AA.23.33.27 Immingham Green Energy Terminal

Prepared for:	Becky Garrett
Prepared by:	Harry Robinson (SYSTRA)
Date:	12th March 2024
Case Reference:	DevHU0144
Document Reference:	DevHU0144 003 TM Final
Reviewed/approved by:	Terry Dale (SYSTRA)

Introduction and background

In September 2023, Associated British Ports [ABP] (the Applicant) submitted an application for a Development Consent Order [DCO] to authorise the construction and operation of a new multi-user green energy terminal [the project] to be located on the eastern side of the Port of Immingham. The project is referred to as the Immingham Green Energy Terminal [IGET].

National Highways has been identified as a statutory consultee pursuant to Section 42 of the Planning Act 2008, and as a relevant consultation body for the purposes of Regulations 11 and 13 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. The Local Planning Authority [LPA] is North East Lincolnshire Council [NELC].

Previously, Jacobs SYSTRA Joint Venture [JSJV], on behalf of National Highways, reviewed the following documents:

- Immingham Green Energy Terminal 6.2 Environmental Statement Chapter 11: Traffic & Transport (TR030008 Volume 6);
- 6.4 Environmental Statement Appendices Appendix 11.B: Traffic and Transport Cumulative Effects Assessment,
- Immingham Green Energy Terminal 6.7 Outline Construction Traffic Management Plan (TR030008 Volume 6); and
- Volume 6 Appendix A: Outline Construction Worker Travel Plan.

DTA, the Applicant's transport consultant, has since responded to National Highways' comments, providing a technical memorandum entitled "03 National Highways Relevant Representations IGET DCO Examination Response", referred to as "IGET Response".

JSJV has reviewed "IGET Response" on behalf of National Highways and would offer the following comments.

Background

Previous response

In November 2023, JSJV reviewed the supporting documentation, as listed within the introduction to this Technical Memorandum, and concluded that consideration should be given to the following:

- After a review of WebTRIS data for the A180, JSJV would consider 07:00-08:00 and 16:00-17:00 as more appropriate weekday peak hour periods than 08:00-09:00 and 17:00-18:00 for the SRN.
- The volume of construction worker vehicle trips has the potential to result in a material impact on the operation of the SRN.
- JSJV would note that ABP has incorrectly presented the number of workers per vehicle. JSJV would recommend that ABP reviews its construction worker vehicle distribution and presents the results on flow diagrams.
- The volume of construction vehicle trips distributed has the potential to result in a material impact on the operation of the SRN. Consequently, JSJV would recommend that ABP provides a junction capacity assessment for the A180 / A1173.
- Section D.2.7 of TAG Unit M3.1 gives the PCU for HGVs on motorways and all-purpose dual carriageways as 2.5. Given the nature of the highway network around the proposed development site, the PCU equivalent value of 2.5 should be used in order to ensure an appropriate assessment of anticipated vehicular traffic associated with the development.
- Subject to the impact at the SRN, there may be a requirement for National Highways to request mitigation measures, e.g., that the arrivals and departures of construction staff occur outside of the SRN peak periods.
- The inclusion of construction traffic associated with the enabling works on land east of Rosper Road, Killingholme (PA/2023/502).
- A Travel Plan should be prepared for the operational stage of the project in order to manage down the traffic impact of development and maximise the accessibility of and within sites by walking, wheeling, cycling, public transport, and shared travel.
- JSJV would note the OCTMP should also include the following:
  - A dust management plan;
  - noise management plan;
  - Pollution prevention measures;
  - Contractor parking.

Immingham Eastern Ro-Ro Terminal

JSJV note that DTA has utilised the junction modelling for the A180/A1173 junction, which was carried out by themselves within the “Update to Technical Note 2 – Junction Modelling Assessments” [TN2], prepared in support of the separate Immingham Easter Ro-Ro Terminal [IERT] DCO application (DevHU0075).

We note that the junction modelling presented within DTA's TN2 has previously been accepted by National Highways and was considered to be appropriate for this assessment.

Existing situation

The location of the application site, relative to the Strategic Road Network [SRN], is presented in **Figure 1**.

The site is located approximately:

- 1.6km to the north of the A180 / A1173 junction [Stallingborough Interchange].
- 3.2km to the southeast of the A160 / Manby Road junction;
- 5.3km to the east of the A160 / A1077 junction; and
- 6km to the east of the A180 / A160 junction [Brocklesby Interchange].

Figure 1. Site location in relation to the Strategic Road Network

IGET Response: 03 National Highways Relevant Representations IGET DCO Examination Response

DTA mention the previous points raised by National Highways and set out their response within the IGET Response technical memorandum.

Construction vehicle trip generation

DTA has presented the construction vehicle trip generation for both workers and HGV's within the AM and PM peak hours. As noted by DTA, National Highways previously stated that local peak hour traffic in the AM is closer to 07:00-08:00 and for the PM, 16:00-17:00. As a result, DTA has provided the AM and PM peak hour total construction traffic for both 07:00-08:00 and 08:00-09:00, and 16:00-17:00 and 17:00-18:00; JSJV would consider this appropriate.

Construction worker vehicle trip generation and distribution

DTA has presented the total worker construction traffic for each peak hour, as shown in **Table 1**.

Table 1. Construction worker vehicle trip generation

Hour	Vehicle trips		
	Arrival	Departure	Total
07:00-08:00	190	15	205
08:00-09:00	38	15	53
16:00-17:00	15	38	53
17:00-18:00	23	114	137

National Highways previously considered the methodology used to derive the construction worker vehicle trip generation, within the Traffic and transport chapter of the Environmental Statement [ES], as appropriate. JSJV can confirm the construction worker vehicle trip generation shown in **Table 1** is consistent with the volume presented in the ES.

DTA has distributed the proposed construction worker trips onto the network based on 2011 census data 'Location of usual residence and place of work by method of travel to work' for North East Lincolnshire 001 MSOA. JSJV previously consider this an appropriate choice and would note the methodology is consistent with the methodology within the ES.

JSJV would note that 51% of construction worker vehicle trips are assigned to the A180/A1173 junction, 9% to/from the west, 26% to/from the east and 16% to/from the south.

JSJV has presented the distribution on the local network shown in **Figure 2**.

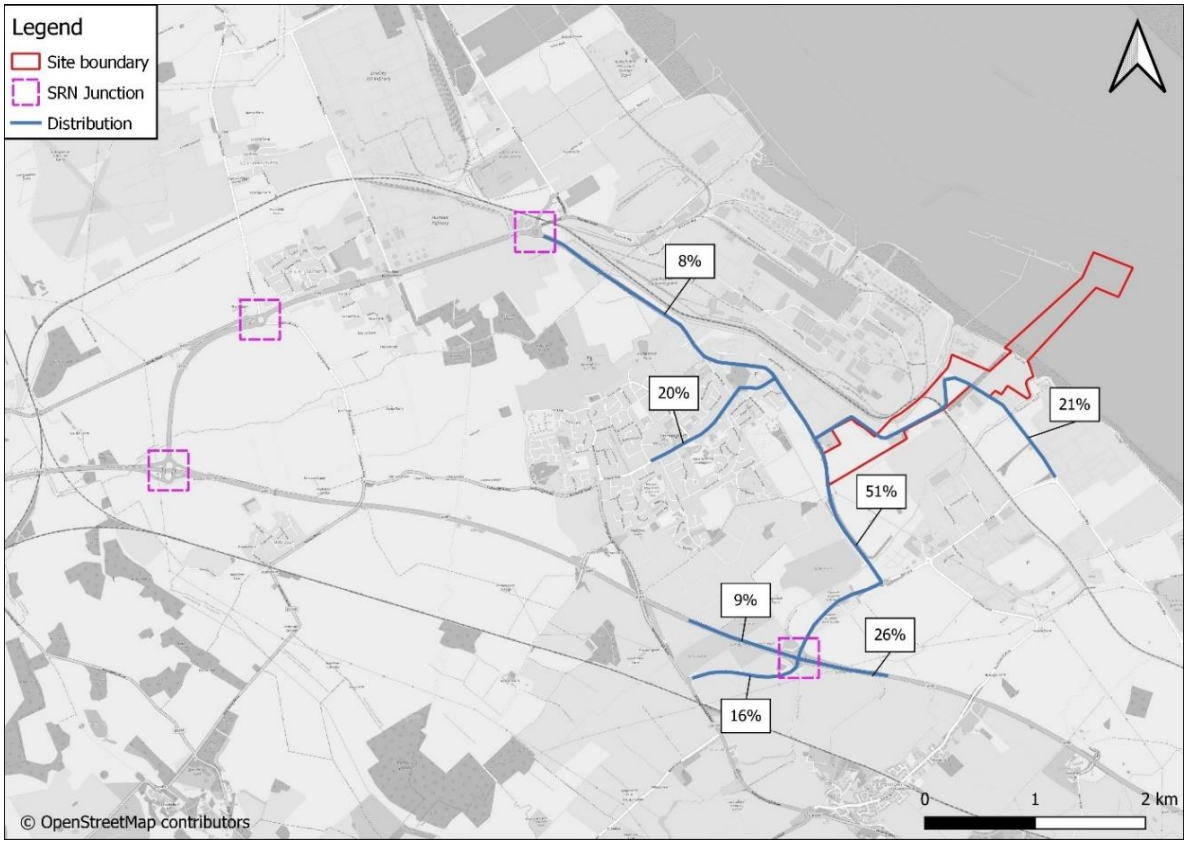

Figure 2. ABP construction worker trip distribution

As shown in **Table 2**, DTA has assigned the construction worker vehicle trips across the A180/A1173 based on the vehicle trip distribution presented in Figure 2.

Table 2.DTA proposed construction worker vehicle trip distribution

Hour	Movement	Vehicle trips		
		Arrival	Departure	Total
07:00-08:00	A180 W	17	1	18
	A180 E	49	4	53
	A1173	30	2	33
	Total	**97**	**8**	**105**
08:00-09:00	A180 W	3	1	5
	A180 E	10	4	14
	A1173	6	2	8
	Total	**19**	**8**	**27**
16:00-17:00	A180 W	1	3	5
	A180 E	4	10	14
	A1173	2	6	8
	Total	**8**	**19**	**27**
17:00-18:00	A180 W	2	10	12
	A180 E	6	30	36
	A1173	4	18	22
	Total	**12**	**58**	**70**

HGV trip generation and distribution

DTA has presented the total HGV construction traffic for each peak hour, as shown in **Table 3**.

Table 3. DTA proposed HGV trip generation

Hour	Movement	Vehicle trips		
		Arrival	Departure	Total
07:00-08:00	A180 W	6	4	10
	A180 E	5	4	8
	Total	**11**	**8**	**19**
08:00-09:00	A180 W	5	4	9
	A180 E	4	4	8
	Total	**9**	**8**	**17**
16:00-17:00	A180 W	5	5	10
	A180 E	4	4	8
	Total	**9**	**9**	**18**
17:00-18:00	A180 W	5	5	10
	A180 E	4	4	8
	Total	**9**	**9**	**18**

As can be seen in **Table 3**, when applying DTA's HGV distribution to the HGV trip generation, the development is forecast to generate at the A180 / A1173 junction:

- 17 two-way HGV trips between 08:00-09:00;
- 18 two-way HGV trips between 17:00-18:00;
- 19 two-way HGV trips between 07:00-08:00; and
- 18 two-way HGV trips between 16:00-17:00

JSJV would note that this is consistent with the HGV trip generation shown within the ES, as a result, we would again consider it to be appropriate.

Total construction vehicle trip generation

JSJV has presented the total construction vehicle trip generation distributed across the A180/A1173 junction in **Table 4** by combining the construction workers and HGV trips from **Table 2** and **3**.

JSJV would note the total construction vehicle trip generation shown in **Table 4** has been appropriately derived from the ES. The volume of vehicle trips shown in **Table 4** has the potential to cause a material impact at the A180/A1173 junction, as a result, National Highways previously requested junction capacity assessments be undertaken. DTA has since provided an assessment of the A180/A1173 junction.

Table 4. Total construction traffic at the A180/A1173 junction

Hour	Movement	Vehicle trips		
		Arrival	Departure	Total
07:00-08:00	A180 W	23	5	28
	A180 E	54	8	61
	A1173	30	2	33
	Total	**108**	**16**	**124**
08:00-09:00	A180 W	8	5	14
	A180 E	14	8	22
	A1173	6	2	8
	Total	**28**	**16**	**44**
16:00-17:00	A180 W	6	8	15
	A180 E	8	14	22
	A1173	2	6	8
	Total	**17**	**28**	**45**
17:00-18:00	A180 W	7	15	22
	A180 E	10	34	44
	A1173	4	18	22
	Total	**21**	**67**	**88**

Junction assessments

The assessment years and scenarios proposed by DTA are as follows:

- Base 2026
- Base 2026 + Committed Development
- Base 2026 + Committed Development + IERRT
- Base 2026 + Committed Development + IERRT + the Project (07:00–0800 and 16:00–17:00)

JSJV would note that the largest number of HGV and daily workforce trips is predicted to occur during the first phase of construction works (2025-2027) with the peak month having been identified as month 23 in late 2026; JSJV would therefore consider 2026 as an appropriate assessment year.

Furthermore:

A Sensitivity Test has also been undertaken using construction traffic generation between 06:00–07:00 and 18:00–19:00, which with reference to Table 11-13 Construction Worker Traffic Daily Profile in ES Chapter 11: Traffic and Transport [APP-053] results in a total of 273 and 288 construction worker trips at these peak hours respectively.

The Sensitivity Test then utilises the IERRT traffic data, from the IERRT TA Addendum Report, for the peak hours between 07:00–08:00 and 16:00–17:00 and adds the highest Project construction traffic generation in the AM and PM periods to reflect a robust level of assessment. This comprises the following scenario:

- Base 2026 + Committed Development + IERRT + the Project (Sensitivity Test, Project construction traffic between 06:00–07:00 and 18:00–19:00)

JSJV welcomes the inclusion of the sensitivity test.

Traffic flows

The modelling provided within the IGET Response is based on the traffic flow information presented in the IERRT TA Addendum Report. DTA notes that the base traffic flows as well as the committed traffic flows have previously been agreed with National Highways and include the relevant passenger car unit [PCU] factors.

Although JSJV would consider this approach to be appropriate, traffic flow diagrams have not been provided; consequently, we cannot confirm whether or not the flows have been extracted from the IEERT TA correctly, or if they align with the modelling. As a result, JSJV would recommend the base and committed traffic flow diagrams are provided for review.

TEMPro

DTA has used TEMPro growth factors to account for strategic traffic growth. As shown in **Table 5**. JSJV has reviewed DTA's growth factors using TEMPro and would consider DTA's factors as appropriate.

Table 5. TEMPro growth factor comparison

	DTA		JSJV	
	AM Peak	PM Peak	AM Peak	PM Peak
2021-2026	1.0367	1.0359	1.0373	1.0379

Junctions 10 Model

The submitted Junctions 10 PDF modelling outputs for the A180 / A1173 junction (Stallingborough Interchange) has been reviewed. The key parameters within the model have been compared against Junction 10 modelling which was previously undertaken in association with Immingham Eastern Ro-Ro Terminal (IERT) and which National Highways approved.

The key inputs within the submitted Junctions 10 assessment have been reviewed and we note the following:

- Vehicle length is 5.75m and this is consistent with the IERT assessment;
- RFC threshold is 0.85 and this is consistent with the IERT assessment;
- Average delay threshold is 36 seconds and this is consistent with the IERT assessment; and
- Q threshold is 20 PCU and this is consistent with the IERT assessment.

The geometry input within the submitted Junctions 10 has been reviewed and we note the following:

- A1173 (north) – the geometry on this arm is consistent with the IERT assessment;
- A180 (east) – the geometry on this arm is consistent with the IERT assessment;
- A1173 (south) – the geometry on this arm is consistent with the IERT assessment;

- A180 (west) – the geometry on this arm is consistent with the IERT assessment;
- Large roundabout data for each arm has been reviewed and this is consistent with the IERT assessment; and
- The submitted Junction Modelling Geometry Measurements plan has been reviewed, this is noted to differ in place from the input geometry (which follows exactly the IERT assessment), the differences have been reviewed and it is concluded the Junctions 10 input geometry is acceptable.

The traffic demand input within the submitted Junctions 10 has been reviewed and we note the following:

- The 'one hour' traffic demand profile has been adopted and this is consistent with the IERT assessment;
- The AM assessment time period is 07:30-08:30 compared with 06:45-08:15 with the IERT assessment, this is understood to be a result of different data sources;
- The PM assessment time period is 17:00-18:30 compared with 15:45-17:15 with the IERT assessment, this is understood to be a result of different data sources;
- Traffic flows are input in origin-destination format consistent with the IERT assessment;
- The input traffic flows are not contained with the Response to National Highways, that document contains trip generation but not the traffic modelling flows;
- The HV Percentages PCU factor is 2.00 and is consistent with the IERT assessment;
- The 2026 Baseline AM 'vehicle mix' is consistent with the IERT assessment 2021 Base; and
- The 2026 Baseline PM 'vehicle mix' is consistent with the IERT assessment 2021 Base.

With regard to calibration and validation of the Junctions 10 model, we note the following:

- There has been no calibration and validation undertaken in association with the submitted Junctions 10 outputs;
- There has been no queue data presented; and
- There was no calibration and validation undertaken for the previous IERT assessment which was accepted by National Highways.

We have reviewed the performance of the junction based on typical traffic data obtained from Google Maps. It is seen that the AM peak experiences a short period of slow moving traffic on the A180 eastbound off-slip as shown in **Figure 3**.

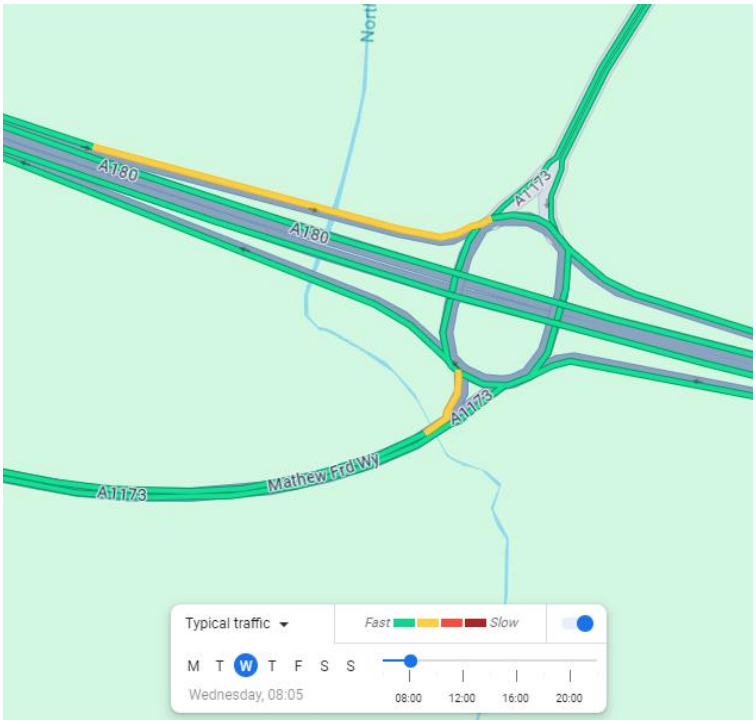

Figure 3. Google Maps typical traffic AM peak

There is negligible delay experienced during the PM peak as shown in **Figure 4**.

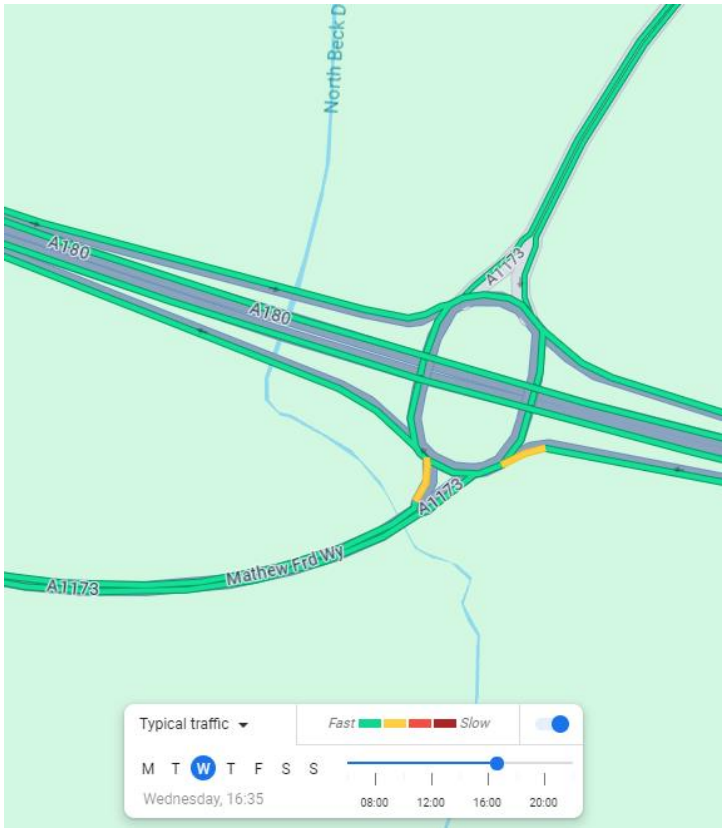

Figure 4. Google Maps typical traffic PM peak

Junction capacity results

JSJV has presented the results of DTA's assessment of A180/A1173 in **Figure 5** for the year 2026.

Table 2: A180/A1173 junction modelling results – 2026 Base

ARM	Base 2026					
	AM			PM		
	Q	Delay	RFC	Q	Delay	RFC
A – A1173 N	0.2	2.01	0.12	0.8	2.42	0.44
B – A180 E	0.5	2.02	0.31	0.3	2.16	0.20
C – A1173 S	0.3	2.82	0.25	0.1	2.12	0.10
D – A180 W	0.4	3.26	0.24	0.2	2.37	0.11

Table 3: A180/A1173 junction modelling results – 2026 Base + Committed Development/2026 Base + Committed Development + IERRT Development

ARM	Base 2026 + Committed Development						Base 2026 + Committed Development + IERRT Development					
	AM			PM			AM			PM		
	Q	Delay	RFC	Q	Delay	RFC	Q	Delay	RFC	Q	Delay	RFC
A – A1173 N	0.3	1.98	0.22	1.4	3.26	0.58	0.4	2.02	0.25	1.8	3.76	0.63
B – A180 E	0.8	2.61	0.43	0.4	2.68	0.30	0.9	2.83	0.45	0.5	3.02	0.32
C – A1173 S	0.7	4.43	0.41	0.2	2.46	0.16	0.8	5.03	0.44	0.2	2.72	0.18
D – A180 W	0.9	5.23	0.44	0.3	2.33	0.20	1.4	6.57	0.56	0.6	2.94	0.30

Table 4: A180/A1173 junction modelling results – 2026 Base + Committed Development + IERRT Development + IGET (Actual/Sensitivity)

ARM	Base 2026 + Committed Development + IERRT Development + IGET (*Actual*: 07:00–08:00, 16:00–17:00)						Base 2026 + Committed Development + IERRT Development + IGET (*Sensitivity:* 06:00–07:00, 18:00–19:00)					
	AM			PM			AM			PM		
	Q	Delay	RFC	Q	Delay	RFC	Q	Delay	RFC	Q	Delay	RFC
A – A1173 N	0.4	2.07	0.26	1.9	3.95	0.64	0.4	2.03	0.26	2.4	4.54	0.69
B – A180 E	1.0	3.04	0.48	0.5	3.14	0.34	1.0	3.00	0.48	0.6	3.28	0.35
C – A1173 S	1.0	5.84	0.49	0.2	2.78	0.18	1.0	5.93	0.50	0.2	2.82	0.18
D – A180 W	2.0	8.70	0.64	0.6	3.01	0.31	2.0	8.88	0.65	0.6	2.96	0.30

Figure 5. DTA junction capacity assessment results (all scenarios)

DTA notes the results indicate that in all scenarios, the junction operates within capacity at all of the arms, with negligible increases in the total queue and delay as a result of the development construction traffic.

Although JSJV would agree with DTA that the modelling results show no significant impact forecast in association with the proposed development, we would note, as shown in **Figure 6**, the results presented within the Response to National Highways are different from those contained within the Junctions 10 output, the reason for this is unknown and should be clarified.

Summary of junction performance

	AM					PM				
	Set ID	Queue (PCU)	Delay (s)	RFC	LOS	Set ID	Queue (PCU)	Delay (s)	RFC	LOS
	2026 Baseline									
1 - A1173 N	D11	0.2	2.01	0.12	A	D12	0.8	2.42	0.44	A
2 - A180 E		0.4	1.92	0.30	A		0.3	2.10	0.19	A
3 - A1173 S		0.3	2.85	0.25	A		0.1	2.14	0.10	A
4 - A180 W		0.4	3.26	0.24	A		0.2	2.46	0.12	A
	2026 Baseline + Committed Development									
1 - A1173 N	D13	0.4	2.41	0.22	A	D14	1.5	3.38	0.57	A
2 - A180 E		0.8	2.54	0.42	A		0.4	2.69	0.29	A
3 - A1173 S		0.7	4.45	0.41	A		0.2	2.53	0.16	A
4 - A180 W		1.0	5.51	0.43	A		0.4	2.93	0.21	A
	2026 Baseline + Committed + IERRT Development									
1 - A1173 N	D15	0.5	2.60	0.25	A	D16	1.9	3.98	0.63	A
2 - A180 E		0.8	2.77	0.44	A		0.5	3.06	0.32	A
3 - A1173 S		0.8	5.05	0.44	A		0.2	2.80	0.18	A
4 - A180 W		1.6	7.52	0.55	A		0.7	3.59	0.31	A
	2026 Baseline + Committed + IERRT Development + IGET (Actual 7-8 AM, 4-5PM)									
1 - A1173 N	D17	0.5	2.64	0.26	A	D18	2.1	4.18	0.64	A
2 - A180 E		0.9	2.96	0.47	A		0.5	3.19	0.34	A
3 - A1173 S		1.0	5.84	0.49	A		0.2	2.86	0.18	A
4 - A180 W		2.1	9.43	0.61	A		0.7	3.68	0.32	A
	2026 Baseline + Committed + IGET (Sensitivity)									
1 - A1173 N	D19	0.5	2.59	0.26	A	D20	2.5	4.78	0.69	A
2 - A180 E		0.9	2.92	0.47	A		0.6	3.35	0.35	A
3 - A1173 S		1.0	5.92	0.50	A		0.2	2.89	0.19	A
4 - A180 W		2.1	9.53	0.61	A		0.7	3.62	0.31	A

Figure 6. Summary of Junctions 10 modelling results

Operational assessment

Vehicle trip generation

DTA notes that National Highways previously agreed that the operational phase of the development will not result in a material impact on the SRN, however, DTA has stated within the IGET Response that the proportion of daytime and shift working has been amended from that given previously. The newly proposed vehicle trip generation for the operational phase of the development is as follows:

> *"From the total of 120 staff, 87 will work a normal daytime 'nine to five' and 33 will work over two separate 12-hour shifts starting at 07:00 and 19:00 respectively."*

As a result, the peak two way vehicle trip generation is estimated to be 87 two-way trips between 08:00-09:00 and 17:00-18:00. DTA notes that these trips will fall outside of the agreed network peak hours of 07:00-08:00 and 16:00-17:00. Although JSJV would agree the trips fall outside the peak hours, 87 two-way vehicle trips has the potential to result in a material impact to the operation of the SRN.

As a result, JSJV would recommend that DTA presents the distribution of the 87 two-way vehicle trips on to the network, in order to show the anticipated impact of vehicle trips on the SRN.

Travel Plan

DTA has confirmed that a Travel Plan [TP] is being developed and will be submitted into the Examination in due course. JSJV welcomes this and would note the TP should aim to manage down the traffic impact of development and maximise the accessibility of and within sites by walking, wheeling, cycling, public transport, and shared travel, in line with Circular 01/2022 and NPPF policy.

Construction Traffic Management Plan

Previously, National Highways suggested the following should be including within the Construction Traffic Management Plan:

- A dust management plan;
- Noise management plan;
- Pollution prevention measures; and
- Contractor parking.

DTA has confirmed that the above plans have been included within the DCO Application in the Outline Construction Environmental Management Plan [CEMP] as set out below:

- *"A dust management plan is included in Appendix C: Outline Dust Management Plan of the Outline CEMP [APP-221].*
- *Noise and vibration mitigation and enhancement measures are included within Table 4: Noise and Vibration of the Outline CEMP [APP-221].*
- *Pollution prevention measures are included in:*
  - *Table 5: Nature Conservation (Terrestrial Ecology) of the Outline CEMP [APP-221]*
  - *Table 9: Marine Transport and Navigation of the Outline CEMP [APP221]*
  - *Table 14: Marine Water and Sediment Quality of the Outline CEMP [APP-221]*
  - *Table 15: Water Quality, Coastal Protection, Flood Risk and Drainage of the Outline CEMP [APP-221]*
- *Contractor parking is addressed within Section 2.5: Parking Provision of the Outline CEMP [APP-221], with the Travel Plan Co-ordinator determining the number of spaces provided on site."*

JSJV would note the suggested plans previously suggested by National Highways have been included within the DCO Application.

Summary and Conclusions

On the basis of this review, the recommendation to National Highways in relation to this development proposals is:

Further information is required (as identified below).

The review has highlighted the need for further information as follows:

- Traffic flow diagrams have not been provided, therefore, we cannot confirm whether or not the flows have been extracted from the IEERT TA correctly, or if they align with the modelling. As a result, JSJV would recommend the base and committed traffic flow diagrams are provided for review.
- DTA notes the modelling results indicate that in all scenarios, the A180/A1173 operates within capacity at all of the arms, with negligible increases in the total queue and delay as a result of the development construction traffic. Although JSJV would agree with DTA that the modelling results show no significant impact forecast in association with the proposed development, we would note the results presented within the Response to National Highways (IGET Response) are different from those contained within the Junctions 10 output, the reason for this is not known and should be clarified.
- JSJV would recommend DTA presents the distribution of the 87 two-way vehicle trips on to the network, in order to show the anticipated impact of vehicle trips on the SRN.