Springwell Solar Farm

Environmental Statement

Volume 1
Chapter 14: Traffic and Transport
(Clean)

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009

EN010149/APP/6.1.2
Revision 2
January 2025
Springwell Energyfarm Ltd

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14. Traffic and Transport

14.1. Introduction

14.1.1. This chapter presents an assessment of likely significant effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon traffic and transport. The full description of the Proposed Development is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

14.1.2. This chapter is supported by the following figures presented in **ES Volume 2 [EN010149/APP/6.2]**:

- **Figure 14.1: Study Area**;
- **Figure 14.2: Link Sensitivity**;
- **Figure 14.3: Personal Injury Collision Study Area**; and
- **Figure 14.4: Transport Routing and Existing Highway Network**.

14.1.3. This chapter is supported by the following appendices presented in **ES Volume 3 [EN010149/APP/6.3]**:

- **Appendix 14.1: Transport Assessment**.

14.1.4. In addition, the following supporting documents are submitted in support of the DCO Application:

- **Outline Public Rights of Way and Permissive Path Management Plan (oPRoWPPMP) [EN010149/APP/7.12]**;
- **Outline Construction Environmental Management Plan (oCEMP) [EN010149/APP/7.7]**; and
- **Outline Construction Traffic Management Plan (oCTMP) [EN010149/APP/7.8]**.

14.1.5. The assessment of traffic and transport effects is based on construction and operational traffic data provided and developed by the Applicant. These data have also been used for the assessment of effects for air quality and noise and vibration.

14.1.6. The assessment should be read in conjunction with the following assessment chapters presented in **ES Volume 1 [EN010149/APP/6.1]**:

- **Chapter 6: Air Quality**;
- **Chapter 8: Climate**; and
- **Chapter 12: Noise and Vibration**.

14.2. Legislative framework, planning policy and guidance

14.2.1. This assessment has been undertaken with regard to the following legislation, planning policy and guidance. Further details of the legislation framework, planning policy and guidance relating to traffic and transport are presented in **ES Volume 3**, **Appendix 14.1: Transport Assessment [EN010149/APP/6.3] (Section 3)**.

14.2.2. It should be noted that this chapter does not assess the compliance of the Proposed Development against relevant planning policy. Such an assessment is presented in the **Planning Statement [EN010149/APP/7.2]**.

Legislation

- The Highways Act 1980 (GOV UK, 2024) **[Ref. 14-2]**.

National planning policy

- Overarching National Policy Statement for Energy (NPS EN-1) (2023) – Section 5.14 details the planning policy for traffic and transport, including guidance on undertaking the Environmental Impact Assessment (EIA) using the Department for Transport 'Transport Analysis Guidance'. NPS EN-1 also outlines the requirements for Nationally Significant Infrastructure Project (NSIP) applications where effects could result upon the strategic or local road network the development of a travel plan and mitigation measure will be required with a focus on demand management measures where appropriate **[Ref. 14-3]**;
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023) – Section 2.10 considers solar development including the assessment of traffic and transport impacts during construction, inclusive of traffic and transport noise and vibration and abnormal loads. Paragraphs 2.10.120 to 2.10.126 refer to routing to sites and cumulative impact assessment requirements. Paragraphs 2.10.139 to 2.10.144 refer to mitigation measures and consultation requirements; consideration should also be given to cumulative transport assessment in line with NPS EN-3 **[Ref.14-4]**. Likewise, Paragraphs 2.10.161 to 2.10.162 note operational traffic is generally limited, and the limited weight to operational impacts will be placed upon from the Secretary of State;
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023) which details issues relating to underground cables, although predominantly dealing with overhead cables **[Ref. 14-5]**. Likewise, Paragraphs 2.9.28 and 2.109 outlining accidental damage and quality assurance during installation; and

- National Planning Policy Framework (NPPF) (2023) – sets out the Government's planning policies for England, along with the expectations for how these policies are to be applied to new developments. This document is currently under review/consultation including aspects regarding traffic and transport. Section 9 outlines policies to ensure that appropriate measures are in place to support sustainable growth. Paragraph 11 makes note of the requirement of a proposed development to meet development needs of the area, improve the environment etc. Paragraphs 114 and 115 relate to promotion of sustainable transport and the importance of considering traffic and transport related issues from an early stage to be prepared to contribute to the achievement of sustainable development via prioritising a positive vision for the future of an area **[Ref. 14-6]**. Consultation on the proposed reform to the NPPF ended on the 24 September 2024. The **Planning Statement [EN010149/APP/7.2]** considers both the current and consulted NPPF.

Local planning policy

- Central Lincolnshire Local Plan (2018 - 2040) adopted 13 April 2023 – specifically Policy S14: Renewable Energy and Policy S47: Accessibility and Transport **[Ref. 14-7]**;
- Local Transport Plan 5 (2022) Consultation draft report – specifically Policy EC1; Policy EC2; Policy EC5; Policy ENV1; and Policy SH1 **[Ref. 14-8]**;
- Lincolnshire Road Safety Strategy (2015-2025) **[Ref. 14-9]**; and
- Lincolnshire Walking Strategy (2021) **[Ref. 14-10]**.

Guidance

- Environmental Assessment of Traffic and Movement (IEMA, 2023) - this guidance applies to impact assessments that have interactions with traffic and movement **[Ref. 14-11]**; and
- National Planning Practice Guidance, (DLUHC, 2014) – this guidance applies to the development of Travel Plans, Transport Assessments and Transport Statements in planning applications **[Ref. 14-12]**.

14.3. Stakeholder engagement

14.3.1. **Table 14.1** provides a summary of the stakeholder engagement activities undertaken separately from the EIA scoping, non-statutory consultation, statutory consultation and targeted consultation process in support of the preparation of this assessment, as well as detailing the matters raised, how such matters have been addressed, and where they have been addressed in the Environmental Statement (ES).

14.3.2. **ES Volume 3, Appendix 5.3: Scoping Opinion Response Matrix [EN010149/APP/6.3]** presents the responses received via the Scoping Opinion and the Applicant's response to each matter raised.

14.3.3. **Appendices A-4, J-1, J-2 and K-3** of the **Consultation Report [EN010149/APP/5.2]**, set out the feedback received during non-statutory, statutory and targeted consultation and how regard has been afforded by the Applicant to each matter raised.

Table 14.1 Summary of stakeholder engagement

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
Lincolnshire County Council (Highways)	25 May 2023	The preferred road network to be utilised for construction traffic was discussed in principle. The approach to traffic surveys was discussed and the quantity and location of Automatic Traffic Counts and Manual Classified Counts surveys was agreed. Initial feedback during this meeting suggested that there should not be an absolute constraint in terms of road network capacity; however there should be focus on managing the timing of construction activities to minimise impacts on local road networks and communities in the area.	Measures required to control any construction traffic impacts have been identified and are secured through the **oCTMP [EN010149/APP/7.8]**. Usage of the A15, B1191, B1188 for construction traffic use was identified. These discussions resulted in the subsequent exclusion of the B1189 and the inclusion of the B1202 in the ongoing assessments relating to construction traffic to those links discussed during scoping.	**ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**. Measures are secured by the **oCTMP [EN010149/APP/7.8]**. **Section 14.4** of this chapter outlines the locations of traffic surveys. **Section 14.8** of this chapter outlines the link-based assessments considered.
Lincolnshire County Council (Highways)	12 April 2024	Public right of way (PRoW) and permissive path proposals associated with the Proposed Development were discussed within this meeting.	Surface proposals per PRoW and permissive path agreed with some locations requiring all-weather surfacing and	Measures are secured by the **oPRoWPPMP [EN010149/APP/7.12]**. and the **Works Plans [EN010149/APP/2.3]**.

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
		The approach to diversion and closure during construction was discussed and agreed. Provision of PRoW improvement locations and measures were discussed and agreed in principle, along with permissive path locations and routes.	others maintenance of existing conditions.	
Lincolnshire County Council (Highways)	29 May 2024	A summary of the assessment parameters relevant to the EIA and transport assessments was presented. Information inclusive of the proposed construction stage working hours, trip generation/distribution, future year assessments; access locations and mitigation and improvement proposals were agreed in principle. A discussion regarding the A15/B1202 was also held pursuant to Lincolnshire County Council's improvement proposals in this location.	The parameters for junction-based assessments have been applied inclusive of trip generation, etc and further confirming that no absolute capacity constraint would be likely. Junction modelling supporting this has been undertaken and any impacts considered as relevant.	**ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**. Measures are secured by the **oCTMP [EN010149/APP/7.8]**.

Consultee	Date of engagement	Summary of matters raised	How this matter has been addressed	Location of where this matter is addressed in the ES
Lincolnshire County Council (Highways)	12 August 2024	Proposed changes to the highway discussed relating to the following improvements: - A proposed change in the location of speed limit terminal sign and village sign on the B1191 west approach to the settlement of Scopwick. - Proposed changes to the road markings at Royal Air Forces (RAF) Digby access from the B1191. - Proposed changes to the road markings at Navenby Lane junction with the B1191. - Proposed widening of B1191 on southbound verge south of Ashby de la Launde.	Measures required to control any construction traffic impacts have been identified.	Embedded mitigation measures have been outlined in **Section 14.7** of this chapter and are shown on the **Streets, Rights of Way and Access Plans [EN010149/APP/2.4]** identifying the design mitigation that has been embedded into the design of the Proposed Development. Additional measures are be secured by the **oCTMP [EN010149/APP/7.8]**.
Lincolnshire Road Safety Partnership	08 July 2024	Discussion on the use of International Road Assessment Programme (iRAP) star rating protocols. Noted that the Lincolnshire Road Safety Partnership and Lincolnshire County Council do not make use of iRAP star rating protocols.	-	**Section 14.10** of this chapter discusses the potential effect of the Proposed Development on road safety.

14.4. Approach to the assessment

Study area

14.4.1. The traffic and transport assessment has considered the impacts of traffic from the Proposed Development on the local highway network during the construction and decommissioning phases, and also considers PRoW and Permissive Paths within the Order Limits. The assessment has examined relevant junctions and connecting highway links for the assessment of likely significant environmental effects.

14.4.2. The Strategic Road Network is considered in detail within the **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**, where impacts are expected to be limited. As the specific routes Heavy Goods Vehicles (HGVs) will take during construction are not known at this time, HGVs are assumed to access/egress the Strategic Road Network as close to the Proposed Development as possible.

14.4.3. The extent of the study area, and relevant links contained within, as illustrated in **ES Volume 2, Figure 14.1: Study Area [EN010149/APP/6.2]** have been identified based on construction traffic routes to the Proposed Development. This has been agreed with stakeholders (North Kesteven District Council; Lincolnshire County Council and National Highways) following submission of the EIA Scoping Report. Further information related to the EIA Scoping Report and Scoping Opinion can be found within **ES Volume 3, Appendix 5.1: Scoping Report** and **Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]** respectively.

14.4.4. The study area has been identified by focusing on the local highway network to be used by construction traffic. The local highway network comprises the following classified road links:

- A15;
- B1202;
- B1188; and
- B1191.

14.4.5. A number of minor links will also be used to access the Primary Construction Compounds from the road network:

- Gorse Hill Lane;
- Navenby Lane; and
- Temple Road.

14.4.6. With respect to PRoW, consideration of those links within the Order Limits and those immediately abutting the Order Limits has been applied within this chapter.

14.4.7. With respect to Road Safety, the study area extends from A15/Lincoln Eastern Bypass roundabout to and including Holdingham Roundabout; the B1188 between Scopwick and Digby to B1188/Lincoln Eastern Bypass Roundabout; and the B1191.

Scope of the assessment

14.4.8. The scope of this assessment has been established throughout the EIA process and design of the Proposed Development. Further information can be found in **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]**.

14.4.9. This section provides an update to the scope of the assessment from that presented in the EIA Scoping Report which is located in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and re-iterates/updates the evidence base for scoping matters in or out following further iterative assessment.

Receptors/matters scoped into the assessment

14.4.10. **Table 14.2** presents the receptors/matters that are scoped into the assessment reported within this ES, together with appropriate justification.

Table 14.2 Receptors/matters scoped into the assessment

Receptor/matter	Phase	Justification
B-Road B1202 (A15 to Metheringham)	Construction and Decommissioning	During the construction phase, traffic will be generated by a range of activities including: • Construction workers arriving and leaving the Construction Compounds; • Supply of construction materials and plant associated with the establishment of Construction Compounds and main construction works; • Removal of soil resources, spoil or waste; and • Service vehicles and visitors. Construction traffic has the potential to affect severance, driver delay, pedestrian delay,
B-Road B1188 (Scopwick to Digby; Scopwick to Metheringham)	Construction and Decommissioning	
B-Road B1191 (A15 to Scopwick)	Construction and Decommissioning	
A-Road A15	Construction and Decommissioning	
Local (minor) roads (Navenby Lane; Bloxholm Lane; Temple Road; Gorse Hill Lane)	Construction and Decommissioning	

Receptor/matter	Phase	Justification
		non-motorised user amenity, fear and intimidation and road safety. Construction works within the highway, comprising mitigation works and cable route crossings, have the potential to affect driver delay. These matters are scoped into the assessment, as detailed within the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report [EN010149/APP/6.3]** and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**.

Receptors/matters scoped out of the assessment

14.4.11. **Table 14.3** presents the receptors/matters that are scoped out of the assessment that are therefore not considered as part of this ES, together with appropriate justification.

Table 14.3 Receptors/matters scoped out of the assessment

Receptor/matter	Phase	Justification
All road users (motorists and non-motorised users) and sensitive locations (e.g. hospitals, schools)	Operation (including maintenance)	Once the Proposed Development is operational, the effect on the local road system is expected to be minimal for maintenance purposes and occasional equipment replacement. Access to the Proposed Development will utilise the same access junctions delivered for the construction phase. Assessment of all road users is scoped out of the assessment, as detailed within the EIA Scoping Report presented in **ES Volume 3, Appendix 5.1: Scoping Report**

Receptor/matter	Phase	Justification
		[EN010149/APP/6.3] and confirmed within the Scoping Opinion presented in **ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**. Details of the operational vehicle types and numbers are presented in **ES Volume 3**, **Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

Establishing baseline conditions

Data sources to inform the EIA baseline characterisation

14.4.12. The following data sources have been used to understand the existing traffic and transport baseline conditions:

- Ordnance Survey mapping **[Ref. 14-14]**;
- Google Maps aerial/satellite imagery **[Ref. 14-15]**;
- Personal injury collision data, obtained from Lincolnshire County Council **[Ref. 14-16]**.

Site visits/surveys

14.4.13. The following site visits/surveys have been undertaken to understand the existing traffic and transport baseline conditions:

- Site visits were undertaken between June 2023 and June 2024 associated with the following objectives:
  - Assess potential traffic access routes for construction and worker traffic. These routes were inspected, and the suitability of these routes was considered;
  - Evaluate the proposed site access locations and associated Construction Compounds for vehicle speeds and visibility;
  - Review existing PRoW located within the Order Limits;
  - Undertake walking, cycling and horse riding assessments; and
  - Identify local areas of sensitivity and receptors within the study area.

- Traffic surveys were undertaken across June and July 2023 with further surveys completed in April 2024, these being key time periods outside of school holidays but inclusive of existing agricultural activities that are predominant in this area.

14.4.14. The locations of traffic surveys were discussed and agreed with Lincolnshire County Council as the local highways authority. **Table 14.4** presents information on the traffic surveys undertaken.

Table 14.4 Traffic survey information

Survey type	Location	Date	Duration
Automatic traffic count	A15, south of the A15 / B1191/Temple Road junction; A15, north of the A15/B1191/Temple Road junction; B1191, north of the B1191/Navenby Lane/Main Street junction; B1191, west of the B1188/B1191 Heath Road junction; B1188, north of the B1188/B1191 Heath Road junction; and B1188, between Digby and Dorrington.	13 June to 19 June 2023	24-hour period, seven days.
Automatic traffic count	B1188, between Scopwick and Blankey.	15 April to 21 April 2024	24-hour period, seven days.
Junction turning count	A15/A17/Lincoln Road signal-controlled roundabout; A15/B1191/Temple Road priority staggered junction; A15/B1202 priority crossroads;	Repeated on a neutral day (Wednesday) and a weekend day: 17 April 2024 (neutral day) 20 April 2024 (weekend)	6-hour period (neutral day) 3-hour period (weekend)

Survey type	Location	Date	Duration
	A15/Navenby Lane priority T-junction; A15/Gorse Hill Lane priority T-junction; B1188/B1202 Metheringham Heath Lane priority T-junction; B1188/B1191 Heath Road priority T-junction; and B1188/B1191 Main Street priority T-junction.		

Approach to design flexibility

14.4.15. The Project Parameters, as outlined in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**, **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and the parameter plans presented in **ES Volume 2, Figures 3.1 – 3.4 [EN010149/APP/6.2]**, set out the reasonable 'worst-case' parameters for the Proposed Development.

14.4.16. **ES Volume 1, Chapter 5: Approach to the EIA [EN010149/APP/6.1]** sets out those elements of the Proposed Development for which optionality is present within the design. The reasonable 'worst-case' scenario that has been assessed in this traffic and transport chapter for each element of the Proposed Development where optionality is present within the design is outlined within **Table 14. 5**.

Table 14.5 Reasonable worst-case scenario assessed for traffic and transport

Project element	Reasonable worst-case scenario that has been assessed
Battery Energy Storage System (BESS), Springwell Substation and Main Collector Compound	This assessment has considered the maximum parameters for the location of the BESS and Springwell Substation and Main Collector Compound as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, to ensure a worst case has been assessed.

Project element	Reasonable worst-case scenario that has been assessed
Balance of Solar System (BoSS)	The inverters which form part of the BoSS would comprise either string inverters which are placed underneath the Solar PV modules or central inverters which are sited at regular intervals amongst the Solar PV modules. A hybrid option of both options is embedded into the design and considered for the assessment. The detailed list of each field and inverter type is detailed and secured in **ES Volume 3, Appendix 3.1: Project Parameters [EN010149/APP/6.3]**.
Construction Compounds	This assessment has considered the maximum parameters for the location of the construction compounds as identified in **ES Volume 2, Figure 3.10: Primary and Secondary Construction Compounds [EN010149/APP/6.2]**.
Satellite Collector Compounds	This assessment has considered the maximum parameters for the location of the Satellite Collector Compounds as outlined in **ES Volume 2, Figure 3.1: Zonal Masterplan [EN010149/APP/6.2]**, to ensure a worst case has been assessed.
Cables routes and internal tracks	This assessment has considered the indicative cable route and access tracks as presented in **ES Volume 2, Figure 3.9: Indicative Cable Crossing [EN010149/APP/6.2]** and **ES Volume 2, Figure 3.14: Indicative Location of Internal Access Tracks [EN010149/APP/6.2]**.

Assessment assumptions

Construction phase

14.4.17. The assessment of the traffic and transport impact of construction traffic has been based on the assumptions set out in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**.

14.4.18. The construction phase is anticipated to be split into phases over a 48-month construction period, and subject to being granted consent, the earliest construction is anticipated to start is 2027. The final construction programme will depend on the detailed layout design and potential environmental constraints on the timing of construction activities.

14.4.19. The traffic and transport assessments consider a robust peak construction year of 2028, as set out in **Table 3.18** of **ES Volume 3, Chapter 3: Proposed Development Description [EN010149/APP/6.1]**. The commissioning phase of the Proposed Development may extend up to six months after completion of construction. However, the volume and composition of traffic associated with this activity will be equivalent to that of the operational (including maintenance) phase and therefore the construction assumptions present a worst-case scenario.

14.4.20. The construction of the Proposed Development will be phased utilising multiple Primary and Secondary Construction Compounds, with the peak volume of construction vehicles for each Construction Compound occurring in different years of the construction programme.

14.4.21. To assess a reasonable worst-case scenario within this chapter, the total anticipated and robust vehicle volume for all individual Construction Compounds has been assessed in a combined approach to determine potential effects during the construction phase of the Proposed Development. The assumptions that have been used for the assessment of the construction phase are outlined in **Table 14.6** below.

Table 14.6 Assumptions underlying the construction phase assessment

Construction assumptions	Summary/justification
Construction working hours	07:00 to 19:00 weekday periods assessed. For Light Goods Vehicles(LGV)/construction workers, an extra hour before and after the start/end of the construction working hours have been included to account for the worker mobilisation period. This period represents the time construction workers travelling by car/LGV would be on the road network while arriving and departing Primary Construction Compounds at the beginning and end of shifts. For LGV/construction workers, a standard day, accounting for this mobilisation period, would be equal to 14-hours. It is noted that there will be working arrangements on Saturday (07:00-12:00 noon); however, analysis across the busiest weekday periods is a most robust assessment for traffic and transport.

Construction assumptions	Summary/justification
LGV/construction workers: mode share in the construction phase	Construction workers have been assumed to travel to Primary Construction Compounds in LGVs, with an occupancy of 1.5 workers per LGV.
Peak volume of two-way trips associated with each Primary Construction Compound	The construction programme is set to last four years across three Primary Construction Compounds (Springwell West, Springwell Central and Springwell East) with each Construction Compound reaching their peak daily two-way construction vehicle trips in separate years of the programme. The traffic and transport assessment has used these peak volumes to assess the potential effect during the construction phase, but has made a number of robust assumptions around the peak hour arrivals/departures of construction traffic. The start and finish times of the assessed weekday working day (07:00 - 19:00) would typically result in construction workers travelling between 06:00-07:00 and 19:00-20:00, which do not align with the identified network peak times (07:15 - 08:15, 16:30 - 17:30). For a robust assessment of peak hours, 35% of the LGV construction traffic has been applied during the peak hours with the remaining 65% of LGV construction traffic travelling outside of these peak hours. The peak LGV two-way trips for each Primary Construction Compound have been outlined in **Table 14.7**. HGVs are expected to arrive/depart from Construction Compounds throughout the working day, with 10% of HGV construction traffic applied across the network within any given hour. The peak HGV daily two-way trips for each Construction Compound have been considered and have been outlined in **Table 14.8.** The peak activity local to each Primary Construction Compound across the four-year construction programme has been taken to

Construction assumptions	Summary/justification
	present a robust and realistic scenario within a single year. Similarly, junctions remote from Primary Construction Compounds have been assessed with a realistic combined impact from multiple compounds representing peak traffic conditions.
Distribution of HGVs and LGVs on the network	LGVs have been assigned to the local road network via the most appropriate route from the Strategic Road Network. The origin and destination of construction workers (travelling in LGVs) has been determined by analysing population data from the NOMIS Census data set **[Ref 14-13]**. HGVs will travel on the local road network, with HGVs limited to specific routes set out within the **oCTMP [EN010149/APP/7.8]**. The HGV distribution is based upon an assumption of 50% arriving and departing from the north and 50% arriving and departing from the south. These HGVs will utilise the A15, B1191, and B1188 (south of Metheringham) to access the Construction Compounds.

14.4.22. Traffic flow diagrams showing how LGV trips have been distributed on the road network form part of the appendices to **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**. **Table 14.7** presents the daily peak LGV two-way trips for all Construction Compounds.

Table 14.7 Peak LGV trips per primary construction compound

Primary construction compound	Peak LGV two-way trips
Springwell West (MC1)	640
Springwell Central (MC2)	374
Springwell East (MC3)	508

Construction phase HGV

14.4.23. All construction traffic will utilise the existing local highway network, with HGVs limited to specific designated routes as set out in the **oCTMP [EN010149/APP/7.8]**. These routes have been identified through principles of adopting the road hierarchy of A roads first and only minor roads where necessary. Measures to enforce adherence to these routes is set out in the same document.

14.4.24. Based on the HGV trips associated with each Construction Compound, HGVs have been assigned to the road network and will route to the Construction Compounds by using the following roads:

- A15;
- B1191;
- B1188;
- Temple Road; and
- Gorse Hill Lane.

14.4.25. Traffic flow diagrams showing how the trips have been distributed on the road network can be found as part of the appendices contained within **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**. **Table 14.8** below provides an outline of the daily peak HGV trips associated with each Primary Construction Compound and the major road(s) these trips have been assumed to use.

Table 14.8 Peak HGV trips per Primary Construction Compound

Primary construction compound	Primary Construction compound peak HGV two-way trips	Secondary Construction compound peak HGV two-way trips	Daily total HGV trips (two-way)	Roads used
Springwell West (MC1)	80	30	110	A15 North and South Gorse Hill Lane/ Temple Road
Springwell Central (MC2)	Up to 70	Up to 70	70	A15 North and South B1191
Springwell East (MC3)	Up to 80	Up to 80	80	A15 North and South B1191 B1188

14.4.26. For robustness, the peak daily HGV two-way trips across each area of the Proposed Development have been considered relative to their respective Construction Compound.

14.4.27. It is not anticipated that these peak movements will occur at any one time across all Primary Construction Compounds but will be distributed across the working day, as outlined in the **oCTMP [EN010149/APP/7.8]**.

Abnormal Invisible Loads considerations

14.4.28. The majority of construction vehicles accessing the Construction Compounds will be standard/normal size LGVs and HGVs. However, it is expected that the Proposed Development would require Abnormal Invisible Load (AIL) delivery during the construction phase for the delivery of heavy transformer equipment from the Grimsby Docks/Immingham Port towards the Site associated with the Springwell Substation. The overall vehicle width of this AIL is expected to be 6.2m with a length of 64m including the attached trailer. A route assessment has been carried out and is summarised within the **oCTMP [EN010149/APP/7.8]**.

Decommissioning phase

14.4.29. The decommissioning phase is assumed to take place 40 years per phase from the start of the operation of the Proposed Development.

14.4.30. As with the construction phase, the movement of workers, materials and plant are likely to generate trips on the local highway network. Any permanent highways related mitigation delivered for the construction phase or enhancements implemented for the Proposed Development will remain in place at the start of the decommissioning phase, including access from the local road network and junction improvements.

14.4.31. The decommissioning year is 40 years after the date of final commissioning. This is considered to be too far into the future to be able to accurately predict traffic flows or road/junction layouts at that time. It is therefore considered reasonable to assume that the impacts during the decommissioning phase will be the same as, or not greater than, the construction phase. This may overestimate the actual impacts slightly, but it is considered to be a robust approach for a reasonable worst case scenario.

14.4.32. The management of movement of decommissioning traffic is documented within and secured by the **Outline Decommissioning Environmental Management Plan (oDEMP) [EN010149/APP/7.13]**, noting that traffic and transport associated impacts are expected to be equal to or less than those occurring during construction in respect to traffic movements.

Assessment methodology and criteria

14.4.33. The pertinent elements for the ES in terms of traffic and transport are the magnitude and consequences (significance) of changes at the assessed links within the study area as a result of the construction and decommissioning phases of the Proposed Development.

14.4.34. The significance of an effect is determined based on the magnitude of an impact and the sensitivity of the affected receptor. This section describes

the criteria applied in this assessment to characterise the magnitude of potential impacts and sensitivity of receptors.

14.4.35. Impacts assessed as part of the traffic and transport assessment are as follows:

- Severance;
- Driver delay;
- Pedestrian delay (incorporating delay to all non-motorised users);
- Non-motorised user amenity;
- Fear and intimidation;
- Road safety; and
- Hazardous/large loads.

14.4.36. The Institute of Environmental Management and Assessment (IEMA) Guidelines **[Ref 14-11]** provides the assessor with two rules to be considered as screening thresholds when assessing the impact of development traffic on a highway link, as follows:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of HGVs will increase by more than 30%); and
- Rule 2: Include highway links of high sensitivity where traffic flows have increased by 10% or more.

14.4.37. Rule 1 and 2 have been used to determine the spatial scope of the traffic and transport assessment based on the geographical extent of the study area. It is considered that any increase in total traffic of less than 30% is imperceptible. Furthermore, forecast increases in total traffic of less than 10% result in no discernible environmental effect, hence the sensitivity threshold set in Rule 2.

14.4.38. On links where the forecast change in total traffic exceeds that which is outlined in Rule 1 or Rule 2 of the IEMA Guidelines **[Ref 14-11]**, a detailed assessment has been carried out based on the assessment criteria.

14.4.39. The assessment criteria used to assess the potential effects associated with the Proposed Development on traffic and transport are outlined below.

14.4.40. As stated in **Section 14.1**, traffic-related noise and vibration and air quality assessments have been informed by the traffic data outlined in this chapter. These effects are assessed in **ES Volume 1, Chapter 6: Air Quality** and **Chapter 12: Noise and Vibration [EN010149/APP/6.1]** respectively.

Sensitivity of the receptor

14.4.41. The levels of sensitivity for the assessment of receptors related to traffic and transport impacts are defined within **Table 14.9** and based upon reasonable application of professional judgement and experience.

Table 14.9 Sensitivity of a receptor

Sensitivity level	Definition
Very High	The receptor has no ability to absorb change without fundamentally altering its present character or is of national or international importance.
High	The receptor has little ability to absorb change without fundamentally altering its present character or is of national or international importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present characteristics.
Low	The receptor is tolerant of change without detriment to its present characteristics.
Negligible	The receptor can fully absorb change without any change to its present character.

14.4.42. It is necessary to identify user groups ('receptors') and associated locations ('links'), which may be sensitive to changes in the traffic and transport network conditions. A sensitive area may be where pedestrian activity is high, for example.

14.4.43. The IEMA Guidelines **[Ref 14-11]** set out the following user groups as a starting point for the assessment of receptor sensitivity:

- Non-motorised users;
- Public PRoW users;
- Motorists and freight vehicles;
- Public transport; and
- Emergency services.

14.4.44. The IEMA Guidelines **[Ref 14-11]** also set out a list of potentially sensitive receptor geographic locations. These sensitive locations and receptors within these locations have been considered and have informed the assessment of significance when traffic associated with the Proposed Development is assigned to the road network:

- People at home;
- People at work;

- Sensitive and/or vulnerable groups (including children; youth; elderly; income; persons with disabilities; ethnic and racial minorities; people with social disadvantages; and access/geographic factors);
- Locations with concentrations of vulnerable groups (e.g., hospitals, places of worship, schools, etc.);
- Retail areas;
- Recreational areas;
- Tourist attractions;
- Collision clusters and routes with road safety concerns; and
- Junctions and highway links at (or over) capacity.

14.4.45. For traffic and transport, receptors are the users of the road, PRoW, and communities through which construction and decommissioning traffic may travel.

14.4.46. The sensitivity of receptors has been identified for each link and has been completed through a combination of site visit(s) and a desktop-based review. In the absence of numerical thresholds and guidelines to determine the sensitivity level of a receptor, the sensitivity of receptors has been identified using the assessor's professional judgement based on a range of factors including but not limited to density of properties along link, length of link, footpath provision.

14.4.47. **Table 14.10** below provides a more detailed criteria for the assessment of receptor sensitivity and sets out the different types of sensitive receptors relevant to traffic and transport.

Table 14.10 Receptor sensitivity to traffic and transport

Affected party (sensitive receptor)	Built environment indicator on link	Receptor sensitivity
People at home	Residential properties	• Negligible: No properties with direct frontage. • Low: Few properties (e.g. one side of the link) with direct highway frontage on construction traffic routes. • Medium: A number of properties with direct highway frontage (e.g. two sides of the link – low density) on construction traffic routes. • High: A large number of properties with direct frontage

Affected party (sensitive receptor)	Built environment indicator on link	Receptor sensitivity
		(e.g. two sides of the link – higher density).
People at work	Employment uses (Offices, Industrial Units etc)	• Negligible/Low: Not adversely impacted when at work.
Sensitive groups (children; youth; elderly; income; persons with disabilities; ethnic and racial minorities; people with social disadvantages; and access/geographic factors)	Disabled parking bays, retirement/care centres, playgrounds/centres and schools	• Negligible: No indication of sensitive groups present. • Low: At least 1 indicator of sensitive groups present, with direct highway frontage. • Medium: Low number of sensitive groups present, with direct highway frontage. • High: Multiple indicators of sensitive groups present, with direct highway frontage.
Sensitive Locations	Hospitals, schools, historic buildings, places of worship	• Negligible: No indication of sensitive groups present. • Low: At least 1 indicator of sensitive groups present, with direct highway frontage. • Medium: Low number of sensitive groups present, with direct highway frontage. • High: Multiple indicators of sensitive groups present, with direct highway frontage.
Users walking	Crossing points, PRoW, footways	• Negligible: No indication of sensitive groups present. • Low: At least 1 indicator of sensitive groups present. • Medium: Medium use by receptor group – footways present. • High: High receptor use with no footways.
Users cycling/scooting	On/off-road routes, designated routes or infrastructure	• Negligible: No indication of sensitive groups present.

Affected party (sensitive receptor)	Built environment indicator on link	Receptor sensitivity
		• Low: At least 1 indicator of sensitive groups present e.g. off-road cycle route. • Medium: On-road cycle route present with segregation. • High: On-road cycle route present with no segregation.
Recreational areas/Open spaces	Parks, playgrounds/areas, shopping and community centres	• Negligible: No indication of sensitive groups present (unlikely usage) • Low: At least 1 indicator of sensitive groups present. • Medium: Low number of sensitive groups present. • High: Multiple indicators of sensitive groups present e.g. children present.
Road users	Road links/junctions, baseline traffic volume, existing signage/infrastructure .	• Presence of affected parties outlined in this table determine the sensitivity. • For driver delay assessment (motorists at junctions): - Negligible: No indication of delay present (unlikely usage) - Low: Less than 0.3 ratio of flow to capacity. - Medium: 0.3 to 0.5 ratio of flow to capacity. - High: 0.5 to 0.85 ratio of flow to capacity. - Very High: Greater than 1.00 ratio of flow to capacity.

14.4.48. The sensitivity of receptors within the study area varies depending on where the study area road links travel through. Receptor sensitivity within residential areas where there are numerous direct frontage accesses to the road, for example, is generally considered to be medium or high, as the receptors may not be able to accommodate change.

14.4.49. Owing to the length of some road links and the varying road conditions of the link travelling through rural areas or communities, the sensitivity of receptors may vary along different sections of the same road link. The

sensitivity of road users in the countryside may vary from that of road users in a residential area along the same link.

14.4.50. The assessment of receptor sensitivity on road links within the study area has subsequently been split into multiple sections of road and are referred to in the assessment as 'links'.

14.4.51. In relation to specifically driver delay assessments, road user sensitivity is determined using ratio of flow to capacity values as determined using junction modelling software. Ratio of flow to capacity values lower than 0.85 are generally considered to be operating 'under capacity', whilst values above 1.00 indicate that the junction will operate 'over capacity'. Between these two ratio of flow to capacity figures (0.85 - 1.00), a junction is considered to be 'approaching capacity'. The Junctions 10 PICADY modelling software module also reports predicted queue length in Passenger Car Units and predicted delay in seconds.

14.4.52. Average ratio of flow to capacity values at each modelled junction for the AM and PM peak periods have been used to identify the sensitivity of receptors in close proximity to the assessed junctions. These are motorists and passengers and the road/junction these user groups are travelling through. At locations where the average ratio of flow to capacity is greater than 1.00, the junction would be operating beyond maximum capacity and therefore unlikely to absorb increases in delay. The receptor sensitivity thresholds are presented below in **Table 14.11**.

Table 14.11 Driver delay: receptor sensitivity thresholds based on average ratio of flow to capacity values

Sensitivity	Threshold (average junction ratio of flow to capacity)
Very High	Greater than 1
High	0.85 to 1
Medium	0.5 to 0.85
Low	0.3 to 0.5
Negligible	Less than 0.3

Magnitude of impact

14.4.53. The magnitude of an impact by category of assessment is outlined below

Severance

14.4.54. The IEMA Guidelines **[Ref 14-11]** consider severance to be the perceived division that can occur within a community when it becomes separated by major transport infrastructure**.** The IEMA Guidelines **[Ref 14-11]** note that severance is affected by changes in total traffic flow and should pay attention to local conditions. The thresholds used in the assessment of severance are presented in **Table 14.16**.

Driver delay

14.4.55. The effect on driver delay has been assessed in accordance with the IEMA Guidelines **[Ref 14-11]**. Driver delay is assessed using junction capacity assessments and the technical analysis carried out in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

14.4.56. Driver delay can develop at several points on the road network surrounding a development owing to the addition of traffic associated with the development in question. Additionally, the existing traffic on the road network may also be reaching or already at maximum capacity which can contribute to driver delay related to the proposed development.

14.4.57. The assessments consider the effect on driver delay by comparing differences in delay between the '2028 future baseline' scenario and the 'construction' scenario for the AM and PM peak periods at identified key junctions.

14.4.58. The IEMA Guidelines **Ref 14-11]** note that driver delay is likely to be significant if there are already delays on the existing road network. In this assessment, driver delay has been assessed based on traffic modelling work carried out in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**, which focuses on conditions in the network peak periods with and without the Proposed Development as agreed with Lincolnshire County Council.

14.4.59. The IEMA Guidelines **[Ref 14-11]** do not set assessment thresholds for driver delay. The assessment of the effect on driver delay has therefore been based on traffic modelling results from **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**. The change in delay with and without the Proposed Development is therefore primarily based on notable changes to delay using modelling results e.g., ratio of flow to capacity and change in delay in seconds. The modelling results have been assessed using the thresholds defined in **Table 14.16**.

14.4.60. The junction capacity assessments carried out in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]** focus on the conditions in the observed survey identified network peak periods (AM

peak: 07:15 – 08:15; PM peak: 16:30 – 17:30). Analysis was conducted in the Junctions 10 PICADY modelling software module.

Pedestrian delay

14.4.61. The IEMA Guidelines **[Ref 14-11]** do not provide a specific methodology to assess the magnitude of impact on pedestrian delay. As a result, changes to the volume, composition or speed of traffic on a road link can influence pedestrian delay.

14.4.62. In the absence of set thresholds, pedestrian delay can be calculated by determining when the traffic on the network surrounding the Proposed Development is already at, or close to, capacity. An increase in total traffic of approximately 30% can double the delay experienced by pedestrians attempting to cross the road.

14.4.63. It should, however, be noted that the IEMA Guidelines **[Ref 14-11]** do not recommend making use of definitive thresholds owing to the range of local factors and conditions that can influence pedestrian delay.

14.4.64. Consideration of the magnitude of impact on pedestrian delay has been determined using professional judgement.

Non-motorised user amenity

14.4.65. The IEMA Guidelines **[Ref 14-11]** define non-motorised user amenity as the relative pleasantness of a journey, and is affected by traffic flow, traffic composition and pavement widths/separation from traffic. The magnitude of impact on non-motorised user amenity has been determined by first identifying locations where the traffic flow or HGV flow is halved or doubled, with consideration of sensitivity levels in these locations used to determine effect later in this chapter.

14.4.66. **Section 4** of **ES Volume 3, Appendix 14.1: Transport Assessment** (**[EN010149/APP/6.3]** examines non-motorised user amenity in detail. Within this chapter, existing infrastructure will form the basis of the environmental assessment of traffic impacts in terms of non-motorised user amenity. A detailed desktop review has also been carried out to take account of specific local conditions and to pay full regard to specific local conditions. Professional judgement and experience has been used to determine the magnitude of impact on non-motorised users in the absence of established thresholds.

Fear and intimidation

14.4.67. The assessment of effects on fear and intimidation has been based on the IEMA Guidelines **[Ref 14-11]** and is a three-step process undertaken to calculate a degree of hazard score, comprised of three elements:

- Calculating the annual average daily traffic (AADT) over an 18-hour day (all vehicles per hour, two-way);
- Calculating the total 18-hour HGV flow; and
- Calculating the average vehicle speed.

14.4.68. The assessment follows the degree of hazard thresholds set out in the IEMA Guidelines **[Ref 14-11]** and these are set out below in **Table 14.12**.

Table 14.12 Fear and intimidation: degree of hazard

Average traffic flow over 18-hour day – all vehicles/hour two-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed (c)	Degree of hazard score
+1,800	+3,000	->40	30
1,200-1,800	2,000-3,000	30-40	20
600-1,200	1,000-2,000	20-30	10
<600	<1,000	<20	0

14.4.69. The total degree of hazard score is calculated by summing the score for each element (a, b, and c) from **Table 14.12** and a level of fear and intimidation is determined, which is set out in **Table 14.13**.

Table 14.13 Level of fear and intimidation

Level of fear and intimidation	Total hazard score (sum of a, b, c from Table 14.10)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

14.4.70. The assessment of the magnitude of impact on fear and intimidation is based on the change in total degree of hazard from baseline conditions. The assessment has followed the IEMA Guidelines **[Ref 14-11]** and is outlined in **Table 14.14**.

Table 14.14 Fear and intimidation: magnitude of impact

Magnitude of impact	Changes in step/traffic flows (AADT) from baseline conditions
High	Two step changes in level.
Medium	One step change in level, but with:

Magnitude of impact	Changes in step/traffic flows (AADT) from baseline conditions
	>400 vehicle increase in average 18-hour all vehicles two-way all vehicle flow; and or >500 heavy vehicle increase in total 18-hour heavy vehicle flow.
Low	One step change in level, with: <400 vehicle increase in average 18 hour all vehicle two-way all vehicle flow'; and/or <500 heavy vehicle increase in total 18-hour heavy vehicle flow.
Negligible	No change in step changes.

Road safety

14.4.71. The IEMA Guidelines **[Ref 14-11]** reference the use of a collision cluster assessment to identify the magnitude of impact at a more detailed level. A collision cluster assessment has been completed and is presented in **Section 14.10**.

14.4.72. The IEMA Guidelines **[Ref 14-11]** set out the use of the 'Safe System' best practice approach, broadly comprised of three stages:

- Identify the study area using historic crash data;
- Undertake evidence-led, objective modelling techniques to establish a baseline road safety level for the roads within the study area on which impact thresholds are exceeded in relation to either non-motorised users or motorised user traffic. This analysis can be carried out using tools such as the International Road Assessment Programme Star Ratings protocols or similar tools produced by individual highways authorities; and
- Assess the effects of additional developments traffic for all users (including vulnerable groups) across the whole width of the highway corridor. This model should also assess the effect of any changes to the baseline road network, such as the provision of access junctions.

14.4.73. The IEMA Guidelines **[Ref 14-11]** also recommend the production of standard and prescribed Road Safety Audits to review the road safety attributes of any proposed engineering changes in the adopted highway prior to submission.

Hazardous and large loads

14.4.74. The Proposed Development may involve the transportation of dangerous, hazardous or AIL by road. Such movements may involve specialist loads

that might be involved in the construction or decommissioning phases of the Proposed Development.

14.4.75. The IEMA Guidelines **[Ref 14-11]** note that the traffic and movement assessment needs to clearly outline the estimated number and composition of such loads. No specific thresholds are provided in the Guidelines, but it is noted that risk or catastrophe analysis may be required where the number of hazardous and large loads is significant.

14.4.76. In the absence of specific thresholds from IEMA Guidelines **[Ref 14-11]**, the magnitude of impact criteria in **Table 14.15** have been applied.

Table 14.15 Hazardous and large loads: magnitude of impact criteria

Impact	Negligible	Low	Medium	High
Hazardous/large loads	<30% increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels.		

Magnitude of impact summary

14.4.77. **Table 14.16** provides a summary of the magnitude of impact thresholds adopted from IEMA Guidelines **[Ref 14-11]**. The thresholds are only a starting point for the assessment, and in the assessment of specific effects, are accompanied by a desktop review and professional judgement.

Table 14.16 Magnitude of impacts: summary

Impacts	Magnitude of impact			
	Negligible	Low	Medium	High
Severance	Changes in total traffic flow of less than 30%.	Changes in total traffic flow of 30%-60%.	Changes in total traffic flow of 60%-90%.	Change in total traffic flow over 90%.
Driver delay	Vehicle delay changes are less than 30 seconds as a result of the Proposed Development	Vehicle delay changes are between 31 and 40 seconds as a result of the Proposed Development	Vehicle delay changes are between 41 and 60 seconds as a result of the Proposed Development	Vehicle delay changes are between 61 and 90 seconds as a result of the Proposed Development
Pedestrian delay	Assessment of this effect is based on a desktop review of pedestrian facilities on links and on the change in total traffic in construction.			

Impacts	Magnitude of impact			
	Negligible	Low	Medium	High
Non-motorised user amenity	Assessment of this link is based on a desktop review of non-motorised user facilities on links used by construction traffic.			
Fear and intimidation	No change in step changes.	One step change in level, with: <400 vehicle increase in average 18 hour all vehicle two-way all vehicle flow' and/or <500 heavy vehicle increase in total 18-hour heavy vehicle flow.	One step change in level, but with: >400 vehicle increase in average 18-hour all vehicles two-way all vehicle flow; and or >500 heavy vehicle increase in total 18-hour heavy vehicle flow.	Two step changes in level
Road safety	Assessment of this link is based on a review of the latest five-year period collision record and cluster analysis.			
Hazardous and large loads	<30% increase in traffic.	Quantitative assessment of road capacity based on existing traffic flows and predicted future levels		

Significance of effect

14.4.78. The significance of the effect upon identified receptors is determined by combining the assessed magnitude of impact and the sensitivity of the receptor.

14.4.79. The IEMA Guidelines **[Ref 14-11]** establish thresholds in respect to changes in the volumes and composition of traffic to facilitate a subjective judgment of traffic impacts and significance. However, the IEMA Guidelines **[Ref 14-11]** note that there is no clear definition of a significant effect in the EIA Regulations:

*"For many effects, there are no simple rules or formulae that define appropriate assessment thresholds and therefore there is a need for interpretation and judgement on the part of the competent traffic and movement expert, backed up by data or quantified information where possible **[…]**. The competent traffic and movement expert will need to make it clear how they have defined whether a change (and the resultant effect) is considered significant or not"*.

14.4.80. A quantitative approach to the assessment of traffic and transport related effects has been used, in accordance with the IEMA Guidelines **[Ref 14-11]**. This relies on percentage changes in daily traffic movements along road links, which determine the significance of effect. However, some traffic and transport related effects, for example non-motorised user amenity and road safety, cannot be assessed using changes in traffic movements associated with the Proposed Development. To that end, the assessment carried out within this chapter will equally need to rely on other assessment criteria as set out in the IEMA Guidelines **[Ref 14-11]**, alongside professional judgement.

14.4.81. **Table 14.17** sets out the significance matrix used to determine significant effects. The shaded boxes indicate those significance ratings are deemed to be 'significant' effects ('major' or 'moderate'). For this assessment, any effects with a significance level of minor or less are considered to be not significant. It should also be noted that any impacts may be temporary (such as construction traffic) or permanent; and that effects may be positive (beneficial) or negative (adverse).

Table 14.17 Significance of effect matrix

Magnitude of impact	Sensitivity of receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

14.4.82. The significance of effect terms presented in **Table 14.17** are defined in **Table 14.18** below.

Table 14.18 Significance of effect definitions

Significance of effect	Indicative definition
Major	Changes which are likely to be perceptible and which would significantly change conditions which would otherwise prevail to the extent that it would significantly affect travel behaviour.
Moderate	Changes which are likely to be perceptible and which materially change conditions which would otherwise prevail to the extent that it may affect travel behaviour to a measurable degree.

Significance of effect	Indicative definition
Minor	Changes which are likely to be perceptible but not to the extent that they would materially change conditions which would otherwise prevail.
Negligible	Changes which are just perceptible.

14.5. Environmental baseline

Existing baseline

14.5.1. The following section presents a summary of the baseline conditions for the receptors scoped into the assessment, as detailed within **Table 14.22**. The full details of the baseline conditions are presented in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

Local highway network

14.5.2. The local highway network surrounding the Site, encompassing the study area, is presented in **ES Volume 2**, **Figure 14.1: Study Area [EN010149/APP/6.2]**. The study area comprises local roads which will be used for direct access to the Proposed Development, as well as the strategic routes (A1/M180) which will be used to link these local roads to the wider network. The latter have not been assessed within this chapter, where construction traffic will dissipate to an imperceivable level by the time it reaches strategic routes. Consideration of this is made in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

14.5.3. The full assessment of local highway conditions is contained within the **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]** and assesses the conditions of the following roads:

- A1;
- M180;
- A15;
- B1191 (Heath Road);
- B1188;
- B1202 (Metheringham Heath Lane); and
- Local (Minor) Roads:
  - Navenby Lane;
  - Gorse Hill Lane; and
  - Temple Road.

14.5.4. The A15, B roads and minor roads listed above are located within a rural setting, connecting small settlements to the wider network. The settlements local to the Site have potentially sensitive receptors, such as residential areas, schools and community facilities. The road links are commensurate with a rural character, with often limited and/or narrow footway provision, limited street lighting and speed limits of 60 miles per hour (mph) outside of built-up areas.

14.5.5. Analysis of the traffic survey data collected across the study area identified the following peak network times:

- Weekday AM Peak: 07:15 – 08:15; and
- Weekday PM Peak: 16:30 – 17:30.

14.5.6. These periods were used to inform the baseline traffic flows on the network where peak hour data is relevant.

Public rights of way

14.5.7. A number of existing PRoW are present within the Study Area and are presented in **Table 14.19**. These have been illustrated in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**

14.5.8. Consideration of all PRoW users (inclusive of cyclists and equestrian) is assessed and described as non-motorised users, and construction stage management requirements are outlined within the **oPRoWPPMP [EN010149/APP/7.12]**.

Table 14.19 PRoW within the study area

PRoW	Type	Proposed Development area
Blan/4/2	Public footpath	Springwell East
Blan/4/3	Public footpath	Springwell East
Scop/738/1	Public footpath	Springwell East
Scop/1134/1	Public footpath	Springwell East
Scop/1135/2	Public bridleway	Springwell East
Scop/1135/3	Public bridleway	Springwell East
Scop/1136/1	Public bridleway	Springwell East
Scop/737/1	Public footpath	Springwell East
Scop/10/1	Restricted byway	Springwell East
Scop/10/2	Restricted byway	Springwell East
Scop/11/1	Restricted byway	Springwell East
Scop/8/2	Public footpath	Springwell East
Blan/737/1	Public footpath	Springwell East

PRoW	Type	Proposed Development area
Scop/11/2	Restricted byway	Springwell East
Scop/11/3	Restricted byway	Springwell East
Scop/11/4	Restricted byway	Springwell East
Scop/1135/1	Public bridleway	Springwell East
Scop/1135/3	Public bridleway	Springwell East
Scop/7/3	Public footpath	Springwell East
Scop/738/1	Public footpath	Springwell East
Scop/8/1	Public footpath	Springwell East
Scop/1135/4	Public bridleway	Springwell East
Scop/739/1	Public footpath	Springwell East
Scop/3/1	Public footpath	Springwell East
Blan/4a/1	Public footpath	Springwell East
Blan/738/1	Public footpath	Springwell East
Scop/12/1	Restricted byway	Springwell Central
Scop/13/1	Restricted byway	Springwell Central
Rows/5/1	Public footpath	Springwell Central
Brau/8/1	Public footpath	Springwell West
AshL/4/1	Public footpath	Springwell West
Temp/2/1	Public footpath	Springwell West
Temp/1/1	Public bridleway	Springwell West
Scop/7/2	Public footpath	Springwell West
AshL/11/1	Public footpath	Springwell West

Receptor sensitivity

14.5.9. A level of sensitivity, based on the criteria set out in **Table 14.9**, has been allocated to the receptors scoped into the assessment, typically taking into account multiple influences such as adjoining land uses, PRoW and collision data. These are summarised in **Table 14.20**.

14.5.10. Owing to the length of some road links (e.g. A15, B1191) and their vicinity to settlements, a number of road links have been divided into multiple sections in order to more accurately reflect potential differences in sensitivity along the extent of the road link assessed.

Table 14.20 Link sensitivity

Link no.	Section description	Sensitivity	Justification
1	A15: Heath Road to B1202 Heath Lane	Low	Limited property frontage, and one PRoW crossing.
2	A15: B1202 Heath Lane to Green Man Road	Medium	Limited property frontage, one PRoW crossing and collision cluster.
3	A15: Green Man Rd to staggered junction	Low	No property frontage or PRoW and small number of collisions.
4	A15: staggered junction to Gorse Hill Lane	Low	No property frontage, one PRoW crossing and small number of collisions.
5	A15: Gorse Hill Lane to Thompsons Bottom Farm	Low	Limited property frontage, one PRoW crossing and small number of collisions.
6	A15: Thompsons Bottom Farm to B1191	Low	Limited property frontage and small number of collisions.
7	A15: B1191 to unnamed road (leading to Ruskington)	Medium	Limited property frontage, one PRoW crossing and small number of collisions.
8	A15: unnamed road (leading to Ruskington) to Sleaford Road	Low	No property frontage or PRoW crossing and collision cluster.
9	A15: Sleaford Road to Leasingham	Negligible	No property frontage or PRoW crossing. No collisions.
10	A15: Leasingham to Holdingham Roundabout	Medium	Some property frontage, one PRoW crossing and access to settlement of Leasingham.
11	B1191: A15 to Ashby de la Launde	Low	Limited property frontage, no PRoW crossing and small number of collisions.
12	B1191: Ashby de la Launde to RAF Digby	Medium	Limited property frontage but passes through the settlements of Ashby de la Launde and RAF Digby. One pedestrian crossing.

Link no.	Section description	Sensitivity	Justification
13	B1191: RAF Digby to edge of Scopwick	Low	Limited property frontage, and no PRoW crossing.
14	B1191: edge of Scopwick to B1188	Medium	Passes through the settlement of Scopwick with some property frontage. Small number of collisions.
15	B1188: Metheringham	High	Limited property frontage but sensitive receptor located adjacent to the link (nursery). One PRoW crossing and one collision cluster.
16	B1188: Between Metheringham and Blankney	Low	Limited property frontage.
17	B1188: Blankney	Medium	Passes through the settlement of Blankney. Some property frontage.
18	B1188: Between Blankney and Scopwick	Low	Limited property frontage, no PRoW crossing.
19	B1188: Scopwick	Medium	Passes through the settlement of Scopwick with some property frontage. Small number of collisions.
20	B1188: Between Scopwick and Digby	Low	Limited property frontage and no PRoW crossing.
21	B1188: Digby	Medium	Limited property frontage and no PRoW crossing.
22	B1202 between A15 and B1188	Low	Limited property frontage and no PRoW crossing.
23	Navenby Lane	Low	Limited property frontage and small number of collisions.
24	Bloxholm Lane	Low	Limited property frontage and no collisions recorded.
25	Gorse Hill Lane	Low	Limited property frontage, no PRoW crossing and no collisions recorded.

Link no.	Section description	Sensitivity	Justification
26	Temple Road	Low	Limited property frontage. Small number of collisions recorded.

14.6. Future baseline in the absence of the Proposed Development

14.6.1. It is anticipated that the future baseline conditions will include traffic growth, allowed for in this assessment using the Department of Transport's Trip End Model Presentation Program (TEMPro) utilising growth factors to estimate baseline traffic flows in a future year. This has been applied by factoring up the 2024 Baseline data using TEMPro Growth Factors, accounting for changes in traffic associated with future employment and housing from developments in the Central Lincolnshire Local Plan (2018-2040) **[Ref. 14-7]** along with changes in car ownership and other influential trends.

14.6.2. The future baseline is considered to be 2028 as the assessed construction year. The TEMPro factors applied to the data sources identified are illustrated in **Table 14.21** for the construction scenario.

Table 14.21 TEMPro factors by road classification

Base year	Future year	AM peak growth factor	PM peak growth factor
2022	2028	1.0471	1.0486
2023	2028	1.0422	1.0435
2024	2028	1.0372	1.0384

14.6.3. For non-motorised users, material alterations to the pedestrian, cycle and PRoW networks (including bridleways) within the timeframe of construction of the Proposed Development are not anticipated.

14.6.4. Public transport networks are often subject to changes, particularly in rural areas. Bus services are susceptible to reductions in service due to the way they are funded and there is the potential for available services to be less frequent and/or less connected in 2028 than they are currently without maintaining or increasing funding.

14.7. Mitigation embedded into the design

14.7.1. This assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to remove potential significant effects as far as practicable, for example by the considered placement of infrastructure. **ES Volume 1**, **Chapter 3: Proposed Development Description [EN010149/APP/6.1]** and **ES**

Volume 3, **Appendix 3.1: Project Parameters [EN010149/APP/6.3]** and the Design Commitments which form part of the **Design Approach Document [EN010149/APP/7.3]** identify measures that have been embedded into the design of the Proposed Development. The embedded mitigation relevant to this assessment is detailed below and in **Table 14.22** and is secured through the management and control documents.

Table 14.22 Embedded mitigation relevant to traffic and transport

Embedded mitigation measure relevant to traffic and transport	Function	Securing mechanism
Upgrade of A15/B1191/Temple Road junction	Provide improvement to existing conditions for all users inclusive of a non-motorised user crossing point.	**Streets, Rights of Way and Access Plans [EN010149/APP/2.4]** **Draft DCO [EN10149/APP/3.1]**
Upgrade A15/Gorse Hill Lane junction	Improved junction infrastructure and surfacing for all users.	**Streets, Rights of Way and Access Plans [EN010149/APP/2.4]** **Draft DCO [EN10149/APP/3.1]**
B1191 RAF Digby and Ashby-de-la-Launde widening	Improved passing opportunities for all HGVs.	**Streets, Rights of Way and Access Plans [EN010149/APP/2.4]** **Draft DCO [EN10149/APP/3.1]**
Vehicle passing bays along Temple Road	Ensure safe passage of vehicles and AILs during construction.	**Streets, Rights of Way and Access Plans [EN010149/APP/2.4]** **Draft DCO [EN10149/APP/3.1]**

14.7.2. The Proposed Development seeks to protect and enhance the existing PRoW network and ensure the provision of new and improved multi-user routes whilst aligning with the Central Lincolnshire Local Plan (2018-2040) **[Ref.14-7]** and Local Transport Plan 5 **[Ref.14-8]** aspirations. These PRoW are outlined in the **oPRoWPPMP [EN010149/APP/7.12]**.

14.8. Assessment of likely effects (without additional mitigation)

Construction

14.8.1. The construction phase is set to be temporary across a four-year period. However, traffic associated with the Proposed Development could have an effect on:

- Severance;
- Driver delay;
- Pedestrian delay;
- Non-motorised user amenity;
- Road safety; and
- Hazardous/large loads.

14.8.2. Construction activities that would result in impacts to the study area are listed below:

- Construction works within the highway (improvements and cable route crossings)
- Movement of the construction workforce to and from the Site; and
- Movement of materials and construction equipment to and from the Site.

14.8.3. The estimated daily two-way construction trips for all Construction Compounds have been added to the '2028 future baseline' scenario to create the 'construction' scenario.

14.8.4. **Table 14.23** sets out the construction daily two-way trips by sensitivity assessed link section as outlined earlier in this chapter and the net and percentage change from the addition of construction flows. Based on this change, the table refers to whether the link is included or excluded from the assessment. It should be noted that 'All vehicles' in this table equates to LGVs and HGVs.

14.8.5. For Bloxholm Lane (Link 24), construction traffic (workers or HGVs) associated with the Proposed Development has not been distributed along this link. It has been assumed, for robustness of the assessment, that construction worker traffic would instead travel via B1202 Metheringham Heath Lane and the B1188 towards the Primary Construction Compound given the most convenient routes available. No traffic survey data has been collected on Bloxholm Lane.

14.8.6. For Gorse Hill Lane (Link 25), 2024 traffic surveys observed zero flows travelling on the link during the survey period. This link currently offers a gravel surface with limited access to properties and substandard

geometry at its junction with the A15, closely representing a private road rather than a through route along public highway. The proposed traffic volumes shown for Gorse Hill Lane therefore only correspond to construction two-way trips utilising the initial 320 metres of the link from the A15, which will be significantly upgraded to modern design standards as part of embedded mitigation for the Proposed Development (refer to **Table 14.22** above). On this basis, it would not be appropriate to assess the effects of construction traffic flows on what is effectively a new or replacement link, particularly as the improvement works are embedded not additional mitigation.

Table 14.23 Construction scenario daily two-way trips (net and percentage change) on assessed links

Link no.	Link Description	2028 future baseline + construction traffic		Difference between 2028 future baseline and construction traffic		% change : 2028 future baseline v construction traffic		Included or excluded from the assessment based on IEMA Guidelines [Ref 14-11] Rule 1 and 2
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	
1	A15: Heath Road to B1202 Heath Lane	18594	670	757	130	4%	24%	Excluded
2	A15: B1202 Heath Lane to Green Man Road	17717	626	740	130	4%	26%	Excluded
3	A15: Green Man Rd to staggered junction	16139	650	586	130	4%	25%	Excluded
4	A15: staggered junction to Gorse Hill Lane	16139	650	586	130	4%	25%	Excluded
5	A15: Gorse Hill Lane to Thompsons Bottom Farm	16139	650	586	130	4%	25%	Excluded

Link no.	Link Description	2028 future baseline + construction traffic		Difference between 2028 future baseline and construction traffic		% change : 2028 future baseline v construction traffic		Included or excluded from the assessment based on IEMA Guidelines [Ref 14-11] Rule 1 and 2
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	
6	A15: Thompsons Bottom Farm to B1191	15088	661	517	138	4%	26%	Excluded
7	A15: B1191 to unnamed road (leading to Ruskington)	17441	714	470	130	3%	22%	Excluded
8	A15: unnamed road (leading to Ruskington) to Sleaford Road	18780	862	426	130	2%	18%	Excluded
9	A15: Sleaford Road to Leasingham	18780	862	426	130	2%	18%	Excluded
10	A15: Leasingham to	18780	862	426	130	2%	18%	Excluded

Link no.	Link Description	2028 future baseline + construction traffic		Difference between 2028 future baseline and construction traffic		% change : 2028 future baseline v construction traffic		Included or excluded from the assessment based on IEMA Guidelines [Ref 14-11] Rule 1 and 2
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	
	Holdingham Roundabout							
11	B1191: A15 to Ashby de la Launde	3364	206	556	150	20%	268%	Included
12	B1191: Ashby de la Launde to RAF Digby	4136	140	248	80	6%	133%	Included
13	B1191: RAF Digby to edge of Scopwick	3280	140	248	80	8%	133%	Included
14	B1191: edge of Scopwick to B1188	3280	140	248	80	8%	133%	Included
15	B1188: Metheringham	12814	264	325	0	3%	0%	Excluded
16	B1188: Between Metheringham and Blankney	5785	104	200	0	4%	0%	Excluded

Link no.	Link Description	2028 future baseline + construction traffic		Difference between 2028 future baseline and construction traffic		% change : 2028 future baseline v construction traffic		Included or excluded from the assessment based on IEMA Guidelines [Ref 14-11] Rule 1 and 2
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	
17	B1188: Blankney	5785	104	200	0	4%	0%	Excluded
18	B1188: Between Blankney and Scopwick	5865	184	280	80	5%	77%	Included
19	B1188: Scopwick	5095	100	156	0	3%	0%	Excluded
20	B1188: Between Scopwick and Digby	3449	88	40	0	1%	0%	Excluded
21	B1188: Digby	3449	88	40	0	1%	0%	Excluded
22	B1202 between A15 and B1188	3589	160	78	0	2%	0%	Excluded
23	Navenby Lane	1425	12	71	0	5%	0%	Excluded
24	Bloxholm Lane	-	-	-	-	-	-	Excluded

Link no.	Link Description	2028 future baseline + construction traffic		Difference between 2028 future baseline and construction traffic		% change : 2028 future baseline v construction traffic		Included or excluded from the assessment based on IEMA Guidelines [Ref 14-11] Rule 1 and 2
		All vehicles	HGV	All vehicles	HGV	All vehicles	HGV	
25	Gorse Hill Lane	723	80	723	80	-	-	Excluded
26	Temple Road	534	42	35	30	7%	250%	Included

14.8.7. The results in **Table 14.23** demonstrate that during the construction of the Proposed Development, the 'all vehicle' daily two-way trips are not predicted to increase by more than 30% across any link. The receptor sensitivity on the A15 (links 1 to 10), B1191 (links 11 to 14) and B1188 (links 15 to 21) varies as a result of residential properties/other sensitive receptors on these links. However, owing to the small increase in daily total two-way trips on these links, it is predicted that potential significant effects would not arise during construction.

14.8.8. Notwithstanding the above, HGV two-way trips are predicted to increase by more than 30% on a number of these links and while any potential effect would be temporary, potential effects are predicted to arise as a result. Therefore prior to the consideration of additional mitigation, potential effects relating to pedestrian delay, non-motorised user amenity and fear and intimidation could arise for users of the A15, B1191, and B1188.

14.8.9. In relation to the increase in HGVs and the associated potential effects, the following points should be taken into consideration:

- The assessed HGV two-way trips represent the sum of peak HGV trips for each Primary and Secondary Construction Compound on the local road network. In practice, the construction of each Construction Compound will be phased, and the peak HGV two-way trips for each Construction Compound will not occur simultaneously; and
- The percentage increase in HGV traffic represents a daily increase in two-way trips and is a result of the low number of existing observed baseline HGV trips. In actual vehicle numbers, the increase in HGVs may not be as considerable as it may first appear. For example, the 268% increase (or 150 two-way trips) in HGV movements on Link 11 is equivalent to an additional HGV trip every 4 minutes in any direction during peak hours.

14.8.10. It is expected that the majority of construction vehicles accessing Primary Construction Compounds would be of standard size (HGVs and LGVs). However, there is expected to be a requirement for a number of AIL deliveries and, across the entire construction phase, these are anticipated to comprise:

- 4 to 7 AILs for the main transformer deliveries.
- 0 to 3 AILs for cranes.
- 18 AILs for the delivery of the 400 kilovolts (kV) cable drums.

14.8.11. No loads of a dangerous nature are anticipated to be transported during construction, based on the classification on loads from the Department for Transport **[Ref 14-18]**. Mitigation measures for AIL is covered in further detail within the **oCTMP [EN010149/APP/7.8]**.

14.8.12. There are also four new PRoW and four new permissive paths proposed across the Site which would improve connectivity for recreational non-motorised users. There could be changes to amenity of non-motorised users through the provision of temporary road closures or temporary traffic management; however, any changes would be temporary in nature and mitigated through appropriate signage and alternative provisions for non-motorised users being made to ensure amenity is not adversely impacted. These are outlined in the **oPRoWPPMP [EN010149/APP/7.12]**.

Decommissioning

14.8.13. It is considered that any effects associated with decommissioning will not be greater than those associated with construction. No detailed assessments in regard to effects (without additional mitigation) have been undertaken. Any effects associated with decommissioning are considered as part of the **oDEMP [EN010149/APP/7.13]**.

14.9. Additional mitigation

Construction

14.9.1. An **oCTMP [EN010149/APP/7.8]** is submitted in support of the DCO Application. The **oCTMP [EN010149/APP/7.8]** provides a framework of the construction traffic routing, site access, delivery of materials, construction working hours, and management and monitoring measures. Detailed CTMP(s) will be developed, submitted and approved post-consent (secured by a Requirement in the **Draft DCO [EN010149/APP/3.1]**).

14.9.2. The **oCTMP [EN010149/APP/7.8]** will be implemented and managed by the principal contractor undertaking the construction works and sets out measures to avoid, minimise or mitigate the environmental effects of traffic during construction, and will limit the impact on existing users of the public highway network or those located close to it.

14.9.3. The aim of the **oCTMP [EN010149/APP/7.8]** is to outline the specific transport impacts arising from the construction works and to provide a framework for addressing these impacts. The **oCTMP [EN010149/APP/7.8]** only considers the construction phase of the Proposed Development and has been prepared to ensure that the construction process, and management and mitigation measures, including temporary diversions and construction vehicle management, minimise the impact on existing users of the public highway network.

14.9.4. The **oCTMP [EN010149/APP/7.8]** includes procedures to mitigate against traffic and transport related impacts and includes procedures to manage movement of workers and HGVs, ensuring continued monitoring, review and improvement of the **oCTMP [EN010149/APP/7.8]** and associated mitigation measures put in place. It also outlines the routeing strategy for

the Proposed Development construction traffic, conditions survey requirements and onsite construction activities (wheel washing etc).

14.9.5. The **Outline Travel Plan** has been prepared and forms part of the **oCTMP [EN010149/APP/7.8]**. The **Outline Travel Plan** sets out strategies to encourage the use of sustainable transport for the construction workforce. This includes details on initiatives to encourage a mode shift away from private car use.

14.9.6. The **Outline Travel Plan** within the **oCTMP [EN010149/APP/7.8]** includes a traffic management measure as an alternative to implementation of a junction improvement scheme at the A15/B1202 junction, due to be delivered by Lincolnshire County Council and the Lincolnshire Road Safety Partnership to address existing road safety matters in this location. In the event that this junction is not improved in advance of construction commencing for the Proposed Development, a commuter bus service will be implemented to pick up construction workers from designated points in Lincoln and Branston and transport them to the Primary Construction Compounds. This is expected to generate around two buses an hour and therefore represents a negligible change in traffic volumes.

14.9.7. The **oPRoWPPMP [EN010149/APP/7.12]** is submitted in support of the DCO Application. This sets out the mitigation, management, and monitoring measures for PRoW affected by construction which may require temporary diversion/closure, or alternative routing where the former is not possible.

Decommissioning

14.9.8. The **oDEMP [EN010149/APP/7.13]** outlines requirements in respect to vehicular routeing and PRoW management during decommissioning and is secured by Requirement in the **Draft DCO [EN010149/APP/3.1].**

14.9.9. Requirements for mitigation associated with decommissioning are not expected to be greater than those detailed associated with the construction phase and will be secured by the **oDEMP [EN010149/APP/7.13]**.

14.9.10. During the decommissioning phase, it is considered that mitigation may have developed, options to mitigate and even route options (for example, associated with PRoW) may have changed. As a result, any decommissioning requirements will be addressed as part of the Decommissioning Environmental Management Plan to be prepared in accordance with the **oDEMP [EN010149/APP/7.13]** and approved under Requirement 19 of the **Draft DCO [EN010149/APP/3.1].**

14.10. Assessment of residual effects (with additional mitigation)

Construction

Severance

14.10.1. For severance, the IEMA Guidelines **[Ref 14-11]** state that any change in all vehicles between 0-30% is of negligible magnitude. In regard to HGVs, the IEMA Guidelines **[Ref 14-11]** acknowledge that changes in the composition of traffic can affect severance. The Proposed Development would require:

- 110 daily total HGV two-way trips for Springwell West (MC1);
- Up to 70 daily total HGV two-way trips for Springwell Central (MC2); and
- Up to 80 daily total HGV two-way trips for Springwell East (MC3).

14.10.2. Owing to the low number of existing HGV trips contained in the '2028 future baseline' scenario, the percentage change may be more pronounced than when it is compared to the net change in HGV two-way trips brought on by the Proposed Development. However, the IEMA Guidelines **[Ref 14-11]** recognise that:

"Caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic".

14.10.3. It is noted therefore that the percentage increase may be overestimating the magnitude of impact owing to the assessment's use of IEMA Guidelines **[Ref 14-11]** traffic change thresholds.

14.10.4. Due to the distribution of HGVs throughout the day, the absolute increase in HGVs is not considered to have an impact on severance. For example, 150 two-way HGV movements on Link 11 as shown in **Table 14-23**, is equivalent to an additional HGV trip every 4 minutes in any direction during peak hours.

14.10.5. In respect to severance, the sensitivity of non-motorised users along these affected links is medium, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of severance, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on users of links following the implementation of additional mitigation measures, which is considered to be **not significant**.

Driver delay

14.10.6. A total of eight junctions have been assessed in detail based on their proximity to the Construction Compounds within the study area. The

change in delay in seconds experienced during the ‘construction’ scenario compared to the ‘2028 future baseline’ scenario is presented in **Table 14.23** and their locations presented within **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

Table 14.24 Driver delay: change in delay (seconds) 'construction' scenario minus '2028 future baseline' scenario

Junction no.	Junction	Streams (vehicle turning movements e.g. B-C = B (B1191) to C (A15 South)		Change in delay in seconds – AM peak period	Change in delay in seconds – PM peak period
1	A15/B1191	Stream B-C	A – A15 North B – B1191 C – A15 South D – Temple Road	0.61	2.22
		Stream B-AD		6.77	18.91
		Stream A-BCD		0.14	7.39
		Stream D-A		8.25	0.24
		Stream D-BC		1.96	1.89
		Stream C-ABD		1.35	0.34
2 SCENARIO: (Lincolnshire County Council junction improvement scheme)	A15/B1202	Stream B-CD	A15 North B1202 Metheringham Heath Lane A15 South B1202 Heath Lane	0.4	0.2
		Stream B-AD		0.5	2.2
		Stream A-BCD		0.2	0.5
		Stream D-A		0.0	-0.2
2 SCENARIO: (Worker commuter bus service)	A15/B1202	Stream B-CD	A – A15 North B – B1202 Metheringham Heath Lane C – A15 South D – B1202 Heath Lane	11.37	17.61
		Stream B-AD		10.78	19.47
		Stream A-BCD		0.01	0.02
		Stream D-A		8.78	0.86
		Stream D-BC		8.7	1.61
		Stream C-ABD		0.0	0.06
3		Stream B-C	A – A15 North	1.33	-7.17

Junction no.	Junction	Streams (vehicle turning movements e.g. B-C = B (B1191) to C (A15 South)		Change in delay in seconds – AM peak period	Change in delay in seconds – PM peak period
	A15/Navenby Lane	Stream B-A	B – Navenby Lane C – A15 South	7.80	4.58
		Stream C-AB		-0.05	-0.08
4	A15/Gorse Hill Lane	Stream B-C	A – A15 South B – Gorse Hill Lane C – A15 North	8.09	9.38
		Stream B-A		28.62	25.00
		Stream C-AB		9.40	7.23
5	B1188/B1202	Stream B-C	A – B1188 South B – B1202 C – B1188 North	1.06	1.23
		Stream B-A		5.32	3.91
		Stream C-AB		-0.13	0.06
6	B1188/B1191 Heath Road	Stream B-C	A – B1188 South B – B1191 Heath Road C – B1188 North	0.27	0.34
		Stream B-A		0.71	0.78
		Stream C-AB		0.34	0.28
7	B1188/B1191 Main Street	Stream B-C	A – B1188 North B – B1191 Main Street C – B1188 South	0.39	0.06
		Stream B-A		1.26	0.11
		Stream C-AB		-0.02	0.05
8	B1191/Navenby Lane/Main Street	Stream B-C	A – B1191 North B – Main Street C – B1191 South D – Navenby Lane	0.12	0.08
		Stream B-AD		0.39	0.22
		Stream A-BCD		0.05	-0.08
		Stream D-A		0.11	0.14

Junction no.	Junction	Streams (vehicle turning movements e.g. B-C = B (B1191) to C (A15 South)	Change in delay in seconds – AM peak period	Change in delay in seconds – PM peak period
		Stream D-BC	0.28	0.27
		Stream C-ABD	-0.09	0.01

14.10.7. The sensitivity of drivers, shown in **Table 14.25** below, has been determined by calculating the average ratio of flow to capacity in the AM and PM peak periods for Junctions 1 to 8 and has been compared against the sensitivity criteria set out in **Table 14.11**.

14.10.8. For Junction no. 4 (A15/Gorse Hill Lane), no existing flows were observed during the traffic surveys and as such the future baseline for this junction cannot be shown in the junction model.

Table 14.25 Driver delay: sensitivity of receptors (drivers) and average ratio of flow to capacity

Junction no.	Average ratio of flow to capacity in the AM peak period	Sensitivity	Average ratio of flow to capacity in the PM peak period	Sensitivity
1	0.16	Negligible	0.13	Negligible
2	0.92	High	0.71	Medium
3	0.12	Negligible	0.13	Negligible
5	0.25	Negligible	0.29	Negligible
6	0.16	Negligible	0.18	Negligible
7	0.17	Negligible	0.10	Negligible
8	0.1	Negligible	0.1	Negligible

14.10.9. With the exception of Junction no. 2, the sensitivity of drivers at these affected junctions is negligible, and the magnitude of impact, following additional mitigation (worker commuter bus service, junction improvements), is negligible. Therefore, in terms of driver delay, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on drivers following the implementation of additional mitigation, which is considered to be **not significant**.

14.10.10. At Junction no. 2, where pre-existing issues have already prompted Lincolnshire County Council to consider plans for junction improvements, the proposals are predicted to result in a maximum change in delay of 0.5 seconds during both peak periods demonstrating that they would mitigate the impact of construction traffic. In the scenario of worker minibus service, it is anticipated that there will be a maximum change in delay of 11.37 seconds in the AM peak period on Stream B-CD. In the PM peak period at the same junction, a maximum change in delay of 19.47 seconds is noted to occur on Stream B-AD.

14.10.11. Additionally, the North Hykeham Relief Road is also expected to reduce traffic flows on the A15, improving performance of the junction (thereby reducing the impact of traffic generated by the Proposed Development).

14.10.12. At Junction no. 2 (A15/B1202), in the AM peak period, the sensitivity of drivers is high, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of driver delay, there is likely to be a direct, temporary, medium-term minor adverse residual effect on drivers following the implementation of additional mitigation measures, which is considered to be not significant. In the PM peak period, the sensitivity of drivers is medium, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of driver delay, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on drivers following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.13. Impacts on driver delay can also occur from construction activities undertaken within the highway. A number of construction works will take place on the local road network, comprising junction upgrades, new accesses to serve Construction Compounds and cable route crossings. These works would be undertaken using single lane closures, maintaining the connectivity of the road at all times. These works will have a temporary impact and are expected to be of short duration with formal traffic management measures implemented and secured through the **oCTMP [EN010149/APP/7.8]**.

14.10.14. Where these occur on the A road network, it is anticipated that any lane closures will need to be undertaken outside of peak hours and inter-peak periods due to the potential disruption to key routes.

14.10.15. On B roads and minor roads, these works are likely to be undertaken under the operation of local traffic management with the use of temporary traffic signals or similar methods to allow single lane closures, outside of peak hours. These measures are also secured in the **oCTMP [EN010149/APP/7.8].**

14.10.16. The sensitivity of drivers travelling along these links during these time periods is considered to be low and the magnitude of impact, following additional mitigation, is medium. Therefore, in terms of driver delay, there is likely to be a direct, temporary, short-term **minor adverse** residual effect on drivers following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.17. The junction upgrade works at the A15/Gorse Hill Lane junction will necessitate the closure of the section of Gorse Hill Lane that is being improved. It is likely that this will need to be closed for a month to allow the works to be completed. Gorse Hill Lane serves a limited number of properties which are accessible from both east and west directions. The traffic survey indicated that the eastern end carried zero traffic.

14.10.18. The sensitivity of drivers travelling along Gorse Hill Lane is considered to be negligible and the magnitude of impact, following additional mitigation, is medium. Therefore, in terms of driver delay, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on drivers following the implementation of additional mitigation measures, which is considered to be **not significant**.

Pedestrian delay

14.10.19. The IEMA Guidelines **[Ref 14-11]** do not recommend solely making use of definitive thresholds, and instead recommends that the competent traffic and movement expert use their judgment to determine whether pedestrian delay constitutes a significant effect. The assessment has therefore taken a two-step approach to determine the effect on pedestrian delay. First, by looking at the percentage change in traffic between the '2028 future baseline' scenario and the 'construction' scenario followed by a review of local site conditions.

14.10.20. **Table 14.26** below provides an overview of the percentage change in total traffic and HGV traffic.

14.10.21. The assessment, as shown in **Table 14.25** above, shows that there is no increase in daily total traffic of more than 30%. It is noted that the HGV component of construction traffic increases more in percentage terms in the Construction scenario compared to daily total traffic. The IEMA Guidelines **[Ref 14-11]** note that changes in the composition of traffic can have as much of an impact on pedestrian delay as overall increases in traffic.

Table 14.26 Pedestrian delay: percentage change in daily total traffic (two-way trips)

Link no.	Link	Percentage change in daily total traffic (two-way trips, all vehicles)	Percentage change in daily HGV traffic (two-way trips)
11	B1191 - A15 to Ashby de la Launde	20%	268%
12	B1191 - Ashby de la Launde to RAF Digby	6%	133%
13	B1191 - RAF Digby to Scopwick	8%	133%
14	B1191 - Scopwick to B1188	8%	133%
18	B1188 - Scopwick to Blankney	5%	77%
26	Temple Road	7%	250%

14.10.22. A review of local conditions has been conducted as the IEMA Guidelines **[Ref 14-11]** note that definitive thresholds to determine the impact on pedestrian delay may not be appropriate as there are too many factors that can affect pedestrian delay.

14.10.23. The detailed review has included links where the receptor sensitivity is noted to be medium, high or very high, as in consideration of the additional mitigation proposed in **Section 14.9** above, impacts on receptors deemed to be of low or negligible sensitivity will not constitute a significant effect (refer to **Table 14.18** above).

14.10.24. The percentage change in total vehicles during the construction of the Proposed Development does not amount to a 30% change. Outputs of the review are summarised below in **Table 14.27**.

Table 14.27 Pedestrian delay: review of local site conditions

Link no.	Link	Formal pedestrian crossing available	Availability of pedestrian infrastructure	Potential for pedestrian delay
12	B1191 - Ashby de la Launde to RAF Digby	Yes. One pedestrian crossing on the B1191 in RAF Digby. The crossing leads to a recreational sports area.	<u>RAF Digby</u> Pedestrian facilities are available on the B1191 within the extent of RAF Digby. Pedestrian provision decreases nearing the extent of RAF Digby. <u>B1191</u> No pedestrian facilities are available on the B1191 between Ashby de la Launde and RAF Digby.	This section of the B1191 travels through the residential areas of RAF Digby. Pedestrian facilities are available throughout the settlement, although it is noted that only one formal pedestrian crossing is available and is located on the B1191. There are a number of trip attractors throughout the settlement. In particular, recreational sports areas are located closely to the pedestrian crossing, making it a desirable path for pedestrians. However, during the construction phase, it is anticipated that the Proposed Development would generate two HGVs every 15-minutes during construction working hours on this link. Based on professional judgement, it is considered that this would not result in a perceivable issue to existing users or in a material change to the provision offered to pedestrians.
14	B1191 - Scopwick to B1188	No	Pedestrian facilities available on the B1191 as it approaches Scopwick in the form of footways. Two bus stops are located on the B1191 next to the	This section of the B1191 travels through the settlement of Scopwick. Footways are only available on the southern extent of the B1191 carriageway and as such, it is unlikely that pedestrians would cross the B1191 to reach trip attractors in Scopwick. Two PRoW are located to the west of Scopwick and

Link no.	Link	Formal pedestrian crossing available	Availability of pedestrian infrastructure	Potential for pedestrian delay
			B1191/The Granaries junction. A number of residential properties with direct frontage on the B1191 can be found.	directly come off the B1191 Heath Road. It is noted that pedestrians would be required to cross the B1191 Heath Road to reach these PRoW. Pedestrian movements would be expected but this would be deemed to be low given the low number of properties and only on one side of the road at a time. On this link, the Proposed Development is estimated to generate two HGV two-way trips every 15 minutes during construction working hours. Based on professional judgement, it is considered that this would not result in a perceivable issue to existing users or in a material change to the provision offered to pedestrians.

14.10.25. The sensitivity of pedestrians is medium, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of pedestrian delay, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on pedestrians following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.26. Impacts on pedestrian delay can also occur as a result of closures of PRoW where these lead to material changes in distance for non-motorised users and therefore changes in journey time.

14.10.27. A number of PRoW will potentially be subject to temporary closures during the construction phase to facilitate construction activities. Within the Springwell East area, there are a number of alternative routes available for both north/south and east/west movements that will be used as diversion routes. These alternative routes retain connectivity throughout the construction phase. With the exception of the Spires and Steeples Trail, which is deemed to have a medium sensitivity, all other PRoW are considered to have a low sensitivity.

14.10.28. The Spires and Steeples Trail (comprising PRoW routes Blan/737/1; Scop/737/1; Scop/1135/2; Scop/1135/1 and Scop/10/1) will therefore not be subject to closures, while all other PRoW have the potential to be closed, subject to the requirements of the principal contractor. All closures and their temporary management arrangements will be secured through the detailed **PRoWPPMP [EN010149/APP/7.12]**.

14.10.29. Consideration of potential impacts to users of PRoW has been assessed against the distance between the principal routes and alternatives proposed in the **oPRoWPPMP [EN010149/APP/7.12]**. It is considered that no alternative route considered within the **oPRoWPPMP [EN010149/APP/7.12]** results in an increase in time taken to replicate similar journey routing greater than +10 minutes compared to the principal route, nor greater distance than +800m, with route compositions remaining as in the existing conditions.

14.10.30. The wide variety of PRoW options, particularly in Springwell East, allow for a multitude of route possibilities and therefore the magnitude of impact on PRoW users is anticipated to be minor where changes are likely to be perceptible, not to the extent that they would materially change conditions which would otherwise prevail. Therefore, in terms of pedestrian delay, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect following the implementation of additional mitigation measures **oPRoWPPMP [EN010149/APP/7.12]**), which is considered to be **not significant**.

Non-motorised user amenity

14.10.31. The effect on non-motorised user amenity has first been determined based on where the traffic two-way flow or HGV component is halved/doubled, followed by a review to pay full regard to specific local conditions.

14.10.32. As per **Table 14.23** above, although traffic is predicted to increase on all assessed links, the total traffic two-way flow does not double on any link and the percentage change remains below 30%. However, the HGV component does increase by more than 100% on a number of links, which have therefore been assessed.

14.10.33. The significance of effect for assessed links is set out in **Table 14.28**.

Table 14.28 Non-motorised user amenity assessment

Link no.	Link	Sensitivity of receptors	Magnitude of impact	Significance of effect
11	B1191 - A15 to Ashby de la Launde	Low	Negligible	**Negligible**
12	B1191 - Ashby de la Launde to RAF Digby	Medium	Negligible	**Negligible**
13	B1191 - RAF Digby to Scopwick	Low	Negligible	**Negligible**
14	B1191 - Scopwick to B1188	Medium	Negligible	**Negligible**
18	B1188 - Scopwick to Blankney	Low	Negligible	**Negligible**
26	Temple Road	Low	Negligible	**Negligible**

14.10.34. The sensitivity of non-motorised users is medium, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of non-motorised user amenity, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on non-motorised users following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.35. At Link no.13 (B1191 - from RAF Digby to Scopwick), the Proposed Development is seeking to establish a new PRoW linking RAF Digby and Scopwick connecting into the existing PRoW network as well as footway improvements. The sensitivity of non-motorised users is low, and the magnitude of impact, following additional mitigation, is high. Therefore, in terms of non-motorised user amenity, there is likely to be a direct, temporary, medium-term **moderate beneficial** residual effect on non-

motorised users following the implementation of additional mitigation measures, which is considered to be **significant**.

14.10.36. The construction phase of the Proposed Development will add HGVs to the road network, and the HGV component of traffic generated by construction in particular could have an effect on the pleasantness of journeys for non-motorised users. However, as per the assessment of pedestrian delay and the review summarised in **Table 14.28**, the number of HGV two-way trips being added to the road network and each link is not anticipated to be substantial enough to result in a perceptible change able to impact the pleasantness of journeys carried out by non-motorised users.

14.10.37. A further review of local conditions for links where the receptor sensitivity has been deemed to be medium, high or very high has been carried out, as in consideration of the additional mitigation proposed in **Section 14.9** above, impacts on receptors deemed to be of low or negligible sensitivity will not constitute a significant effect (refer to **Table 14.18** above). The review has shown that the overall existing level of provision for non-motorised users is limited. **Table 14.29** summarises this review.

Table 14.29 Non-motorised user amenity - review of local conditions

Link no.	Link	Site conditions
12	B1191 - Ashby de la Launde to RAF Digby	No non-motorised user facilities are available on the B1191 between Ashby de la Launde and RAF Digby. Grass verges are located on both sides of the carriageway. Pedestrian facilities are available on the B1191 within the extent of RAF Digby but it is noted that this provision takes the form of existing footways. Pedestrian provision decreases nearing the extent of RAF Digby. A signalised pedestrian crossing (Belisha beacons) is available within RAF Digby and provides a connection to a nearby recreational/outdoor sports area to the immediate east of the B1191.
14	B1191 - Scopwick to B1188	Pedestrian facilities are available on the B1191 as it approaches Scopwick in the form of footways. The footway in this location is approximately 1.5-2m wide and crosses a number of private access junctions which are provided with dropped kerbs.

14.10.38. The PRoW likely to be affected by construction are outlined in the **oPRoWPPMP [EN010149/APP/7.12]**.

14.10.39. The Proposed Development includes proposals to provide three new PRoW and four permissive paths, as well as improvements to existing PRoW, as follows:

- Proposed new PRoW linking RAF Digby to Scopwick;
- Proposed new permissive path from Heath Road to link to the existing PRoW between RAF Digby and Rowston and to enable a circular walking route;
- Proposed new PRoW to provide a connection between the existing PRoW west of the A15 (near Navenby Lane) to New England Lane;
- Proposed new permissive path along the western edge of the Proposed Development linking New England Lane to Temple Road, north of Brauncewell;
- Proposed new PRoW from Temple Road (north of Brauncewell) to the Bloxham Woods Car Park to provide a connection across the A15;
- Proposed new permissive path linking Bloxholm Wood to Brauncewell Village;
- Proposed new permissive paths creating a circular walk at Bloxholm Wood;
- Improvements to the Bloxham Wood access on Heath Road; and
- Proposed enhancement to the existing PRoW between Scopwick and Blankney.

14.10.40. The above will have a beneficial effect on non-motorised user amenity and severance. This is further detailed in the **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

14.10.41. The introduction of new PRoW and permissive path routes post-construction will provide important circular and linear routes across the Order Limits, as set out in the **Streets, Rights of Way and Access Plans [EN010149/APP/2.4],** and **oPRoWPPMP [EN010149/APP/7.12]**. These will be signposted and operational post-construction for all users. These will have an additional beneficial effect on non-motorised user amenity and severance during the operational (including maintenance) phase. This is further detailed in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]** and not assessed in this chapter.

Fear and intimidation

14.10.42. In accordance with the IEMA Guidelines **[Ref. 14-11]**, the assessment has calculated a total degree of hazard score for the '2028 future baseline' scenario and the 'construction' scenario and has compared them to determine the change in degree of hazard score to identify the significance of effect.

14.10.43. **Table 14.30** below sets out the average traffic flow over an 18-hour day (all vehicles per hour two-way), the total 18-hour HGV two-way flow and the average vehicle speed in the '2028 future baseline' scenario and the 'construction' scenario.

Table 14.30 Fear and intimidation – '2028 future baseline' scenario and 'construction' scenario data

Link no.	Link	2028 future baseline scenario			Construction scenario		
		Average traffic flow over 18-hr day - all vehicles/hour 2-way (A)	Total 18-hr HGV flow (B)	Average vehicle speed (mph) (C)	Average traffic flow over 18-hr day - all vehicles/hour 2-way (A)	Total 18-hr HGV flow (B)	Average vehicle speed (mph) (C)
11	B1191 - A15 to Ashby de la Launde	167	74	60*	208	274	60*
12	B1191 - Ashby de la Launde to RAF Digby	231	80	45	250	186	45
13	B1191 - RAF Digby to Scopwick	181	80	54	199	186	54
14	B1191 - Scopwick to B1188	181	80	30*	199	186	30*
18	B1188 - Scopwick to Blankney	333	138	52	353	245	52
26	Temple Road	30	16	60*	32	56	60*

**Corresponds to the speed limit and not the average observed vehicle speed due to unavailability of data.*

14.10.44. **Table 14.30** sets out the degree of hazard score for the '2028 future baseline' scenario and the 'construction' scenario, based on the IEMA Guidelines **[Ref 14-11]** thresholds.

Table 14.31 Fear and intimidation – '2028 future baseline' scenario and 'construction' scenario degree of hazard score

Link no.	Link	2028 future baseline scenario			Construction scenario		
		Average traffic flow over 18-hr day - all vehicles/ hour 2-way (A)	Total 18-hr HGV flow (B)	Average vehicle speed (mph) (C)	Average traffic flow over 18-hr day - all vehicles/hour 2-way (A)	Total 18-hr HGV flow (B)	Average vehicle speed (mph) (C)
11	B1191 - A15 to Ashby de la Launde	0	0	30	0	0	30
12	B1191 - Ashby de la Launde to RAF Digby	0	0	30	0	0	30
13	B1191 - RAF Digby to Scopwick	0	0	30	0	0	30
14	B1191 - Scopwick to B1188	0	0	10	0	0	10
18	B1188 - Scopwick to Blankney	0	0	30	0	0	30
26	Temple Road	0	0	30	0	0	30

14.10.45. The total hazard score and the level of fear and intimidation for the '2028 future baseline' scenario and the 'construction' scenario is summarised in **Table 14.31**.

Table 14.32 Fear and intimidation – '2028 future baseline' scenario and 'construction' scenario total hazard score and level of fear and intimidation

Link no.	Link	2028 future baseline scenario		Construction scenario	
		Total hazard score	Level of fear and intimidation	Total hazard score	Level of fear and intimidation
11	B1191 - A15 to Ashby de la Launde	30	Moderate	30	Moderate
12	B1191 - Ashby de la Launde to RAF Digby	30	Moderate	30	Moderate
13	B1191 - RAF Digby to Scopwick	30	Moderate	30	Moderate
14	B1191 - Scopwick to B1188	10	Small	10	Small
18	B1188 - Scopwick to Blankney	30	Moderate	30	Moderate
26	Temple Road	30	Moderate	30	Moderate

14.10.46. The assessment of fear and intimidation has shown that overall, there is no change in the level of fear and intimidation between the '2028 future baseline' scenario and the 'construction' scenario.

14.10.47. The magnitude of impact on fear and intimidation and the significance of effect is summarised in **Table 14.33** below.

Table 14.33 Fear and intimidation - significance of effect

Link no.	Link	Sensitivity of receptor	Magnitude of impact	Significance of effect
11	B1191 - A15 to Ashby de la Launde	Low	Negligible	**Negligible**
12	B1191 - Ashby de la Launde to RAF Digby	Medium	Negligible	**Negligible**
13	B1191 - RAF Digby to Scopwick	Low	Negligible	**Negligible**
14	B1191 - Scopwick to B1188	Medium	Negligible	**Negligible**
18	B1188 - Scopwick to Blankney	Low	Negligible	**Negligible**
26	Temple Road	Low	Negligible	**Negligible**

14.10.48. The maximum sensitivity of users of assessed links is **medium**, and the magnitude of impact, following additional mitigation, is **negligible**. Therefore, in terms of fear and intimidation, there is likely to be a direct, temporary, medium-term **negligible adverse** residual effect on users of links following the implementation of additional mitigation measures, which is considered to be **not significant**.

Road safety

14.10.49. The IEMA Guidelines **[Ref 14-11]** recommend the use of the 'Safe System' best practice approach which includes the use of International Road Assessment Programme star rating protocols or similar tools produced by individual highway authorities. The Applicant has contacted Lincolnshire Road Safety Partnership and Lincolnshire County Council highways officers (as the local highway authority) and notes that it does not hold International Road Assessment Programme star rating data for the links assessed within this chapter. A review of National Highways' Star Rating Report dated March 2022 **[Ref 14-17]** suggests that there are no International Road Assessment Programme star ratings available for the road network surrounding the Proposed Development.

14.10.50. In the absence of iRAP ratings, the assessment considers a cluster-focused approach.

14.10.51. The Proposed Development will generate additional daily two-way trips, but this remains at less than 30% for all traffic. The percentage increase in HGVs is more sizeable in comparison, although as previously noted, this is due to the low number of existing daily HGV two-way trips on links 11-14, 18 and 25.

14.10.52. HGVs present a higher risk when turning into an access or at a junction and the junction improvements on the A15 as part of the embedded mitigation (refer to **Table 14.22** above) already minimise effects in these locations. The existing B1191/B1188 junction has been reviewed against highway design standards and meets the necessary criteria, while all Site accesses have been designed to meet highway design standards. The B1191 will also be improved to facilitate increased two-way movement of HGVs along links 11 and 12.

14.10.53. The embedded mitigation proposals (refer to **Table 14.22** above) outline the improvements to be made to the A15/B1191 and A15/Gorse Hill Lane junctions as part of the Proposed Development as a consequence of the assessments undertaken in this chapter. A Road Safety Audit of wider junction improvements has been completed and is provided in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

PIC review

14.10.54. Personal Injury Collision (PIC) data have been obtained for the most recent five-year period available (01/05/2019 to 30/04/2024) from the Lincolnshire Road Safety Partnership. As part of **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**, a review has been conducted across the study area and a cluster analysis has also been conducted.

14.10.55. The section provides a summary of the assessment and main conclusions, which are set out in full in **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]**.

14.10.56. PIC severity can be classed as slight, serious, and fatal. Within this five-year period, a total 279 collisions took place along the links identified/assessed, resulting in 214 slight accidents (77%), 54 serious accidents (19%) and 11 fatal accidents (4%). **Table 14.34** summarises the PIC data for the most recent five-year period available at the time of assessment.

Table 14.34 Summary of collisions (1 May 2019 to 30 April 2024)

Severity	1 May 2019 – 30 April 2020	1 May 2020 – 30 April 2021	1 May 2021 – 30 April 2022	1 May 2022 – 30 April 2023	1 May 2023 – 30 April 2024
Slight	47	26	41	42	58
Serious	11	9	6	10	18
Fatal	2	2	3	1	3
Total	**60**	**37**	**50**	**53**	**79**

Collision clusters

14.10.57. **ES Volume 3, Appendix 14.1: Transport Assessment [EN010149/APP/6.3]** has identified a number of collision clusters. For the purposes of the traffic and transport assessment, a collision cluster is defined as a 50m radius in which five or more collisions have occurred over a five-year period.

14.10.58. Where clusters have been identified at/or adjacent to junctions, for robustness, the junction has been assessed as a whole, including all collisions within and on approach to the junction – even if not within a 50m radius. The identified clusters are presented in **Table 14.35**.

Table 14.35 Collision cluster analysis

Junction collision cluster	PICs
A15/A17 Holdingham roundabout	Three serious and 17 slight collisions were observed.
A15/B1202 priority crossroads	15 slight, one serious, and one fatal collision were observed.
A17 Bonemill junction	Two slight and 10 slight collisions were observed.
B1188 / B1202 priority T-junction:	Three serious and four slight collisions were observed.
A15/Green Man Road priority T-junction:	Seven slight collisions were observed.
B1188/B1178 priority staggered crossroads:	Two serious and four slight collisions were observed.
A15, adjacent to the Brauncewell Church access:	Two serious and four slight collisions were observed.
B1191/B1189 / Station Road priority crossroads:	Five slight collisions were observed.

14.10.59. A review of the PICs at each cluster has been carried out to determine if there is a common contributory factor between clusters. A summary of this review is presented in **Table 14.36**.

Table 14.36 Cluster analysis: factors leading to collisions

Cluster	Junction collision cluster	PIC summary
1	A15/A17 Holdingham roundabout	Of the 20 collisions that have been reported at this junction, nine comprise rear-end shunts, six were attributed to drivers/riders overturning/losing control, three occurred as vehicles were entering the junction, one involved a vehicle entering the oncoming lane, and the cause of one is unknown.
2	A15/B1202 priority crossroads	Of the 17 collisions that have been reported at this junction, 13 occurred as vehicles were entering the junction, three were rear-end shunts, and one occurred as a vehicle was overtaking another vehicle.
3	A17 Bonemill junction	Of the 12 collisions that have occurred at this junction, five occurred as vehicles were entering/exiting the carriageway, five occurred as vehicles were travelling along the carriageway, and two were rear-end shunts.
4	B1188/B1202 priority T-junction:	Of the seven collisions that have been reported at this junction, five comprise rear-end shunts, one occurred as a vehicle entered the junction, and one occurred as an emergency vehicle was overtaking.
5	A15/Green Man Road priority T-junction:	Of the six collisions that have been reported at this section of the A15, four involved a single vehicle leaving the carriageway on or adjacent to the bend and two involved several vehicles colliding on the bend.
6	B1188/B1178 priority staggered crossroads:	Of the five collisions that have been reported at this junction, all occurred as vehicles were entering the junction.
7	A15, adjacent to the Brauncewell Church access:	Of the six collisions that have been reported at this section of the A15, four involved a single vehicle leaving the carriageway on or adjacent to the bend and two involved several vehicles colliding on the bend.

Cluster	Junction collision cluster	PIC summary
8	B1191/B1189 / Station Road priority crossroads:	Of the five collisions that have been reported at this junction, all occurred as vehicles were entering the junction.

14.10.60. The PIC and collision cluster review has concluded that there are no specific concerns in relation to the geometric design/road layout of the local highway network leading to safety issues that could be exacerbated by the Proposed Development. The collision cluster analysis does not highlight specific issues, with the majority of recorded collisions being attributed to driver error within the PIC reporting.

14.10.61. It is recognised that future traffic growth could cause roads to be busier, resulting in an overall potential increase in collisions occurring. The latest five-year period PIC data shows that the total number of PICs has been steadily increasing since the Covid-19 pandemic (Year 2 and Year 3 of the five-year period).

14.10.62. The presence and intensity (the number of collisions contained within the cluster) of a cluster determines the sensitivity of road users at a given location.

14.10.63. Additional mitigation has been proposed to control and manage the movement of HGVs. HGVs will be routed via the A15 and will only be permitted to turn through the A15/B1191 and A15/Gorse Hill Lane, B1191/B1188 junctions to access the respective construction compounds. As such, the impact of HGVs on road safety is limited to three junctions in the construction phase, all of which are not clusters. For cars and LGVs (workers), while there is no such additional mitigation measure in place, the resulting percentage change will not be great enough to cause an perceptible impact.

14.10.64. At the identified clusters, the sensitivity of road users is high, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of road safety, there is likely to be a direct, temporary, medium-term **negligible** residual effect on road users following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.65. At other locations to be used by HGVs which have not been identified as clusters, the sensitivity of road users is low, and the magnitude of impact, following additional mitigation, is medium. Therefore, in terms of road safety, there is likely to be a direct, temporary, medium-term **minor adverse** residual effect on road users following the implementation of additional mitigation measures, which is considered to be **not significant**.

14.10.66. Overall, the effect on road safety is considered to be **not significant**.

Hazardous and large loads

14.10.67. AILs will be required to transport components of the Springwell Substation, travelling from the nearest port of Immingham, across the entire construction phase, and these are anticipated to comprise:

- 4 to 7 AILs for the main transformer deliveries.
- 0 to 3 AILs for cranes.
- 18 AILs for the delivery of the 400kV cable drums.

14.10.68. No dangerous goods are proposed to be delivered, based on the Department for Transport's classification of dangerous goods **[Ref 14-18]**.

14.10.69. These AIL deliveries are equal to less than a 30 percent increase in traffic.

14.10.70. The preferred entry and exit route for AIL and segments of this route has been included within the Order Limits. An assessment of AIL routes and swept path analysis has been undertaken and is summarised in the **oCTMP [EN010149/APP/7.8]**. The route assessment has not identified any structural issues nor oversail of the AIL vehicle.

14.10.71. Traffic management measures would be utilised for the duration of the construction phase. Police escort would be required to facilitate the safe passage of the AIL. Details are contained in the **oCTMP [EN010149/APP/7.8]**.

14.10.72. The improvements proposed at the A15/Gorse Hill Lane junction (refer to **Table 14.22** above) will assist vehicles delivering AILs with entering Gorse Hill Lane and turning into the Primary Construction Compound entrance.

14.10.73. The sensitivity of users of links used for AIL delivery is high, and the magnitude of impact, following additional mitigation, is negligible. Therefore, in terms of hazardous and large loads, there is likely to be a direct, temporary, medium-term **minor adverse** residual effect on users of links used for AIL delivery following the implementation of additional mitigation measures, which is considered to be **not significant**.

Decommissioning

14.10.74. The decommissioning phase is anticipated to follow a reverse of the process of construction of the Proposed Development. In relation to traffic and transport, this will lead to traffic volumes equal to or less than that predicted for construction. Vehicles are likely to use the same access locations, serving temporary compounds in the same or similar locations. As a worst-case, permanent internal access roads and site accesses onto the highway will be removed and reinstated to their original state. Permanent mitigation within the highway, including junction improvements, are expected to be retained.

14.10.75. Similar activities experienced during the construction phase are therefore expected to occur during the decommissioning phase, comprising worker travel and transportation of materials from the Site. It is also likely that some temporary closures and/or diversions of PRoW will be required. These activities have the potential to have an effect on severance, driver delay, pedestrian delay, non-motorised user amenity, fear and intimidation, road safety and hazardous loads.

14.10.76. Given that the activities are expected to be the same and traffic volumes are anticipated to be no greater than that experienced during the construction phase, it is considered that the embedded (permanent) mitigation implemented during the construction phase and the implementation of additional mitigation in the form of a Decommissioning Traffic Management Plan and PRoW and Permissive Path Management Plan (secured within the **oDEMP [EN010149/APP/7.13]**) will be adequate to mitigate the potential effects during decommissioning and therefore, the effects on all users will be no greater than those predicted for the construction phase.

14.10.77. On this basis, the potential effects of the decommissioning phase on severance, driver delay, pedestrian delay, non-motorised user amenity, fear and intimidation, road safety and hazardous loads are considered to be **not significant**.

Operational trips (scoped out)

14.10.78. Given the nature of the Proposed Development, operational trips are expected to be negligible. As per PINS requirements, an estimate of the operational flows and consideration to thresholds within the IEMA guidance is noted below.

14.10.79. As outlined by the Planning Inspectorate and noted within the Scoping Opinion (**ES Volume 3, Appendix 5.2: Scoping Opinion [EN010149/APP/6.3]**), the description of the operational phase of development should clearly set out the operational vehicle types and numbers. In the operational (including maintenance) phase of the Proposed Development, it is estimated that approximately 24 permanent staff will be required across all links on a daily basis. Of these movements, the majority would be accessing the Substation/BESS infrastructure located off the A15 at Gorse Hill Lane and as such, limited vehicular movements are anticipated across the wider local road network where these vehicles will gain occasional access from the proposed operational access points. Owing to this low number of anticipated trips during the operational phase, and as these vehicle movements are expected to be within the 10% daily variation of traffic flows to be expected across the highway network at operational years', these vehicle movements will be imperceptible, thus an assessment is not required.

14.10.80. For the replacement of equipment during the operational phase, the number of LGV movements to facilitate these works are not expected to exceed the IEMA guidance Rule 1 criteria “Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)”.

14.10.81. As well as routine maintenance there may also be a requirement to repair and replace components on site as part of maintaining the Proposed Development during the operational phase. This could require the use of HGVs. Certainty of the number of HGVs required for these works is not known at this stage, given the extent of any repair and replacement works is unknown, however as traffic flows are not expected to exceed the IEMA guidance Rule 1 criteria “Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)” and so an operational traffic assessment is not required in accordance with the Scoping Opinion. In addition, such works will not be undertaken frequently and highway works delivered for construction accesses will be retained permanently during operation, as set out in **ES Volume 1, Chapter 3: Proposed Development Description [EN010149/APP/6.3].**

14.11. Opportunities for enhancement

14.11.1. Opportunities for environmental enhancement in relation to traffic and transport are detailed in the **Design Approach Document [EN010149/APP/7.3]** which are submitted in support of the Development Consent Order (DCO) Application.

14.12. Monitoring requirements

14.12.1. To ensure that the impact of traffic and transport is controlled, the construction and decommissioning phases shall be audited against the requirements of the **oCTMP [EN010149/APP/7.8]** and supporting **Outline Travel Plan**, by the principal contractor to ensure adherence.

14.12.2. As part of the **Outline Travel Plan**, it is proposed that the principal contractor will encourage and promote sustainable travel to the Site. Supporting this are the monitoring and review of the procedures proposed within the **oCTMP [EN010149/APP/7.8]** that will be carried out at an appropriate frequency, to be agreed with Lincolnshire County Council. The **Outline Travel Plan** within the **oCTMP [EN010149/APP/7.8]** details actions and responsibilities to ensure ongoing compliance.

14.12.3. Though the Proposed Development is not reliant on the following schemes, monitoring the progress of the Lincolnshire Road Safety Partnership (A15/B1202 junction improvement proposals), and the North Hykeham Relief Road schemes is proposed. This will consider how the Proposed Development’s temporary impacts may be linked to these

schemes will be discussed, agreed and monitored in liaison with Lincolnshire County Council. In the event of either of these schemes not being completed prior to the commencement of the construction phase of the Proposed Development, implementation of the proposed worker commuter bus service will be triggered, as outlined in the **oCTMP [EN010149/APP/7.8]**.

14.12.4. The measures outlined within the **oCTMP [EN010149/APP/7.8]** are considered to address monitoring and management of these schemes and consultation with Lincolnshire County Council. Detailed CTMP(s) will be developed in liaison with Lincolnshire County Council and the principal contractor pursuant to a requirement to the DCO.

14.13. Difficulties and uncertainties

14.13.1. Traffic surveys record daily or weekly flows, rather than constant recording. Therefore, data are considered a snapshot of road network behaviour inclusive of flows, turning movements and speed. However, it is not considered that this impacted the Applicant's ability to undertake the assessment presented in this chapter, nor has it affected the conclusions of the assessment, as this has been addressed by ensuring any analysis is conducted as a robust assessment scenario.

14.14. Summary

14.14.1. A summary of this assessment is presented in **Table 14.37**. The sensitivity of each receptor is identified alongside any relevant embedded mitigation and the potential effects that could arise on those receptors. Any proposed additional mitigation measures are stated, and the magnitude of impact and residual effects then assessed. Finally, any monitoring requirements are stated where applicable.

Table 14.37 Assessment summary

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Links							
11 - B1191: A15 to Ashby de la Launde	Low	Junction improvements /non-motorised user crossing facility (refuge island), widening of B1191 RAF Digby and Ashby de la Launde.	Potential effects on: Severance; Pedestrian delay; Non-motorised user amenity; Fear and intimidation; Road safety; and Hazardous loads.	**oCTMP [EN010149/ APP/7.8]**	Daily total traffic impact: Negligible	Daily total traffic residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.
12 - B1191: Ashby de la Launde	Medium	Widening of B1191 RAF Digby and Ashby de la Launde.	Potential effects on: Severance; Pedestrian delay;	**oCTMP [EN010149/ APP/7.8]**	Daily total traffic impact: Negligible	Daily total traffic residual effect: **Negligible adverse**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
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to RAF Digby			Non-motorised user amenity; Fear and intimidation; Road safety; and Hazardous loads.			**(-) (D) (MT) (T) Not significant**	to future iterations of the CTMP and Travel Plan.
13 - B1191: RAF Digby to edge of Scopwick	Low	New PRoW proposed between RAF Digby and Scopwick.	Potential effects on: Severance; Pedestrian delay; Non-motorised user amenity; Fear and intimidation; Road safety; and Hazardous loads.	**oCTMP [EN010149/APP/7.8] oPRoWPPMP [EN010149/APP/7.12]**	Daily total traffic impact: Negligible	Daily total traffic residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant** The addition of a new PRoW would result in a residual effect: **Moderate beneficial**	**oPRoWPPMP [EN010149/APP/7.12]** Monitoring of the CTMP(s) to be discussed with Lincolnshire County Council. Ongoing monitoring of construction traffic and staff travel

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
						(+) (D) (LT) (P) Significant	matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.
14 - B1191: edge of Scopwick to B1188	Medium	-	Potential effects on: Severance; Pedestrian delay; Non-motorised; user amenity; Fear and intimidation; Road safety; and Hazardous loads.	**oCTMP [EN010149/ APP/7.8]**	Daily total traffic impact: **Negligible**	Daily total traffic residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
18 - B1188: Between Blankney and Scopwick	Low	-	Potential effects on: Severance; Fear and intimidation; road safety; and hazardous loads	**oCTMP [EN010149/ APP/7.8]**	Daily total traffic impact: **Negligible**	Daily total traffic residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.
26 - Temple Road	Low	Improvements to the A15/B1191/Temple Road junction and addition of non-motorised user crossing (pedestrian island).	Potential effects on: Severance; Pedestrian delay; Non-motorised user amenity; fear and intimidation; road safety; hazardous loads.	**oCTMP [EN010149/ APP/7.8]**	Daily total traffic impact: **Negligible**	Daily total traffic residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
Junctions							
Junction no. 2 – A15/B1202	AM peak: High PM peak: Medium	-	Potential effect on driver delay at this junction.	**oCTMP [EN010149/ APP/7.8]**	AM peak magnitude: Negligible PM peak magnitude: Negligible	AM peak residual effect: **Minor adverse (-) (D) (MT) (T) Not significant** PM peak residual effect: **Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.
Junction no. 4 – A15/Gorse Hill Lane	Negligible	Junction improvements at the A15/Gorse Hill Lane junction: widening of junction mouth and widening of A15.	Potential effect on driver delay at this junction.	**oCTMP [EN010149/ APP/7.8]**	Negligible	**Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
							the CTMP and Travel Plan.
All other junctions	Negligible	Improvements to the A15/B1191/Temple Road junction and addition of non-motorised user crossing (pedestrian island).	Potential effect on driver delay.	**oCTMP [EN010149/ APP/7.8]**	Negligible	**Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP and Travel Plan.
Road Closures							
Gorse Hill Lane (full closure)	Negligible	-	Potential effect on driver delay	**oCTMP [EN010149/ APP/7.8]**	Medium	**Negligible adverse (-) (D) (MT) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant

Receptor/ matter	Sensitivity of the receptor	Embedded mitigation	Potential effects (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Key: + = positive, - = negative, D = direct, I = indirect, ST = short-term, MT = medium-term, LT = long-term, P = Permanent, T = temporary							
							to future iterations of the CTMP.
A15, B1191, B1188 (temporary off peak single lane closures)	Low	-	Potential effect on driver delay	**oCTMP [EN010149/ APP/7.8]**	Medium	**Minor adverse (-) (D) (ST) (T) Not significant**	Ongoing monitoring of construction traffic and staff travel matters will be undertaken pursuant to future iterations of the CTMP.

14.15. References

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Application Document Ref: EN010149/APP/6.1
Planning Inspectorate Scheme Ref: EN010149