assessment

	BASE + COMMITTED (AAWT)	BASE + COMMITTED + DEVELOPMENT (AAWT)	PERCENTAGE INCREASE
Kiln Lane	7,487	8,132	8.6%
South Marsh Road	1,101	1,128	2.5%

10.3.4 To provide more context, Tables 10.59 and 10.60 set out the number of vehicles crossing the railway line per minute during the AM Peak hour (07:00 – 08:00) and PM Peak hour (16:00 – 17:00) with and without Proposed Development traffic.

Table 10.59: Vehicles per Minute crossing Kiln Lane Level Crossing

YEAR OF OPENING	BASE + COMMITTED		BASE + COMMITTED + DEVELOPMENT		NET INCREASE	
	AM	PM	AM	PM	AM	PM
2023	12.3	11.4	13.4	11.8	1.1	0.4
2024	12.3	11.4	13.5	11.9	1.2	0.5
2030	12.6	11.7	13.8	12.2	1.2	0.5

Table 10.60: Vehicles per Minute crossing South Marsh Road Level Crossing

YEAR OF OPENING	BASE + COMMITTED		BASE + COMMITTED + DEVELOPMENT		NET INCREASE	
	AM	PM	AM	PM	AM	PM
2023	2.7	2.9	2.8	2.9	0.1	0.0
2024	2.8	2.9	2.8	2.9	0.0	0.0
2030	2.9	3.1	2.9	3.1	0.0	0.0

10.3.5 The analysis above shows that with development traffic, the number of vehicles crossing Kiln Lane level crossing would increase by approximately 1 vehicle per minute in the AM Peak Hour and 1 vehicle every 2 minutes in the PM Peak hour. The increase in the number of vehicles per minute crossing South Marsh Road level crossing would be minimal. It is therefore not considered that the additional traffic generated by the Proposed Development would have a significant effect on the operational railway or the level crossings on Kiln Lane and South Marsh Road.

11.0 CONSTRUCTION TRAFFIC IMPACTS

11.1 Introduction

11.1.1 Construction of the Proposed Development is due to start in Q2 2020 with the construction programme lasting around 36 months and the peak construction period anticipated to be in 2021. However, should construction not start in early 2020, the worst case scenario in terms of traffic would be construction starting in 2021 (following DCO consent) or 2026 with the peak construction period anticipated to be 2022 or 2027 respectively.

11.1.2 It is proposed that all construction worker vehicles and HGVs will access the Site from South Marsh Road via two access points on South Marsh Road to the east of the SHBPS entrance.

11.2 Construction Generation

11.2.1 The estimated profile of workforce over the construction period for the Proposed Development is shown below in Table 11.1 and reveals the peak workforce is forecast to occur in the period around Q2 2021, Q3 2022 or Q3 2027 when up to around 750 workers are expected on Site.

Table 11.1: Profile of Daily Workforce throughout Construction

YEAR OF CONSTRUCTION			DAILY WORKFORCE
SCENARIO 1	SCENARIO 2	SCENARIO 3	
Q2 2020	Q3 2021	Q3 2026	80
Q3 2020	Q4 2021	Q4 2026	170
Q4 2020	Q1 2022	Q1 2027	295
Q1 2021	Q2 2022	Q2 2027	590
Q2 2021	Q3 2022	Q3 2027	750
Q3 2021	Q4 2022	Q4 2027	750
Q4 2021	Q1 2023	Q1 2028	750
Q1 2022	Q2 2023	Q2 2028	750
Q2 2022	Q3 2023	Q3 2028	530
Q3 2022	Q4 2023	Q4 2028	360
Q4 2022	Q1 2024	Q1 2029	225
Q1 2023	Q2 2024	Q2 2029	140

11.2.2 In relation to traffic generation associated with construction workers, an average occupancy of two workers per vehicle has been applied. This occupancy rate has been accepted by transport stakeholders on other recent power station

construction projects including the Consented Development, Eggborough CCGT and Knottingley CCGT and is therefore considered robust. A Construction Worker Travel Plan aimed at identifying measures and establishing procedures to ensure the vehicle occupancy rates used in assessment are achieved will be implemented by the appointed contractor. A Framework Construction Travel Plan has been prepared and is included as Annex 27.

11.2.3 When this occupancy rate is applied to the workforce associated with construction of the Proposed Development at the peak of construction (Q2 2021, Q3 2022 or Q3 2027), this equates to 375 daily one-way car movements per day.

11.2.4 The volume of construction HGVs on the network is predicted to be at its maximum of around 412 two-way daily vehicle movements (206 in and 206 out) at the start of the construction period (around Q2 2020, Q3 2021 or Q3 2026), associated with the potential cut and fill of the top layer of ground within the Main Development Area for geotechnical purposes. During the remainder of the construction period HGV movements will vary between 18 and 116 daily two-way movements as shown in Table 11.2.

Table 11.2: Profile of Daily HGVs throughout Construction

YEAR OF CONSTRUCTION			DAILY HGVS (TWO-WAY)
SCENARIO 1	SCENARIO 2	SCENARIO 3	
Q2 2020	Q3 2021	Q3 2026	412
Q3 2020	Q4 2021	Q4 2027	80
Q4 2020	Q1 2022	Q1 2027	94
Q1 2021	Q2 2022	Q2 2027	108
Q2 2021	Q3 2022	Q3 2027	116
Q3 2021	Q4 2022	Q4 2027	70
Q4 2021	Q1 2023	Q1 2028	64
Q1 2022	Q2 2023	Q2 2028	52
Q2 2022	Q3 2023	Q3 2028	34
Q3 2022	Q4 2023	Q4 2028	18
Q4 2022	Q1 2024	Q1 2029	32
Q1 2023	Q2 2024	Q2 2029	26

11.2.5 Combining construction workforce vehicle movements with construction HGV movements over the entire construction programme shows the overall peak of construction to occur in around Q2 2021, Q3 2022 or Q3 2027 when 116 two-way HGV movements per day are anticipated.

11.2.6 The total two-way construction vehicle traffic expected over the 36 month construction period is illustrated in Annex 23.

11.3 Daily Vehicle Profile during the Peak Month

11.3.1 Working hours on major construction sites tend to be long due to the pressures of timescales and available light. Therefore, the arrival and departure of workers' vehicles tend to be spread over the peak periods rather than all falling in the traditional network peak hours.

11.3.2 Based on a traffic count undertaken at the site entrance of a current energy from waste plant construction project at Ferrybridge, near Wakefield (known as Ferrybridge Multifuel 2) and operated by SSE, a profile of arrivals and departures over the working day has been produced. Table 11.3 below sets out the percentage of daily inbound and outbound trips on an hour-by-hour basis and calculates the totals for the peak of construction (around Q2 2021, Q3 2022 or Q3 2027).

Table 11.3: Daily Vehicle Profile during Peak of Construction

HOUR BEGINNING	% OF DAILY INBOUND	% OF DAILY OUTBOUND	ARRIVALS	DEPAR-TURES
06:00	42%	0%	158	0
07:00	37%	0%	138	0
08:00	12%	0%	45	0
09:00	9%	0%	34	0
16:00	0%	22%	0	82
17:00	0%	26%	0	98
18:00	0%	47%	0	176
19:00	0%	5%	0	19
Total	**100%**	**100%**	**375**	**375**

11.3.3 The daily profile of HGV movement over the day is based on experience from other power sector construction projects and assumes HGVs will be spread evenly over the day. Based on deliveries taking place between 07:00 and 19:00, this equates to 5 HGV arrivals and departures per hour.

11.4 Abnormal Loads

11.4.1 During the construction phase of the Proposed Development a number of AIL deliveries to the Site are expected. The Site is located adjacent to the existing SHBPS so there is a history of abnormal load access to the Site.

11.4.2 The contractor will work with the relevant authorities and stakeholders to secure appropriate approvals for the transportation of abnormal loads on the strategic

and local road network. Specific mitigation measures that would be investigated to deliver abnormal loads to the Site could include the temporary removal of street furniture (i.e. pedestrian islands, signage) and avoiding peak traffic periods for the delivery of abnormal loads.

11.5 Trip Distribution and Assignment

11.5.1 The distribution of construction workforce traffic to the network has been based on the population of towns and cities within a 45 minute drive time of the Site and the shortest/ quickest route to the Site. Table 11.4 shows the workforce distribution and the number of workers this equates to at the peak of construction (around Q2 2021, Q3 2022 or Q3 2027).

Table 11.4: Daily Vehicle Profile during Peak of Construction

DISTRICT	POPULATION (2011 CENSUS)	PERCENTAGE DISTRIBUTION	NO. OF PERMANENT RESIDENT WORKERS (PEAK MONTH OF CONSTRUCTION)
Gainsborough	27,117	6%	45
Grimsby	88,243	18%	135
Hull	284,321	58%	435
Immingham	10,750	2%	15
Scunthorpe	79,977	16%	120

11.5.2 The assignment of the construction workforce to the network is shown in Annex 24.

11.5.3 All HGV construction traffic will access/ depart the Site from the A180 via the A1173, Kiln Lane, Hobson Way and South Marsh Road. At the junction of the A180, it is assumed that 50% would arrive/ depart to the east and 50% arrive/ depart to the west. The routing of HGVs between the construction site and the A180 will be controlled through the implementation of a HGV routing plan included as a measure within the Construction Traffic Management Plan (CTMP) which will be prepared by the appointed contractor. A Framework CTMP which identifies the measures to control the routing and impact that HGVs will have on the local road network has been prepared and is included as Annex 28.

11.5.4 The combined HGV and workforce traffic demand for the AM (07:00 – 08:00) and PM (16:00 – 17:00) network peak hours is provided in Annex 25.

11.6 Link Flow Impact Assessment

11.6.1 The percentage impact of construction traffic at the peak of construction of the Proposed Development has been carried out on key links of the vehicle routing corridor to serve the Proposed Development.

11.6.2 Table 11.5 below demonstrates the predicted changes to the future 2021, 2022 and 2027 Baseline (including committed developed and with link road open) two-way link flows following the addition of construction traffic associated with the Proposed Development.

Table 11.5: Construction Link Impact Assessment

South Marsh Road (East of Hobson Way)

2021 PEAK OF CONSTRUCTION	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	148	126	274	117.5%
16:00 – 17:00 PM Peak	92	73	165	126.0%
24 Hour	866	822	1,688	105.4%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	148	128	276	115.6%
16:00 – 17:00 PM Peak	92	75	167	122.7%
24 Hour	866	833	1,699	104.0%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	148	134	282	110.4%
16:00 – 17:00 PM Peak	92	78	170	117.9%
24 Hour	866	878	1,744	98.6%

South Marsh Road (West of Hobson Way)

2021 PEAK OF CONSTRUCTION	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	8	160	168	5.0%
16:00 – 17:00 PM Peak	5	167	172	3.0%
24 Hour	45	813	858	5.5%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**

07:00 – 08:00 AM Peak	8	161	169	5.0%
16:00 – 17:00 PM Peak	5	169	174	3.0%
24 Hour	45	824	869	5.5%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	8	170	178	4.7%
16:00 – 17:00 PM Peak	5	177	182	2.8%
24 Hour	45	869	914	5.2%

South Humber Bank Link Road (South of South Marsh Road)

2021 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	25	818	843	3.1%
16:00 – 17:00 PM Peak	15	668	683	2.2%
24 Hour	136	2,709	2,845	5.0%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	25	828	853	3.0%
16:00 – 17:00 PM Peak	15	669	684	2.2%
24 Hour	136	2,817	2,953	4.8%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	25	831	856	3.0%
16:00 – 17:00 PM Peak	15	670	685	2.2%
24 Hour	136	2,632	2,768	5.2%

Hobson Way (North of South Marsh Road)

2021 PEAK OF CONSTRUCTION	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	115	973	1,088	11.8%
16:00 – 17:00 PM Peak	72	823	895	8.7%
Weekday 24 Hour	686	4,711	5,397	14.5%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	984	1,099	11.7%
16:00 – 17:00 PM Peak	72	825	897	8.7%
Weekday 24 Hour	686	4,840	5,526	14.2%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	995	1,110	11.6%
16:00 – 17:00 PM Peak	72	834	906	8.6%
Weekday 24 Hour	686	4,768	5,454	14.4%

Kiln Lane (West of Hobson Way)

2021 PEAK OF CONSTRUCTION	DEV TRIPS	BASELINE FLOWS	BASELINE + DEV FLOWS	% INCREASE
07:00 – 08:00 AM Peak	115	712	827	16.2%
16:00 – 17:00 PM Peak	72	676	748	10.7%
24 Hour	686	5,793	6,479	11.8%
2022 Peak of Construction	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	730	845	15.8%

16:00 – 17:00 PM Peak	72	679	751	10.6%
24 Hour	686	6,098	6,784	11.2%
2027 Peak of Construction	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	750	865	15.3%
16:00 – 17:00 PM Peak	72	696	768	10.3%
24 Hour	686	6,046	6,732	11.3%

A1173 (West of North Moss Lane)

2021 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	511	626	22.5%
16:00 – 17:00 PM Peak	72	571	643	12.6%
24 Hour	686	7,183	7,869	9.6%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	542	657	21.2%
16:00 – 17:00 PM Peak	72	588	660	12.2%
24 Hour	686	7,602	8,288	9.0%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	115	587	702	19.6%
16:00 – 17:00 PM Peak	72	638	710	11.3%
24 Hour	686	7,749	8,435	8.9%

A1173 (North of A180)

2021 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	112	1,399	1,511	8.0%

16:00 – 17:00 PM Peak	71	1,588	1,659	4.5%
24 Hour	671	13,874	14,545	4.8%
2022 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	112	1,380	1,492	8.1%
16:00 – 17:00 PM Peak	71	1,606	1,677	4.4%
24 Hour	671	14,811	15,482	4.5%
2027 PEAK OF CONSTRUCTION	**DEV TRIPS**	**BASELINE FLOWS**	**BASELINE + DEV FLOWS**	**% INCREASE**
07:00 – 08:00 AM Peak	112	1,548	1,660	7.2%
16:00 – 17:00 PM Peak	71	1,794	1,865	4.0%
24 Hour	671	16,289	16,960	4.1%

11.6.3 Table 11.5 shows the greatest impact of construction traffic arising from the Proposed Development is on South Marsh Road (East of Hobson Way). At this location base flows are low thus the calculated percentage impact appears high.

11.7 Junction Capacity Assessment

11.7.1 In order to determine the level of impact during the peak of construction of the Proposed Development, junction capacity assessments have been carried out at key junctions within the Study Area (see Figure 3.2). It was agreed with NELC Highways during scoping that junction modelling was not required at Pyewipe Roundabout as construction flows in the peak hours are below the 30 two-way trip threshold for assessment.

11.7.2 Based on the construction demand profile included in Annex 23, peak of construction of the Proposed Development is expected to occur in 2021 (earliest construction scenario) or 2027 (latest construction scenario) and would be characterised by staff travel associated with 750 workers based on Site and up to 116 daily HGV movements (58 in/ 58 out).

11.7.3 Junction capacity assessments have been undertaken at the following junctions:

- Hobson Way/ South Marsh Road (East of Hobson Way) T-Junction;
- Hobson Way/ South Marsh Road (West of Hobson Way) T-Junction;
- Laporte Road/ Kiln Lane/ Hobson Way Roundabout;
- Kiln Lane/ North Moss Lane/ Trondheim Way Roundabout;
- A1173/ Kiln Lane Roundabout;

- A1173/ SHIIP Site Access;
- A180 Stallingborough Interchange; and
- A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout).

11.7.4 The scenarios tested included:

- 2021 Base + Committed;
- 2021 Base + Committed + Peak of Construction;
- 2022 Base + Committed;
- 2022 Base + Committed + Peak of Construction;
- 2027 Base + Committed; and
- 2027 Base + Committed + Peak of Construction.

11.7.5 The modelling has been undertaken based on passenger car unit values (PCUs) in order to best reflect any construction effects associated with HGV traffic.

Hobson Way/ South Marsh Road (East of Hobson Way) T-Junction

2021 Base + Committed Development Scenario

11.7.6 The modelling outputs suggest that the existing junction operates well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.11 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.6 below. The full outputs of these assessments are attached as Annex 16.

Table 11.6: 2021 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.11	0.1
Hobson Way (Right Turn)	0.00	0.0

2021 Base + Committed + Peak of Construction Scenario

11.7.7 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.26 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.7 below. The full outputs of these assessments are attached as Annex 16.

Table 11.7: 2021 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.06	0.1
Hobson Way (Right Turn)	0.04	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.03	0.0
South Marsh Road (Right Turn)	0.26	0.4
Hobson Way (Right Turn)	0.00	0.0

2022 Base + Committed Development Scenario

11.7.8 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.12 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.8 below. The full outputs of these assessments are attached as Annex 16.

Table 11.8: 2022 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.12	0.1
Hobson Way (Right Turn)	0.00	0.0

2022 Base + Committed + Peak of Construction Scenario

11.7.9 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.26 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.9 below. The full outputs of these assessments are attached as Annex 16.

Table 11.9: 2022 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.06	0.1
Hobson Way (Right Turn)	0.04	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.03	0.0
South Marsh Road (Right Turn)	0.26	0.4
Hobson Way (Right Turn)	0.00	0.0

2027 Base + Committed Development Scenario

11.7.10 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.12 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.10 below. The full outputs of these assessments are attached as Annex 16.

Table 11.10: 2027 Base + Committed Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.04	0.0
Hobson Way (Right Turn)	0.00	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.12	0.1
Hobson Way (Right Turn)	0.00	0.0

2027 Base + Committed + Peak of Construction Scenario

11.7.11 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.27 being forecast on South Marsh Road arm during the PM Peak as summarised in Table 11.11 below. The full outputs of these assessments are attached as Annex 16.

Table 11.11: 2027 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.06	0.1
Hobson Way (Right Turn)	0.04	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.03	0.0
South Marsh Road (Right Turn)	0.27	0.4
Hobson Way (Right Turn)	0.00	0.0

<u>Hobson Way/ South Marsh Road (West of Hobson Way) T-Junction</u>

2021 Base + Committed Development Scenario

11.7.12 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.18 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.12 below. The full outputs of these assessments are attached in Annex 17.

Table 11.12: 2021 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.14	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.18	0.2

2021 Base + Committed + Peak of Construction Scenario

11.7.13 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.13 below. The full outputs of these assessments are attached in Annex 17.

Table 11.13: 2021 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2022 Base + Committed Development Scenario

11.7.14 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.18 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.14 below. The full outputs of these assessments are attached in Annex 17.

Table 11.14: 2022 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.15	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.18	0.2

2022 Base + Committed + Peak of Construction Scenario

11.7.15 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.15 below. The full outputs of these assessments are attached in Annex 17.

Table 11.15: 2022 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.15	0.2
South Marsh Road (Right Turn)	0.17	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.01	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2027 Base + Committed Development Scenario

11.7.16 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.19 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.16 below. The full outputs of these assessments are attached in Annex 17.

Table 11.16: 2027 Base + Committed Development Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.16	0.2
South Marsh Road (Right Turn)	0.16	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.19	0.2

2027 Base + Committed + Peak of Construction Scenario

11.7.17 The modelling outputs suggest that the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.20 being forecast on the right turn lane from Hobson Way during the PM Peak as summarised in Table 11.17 below. The full outputs of these assessments are attached in Annex 17.

Table 11.17: 2027 Base + Committed + Peak of Construction Modelling Outputs (South Marsh Road/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
South Marsh Road (Left Turn)	0.16	0.2
South Marsh Road (Right Turn)	0.18	0.2
Hobson Way (Right Turn)	0.01	0.0
PM Peak (16:00 – 17:00)		
South Marsh Road (Left Turn)	0.00	0.0
South Marsh Road (Right Turn)	0.01	0.0
Hobson Way (Right Turn)	0.20	0.2

Laporte Road/ Hobson Way/ Kiln Lane Roundabout

2021 Base + Committed Development Scenario

11.7.18 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.40 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 11.18 below. The full outputs of these assessments are attached as Annex 18.

Table 11.18: 2021 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.31	0.5
Laporte Road SB Approach	0.11	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.18	0.2
Kiln Lane EB Approach	0.08	0.1
Laporte Road SB Approach	0.40	0.7
Unnamed Access	0.00	0.0

2021 Base + Committed + Peak of Construction Scenario

11.7.19 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.40 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 11.19 below. The full outputs of these assessments are attached as Annex 18.

Table 11.19: 2021 Base + Committed + Peak of Construction Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.38	0.7
Laporte Road SB Approach	0.12	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.19	0.3
Kiln Lane EB Approach	0.09	0.1
Laporte Road SB Approach	0.40	0.7
Unnamed Access	0.00	0.0

2022 Base + Committed Development Scenario

11.7.20 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.40 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 11.20 below. The full outputs of these assessments are attached as Annex 18.

Table 11.20: 2022 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.33	0.5
Laporte Road SB Approach	0.11	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.16	0.2
Kiln Lane EB Approach	0.08	0.1
Laporte Road SB Approach	0.40	0.7
Unnamed Access	0.00	0.0

2022 Base + Committed + Peak of Construction Scenario

11.7.21 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 11.21 below. The full outputs of these assessments are attached as Annex 18.

Table 11.21: 2022 Base + Committed + Peak of Construction Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.29	0.4
Kiln Lane EB Approach	0.40	0.7
Laporte Road SB Approach	0.12	0.2
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.20	0.3
Kiln Lane EB Approach	0.12	0.2
Laporte Road SB Approach	0.41	0.7
Unnamed Access	0.00	0.0

2027 Base + Committed Development Scenario

11.7.22 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Laporte Road arm during the PM Peak as summarised in Table 11.22 below. The full outputs of these assessments are attached as Annex 18.

Table 11.22: 2027 Base + Committed Development Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.28	0.4
Kiln Lane EB Approach	0.34	0.6
Laporte Road SB Approach	0.12	0.1
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.16	0.2
Kiln Lane EB Approach	0.09	0.1
Laporte Road SB Approach	0.41	0.7
Unnamed Access	0.00	0.0

2027 Base + Committed + Peak of Construction Scenario

11.7.23 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.41 being forecast on the Kiln Lane arm during the AM Peak and on the Laporte Road arm during the PM Peak as summarised in Table 11.23 below. The full outputs of these assessments are attached as Annex 18.

Table 11.23: 2027 Base + Committed + Peak of Construction Modelling Outputs (Laporte Rd/ Kiln Lane/ Hobson Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Hobson Way NB Approach	0.29	0.4
Kiln Lane EB Approach	0.41	0.8
Laporte Road SB Approach	0.12	0.2
Unnamed Access	0.00	0.0
PM Peak (16:00 – 17:00)		
Hobson Way NB Approach	0.20	0.3
Kiln Lane EB Approach	0.09	0.1
Laporte Road SB Approach	0.41	0.7
Unnamed Access	0.00	0.0

Kiln Lane/ North Moss Lane/ Trondheim Way Roundabout

2021 Base + Committed Development Scenario

11.7.24 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.28 being forecast on the A1173 arm during the PM Peak as summarised in Table 11.24 below. The full outputs of these assessments are attached as Annex 19.

Table 11.24: 2021 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.15	0.3
North Moss Lane	0.09	0.1
A1173	0.24	0.4
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.23	0.4
North Moss Lane	0.07	0.1
A1173	0.28	0.5
Trondheim Way	0.05	0.1

2021 Base + Committed + Peak of Construction Scenario

The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.32 being forecast on the A1173 arm during the AM Peak as summarised in Table 11.25 below. The full outputs of these assessments are attached as Annex 19.

Table 11.25: 2021 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.15	0.3
North Moss Lane	0.09	0.1
A1173	0.32	0.5
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.28	0.5
North Moss Lane	0.07	0.1
A1173	0.29	0.5
Trondheim Way	0.05	0.1

2022 Base + Committed Development Scenario

11.7.25 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.29 being forecast on the A1173 arm during the PM Peak as summarised in Table 11.26 below. The full outputs of these assessments are attached as Annex 19.

Table 11.26: 2022 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.15	0.3
North Moss Lane	0.10	0.1
A1173	0.26	0.4
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.23	0.4
North Moss Lane	0.07	0.1
A1173	0.29	0.5
Trondheim Way	0.05	0.1

2022 Base + Committed + Peak of Construction Scenario

11.7.26 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.33 being forecast on the A1173 arm during the AM Peak as summarised in Table 11.27 below. The full outputs of these assessments are attached as Annex 19.

Table 11.27: 2022 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.16	0.3
North Moss Lane	0.10	0.1
A1173	0.33	0.6
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.29	0.5
North Moss Lane	0.07	0.1
A1173	0.29	0.6
Trondheim Way	0.05	0.1

2027 Base + Committed Development Scenario

11.7.27 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.30 being forecast on the A1173 arm during the PM Peak as summarised in Table 11.28 below. The full outputs of these assessments are attached as Annex 19.

Table 11.28: 2027 Base + Committed Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.16	0.3
North Moss Lane	0.11	0.1
A1173	0.29	0.5
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.26	0.4
North Moss Lane	0.08	0.1
A1173	0.30	0.6
Trondheim Way	0.06	0.1

2027 Base + Committed + Peak of Construction Scenario

11.7.28 The modelling outputs suggest that the junction operates well within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.36 being forecast on the A1173 arm during the AM Peak as summarised in Table 11.29 below. The full outputs of these assessments are attached as Annex 19.

Table 11.29: 2027 Base + Committed + Development Modelling Outputs (Kiln Lane/ North Moss Lane/ Trondheim Way)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Kiln Lane	0.16	0.3
North Moss Lane	0.09	0.1
A1173	0.36	0.7
Trondheim Way	0.03	0.0
PM Peak (16:00 – 17:00)		
Kiln Lane	0.31	0.5
North Moss Lane	0.08	0.1
A1173	0.31	0.6
Trondheim Way	0.06	0.1

A1173/ Kiln Lane Roundabout

11.7.29 It is noted that as part of the Stallingborough Employment Site development, a number of improvements to the roundabout are proposed including:

- an improved southern arm onto the roundabout and formalise the site access arrangement;
- marginal widening of the A1173 northern arm into the roundabout to increase the flare length on the approach whilst maintaining a two-lane entry; and
- marginal widening of the A1173 western arm into the roundabout to increase the flare length on the approach whilst maintaining a two-lane entry.

11.7.30 This junction has therefore been modelled with these improvements in place for the remaining scenarios.

2021 Base + Committed Development Scenario

11.7.31 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.81 being forecast on the A1173 southbound approach arm during the PM Peak generating a maximum queue of 4.1 PCUs as summarised in Table 11.30 below. The full outputs of these assessments are attached as Annex 20.

Table 11.30: 2021 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.70	2.5
A1173 SB Approach	0.38	0.7
Kiln Lane WB Approach	0.17	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.32	0.6
A1173 SB Approach	0.81	4.1
Kiln Lane WB Approach	0.29	0.5

2021 Base + Committed + Peak of Construction Scenario

11.7.32 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.81 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 4.3 PCUs as summarised in Table 11.31 below. The full outputs of these assessments are attached as Annex 20.

Table 11.31: 2021 Base + Committed + Peak of Construction Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.76	3.3
A1173 SB Approach	0.40	0.8
Kiln Lane WB Approach	0.18	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.33	0.6
A1173 SB Approach	0.81	4.3
Kiln Lane WB Approach	0.34	0.6

2022 Base + Committed Development Scenario

11.7.33 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.81 being forecast on the A1173 southbound approach arm during the PM Peak generating a maximum queue of 4.3 PCUs as summarised in Table 11.32 below. The full outputs of these assessments are attached as Annex 20.

Table 11.32: 2022 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.66	2.1
A1173 SB Approach	0.39	0.7
Kiln Lane WB Approach	0.18	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.32	0.6
A1173 SB Approach	0.81	4.3
Kiln Lane WB Approach	0.30	0.5

2022 Base + Committed + Peak of Construction Scenario

11.7.34 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.82 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 4.4 PCUs as summarised in Table 11.33 below. The full outputs of these assessments are attached as Annex 20.

Table 11.33: 2022 Base + Committed + Peak of Construction Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.00	0.0
A1173 EB Approach	0.71	2.7
A1173 SB Approach	0.41	0.8
Kiln Lane WB Approach	0.19	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.01	0.0
A1173 EB Approach	0.33	0.6
A1173 SB Approach	0.82	4.4
Kiln Lane WB Approach	0.34	0.7

2027 Base + Committed Development Scenario

11.7.35 The modelling outputs suggest that the junction operates within its design capacity during both the AM and PM peak periods, with a maximum RFC of 0.88 being forecast on the A1173 southbound approach arm during the PM Peak generating a maximum queue of 6.6 PCUs as summarised in Table 11.34 below. The full outputs of these assessments are attached as Annex 20.

Table 11.34: 2027 Base + Committed Development Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.03	0.1
A1173 EB Approach	0.72	2.7
A1173 SB Approach	0.43	0.9
Kiln Lane WB Approach	0.19	0.3
PM Peak (16:00 – 17:00)		
Unnamed Access	0.10	0.2
A1173 EB Approach	0.36	0.7
A1173 SB Approach	0.88	6.6
Kiln Lane WB Approach	0.34	0.7

2027 Base + Committed + Peak of Construction Scenario

11.7.36 The modelling outputs suggest that the junction operates within its theoretical capacity during both the AM and PM peak periods, with a maximum RFC of 0.88 being forecast on the A1173 southbound approach during the PM Peak generating a maximum queue of 6.9 PCUs as summarised in Table 11.35 below. The full outputs of these assessments are attached as Annex 20.

Table 11.35: 2027 Base + Committed + Peak of Construction Modelling Outputs (A1173/ Kiln Lane)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Unnamed Access	0.03	0.1
A1173 EB Approach	0.77	3.6
A1173 SB Approach	0.45	1.0
Kiln Lane WB Approach	0.20	0.4
PM Peak (16:00 – 17:00)		
Unnamed Access	0.11	0.2
A1173 EB Approach	0.37	0.7
A1173 SB Approach	0.88	6.9
Kiln Lane WB Approach	0.39	0.8

A1173/ SHIIP Site Access

2021 Base + Committed Development Scenario

11.7.37 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.51 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.36: 2021 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.01	0.0
A1173 (EB Approach)	0.51	1.2
Site Access North	0.03	0.0
A1173 (WB Approach)	0.13	0.2
PM Peak (16:00 – 17:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.22	0.4
Site Access North	0.01	0.0
A1173 (WB Approach)	0.40	0.7

2021 Base + Committed + Development Scenario

11.7.38 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.55 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.37: 2021 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.01	0.0
A1173 (EB Approach)	0.55	1.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.13	0.2
PM Peak (16:00 – 17:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.23	0.4
Site Access North	0.01	0.0
A1173 (WB Approach)	0.43	0.8

2022 Base + Committed Development Scenario

11.7.39 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.50 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.38: 2022 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.50	1.1
Site Access North	0.03	0.0
A1173 (WB Approach)	0.21	0.3
PM Peak (16:00 – 17:00)		
Site Access South	0.09	0.1
A1173 (EB Approach)	0.24	0.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.41	0.8

2022 Base + Committed + Development Scenario

11.7.40 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.54 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.39: 2022 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.03	0.0
A1173 (EB Approach)	0.54	1.3
Site Access North	0.03	0.0
A1173 (WB Approach)	0.21	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.09	0.1
A1173 (EB Approach)	0.24	0.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.44	0.9

2027 Base + Committed Development Scenario

11.7.41 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.55 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.40: 2027 Base + Committed Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.55	1.4
Site Access North	0.03	0.0
A1173 (WB Approach)	0.23	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.16	0.2
A1173 (EB Approach)	0.27	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.44	0.9

2027 Base + Committed + Development Scenario

11.7.42 The modelling outputs suggest the junction will operate well within capacity during both the AM and PM peak periods, with a maximum RFC of 0.59 being forecast on the A1173 (EB Approach) arm during the AM Peak. The full outputs of these assessments are attached as Annex 21.

Table 11.41: 2027 Base + Committed + Development Modelling Outputs (A1173/ SHIIP Access)

ARM	RFC	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
Site Access South	0.06	0.1
A1173 (EB Approach)	0.59	1.6
Site Access North	0.03	0.0
A1173 (WB Approach)	0.23	0.4
PM Peak (16:00 – 17:00)		
Site Access South	0.17	0.2
A1173 (EB Approach)	0.28	0.5
Site Access North	0.03	0.0
A1173 (WB Approach)	0.47	1.0

A180/ A1173 Stallingborough Interchange

2021 Base + Committed Development Scenario

11.7.43 It is noted that as part of the Stallingborough Employment Site development, it is proposed to marginally widen the northern arm (A1173) into the roundabout to increase the flare length on the approach whilst maintaining a two lane entry. The junction has therefore been modelled with this improvement in place for the remaining scenarios.

11.7.44 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUs as summarised in Table 11.42 below. The full outputs of these assessments are attached as Annex 22.

Table 11.42: 2021 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.7
A180 EB Off-Slip	A	0.7
A1173 SB Approach	A	0.3
A180 WB Off-Slip	A	2.1
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	0.6
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	1.3
A180 WB Off-Slip	A	0.5

2021 Base + Committed + Peak of Construction Scenario

11.7.45 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUs as summarised in Table 11.43 below. The full outputs of these assessments are attached as Annex 22.

Table 11.43: 2021 Base + Committed + Peak of Construction Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.9
A180 EB Off-Slip	A	1.0
A1173 SB Approach	A	0.3
A180 WB Off-Slip	A	2.1
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.1
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	1.6
A180 WB Off-Slip	A	0.5

2022 Base + Committed Development Scenario

11.7.46 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms as summarised in Table 11.44 below. The full outputs of these assessments are attached as Annex 22.

Table 11.44: 2022 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	0.8
A180 EB Off-Slip	A	0.6
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	1.9
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.4
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	1.4
A180 WB Off-Slip	A	0.5

2022 Base + Committed + Peak of Construction Scenario

The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all as summarised in Table 11.45 below. The full outputs of these assessments are attached as Annex 22.

Table 11.45: 2022 Base + Committed + Peak of Construction Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.0
A180 EB Off-Slip	A	0.9
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	1.7
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.3
A180 EB Off-Slip	A	0.5
A1173 SB Approach	A	2.3
A180 WB Off-Slip	A	0.5

2027 Base + Committed Development Scenario

11.7.47 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms apart from A180 Westbound Off-Slip which would operate in approaching unstable PCUs as summarised in Table 11.46 below. The full outputs of these assessments are attached as Annex 22.

Table 11.46: 2027 Base + Committed Development Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.1
A180 EB Off-Slip	A	0.8
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	2.6
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.6
A180 EB Off-Slip	A	0.6
A1173 SB Approach	A	2.7
A180 WB Off-Slip	A	0.5

2027 Base + Committed + Peak of Construction Scenario

11.7.48 The modelling outputs suggest the junction will operate within free flow conditions (LOS = A) during the AM and PM peak periods on all arms PCUs as summarised in Table 11.47 below. The full outputs of these assessments are attached as Annex 22.

Table 11.47: 2027 Base + Committed + Peak of Construction Modelling Outputs (A1173/ A180)

ARM	LOS	MAX QUEUE (PCU)
AM Peak (07:00 – 08:00)		
A1173 NB Approach	A	1.1
A180 EB Off-Slip	A	1.3
A1173 SB Approach	A	0.4
A180 WB Off-Slip	A	2.1
PM Peak (16:00 – 17:00)		
A1173 NB Approach	A	1.4
A180 EB Off-Slip	A	0.6
A1173 SB Approach	A	2.6
A180 WB Off-Slip	A	0.6

A180/ Moody Lane/ Pyewipe Road (Westgate Roundabout)

11.7.49 Analysis shown in Table 3.8 of this report shows that the junction currently operates above its theoretical capacity on the A180 Eastern arm during the AM Peak and the A180 Western arm and Moody Lane arm during the PM peak. By 2021, 2022 and 2027, the junction would continue to operate above theoretical capacity largely due to the increase in background traffic flows.

11.7.50 To understand the impact development traffic has on this junction, Tables 11.48 to 11.53 summarise the AM and PM forecast development flows as a proportion of the modelled flows at Westgate Roundabout for the peak of construction years 2021, 2022 or 2027. Figures 11.1 to 11.6 illustrate the information graphically.

Table 11.48: 2021 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,206	280	1,900	719	153	4,258
Committed	68	3	118	30	4	223
Development	4	0	15	14	0	33
Total Flows	1,278	283	2,033	763	157	4,514
Development Flow as % of Total	*0.31%*	*0.0%*	*0.73%*	*1.83%*	*0.0%*	*0.73%*

Figure 11.1: 2021 AM Assessed Traffic Flows at Westgate Roundabout

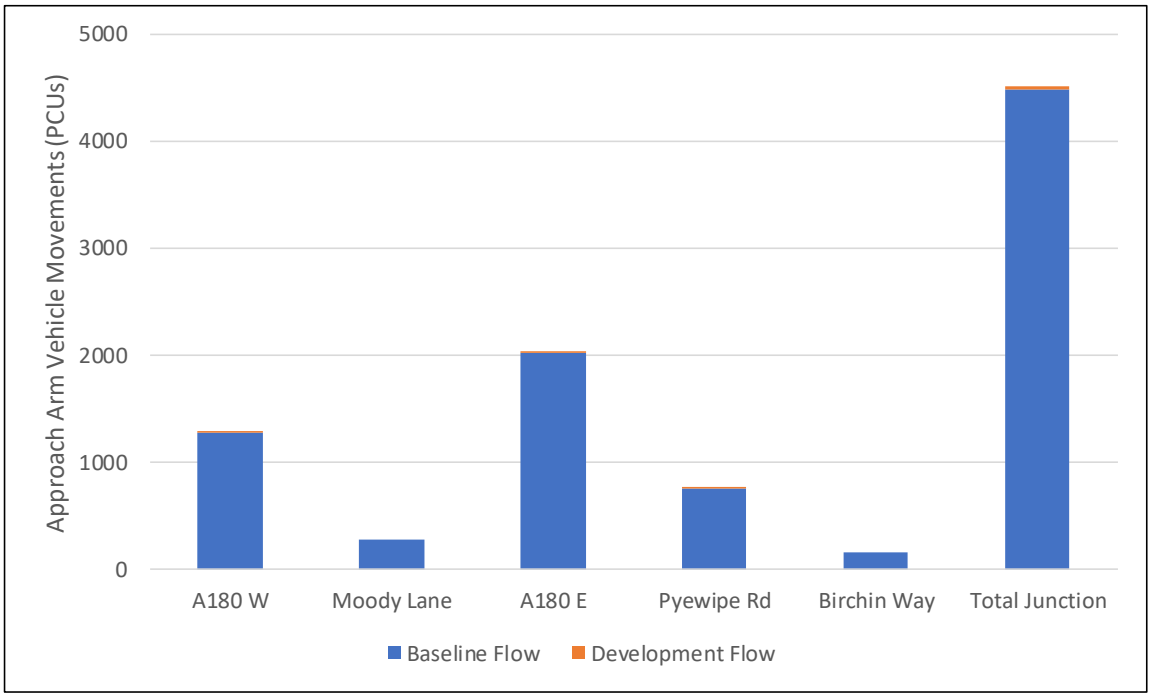


Table 11.49: 2021 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,134	420	1,326	703	313	4,896
Committed	82	0	60	5	0	147
Development	19	0	2	2	0	23
Total Flows	2,235	420	1,388	710	313	5,066
Development Flow as % of Total	*0.85%*	*0.0%*	*0.14%*	*0.28%*	*0.0%*	*0.45%*

Figure 11.2: 2021 PM Assessed Traffic Flows at Westgate Roundabout

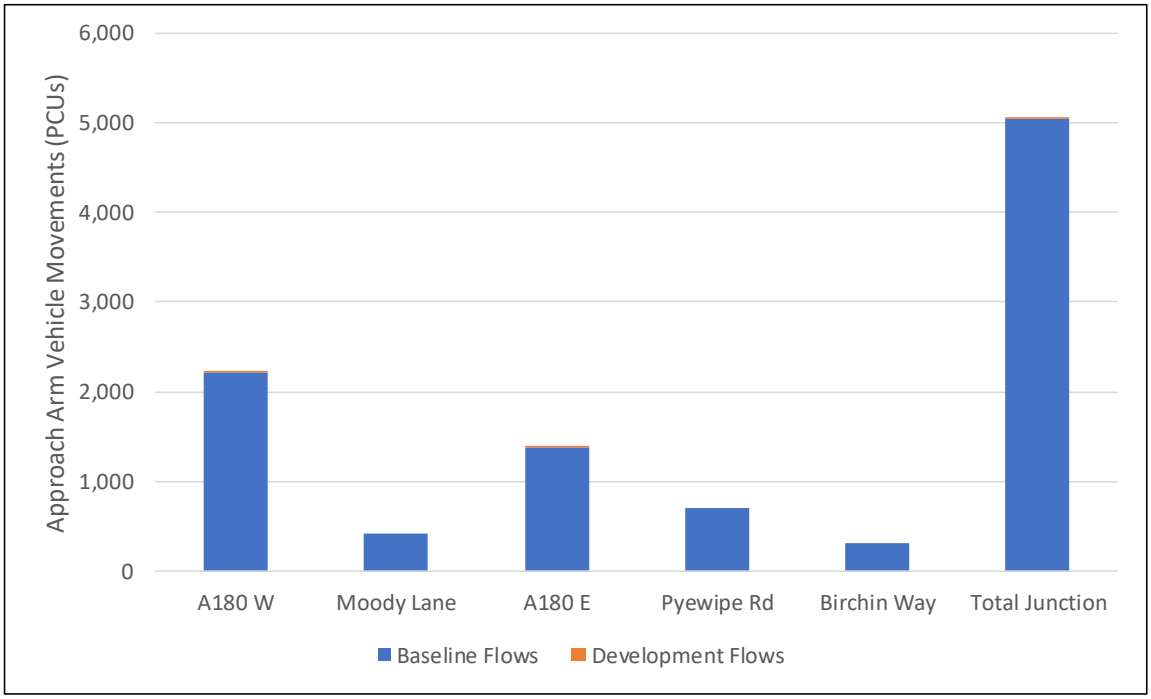


Table 11.50: 2022 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,223	283	1,925	727	156	4,314
Committed	79	2	80	20	2	183
Development	4	0	15	14	0	33
Total Flows	1,306	285	2,020	761	158	4,530
Development Flow as % of Total	*0.31%*	*0.0%*	*0.74%*	*1.84%*	*0.0%*	*0.73%*

Figure 11.3: 2022 AM Assessed Traffic Flows at Westgate Roundabout

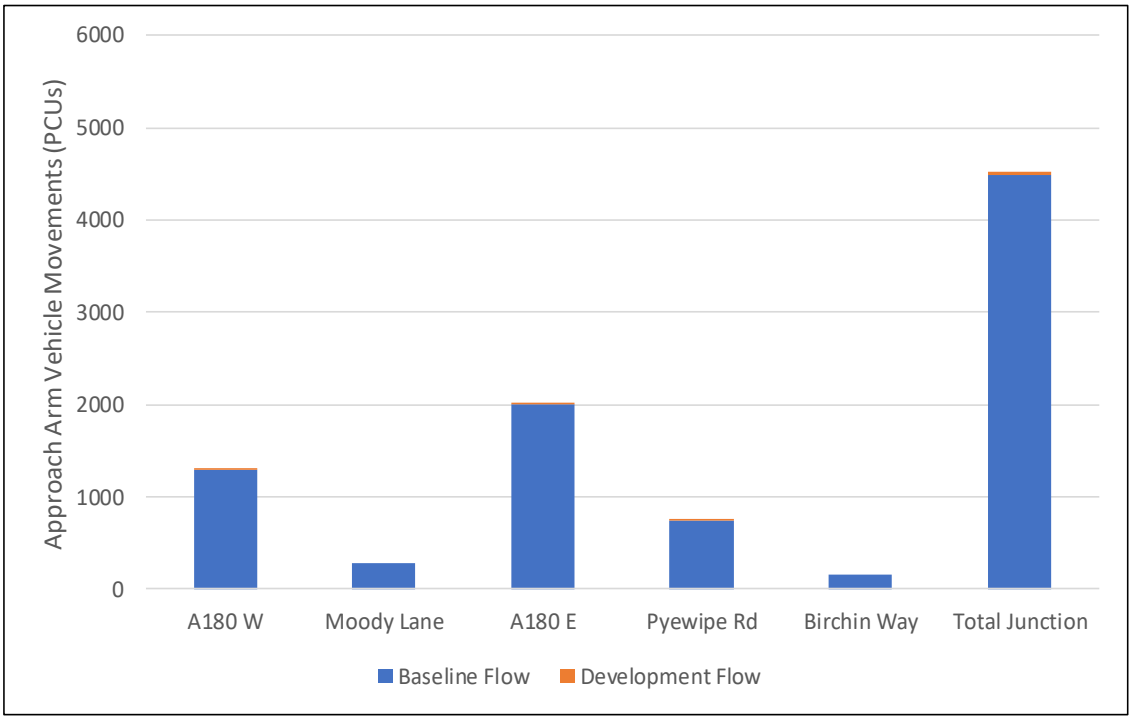


Table 11.51: 2022 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,161	424	1,344	712	317	4,958
Committed	105	0	69	7	2	183
Development	19	0	2	2	0	23
Total Flows	2,285	424	1,415	721	319	5,164
Development Flow as % of Total	*0.83%*	*0.0%*	*0.14%*	*0.28%*	*0.0%*	*0.45%*

Figure 11.4: 2022 PM Assessed Traffic Flows at Westgate Roundabout

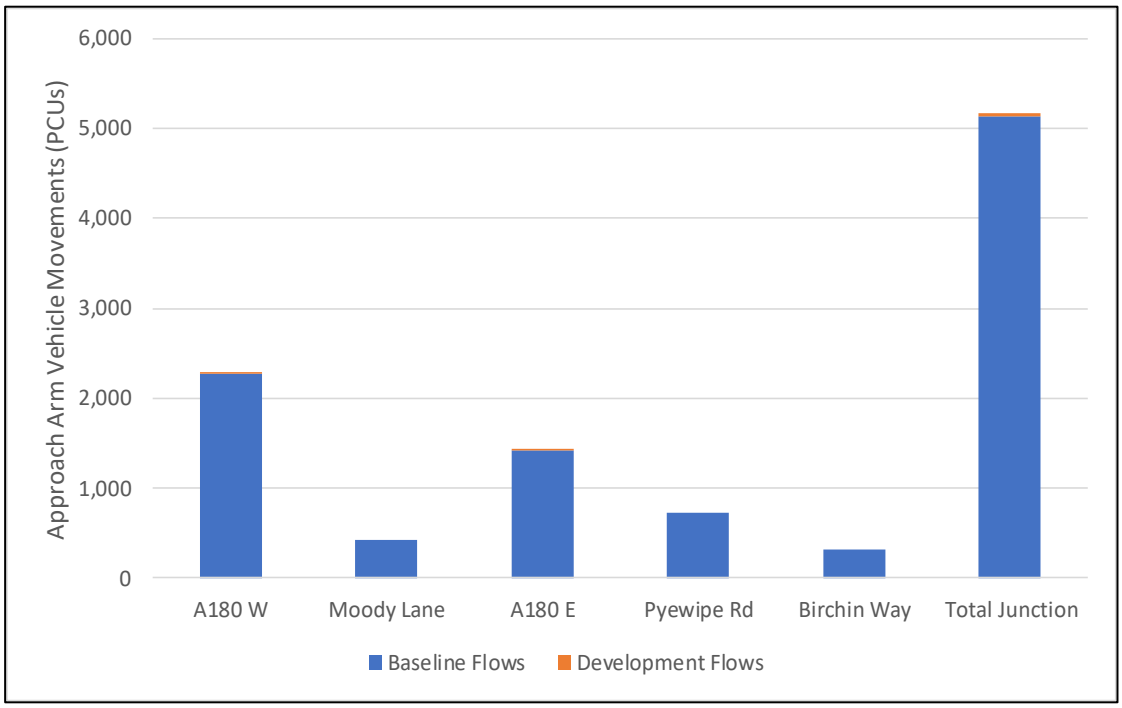


Table 11.52: 2027 AM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCHIN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	1,291	294	2,029	763	165	4,542
Committed	92	2	101	26	3	224
Development	4	0	15	14	0	33
Total Flows	1,387	296	2,145	803	168	4,799
Development Flow as % of Total	*0.29%*	*0.0%*	*0.70%*	*1.74%*	*0.0%*	*0.69%*

Figure 11.5: 2027 AM Assessed Traffic Flows at Westgate Roundabout

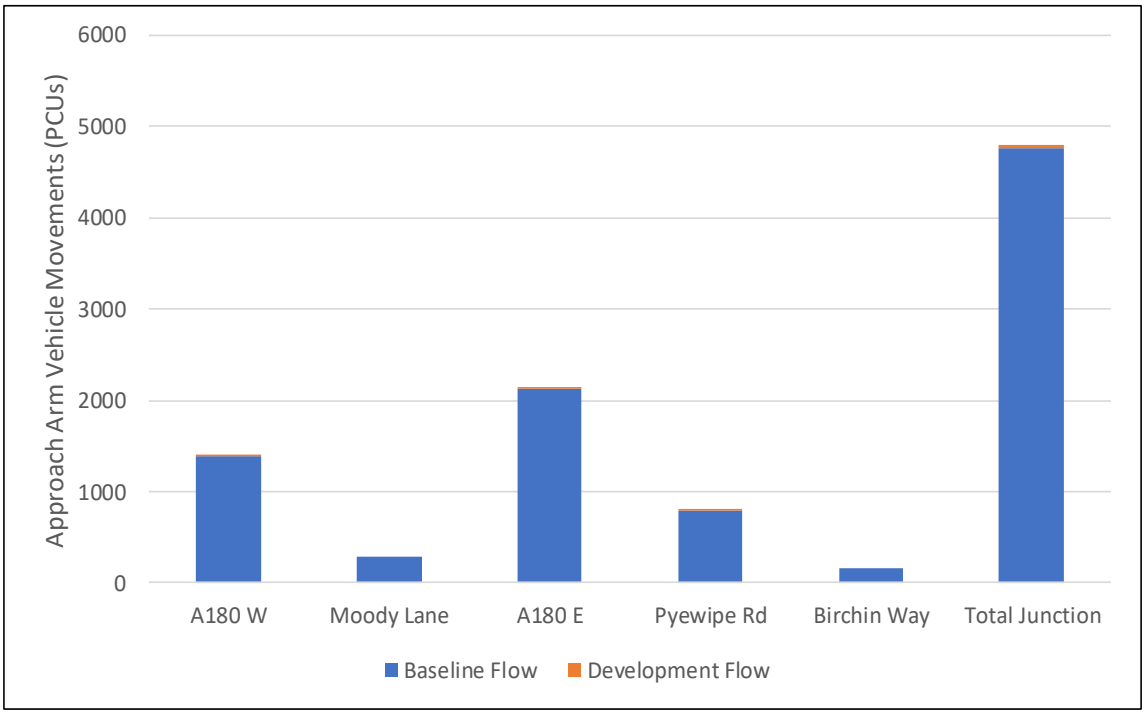
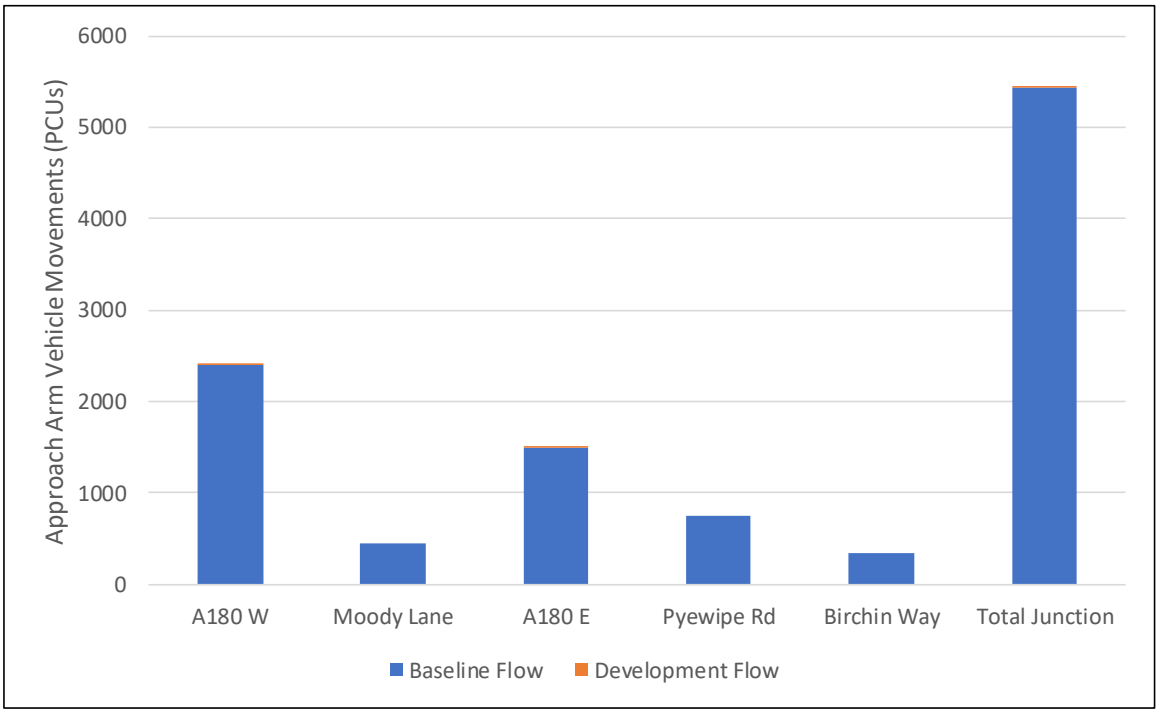


Table 11.53: 2027 PM Assessed Traffic Flows at Westgate Roundabout

APPROACH FLOWS (PCUS)	A180 WEST	MOODY LANE	A180 EAST	PYE-WIPE ROAD	BIRCH-IN WAY	TOTAL JUNC-TION
Background (Adjusted to account for Link Road Opening)	2,258	440	1,415	744	334	5,191
Committed	139	1	80	12	3	235
Development	19	0	2	2	0	23
Total Flows	2,416	441	1,497	758	337	5,449
Development Flow as % of Total	*0.79%*	*0.0%*	*0.13%*	*0.26%*	*0.0%*	*0.42%*

Figure 11.6: 2027 PM Assessed Traffic Flows at Westgate Roundabout



11.7.51 The analysis above shows the construction traffic as a percentage of total traffic at this location is likely to be in the order of 0.7% in the AM Peak hour and 0.4% during the PM Peak hour at the peak of construction.

11.7.52 Considering the small percentage that construction flows are adding to the junction and the temporary nature of construction, it is reasonable to consider that mitigation at this junction would be disproportionate to the marginal impact

on the junction's performance. Therefore, no mitigation is proposed at this junction.

12.0 SUMMARY AND CONCLUSION

12.1.1 This TA has been prepared by AECOM on behalf of EP Waste Management Limited to accompany a DCO application for the construction and operation (including maintenance) of the Proposed Development, an up to 95 MW energy from waste power station adjacent to South Humber Bank Power Station.

12.1.2 Baseline traffic flows for the immediate local highway network have been established through the collection of link and junction count data. Review of this data identified the network peak hours to be 07:00 to 08:00 and 16:00 to 17:00.

12.1.3 Review of personal injury accident data for the Study Area which includes South Marsh Road, Hobson Way, Kiln Lane and the A1173 shows a limited number of accidents over the five year study period. As such it is considered that there are no demonstrable highway safety concerns on the local road network.

12.1.4 Operational access to the Proposed Development will be taken via a new access at the eastern end of the adopted section of South Marsh Road. This access will cater for all vehicle movements to and from the Proposed Development.

12.1.5 It is proposed that 57 parking spaces will be provided on Site. This level of parking has been identified as being suitable to accommodate the proposed staffing levels at the Site and a level of visitor provision.

12.1.6 Once operational, the Proposed Development is estimated to generate a maximum of 368 one-way vehicle trips per day. This equates to a total two-way traffic flow of 736 vehicles. Of the total two-way flow, 624 would be HGV (312 inbound and 312 outbound) and 112 would be staff movements (56 inbound and 56 outbound).

12.1.7 It is proposed that operational HGV traffic to/ from the Proposed Development will be required to use a designated HGV route to the Site with all HGVs routing to/ from the A180 via the A1173, Kiln Lane, Hobson Way and South Marsh Road.

12.1.8 To assess the impact of the Proposed Development in a future year, growth rates for the North East Lincolnshire district have been obtained from TEMPRO software. The use of TEMPRO software is generally recognised as the industry standard tool for determining traffic growth factors to apply to base flows in order to estimate future year traffic flows.

12.1.9 Committed developments have been identified in the North East Lincolnshire area and incorporated into future year analysis.

12.1.10 Junction Capacity Assessments have been undertaken at nine key junctions within the study area. The modelling results show that seven junctions would operate within capacity without the need to undertake any off Site highway improvement works. The assessment results for the A180 Westgate Roundabout and A180 Pyewipe Roundabout show the junctions to be already operating above their theoretical capacity in 2018. However, considering the small percentage that development flows will add to Westgate Roundabout (1.6% in the AM Peak; 0.5% in the PM Peak) and Pyewipe Roundabout (1.5% in the AM Peak; 0.5% in the PM Peak), it is reasonable to consider that mitigation at this junction would be disproportionate to the marginal impact on the junction's performance. Therefore, no mitigation is proposed at this junction.

12.1.11 To mitigate the impact of operational traffic, an Operational Travel Plan and Delivery Servicing Plan will be implemented.

12.1.12 Construction of the Proposed Development will represent a temporary increase in traffic over the 36 month construction programme. Peak HGV movements are expected to occur at the start of construction when around 412 daily two-way movements are anticipated. This is associated with the potential cut and fill of the top layer of ground within the Main Development Area for geotechnical purposes. However, the overall peak of construction which has been used as the basis for assessment is due to occur in Q2 2021 (in the earliest construction scenario), Q3 2022 (middle construction scenario) or Q3 2027 (in the latest construction scenario) and could result in the requirement for up to 750 staff to be based at the Site and 116 two-way HGV movements. Capacity testing of eight key junctions within the Study Area identifies that seven of the junctions would operate within capacity without the need to undertake any off Site highway improvement works. As described above in relation to the operational assessment, the A180 Westgate Roundabout junction is already operating above its theoretical capacity, but given the small percentage that construction traffic flows will add to the junction (0.7% in the AM Peak; 0.4% in the PM Peak), it is reasonable to consider that mitigation at this junction would be disproportionate to the marginal impact on the junction's performance. Therefore, no mitigation is proposed at this junction.

12.1.13 To minimise the impact of construction traffic, a Construction Worker Travel Plan and Construction Traffic Management Plan will be implemented.

12.1.14 On this basis, it is not considered that the Proposed Development will have a material impact in terms of highway capacity or safety and that the Proposed Development represents acceptable development in highways and transport terms.

12.1.15 It is noted that the construction and operational traffic flows associated with the Proposed Development are the same as the construction and operational traffic flows associated with the Consented Development.

13.0 REFERENCES

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