

Gate Burton Energy Park Environmental Statement

Volume 1, Chapter 13: Transport and Access

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13. Transport and Access

13.1 Introduction

- 13.1.1 This chapter of the Environmental Statement (ES) presents the findings of an assessment of the likely significant effects from Transport and Access as a result of the Scheme. For a description of the Scheme, refer to **Chapter 2: The Scheme** of this ES [EN010131/APP/3.1].
- 13.1.2 This chapter identifies and proposes measures to address the potential impacts and likely significant effects of the Scheme on Transport and Access, during the construction, operation, and decommissioning phases.
- 13.1.3 This chapter is supported by the following figures in **ES Volume 2** [EN010131/APP/3.2]:
- **Figure 2-2:** Existing Public Rights of Way (PRoW);
 - **Figure 2-4:** Indicative Site Layout Plan;
 - **Figure 2-5:** Grid Connection Corridor Access Locations;
 - **Figure 5-1:** Shared Grid Connection Corridor;
 - **Figure 13-1:** Transport Study Area;
 - **Figure 13-2:** Traffic Survey Locations;
 - **Figure 13-3:** Heavy Goods Vehicle (HGV) Routing;
 - **Figure 13-4:** Surrounding Highway Network;
 - **Figure 13-5:** Walking and Cycling Network;
 - **Figure 13-6:** Abnormal Load Routing;
 - **Figure 13-7:** PRoW Management (Construction Phase); and
 - **Figure 16-1:** Cumulative Schemes.
- 13.1.4 This chapter is supported by the following appendices in **ES Volume 3** [EN010131/APP/3.3]:
- **Appendix 1-C:** Consultation Responses;
 - ~~Appendix 5-A: Cumulative Schemes;~~
 - **Appendix 13-A:** Transport Assessment Scoping Note;
 - **Appendix 13-B:** Key Policies and Guidance;
 - **Appendix 13-C:** Summary of Non-Significant Effects;
 - **Appendix 13-D:** Transport Assessment; ~~and~~
 - ~~Appendix 13-E:~~ Framework Construction Traffic Management Plan (CTMP); ~~and-~~
 - ~~Appendix 16-A: Short List of Cumulative Schemes.~~
- 13.1.5 Furthermore, this chapter is supported by an **Outline PRoW Management Plan** [EN010131/APP/7.8].

13.2 Consultation

- 13.2.1 A request for an EIA Scoping Opinion (Ref. 13-1) was sought from the Secretary of State through the Planning Inspectorate in 2021 as part of the EIA scoping process. Further consultation in response to formal pre-

application engagement was carried out through the Preliminary Environmental Information (PEI) Report, in June 2022. Consultation responses in relation to Transport and Access, are presented in **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**.

- 13.2.2 As part of the EIA Scoping Opinion (Ref. 13-1) which is held in **ES Volume 3: Appendix 1-B [EN010131/APP/3.3]**, National Highways confirmed that they had no comments given that the Site is located a significant distance away from the motorway and trunk road network. Therefore, as there are no effects on the strategic road network as a result of the Scheme, no further consultation has been carried out with National Highways.
- 13.2.3 Consultation has been undertaken with key stakeholders including Lincolnshire County Council (LCC), Nottinghamshire County Council (NCC), West Lindsey District Council (WLDC) and Bassetlaw District Council (BDC). The following matters have been discussed:
- The access and routing strategy for the Scheme;
 - The scope and methodology for the transport deliverables;
 - The study area for the collision review;
 - Measures to include within the Framework CTMP; and
 - The cumulative assessment including relevant developments (mainly, West Burton and Cottam Solar Projects).
- 13.2.4 As part of the above, a transport scoping meeting was held on 22nd March 2022 to inform the preparation of a Transport Scoping Note which was used to address comments raised during scoping discussions and to agree the scope and methodology for the Transport and Access Chapter of this Environmental Statement (ES), and the Transport Assessment (TA) that will accompany the Development Consent Order (DCO) application. The Transport Scoping Note (**ES Volume 3: Appendix 13-A [EN010131/APP/3.3]**) includes the minutes from the transport scoping meeting.
- 13.2.5 The Transport Scoping Note included details of the proposed access points during the construction phase for both the Solar and Energy Storage Park and the Grid Connection Corridor. In addition, details of the anticipated access strategy were provided including the forecast distribution of construction vehicles across the access points with an initial forecast daily trip attraction for each access. Details on operational access were also provided within the Transport Scoping Note.
- 13.2.6 Following the preparation of the Transport Scoping Note, the following comments were received from NCC and LCC:
- NCC Comments (5th April 2022):
 - Within the confines of the Nottinghamshire road network collision data can be obtained from roadinjuryaccidentdata@viaem.co.uk. As this is only likely to be relevant to the grid connection corridor, it is difficult to agree the extent of a study area without details of the potential road crossings and what would be involved. However, it is envisaged that this could be addressed by appropriate traffic management. In this regard we would wish to see provision for; parking of site operatives

and visitors; the loading and unloading of plant and materials; and the storage of plant, materials, and waste associated with the construction of the grid connection corridor to be addressed within the Construction Traffic Management Plan or other relevant section of the submission.

- The construction of the grid connection corridor within Nottinghamshire is not in an area that would be likely to be materially affected by the traffic impact of committed development. However, this Authority would welcome the inclusion of the traffic associated with the construction of the proposed West Burton and Cottam Solar Farms within the Transport Assessment including the opportunity to construct a shared grid connection to Cottam Power Station thereby reducing the potential cumulative disruption during construction.
- LCC confirmed that the study area for the collision data review was acceptable on 19th April 2022.
- LCC Comments (26th April 2022): *This scoping note and Figure 2 is acceptable to LCC. As mentioned at the meeting, we would like the TA to ensure that a cumulative assessment is undertaken which also includes the other solar farms in this area which are currently being developed by others (West Burton and Cottam solar farms).*

13.2.7 In view of the above, a TA and Framework Construction Traffic Management Plan (CTMP) have been prepared as part of the DCO submission and in support of the ES. These include details of traffic management, the Grid Connection Corridor and committed developments. Further details relating to committed developments are also presented in Section 13.13 of this ES. An **Outline PRoW Management Plan [EN010131/APP/7.8]** is also being prepared to outline how PRoW will be managed safely during the construction, operation and decommissioning phases.

13.2.8 As part of the PEI Report statutory feedback received in August 2022, the following comments were made:

- LCC confirmed that the scope set out within the Transport Scoping Note (**ES Volume 3: Appendix 13-A [EN010131/APP/3.3]**) was considered to be appropriate as the basis for the TA for this development;
- NCC confirmed that they had no further comments as the traffic impact on the Nottinghamshire highway network is unlikely to be material;
- BDC confirmed that they had no further comments regarding transport and access to those comments raised in relation to the original EIA Scoping Report; and
- WLDC confirmed that the preliminary findings of the PEI Report were recognised and defer to LCC as the Local Highway Authority.

13.2.9 As above, further details of the consultation feedback received from key stakeholders and Applicant responses are held in **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**.

13.3 Legislation and Planning Policy

13.3.1 There are a number of policies that relate to how traffic and transport-related impacts should be assessed, in terms of identifying both the level of impact of the Scheme and any necessary mitigation.

13.3.2 Planning policy and guidance relating to transport and relevant to the Scheme comprise the following, of which a review is provided within **ES Volume 3: Appendix 13-B [EN010131/APP/3.3]**:

- National Planning Policy
 - *Overarching National Policy Statement for Energy (NPS EN-1) (2011) (Ref. 13-2);*
 - *Draft Overarching National Policy Statement for Energy (2021) (NPS EN-1) (Ref. 13-3);*
 - *National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011) (Ref. 13-4);*
 - *Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2021) (Ref. 13-5);*
 - *National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011) (Ref. 13-6);*
 - *Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2021) (Ref. 13-7);*
 - *National Planning Policy Framework (2021) (Ref. 13-8); and*
 - *National Planning Practice Guidance (2019) (Ref. 13-9).*
- Local Planning Policy
 - *Lincoln Transport Strategy 2020 to 2036 (Ref. 13-10);*
 - *Adopted Central Lincolnshire Local Plan (Ref. 13-11);*
 - *Fourth Lincolnshire Local Transport Plan 2013/14 to 2022/23 (Ref. 13-12);*
 - *Fifth Lincolnshire Local Transport Plan (Consultation Draft) (Ref. 13-13);*
 - *Gainsborough Transport Strategy (May 2022-2036) (Ref. 13-14);*
 - *Draft Bassetlaw District Local Plan 2020-2037 (July 2022) (Ref. 13-15); and*
 - *Nottinghamshire Local Transport Plan 2011-2026 (Ref. 13-16).*
- Industry Guidance
 - *Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic (1993) (Ref. 13-17); and*
 - *Construction Logistics and Community Safety (CLOCS) CLOCS Standard, Version 4 (August 2022) (Ref. 13-18).*

13.4 Assessment Assumptions and Limitations

13.4.1 This assessment is based on baseline data and Scheme design information (see **Chapter 2: The Scheme [EN010131/APP/3.1]**) available at the time of writing this ES. The assessment of the Scheme is based on a daily peak of 400 construction workers which is a maximum daily figure and includes total workers associated with both the Solar and Energy Storage Park and the Grid Connection Corridor (which will connect the Solar and Energy Storage Park to the Cottam Substation).

13.4.2 A TA and Framework Construction Traffic Management Plan (CTMP) have also been prepared as part of the DCO submission and form part of the ES.

This chapter has been informed by the consultation responses to the EIA Scoping Opinion and the PEI Report during statutory consultation (see **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**), as well as a Transport Scoping Meeting which was held with the local authorities and a subsequent Transport Scoping Note (see **ES Volume 3: Appendix 13-A [EN010131/APP/3.3]**).

- 13.4.3 The main construction phase for the Scheme is currently predicted to be 24-36 months between 2025 and 2027, with the construction peak in terms of activity and vehicle movements expected to take place in 2026. The approach taken in this chapter offers a reasonable worst-case assessment, as this is based on the shorter end of this construction period (24 months) that would generate the highest number of peak hour and daily road trips on the local network.
- 13.4.4 There is expected to be a daily peak of 400 construction workers associated with the Scheme, including 375 construction workers for the Solar and Energy Storage Park and 25 construction workers for the Grid Connection Corridor. All 400 construction workers will travel to/ from the Solar and Energy Storage Park at the start and end of the working day. A minibus service will be utilised to transport construction workers from the Solar and Energy Storage Park to the Grid Connection Corridor (and vice-versa) to reduce vehicular trips on the surrounding highway network.
- 13.4.5 In addition to the above, there will be a daily peak of 30 LGVs and 60 HGVs associated with the Solar and Energy Storage Park. The associated vehicle trips will be split across four access points including the A156 Gainsborough Road primary site access, and secondary access points on Kexby Lane (North and South) and Marton Road. In the absence of 2021 Census journey to work data (which is not currently available), the forecast trip distribution of construction staff vehicles has been derived using 2011 Census journey to work data which is an industry approved technique. This ES includes an assessment of the Solar and Energy Storage Park within Section 13.10.
- 13.4.6 In addition to the above, there is expected to be a daily peak of 16 LGVs and 12 HGVs associated with the Grid Connection Corridor. The associated vehicle trips are expected to be split across multiple access points (see Section 13.6) including those to the east of the River Trent (in Lincolnshire) and those to the west of the River Trent (in Nottinghamshire). In view of the minimal levels of vehicle trips to be generated and given that different access points would be utilised than those used to access the Solar and Energy Storage Park, the Grid Connection Corridor is not expected to have a material impact on the surrounding highway network. Nonetheless, these trips have been included as part of the assessment of the Scheme to provide a worst-case assessment.
- 13.4.7 It is not considered that the conclusions of this ES would change in the instance that the start of construction is delayed. For example, other cumulative schemes may have been completed by the time the Scheme construction begins, which would elevate the trips on the local road network in the future baseline. As the assessment criteria is based on a percentage change of vehicle numbers, a higher baseline flow would reduce the proportional impact that the Scheme has on the road network. This would

reduce or maintain the levels of effect presented in this chapter. It is therefore considered that assessment of 2026 reflects a worst case approach and the conclusions would remain valid should the peak be later than this.

- 13.4.8 Although the Scheme is located close to a number of small villages/settlements including Willingham by Stow, Lea and Marton, only a small proportion of trips are expected to either originate from or pass through these villages during the construction, operation, or the decommissioning phases. For example, the Framework CTMP restricts HGVs to routes which avoid these villages when travelling to/ from the main site access on the A156 Gainsborough Road as illustrated by the HGV routing plan shown in **ES Volume 2: Figure 13-3 [EN010131/APP/3.2]**. In addition, the majority of construction vehicle trips will travel to/ from the main site access on the A156 Gainsborough Road as identified in Table 13-1. Whilst some staff may originate from larger settlements nearby (e.g. Gainsborough and Lincoln) and may travel by public transport or bicycle (the distance is too far to walk) these modes are not expected to constitute a significant proportion of trips to the Solar and Energy Storage Park.
- 13.4.9 In terms of potentially utilising the railway for deliveries during the construction phase, whilst the existing Cottam Power Station is served by a rail station, it is understood that this section of track is no longer in use. The railway running through the Solar and Energy Storage Park is frequently used by mainline passenger services and is therefore not considered to be viable for serving the Scheme in terms of delivering equipment, materials etc.
- 13.4.10 Further details relating to the assumptions that have been adopted in support of the assessment work (e.g. relating to access points, working hours, trip generation) are set out within Section 13.6. As set out above, the assessment is based on worst-case parameters in terms of the length of the construction programme and the peak number of daily vehicle trips associated with both the Solar and Energy Storage Park and the Grid Connection Corridor. The approach for the assessment work has also been reviewed and agreed with the local highway authorities as set out within Section 13.2.

13.5 Study Area

- 13.5.1 The study area includes areas of the highway and Public Rights of Way (PRoW) networks which, based on professional judgement and experience of other Solar Farm DCO submissions, are considered to be potentially at risk from possible direct and indirect impacts arising from the Scheme. The study area is shown in **ES Volume 2: Figure 13-1 [EN010131/APP/3.2]**.
- 13.5.2 Consideration has been given to a number of locations within the surrounding highway network which could potentially be impacted. The following junctions have been considered based on traffic surveys which were carried out in March and April 2022 (see **ES Volume 2: Figure 13-2 [EN010131/APP/3.2]**):
- A156 High Street/A1500 Stow Park Road staggered junction;
 - A1500 Tillbridge Road/Saxilby Road T-Junction;
 - B1241 High Street/Marton Road T-Junction;

- A156 Gainsborough Road/Willingham Road Junction; and
- Cottam Road/Power Station Access.

13.5.3 The following road links have also been considered based on the traffic surveys (see **ES Volume 2: Figure 13-2 [EN010131/APP/3.2]**):

- A156 Gainsborough Road (north of Kexby Lane);
- A156 Gainsborough Road (south of Kexby Lane);
- A156 Gainsborough Road (north of A1500 Stow Park Road);
- Clay Lane (east of A156);
- Willingham Road (east of 156);
- A1500 Stow Park Road (east of A156);
- A156 Gainsborough Road (south of A1500 Stow Park Road);
- High Street (east of Marton);
- B1241 Gainsborough Road (south of Kexby Lane);
- Marton Road (south of B1241 Gainsborough Road);
- B1241 Kexby Lane (east of Upton Road);
- B1241 High Street (north of A1500 Tillbridge Road);
- A1500 Tillbridge Road (east of Saxilby Road);
- Saxilby Road (south of A1500 Tillbridge Road);
- Cottam Road (west of Cow Pasture Lane); and
- Headstead Bank (north of Cottam Road).

13.5.4 The study area (as it was at that point in time related to the Solar and Energy Storage Park and the Grid Connection Corridor within Lincolnshire) was submitted for agreement with LCC and NCC, as the local highway authorities as part of the PEI Report. The study area has since been updated to incorporate the Grid Connection Corridor within Nottinghamshire, including Cottam Road and Headstead Bank which will provide access to the Grid Connection Corridor. This is considered to represent an appropriate study area within Nottinghamshire, given that NCC does not expect the traffic impact to be material on this part of the highway network (see Section 13.2). Nonetheless, the review of abnormal loads considers the wider routing of construction vehicles between the A57 and the Grid Connection Corridor and further details are set out within the Framework CTMP (**ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**).

13.6 Assessment Methodology

Sources of Baseline Information

13.6.1 To inform the assessment of the Scheme, information has been collected from a number of sources including:

- Traffic counts carried out for the surrounding highway network in March and April 2022 (see the Transport Scoping Note within **ES Volume 3: Appendix 13-A [EN010131/APP/3.3]** as well as the locations shown on **ES Volume 2: Figure 13-2 [EN010131/APP/3.2]** for further details);
- Traffic growth has been calculated using National Road Traffic Forecast (NRTF) growth factors, with National Transport Model (NTM) adjustments applied within the Trip Ends Model Program (TEMPRO) utilising National Trip Ends Model (NTEM) dataset v7.2;
- Local travel and network information gathered from various sources including local rail and bus operators;
- Personal Injury Collision (PIC) data from LCC and NCC for the study area shown on **ES Volume 2: Figure 13-1 [EN010131/APP/3.2]**;
- Ordnance Survey (OS) Base Mapping to ascertain an accurate geographical representation of the areas in the vicinity of the Scheme;
- Location of usual residence and place of work by method of travel to work data from the 2011 Census (please note that more recent Census journey to work data is not currently available); and
- Route planning software, such as Google Maps, was used to inform the review of the most direct and functional routes to the Scheme (in combination with the above).

Proposed Access Arrangements

Solar and Energy Storage Park

- 13.6.2 The proposed construction accesses for the Solar and Energy Storage Park are as follows:
- A156 Gainsborough Road North (primary access located to the north of Gate Burton);
 - Kexby Lane North (secondary access located between Knaith Park and Kexby);
 - Kexby Lane South (secondary access located between Knaith Park and Kexby); and
 - Marton Road (secondary access located by Willingham by Stow, utilising an existing farm access and track).
- 13.6.3 Operational access will primarily be taken from the A156 Gainsborough Road via Clay Lane (existing access), but will also be achievable via Kexby Lane North, Kexby Lane South and Marton Road (as above) which will all be retained during the operational phase. An additional operational access will also be utilised on a separate part of Marton Road at the south-eastern boundary of the Solar and Energy Storage Park. The majority of routine visits by vans and four-wheel drive vehicles would utilise the Clay Lane rail underpass for access to the eastern part of the Solar and Energy Storage Park. If larger vehicles are required to access the eastern part of the Solar and Energy Storage Park, then these would utilise the Kexby Lane South and/ or the Marton Road access points. The A156 Gainsborough Road North

access would only be utilised should larger vehicles be required for heavy component replacement.

13.6.4 The proposed locations of the above access points are shown on **ES Volume 2: Figure 2-4 [EN010131/APP/3.2]**.

13.6.5 Further to the above, several existing access points will be stopped-up as part of the proposals for the Solar and Energy Storage Park, including in instances where an alternative (new) access is to be provided in support of the Scheme or where an existing access will be redundant (no longer required) with the Scheme in place. For example, an existing access on the southern side of Kexby Lane will be stopped-up and replaced by the proposed access on the southern side of Kexby Lane. Nonetheless the majority of existing access points across the Order limits will be retained in order to maintain access to existing land parcels where necessary. Further details of these arrangements are set out within the Framework CTMP (**ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**).

Grid Connection Corridor

13.6.6 The proposed construction accesses for the Grid Connection Corridor are as follows:

- A1500 Stow Park Road North (located east of Marton);
- A1500 Stow Park Road South (located east of Marton);
- A156 High Street East (located circa. 600m south of Marton);
- A156 High Street West (located circa. 1.4km south of Marton);
- Headstead Bank East (located circa. 100m south of Broad Lane);
- Headstead Bank West (located circa. 130m south of Broad Lane);
- Cottam Road North (located west of Cow Pasture Lane);
- Cottam Road South (located west of Cow Pasture Lane); and
- Cow Pasture Lane East (located circa. 550m north of Cottam Road).

13.6.7 It should be noted that the Cow Pasture Lane access will only be used during the early part of the construction programme by vehicles up to 7.2m in length. This will subsequently change in form to a vehicle crossover (rather than a priority junction) once the internal haul road has been constructed to allow all construction vehicles (including HGVs) to access the area to the east of Cow Pasture Lane via the new access on the northern side of Cottam Road and the haul road. This will avoid the need for HGVs to use Cow Pasture Lane and no improvements at the junction with Cottam Road are expected to be required. However, there may be the requirement to resurface Cow Pasture Lane at the crossover point.

13.6.8 Further to the above, a restricted (emergency) access will be utilised on the northern side of Torksey Ferry Road which will only be utilised by light vehicles during exceptional circumstances if required i.e. should it not be possible to utilise the access on Cottam Road South.

- 13.6.9 It is envisaged that the majority of the above accesses will be retained during the operational phase, although these will be gated to prevent any unauthorised access during the lifetime of the Scheme and it is expected these will be used very infrequently.
- 13.6.10 The proposed locations of the above access points are shown on **ES Volume 2: Figure 2-5 [EN010131/APP/3.2]**.
- 13.6.11 An existing access point on the western side of the A156 (circa. 1.4km south of Marton) will be stopped-up and replaced by the proposed access for the Grid Connection Corridor at this location. An alternative (new) access point will then be provided circa. 80m to the north in order to maintain access to the existing land parcel (agricultural field and National Grid Pylon) to the west of the A156. Further details of these arrangements are set out within the Framework CTMP (**ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**).

Programme and Working Hours

- 13.6.12 The following assumptions have been adopted to provide a robust assessment of the Scheme:
- The shortest expected construction programme will be 24 months, which provides a worst-case in terms of monthly (and therefore daily) construction vehicle trips;
 - The core summer construction working hours will be Monday to Friday (07:00-19:00) and Saturday (09:00-13:00) with no Sunday or Bank Holiday working;
 - The core winter construction hours will be Monday to Friday (08:00-18:00) and Saturday (09:00-13:00) with no Sunday or Bank Holiday working;
 - To provide a robust assessment, the core winter weekday working hours have been adopted so that staff travel patterns are more closely aligned with the traditional network hours of 08:00-09:00 and 17:00-18:00;
 - As such, staff arrivals are expected between 07:00-08:00 and staff departures are expected between 18:00-19:00 (Monday to Friday);
 - HGV and Light Goods Vehicle (LGV) movements have been distributed across an 8-hour window, avoiding the weekday peak hours, arriving and departing between 09:00-17:00; and
 - A weekday assessment (Monday to Friday) has been carried out to provide a worst-case assessment of the peak construction phase based on the above. A Saturday assessment has been excluded given that both baseline traffic flows and construction traffic flows would be lower than weekday traffic flows (i.e. the network will have more capacity to accommodate construction traffic at this time).

Construction Traffic Flows

Solar and Energy Storage Park

- 13.6.13 For the purposes of this assessment and based on the information provided in support of the application, the peak daily number of HGVs, LGVs and construction staff required for the Solar and Energy Storage Park are identified below. It should be noted that the forecast numbers below include consideration of daily variation and peak daily movements to provide a robust assessment:
- 60 HGV deliveries (120 movements per day);
 - 30 LGV deliveries (60 movements per day); and
 - 400 construction staff (persons) with the forecast number of staff vehicles identified below.
- 13.6.14 In terms of construction staff vehicles, the following has been included as part of this assessment:
- 55% of construction staff (220 persons) to be transferred to/ from the Solar and Energy Storage Park by shuttle service (each with capacity for 50 staff) to/ from four centres in the vicinity considered to be Gainsborough (north), Lincoln (south), Retford (west) and Newark on Trent (also south). It is assumed that an average of 55 staff would reside within each of the four areas (as indicated) and two shuttle services would be required to/ from each area equating to a total of eight shuttle services in the morning (16 movements) and eight shuttle services in the evening (16 movements). All shuttle services will be required to travel via the main site access on the A156 Gainsborough Road. It has been assumed that 50% shuttle services would travel via the A156 to the north (for Gainsborough and Retford) and 50% would travel via the A156 to the south (for Lincoln and Newark on Trent); and
 - 45% of construction staff (180 persons) to travel by private vehicle with an average occupancy of 1.3 staff per vehicle, resulting in 138 staff vehicles (276 daily movements).
- 13.6.15 In relation to the shuttle service provision, if additional demand is identified by the monitoring carried out as part of **ES Volume 3, Appendix 13-E: Framework CTMP [EN010131/APP/3.3]** and/ or the Detailed CTMPs (which will be secured through the DCO) then additional shuttle services will be provided to further reduce the number of construction staff vehicles on the network.
- 13.6.16 Given the locations of the nearest rail and bus services/ stops to the Scheme and considering the public transport timetables in relation to the construction staff working hours, there will be limited opportunity for construction staff to travel to the Solar and Energy Storage Park by rail or bus. Nevertheless, sustainable travel will be promoted for usage by construction staff travelling to/ from the Solar and Energy Storage Park with further details set out within **ES Volume 3, Appendix 13-E: Framework CTMP [EN010131/APP/3.3]**. The above mode share is considered to provide a worst-case assessment in terms of the number of construction staff vehicles forecast.

13.6.17 The forecast distribution of HGVs, LGVs and construction staff vehicles across the site accesses for the Solar and Energy Storage Park is presented below in Table 13-1. A slightly different distribution has been adopted for construction workers based on the proposed levels of parking at each of the compounds, with the majority of parking to be provided at the main compound accessed via the A156 Gainsborough Road.

Table 13-1 Forecast Trip Distribution (Construction Accesses) for Solar and Energy Storage Park

Access	Description	Construction Staff (%)	HGVs and LGVs (%)
A156 Gainsborough Road	Primary access serving the majority of the Solar and Energy Storage Park (west of the railway line)	70%	62%
Kexby Lane North	Secondary access serving a few parcels to the north of Kexby Lane	9%	9%
Kexby Lane South	Secondary access serving the Solar and Energy Storage Park (east of the railway line)	12%	20%
Marlon Road	Secondary access serving a few parcels to the southeast	9%	9%
Total	-	100%	100%

13.6.18 Based on the trip generation and distribution outlined above, the forecast peak daily trip generation for each of the Solar and Energy Storage Park accesses during the construction period (in terms of vehicles) is set out in Table 13-2 below.

Table 13-2 Forecast Peak Daily Construction Vehicles for Solar and Energy Storage Park

Site Access	HGVs	LGVs	Staff Vehicles	Shuttle Services	Total Vehicles
A156	38	18	97	16*	169
Kexby Lane North	5	3	12	0	20
Kexby Lane South	12	6	17	0	35
Marlon Road	5	3	12	0	20
Total	60	30	138	16*	244

**each shuttle service to depart from and arrive back to the Site twice per day i.e. eight shuttle services picking-up and dropping-off staff in the morning, and eight shuttle services in the evening*

13.6.19 A daily profile of overall construction movements (arrivals and departures) for just the Solar and Energy Storage Park is presented in Table 13-3 below based on the anticipated travel patterns of staff, LGVs and HGVs across the day and the winter profile in terms of staff working hours (to provide a robust assessment due to compressed working hours close to the traditional network peak hours).

Table 13-3 Forecast Peak Daily and Hourly Construction Movements for Solar and Energy Storage Park

Hour	HGVs and LGVs		Staff Vehicles (inc. Shuttle Services)		Total Vehicles		
	Arr	Dep	Arr	Dep	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0
07:00-08:00	0	0	146	8	146	8	154
08:00-09:00	0	0	0	0	0	0	0
09:00-10:00	11	11	0	0	11	11	22
10:00-11:00	12	12	0	0	12	12	24
11:00-12:00	11	11	0	0	11	11	22
12:00-13:00	11	11	0	0	11	11	22
13:00-14:00	11	11	0	0	11	11	22
14:00-15:00	12	12	0	0	12	12	24
15:00-16:00	11	11	0	0	11	11	22
16:00-17:00	11	11	0	0	11	11	22
17:00-18:00	0	0	0	0	0	0	0
18:00-19:00	0	0	8	146	8	146	154
19:00-20:00	0	0	0	0	0	0	0
Total	90	90	154	154	244	244	488

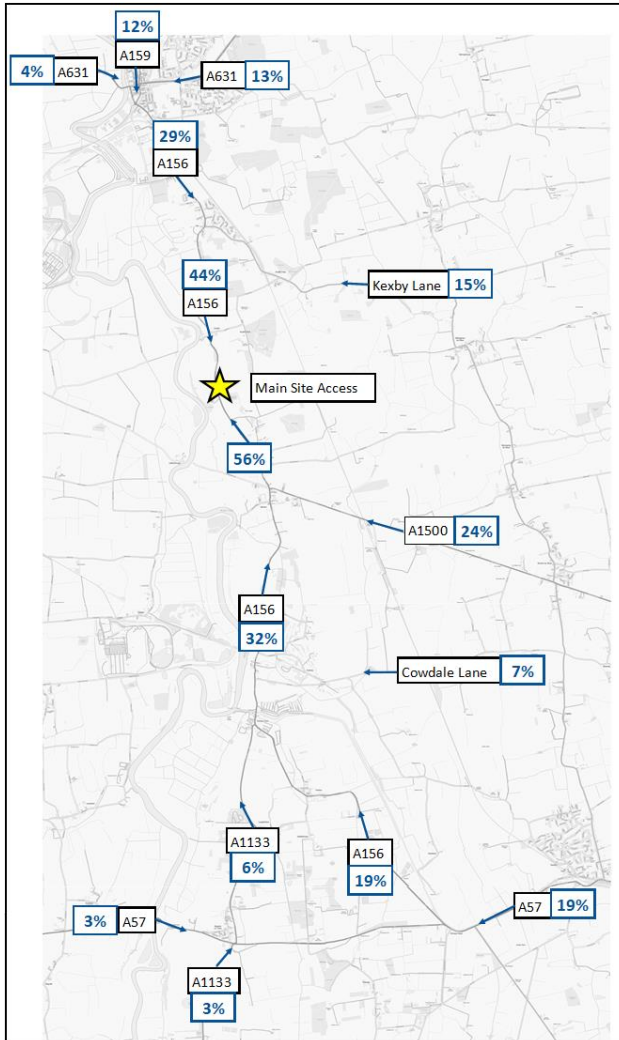
13.6.20 For the purposes of the assessment the following assignment of HGV and LGV trips (excluding abnormal loads which will follow defined routes via the strategic highway network) have been made onto the local highway network (as proposed and agreed during scoping discussions with the LHAs):

- 50% of HGVs and LGVs to travel to/ from the A156 to the north; and
- 50% of HGVs and LGVs to travel to/ from the A156 to the south.

13.6.21 An HGV routing plan is shown in **ES Volume 2: Figure 13-3 [EN010131/APP/3.2]**, identifying the key routes which will be used by HGVs and LGVs (including shuttle services) to travel to/ from each site access. It should be noted that for the Solar and Energy Storage Park, all HGVs (excluding abnormal loads) will be expected to travel via the A156 and the majority of these vehicles would avoid the local towns/ villages such as

Sturton by Stow and Willingham by Stow. A separate routing plan for abnormal loads is held in **ES Volume 2: Figure 13-6 [EN010131/APP/3.2]** and further details on abnormal loads are set out within the Framework CTMP held in **ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**.

- 13.6.22 Given no more recent Census data is available, the forecast trip distribution of construction staff vehicles has been derived using the 2011 Census 'WU03EW – Location of usual residence and place of work by method of travel to work' dataset for the West Lindsey Middle Super Output Area (MSOA) 007 i.e. to identify incoming vehicle trips to the area where the Solar and Energy Storage Park is located. Route planning software has been used to determine the likely routes that will be used by construction staff to/ from each of the Solar and Energy Storage Park site accesses.
- 13.6.23 To provide an example, the distribution of construction staff vehicle trips (excluding shuttle services) to/ from the main site access on the A156 is identified in Plate 13-1 below. It should be noted that a separate distribution has been derived for each site access point and further information relating to the distribution and assignment of construction staff vehicles to all of the site accesses of the Solar and Energy Storage Park will be provided in the TA.



**Plate 13-1. Staff Trip Distribution Example (Main Site Access on the A156)
 Grid Connection Corridor**

13.6.24 There is expected to be a daily peak of 25 construction workers, 16 LGVs and 12 HGVs associated with the Grid Connection Corridor. The associated vehicle trips are expected to be split across multiple access points (see Paragraph 13.6.5 above) including those to the east of the River Trent (in Lincolnshire) and those to the west of the River Trent (in Nottinghamshire). A minibus service will transport construction workers from the Solar and Energy Storage Park to the Grid Connection Corridor (and vice-versa). In view of the minimal levels of vehicle trips to be generated and given that different access points would be utilised than those used to access the Solar and Energy Storage Park, the Grid Connection Corridor is not expected to have a material

impact on the surrounding highway network. Nonetheless, these trips have been included as part of the assessment of the Scheme to provide a worst-case assessment.

13.6.25 The above 12 HGVs per day includes the removal of circa 3000 tonnes of spoil from the grid connection corridor, which would amount to approximately 3-4 HGVs per day across the construction programme.

13.6.26 A daily profile of overall construction movements (arrivals and departures) for the Grid Connection Corridor is presented in Table 13-4 below based on the anticipated travel patterns of staff, LGVs and HGVs across the day and the winter profile in terms of staff working hours (to provide a robust assessment due to compressed working hours close to the traditional network peak hours).

Table 13-4. Forecast Peak Daily and Hourly Construction Movements for Grid Connection Corridor

Hour	HGVs and LGVs		Staff Vehicles (inc. Shuttle Services)		Total Vehicles		
	Arr	Dep	Arr	Dep	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0
07:00-08:00	0	0	0	0	0	0	0
08:00-09:00	0	0	1	0	1	0	1
09:00-10:00	3	3	0	0	3	3	6
10:00-11:00	3	3	0	0	3	3	6
11:00-12:00	4	4	0	0	4	4	8
12:00-13:00	4	4	0	0	4	4	8
13:00-14:00	3	3	0	0	3	3	6
14:00-15:00	4	4	0	0	4	4	8
15:00-16:00	4	4	0	0	4	4	8
16:00-17:00	3	3	0	0	3	3	6
17:00-18:00	0	0	0	1	0	1	1
18:00-19:00	0	0	0	0	0	0	0
19:00-20:00	0	0	0	0	0	0	0
Total	28	28	1	1	29	29	58

13.6.27 For the purposes of the assessment, all HGVs and LGVs identified in Table 13-4 above have been assigned across the following parts of the network to access all parts of the Grid Connection Corridor:

- A156 Gainsborough Road between the A631 at the northern extent of the study area and the A57 at the southern extent of the study area;
- A1500 Stow Park Road to/ from accesses on A1500;
- Cottam Road; and

- Headstead Bank.

- 13.6.28 The above will result in some double-counting of trips, as HGVs and LGVs would only travel to/ from a few accesses each day rather than all of those listed above i.e. depending on the section of the Grid Connection Corridor that is being installed. This is therefore considered to provide a worst-case assessment.
- 13.6.29 In terms of construction workers, it is assumed that a single minibus service would transport the 25 construction workers from the Solar and Energy Storage Park to the Grid Connection Corridor in the morning and vice-versa in the evening. The same assumptions have been adopted as above in terms of routing the minibus service to all access points. Again, it should be noted that construction workers would travel to/ from the Solar and Energy Storage Park at the very start and end of their working day, as per the arrangements set out in the earlier section.
- 13.6.30 The HGV routing plan in **ES Volume 2: Figure 13-3 [EN010131/APP/3.2]** identifies the key routes which will be used by HGVs and LGVs to travel to/ from each site access for the Grid Connection Corridor. All HGVs will be expected to travel via the A57, Laneham Road and Rampton Road in order to access Cottam Road and Headstead Bank.

Operational Traffic Flows

- 13.6.31 During the operational phase, the Scheme will be operated by a nominal amount of people across the Site (up to 14 permanent staff per day), predominantly undertaking maintenance tasks. In addition, there is expected to be approximately 3-4 visitors per week (equating to one visitor per day) for deliveries, and periodic replacement of any components. Staff vehicles (and those used for maintenance) will primarily be four wheeled drive vehicles and vans, with HGVs rarely accessing the Site once it is operational.
- 13.6.32 Therefore, due to the low level of trips likely to be generated within the network peak hours (with up to 15 arrivals and 15 departures expected daily), an assessment of the operational phase has been excluded from this ES. Operational phase effects have also been excluded from the EIA and this has been agreed in the Scoping Opinion ref ID 3.8.1 (see **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**). Further details of the operational stage transport arrangements are set out in the TA to support this approach.
- 13.6.33 Given the assumed 60-year operational life of the Scheme, there will be requirement for periodic replacement of some or all of the Solar and Energy Storage Park elements (see **Chapter 15: Other Environmental Topics [EN010131/APP/3.1]** which includes waste). At this stage, the level of vehicle trips associated with component replacement (e.g. batteries and panels) is expected to be considerably lower than the level of vehicle trips generated during the peak construction phase. For example, even in the instance that full panel replacement is required, this would be programmed in stages over a much longer period than the construction phase (when the panels will be installed more rapidly). This approach would maximise the number of panels which are kept 'live' at any given time and avoid compromising the electricity generating capacity of the Scheme. Otherwise, components would be

replaced as and when required throughout the operational lifetime of the scheme (circa. 60-year period). As such, it is not considered necessary to include an assessment of the operational phase, including in the instance that any components need to be replaced.

- 13.6.34 It should be noted that the TA considers the operational scenario on the same basis as the above; this is in line with the scoping discussions held with the local authorities and the Transport Scoping Note (**ES Volume 3: Appendix 13-A [EN010131/APP/3.3]**).
- 13.6.35 The above meets the requirements of ID 3.8.3 of the EIA Scoping Opinion in **ES Volume 3: Appendix 1-B [EN010131/APP/3.3]** which states the following with respect to replacing components during the operational phase *“The Inspectorate accepts that a full assessment of traffic impacts may not be possible at the current time, however, the ES should provide commentary on the likely transport impacts of the decommissioning process in light of comments in section 3.10 of this Opinion regarding component refurbishment, where possible”*, as well as ID 3.8.10 which states *“there is a potential need for substantial removal of panel waste prior to the end of the stated operational period that should be addressed within the ES and/ or ODEMP.”*
- 13.6.36 In terms of operational access for the Solar and Energy Storage Park, this is expected to be mainly taken from the A156 Gainsborough Road via Clay Lane. Routine visits by vans and four-wheel drive vehicles would utilise the Clay Lane rail underpass to access the eastern part of the Solar and Energy Storage Park. Larger vehicles are expected to be very infrequently required and where necessary could utilise the proposed access points along Kexby Lane (north and south) and/ or Marton Road to access the eastern part of the Solar and Energy Storage Park which will be retained during the operational phase. An additional operational access will also be provided on a separate part of Marton Road at the south-eastern boundary of the Solar and Energy Storage Park.
- 13.6.37 In terms of the Grid Connection Corridor, it is envisaged that the majority of the proposed accesses will be retained during the operational phase, although these will be gated to prevent any unauthorised access during the lifetime of the Scheme.

Decommissioning Traffic Flows

- 13.6.38 For the purposes of the EIA, the decommissioning assessment year is assumed to be 2088 (60 years from opening) which has been addressed through a **Framework Decommissioning Environmental Management Plan (DEMP) [EN010131/APP/7.5]**. The decommissioning period is expected to be similar in duration and nature to the construction phase, albeit with fewer vehicle trips over a slightly shorter duration. In addition, this scenario 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 traffic flows 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 broadly accurate and robust. The proposed approach for assessing the decommissioning phase is set out below.

Assessment Scenarios

13.6.39 The nature of the proposal is such that the greatest impact is likely to occur during the construction and decommissioning phases. The construction of the Solar and Energy Storage Park is anticipated to take place over a 24 to 36-month period between 2025 and 2027, with peak construction expected to occur in 2026. Therefore, to determine the likely effects of the Scheme, and in view of the above, the following scenarios have been considered as part of this ES:

- Baseline (2022) – AM, PM and daily; and
- Peak Construction Year (2026) With and Without Development – AM, PM and Daily.

13.6.40 The baseline reporting sets out the existing conditions within the study area against which the construction impacts have then been assessed.

13.6.41 As set out in Section 13.4, it is not considered that the conclusions of this ES would change in the instance that the start of construction is delayed. For example, other cumulative schemes may have been completed by the time the Scheme construction begins, which would elevate the trips on the local road network in the future baseline. As the assessment criteria is based on a percentage change of vehicle numbers, a higher baseline flow would reduce the proportional impact that the Scheme has on the road network. This would reduce or maintain the levels of effect presented in this chapter.

13.6.42 As above, the decommissioning assessment year is assumed to be 2088 (60 years from opening) which is considered to be too far into the future to accurately predict traffic flows or junction forms. Therefore, the assessment of the construction phase has been used to determine the anticipated impact of the Scheme during its decommissioning phase.

Consultation

13.6.43 Details of the consultation held in support of this assessment are provided within Section 13.2, as well as within **ES Volume 3: Appendix 13-A** and **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**.

Impact Assessment Methodology

13.6.44 The assessment methodology adopted in this ES has been informed by the Guidelines for the Environmental Assessment of Road Traffic (Ref. 13-17). The guidelines outline the issues and the respective changes in volume and composition of traffic regarded as necessary before each issue results in traffic and transport impacts.

13.6.45 In accordance with the above, the following criteria has been considered in this assessment:

- Severance;

- Driver delay;
 - Pedestrian delay;
 - Pedestrian and cyclist amenity;
 - Fear and Intimidation;
 - Accidents and safety; and
 - Hazardous loads.
- 13.6.46 The significance of effect has been determined through consideration of two elements; the magnitude of impact and the sensitivity of the receptor.
- 13.6.47 The overall effect has been determined by measuring the magnitude of the impact following implementation of embedded and additional mitigation measures (where applicable) against criteria including; the number of activities of the population affected; the type and sensitivity of the receptor; and the type of impact. Effects are defined as beneficial or adverse, with effects further defined using the following classifications:
- **Minor** – slight, very short, or highly localised impact of no significant consequence;
 - **Moderate** – limited impact (by extent, duration or magnitude) which may be considered significant; and
 - **Major** – considerable impact (by extent, duration or magnitude) of more than local significance, or in breach of recognised acceptability, legislation, policy or standards.
- 13.6.48 The IEMA guidelines (Ref. 13-17) state that the magnitude of each impact should be determined as the predicted deviation from the baseline conditions.
- 13.6.49 IEMA (Ref. 13-17) sets out a number of criteria by which the magnitude of impact can be measured. These are outlined below based on the EIA Scoping Report (see **ES Volume 3: Appendix 1-A [EN010131/APP/3.3]**). Many of the criteria do not provide specific thresholds by which such impacts can be measured, and as a result will be measured qualitatively where necessary.
- 13.6.50 It should be noted that irrespective of the proportional increase in traffic flows, an increase of fewer than 30 additional vehicle trips per hour during each of the development peak hours has been categorised as a very low magnitude of change. This threshold has been determined based on professional judgement, as it is considered that an increase of less than one vehicle every two minutes would be immaterial and would not result in any significant effects.
- 13.6.51 **Severance** is defined in the IEMA guidelines (Ref. 13-17) as the “*perceived division that can occur with a community when it becomes separated by a major traffic artery*”. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they

impede pedestrian access to essential facilities. IEMA guidelines suggest that 30%, 60% and 90% increases in traffic flows will result in slight, moderate and substantial changes in severance, respectively.

- 13.6.52 **Driver Delay** is typically measured in terms of change in delay per vehicle (in seconds) from the baseline situation. This criterion is considered to be applicable to all modes of transport using the public highway, namely cars, motorcycles, pedal cycles and buses. However, as no junction capacity assessments were deemed to be required by the local highway authorities, this impact is expected to be negligible for all junctions within the study area (which is consistent with the approach set out within the PEI Report in the absence of any junction modelling within the TA). However, a review of the forecast proportional increases in traffic flows at junctions has been carried out to support the expectation that no adverse impacts are envisaged in terms of additional delay to road users across the highway network.
- 13.6.53 **Pedestrian Delay** is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to cross roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay.
- 13.6.54 **Pedestrian and Cycle Amenity** is broadly defined as *“the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width / separation from traffic”*. The guidance suggests that a tentative threshold for judging the significance of changes in pedestrian and cycle amenity would be where the traffic flow is halved or doubled.
- 13.6.55 **Fear and Intimidation** is defined as *“dependent on the volume of traffic, its HGV composition, and its proximity to people or the lack of protection caused by such factors as narrow pavement widths”*.
- 13.6.56 An assessment of **Accidents and Safety** has been carried out by an examination of PIC data for the most recent five-year period available. This ES includes a summary of the PIC data for the highway network in the vicinity of the Solar and Energy Storage Park and the Grid Connection Corridor based on the analysis included in the TA to determine whether there are any existing safety issues on the local road network which may be exacerbated by the Scheme.
- 13.6.57 With regard to **Hazardous and Dangerous Loads**, the guidance indicates that *“the Statement should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event”*. There are not expected to be any Hazardous and Dangerous Loads associated with the Scheme e.g. vehicles transporting explosives, oxidising/toxic substances, radioactive material or corrosive substances. Whilst there will be a requirement for abnormal loads, a Police escort will be arranged to assist with traffic control. The Framework CTMP (**ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**) which will be secured as part of the DCO includes measures to specifically manage abnormal loads as well as any mitigation required. Furthermore, analysis of the road network within the study area indicates that there are no particular features, such as a significant vertical drop immediately beyond the carriageway, which would suggest that

the transfer of materials by standard (non-abnormal) vehicles poses a particular risk beyond that which would be expected on the general highway network.

- 13.6.58 In view of the above, it is concluded that the impacts of Hazardous and Dangerous Loads do not warrant further consideration in the preparation of the ES, and with reference to ID 3.8.2 of the Scoping Opinion (see **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**), this has not been assessed beyond an estimation of the likely number and composition of loads required and the measures which will be implemented to safely transport components to and from the Scheme, as identified within the Framework CTMP **[EN010131/APP/3.3]** and this ES.
- 13.6.59 The IEMA guidelines set out two rules in identifying potential links for analysis:
- **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 any other specifically sensitive areas (e.g. accident black spots, conservation areas, hospitals, links with high pedestrian flows etc.) where traffic flows have increased by 10% or more.
- 13.6.60 Based on this, links have been assessed where traffic flows are expected to increase by 30% or more during the peak hours of the peak construction phase (2026). However, links have not been assessed where there is expected to be a less than 30% increase in traffic flows as a result of the Scheme, unless any specifically sensitive areas are identified. In addition, a very low magnitude of change has been assigned where there is expected to be fewer than 30 additional vehicle trips per hour during each of the development peak hours as a result of the Scheme, irrespective of the proportional increase in traffic flows.
- 13.6.61 In terms of **Severance, Pedestrian Delay, Pedestrian / Cycle Amenity and Fear and Intimidation**, the road links within an easy walking/ cycling distance of the Scheme have been used as receptors, as well as any road links which are expected to provide a main vehicular route to/ from the Solar and Energy Storage Park and contain pedestrian/ cycle facilities.
- 13.6.62 For the construction impacts, the sensitivity of pedestrian routes and cycle routes are based on a qualitative assessment of the 2022 baseline scenario, taking into consideration the importance and attractiveness of the routes and the destinations served. The thresholds have been defined based on professional judgement and experience of other Solar Farm DCO submissions and are as follows:
- **Very Low Sensitivity:** Rural road with no pedestrian/cycle facilities provided;
 - **Low Sensitivity:** Strategic vehicular route in a rural setting with pedestrian/cycle facilities;
 - **Medium Sensitivity:** Main vehicular route with pedestrian/ cycle facilities provided in built up area; and

- **High Sensitivity:** Lightly trafficked route provided in town centre setting.

13.6.63 As mentioned above, no junction capacity assessments were deemed to be required or have been carried out as part of the TA and it has not therefore been possible to carry out a full assessment of Driver Delay due to an absence of detailed junction capacity analysis. Therefore, a high-level review of the forecast proportional increases in traffic flows at junctions has been carried out to support the expectation that no adverse impacts are envisaged in terms of additional delay to road users across the highway network. The receptor sensitivity of junctions has been based on the queue lengths measured as part of the traffic surveys (see Section 13.5) during the development peak hours (07:00-08:00 and 18:00-19:00) and has been determined as follows:

- **Very Low Sensitivity:** No queuing at the junction or low queuing (3-4 vehicles) on 1-2 arms;
- **Low Sensitivity:** Low queuing (3-4 vehicles) on 3-4 arms and/ or moderate queuing (5-9 vehicles) on 1-2 arms;
- **Medium Sensitivity:** Moderate queuing (5-9 vehicles) on 3-4 arms and/ or high queuing (10+ vehicles) on 1-2 arms; and
- **High Sensitivity:** High queuing (10+ vehicles) on 3-4 arms.

13.6.64 In terms of **Accidents and Safety** the impacts of the Scheme has been assessed based on the findings of the TA, in terms of whether any accident clusters or patterns have been identified across the study area. Receptor sensitivity has been determined as follows:

- **Very Low Sensitivity:** Fewer than three collisions (with no fatal collisions) in five years;
- **Low Sensitivity:** 3-4 collisions in five years (with no fatal collisions) in five years;
- **Medium Sensitivity:** Five collisions (with no fatal collisions) in five years, or fewer than five collisions with one fatal collision; and
- **High Sensitivity:** Greater than five collisions in five years or more than one fatal collision.

13.6.65 The significance of effect is determined through the consideration of two elements; the sensitivity of receptors and the magnitude of impact, as outlined above. The matrix that has been used to determine the effect category is identified within Table 5-1 of **Chapter 5: EIA Methodology** of this ES [EN010131/APP/3.1]. Effects which are classified as major or moderate are considered to be significant.

Deliverables

13.6.66 The following deliverables have been prepared to accompany the submission as part of **ES Volume 3 [EN010131/APP/3.3]**:

- Transport Scoping Note;
- Transport Assessment (TA); and

- Framework CTMP.

13.6.67 In addition, an **Outline PROW Management Plan [EN010131/APP/7.8]** has been prepared as part of the **ES**.

13.6.68 It should be noted that the Framework CTMP includes a chapter on construction worker travel patterns and measures to encourage travel by alternative modes to the single occupancy vehicle. Given the above, a standalone Travel Plan has not been prepared for the construction phase and due to the low level of trips which will be attracted during the operational phase no travel plan has been produced for this phase either.

13.7 Baseline Conditions

Existing Baseline

13.7.1 This section describes the baseline environmental characteristics for the Scheme and surrounding areas with specific reference to Transport and Access.

Strategic Highway Network

13.7.2 The A1(M) is a dual carriageway road which forms part of the trunk road network and is managed by National Highways. The A1(M) can be accessed via the A614 Blyth Interchange, A638, A631 and A156 Gainsborough Road to the north or via the A57, Markham Moor Interchange and A156 Gainsborough Road to the south.

13.7.3 The A614 is a single carriageway road which links the A1(M) to the A638 which runs north to Doncaster. The A614 is classified by the Department of Transport (DfT) as part of the Major Road Network (MRN) and provides access to the A631, which joins with A631 to the northwest and provides access to A156 from the north.

13.7.4 The A57 is a single carriageway road which links the A1(M) to the A46 to the west of Lincoln. The A57 is classified by the DfT as part of the MRN and provides access to the A156 from the south. The A57 also provides access to Laneham Road, which joins with Rampton Road and provides access to Cottam Road from the west.

13.7.5 A plan showing the surrounding highway network as this relates to the study area for the Scheme is shown in **ES Volume 2: Figure 13-4 [EN010131/APP/3.2]**.

Local Highway Network

Solar and Energy Storage Park

13.7.6 The A156 High Street/ Gainsborough Road runs north-south, bordering the Solar and Energy Storage Park to the west between and including its junctions with the A631/ A159 within Gainsborough to the north and the A57 to the southwest of Saxilby to the south.

13.7.7 The A156 High Street/ Gainsborough Road is a single carriageway road connecting with the A57 to the west of Saxilby in the south and with the A631/

A159 in Gainsborough to the north. The road is subject to the National Speed Limit (60mph) and does not contain pedestrian footways or street lighting provision, which is in keeping with their rural character. In the vicinity of Marton, to the south of the Solar and Energy Storage Park, the A156 High Street is restricted to 30mph and some pedestrian footways and street lighting provision are provided.

- 13.7.8 The B1241 runs both north-south and east-west, to the north and east of the Solar and Energy Storage Park between and including its junctions with the B1241 Kexby Lane/ Upton Road/ Willingham Road to the north and A1500 Till Bridge Lane to the southeast. The B1241 is a rural single carriageway; the road is subject to a 60mph speed limit and does not contain pedestrian footways or street lighting. There are a number of villages along the B1241 to the east of the Solar and Energy Storage Park including Kexby, Willingham by Stow, Normanby by Stow and Sturton by Stow and as a result the speed limit in the vicinity of, and through these villages is 30mph. In the more rural sections it is subject to a derestricted speed limit and in keeping with their rural character.
- 13.7.9 Willingham Road, which becomes Marton Road are both narrow rural roads with passing places along its route; the roads connect to the A156 to the west and B1241 to the east. The two roads provide a physical border to the south and east of the Solar and Energy Storage Park and are subject to a derestricted speed limit. The route has signing stating it is unsuitable for HGV use.
- 13.7.10 Clay Lane is a no-through road single lane track (with passing places) accessed via the A156 to the southwest of the Solar and Energy Storage Park and passing underneath the railway via a relatively narrow and low underpass.
- 13.7.11 The A1500 Stow Park Road/ Marton Road/ Till Bridge Lane runs east-west, to the south of the Solar and Energy Storage Park between and including its junctions with the A156 to the west and the B1241 to the east. In the vicinity of Marton to the west and Sturton by Stow to the east, the road is subject to a 30mph speed limit, in the more rural sections it is subject to a derestricted speed limit in keeping with its rural character.

Grid Connection Corridor

- 13.7.12 The Grid Connection Corridor will run in a southwest direction within the county of Lincolnshire from the Solar and Energy Storage Park, crossing the A1500 (to the east of Marton), the A156 (to the south of Marton) and the River Trent. The route will then head west into the county of Nottinghamshire connecting to Cottam Power Station, crossing agricultural land as well as Headstead Bank, the disused railway track to the northwest of Cottam, Cow Pasture Lane and Cottam Road at the southern-most extent of the Site. Headstead Bank and Cow Pasture Lane are both narrow, minor, very low trafficked single-track roads with no pedestrian facilities/ street lighting etc.
- 13.7.13 Cottam Road is located between its junction with Rampton Road/ Green Lane to the west and the village of Cottam to the east. Cottam Road is a single carriageway road, with a single lane in each direction and subject to a

derestricted speed limit. Sections of footway exist on Cottam Road around the existing power station access and to the east of the power station running towards Cottam village.

13.7.14 Rampton Road is a single carriageway road which connects to Cottam Road and Green Lane at a junction in the north and Laneham Road to the south. Laneham Road connects to Rampton Road in the north and the A57 in the south. Both of the roads are subject to the National Speed Limit (60mph) and do not feature pedestrian footways or street lighting, which is in keeping with their rural character.

Baseline Traffic Flows

13.7.15 The following time periods have been reviewed to inform the assessment, based on the winter working hours of 08:00-18:00 (as opposed to the summer working hours of 07:00-19:00) in order to provide a robust assessment given that the development peak hours will be more closely orientated with the traditional network peak hours:

- 07:00 to 08:00 – construction staff AM peak hour (winter profile);
- 18:00 to 19:00 – construction staff PM peak hour (winter profile); and
- Daily (24 hours).

13.7.16 A summary of the baseline traffic data within the study area is set out in Table 13-5 and Table 13-6 below, based on the traffic surveys carried out in March and April 2022 (these were carried out between 22nd to 28th March as shown by **ES Volume 2: Figure 13-2 [EN010131/APP/3.2]**, with the exception of traffic count ATC 6 which was resurveyed between 30th March to 10th April due to a technical issue). The results have been presented for an average weekday and include rounded values. The majority of traffic count locations are in Lincolnshire, with ATC 12, ATC 13 and MCC 5 carried out in Nottinghamshire.

Table 13-5 Baseline Traffic Survey Data (2022) – Average Weekday – Total Vehicles – Links

Ref	Link	AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)		
		Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
ATC1	A156 (south of Kexby Lane)	831	47	5.6%	503	12	2.4%	9,663	540	5.6%
ATC2	A156 (north of A1500)	835	42	5.1%	500	13	2.5%	9,686	533	5.5%
ATC3	Clay Lane	1	0	0.0%	1	0	0.0%	22	1	2.7%
ATC4	Willingham Road	14	0	1.4%*	10	0	2.0%*	228	13	5.8%
ATC5	A1500 Stow Park Road	418	17	4.0%	245	6	2.6%	4,539	228	5.0%
ATC6	A156 (south of A1500)	425	34	8.0%	297	10	3.5%	5,897	397	6.7%
ATC7	High Street (east of Marton Road)	163	8	4.7%	133	4	2.7%	2,512	112	4.5%

Location		AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)		
Ref	Link	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
ATC8	B1241 (south of Kexby Lane)	173	10	6.0%	138	3	2.5%	2,574	140	5.4%
ATC9	Marton Road (south of B1241)	15	1	3.9%	13	0	1.6%*	251	12	4.8%
ATC10	B1241 Kexby Lane	54	3	5.5%	56	2	3.6%	1,083	69	6.4%
ATC11	A156 (north of Kexby Lane)	942	52	5.5%	655	17	2.6%	12,249	617	5.0%
ATC12	Cottam Road	83	6	7.2%	46	1	3.0%	720	75	10.4%
ATC13	Headstead Bank	6	0	6.5%*	9	1	9.1%	138	18	13.4%
ATC14	B1241 High Street (north of A1500)	212	14	6.4%	154	4	2.6%	2,741	138	5.0%
ATC15	A1500 (east of Saxilby Road)	561	23	4.1%	309	4	1.4%	5,718	263	4.6%
ATC16	Saxilby Road (south of A1500)	299	16	5.4%	203	4	2.0%	3,612	186	5.2%

*difference between number and % HGVs due to rounding

Table 13-6 Baseline Traffic Survey Data (2022) – Average Weekday – Total Vehicles – Junctions

Location		AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)		
Ref	Junction	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
MCC1	A156 High Street/ A1500 Stow Park Road	930	40	4.3%	546	11	2.0%
MCC2	A1500 Tillbridge Road/ Saxilby Road	840	34	4.0%	505	5	1.0%
MCC3	B1241 High Street/ Marton Road	200	13	6.5%	121	3	2.5%
MCC4	A156 Gainsborough Road/ Willingham Road	977	33	3.4%	632	11	1.7%
MCC5	Cottam Road/ Power Station Access	79	10	12.7%	58	2	3.4%

Collision Data Review

13.7.17 This section provides a summary of Personal Injury Collision (PIC) data obtained from LCC and NCC for the highway network in the vicinity of the Scheme as shown by the study area within **ES Volume 2: Figure 13-1 [EN010131/APP/3.2]**. The PIC data covers the most recent five-year period available:

- Lincolnshire: 01/08/2017 to 31/07/2022 (five years); and
- Nottinghamshire: 31/05/2017 to 30/04/2022 (five years).

13.7.18 A total of 42 collisions have occurred within the study area, for the most recent five-year period. A summary of these collisions by location and severity is set out in Table 13-7 below (for those locations where collisions were recorded). Please note that parts of the network have been excluded where no collisions were recorded.

Table 13-7 Collision Data Summary

Location	Number of Collisions			
	Slight	Serious	Fatal	Total
A156 Gainsborough Road (north of Kexby Lane)	3	0	0	3
A156 Gainsborough Road/ B1241 junction	1	0	0	1
A156 Gainsborough Road (south of Kexby Lane, circa. 2km)	3	1	0	4
Private road (west of 156 Gainsborough Road)	1	0	0	1
A156 Gainsborough Road (north of 1500 Stow Park Road, circa. 3km)	2	0	1	3
A156 Gainsborough Road/ A1500 Stow Park Road junction	2	1	0	3
A156 High Street (south of A1500 Stow Park Road)	1	1	0	2
B1241 Willingham Road (east of A156 Gainsborough Road)	2	0	0	2
B1241 Willingham Road/ Kexby Lane/ Upton Road	1	0	0	1
B1241 Kexby Lane	0	1	0	1
B1241 Kexby Lane/ Willingham Road junction (east)	1	0	0	1
Padmoor Lane (north of B1241 Kexby Lane)	0	1	0	1
A1500 Stow Park Road (east of A156)	2	0	0	2
A1500 Tillbridge Rd/ Saxilby Road junction	3	2	0	5
A1500 Tillbridge Road (east of Saxilby Road)	2	0	0	2
Saxilby Road (south of A1500 Tillbridge Road)	2	0	0	2
B1241 High Street (north of A1500 Tillbridge Road)	1	0	0	1
B1241 Sturton Road/ Ingham Road/ Stow Park Road junction	1	1	0	2
B1241 Normandy Road (north of Ingham Road)	1	0	0	1
Ingham Road (east of B1241 Sturton Road)	0	1	0	1
Cottam Road/ Rampton Road junction	1	0	0	1
Cottam Road (east of Rampton Road)	0	0	1	1
Westbrecks Lane (north of Cottam Road)	0	1	0	1

13.7.19 The above indicates that a total of five collisions (one serious and four slight) occurred at the A1500 Tillbridge Road/ Saxilby Road junction during the five year period, equivalent to one collision per year. This is therefore considered to represent a cluster site which is reflected within the assessment of accidents and safety within Section 13.10.

13.7.20 A total of four collisions (one serious and three slight) occurred along a circa. 2km stretch of the A156 Gainsborough Road between the junction with the B1241 Willingham Road to the north and the junction with Knaith Hill to the south. This is equivalent to less than one collision per year along this section which is not considered to represent a cluster site.

- 13.7.21 In terms of the remaining collisions, one fatal collision occurred on the A156 Gainsborough Road approximately 300m north of the junction with Clay Lane. The incident occurred during dark conditions on a wet road surface when a southbound car driver attempted to overtake a bus but collided head-on with an oncoming vehicle.
- 13.7.22 Further to the above, one fatal collision occurred on Cottam Road approximately 450m east of the junction with Cow Pasture Lane. The incident occurred during dark conditions following the loss of control of an eastbound vehicle which subsequently overturned and collided with a tree. No additional vehicles were involved.
- 13.7.23 For the remainder of the network within the study area, three or fewer collisions occurred at any junction or link between junctions within the five-year period, equivalent to less than one collision per year. On this basis, no additional cluster sites have been identified.

Walking Facilities

Solar and Energy Storage Park

- 13.7.24 Due to the rural location of the Solar and Energy Storage Park, there is limited footway provision in the surrounding area. Footways are limited to the settlements that surround the Solar and Energy Storage Park, as follows:
- A156 – footways on both sides of A156 within Marton village; footways on western side of A156 north of Marton to Gate Burton and further north between Knaith and Lea;
 - B1241 (North) - footway provision, varying from both sides to one side between Lea and Knaith Park and then on the northern side of B1241 between Upton Rd/ Willingham Road junction and western extent of residential dwellings on eastern part of Kexby Lane;
 - B1242 (East) – footway provision, on at least one side of the carriageway exists along the full extent of the route from the Kexby lane junction in the north to the A1500 junction in the south; and
 - A1500 – Other than in the settlements of Marton and Sturton by Stow (at either extent of the A1500 within the study area) there is no footway provision along this route.
- 13.7.25 There is one PRow crossing the Solar and Energy Storage Park, and three further PRow which run in close proximity to its boundary. These PRow are as follows from north to south:
- **PRoW LL|Upto|53/1** – a footpath which runs for 1,250m within the vicinity of the northern extent of the Solar and Energy Storage Park, running in an east to west direction between PRow Kexb/53/1 and Upton Road;
 - **PRoW LL|Knai|44/1** – a footpath which runs for approximately 330m within the vicinity of the northern extent of the Solar and Energy Storage Park, running in an east-west direction between the railway line in the west and the B1241 to the east;
 - **PRoW LL|Knai|44/2** – a footpath which runs for approximately 450m in a west-east direction, along the northern extents of the Solar and Energy

Storage Park (in its northwest corner) from Knaith Hill/ Station Road to the railway line to the east. The PRoW also runs through the Solar and Energy Storage Park for a short distance; and

- **PRoW LL|Mton|69/1** – a footpath which runs for approximately 350m and meets the south-western boundary of the Solar and Energy Storage Park to the south of Willingham Road, running in a north-south direction between the Solar and Energy Storage Park in the north and A1500 Stow Park Road in the south.

Grid Connection Corridor

13.7.26 As above, due to the rural location of the Grid Connection Corridor, there is limited footway provision in the surrounding area. Footways are limited to the northern side of Cottam Road and the western side of Town Street both near and through the village of Cottam, as well as both sides of Torksey Ferry Road within the village of Rampton.

13.7.27 A list of all PRoW which could be potentially impacted by the proposed Grid Connection Corridor (including both the PRoW located in Lincolnshire and Nottinghamshire county, listed in north-south direction along the Grid Connection Corridor) is as follows:

- **PRoW LL|Mton|68/1** – a footpath which runs for approximately 450m within the vicinity of the Grid Connection Corridor boundary, through the field to the south of A1500 Stow Park Road in a south-western direction towards A156 High Road.
- **PRoW LL|Mton|66/4** – a footpath that runs for approximately 500m along the eastern bank of the River Trent, to the west of A156 High Street and south of Marton. The PRoW runs in a north-south direction commencing at Trent Port Road in the north and connecting with PRoW LL|Bram|66/1 in the south.
- **PRoW LL|Bram|66/1** – a footpath that runs for approximately 1000m along the eastern bank of the River Trent. The footpath commences to the east of A156 High Street to the south of Marton along an existing field access track and runs in a north-western direction towards the eastern bank of the River Trent where it links with PRoW LL|Mton|66/4.
- **PRoW NT|Cottam|FP1** – a footpath that runs for approximately 1200m along the western bank of the River Trent. The PRoW runs in a north-south direction, linking with Hablesthorpe|FP9 in the north, PRoW NT|Treswell|FP7 and NT|Cottam|BW7 in the south and PRoW NT|Cottam|FP3 in the west.
- **PRoW NT|Cottam|FP3** – a footpath that runs for approximately 1000m along the western bank of the River Trent, north of Cottam. The footpath commences to the east of Headstead Bank, along an existing field access track which runs in a west-east direction through the fields where it joins with PRoW NT|Cottam|FP1.
- **PRoW NT|Cottam|RB4** – a restricted byway that runs for approximately 1100m in a north-south direction between Broad Lane in the north and Cottam Road in the south.

- **PRoW NT|SouthLeverton|BOAT16** – a byway that runs for approximately 1100m along Cow Pasture Lane in a north-south direction between Broad Lane in the north and Cottam Road (Outgang Lane) in the south.
- **PRoW NT|Treswell|FP4** – a footpath that runs for approximately 250m to the west of Cottam Power Station. The PRoW runs through the fields to the north of Torksey Ferry Road in a southwest-northeast direction, connecting with PRoW NT|Rampton|FP5 to the south of Rampton Thorns, and with PRoW NT|Treswell|FP5 to the east of Rampton Thorns, outside of the Grid Connection Corridor boundary.
- **PRoW NT|Rampton|FP5** – a footpath that runs for approximately 800m to the west of Cottam Power Station. The PRoW runs through the fields to the north of Torksey Ferry Road in a southwest-northeast direction, connecting with PRoW NT|Treswell|FP4 to the south of Rampton Thorns and Torksey Ferry Road in the south.
- **PRoW NT|Treswell|FP5** – a footpath that runs for approximately 600m to the west of Cottam Power Station. The PRoW runs through the field to the south of Cottam Road in a north-south direction, connecting with PRoW NT|Treswell|FP4 and PRoW NT|Rampton|FP6 in the south.
- **PRoW NT|Rampton|FP6** – a footpath that runs for approximately 500m to the west of Cottam Power Station. The PRoW runs through the field to the north of Torksey Ferry Road in a north-south direction, connecting with PRoW NT|Treswell|FP5 in the north and Torksey Ferry Road in the south.
- **PRoW NT|Rampton|BOAT13** – a byway that runs for approximately 2000m along Torksey Ferry Road in a west-east direction. The PRoW connects with PRoW NT|Rampton|FP10, NT|Rampton|FP6, NT|Rampton|FP20, NT|Rampton|BOAT12 in the west along Torksey Ferry Road and with NT|Rampton|BW8 and NT|Rampton|FP7 in the east.
- **PRoW NT|Rampton|FP20** – a footpath that runs for approximately 380m to the south of Torksey Ferry Road, along Nightleys Road in a north-south direction. The PRoW connects with PRoW NT|Rampton|BOAT13 to the north and with NT|Rampton|FP9 in the south.
- **PRoW NT|Rampton|BOAT12** – a byway that runs for approximately 600m to the south of Torksey Ferry Road, along Shortleys Road in a north-south direction. The PRoW connects with PRoW NT|Rampton|BOAT13 to the north and with NT|Laneham|BOAT10 in the south.

Cycling Facilities

Solar and Energy Storage Park

13.7.28 There are no on or off carriageway dedicated/ marked cycling facilities within the immediate vicinity of the Solar and Energy Storage Park and whilst relatively fast vehicle speeds and high traffic flows on the two A-roads (A156 and A1500) may deter cyclists, the B1421 to the north and east of the Site,

as well as the smaller roads closer and within the Solar and Energy Storage Park itself are likely to be attractive to leisure cycling. The Solar and Energy Storage Park could be potentially accessed by cyclists from Lea, Willingham, Stow, Upton and Brampton located within an approximate 2.5km cycle distance.

- 13.7.29 There are no formal cycle facilities in the vicinity of the Solar and Energy Storage Park. The nearest National Cycle Network route (between Harby and Lincoln) is located approximately 12km to the south.

Grid Connection Corridor

- 13.7.30 There are no on or off carriageway dedicated/ marked cycling facilities within the immediate vicinity of the Grid Connection Corridor. The eastern extent of the Grid Connection Corridor connects to the Solar and Energy Storage Park and therefore as previously mentioned above, the relatively fast vehicle speeds and high traffic flows on the two A-roads (A156 and A1500) may deter cyclists within the vicinity of the Grid Connection Corridor within the Lincolnshire part of the Scheme study area. However, there are a number of minor roads within the western extents of the Grid Connection Corridor within Nottinghamshire, including Cottam Road which is relatively lowly trafficked and would appear to be attractive to leisure cyclists. Additionally, this area could be potentially accessed by cyclists from Coates, South Leverton, Rampton and Treswell, all within a 2.5km cycle distance.

Equestrian Facilities

Solar and Energy Storage Park

- 13.7.31 There are no formal equestrian facilities (i.e. Bridleways) in the vicinity of the Solar and Energy Storage Park, however, some of the surrounding roads are generally lightly trafficked and could be used by equestrians on this basis.

Grid Connection Corridor

- 13.7.32 There are formal equestrian facilities in the vicinity of the Grid Connection Corridor along its western part within Nottinghamshire. These include Bridleways, Restricted Byways and Byways Open to All Traffic (BOAT) as listed earlier above. Also, there are a number of narrow single-track roads to the north of Cottam near to Headstead Bank which appear to be very low trafficked and therefore may be appealing to equestrians.

Public Transport Facilities

Solar and Energy Storage Park

Bus

- 13.7.33 Bus stops are located on the A156 and B1421 (north and east) which broadly surround the Solar and Energy Storage Park. The bus routes which serve these bus stops are identified in Table 13-8 below:

Table 13-8 Bus Stops/ Services near the Solar and Energy Storage Park

Bus Stop	Service Route	Typical Frequency	
		Weekday	Weekend
A156 Gainsborough Road (Gate Burton Clay Lane)	107 Gainsborough to Lincoln	One service per hour	Saturday service same as weekday service No service on Sunday
B1241 Willingham Road (Knaith Park)	100 Gainsborough to Lincoln	One service per hour	Saturday service same as weekday service No service on Sunday
B1241 Willingham Road (Knaith Park)	105 Gainsborough to Lincoln	One service a day	No service on Saturday No service on Sunday (School days only)

Rail

- 13.7.34 Gainsborough is located to the north of the Solar and Energy Storage Park and has two railway stations, Gainsborough Central and Gainsborough Lea Road.
- 13.7.35 Gainsborough Central Station is located approximately 6km to the north of the Solar and Energy Storage Park and is managed by Northern Rail, running services between Sheffield and Cleethorpes/ Lincoln. The only passenger services calling at the station during a weekday are two services in the AM peak and two services in the PM peak.
- 13.7.36 Gainsborough Lea Road Station is located approximately 4.5km to the north of the Solar and Energy Storage Park and is served by rail services operated by both Northern Rail and East Midlands Railway, running services from Sheffield to Lincoln/ Cleethorpes and Peterborough to Doncaster via Lincoln. The services run at the following combined frequency:
 - Sheffield to Lincoln/ Cleethorpes (Northern Rail) – Three services during the morning (07:00-10:00) and afternoon (16:00-19:00) in each direction, with a total of circa. 20 services a day in each direction running every hour (Monday to Friday); and
 - Peterborough to Doncaster via Lincoln (East Midlands Railway) – Five services a day in each direction (Monday to Friday), two services (one in each direction) in the AM peak and one service in the PM peak towards Doncaster.
- 13.7.37 Saxilby Station is located approximately 10.5km to the south of the Solar and Energy Storage Park and is served by the same rail services as Gainsborough Lea Road Station.

Grid Connection Corridor

Bus

13.7.38 The eastern extent of the Grid Connection Corridor could be served by the same bus services as the Solar and Energy Storage Park mentioned above. However, as the Grid Connection Corridor is severed by the River Trent, the nearest bus stops and bus services to the western extent of the Grid Connection Corridor are located on Cottam Road. The bus stops are situated approximately 1.3km to the west of Cottam Power Station on Cottam Lane/ Green Lane on the eastern side of Treswell. Bus Route 190 serves these stops, with the service running between Retford to Tuxford (via Rampton). There are only two daily services which run from Tuxford to Retford (during the AM peak) and only three daily services which run from Retford to Tuxford (during the PM peak).

Rail

13.7.39 Retford Station is located approximately 10.5km to the west of Cottam Power Station and is managed by East Coast Mainline, running services between York, Hull and Newcastle in the north and London King's Cross in the south. The station runs the same services as Gainsborough Central and Gainsborough Lea Road to Lincoln/ Cleethorpes and Sheffield/ Lincoln. The service between London King's Cross and Hull or Edinburgh runs two services in each of the AM and PM peaks, a total of 30 services (Monday to Friday) run in both directions through Retford.

Future Baseline

13.7.40 The future baseline scenarios are set out in **Chapter 5: EIA Methodology** of this ES [EN010131/APP/3.1].

13.7.41 In the absence of the Scheme, traffic flows on the surrounding highway network would be expected to increase as a result of housing and employment growth. Therefore, projected background traffic growth has been applied to the traffic flows derived from the traffic surveys (March/ April 2022) to represent conditions during the future baseline (and construction peak assessment year) of 2026. As previously mentioned, the decommissioning assessment year is assumed to be 2088 which is considered to be too far into the future to be able to accurately predict traffic flows at that time.

13.7.42 Traffic growth has been calculated using National Road Traffic Forecast (NRTF) growth factors, reflecting projected increases in annual vehicle mileage on roads within the England and Wales. National Transport Model (NTM) adjustments have then been applied within the Trip Ends Model Program (TEMPRO) utilising National Trip Ends Model (NTEM) dataset v7.2 and 2018 RTF – Scenario 1 (Reference Case) to reflect local factors (i.e. West Lindsey) for the appropriate road types, to determine the forecast increases in future baseline car driver trips during each weekday peak period. These represent the latest datasets available, covering the period up to 2050.

13.7.43 A summary of the growth factors is set out in Table 13-9 below.

Table 13-9 Traffic Growth Factors

Growth Period	Road Type	Traffic Growth Factor (West Lindsey)		
		AM Peak	PM Peak	Average Weekday
2022 to 2026 (Construction)	Principal	1.030	1.031	1.033
	Minor	1.029	1.030	1.032
	All	1.034	1.035	1.037

13.7.44 To provide a robust approach, the highest growth factors (all roads) as presented above in **bold** have been applied to the 2022 baseline traffic flows.

13.7.45 The anticipated future baseline flows on the surrounding highway network are set out in Table 13-10 and Table 13-11 below. Again, the results have been presented for an average weekday and include rounded values. The majority of traffic count locations are in Lincolnshire, with ATC 12, ATC 13 and MCC 5 in Nottinghamshire.

Table 13-10 Future Baseline Traffic Flows (2026) – Average Weekday – Total Vehicles – Links

Ref	Location Link	AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)		
		Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
ATC1	A156 (south of Kexby Lane)	860	48	5.6%	520	13	2.4%	10,021	560	5.6%
ATC2	A156 (north of A1500)	864	44	5.1%	517	13	2.5%	10,045	553	5.5%
ATC3	Clay Lane	1	0	0.0%	1	0	0.0%	23	1	2.7%
ATC4	Willingham Road	15	0	1.4%*	11	0	2.0%*	237	14	5.8%
ATC5	A1500 Stow Park Road	432	17	4.0%	254	7	2.6%	4,708	236	5.0%
ATC6	A156 (south of A1500)	440	35	8.0%	308	11	3.5%	6,116	411	6.7%
ATC7	High Street (east of Marton Road)	168	8	4.7%	138	4	2.7%	2,605	116	4.5%
ATC8	B1241 (south of Kexby Lane)	179	11	6.0%	143	4	2.5%	2,669	145	5.4%
ATC9	Marton Road (south of B1241)	16	1	3.9%	13	0	1.6%*	260	12	4.8%
ATC10	B1241 Kexby Lane	56	3	5.5%	58	2	3.6%	1,123	71	6.4%
ATC11	A156 (north of Kexby Lane)	974	53	5.5%	678	17	2.6%	12,703	640	5.0%
ATC12	Cottam Road	86	6	7.2%	48	1	3.0%	747	78	10.4%
ATC13	Headstead Bank	6	0	6.5%*	9	1	9.1%	143	19	13.4%

Location		AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)		
Ref	Link	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
ATC14	B1241 High Street (north of A1500)	219	14	6.4%	160	4	2.6%	2,843	143	5.0%
ATC15	A1500 (east of Saxilby Road)	581	24	4.1%	320	4	1.4%	5,930	273	4.6%
ATC16	Saxilby Road (south of A1500)	309	17	5.4%	210	4	2.0%	3,745	193	5.2%

*difference between number and % HGVs due to rounding

Table 13-11 Future Baseline Traffic Flows (2026) – Average Weekday – Total Vehicles – Junctions

Location		AM Dev Peak (07:00-08:00)			PM Dev Peak (18:00-19:00)		
Ref	Junction	Total	HGVs (#)	HGVs (%)	Total	HGVs (#)	HGVs (%)
MCC1	A156 High Street/ A1500 Stow Park Road	962	41	4.3%	565	11	2.0%
MCC2	A1500 Tillbridge Road/ Saxilby Road	869	35	4.0%	522	5	1.0%
MCC3	B1241 High Street/ Marton Road	207	13	6.5%	125	3	2.5%
MCC4	A156 Gainsborough Road/ Willingham Road	1,010	34	3.4%	654	11	1.7%
MCC5	Cottam Road/ Power Station Access	82	10	12.7%	60	2	3.4%

13.7.46 The consideration of cumulative effects as a result of committed developments is set out within Section 13.12 of this report.

13.8 Potential Impacts

13.8.1 Mitigation measures being incorporated in the design and construction of the proposed Scheme are set out below in Section 13.9. Prior to the implementation of the mitigation, the proposed Scheme has the potential to adversely affect the following, during the construction and decommissioning phases:

- Increase in HGV movements (with the potential to increase severance, congestion, as well as fear & intimidation to pedestrians and cyclists for example);
- Abnormal Indivisible Loads (AILs) including cranes (with the potential to create disruption to the surrounding highway network unless carefully managed with Police escort for example);

- Travel to and from site by construction staff (with the potential to increase congestion and driver delay for example);
- Increase in delay to vehicles, pedestrians, cyclists and equestrians due to increase in vehicle movements (as above), as well as reduction in pedestrian/ cycle amenity;
- Change in route connections and amenity for pedestrians, cyclists and equestrians due to Scheme (potential PRow and/ or road diversions during the construction phase); and
- Impacts on operational road or rail safety due to glint and glare impacts, and/ or rail assets such as bridges and level crossings due to HGV movements.

13.8.2 Consideration has also been given to those users of local facilities which could be impacted by the Scheme. For example, PRow have been reviewed to determine whether they will need to be temporarily diverted to provide safe access for members of the public during construction.

13.9 Embedded Mitigation Measures

13.9.1 Embedded and measures form an integral, committed and deliverable part of the scheme design or comprise standard construction practices. They are assumed to be implemented and are therefore factored into the determination of significant residual effects.

Construction and Decommissioning

Embedded Mitigation

- 13.9.2 The Scheme will minimise construction and decommissioning impacts through:
- Implementation of a **Framework CTMP [EN010131/APP/3.3]** and **Framework Construction Environmental Management Plan (CEMP) [EN010131/APP/7.3]** during the construction phase, as well as a **Framework Decommissioning Environmental Management Plan (DEMP) [EN010131/APP/7.5]** during the decommissioning phase, which will be secured as part of the DCO, to detail and formalise the measures that will mitigate construction-related and decommissioning-related effects;
 - Providing suitable points of access for construction vehicles to accommodate swept paths and designed with adequate visibility, with any supporting improvements (e.g. vegetation clearance) to take place within the highway boundary and/ or the Order limits if required;
 - Delivering internal construction routes through the Solar and Energy Storage Park, to allow vehicles to access all areas via the site access points;
 - Providing a haul road to facilitate the construction of the Grid Connection Corridor;

- Prohibiting construction vehicles from using any level crossings and the Clay Lane underpass to ensure operational rail safety (construction vehicles will be able to use the Kexby Lane South access or the Marton Road access and internal construction routes to access all areas of the Solar and Energy Storage Park);
- Maintaining access to/ along PRoW, or otherwise providing temporary PRoW diversion routes where necessary to avoid any PRoW closures or potential conflicts with the Scheme (e.g. for the Grid Connection Corridor) where possible. The diversion routes will be agreed with the local authorities prior to construction;
- Providing sufficient protection/ separation between existing PRoW and construction routes where necessary;
- Managing areas where the proposed construction route crosses any existing PRoW (where these are unable to be diverted) or local access roads, by maximising visibility between construction vehicles and other users (pedestrians and road users), implementing traffic management e.g. advanced signage to advise other users of the works, as well as manned controls at each crossing point (marshals/ banksmen), with a default priority that construction traffic will give-way to other users. This includes several PRoW crossing points as detailed within the **Outline PRoW Management Plan [EN010131/APP/7.8]**;
- Restricting HGV movements and abnormal loads to certain routes (see HGV Routing Plan in **ES Volume 2: Figure 13-3** and Abnormal Load Routing Plan in **ES Volume 2: Figure 13-6 [EN010131/APP/3.2]**);
- Reducing HGV movements during certain times of the day (e.g. between 07:00 and 09:00, as well as between 17:00 and 19:00), to avoid increasing traffic levels on the surrounding highway network during the traditional weekday peak hours;
- Carrying out road condition surveys pre-construction, during construction and post-construction, to identify any defects that arise to highway assets/verges during the construction phase of the Scheme for re-instatement. The proposed locations of the road condition surveys are identified within the **Framework CTMP [EN10131/APP/3.3]** and include sections of carriageway within the vicinity of the proposed access points, as well as the abnormal vehicle route for the transformer to the Solar and Energy Storage Park between the A15/A1500 roundabout and the proposed site access on the A156;
- Implementing a Delivery Management System to control the bookings of HGV deliveries from the start of the construction period. This will be used to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance of HGV routing;
- Implementing a monitoring system to record the route of all HGVs travelling to and from the Scheme, to record any non-compliance with the agreed routing plan/ delivery hours and to communicate any issues to the relevant suppliers to ensure the correct routes and times are followed;

- Developing a communications strategy including regular meetings with contractors to review and address any issues associated with travel to/ from the Scheme, as well as to relay information including any restrictions and requirements which should be followed;
- Utilising the existing access arrangements for Cottam Power Station to access the Substation via Cottam Road, which will be managed and maintained by National Grid;
- Implementing Temporary Traffic Management (TTM) where required when the Grid Connection Cables are installed to connect Cottam Substation with the Solar and Energy Storage Park. It is envisaged that the TTM will be secured by the DCO through the TTM plans;
- Encouraging local construction staff to car share to reduce single occupancy car trips, by promoting the benefits of car sharing such as reduced fuel costs and by providing dedicated parking spaces for those car sharing within the compounds. A formal Car Share Scheme will be implemented to match potential sharers and to help staff identify any colleagues who could potentially be collected along their route to/ from site;
- Implementing a shuttle service to transfer staff to/ from nearby catchment areas to reduce vehicle trips on the surrounding highway network. It is expected that shuttle services would travel to/ from Gainsborough (north), Lincoln (south), Retford (west) and Newark on Trent (south) to collect/ drop off construction staff from 'hubs' at each of these four locations. A total of eight shuttle buses will be provided, each with a capacity of 50 staff, to transfer the expected peak demand (220 construction workers) to/ from the Site. All shuttle services will utilise the main site access on the A156 Gainsborough Road;
- Implementing minibuses to transfer staff internally within the Solar and Energy Storage Park, as well as to/ from the Grid Connection Corridor as required e.g. between the eastern and western parts of the Site via the Clay Lane railway underpass, to minimise external trips on the surrounding highway network;
- Providing sufficient (but limited) on-site car parking within the main compound (A156 Gainsborough Road) to accommodate the expected peak parking demand of construction staff within the Solar and Energy Storage Park;
- Providing limited on-site car parking within the smaller compounds (Kexby Lane North, Kexby Lane South and Marton Road) to accommodate the required parking demand of construction staff within the Solar and Energy Storage Park, but to encourage use of the main compound on the A156 Gainsborough Road to minimise vehicle trips on the local highway network. Construction workers will also be able to access other areas of the Site using the internal minibus service if required;
- Implementing local off-site highway improvements to accommodate construction vehicles and abnormal loads travelling to the Solar and Energy Storage Park and the Grid Connection Corridor e.g. carriageway

widening, pavement protection, removal of street furniture, vegetation clearance including overhanging trees and lifting overhead cables if required (**Appendix 13-E: Framework CTMP [EN010131/APP/3.3]**);

- Implementing traffic management and the temporary closure of affected footways in the vicinity of the A156 / A1500 junction to facilitate the turning manoeuvre of the abnormal load (transformer) at this junction. Any damage to existing pavement infrastructures such as kerblines or tactile paving will be reinstated to the satisfaction of the Local Authority;
- Positioning of suitably qualified banksmen at the proposed accesses for the Scheme and at internal crossing points, to allow all vehicle arrivals and departures to be safely controlled during the construction period;
- Vegetation clearance at the proposed access points where required to achieve appropriate levels of visibility at these locations. Drawings showing the proposed access points, visibility splays and swept paths are held within **Appendix 13-E: Framework CTMP** of the ES **[EN010131/APP/3.3]**;
- Providing sufficient cycle parking spaces within the Solar and Energy Storage Park to encourage construction staff to travel by bicycle where viable (six cycle parking spaces to be provided);
- Should it be necessary, access for emergency vehicles will be achievable via several access points including the A156, Kexby Lane and Marton Road;
- In terms of construction compounds, the main construction compound for the Solar and Energy Storage Park will be served by the proposed access on the A156. There are also expected to be three smaller secondary compounds across the Solar and Energy Storage Park, served by alternative access points or the internal construction access routes;
- A specialised haulage service will be employed to allow abnormal loads to transfer components with the necessary escort, permits and traffic management, with the applicant consulting with the relevant highways authorities to ensure the correct permits are obtained. The Police will also be given advanced notification under the Road Vehicle Authorisation of Special Types Order 2003; and
- The opportunity to combine mitigation (including some of the above measures) for the West Burton Solar Project and Cottam Solar Project schemes (see Section 13.12) will be explored in order to reduce cumulative impacts during the construction phase. This could include sharing the shuttle service to transport construction workers to/ from multiple sites or sharing construction compounds to consolidate trips. Further details will be set out within the Detailed CTMP(s) once further details in relation to the Cottam and West Burton solar projects are known.

13.9.3 As above, it is expected that the above measures will be secured as part of the **Framework CTMP [EN010131/APP/3.3]** and **Framework CEMP [EN010131/APP/7.3]** during the construction phase, as well as a **Framework**

DEMP [EN010131/APP/7.5] during the decommissioning phase. In addition, these measures will be secured as part of the Detailed CTMP(s) which will be prepared post-consent.

Operation

Embedded Mitigation

13.9.4 The proposed Scheme minimises operational impacts by:

- Providing suitable points of access for operational phase vehicles, including on the A156, Kexby Lane (North and South) and Marton Road;
- Converting the internal construction routes to maintenance routes, to allow operational vehicles to access all areas of the Solar and Energy Storage Park via the proposed access points during the operational phase;
- Prohibiting vehicles from using any level crossings;
- Providing additional screening e.g. hedgerows where required to conceal solar reflections and ensure operational road and rail safety (see the Glint & Glare Assessment in **Chapter 15: Other Environmental Topics [EN010131/APP/3.1]**);
- Prohibiting large maintenance vehicles from using the Clay Lane underpass by utilising the Kexby Lane South access or the Marton Road access to ensure operational rail safety;
- Maintaining access to all existing PRoW within the Scheme, with no diversions or closures (any PRoW temporarily diverted during the construction phase will be reinstated during the operational phase); and
- Controlling areas where the internal maintenance route crosses any existing PRoW or local access roads (such as providing gates), permitting only operational traffic to utilise these internal routes within the Solar and Energy Storage Park. Operational traffic should give-way to other users (pedestrians and road users) when utilising the crossing points. Visibility will be maximised between operational vehicles and other users, with warning signage provided if required.

13.9.5 It is expected that the above measures will be secured as part of the **Framework Operational Environmental Management Plan (OEMP) [EN010131/APP/7.4]**.

Monitoring

13.9.6 The following monitoring will be carried out during the construction and decommissioning phases of the Scheme, and secured as part of the Framework CTMP **[EN010131/APP/3.3]**, **Framework CEMP [EN010131/APP/7.3]** or Detailed CTMPs when these are prepared in due course:

- Construction vehicles (HGVs) will be monitored to ensure HGV drivers are adhering to the agreed routing plan (see **ES Volume 2: Figure 13-3** and **ES Volume 2 Figure 13-6 [EN010131/APP/3.2]**);

- Road safety will be monitored within the Site including at any PRow crossing points, temporary PRow diversion points, and crossing points of the local highway network; and
- Temporary Traffic Management (TTM) will be monitored when this is required.

13.10 Assessment of Likely Impacts and Effects

- 13.10.1 The effects have been assessed following consideration of the potential impacts outlined in Section 13-8 and taking into account the embedded mitigation measures as detailed in Section 13-9 above. The potential for the Scheme to generate effects has been assessed using the methodology as detailed in Section 13-6 of this Chapter. Please see paragraphs 13.10.8 and 13.10.9 below for further details of the potential impacts. Further details of road and PRow receptors are set out under each assessment where relevant e.g. paragraph 13.10.11 for severance.
- 13.10.2 The environmental effects have been classified using the matrix contained within Table 5-1 of **Chapter 5: EIA Methodology** of this ES [EN010131/APP/3.1], based on the sensitivity of receptor and magnitude of impact.

Construction (assumed 2025 to 2027) and Decommissioning (assumed 2088)

Initial Highway Impact Assessment

- 13.10.3 The full traffic impact methodology is set out within **Appendix 13-D: Transport Assessment** of the **ES Volume 3 [EN010131/APP/3.3]**. The forecast increases in vehicle movements during the proposed development weekday peak hours and across the day (24 hours), both in terms of actual increases and percentage increases relative to the future baseline traffic flows, are presented in Table 13-12 and Table 13-13 below. It should be noted that these figures represent both the Solar and Energy Storage Park and the Grid Connection Corridor.

Table 13-12 2026 Construction Traffic Impact – Development Peak Hours

Ref	Location	AM Development Peak (07:00-08:00)				PM Development Peak (18:00-19:00)			
		Base	Dev	Total	% Uplift	Base	Dev	Total	% Uplift
ATC1	A156 (south of Kexby Lane)	860	74	934	8.6%	520	74	594	14.2%
ATC2	A156 (north of A1500)	864	85	949	9.9%	517	85	602	16.5%
ATC3	Clay Lane	1	0	1	0.0%	1	0	1	0.0%
ATC4	Willingham Road	15	0	15	0.0%	11	0	11	0.0%
ATC5	A1500 Stow Park Road	432	33	465	7.6%	254	33	287	13.0%
ATC6	A156 (south of A1500)	440	52	492	11.9%	308	52	360	17.0%
ATC7	High Street (east of Marton Road)	168	0	168	0.0%	138	0	138	0.0%
ATC8	B1241 (south of Kexby Lane)	179	12	191	7.0%	143	12	155	8.7%
ATC9	Marton Road (south of B1241)	16	12	28	78.2%	13	12	25	95.6%
ATC10	B1241 Kexby Lane	56	41	97	72.6%	58	41	99	70.8%
ATC11	A156 (north of Kexby Lane)	974	49	1,023	5.0%	678	49	727	7.2%
ATC12	Cottam Road	86	0	86	0.0%	48	0	48	0.0%
ATC13	Headstead Bank	6	0	6	0.0%	9	0	9	0.0%
ATC14	B1241 High Street (north of A1500)	219	0	219	0.0%	160	0	160	0.0%
ATC15	A1500 (east of Saxilby Road)	581	33	613	5.7%	320	33	353	10.3%
ATC16	Saxilby Road (south of A1500)	309	0	309	0.0%	210	0	210	0.0%
MCC1	A156 High Street/ A1500 Stow Park Road	962	85	1,047	8.9%	565	85	650	15.1%
MCC2	A1500 Tillbridge Road/ Saxilby Road	869	33	902	3.8%	522	33	555	6.3%
MCC3	B1241 High Street/ Marton Road	207	12	219	6.0%	125	12	138	9.95%*
MCC4	A156 Gainsborough Road/ Willingham Road	1,010	86	1,097	8.5%	654	86	740	13.2%
MCC5	Cottam Road/ Power Station Access	82	0	82	0.0%	60	0	60	0.0%

*shown at an additional decimal place to demonstrate this is below 10%

Table 13-13 2026 Construction Traffic Impact – Daily (24 Hours)

Ref	Location	Daily (24 hours)			
		Base	Dev	Total	% Uplift
ATC1	A156 (south of Kexby Lane)	10,021	294	10,315	2.9%
ATC2	A156 (north of A1500)	10,045	318	10,363	3.2%
ATC3	Clay Lane	23	0	23	0.0%
ATC4	Willingham Road	237	0	237	0.0%
ATC5	A1500 Stow Park Road	4,708	124	4,831	2.6%
ATC6	A156 (south of A1500)	6,116	252	6,368	4.1%
ATC7	High Street (east of Marton Road)	2,605	0	2,605	0.0%
ATC8	B1241 (south of Kexby Lane)	2,669	41	2,710	1.5%
ATC9	Marton Road (south of B1241)	260	41	301	15.8%
ATC10	B1241 Kexby Lane	1,123	134	1,257	11.9%
ATC11	A156 (north of Kexby Lane)	12,703	244	12,947	1.9%
ATC12	Cottam Road	747	58*	805	7.8%
ATC13	Headstead Bank	143	58*	201	40.6%
ATC14	B1241 High Street (north of A1500)	2,843	0	2,843	0.0%
ATC15	A1500 (east of Saxilby Road)	5,930	66	5,996	1.1%
ATC16	Saxilby Road (south of A1500)	3,745	0	3,745	0.0%

*represents a worst-case assessment on these parts of the network for the Grid Connection Corridor (16 HGVs, 12 LGVs and one minibus)

13.10.4 The results shown in Table 13-12 and Table 13-13 indicate that the following parts of the network are expected to experience increases of at least 30 additional vehicle trips during the development peak hours. This represents at least a 10% increase compared to baseline flows during the development peak hours or across the day (thresholds of 10%, 30%, 60% and 90% have been adopted for consistency with later assessment criteria):

- ATC1 and ATC2 – A156 Gainsborough Road (south of Kexby Lane and north of the A1500)
 - +10% increase during PM development peak hour; however the future baseline traffic flows *with* development traffic remain below the future baseline traffic flows *without* development traffic during the AM development peak hour.
 - In addition, construction vehicle trips represent a <10% increase compared to future baseline flows during the AM development peak hour.
 - Therefore, the Scheme is not expected to cause congestion on this part of the network during the AM and PM development peak hours.
- ATC5 and ATC15 – A1500 Stow Park Road (east of A156) and A1500 Tillbridge Road (east of Saxilby Road).

- +10% increase during PM development peak hour; however the future baseline traffic flows with development traffic remain below the future baseline traffic flows without development traffic during the AM development peak hour.
- In addition, construction vehicle trips represent a <10% increase compared to future baseline flows during the AM development peak hour.
- Therefore, the Scheme is not expected to cause congestion on this part of the network during the AM and PM development peak hours.
- ATC6 – A156 Gainsborough Road (south of A1500)
 - +10% increase during AM development peak hour (52 additional trips as a result of construction traffic).
 - +10% increase during PM development peak hour (52 additional trips as a result of construction traffic).
- ATC9 – Marton Road (south of B1241 Gainsborough Road)
 - Fewer than 30 additional vehicle trips during each of the development peak hours (which represents a very low magnitude of change at these times – see Section 13.6).
 - +10% increase across the day (24 hours).
- ATC10 – B1241 Kexby Lane (east of Upton Road)
 - +60% increase during AM development peak hour (41 additional trips as a result of construction traffic), equating to a medium magnitude of change.
 - +60% increase during PM development peak hour (41 additional trips as a result of construction traffic), equating to a medium magnitude of change.
 - +10% increase across the day (24 hours).
- ATC13 – Headstead Bank (north of Cottam Road)
 - No additional vehicle trips during each of the development peak hours.
 - +30% increase across the day (24 hours).
- MCC1 – A156 High Street/ A1500 Stow Park Road
 - +10% increase during PM development peak hour; however the future baseline traffic flows with development traffic remain below the future baseline traffic flows without development traffic during the AM development peak hour.
 - In addition, construction vehicle trips represent a <10% increase compared to future baseline flows during the AM development peak hour.
 - Therefore, the Scheme is not expected to cause congestion on this part of the network during the AM and PM development peak hours.
- MCC4 – A156 Gainsborough Road/ Willingham Road
 - +10% increase during PM development peak hour; however the future baseline traffic flows with development traffic remain below the future baseline traffic flows without development traffic during the AM development peak hour.

- *In addition, construction vehicle trips represent a <10% increase compared to future baseline flows during the AM development peak hour.*
- *Therefore, the Scheme is not expected to cause congestion on this part of the network during the AM and PM development peak hours.*

13.10.5 In view of the above for the A156 High Street/ A1500 Stow Park Road (MCC2) and A156 Gainsborough Road/ Willingham Road (MCC4) junctions and given the temporary nature of construction trips and the minimal anticipated levels of additional traffic movements for the remaining junctions during the development peak hours (less than 10% increase for MCC2, MCC3 and MCC5), no junction modelling has been carried out in support of the TA and ES. This follows the approach set out within the Transport Scoping Note (**ES Volume 3: Appendix 13-A [EN010131/APP/3.3]**) which has been reviewed and agreed by the local highway authorities (LCC and NCC) as set out in Section 13.2.

13.10.6 Following the above, the anticipated impacts for each of the assessment criteria is set out below.

13.10.7 Impacts on road receptors during construction of the Scheme could include:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian and cyclist amenity;
- Fear and intimidation; and
- Accidents and safety.

13.10.8 Impacts on PRoW receptors during construction of the Scheme could include:

- Severance;
- Pedestrian delay;
- Pedestrian and cyclist amenity; and
- Fear and intimidation.

Severance

13.10.9 It is anticipated that as a worst case during the peak construction period, there would be up to 60 HGVs per day to/ from the Solar and Energy Storage Park representing 120 movements and 30 LGVs per day to/ from the Solar and Energy Storage Park representing 60 movements. In addition, there will be up to 138 cars and 16 shuttle services per day associated with staff for the Solar and Energy Storage Park, representing 308 movements. Furthermore, for the Grid Connection Corridor, there would be up to 16 HGVs, 12 LGVs and one minibus service for construction workers per day, representing 58 movements.

13.10.10 The following road link receptors have been examined for the assessment of severance in relation to the Scheme based on the agreed study area and traffic count locations identified previously:

- A156 Gainsborough Road (north of Kexby Lane);
- A156 Gainsborough Road (south of Kexby Lane);
- A156 Gainsborough Road (north of A1500 Stow Park Road);
- A156 Gainsborough Road (south of A1500 Stow Park Road);
- B1241 Kexby Lane (east of Upton Road);
- A1500 Stow Park Road (east of A156);
- A1500 Tillbridge Road (east of Saxilby Road);
- B1241 High Street (north of A1500 Tillbridge Road);
- Station Road (east of A156);
- Clay Lane (east of the A156);
- Willingham Road (east of the A156);
- High Street (east of Marton Road);
- B1241 Gainsborough Road (south of Kexby Lane);
- Marton Road (south of B1241 Gainsborough Road);
- Saxilby Road (south of A1500 Tillbridge Road);
- Cottam Road (west of Cow Pasture Lane); and
- Headstead Bank (north of Cottam Road).

13.10.11 The following PRoW receptors (running from north to south) have been examined for the assessment of severance. This is based on the agreed study area and the locations where the proposed construction routes will cross PRoW within the Order limits or where the Grid Connection Corridor will require temporary PRoW diversions to accommodate the installation of cables or to ensure that these remain physically separated from the proposed construction routes (see the **Outline PRoW Management Plan [EN010131/APP/7.8]** for further details):

- PRoW LL|Knai|44/2 (construction route crossing point);
- PRoW LL|Mton|68/1 (to be managed, although no crossing points or diversions expected);
- PRoW LL|Mton|66/4 (cable and construction route crossing point and a temporary diversion);
- PRoW LL|Bram|66/1 (temporary diversion to be separated from the construction route);
- PRoW NT|Cottam|FP1 (cable route crossing point and a temporary diversion);
- PRoW NT|Cottam|FP3 (temporary diversion to be separated from the construction route);

- PRow NT|Cottam|RB4 (cable and construction route crossing point and a temporary diversion);
- PRow NT|SouthLeverton|BOAT16 (cable and construction route crossing point and a temporary diversion);
- PRow NT|Rampton|FP5 (cable and construction route crossing point and a temporary diversion);
- PRow NT|Rampton|FP6 (temporary diversion to be separated from the construction route); and
- PRow NT|Rampton|BOAT13 (to be managed, although no crossing points or diversions expected).

13.10.12 It should be noted that there will be no PRow closures as a result of the Scheme and all PRow receptors within the Order limits will be physically separated from construction routes and works.

13.10.13 Details of receptor sensitivity are set out within Table 13-14 below. It should be noted that these receptors and receptor sensitivities have also been adopted for the assessments of pedestrian delay, pedestrian and cyclist amenity, as well as fear and intimidation.

Table 13-14 Receptor Sensitivity (Severance, Pedestrian Delay, Pedestrian and Cyclist Amenity, and Fear and Intimidation)

Scheme Aspect	Receptor	Sensitivity	Justification
Solar and Energy Storage Park	A156 Gainsborough Road (north of Kexby Lane)	Medium	Main vehicular route in built-up area with ped/ cycle facilities
	A156 Gainsborough Road (south of Kexby Lane)	Low	Rural setting with limited pedestrian/ cycle facilities
	A156 Gainsborough Road (north of A1500 Stow Park Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	A156 Gainsborough Road (south of A1500 Stow Park Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	B1241 Kexby Lane (east of Upton Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	A1500 Stow Park Road (east of 156)	Very Low	Rural setting with no pedestrian/ cycle facilities
	A1500 Tillbridge Road (east of Saxilby Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	B1241 High Street (north of A1500 Tillbridge Road)	Medium	Main vehicular route in built-up area with ped/ cycle facilities
	Station Road (east of A156)	Low	Rural setting with limited pedestrian/ cycle facilities
	Clay Lane (east of A156)	Very Low	Rural setting with no pedestrian/ cycle facilities
Willingham Road (east of A156)	Very Low	Rural setting with no pedestrian/ cycle facilities	

Scheme Aspect	Receptor	Sensitivity	Justification
Grid Connection Corridor	High Street (east of Marton Road)	Medium	Main vehicular route in built-up area with ped/ cycle facilities
	B1241 Gainsborough Road (south of Kexby Lane)	Medium	Main vehicular route in built-up area with ped/ cycle facilities
	Marton Rd (south of B1241 Gainsborough Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	Saxilby Rd (south of A1500 Tillbridge Road)	Medium	Main vehicular route in built-up area with ped/ cycle facilities
	PRoW LL Knai 44/2	Very Low	Footpath (non-trafficked route)
	Cottam Road (west of Cow Pasture Lane)	Very Low	Rural setting with no pedestrian/ cycle facilities
	Headstead Bank (north of Cottam Road)	Low	Rural setting with limited pedestrian/ cycle facilities
	PRoW LL Mton 68/1	Very Low	Footpath (non-trafficked route)
	PRoW LL Mton 66/4	Very Low	Footpath (non-trafficked route)
	PRoW LL Bram 66/1	Low	Footpath (gated field access)
	PRoW NT Cottam FP1	Very Low	Footpath (non-trafficked route)
	PRoW NT Cottam FP3	Low	Footpath (field access)
	PRoW NT Cottam RB4	Low	Restricted Byway (field access)
	PRoW NT SouthLeverton BOAT16	Medium	Byway Open to All Traffic (along Cow Pasture Lane)
	PRoW NT Rampton FP5	Very Low	Footpath (non-trafficked route)
PRoW NT Rampton FP6	Very Low	Footpath (non-trafficked route)	
PRoW NT Rampton BOAT13	Medium	Byway Open to All Traffic (along Torksey Ferry Road)	

13.10.14 IEMA guidelines suggest that 30%, 60% and 90% increases in traffic flows would result in low, medium, and high changes in magnitude with respect to severance, respectively. Based on the construction traffic impact assessment summarised above, there is expected to be a less than 30% increase in traffic flows across the majority of road link receptors within the study area, except for the following where there will be at least 30 additional trips per hour:

- B1241 Kexby Lane
 - +60% increase during AM development peak hour (41 additional trips as a result of construction traffic).
 - +60% increase during PM development peak hour (41 additional trips as a result of construction traffic).

13.10.15 The Scheme is expected to result in a medium magnitude of change with respect to severance on Kexby Lane during the construction phase.

13.10.16 Further to the above, whilst there will be fewer than 30 additional trips per hour, Headstead Bank is expected to experience a greater than 30% increase

in daily traffic flows as a result of the Scheme which represents a low magnitude of change with respect to severance on Headstead Bank during the construction phase.

13.10.17 In terms of the remaining road link receptors, the Scheme is expected to result in a very low magnitude of change with respect to severance during the construction phase. This includes Marton Road where there is only expected to be an additional 12 vehicle trips per hour as a result of the Scheme (i.e. this falls below 30 additional vehicle trips during the development peak hours which equates to a very low magnitude of change as per Section 13.6).

13.10.18 In terms of magnitude of change with respect to severance across PRow receptors during the construction phase, this has been categorised as follows:

- Very Low: Up to one temporary localised diversion around the Grid Connection Corridor or one construction route crossing point;
- Low: Two temporary localised diversions around the Grid Connection Corridor and/ or construction route crossing points (inclusive) or one temporary diversion to accommodate the construction route;
- Medium: Three temporary localised diversions around the Grid Connection Corridor and/ or construction route crossing points (inclusive); and
- High: Four or more temporary localised diversions around the Grid Connection Corridor and/ or construction route crossing points (inclusive).

13.10.19 In view of the above, the Scheme is expected to have a very low or low magnitude of change with respect to severance across PRow receptors during the construction phase.

13.10.20 The impact of severance on road link receptors has been assessed as **minor adverse** (Kexby Lane) or **negligible** (all other receptors) and is considered to be **not significant**. The impact of severance on PRow receptors has been assessed as **minor adverse** (PRow NT|SouthLeverton|BOAT16) or **negligible** (all other receptors) and is considered to be **not significant**. A summary of the results (non-significant effects) is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Driver Delay

13.10.21 The following road junction receptors have been examined as part of the assessment of driver delay, based on the traffic counts which were carried out:

- A156 High Street/A1500 Stow Park Road staggered junction;
- A1500 Tillbridge Road/Saxilby Road T-Junction;
- B1241 High Street/Marton Road T-Junction;
- A156 Gainsborough Road/Willingham Road Junction; and

- Cottam Road/Power Station Access.

13.10.22 Based on the queue length surveys and the criteria set out in Section 13-6, the B1241 High Street/Marton Road T-Junction and Cottam Road/Power Station access have been assigned a very low sensitivity level, the A156 Gainsborough Road/Willingham Road junction has been assigned a low sensitivity level and the A156 High Street/A1500 Stow Park Road and A1500 Tillbridge Road/Saxilby Road junctions have been assigned a medium sensitivity level with respect to driver delay. These sensitivity levels have been based on the worst-case development peak hour for each junction in terms of existing queue lengths.

13.10.23 The A156 High Street/ A1500 Stow Park Road junction and the A156 Gainsborough Road/ Willingham Road junction are both expected to experience a greater than 10% increase in traffic flows during the PM development peak hour as a result of construction traffic associated with the Scheme. However, the total junction flows at this time (with development traffic included) will remain well below future baseline flows during the AM development peak hour without development traffic, which is considered to represent the overall network peak when peak congestion is expected. There will also be a less than 10% increase in traffic flows at these two junctions during the AM development peak hour. The remaining junctions within the study area are also expected to experience a less than 10% increase in traffic flow during all periods. As such and given the temporary nature of construction trips and the minimal anticipated levels of additional traffic movements, there has not been a requirement to carry out any junction modelling in support of the TA and ES. A very low magnitude of change has therefore been assigned to all five road junction receptors.

13.10.24 In view of the above, the impact of driver delay on road junction receptors has been assessed as **negligible** for all receptors and is considered to be **not significant**. A summary of the results (non-significant effects is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Pedestrian Delay

13.10.25 The receptors and receptor sensitivities have been determined using the same criteria as severance above (see Table 13-14).

13.10.26 In general, increases in traffic levels and/ or traffic speeds are likely to lead to greater increases in pedestrian delay on road links. Based on the construction traffic impact assessment summarised above, there is expected to be a less than 30% increase in traffic flows across the majority of road link receptors within the study area, except for the following where there will be at least 30 additional trips per hour:

- B1241 Kexby Lane
 - +60% increase during AM development peak hour (41 additional trips as a result of construction traffic).
 - +60% increase during PM development peak hour (41 additional trips as a result of construction traffic).

13.10.27 The Scheme is expected to result in a medium magnitude of change with respect to pedestrian delay on Kexby Lane during the construction phase.

- 13.10.28 Further to the above, whilst there will be fewer than 30 additional trips per hour, Headstead Bank is expected to experience a greater than 30% increase in daily traffic flows as a result of the Scheme, which represents a low magnitude of change with respect to pedestrian delay on Headstead Bank during the construction phase.
- 13.10.29 In terms of the remaining road link receptors, the majority of vehicles will be cars (associated with construction staff) with up to 72 HGVs per day to/ from the Scheme and a peak of 24 HGV movements per hour on any given link. It is not expected that vehicle speeds would change on the surrounding highway network as a result of the additional vehicles to be generated by the Scheme.
- 13.10.30 In view of the above, the Scheme is expected to have a very low magnitude of change with respect to pedestrian delay across the remaining road link receptors during the construction phase. This includes Marton Road where there is only expected to be an additional 12 vehicle trips per hour as a result of the Scheme.
- 13.10.31 The magnitude of change with respect to pedestrian delay across all PRow receptors during the construction phase has been categorised using the same criteria as severance above. The Scheme is therefore expected to have a very low or low magnitude of change with respect to pedestrian delay across PRow receptors during the construction phase. There will be no PRow closures as a result of the Scheme and all PRow receptors within the Order limits will be physically separated from construction routes and works.
- 13.10.32 The impact of pedestrian delay on road link receptors has been assessed as **minor adverse** (Kexby Lane) or **negligible** (all other receptors) and is considered to be **not significant**. The impact of pedestrian delay on PRow receptors has been assessed as **minor adverse** (PRow NT|SouthLeverton|BOAT16) or **negligible** (all other receptors) and is considered to be **not significant**. A summary of the results (non-significant effects) is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Pedestrian and Cyclist Amenity

- 13.10.33 The receptors and receptor sensitivities have been determined using the same criteria as severance and pedestrian delay above (see Table 13-14).
- 13.10.34 The guidance for pedestrian and cyclist amenity suggests that a tentative threshold for judging the significance of changes in pedestrian and cycle amenity on a road link receptor would be where the traffic flow is halved or doubled. As identified above, there are no areas of the highway network where the Scheme would be expected to result in a 50% reduction (i.e. halving) or 100% increase (i.e. doubling) in traffic flows. The Scheme is therefore expected to have a very low magnitude of change with respect to pedestrian and cyclist amenity across all road link receptors during the construction phase.
- 13.10.35 In terms of magnitude of change with respect to pedestrian and cyclist amenity across PRow receptors during the construction phase, this has been categorised using the same criteria as severance and pedestrian delay above. The Scheme is therefore expected to have a very low or low

magnitude of change with respect to pedestrian and cyclist amenity across PRow receptors during the construction phase. There will be no PRow closures as a result of the Scheme and all PRow receptors within the DCO Order limits will be physically separated from construction routes and works.

13.10.36 The impact of pedestrian and cyclist amenity on road link receptors has been assessed as **negligible** and **not significant**. The impact of pedestrian and cyclist amenity on PRow receptors has been assessed as **minor adverse** (PRow NT|SouthLeverton|BOAT16) or **negligible** (all other receptors) and is considered to be **not significant**. A summary of the results (non-significant effects) is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Fear and Intimidation

13.10.37 The receptors and receptor sensitivities are determined using the same criteria as severance, pedestrian delay, as well as pedestrian and cyclist amenity as set out above (see Table 13-14).

13.10.38 Fear and intimidation are affected by the volume of traffic, its HGV composition, and its proximity to people or the lack of protection caused by factors such as narrow pavement widths. As identified above, there is expected to be fewer than 30 additional vehicle trips or a less than 30% hourly and daily increase in traffic flows across the majority of links within the study area as a result of the Scheme except for on Kexby Lane.

13.10.39 The Scheme is expected to result in a medium magnitude of change with respect to fear and intimidation on Kexby Lane and a low magnitude of change with respect to fear and intimidation on Headstead Bank during the construction phase.

13.10.40 For the remaining road link receptors, the majority of vehicles will be cars (associated with construction staff) with up to 72 HGVs per day to/ from the Scheme and a peak of 24 HGV movements per hour on any given link. The Scheme is therefore expected to have a very low magnitude of change with respect to fear and intimidation across the remaining road link receptors during the construction phase. This includes Marton Road where there is only expected to be an additional 12 vehicle trips per hour as a result of the Scheme.

13.10.41 The magnitude of change with respect to fear and intimidation across the PRow receptors during the construction phase has been categorised the same as for severance, pedestrian delay and pedestrian and cyclist amenity above. The Scheme is therefore expected to have a very low or low magnitude of change with respect to fear and intimidation across PRow receptors during the construction phase. There will be no PRow closures as a result of the Scheme and all PRow receptors within the DCO Order limits will be physically separated from construction routes and works.

13.10.42 The impact of fear and intimidation on road link receptors has been assessed as **minor adverse** (Kexby Lane) or **negligible** (all other receptors) and is considered to be **not significant**. The impact of fear and intimidation on PRow has been assessed as **minor adverse** (PRow NT|SouthLeverton|BOAT16) or **negligible** (all other receptors) and is **not**

considered to be significant. A summary of the results (non-significant effects) is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Accidents and Safety

13.10.43 An assessment of accidents and safety has been carried out as part of the TA for the study area shown in **ES Volume 2: Figure 13-1 [EN010131/APP/3.2]**, for the most recent five year periods available:

- Lincolnshire: 01/08/2017 to 31/07/2022 (five years); and
- Nottinghamshire: 31/05/2017 to 30/04/2022 (five years).

13.10.44 The following road receptors have been examined as part of the assessment of accidents and safety:

- A156 Gainsborough Road (north of Kexby Lane);
- A156 Gainsborough Road (south of Kexby Lane);
- A156 Gainsborough Road (north of A1500 Stow Park Road);
- A156 Gainsborough Road (south of A1500 Stow Park Road);
- B1241 Kexby Lane (east of Upton Road);
- A1500 Stow Park Road (east of A156);
- A1500 Tillbridge Road (east of Saxilby Road);
- B1241 High Street (north of A1500 Tillbridge Road);
- Station Road (east of A156);
- Clay Lane (east of the A156);
- Willingham Road (east of the A156);
- High Street (east of Marton Road);
- B1241 Gainsborough Road (south of Kexby Lane);
- Marton Road (south of B1241 Gainsborough Road);
- Saxilby Road (south of A1500 Tillbridge Road);
- Cottam Road (west of Cow Pasture Lane);
- Headstead Bank (north of Cottam Road);
- A156 High Street/A1500 Stow Park Road staggered junction;
- A1500 Tillbridge Road/Saxilby Road T-Junction;
- B1241 High Street/Marton Road T-Junction;
- A156 Gainsborough Road/Willingham Road Junction; and
- Cottam Road/Power Station Access.

13.10.45 The review indicates that a total of five collisions occurred at or within circa. 200m of the A1500 Tillbridge Road/ Saxilby Road junction during the five year period, equivalent to one collision per year. As such, this part of the network has been assigned a medium level of sensitivity in terms of accidents and safety.

13.10.46 Further to the above, one fatal collision occurred on the A156 Gainsborough Road (north of A1500 Stow Park Road) and one fatal collision occurred on Cottam Road during the five year period. These parts of the network have also been assigned a medium level of sensitivity in terms of accidents and safety.

13.10.47 For the remainder of the network within the study area, fewer than five collisions have occurred at any junction or link between junctions within the five year period, equivalent to less than one collision per year. Nonetheless, the following parts of the network have been assigned a low level of sensitivity in terms of accidents and safety (rather than very low):

- A156 Gainsborough Road (north of Kexby Lane) – three collisions in five years;
- A156 Gainsborough Road (south of Kexby Lane) – four collisions in five years;
- A156 High Street/ A1500 Stow Park Road junction – three collisions in five years;
- A1500 Tillbridge Road (east of Saxilby Road) – three collisions in five years including one near the A1500 Tillbridge Road/ Saxilby Road junction; and
- Saxilby Road (south of A1500 Tillbridge Road) – three collisions in five years including one near the A1500 Tillbridge Road/ Saxilby Road junction.

13.10.48 There have been fewer than three collisions within the five year period for the remainder of the network (with no fatal collisions) which has therefore been assigned a very low level of sensitivity in terms of accidents and safety.

13.10.49 As identified above, there is expected to be a less than 30% hourly and daily increase in traffic flows across the majority of links and junctions within the study area as a result of the Scheme including at the A1500 Tillbridge Road// Saxilby Road junction and on Cottam Road (both classified as medium in sensitivity) where there is expected to be a less than 10% increase in traffic flows in each instance. As such, the Scheme is expected to result in a very low magnitude of change with respect to accidents and safety across all receptors during the construction phase except for Kexby Lane (medium magnitude of change) and Headstead Bank (low magnitude of change).

13.10.50 The impact of accidents and safety on road receptors has been assessed as **negligible** and is considered to be **not significant**. This includes Kexby Lane which has been assigned a very low level of sensitivity in terms of accidents and safety with just one collision recorded along this link between the junctions with Upton Road (west) and B1241 Willingham Road (east) within the five-year period, as well as Headstead Bank where no collisions were recorded. A summary of the results (non-significant effects) is set out within **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]**.

Additional Mitigation

13.10.51 No additional mitigation measures are proposed for the construction phase following the above embedded measures, given that there are not expected to be any significant effects as a result of the Scheme.

Operation (assumed to be 2028)

13.10.52 The Scheme is expected to attract a low level of vehicle trips during the operational phase i.e. up to 15 vehicle arrivals and 15 vehicle departures daily, and a detailed assessment of this scenario has therefore been excluded from this ES, as agreed in the Scoping Opinion ref ID 3.8.1 (see **ES Volume 3: Appendix 1-C [EN010131/APP/3.3]**).

13.10.53 A Glint and Glare Assessment has been prepared in support of the DCO submission which is held within **ES Volume 1, Chapter 15: Other Environmental Topics [EN010131/APP/3.1]**. The report states that the Solar and Energy Storage Park is considered to be a potential glare source and that screening will be provided in the form of vegetation or security fencing to ensure that this does not have an impact on road, railway or aviation safety, or the reasonable amenity of residents of nearby dwellings. This mitigation will be secured as part of the **Framework OEMP [EN010131/APP/7.4]**.

Additional Mitigation

13.10.54 No additional mitigation measures are proposed for the operation phase following the above embedded measures, given that there are not expected to be any significant effects as a result of the Scheme.

Summary of Effects

13.10.55 Following the above assessment, **no significant** effects have been identified as a result of the Scheme on transport and access during any phase as all effects have either been categorised as minor adverse or negligible. As such, no additional mitigation is necessary. **ES Volume 3: Appendix 13-C [EN010131/APP/3.3]** presents a summary of non-significant effects.

13.11 Enhancement Measures

Construction and Decommissioning Phases

13.11.1 The following enhancement measures are proposed for the construction and decommissioning phases to provide added benefits post-submission:

- Conduct a Stage 1 Road Safety Audit (RSA) on the preliminary design of the access points and proposed highway improvements (to be secured as part of the detailed CTMPs). A Designer's Response will then be prepared so that any road safety concerns are addressed as part of the final design.

Operational Phase

13.11.2 No enhancement measures are proposed for the operational phase following the embedded measures set out in Section 13.9.

13.12 Residual Effects and Conclusions

- 13.12.1 This section summarises the residual significant effects of the Scheme on transport and access following the implementation of embedded and additional mitigation.
- 13.12.2 Following the above assessment, **no residual effects** have been identified as a result of the Scheme on transport and access during any phase.

13.13 Cumulative Assessment

Introduction

- 13.13.1 This section presents an assessment of cumulative effects between the Scheme during the peak construction phase (2026) and other proposed and committed plans and projects including other developments.
- 13.13.2 This cumulative effect assessment identifies those areas where the predicted effects of the Scheme could interact with effects arising from other plans or projects based on a spatial and/ or temporal basis.
- 13.13.3 This assessment has been made with reference to the methodology and guidance set out in **ES Volume 1, Chapter 5: EIA Methodology** of this ES [EN010131/APP/3.1] and the shortlist of cumulative schemes identified in **ES Volume 3: Appendix 516-A [EN010131/APP/3.3]**.
- 13.13.4 Following a review of the shortlist of cumulative schemes, it is considered that the West Burton Solar Project and the Cottam Solar Project have the potential to result in cumulative effects with the Scheme during the peak construction phase (2026). The approach to include the West Burton Solar Project and Cottam Solar Projects has been agreed with LCC and NCC (see Section 13.2). In addition, Tillbridge Solar has been examined based on the Tillbridge Solar EIA Scoping Report (Ref. 13-21) which has recently become available.
- 13.13.5 The West Burton Solar Project and the Cottam Solar Project are identified on **ES Volume 2: Figure 16-1 [EN010131/APP/3.2]**. Further details are set out below based on the PEI reports (Ref. 13-19 and Ref. 13-20) which were submitted to the LHAs for the Cottam and West Burton solar projects in June 2022. Further details are also available on the Planning Inspectorate website.
- 13.13.6 As set out in Section 13.7, TEMPRO growth factors have been applied to the 2022 surveyed traffic flows to reflect local housing and employment growth and to derive future baseline traffic flows for the peak construction year of 2026. Therefore, it is not considered that any of the remaining cumulative schemes identified in **ES Volume 3: Appendix 516-A [EN010131/APP/3.3]** need to be assessed given that additional trips have already been included on the surrounding highway network to reflect these. In addition, the remaining cumulative schemes are not expected to have the potential to result in cumulative effects during the peak construction phase (2026) in terms of transport and access due to them being located outside of the study area and/ or not being expected to result in any additional trips during the

future baseline year of 2026 for example. Further details are set out at the end of this section.

West Burton Solar Project

13.13.7 West Burton Solar Project consists of four land parcels (as indicated by **ES Volume 2: Figure 16-1 [EN010131/APP/3.2]**) and is expected to be constructed over a two-year period (starting in 2024 at the earliest), with a planned grid connection date of 2029. Therefore, whilst West Burton Solar Project may be complete prior to the peak construction phase of the Scheme (2026), there is likely to be some form of overlap which has been considered below.

13.13.8 West Burton Solar Project parcels WB1, WB2 and WB3 are all located to the south of the A1500 Till Bridge Lane, towards Sturton-by-Stow, whereas WB4 is located to the south of the A631, to the east of Clayworth. It is not anticipated that any construction trips relating to parcel WB4 would pass through the study area for the Scheme and the cumulative assessment therefore focusses on the other three parcels. A summary of each parcel is set out below and further details relating to the proposed access point(s) for each parcel are provided within the West Burton Solar Project PEI Report (Ref. 13-19).

Parcel WB1

13.13.9 Parcel WB1 is located to the south of the A1500 and is the smallest of the four parcels. It is currently expected that during construction, the parcel would be accessed via two junctions on the unclassified road to the east of Broxholme which connects to the A1500.

13.13.10 At this stage, the HGV routing for WB1 is proposed via the A15 and the A1500 (from the east), therefore HGV trips related to WB1 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Parcel WB2

13.13.11 Parcel WB2 is located to the west of WB1 and to the south of the A1500. It is currently expected that during construction, the parcel would be accessed via four junctions, two from B1241 Sturton Road (as the road bisects the parcel) and two additional junctions on Broxhome Lane which connects to the A1500.

13.13.12 At this stage, the HGV routing for WB2 is proposed via the A46, A57 and B1241, therefore HGV trips related to WB2 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Parcel WB3

13.13.13 Parcel WB3 is located to the north-west of WB2, and to the south of the A1500. The Sheffield to Lincoln railway line dissects the land parcel in a south-east to north-west alignment. It is currently expected that during construction, the parcel would be accessed via two junctions, both on the A1500.

13.13.14 At this stage, the HGV routing for WB3 is proposed via the A15 and A1500 (from the east), therefore HGV trips related to WB3 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Parcel WB4

13.13.15 Parcel WB4 is located to the south of the A631, to the east of Clayworth. It is currently expected that during construction, the parcel would be accessed via a junction on the B1403 Clayworth Road.

13.13.16 At this stage, the HGV routing for WB4 is proposed via the A1(M), A614 and A631, therefore HGV trips related to WB4 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Construction Trips

13.13.17 Based on the West Burton Solar Project PEI Report (Ref. 13-19), the construction phase is expected to require 400 workers across all four parcels, with the assumption of 200 vehicle arrivals and 200 vehicle departures associated with the construction workers.

13.13.18 It is also envisaged that non-local workers would stay at local accommodation and be transported to the parcels by minibus to minimise the impact on the surrounding highway network.

13.13.19 The proposed number of average daily HGVs and LGVs for each parcel envisaged at this stage is summarised in Table 13-15 below. It is unclear whether there would be any overlap between the construction phases of each of the four parcels at this stage, however the below figures have been based on a 78-week construction phase.

Table 13-15 West Burton Solar Project – Forecast HGVs and LGVs

Parcel	Average Daily HGVs (Vehicles)*	Average Daily LGVs (Vehicles)*
WB1	2	21
WB2	7	54
WB3	8	67
WB4	7	58

*average daily HGVs and LGVs, rather than peak daily

Additional considerations

13.13.20 There is likely to be some temporal and geographical overlap between West Burton Solar Project and the Scheme, therefore discussions have been held with the developers to review how both projects could potentially work together to minimise any cumulative effects where viable. It is considered that a joint CTMP could be prepared between the Scheme and West Burton Solar Project post-consent to manage and mitigate cumulative effects if necessary. The shared Grid Connection Corridor and the location of the West Burton Solar Project are shown in **ES Volume 2: Figure 5-1 [EN010118/APP/3.2]**.

13.13.21 Proposed mitigation measures for West Burton Solar Project are set out within the West Burton Solar Project PEI Report (Ref. 13-19) and include:

- Avoiding HGV movements during the traditional AM peak hour (08:00-09:00) and PM peak hour (17:00-18:00);
- Construction worker travel outside of the peak hours, working hours 07:00 to 18:00 during the weekday and 08:00 to 13:30 on Saturdays;
- Commitment to seek to coordinate deliveries with other developments in the area; and
- Banksmen to be provided at site access points and PRow to ensure the safe movement of all construction vehicles.

Cottam Solar Project

13.13.22 Cottam Solar Project consists of three land parcel sites (as indicated by **ES Volume 2: Figure 16-1 [EN010131/APP/3.2]**) and is expected to be constructed over a two-year period (starting in 2024 at the earliest), with a planned grid connection date of 2028. Therefore, whilst Cottam Solar Farm may be complete prior to the peak construction phase of the Scheme (2026), there is likely to be some form of overlap which has been considered below.

13.13.23 Cottam Solar Project parcels C1, C2 and C3 are all located to the west of the A15 between Lincoln and Scunthorpe. It is not anticipated that any construction trips relating to parcels C2 (located to the north of A631) and C3 (to the east of A159) would pass through the study area for the Scheme and the cumulative assessment therefore focusses on the trips relating to parcel C1 (to the east of B1241). A summary of each parcel is set out below and further details relating to the proposed access point(s) for each parcel are provided within the Cottam Solar Project PEI Report (Ref. 13-20).

Parcel C1

13.13.24 Parcel C1 is located to the north of the A1500 and is the largest of the three parcels. It is currently expected that during construction, the parcel could potentially be accessed via 11 junctions; one from Thorpe Lane, one from Stow Lane, one from Ingham Road, two from Fleet Lane, one from South Lane, three from Willingham Road and two via an existing farm track to the west of Coates.

13.13.25 At this stage, the construction vehicle routing for C1 is proposed via either the A1500 or Ingham Lane/ Stow Lane, accessing the parcel via the A15, from either the M180 to the north or the A46 from the south. Therefore, HGV trips related to C1 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Parcel C2

13.13.26 Parcel C2 is located to the north of C1 and is located to the east of the village of Corringham, to the north of the A631. It is currently expected that during construction, the parcel would be accessed via a junction on the A361 to the east of Corringham.

13.13.27 At this stage, the construction vehicle routing for C2 is proposed via the A631 from the A15, HGV trips related to C2 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Parcel C3

13.13.28 Parcel C3 is located to the north of C2 and is split into two distinct areas, C3a is located around the village of Blyton whilst C3b is located to the east of Pilham. It is currently expected that during construction, parcel C3a would be accessed via two junctions on the B1205, to the east of Blyton. For parcel C3b, it is currently expected that access would be via a junction to the west of the parcel (the specific location of the access has not been defined at this stage).

13.13.29 At this stage, the construction vehicle routing for C3 is proposed via the B1205 from the A15, therefore HGV trips related to C3 would not be expected to utilise parts of the highway network located within the Scheme's study area.

Construction Trips

13.13.30 Based on the Cottam Solar Project PEI Report (Ref. 13-20), the construction phase is expected to require 400 workers across all three parcels, with the assumption of 200 vehicle arrivals and 200 vehicle departures associated with the construction workers.

13.13.31 It is also envisaged that non-local workers would stay at local accommodation and be transported to the parcels by minibus to minimise the impact on the surrounding highway network.

13.13.32 The proposed number of average daily HGVs and LGVs for each parcel envisaged at this stage is summarised in Table 13-16 below. It is unclear whether there would be any overlap between the construction phases of each of the three parcels at this stage, however the below figures have been based on a 78-week construction phase.

Table 13-16 Cottam Solar Project – Forecast HGVs and LGVs

Parcel	Average Daily HGVs (Vehicles)*	Average Daily LGVs (Vehicles)*
C1	23	150
C2	3	22
C3	4	28

*average daily HGVs and LGVs, rather than peak daily

Additional Considerations

13.13.33 There is likely to be some temporal overlap between Cottam Solar Project and the Scheme, therefore discussions have been held with the developers to review how both projects could potentially work together to minimise any cumulative effects. It is considered that a joint CTMP could be prepared between the Scheme and Cottam Solar Project post-consent to manage and mitigate cumulative effects if necessary.

13.13.34 Proposed mitigation measures for Cottam Solar Project are set out within the PEI Report (Ref. 13-20) and include those set out above for West Burton Solar Project.

Shared Grid Connection Corridor

13.13.35 The Grid Connection Corridor has the potential to be shared with the Cottam and West Burton solar projects above. To better understand the effects associated with the Grid Connection Corridor for this Scheme, and cumulatively, the following Scenarios have been considered:

- Scenario 1: All three projects' ducts and cables are installed within the same construction programme of 24-36 months. As a worst case, it is assumed all the ducts will be installed at once and launch and reception pits and trenches will be backfilled so the area can then be re-instated. Due to the uncertainty of each project, three lots of separate cable-pulling activities are assumed. The access points, haul routes and compounds will remain in place for a maximum of 36 months to enable future cable pull.
- Scenario 2: The sequential installation of all three projects' ducts and cables over a maximum 5-year period. As a worse case, all projects assume the construction, and subsequent removal of the haul road, and compounds.

13.13.36 All assumptions for the Shared Grid Connection Corridor remain the same as those given for the Scheme in **ES Volume 3, Appendix 2-B [EN010118/APP/3.3]**, with the exception of those presented in **ES Volume 3, Chapter 5: EIA Methodology [EN010131/APP/3.1]**. The shared Grid Connection Corridor and the location of the Cottam and West Burton Schemes are shown in **ES Volume 2: Figure 5-1 [EN010118/APP/3.2]**.

13.13.37 For the purposes of transport and access, it is considered that a shared Grid Connection Corridor would reduce potential cumulative effects associated with the Scheme and the Cottam and West Burton solar projects as previously set out above. In terms of Scenario 1, this would allow the same pits, trenches, access points, haul routes and compounds to be used, thereby consolidating and reducing trips across the network compared to a situation where separate Grid Connection Corridors were taken forward. In terms of Scenario 2, the sequential installation of ducts and cables would reduce any temporal overlap between the Scheme and the Cottam and West Burton solar projects, thereby reducing the peak level of cumulative activity and associated vehicle movements. Whilst this would elongate the overall programme covered by the three projects, this would minimise any cumulative impacts.

13.13.38 It is considered that a joint CTMP could be prepared between the Scheme and the Cottam and West Burton solar projects post-consent to manage and mitigate cumulative effects if necessary once further details are known on project timeframes and the approach for the shared Grid Connection Corridor. This would be secured as part of the Detailed CTMP(s).

Tillbridge Solar

13.13.39 Tillbridge Solar consists of one land parcel site (as indicated by **ES Volume 2: Figure 16-1 [EN010131/APP/3.2]**) and is expected to be constructed over a two-year period (starting in 2025 at the earliest), with a planned operation

of the scheme by 2027. Therefore, the construction of Tillbridge Solar may coincide with the peak construction phase of the Scheme (2026).

13.13.40 Tillbridge Solar is located to the south of the A631, west of the A15 between Lincoln and Scunthorpe. It is anticipated that all three proposed access points into the site will be located off the A631.

13.13.41 It is not anticipated that any construction trips relating to the site would pass through the study area of the Scheme based on the information presented within the Tillbridge Solar EIA Scoping Report (September 2022) (Ref. 13-21). At this stage, the HGV routing for the scheme has not been confirmed, however, it is expected that HGVs would be directed from the east via the A15 and onto the A631 due to the close proximity of this part of the highway network route to the site.

13.13.42 The Grid Connection Corridor is expected to overlap with the study area of the Scheme as this will also form a connection with the National Grid at Cottam Power Station. Consideration will be given to a number of roads which are included within the study area for the Scheme, these include; A156, B1241 Willingham Road, Kexby Road, Willingham Road and Cottam Road.

Construction Trips

13.13.43 At this stage, it is anticipated that the scheme could generate up to 66 HGV deliveries per day (during the construction peak) and on average around 47-49 HGV deliveries per day. Construction worker numbers are anticipated to peak at 1,125 staff per day with an average of 500 staff per day; traffic forecasts associated with the above will be provided in the ES and TA which are proposed to be published in Q3 of 2023. The forecast split of HGVs, LGVs and construction staff across the three site access points into Tillbridge Solar is currently unknown.

13.13.44 It is also envisaged that non-local workers would stay at local accommodation and be transported to the work site by minibus to minimise the impact on the surrounding highway network.

Additional Considerations

13.13.45 Proposed mitigation measures for Tillbridge Solar are set out within the Tillbridge Solar EIA Scoping Report (Ref. 13-21) and include:

- Restricting HGV movements to certain routes, days of the week and times of day;
- Upgrading routes where considered necessary, to cater for the additional or larger vehicles;
- Positioning of suitably qualified marshals at the site access points, to allow all vehicle arrivals and departures to be safely controlled during the construction period;
- Providing road signs and/ or markings to increase awareness of the site access points during the construction phase and undertaking vegetation clearance in the vicinity of the site access points to improve visibility;

- Encouraging local construction staff to car share, to reduce single occupancy car trips, by promoting the benefits of car sharing such as reduced fuel costs and by providing dedicated parking spaces nearer to the compound for those car sharing;
- Implementing a mini-bus/ shuttle-bus service to transfer non-local staff to/ from local worker accommodation, or potentially bus stops or railway stations, to reduce vehicle trips on the surrounding highway network;
- Implementing a Delivery Management System to control the bookings of HGV deliveries from the start of the construction period i.e. to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance with agreed HGV routing;
- Maintaining access to PRoW during the construction phase where possible, or potentially providing temporary diversion routes if appropriate.

13.13.46 The ability to minimise any cumulative effects between Tillbridge Solar and the Scheme will be considered where viable such as by consolidating trips in order to reduce the impact on local roads. Further details will be provided within the Detailed CTMP(s).

Additional Cumulative Schemes

13.13.47 Several additional cumulative schemes have been identified for consideration as part of this ES which have therefore been reviewed from a transport and access perspective to determine whether they could materially affect the highway impact assessment during the future baseline year (2026). The following schemes have been examined as part of the Transport Assessment (**ES Volume 3: Appendix 13-D [EN010131/APP/3.3]**):

- Highfields Roundabout Residential Development;
- West Burton C Power Station (planning application 60572265);
- Demolition of West Burton C Power Station (22/00831/SCR);
- Land east of Bumble Bee Farm Solar Development (21/01550/SCR);
- Farm Wood Lane Solar Development (20/00117/FUL);
- Solar Photovoltaic Farm, Land west of Sturton Road (21/00737/SCR);
- Cottam Power Station Demolition (19/00167/SCR);
- Sturton le Steele Quarry (122/00047/CDM);
- Bole Ings Ash Disposal Site (1/19/01556/CDM);
- Cottam Power Station Redevelopment;
- Stow Park Road Residential Development (planning application 141141);
- Willingham Road Residential Development (planning application 139840); and,
- Gainsborough Southern Sustainable Urban Extension Development (planning application 144350).

13.13.48 Based on the review conducted as part of the Transport Assessment (**ES Volume 3: Appendix 13-D [EN010131/APP/3.3]**), the above schemes have been excluded from the cumulative assessment due to being located outside of the study area and/ or not being expected to result in any additional trips during the future baseline year of 2026, or in consideration of the background traffic growth that has already been applied to the network using TEMPRO.

Summary

13.13.49 Based on the above, no projects identified in **ES Volume 3: Appendix 516-A [EN010131/APP/3.3]** are considered (in combination) to impact any of the receptors identified in this assessment and considered in Section 13.10. Any overlaps between the construction vehicle trips associated with the Scheme and West Burton Solar Project, Cottam Solar Project and Tillbridge Solar are likely to be primarily confined to wider strategic routes. The potential sharing of the Grid Connection Corridor between the Scheme and the Cottam and West Burton solar projects would be expected to reduce potential cumulative effects as this would consolidate and reduce trips across the network compared to a situation where separate Grid Connection Corridors were taken forward. Alternatively, the sequential installation of ducts and cables would reduce any temporal overlap between the Scheme and the Cottam and West Burton projects. In terms of the other schemes which have been reviewed, these are also not likely to contribute to the effects on transport and access receptors identified in this chapter and therefore the effects are **not significant**.

References

- Ref. 13-1 The Planning Inspectorate (PINS) (2021) Scoping Opinion: Proposed Gate Burton Energy Park
- Ref. 13-2 Department of Energy and Climate Change (DECC) (2011) National Policy Statement for Energy (EN-1)
- Ref. 13-3 DECC (2021) Draft Overarching National Policy Statement for Energy (EN-1)
- Ref. 13-4 DECC (2011) National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref. 13-5 DECC (2021) Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)
- Ref. 13-6 DECC (2011) National Policy Statement for Electricity Networks Infrastructure (EN-5)
- Ref. 13-7 DECC (2021) Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)
- Ref. 13-8 Ministry of Housing, Communities and Local Government (MHCLG) (2021) National Planning Policy Framework (NPPF).
- Ref. 13-9 MHCLG (2019) Planning Practice Guidance: Travel plans transport assessments and statements.
- Ref. 13-10 Lincolnshire County Council (LCC) (2020) Lincoln Transport Strategy 2020-2036
- Ref. 13-11 Central Lincolnshire Joint Strategic Planning Committee (CLJSPC) (2017) Central Lincolnshire Local Plan
- Ref. 13-12 LCC (2013) Fourth Lincolnshire Local Transport Plan 2013/14 – 2022/23
- Ref. 13-13 LCC (2022) Fifth Lincolnshire Local Transport Plan (Consultation Draft)
- Ref. 13-14 LCC (2022) Gainsborough Transport Strategy, May 2022-2036
- Ref. 13-15 Bassetlaw District Council (2022) Bassetlaw Local Plan 2020-2037: Publication Version
- Ref. 13-16 Nottinghamshire County Council (NCC) (2011) Nottinghamshire Local Transport Plan 2011-2026
- Ref. 13-17 Institute of Environmental Management and Assessment (IEMA) (1993) Guidelines for Environmental Assessment of Road Traffic. Lincoln: IEMA.
- Ref. 13-18 Construction Logistics and Community Safety (CLOCS) (August 2022) CLOCS Standard (Version 4)
- Ref. 13-19 West Burton Solar Project Limited (2022) West Burton Solar Project Preliminary Environmental Impact Report
- Ref. 13-20 Cottam Solar Project Limited (2022) Cottam Solar Project Preliminary Environmental Impact Report
- Ref. 13-21 Tillbridge Solar Ltd (2022) Tillbridge Solar EIA Scoping Report