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13. Transport and Access

13.1 Introduction

13.1.1 This chapter of the Environmental Statement (ES) considers the potential effects of the Scheme on traffic and transport during the construction, operation, and decommissioning phases. The details of the Scheme are described in ***Chapter 2: The Scheme*** of this ES and Schedule 1 of the draft Development Consent Order (DCO) submitted with the Application.

13.1.2 This report is supported by ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** and ***Appendix 13B: Framework Construction Traffic Management Plan*** of the ES **[EN010118/APP/6.2]**, which have been prepared as part of the Application to demonstrate that the Scheme is acceptable in transportation terms. An Outline Public Right of Way Management Plan (PRoW MP) has also been prepared in support of the Framework Construction Traffic Management Plan (CTMP). The Transport Assessment (TA) builds upon the Transport Assessment Scoping Report (TASR) dated April 2021 and the Scoping Opinion published by the Secretary of State (SoS) in December 2020. It sets out the consultation undertaken to date, the baseline data and the forecast highway impact of the Scheme on the study area (see Plate 13-1 further below) and has been prepared with reference to National Policy Statement (NPS) EN-1 (Ref. 13.1).

13.1.3 It should be noted that this chapter of the ES is also informed by the Preliminary Environmental Information (PEI) Report which was submitted in May 2021 and subsequent comments received during statutory consultation (feedback received in July 2021).

13.2 Legislation and Planning Policy

13.2.1 The following policies set out 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.

13.2.2 Planning policy and guidance relating to transport and relevant to the Scheme comprise the following:

National Planning Policy

National Policy Statement for Energy (NPS EN-1)

13.2.3 The NPS for Energy (EN-1) (Ref 13.1) was published in 2011 and provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.13 outlines the planning policy for traffic and transport, including guidance on undertaking relevant parts of the EIA. The most relevant paragraphs for this purpose are 5.13.3 to 5.13.5 which are set out as follows:

a. Paragraph 5.13.3, which states that if a project is likely to have significant transport implications, a Transport Assessment should be included with the ES;

b. Paragraph 5.13.4, which states that where appropriate, a Travel Plan to include demand management measures to mitigate transport impacts should be prepared; and

c. Paragraph 5.13.5, which states that where additional transport infrastructure is proposed, this should be discussed with the relevant network providers (in terms of the possibility of co-funding by Government for any third-party benefits).

13.2.4 In addition, Section 3.1 relates to Infrastructure Planning Commission (IPC) decision making which includes the following:

a. Paragraph 3.1.1, the UK needs all the types of energy infrastructure covered by this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions;

b. Paragraph 3.1.2, it is for industry to propose new energy infrastructure projects within the strategic framework set by Government. The Government does not consider it appropriate for planning policy to set targets for or limits on different technologies;

c. Paragraph 3.1.3, the IPC should therefore assess all applications for development consent for the types of infrastructure covered by the energy NPSs on the basis that the Government has demonstrated that there is a need for those types of infrastructure and that the scale and urgency of that need is as described for each of them in this Part; and

d. Paragraph 3.1.4, the IPC should give substantial weight to the contribution which projects would make towards satisfying this need when considering applications for development consent under the Planning Act 2008.

13.2.5 The NPS EN-1 is currently under review and an updated draft was published for consultation in September 2021, where the above paragraphs are proposed to be relocated to Section 5.14, supported by the following proposed updates:

a. Paragraph 5.14.4, which also states that the assessment should consider any possible disruption to services and infrastructure (such as road, rail and airports); and

b. Paragraph 5.14.8, which states that the SoS should only consider preventing or refusing development on highways grounds if there would be an unacceptable impact on highway safety, or residual cumulative impacts on the road network would be severe.

National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)

13.2.6 The NPS for Renewable Energy Infrastructure (EN-3) (Ref 13.2) was published in 2011 and sets out the policies relating to electricity generation from renewable sources of energy, for consideration in conjunction with NPS EN-1. It should however be noted that solar farms are not explicitly included within the document.

13.2.7 The NPS EN-3 is currently under review and an updated draft was published for consultation in September 2021, with the inclusion of solar photovoltaic

generation impacts within Section 2.54. The most relevant paragraphs are set out as follows:

a. Paragraph 2.54.3, which discusses the importance of assessing various potential routes to the Order limits for the delivery of materials and components during the construction period;

b. Paragraph 2.54.4, which considers the suitability of access roads for vehicles transporting components and the need to identify potential modifications where necessary;

c. Paragraph 2.54.9, which states that consistent with EN-1, the SoS should be satisfied, taking into account the views of the relevant local highway authorities, that any abnormal loads can be safely transported whilst minimising inconvenience to other road users and that the environmental effects of this and other construction traffic, after mitigation, are acceptable; and

d. Paragraph 2.54.10, which states that once solar farms are in operation, traffic movements to and from the site are expected to be generally very light, and it is therefore very unlikely that traffic or transport impacts from the operational phase of a project would prevent it from being approved by the SoS.

National Planning Policy Framework

13.2.8 The National Planning Policy Framework (NPPF) (Ref. 13.3) sets out the Government's planning policies for England. The most relevant paragraphs in the context of transport are set out below:

a. In paragraph 104, it outlines that 'transport issues should be considered from the earliest of stages of plan-making and development proposals' to ensure that:

- The potential impacts of development on transport networks can be addressed;
- Opportunities from existing or proposed transport infrastructure, and changing transport technology and usage, are realised – for example in relation to the scale, location or density of development that can be accommodated;
- Opportunities to promote walking, cycling and public transport use are identified and pursued;
- The environmental impacts of traffic and transport infrastructure can be identified, assessed and considered – including appropriate opportunities for mitigation and for net gains in environmental quality; and
- Patterns of movement, streets, parking and other transport considerations are integral to the design of schemes and contribute to making high quality places.

b. In paragraph 110, it outlines the key considerations when assessing sites to be allocated for development in plans or specific development applications. These are:

- Appropriate opportunities to promote sustainable transport modes can be (or have been) taken up, given the type of development and its location;
- Safe and suitable access to the Order limits can be achieved for all users;
- The design of streets, parking areas, other transport elements and the content of associated standards reflects current national guidance; and
- Any significant impacts from the development on the transport network (in terms of capacity and congestion), or on highway safety, can be cost effectively mitigated to an acceptable degree.

c. In paragraph 111, it states that development should only be prevented or refused on highways grounds where there would be an unacceptable impact on highway safety or the residual cumulative impacts of development on the road network are severe;

d. In paragraph 112, it states that applications for development should give priority first to pedestrian and cycle movements and then, as far as possible, to facilitating access to high quality public transport; and

e. In paragraph 113, it states that all developments that will generate significant amounts of movements should be required to provide a Travel Plan. Applications should be supported by a Transport Statement (TS) or TA so that the likely impacts of the proposal can be assessed.

National Guidance

13.2.9 The Government's Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements in Decision Taking' (Ref. 13.4) provides advice on when TAs and TSs are required, and what they should contain. Further details are therefore set out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Local Planning Policy

13.2.10 The following identifies various local planning policy documents before picking out the key policies which are considered to be relevant to the Scheme.

13.2.11 Essex County Council Essex Transport Strategy: The Local Transport Plan for Essex (June 2011) (Ref. 13.5) includes the following policy relevant to this chapter:

a. Policy 6 Freight Movement which states the Council will manage the efficient movement of freight within the county by working with operators to ensure that heavy goods vehicles use identified routes and that other freight traffic uses the most appropriate routes.

13.2.12 Essex County Council Development Management Policies (February 2011) (Ref. 13.6) includes the following relevant policies:

a. Policy DM1 General Policy, which sets out that the Highway Authority will protect the highway network for the safe and efficient movement of people and goods by all modes of travel.

b. Policy DM2 Strategic Routes/ Main Distributors, Policy DM3 Secondary Distributors and Policy DM5 Secondary or Multiple Vehicular Accesses which state how the Highway Authority will protect the function of these categories of road.

c. Policy DM4 Other Routes, which states that the Highway Authority will protect the function of all other routes by ensuring that new access points are designed and constructed in accordance with the current standards and by seeking improvement to existing substandard access.

d. Policy DM7 Application of Design Standards, which states that the Highway Authority will protect the highway network for the safe and efficient movement of people and goods by ensuring that all works within the highway comply with the current national and ECC design standards appropriate for the category of road and ensuring that visibility splays and Stopping Sight Distances (SSD) for all roads comply with standards contained within the Design Manual for Roads and Bridges (DMRB) unless otherwise agreed with the Highway Authority.

e. Policy DM8 Vehicle Parking Standards, which states that development proposals should comply with the Essex County Council's current "Parking Standards: Design and Good Practice" document, or its subsequent replacement.

f. Policy DM9 Accessibility and Transport Sustainability, which states that the Highway Authority will ensure that the developer will minimise the number of trips by the private vehicle through the provision of alternative transport modes and/ or associated infrastructure.

g. Policy DM11 Public Rights of Way, which states that any existing PRoW affected by development are required to remain protected and open for use by the public. These should remain on their existing alignment with the development designed and laid out to accommodate them. In the event there is no alternative and the development cannot accommodate the existing route, a diversion or alternative route shall be provided, this must be as convenient and suitable in all respects and constructed in accordance with current standards.

h. Policy DM13 Transport Assessments, which sets out that the Highway Authority will require a TS or TA as appropriate.

i. Policy DM14 Safety Audits, which states that the Highway Authority will require a Stage 1 Road Safety Audit including designer's response where appropriate, to accompany any planning application which seeks to materially alter the existing highway.

j. Policy DM15 Congestion, which states that the Highway Authority will protect the safety and efficiency of the public highway by requiring the developer to demonstrate that the development proposal has no detrimental impact upon the existing or proposed highway in congestion terms, as measured by assessing existing and proposed

link/ junction capacity relevant to the development site, or by requiring appropriate mitigation measures.

k. Policy DM19 HGV Movement, which sets out that the Highway Authority will protect the safety and efficiency of the highway network by ensuring that any proposals which generate significant numbers of heavy goods vehicle movements are located in close proximity to the main road network, and

l. Policy DM20 Construction Management, which states that the Highway Authority will protect the safety and efficiency of the highway network. This will include ensuring that any temporary construction accesses are agreed with the Highway Authority prior to commencement of development.

13.2.13 Chelmsford City Council Chelmsford Local Plan 2013-2036 (adopted May 2020) (Ref. 13.7) includes the following relevant policy:

a. Policy DM19 Renewable and Low Carbon Energy, which identifies that proposals should not have a detrimental impact on highway safety.

13.2.14 Braintree District Council's Local Plan Review (2005) (Ref. 13.8) 'saved' policies within Chapter 5 (Transport) includes policies on pedestrian networks, cycleways, public transport and generators of demand.

13.2.15 Braintree District Council Local Development Framework Core Strategy (adopted September 2011) (Ref. 13.9) includes the following relevant policies:

a. Policy CS7 Promoting Accessibility for All, which states the following:

- The Council will work with partners to improve accessibility, reduce congestion and reduce the impact of development upon climate change;
- Future development will be provided in accessible locations to reduce the need to travel;
- Sustainable travel will be encouraged through the requirement for travel plans from major developments, employers and institutions;
- Sustainable transport links will be improved, including provision of and contributions for cycling and walking and quality bus partnership;
- Traffic and car parking will be carefully managed to encourage sustainable travel; and
- The promotion of community-based initiatives such as car pools, car sharing and voluntary mini- bus services will be encouraged.

13.2.16 Braintree District Council Publication Draft Local Plan (June 2017) (Ref. 13.10) includes the following relevant policies:

a. Policy LPP44 Sustainable Transport;

b. Policy LPP 45 Parking Provision; and

c. Policy LPP 46 Protected Lanes.

Industry Guidance

13.2.17 Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic (1993) (Ref. 13.11) provides guidance on examining the environmental impacts of developments in terms of traffic and transportation.

13.2.18 It should be noted that a TA has also been prepared (which forms ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**) in accordance with the appropriate guidance which includes the Government's Planning Practice Guidance; Travel Plans, TAs and Transport Statements in Decision Taking (2014).

Summary

13.2.19 This ES chapter has been prepared in accordance with various policies and guidance including the NPS EN-1, NPS EN-3, NPPF, NPPG, ECC's Development Management Policies, Chelmsford City Council's Local Plan and Braintree District Council's Local Plan, to assess the likely impacts of the Scheme and identify any required mitigation. As above, this has been developed through ongoing collaborative working with Essex County Council (ECC) Highways and National Highways (formerly Highways England) and is both tailored to local circumstances whilst reflecting the size and scope of the Scheme. In accordance with NPS EN-1, NPS EN-3 and NPPF, this ES chapter demonstrates that the Scheme would not result in an unacceptable impact on highway safety and that the residual cumulative impacts of the development on the road network would not be severe.

13.3 Assessment Assumptions and Limitations

13.3.1 This assessment is informed by Scheme design information (see ***Chapter 2: The Scheme*** of the Environmental Statement **[EN010118/APP/6.1]**) and ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

13.3.2 The following assumptions and limitations are reflected in this assessment, with respect to baseline data and the baseline network:

a. The COVID-19 pandemic and associated restrictions disrupted the normal traffic flows and patterns on the UK road network, limiting the potential to carry out traffic surveys outside of school holidays for this ES. Nonetheless, a traffic speed survey and two junction counts were carried out on the local highway network in September 2021 to obtain baseline speeds and flows, as agreed with ECC Highways. The remainder of the baseline traffic flows for the surrounding highway network have been informed by historic traffic survey data in 2019 (see Section 13.5 for further details). TEMPro growth factors have been applied to the 2019 traffic survey data to account for regional traffic growth;

b. During early consultation with ECC Highways in January 2021, it was advised that pedestrian surveys should be carried out in spring/ summer 2021 (if possible) for any pedestrian or cycle routes to be potentially affected by the Scheme. However, given the above restrictions during the COVID-19 pandemic and based on the proposed mitigation set out with the Outline PRoW MP and Framework CTMP,

the proposed impacts on PRoW within the Order limits during the construction are not expected to be significant. Therefore, the requirement to carry out any surveys was not identified during a PRoW Transport Meeting with ECC Highways in August 2021, and ECC Highways subsequently confirmed (in January 2022) that surveys were not required in view of the above. As such, no baseline data is available regarding the local pedestrian and cycle usage; and

c. Given the nature of the local routes and area, pedestrian and cycle flows are expected to be generally low.

d. The Boreham Interchange improvements and the Radial Distributor Road (RDR) including the new roundabout with the private road to / from Bulls Lodge Substation are currently under construction and are expected to be complete (and therefore operational) both prior to and during the future assessment scenario (2025);

e. As part of the proposals for Phase 1 of the Chelmsford North East Bypass (CNEB), the alignment of Cranham Road will change to accommodate the bypass and the provision of a combined Cranham Road/ Drakes Lanes overbridge. The new structure will be constructed offline to keep Cranham Road open for as long as possible. However, Cranham Road may need to be temporarily closed to permit the tie-in of this existing route with the new approaches to the overbridge (this cannot be confirmed at this stage however). Therefore, depending on the nature/ duration/ programme of the above closure (if required), an alternative route may need to be temporarily followed by construction vehicles travelling to/ from the Solar Farm Site which will be agreed with ECC Highways. Alternatively, it may be possible to reschedule HGVs to avoid any periods where there may be a closure. Further details will be provided as part of the Detailed CTMP for the Solar Farm Site once further details are known.

f. In terms of the above, should a temporary diversion route be required then it is expected that this temporary diversion route would be via the B1137 Main Road and Waltham Road which has been agreed in principle with ECC Highways. There will be a maximum of 50 daily HGVs (100 two-way movements) associated with the Solar Farm Site. This would represent a 1.2% increase in daily traffic levels along the B1137 Main Road (see Table 13-10 for 2025 baseline flows) and a 1.2% increase in daily traffic levels along Waltham Road north of Main Road (see Table 13-10 for 2025 baseline flows) in the instance that these HGVs are temporarily diverted via the B1137 Main Road and Waltham Road due to a closure on Cranham Road. Both B1137 Main Road and Waltham Road currently accommodate and are therefore suitable for accommodating HGVs. Therefore, these temporary increases are considered to be immaterial and are not expected to result in any significant effects.

13.3.3 Notwithstanding the limitations regarding traffic data, it is considered that the methodology and conclusions to this chapter are robust. Professional judgement has been applied to form a conclusion in the absence of any data where required, supported by regular liaison with ECC Highways.

13.3.4 The following additional assumptions and limitations are reflected in this assessment, with respect to the construction phase:

a. The peak construction year is anticipated to be 2025 which assumes that the commencement of construction is no earlier than Q1 2024 and that the Scheme is built out over a 24-month period. This is likely to provide a worst-case from a traffic generation point of view by compressing the trip numbers into a shorter duration and representing a greater impact on the highway network. A lengthened construction phase would be expected to result in lower traffic impacts (in terms of magnitude); therefore, the likely worst-case scenario has been assessed within the ES;

b. The Battery Energy Storage System (BESS) will be constructed in two phases, with the first phase during construction of the Solar PV and the second phase expected five years later. The traffic and transport assessment has assessed the reasonable worst-case scenario, where the BESS is built out in its entirety during the main construction works and prior to operation. This reflects a compressed construction period which generates more HGV movements per day during peak construction than if the BESS was built out over a longer period;

c. Projected background traffic growth has been applied to the traffic flows derived from the available traffic survey data to represent conditions during the future construction assessment year of 2025. In addition, vehicular trips associated with cumulative schemes such as the committed development on Land North of Cranham Road have also been included to provide a robust assessment of the Scheme in terms of cumulative impacts (see **Section 13.11** for further details);

d. For the purposes of the assessment work, the potential use of parking spaces within the Chelmer Valley Park & Ride (CVPR) for construction staff has been considered as additional mitigation rather than embedded mitigation, to provide a robust assessment of the Scheme prior to the introduction of this additional mitigation in the instance that this is required by ECC Highways;

e. To provide a worst-case assessment and to allow for some contingency in the phasing, the individual peaks in terms of construction vehicle trips for the Solar Farm Site and Bulls Lodge Substation have been combined. In reality, the ‘peak’ number of daily movements is expected to be lower than that assessed, as the individual peaks for the Solar Farm Site and Bulls Lodge Substation are not expected to overlap. Further details are set out below.

f. There is expected to be a maximum of 75 HGVs per day across the Order limits for a period of one month. However, to provide a robust assessment of each part of the Site, the individual peaks for the Solar Farm Site and Bulls Lodge Substation Site have been combined which represents the following (it should be noted that these peaks are not expected to coincide):

   – A maximum of 50 HGVs associated with the Solar Farm Site (travelling to/ from the proposed access on Waltham Road via Cranham Road, Wheelers Hill and A130 Essex Regiment); and

- A maximum of 46 HGVs associated with the extension to Bulls Lodge Substation (travelling to/ from the substation via the A12(T), RDR and private road).

g. HGV trips are expected to be split evenly across the day and will avoid the peak hours where possible to minimise impacts on the surrounding highway network at these times;

h. There is expected to be a maximum of 533 construction workers per day across the Order limits during the peak months of construction. However, to provide a robust assessment of each part of the Site, the individual peaks for the Solar Farm Site and Bulls Lodge Substation Site have been combined which represents the following (it should be noted that these peaks are not expected to coincide):

- A maximum of 500 construction workers for the Solar Farm Site per day for a period of up to two months, with 45% likely to be sourced locally and 55% likely to be non-local (refer to **Section 12.8** of this ES for further details relating to the construction worker split and accommodation to be provided during the construction phase); and
- A maximum of 33 construction workers for the Bulls Lodge Substation Site per day for a period of up to 18 months, with all staff to be sourced locally and to travel directly to/ from the Bulls Lodge Substation Site.

i. For the Solar Farm Site, local staff have been assumed to travel by car (95%, average car occupancy of 1.5 per vehicle which will be monitored and managed as part of the Framework CTMP) or by other modes (5%) such as by bus or bicycle, which reflects the agreed mode share with ECC Highways;

j. For the Solar Farm Site, all non-local staff will reside within local worker accommodation and will be transported to / from the Order limits by shuttle service (assumed average occupancy of 25 workers per service) which will be secured by the Framework CTMP;

k. For Bulls Lodge Substation, all staff are expected to be sourced locally and there is expected to be a maximum of 26 construction worker vehicles per day. This allows for limited car sharing amongst the 33 construction workers equivalent to 1.2 occupants per vehicle i.e. given there will be fewer staff and therefore fewer opportunities to car share than for the Solar Farm Site. The shuttle service will not be used to transfer workers to/ from Bulls Lodge Substation as construction workers will be expected to travel directly to/ from the substation rather than via the Solar Farm Site;

l. For Bulls Lodge Substation, there will also be up to 22 LGVs per day (for up to five months) in addition to the above construction worker trips;

m. The above construction vehicle numbers (LGVs and HGVs) consider all expected activities including those relating to servicing and the disposal of waste;

n. For the purposes of the traffic assessment, the compressed winter working hours of 08:00-18:00 (10-hour shift) have been adopted to

forecast staff travel patterns to / from the Order limits, rather than the summer working hours of 07:00-19:00 (12-hour shift), to provide a robust assessment given that the development peak hours will be more closely orientated with the traditional network peak hours. Essentially, construction workers will be expected to arrive between 07:00-08:00 and expected to depart between 18:00-19:00 (reflecting the development peak hours), whereas the network peak hours for the local highway network (based on the survey data) are 08:00-09:00 and 17:00-18:00. The same working hours have been adopted for the Solar Farm Site and Bulls Lodge Substation to provide a worst-case cumulative assessment of the Order limits;

o. For the Solar Farm Site, the proposed construction worker vehicle trip distribution has been informed by journey to work patterns from the 2011 Census database for residents travelling to Chelmsford Middle Super Output Area (MSOA) 005 as a destination (i.e. to their place of work);

p. For Bulls Lodge Substation, it has been assumed that all construction workers would travel directly to/ from the substation via the A12(T), the Boreham Interchange and the RDR;

q. For the Solar Farm Site, shuttle services would travel to / from local worker accommodation and would not therefore be expected to utilise the A12(T) as they would utilise the local highway network, rather than the Strategic Road Network (SRN). The locations for local worker accommodation have yet to be determined, and it has therefore been assumed that shuttle buses would travel via the A130 and A131 towards Braintree to the north (30%), the A130 towards Chelmsford to the south (40%), or alternatively via the B1137 Main Road towards Boreham (20%) or Hatfield Peverel (10%) to the east;

r. For the Solar Farm Site, HGVs would be strategic trips (e.g. originating from ports such as Felixstowe or Southampton) and would therefore be expected to utilise the A12(T) to the south (50%), the A12(T) to the north (25%) or the A130 and A131 to the north (25%) when travelling to/ from the Solar Farm Site. These vehicles would then follow the agreed routing strategy via Wheelers Hill, Cranham Road, and Waltham Road (see ***Figure 13-3***);

s. For Bulls Lodge Substation, it has been assumed that 50% HGVs and LGVs (including staff) would travel to/ from the A12(T) to the north and the remaining 50% would travel to/ from the A12(T) to the south, utilising the Boreham Interchange, RDR and the private road to/ from the substation;

t. No vehicle trips are expected to travel along the A130 Colchester Road or the A130 White Hart Lane as vehicles will be expected to utilise the RDR to travel to / from the Order limits; and

u. At this stage, there are expected to be three abnormal loads associated with Longfield substation and two abnormal loads associated with Bulls Lodge Substation. These abnormal loads will be expected to follow the agreed routing strategy for HGVs and have been considered as part of the assessment carried out within the ***Appendix 13A: Transport***

Assessment of the ES **[EN010118/APP/6.2]**. The vehicles transporting the abnormal loads will be no larger (in terms of height, width or length) than a maximum legal articulated vehicle and are only expected to be abnormal due to the weight of the components transported. A specialised haulage service will be employed to allow these components to be transported with the necessary escort, permits and traffic management, with the contractor consulting 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. Swept paths have been carried out as part of ***Appendix 13B: Framework CTMP*** of the ES **[EN010118/APP/6.2]**.

13.3.5 In addition to the above, it is not considered that a short delay in construction would result in a change to the conclusions of this ES. In addition, the following is considered to be applicable should there be a delay of up to 5 years to the start of construction:

a. Road improvement schemes in the cumulative assessments (e.g. A12 Chelmsford to A120 Widening Scheme) may have already been completed by the time the Scheme construction begins, which would result in a better future baseline than that assessed. If any road improvement schemes remain under construction then there would be no change i.e. they would remain as a cumulative scheme; and

b. 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.

13.3.6 The following assumptions and limitations are reflected in this assessment, with respect to the operational phase:

a. There is expected to be up to eight members of staff on site per day during the operational phase, with the majority of trips taking place in four-wheel drive vehicles or transit vans, with HGVs rarely expected to access the Order limits. This therefore equates to a maximum of eight vehicles (or 16 daily two-way vehicle trips) per day; and

b. A separate Glint and Glare assessment (***Appendix 10G:*** **EN010118/APP/6.2**) has been prepared which has informed the review of road safety on the surrounding highway network and railway receptors.

13.3.7 The following assumptions and limitations are reflected in this assessment, with respect to the decommissioning phase:

a. The decommissioning effects of the Scheme are expected to be of a similar (or lesser) magnitude to the construction effects. On this basis, the construction period is considered to have the greatest change on the surrounding transport network and the construction phase has therefore been used to identify the likely impacts of the

decommissioning phase including whether any mitigation will be required. A Decommissioning Strategy **[EN010118/APP/7.12]** has been prepared as part of the DCO application. A detailed Decommissioning Environmental Management Plan and Decommissioning Transport Management Plan (DTMP) will be developed prior to the decommissioning phase to detailing measures control the potential impacts.

The Scheme Parameters Assessed

13.3.8 The Design Principles for the Scheme have been considered with respect to the transport impact assessment. This chapter therefore reports the assessment of effects associated with the Design Principles, including the site access points, internal access tracks, Bulls Lodge Substation Extension, the Grid Connection Route, permissive paths and cycle routes.

13.3.9 It should be noted that the transport impact assessment is based on the worst-case parameters (based on Design Principles) in terms of daily construction staff and HGVs during the peak phase of construction. The approach and scope for the assessment has also been agreed with the local highway authorities, including with respect to vehicular access, routing and mitigation. A Framework CTMP has also been prepared. Therefore, the conclusions are considered to remain valid in the instance that the Scheme is built out differently as allowed for by the Design Principles.

13.4 Stakeholder Engagement

13.4.1 An EIA Scoping Report was prepared and submitted by the Applicant in October 2020. An EIA Scoping Opinion was subsequently issued by the Planning Inspectorate on behalf of the Secretary of State in December 2020. This included responses from ECC, National Highways, Chelmsford City Council, and Braintree District Council.

13.4.2 The Applicant has subsequently held pre-application and scoping discussions with the local authority, ECC Highways, and National Highways to review the access and routing strategy for the Scheme and to agree the appropriate scope and methodology for the TA. The pre-application discussions with ECC Highways took place on 25 January 2021. The pre-application discussions with National Highways took place on 28 January 2021.

13.4.3 The following additional meetings have been held with ECC Highways:

a. 14 July 2021 – Transport meeting with ECC Highways (as well as Chelmsford City Council and Braintree District Council) to provide a project update and a summary of pre-application responses, before running through the proposed access and routing strategy, the Grid Connection Route, other highway schemes and committed developments, scenarios and study area, construction workforce and trips, assessment of impacts and next steps;

b. 5 August 2021 – Park and Ride meeting with ECC to understand the potential viability of using the CVPR for construction worker parking during the construction of the Scheme;

c. 12 August 2021 – Public Rights of Way meeting with ECC Highways (including PRoW officers) to run through the Scheme in detail in terms of managing PRoW throughout the lifetime of the Scheme, including with respect to crossings and separation of construction traffic, the Chelmsford Garden Community and post-decommissioning, the cable route, desire lines, amenity considerations and next steps;

d. 14 December 2021 – Technical update meeting with local authorities (ECC, Chelmsford City Council (CCC) and Braintree District Council (BDC)) which included a general overview on the proposals for transport and access; and

e. 20 January 2022 – Transport meeting with ECC Highways to provide updates in relation to the Grid Connection Route, Bulls Lodge Substation and PRoW management, as well as to find out more details in relation to CNEB (Phase 1) and the Cranham Road/ Drakes Lane overbridge.

13.4.4 As part of the consultation process, a number of principles have been agreed with ECC Highways including the proposed access location for the Solar Farm Site, visibility splays, crossing points on Noakes Lane and the approach for surveys and supporting assessment work. In addition, it has been agreed that the routing of HGVs to/ from the Solar Farm Site should be via the RDR, A130 Essex Regiment Way, Wheelers Hill, Cranham Road and Waltham Road in order to prevent these larger vehicles from passing through the villages of Hatfield Peverel and Boreham, e.g. along the B1137 Main Road. Vehicles travelling to/ from Bulls Lodge Substation will also utilise the RDR and the private road for the substation. Further details, including drawings showing the locations of access points, visibility splays and swept paths are held within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

13.4.5 Following the pre-application meeting with National Highways, an additional meeting was held with National Highways and Jacobs (National Highways consultant for the East Region, working as a partner with Costain) on 8 February 2021 to review the potential interactions between National Highways proposed highway improvements (A12 Chelmsford to A120 Widening Scheme) and the construction and operational phase of the Scheme. This included a review of timescales for the delivery of the schemes, as well as the benefits of the proposed highway improvements in relation to the Scheme and potential arrangements relating to compounds and the workforce during the construction phase.

13.4.6 A further project update meeting for the A12 Chelmsford to A120 Widening Scheme was held by Jacobs on 11 June 2021. This provided the opportunity for both the Longfield Solar Farm and A12 Chelmsford to A120 Widening project teams to share construction programmes, understand potential cumulative impacts and to discuss possible inter-relationships between the projects.

13.4.7 A summary of the main considerations in relation to transport and access based upon the consultation summarised above is outlined in Table 13-1. Further details of the scoping discussions are held within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Table 13-1 Main matters raised during Scoping Phase

Consultee	*Main matter raised*	*How has the concern been addressed*	*Location of response in chapter*
ECC, National Highways, Great and Little Leighs Parish Council, Terling and Fairstead Parish Council and PINS	Construction Vehicles	Vehicle routing has been carefully considered, including with reference to HGVs where there is an agreed routing strategy in place (see ***Figure 13-3***). The number of HGV trips during the peak construction phase has been identified. A Framework CTMP ***Appendix 13B*** of ES **[EN010118/APP/7.12]** has been prepared to provide further details of management and mitigation.	Sections 13.3 and 13.5
ECC, Braintree District Council (BDC) and PINS	Hazardous and Dangerous Loads	Hazardous and Dangerous Loads have been considered but are not expected to result in any adverse impacts. As such, an assessment of impacts associated with the transport of hazardous loads has been scoped out of this ES.	Section 13.5
ECC and Terling and Fairstead Parish Council	Construction Workforce	The majority of construction workers will travel to / from the Order limits by car or shuttle service, with limited potential to travel by sustainable modes. Measures have been considered to reduce the impact of the construction workforce in terms of additional vehicle movements on the surrounding network. Details of the strategy in terms of local and non-local staff and how they would travel to / from the Order limits have been provided in the TA and CTMP.	Sections 13.5 and 13.7
ECC and Chelmsford City Council (CCC)	Vehicle Access; Baseline	The Solar Farm Site will be served by a single point of access on Waltham Road. A speed survey has been carried out in the vicinity of the proposed access point as agreed with ECC Highways (and in accordance with CA185) in order to establish the appropriate junction visibility and forward Sight Stopping Distance (SSD). The Bulls Lodge Substation will be accessed via the Boreham Interchange, RDR and a new roundabout with the existing private road which serves the substation. The new roundabout has already been constructed as part of the RDR works.	Section 13.5
ECC, Chelmsford City Council	Vehicle Routing; Impact on Protected	An appropriate routing and access strategy has been identified to prevent HGVs from using Protected Lanes and local roads through Boreham and	Sections 13.5 and 13.9

Consultee	Main matter raised	How has the concern been addressed	Location of response in chapter
(CCC) and PINS	Lanes and Byways	Hatfield Peverel to the south. HGVs will be routed to / from the west via Wheelers Hill, and Cranham Road, with supporting highway improvements (carriageway widening) which will be implemented as part of the DCO application where necessary. There will be the potential to utilise the RDR following its completion prior to the construction phase.	
ECC and PINS	Trip Distribution	HGVs will follow the agreed routing strategy (see ***Figure 13-3***). Journey to Work Census data has been used to forecast the trip distribution of construction workers, based on Chelmsford MSOA 005. Shuttle buses will travel to / from local worker accommodation, as well as the CVPR when this is utilised.	Section 13.5
ECC, National Highways, CCC and PINS	Road Safety; Baseline conditions	The collision record has been reviewed for the surrounding highway network. The findings of the Glint and Glare assessment have also been reviewed. Stage 1 Road Safety Audits (RSAs) will also be carried out where necessary post-submission.	Sections 13.7 and 13.8
ECC and PINS	Public Rights of Way; Impact on users of PRoW; Baseline Conditions	Public Rights of Way (PRoW) will be carefully managed during the construction phase (and a separate Outline PRoW MP has also been prepared). Additional permissive routes will be provided for pedestrians and cyclists during the operational phase to facilitate connections across the Order limits, as well as with National Cycle Route 50 and Essex Way.	Section 13.7
ECC, National Highways and PINS	Highway Schemes	The potential overlap with and cumulative effects of other schemes within the vicinity of the Order limits, e.g. A12 Chelmsford to A120 widening, Chelmsford North East Bypass (CNEB) and Boreham Interchange improvements have been considered.	Section 13.11
ECC, National Highways, CCC and PINS	Committed Developments and Traffic Growth	Committed developments including the Chelmsford Garden Community and Land North of Cranham Road, as well as highway improvements schemes including the A12 Chelmsford to A120 Widening Scheme have been considered. Future traffic growth has been determined using National Road Traffic Forecast (NRTF) growth factors	Sections 13.5 and 13.11

Consultee	Main matter raised	How has the concern been addressed	Location of response in chapter
		with local National Transport Model (NTM) adjustments.	
PINS, ECC Highways, CCC and National Highways	Construction Assessment; Impacts	The construction assessment identifies any potential impacts and mitigation required in support of the Scheme, based on the forecast increase in trips on local roads and junctions. Further details are also provided within the TA and CTMP.	Sections 13.7 to 13.9
PINS, ECC Highways and National Highways	Operational Assessment	The Scheme is expected to generate considerably fewer vehicle trips during the operational phase (compared to construction) and is not expected to have a significant impact on the surrounding highway network.	Section 13.5
PINS, ECC Highways and National Highways	Decommissioning	The decommissioning effects of the Scheme are expected to be of a similar (or lesser) magnitude to the construction effects. On this basis, the construction period is considered to have the greatest change on the surrounding transport network and the construction phase has therefore been used to identify the likely impacts of the decommissioning phase including whether any mitigation will be required. A Decommissioning Strategy **[EN010118/APP/7.12]** has been prepared as part of the ES which will be developed prior to the decommissioning phase to control the potential impacts.	Section 13.5
ECC Highways and National Highways	Consultation / Scoping	Ongoing consultation has been held with various stakeholders throughout the preparation of this ES, as well as the TA. See above and below for further details.	Section 13.4

13.4.8 Further to the above, feedback has been received through Statutory Consultation. These comments have been reviewed and a summary of the comments and subsequent responses with respect to transport and access is set out within Table 13-2 below.

Table 13-2. Main matters raised during Statutory Consultation

Consultee	*Main matter raised*	*How has the concern been addressed*	*Location of response in chapter*
Braintree District Council (BDC)	Glint and glare	A Glint and Glare assessment has been undertaken, which informs the ES and has been considered by the TA.	Section 13.8 and ***Appendix 10G*** of the ES **[EN010118/APP/6.2]**
BDC	Construction	A Framework CTMP has been prepared and the management of construction traffic is also considered / assessed within the ES and TA.	Section 13.7 and ***Appendix 13B*** of the ES **[EN010118/APP/6.2]**
BDC	Traffic movements	The forecast level of traffic movements during the construction phase (as a result of the Scheme) have been identified and assessed as part of the ES and TA. HGVs will follow the agreed routing strategy (see ***Figure 13-3***) and will avoid peak hours.	Sections 13.3 and 13.5
BDC	Cumulative impacts	Cumulative impacts between the construction phase of the Scheme and other committed developments / highway improvements including the A12 widening scheme have been considered as part of the ES and TA.	Section 13.11
BDC	Permissive cycleways	Several permissive paths (for pedestrians and cyclists) are proposed during the operational phase of the Scheme and are shown by supporting drawings.	Section 13.7
Chelmsford City Council (CCC)	Chelmsford Garden Community	The Scheme includes a potential pedestrian / cycle connection point with the Chelmsford Garden Community, to accommodate a potential future desire line following the completion of this development and to improve public accessibility into the wider countryside.	Section 13.7
ECC	Highway network categorisation	The categorisation of the surrounding highway network is described and shown in the ES and TA.	Section 13.6
ECC	Future highway network changes	The future highway improvements / changes (including the RDR which will become the A131) are considered as part of the future baseline conditions of the ES and TA. The RDR forms part of the routing strategy for construction	Sections 13.6 and 13.11

Consultee	Main matter raised	How has the concern been addressed	Location of response in chapter
		vehicles, given that this will provide access between the Boreham Interchange and the A130 Essex Regiment Way. Further details of other improvements including the A12 Chelmsford to A120 widening and the Chelmsford North East Bypass are provided within the ES and TA.	
ECC	PRoW management and amenity	Several meetings have been held with ECC Highways (including PRoW officers) to review, revise, and agree the proposed strategy for managing PRoW during the construction and decommissioning phases of the Scheme. This includes measures to physically segregate existing PRoW from proposed construction routes, as well as having controlled crossing points (with gates and banksmen) to safely accommodate pedestrians and cyclists. No PRoW will be permanently closed or diverted as a result of the Scheme, and the minimum legal PRoW widths will continue to be met or bettered in all instances. A separate Outline PRoW MP has been prepared to illustrate the proposed strategy which supports the Framework CTMP. See also ***Figure 13-4***.	Sections 13.4 and 13.7
ECC	Permissive paths	Several permissive paths will be provided within the Order limits during the operational phase of the Scheme to improve connectivity through the Order limits as well as within existing PRoW. Whilst existing PRoW will remain in place after decommissioning, it is envisaged that any permissive paths created by the Scheme during the operational phase would ultimately be removed during decommissioning, as the potential retention of these routes would be outside the control of Longfield Solar Energy Farm Ltd and subject to third party landowner agreement. Measures (e.g. signage or temporary access restrictions) will be implemented to prevent the permissive paths from becoming PRoW during the operational phase, so that these can subsequently be removed if the landowner chooses. It should be noted that the connectivity of the Order limits post-decommissioning would be no worse than the existing situation.	Section 13.7

Consultee	*Main matter raised*	*How has the concern been addressed*	*Location of response in chapter*
ECC	Glint and glare	A Glint and Glare assessment has been undertaken to identify any required mitigation, which informs the ES and has been considered by the TA.	Section 13.8 and ***Appendix 10G*** of the ES **[EN010118/APP/6.2]**
Hatfield Peverel Parish Council (HPPC)	Routing strategy	The proposed routing strategy (see ***Figure 13-3***) for larger construction vehicles (i.e. HGVs) has been agreed with ECC and carriageway widening improvements are proposed where necessary on the local highway network. This is detailed within (and will be secured via) the CTMP.	Sections 13.3 and 13.9
National Highways	Transport Assessment	A couple of meetings have been held with National Highways to run through and agree the scope of the TA. The Scheme is not expected to have a material impact on the SRN.	Sections 13.4 and 13.10
National Highways	A12 Chelmsford to A120 Widening Scheme	A couple of meetings have been held with National Highways / Jacobs to review potential synergies between the A12 Chelmsford to A120 Widening proposals and the Scheme. Also, potential cumulative impacts during the construction phase of the Scheme and mitigation to reduce these impacts on the SRN including the A12(T) and the Boreham Interchange have been considered. The ES, TA and CTMP include details of the mitigation that will be implemented to reduce the traffic impacts of the Scheme during the construction phase. It is acknowledged that the construction A12 widening team sees no objection to the plans presented by Longfield Solar Energy Farm Ltd.	Sections 13.4 and 13.7
Purdy Land	Construction impacts	The ES, TA and CTMP identify the potential traffic and highway safety impacts of the Scheme during the construction phase and include mitigation where required to prevent any adverse effects.	Sections 13.7 and 13.8
Little Waltham Parish Council	Vehicular access	The TA includes a highway impact assessment (including junction modelling) to demonstrate that the proposed access for the Solar Farm Site on Waltham Road will be suitable for accommodating traffic during the construction phase. A secondary point of access is not required (or desired) for	Sections 13.6, 13.8 and 13.9

Consultee	Main matter raised	How has the concern been addressed	Location of response in chapter
		the Solar Farm Site, and the proposed routing and access strategy has been agreed with ECC Highways and National Highways. It should be noted that two separate points of access will be used to access the Bulls Lodge Substation during the construction phase. Several strategic routes can be used to travel to / from the Order limits including the A12 (north and south) and the A120 / A131. Carriageway widening improvements will be implemented on the local highway network where necessary to accommodate larger vehicles / HGVs during the construction phase.	
Royal Mail	Cumulative impacts on the A12	A series of meetings have been held with National Highways / Jacobs to review potential synergies between the A12 Chelmsford to A120 Widening proposals and the Scheme. Also, potential cumulative impacts during the construction phase of the Scheme have been considered. The ES and TA include details of the mitigation that will be implemented to reduce the traffic impacts of the Scheme during the construction phase. The Scheme is not expected to have a material impact on the SRN.	Sections 13.4, 13.7 and 13.8
Natural England	PRoW and permissive paths	Several meetings have been held with ECC Highways (including PRoW officers) to review, revise and agree the proposed strategy for managing PRoW during the construction and decommissioning phases of the Scheme. This includes measures to physically segregate existing PRoW from proposed construction routes, as well as having controlled crossing points (with gates and banksmen) to safely accommodate pedestrians and cyclists. No PRoW will be permanently closed or diverted as a result of the Scheme, and the minimum legal PRoW widths will continue to be met or exceeded in all instances. A separate Outline PRoW MP has been prepared to illustrate the proposed strategy which supports the Framework CTMP. See also ***Figure 13-4***. Several permissive paths will be provided within the Order limits during	Sections 13.4 and 13.7

Consultee	Main matter raised	How has the concern been addressed	Location of response in chapter
		the operational phase of the Scheme to improve connectivity through the Order limits as well as with existing PRoW.	

13.5 Assessment Methodology

Existing Study Area

13.5.1 Due to the nature of the Scheme, consideration has been given to a number of locations within the surrounding highway network which could potentially be impacted. Based on the proposed vehicle routing and access strategy as outlined in ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, the following junctions have been considered which can also be identified on **Figure 13-1** which shows the surrounding highway network:

a. A12 Junction 19 Slip Roads, Chelmsford (the 'Boreham Interchange');

b. A130 Essex Regiment Way (ERW) / Wheelers Hill junction, Chelmsford;

c. Boreham Road / Cranham Road junction, Russell Green; and

d. B1137 Main Road / Waltham Road junction, Boreham.

13.5.2 The following road links have also been considered as part of the existing highway network:

a. Waltham Road;

b. Wheelers Hill and Cranham Road;

c. B1137 Main Road;

d. A130 ERW; and

e. Private Road to / from Bulls Lodge Substation.

13.5.3 The existing study area is shown in **Plate 13-1**; it should be noted that this excludes the Boreham Interchange improvements and RDR which are currently under construction and therefore form part of the future baseline network as described further below:

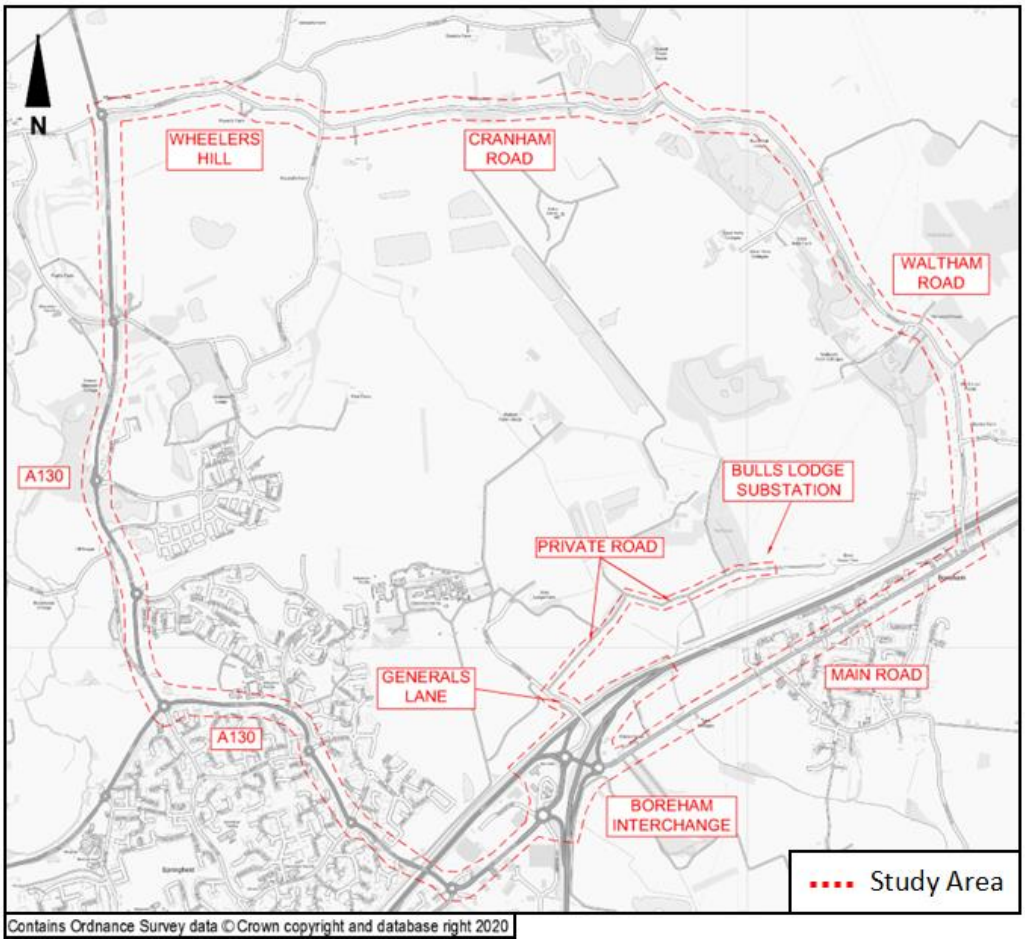

Plate 13-1. Existing Study Area

13.5.4 The above study area is summarised as follows:

a. Along the western boundary it comprises the A130 through Springfield and A130 ERW. The A130 ERW is a dual carriageway road which links Little Waltham, north of Chelmsford, to the A131 in the north heading towards Braintree, and is classified by ECC as a Priority 1 Road (PR1);

b. Along the northern boundary it comprises Wheelers Hill and Cranham Road which are both rural single carriageway routes and provide a connection to the A130 ERW to the west via Wheelers Hill. Cranham Road and Wheelers Hill are both classified as PR2s, are subject to the National Speed Limit (60mph) and do not contain any pedestrian footways or street lighting provision;

c. On the eastern boundary it comprises Waltham Road which is a rural single carriageway road (classified as PR2) and connects Boreham in the south with Great Leighs in the north and serves a mixture of localised residential, leisure, agricultural, commercial and industrial land uses. This road is subject to the National Speed Limit (60mph) and does not contain pedestrian footways or street lighting provision which is in keeping with its rural character; and

d. On the southern boundary it is formed by the B1137 Main Road which is classified as a Priority 2 Road (PR2) and is a single carriageway road with footways along the majority of its length along with street lighting provision.

13.5.5 The existing study area has been agreed with National Highways and ECC, as Highway Authorities for the SRN and Local Road Network (LRN) respectively. It should be noted that Boreham Road (Protected Lane) will not be utilised by vehicles associated with the Scheme and this has therefore been excluded from the study area as agreed with ECC Highways in January 2021.

13.5.6 Further to the above, the existing study area includes all existing PRoW which either pass through the Order limits or provide a connection with the Order limits. Further details of existing PRoW are set out within the Transport Assessment.

Future Baseline Study Area

13.5.7 The study area during the future baseline scenario with and without construction (2025) will differ from the existing study area as a result of the following:

a. The Boreham Interchange improvements are due to be completed in spring 2023 including the removal of the Generals Lane connection with the Boreham Interchange by demolishing the A12(T) overbridge; and

b. The RDR is due to be completed in May 2023 which will create a new connection with the Boreham Interchange, as well as a new roundabout with the private road to / from Bulls Lodge Substation.

13.5.8 In view of the above, the RDR will be utilised to access the Bulls Lodge Substation Site, as well as the Solar Farm Site for vehicles travelling to/ from the A12(T) and via the Boreham Interchange. Therefore, the future baseline study area excludes Generals Lane, but includes both the RDR and the new roundabout with the private road to / from Bulls Lodge Substation. A plan showing the surrounding highway network during the future baseline scenario of 2025 is held within ***Figure 13-1***.

Sources of Information

13.5.9 To inform the assessment of the Scheme, information has been collected from a number of sources to inform this ES as well as ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** including:

a. Planning policy as covered in Section 13-2;

b. Local travel and network information gathered from various sources including ECC's Interactive Map of PRoW (Ref. 13.13) as well as public transport information from First Essex, Hedingham, Traveline and Greater Anglia;

c. Personal Injury Collision (PIC) data from ECC;

d. OS Base Mapping to ascertain an accurate geographical representation of the areas in the vicinity of the Scheme;

e. Highway boundary information from ECC;

f. Mode share data from the 2011 Census; and

g. Various traffic count and speed survey data (see next section for further details).

Baseline Survey Data

Historic Data (2019)

13.5.10 Due to issues of collecting new reliable traffic data during the COVID-19 pandemic, a review of historic traffic count data was initially carried out to identify any available appropriate sources of survey data for the TA. The following provides a summary of the traffic data which has been collated in support of the TA and this ES. It should be noted that all traffic data has been collated for a common baseline year (2019), which reflects the most recent period prior to the Government's COVID-19 restrictions, which initially came into effect in March 2020.

13.5.11 Following this review, three separate Automatic Traffic Counts (ATCs) were identified which were carried out by a third party on Waltham Road and Boreham Road in October 2019. These traffic counts are considered to provide representative traffic flows and speeds within the study area given these were carried out during a neutral month in 2019.

13.5.12 The locations of the traffic counts are shown in **Plate 13-2** below, with counts 1 and 2 carried out on Waltham Road, and count 3 carried out on Boreham Road (whilst this is outside of the study area, this was included given its proximity to the Waltham Road/ Cranham Road junction).

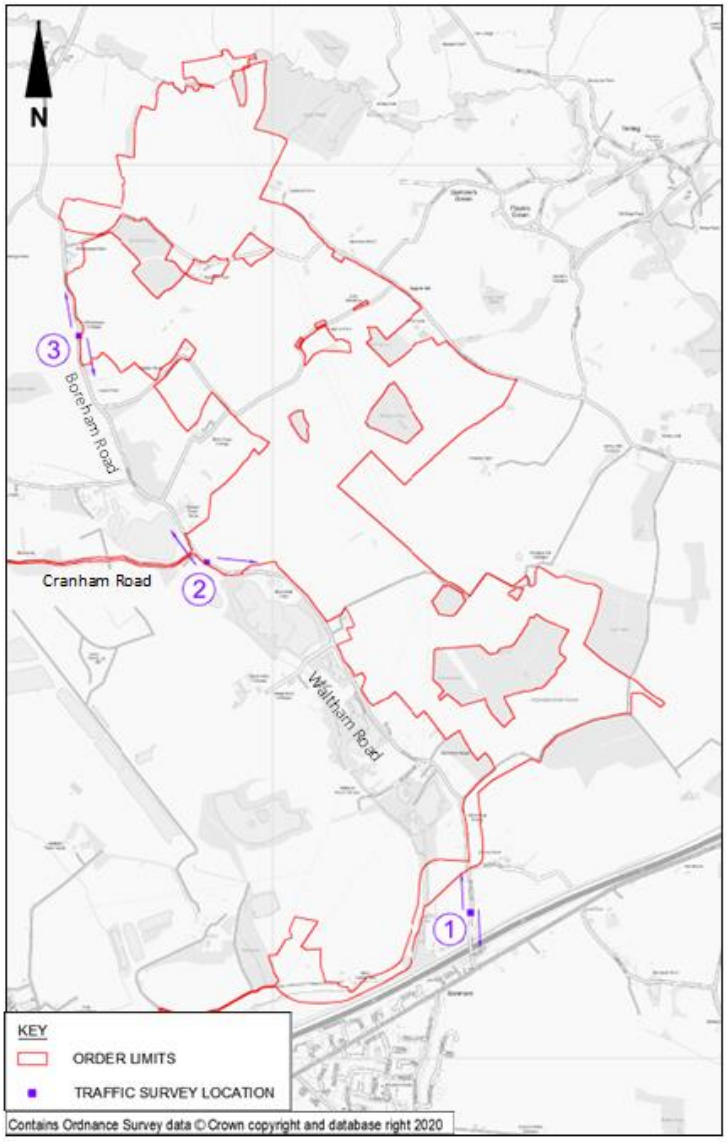

Plate 13-2. Traffic Survey Locations (Waltham Road and Boreham Road)

13.5.13 Further to the above, recent traffic count data has been identified for Cranham Road based on ATCs which were carried out in February 2019 as part of the Site Access Technical Review (162328/N01) prepared in support of the Land North of Cranham Road consented development (16/01394/OUT).

13.5.14 In terms of the SRN, traffic data for the A12(T) has been sourced from National Highways' WebTRIS database. In addition, Department for Transport (DfT) count data has been utilised for the surrounding highway network where available.

13.5.15 The following DfT traffic count data (site numbers below as DfT references) has been utilised for the study area:

a. DfT Site 941145: B1137 Main Road, to the west of the junction with Waltham Road; and

b. DfT Site 60001: A130 ERW, to the north of the roundabout with Channels Drive.

13.5.16 The following traffic count data (National Highways site references shown below) has been extracted from National Highways' WebTRIS database for the A12(T):

a. WebTRIS Site 6261/2: A12(T) northbound, to the north of the northbound off-slip at Junction 19 (Boreham Interchange);

b. WebTRIS Site 6261/1: A12(T) northbound off-slip at Junction 19 (Boreham Interchange);

c. WebTRIS Site 6262/2: A12(T) southbound, to the south of the southbound off-slip at Junction 19 (Boreham Interchange); and

d. WebTRIS Site 6262/1: A12(T) southbound off-slip at Junction 19 (Boreham Interchange).

13.5.17 A summary of the above traffic count data is set out within Section 13.6, as well as within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Additional Data (2021)

13.5.18 Following discussions with ECC, further traffic count data was obtained in 2021 to inform the local highway modelling of the Waltham Road / Cranham Road junction and the Main Road / Waltham Road junction. These surveys were carried out on Tuesday 7 September 2021 (between 07:00 - 10:00 and 16:00 - 19:00) following the relaxation of the COVID-19 restrictions in July 2021 and the return of the schools (including New Hall School) after the Summer school holiday period and therefore reflecting 'normal' traffic conditions.

13.5.19 Furthermore, an additional speed survey was carried out at the location of the proposed access on Waltham Road in May 2021 (neutral month), to confirm the visibility requirements for the proposed access for the Solar Farm Site. Whilst COVID-19 restrictions remained in place at this time, it was agreed with ECC Highways that these would not be expected to have affected vehicle speeds. The speed survey was conducted in accordance with CA 185 which forms part of the Design Manual for Roads and Bridges (DMRB) and sets out the requirements for measuring vehicle speeds and determining 85th percentile speeds.

13.5.20 A summary of the above traffic count and speed survey data is set out within Section 13.6, as well as within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Construction Programme

13.5.21 The earliest construction would start is Q1 2024 and with an estimated programme of 24 months, the Scheme could be expected to be operational by the end of Q1 2026. It is not intended that the Scheme will be built in phases, with the exception of the BESS. The BESS will be constructed in two phases, with the first part built alongside the Solar PV, and a second phase after five years of operation. However, as mentioned above, in order to provide a robust assessment a worst-case assumption has been taken that the BESS would be built in a single phase alongside the Solar PV.

13.5.22 The approach taken in this chapter is considered a reasonable worst-case assessment, which is based on a short construction period that would generate the highest number of peak hour and daily vehicle trips on the local network. Should the construction period be extended, and the BESS be phased, then the impact on peak hour and daily flows would then be reduced across the construction period.

Construction Traffic Flows

13.5.23 Details of the forecast trip attraction and distribution of the Scheme during the construction phase are set out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

13.5.24 Tables 13-3 to 13-5 present the levels of traffic predicted for the Order limits during the peak construction phase. As set out within Section 13.3, the below reflects the compressed winter working hours of 08:00 - 18:00 (10-hour shift), rather than the summer working hours of 07:00 - 19:00 (12-hour shift), to provide a robust worst-case assessment given that the development peak hours will be more closely orientated with the traditional network peak hours. Essentially, construction workers will be expected to arrive between 07:00-08:00 and expected to depart between 18:00-19:00 (reflecting the development peak hours), whereas the network peak hours for the local highway network (based on the survey data) are 08:00-09:00 and 17:00-18:00. The same working hours have been adopted for the Solar Farm Site and Bulls Lodge Substation to provide a worst-case cumulative assessment of the Order limits.

13.5.25 As identified earlier, in order to provide a worst-case assessment and to allow for some contingency in the phasing, the individual peaks in terms of construction vehicle trips for the Solar Farm Site and Bulls Lodge Substation have been combined. In reality, the 'peak' number of daily movements is expected to be lower than that assessed, as the individual peaks for the Solar Farm Site and Bulls Lodge Substation are not expected to overlap:

a. There is expected to be a maximum of 75 HGVs per day across the Order limits for a period of one month. However the following has been assessed:
   - A maximum of 50 HGVs associated with the Solar Farm Site (travelling to/ from the proposed access on Waltham Road via Cranham Road, Wheelers Hill and A130 Essex Regiment); and
   - A maximum of 46 HGVs associated with the extension to Bulls Lodge Substation (travelling to/ from the substation via the A12(T), RDR and private road).

b. There is expected to be a maximum of 533 construction workers per day across the Order limits during the peak months of construction. However, the following has been assessed:
   - A maximum of 500 construction workers for the Solar Farm Site, with 45% likely to be sourced locally and 55% likely to be non-local; and
   - A maximum of 33 construction workers for the Bulls Lodge Substation Site per day, with all staff to be sourced locally and to travel directly to/

from the Bulls Lodge Substation Site. There will also be up to 22 LGVs per day in addition to the above construction worker trips.

c. The above construction vehicle numbers (LGVs and HGVs) consider all expected activities including those relating to servicing and the disposal of waste.

Table 13-3. Solar Farm Site – Forecast Vehicular Trip Attraction – Peak Construction Phase

Time	Cars		Shuttle Buses		HGVs		Total		
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	**0**
07:00-08:00	108	0	9	9	0	0	117	9	**126**
08:00-09:00	28	0	2	2	0	0	30	2	**32**
09:00-10:00	3	0	0	0	7	0	10	0	**10**
10:00-11:00	2	0	0	0	7	7	9	7	**16**
11:00-12:00	2	0	0	0	7	7	9	7	**16**
12:00-13:00	0	0	0	0	8	7	8	7	**15**
13:00-14:00	0	0	0	0	7	8	7	8	**15**
14:00-15:00	0	2	0	0	7	7	7	9	**16**
15:00-16:00	0	2	0	0	7	7	7	9	**16**
16:00-17:00	0	31	2	2	0	7	2	40	**42**
17:00-18:00	0	28	2	2	0	0	2	30	**32**
18:00-19:00	0	80	7	7	0	0	7	87	**94**
19:00-20:00	0	0	0	0	0	0	0	0	**0**
Total	**143**	**143**	**22**	**22**	**50**	**50**	**215**	**215**	**430**

Table 13-4. Bulls Lodge Substation – Forecast Vehicular Trip Attraction – Peak Construction Phase

Time	Cars		LGVs		HGVs		Total		
	Arr	Dep	Arr	Dep	Arr	Dep	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	**0**
07:00-08:00	20	0	0	0	0	0	20	0	**20**
08:00-09:00	6	0	0	0	0	0	6	0	**6**
09:00-10:00	0	0	3	0	7	0	10	0	**10**
10:00-11:00	0	0	3	3	6	7	9	10	**19**
11:00-12:00	0	0	3	3	7	6	10	9	**19**
12:00-13:00	0	0	3	3	6	7	9	10	**19**
13:00-14:00	0	0	4	3	7	6	11	9	**20**
14:00-15:00	0	0	3	4	6	7	9	11	**20**
15:00-16:00	0	0	3	3	7	6	10	9	**19**
16:00-17:00	0	6	0	3	0	7	0	16	**16**
17:00-18:00	0	5	0	0	0	0	0	5	**5**
18:00-19:00	0	15	0	0	0	0	0	15	**15**
19:00-20:00	0	0	0	0	0	0	0	0	**0**
Total	**26**	**26**	**22**	**22**	**46**	**46**	**94**	**94**	**188**

Table 13-5. Total Forecast Vehicular Trip Attraction – Peak Construction Phase

Time	Solar Farm Site			Bulls Lodge Substation			Total		
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	0
07:00-08:00	117	9	126	20	0	20	137	9	146
08:00-09:00	30	2	32	6	0	6	36	2	38
09:00-10:00	10	0	10	10	0	10	20	0	20
10:00-11:00	9	7	16	9	10	19	18	17	35
11:00-12:00	9	7	16	10	9	19	19	16	35
12:00-13:00	8	7	15	9	10	19	17	17	34
13:00-14:00	7	8	15	11	9	20	18	17	35
14:00-15:00	7	9	16	9	11	20	16	20	36
15:00-16:00	7	9	16	10	9	19	17	18	35
16:00-17:00	2	40	42	0	16	16	2	56	58
17:00-18:00	2	30	32	0	5	5	2	35	37
18:00-19:00	7	87	94	0	15	15	7	102	109
19:00-20:00	0	0	0	0	0	0	0	0	0
Total	**215**	**215**	**430**	**94**	**94**	**188**	**309**	**309**	**618**

13.5.26 The above indicates that for the Solar Farm Site, there is expected to be a maximum of 126 two-way vehicle trips during the morning development peak hour (07:00-08:00) and 94 two-way vehicle trips during the evening development peak hour (18:00-19:00). A lower number of additional trips is expected during the traditional network weekday peak hours of 08:00-09:00 and 17:00-18:00, representing 32 two-way vehicle trips during each of these periods. These construction vehicles will access the Order limits via the proposed access on Waltham Road.

13.5.27 In terms of Bulls Lodge Substation, there is expected to be a maximum of 20 two-way vehicle trips for any given hour of the day. These construction vehicles will access the Order limits via the A12(T), Boreham Interchange, RDR and the private road to the east of the new roundabout. There is not expected to be a requirement for any off-site road modifications as a result of these works (other than to provide the eastern and western access points) as the private road was upgraded when the original substation was constructed and is currently suitable for larger vehicles which currently infrequently access the substation.

13.5.28 A highway impact assessment is set out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** and is represented within Section 13.8.

Operational Traffic Flows

13.5.29 It is anticipated that there will be up to eight permanent staff on-site during the operational phase. Therefore, based on ***Appendix 13A: Transport***

Assessment of the ES **[EN010118/APP/6.2]**, the Scheme is expected to attract a low level of trips during the operational phase, i.e. up to eight staff arrivals and eight staff departures daily, with a limited number of additional maintenance trips. A detailed assessment of this scenario has therefore been excluded from this ES (as per ID 4.8.1 of the Scoping Opinion).

Decommissioning Traffic Flows

13.5.30 For the purposes of the EIA, the decommissioning assessment year is assumed to be not earlier than 2066. The decommissioning period is expected to be similar in duration and nature to the construction phase, albeit slightly shorter in duration and with fewer vehicle trips. It is therefore considered reasonable to assume that the traffic flows will be the same as, and not greater than, the construction phase. This may overestimate the actual traffic flows slightly but is considered to be broadly accurate. In addition, this scenario is considered to be too far into the future to be able to accurately predict future baseline traffic flows or road / junction layouts at that time.

13.5.31 It should be noted that the above approach is consistent with ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** as well as the PEI Report which was submitted in May 2021.

Assessment Scenarios

13.5.32 To determine the likely effects of the Scheme, the following scenarios have been considered as part of this ES:

a. Construction (2024 – 2026)

- The peak construction year is assessed to be 2025; this assumes commencement of construction in Q1 2024 and that the Scheme is built out over a 24-month period. This is a likely worst case from a traffic generation point of view because it compresses the trip numbers into a shorter duration and represents the greatest impact on the highway network. A lengthened construction phase would be expected to result in lower traffic impacts; therefore, the likely worst-case scenario has been assessed within the ES.
- The BESS may be constructed in two phases, with the first phase during construction of the Solar PV and the second phase an estimated five years later. The traffic and transport assessment has assessed the reasonable worst-case scenario, where the BESS is built out in its entirety during the main construction works and prior to operation. This reflects a compressed construction period which generates more HGV movements per day during peak construction.

b. Operation (2026) – this is the opening year of the Scheme; it is assumed that the Scheme will be operational by the end of Q1 2026.

c. Decommissioning (not earlier than 2066) – this would be the year when decommissioning would commence based on a typical 40-year lifetime. The Application allows flexibility on the decommissioning date to allow maximum renewable energy generation from the Order limits, should the Scheme still be operating efficiently after 40 years.

13.5.33 The baseline reporting sets out the future baseline conditions within the study area against which the construction impacts can then be assessed.

13.5.34 As stated above, the assessment of the construction phase has been used to determine the anticipated impact of the Scheme during its decommissioning phase.

13.5.35 As stated in Section 13.3, the conclusions of this ES are considered to remain valid in the instance that there is a delay to the start of the construction phase of up to 5 years. For example, road improvement schemes in the cumulative assessments (e.g. A12 Chelmsford to A120 Widening Scheme and Phase 1 of the CNEB including the Cranham Road/ Drakes Lane overbridge) may have already been completed by the time the Scheme construction begins which would result in a better future baseline than that assessed. In addition, 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.

Junction Modelling

13.5.36 Local junction modelling has been carried out to determine whether any improvements are likely to be required on the surrounding highway network to support the Scheme. The following junction modelling has been undertaken as part of the TA for the local highway network, as agreed with ECC Highways:

a. Waltham Road / Cranham Road junction;

b. B1137 Main Road / Waltham Road junction; and

c. Proposed Solar Farm Site access junction on Waltham Road.

13.5.37 No modelling is required for the SRN, given that the Scheme is not expected to have any significant impacts on this part of the network including the A12(T) as agreed with National Highways during pre-application discussions.

13.5.38 Further details of the agreed approach for the junction modelling are set out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Impact Assessment Methodology

13.5.39 The assessment methodology adopted in this ES, as contained in the Guidelines for the Environmental Assessment of Road Traffic (Ref. 13.11), is recognised as the industry standard methodology for the assessment of traffic and highway impacts. 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.

13.5.40 In accordance with the above, the following criteria will be considered in this assessment:

a. Severance;

b. Driver delay;

c. Pedestrian delay;

d. Pedestrian and cyclist amenity;

e. Fear and Intimidation;

f. Accidents and safety; and

g. Hazardous loads.

13.5.41 The IEMA guidelines (Ref. 13.11) states that the magnitude of each impact should be determined as the predicted deviation from the baseline conditions.

13.5.42 IEMA (Ref. 13.11) 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 prepared by AECOM in October 2020. 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. Details relating to receptor sensitivity are also set out further below for each of the criteria.

13.5.43 **Severance** is defined in the IEMA guidelines (Ref. 13.11) 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.

13.5.44 **Driver Delay** has been determined through the analysis of the junction capacity assessments carried out as part of the TA, where required (as requested by ECC Highways). Delay is 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. This impact has been considered to be negligible (and therefore has not been considered further) for any parts of the network where junction capacity assessments were not required as part of the TA, given that no adverse impacts are envisaged for these parts of the network in terms of additional delay to road users.

13.5.45 **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.

13.5.46 **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.

13.5.47 **Fear and Intimidation** is *"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"*.

13.5.48 A detailed assessment of **Accidents and Safety** has been carried out following examination of road traffic accident data, based on data obtained for the agreed study area during the most recent five-year period available at the time of the request. The review examines the most recent three-year period prior to the introduction of COVID-19 restrictions in March 2020 for the majority of the network. However, a review of the full five-year period has been carried out for Waltham Road in the vicinity of the proposed access following comments received from ECC Highways. This analysis has been included in ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** to highlight if there are any existing safety issues on the local road network which may be exacerbated by the Scheme. The outcome of the assessment has been presented in this ES.

13.5.49 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."* 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 poses a particular risk beyond that which would be expected on the general highway network. In addition, there are not expected to be any Hazardous and Dangerous Loads associated with the Scheme. It is therefore 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 4.8.2 of the Scoping Opinion, an assessment of impacts associated with the transport of hazardous loads has been scoped out of this ES.

13.5.50 In terms of **Severance, Pedestrian Delay, Pedestrian / Cycle Amenity** and **Fear and Intimidation**, the road links within an easy walking / cycling distance of the Order limits have been used as receptors, as well as any road links which are expected to provide a main vehicular route to / from the Order limits and contain pedestrian / cycle facilities. A review of existing PRoW has also been carried out as part of this ES Chapter, in the instance that these have the potential to be affected by the Scheme.

13.5.51 For the construction impacts, the sensitivity of pedestrian routes and cycle routes are based on a qualitative assessment of the baseline scenario, taking into consideration the importance and attractiveness of the routes and the destinations served. The thresholds are defined as:

a. Neutral Sensitivity:
   - Rural road with no pedestrian / cycle facilities provided;

b. Low Sensitivity:
   - Strategic vehicular route in a rural setting with pedestrian / cycle facilities;

c. Medium Sensitivity:
   - Main vehicular route with pedestrian / cycle facilities provided in built up area; and

d. High Sensitivity:

– Lightly trafficked route provided in town centre setting.

13.5.52 The impacts of **Driver Delay** have been assessed at junction level. The sensitivity of these receptors is expressed in terms of Ratio to Flow Capacity (RFC) or Degree of Saturation (DoS). The worst-case peak hours have been assessed based on baseline traffic flows on the surrounding highway network.

13.5.53 The thresholds for sensitivity of junctions have been defined as:

a. Low Sensitivity: RFC / DoS below 90%;

b. Medium Sensitivity: RFC / DoS between 90% and 95%; and

c. High Sensitivity: RFC / DoS above 95%.

13.5.54 As mentioned above, an assessment of Driver Delay has not been carried out for any parts of the network where detailed junction capacity analysis was not required as part of the TA.

13.5.55 In terms of **Accidents and Safety** the impacts of the Scheme have been assessed based on the findings of ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, in terms of whether any accident clusters or patterns have been identified across the study area.

Highway Receptors

13.5.56 The following road links have been adopted as receptors for the assessment of the criteria listed above:

a. Waltham Road;

b. Cranham Road and Wheelers Hill;

c. B1137 Main Road;

d. A130 ERW;

e. Radial Distributor Road (RDR); and

f. Private road to / from Bulls Lodge Substation.

13.5.57 As previously mentioned, Boreham Road will be not be utilised by construction vehicles associated with the Scheme and this has therefore been excluded from the study area as agreed with ECC Highways.

Significance Criteria

13.5.58 The significance of effect is determined through the consideration of two elements; the magnitude of the impact and the sensitivity of the receptor. The following sections outline the approach that has been used to determine these factors.

13.5.59 The overall effect is determined by measuring the magnitude of the impact following 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:

a. Neutral – barely distinguishable from the background conditions, and not usually detectable;

b. Minor – slight, very short, or highly localised impact of no significant consequence;

c. Moderate – limited impact (by extent, duration or magnitude) which may be considered significant; and

d. Major – considerable impact by extent, duration or magnitude) of more than local significance, or in breach of recognised acceptability, legislation, policy or standards.

13.5.60 In order to determine the effect on the receptors within the study area (identified within Section 13.8), both the sensitivity of receptors and the magnitude of impact, as outlined above, are considered. Table 13-6 below shows the matrix that has been used to determine the effect category. Effects which are classified as major or moderate are considered to be significant (as indicated by the shaded cells below).

Table 13-6. Matrix for Determining Effect Category

Sensitivity or value of resource /	*Magnitude of impact*			
	High	*Medium*	*Low*	*Very low*
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

13.6 Baseline Conditions

13.6.1 This section describes the baseline environmental characteristics for the Scheme and surrounding areas with specific reference to the highway network, walking, cycling, equestrian and public transport facilities.

Existing Baseline (2021)

Strategic Highway Network

13.6.2 The A12(T) is a dual carriageway road which forms part of the SRN and is managed by National Highways. The A12(T) can be accessed via the B1137 Main Road, Boreham at Junction 19 (the Boreham Interchange), and / or the B1137 The Street, Hatfield Peverel at Junctions 20A and 20B (the Hatfield Peverel Interchange).

13.6.3 The A130 ERW is a dual carriageway road which links Little Waltham, north of Chelmsford, to the A131 in the north heading towards Braintree. The A130 is classified by ECC as a Priority 1 Road (PR1) and provides access to Wheelers Hill, which joins with Leighs Road, Drakes Lane and Cranham Road to the east which subsequently provide access to both Boreham Road and Waltham Road. In the south the route links with the A1016 near Belstead Hall and with the A12(T) at the Boreham Interchange.

13.6.4 As set our previously, the Boreham Interchange improvements and the RDR including the new roundabout with the private road to / from Bulls Lodge Substation are currently under construction. These works are expected to be completed by spring/ May 2023.

13.6.5 A plan showing the surrounding highway network is held within ***Figure 13-1***.

Local Highway Network

B1137 Main Road

13.6.6 The B1137 Main Road is classified as a Priority 2 Road (PR2) and is a single carriageway road with footways along the majority of its length and street lighting provision within the villages of Boreham and Hatfield Peverel. The existing speed restrictions applicable on the B1137 vary along its route, comprising the National Speed Limit (60mph) between the Boreham Interchange and the village of Boreham, 40mph within Boreham itself, a section of National Speed Limit (60mph) to the east of Boreham, a section of 50mph speed restriction to the west of Hatfield Peverel and 30mph within Hatfield Peverel itself.

Waltham Road and Boreham Road

13.6.7 Waltham Road and Boreham Road are rural single carriageway roads (both classified as PR2) and together connect Boreham in the south with Great Leighs in the north and serve a mixture of localised residential, leisure, agricultural, commercial and industrial land uses. These roads are subject to the National Speed Limit (60mph) and do not contain pedestrian footways or street lighting provision, which is in keeping with their rural character. The Solar Farm Site borders Waltham Road and Boreham Road at various locations.

Cranham Road and Wheelers Hill

13.6.8 Waltham Road forms a priority junction with Cranham Road approximately 2.8km to the north of the B1137 Main Road junction. Cranham Road is a rural single carriageway road which provides a connection to the A130 ERW to the west via Wheelers Hill. Cranham Road and Wheelers Hill are both classified as PR2, are subject to the National Speed Limit (60mph), and do not contain any pedestrian footways or street lighting provision.

Braintree Road

13.6.9 Braintree Road runs to the north of the Order limits and is a rural single carriageway road which is accessed via Boreham Road at its western extent and serves the villages of Fuller Street and Terling. Braintree Road is rural in character, subject to the National Speed Limit (60mph) and does not contain any pedestrian footways or street lighting provision. It should be noted that Braintree Road falls outside of the study area (see Section 13.5).

Terling Hall Road

13.6.10 Terling Hall Road runs along the eastern boundary of the Solar Farm Site and is accessed via the B1137 Main Road to the south, where there is a 12’ 6” height restriction as the route passes underneath the railway line. Terling Hall Road is a narrow rural single carriageway road which principally serves agricultural properties. It should be noted that Terling Hall Road falls outside of the study area (see Section 13.5).

Generals Lane, Private Road and Bulls Lodge Substation

13.6.11 Generals Lane is located to the southwest of the Order limits and is a local road which is accessed via the Boreham Interchange. Generals Lane passes over the A12(T) and the Great Eastern Main Line (GEML) at which point it narrows providing priority to northbound road users. Generals Lane provides access to a private road (subject to a 30mph speed limit) which subsequently runs eastwards and provides access to the existing Bulls Lodge Substation. It is understood that the private road was previously upgraded to accommodate the works which were carried out when the substation was originally constructed.

13.6.12 As previously mentioned, the Generals Lane connection with the Boreham Interchange and A12(T) overbridge will be demolished as part of the works at the Boreham Interchange which does not therefore form part of the study area during the future baseline scenario.

Baseline Traffic Flows

13.6.13 The following time periods have been reviewed to inform the assessment:

a. 07:00 to 08:00 – development peak hour (based on the winter profile which offers a robust assessment);

b. 08:00 to 09:00 – network peak hour for the local highway network;

c. 17:00 to 18:00 – network peak hour for the local highway network; and

d. 18:00 to 19:00 – development peak hour (based on the winter profile as above).

13.6.14 A summary of the baseline traffic data within the study area is set out in Table 13-7.

Table 13-7. Baseline Traffic Data (2019)

Location	Source	Date	Period	Total Vehicles (Two-Way)				
				07:00-08:00*	08:00-09:00	17:00-18:00	18:00-19:00*	24 hours
Waltham Road (Site 1)	ATR	October 2019	Average Weekday	868	833	849	452	7,939
Waltham Road (Site 2)	ATR	October 2019	Average Weekday	880	822	811	420	7,368
Boreham Road (Site 3)	ATR	October 2019	Average Weekday	727	531	482	238	3,878
Cranham Road	Site Access Technical Review	February 2019	Average Weekday	455	369	400	218	4,003
B1137 Main Road	Dft Count (941145)	2019	AADF	765	760	778	633	7,829
A130 Essex Regiment Way	Dft Count (60001)	2019	AADF	2,476	2,306	2,551	2,013	27,334
Boreham Interchange (SB Off-Slip)	WebTRIS (6262/1)	October 2019	Average Weekday	1,626	1,638	938	699	13,681

Location	Source	Date	Period	Total Vehicles (Two-Way)				
				07:00-08:00*	08:00-09:00	17:00-18:00	18:00-19:00*	24 hours
Boreham Interchange (NB Off-Slip)	WebTRIS (6261/1)	October 2019	Average Weekday	1,355	1,232	1,096	936	15,223
A12(T)	WebTRIS (4 locations)	October 2019	Average Weekday	7,612	7,278	6,373	5,111	92,175

*anticipated development peak hours in terms of traffic flows during the winter (worst-case scenario)

13.6.15 Following discussions with ECC Highways, further traffic count data has been obtained to inform the local highway modelling for the Waltham Road / Cranham Road junction and the B1137 Main Road / Waltham Road junction. These surveys were carried out on Tuesday 7 September 2021 (between 07:00 - 10:00 and 16:00 - 19:00) following the relaxation of the COVID-19 restrictions in July 2021 and the return of the schools (including New Hall School) after the Summer school holiday period. The 2021 baseline traffic flows have been adopted in place of the 2019 baseline data where applicable. A summary of the 2021 baseline traffic flows, including a comparison against the 2019 baseline data where applicable (change identified in brackets), is set out below in Table 13-8.

Table 13-8. Baseline Traffic Data (2021)

Traffic Count	Location	Total Vehicles (Two-Way)			
		07:00-08:00*	08:00-09:00	17:00-18:00	18:00-19:00*
Waltham Road/ Cranham Road Junction	Boreham Road (north of Cranham Road)	210	277	258	166
	Waltham Road (south of Cranham Rd)	657 (-123)	747 (-125)	719 (-92)	416 (-4)
	Cranham Road	467 (+12)	498 (+129)	483 (+83)	286 (+68)
Main Road/ Waltham Road Junction	Waltham Road (north of Main Rd)	743 (-125)	855 (+22)	813 (-36)	491 (+39)
	B1137 Main Road (west of Waltham Road)	698 (-67)	893 (+133)	988 (+210)	617 (-16)
	B1137 Main Road (east of Waltham Road)	831	880	1,061	652

*anticipated development peak hours in terms of traffic flows during the winter (worst-case scenario)

13.6.16 The above results indicate the following when comparing the 2019 baseline data with the 2021 traffic flows:

a. Traffic flows on Waltham Road to the south of Cranham Road were lower in September 2021 than in October 2019, but were comparable to the north of the B1137 Main Road;

b. Traffic flows on Cranham Road were higher in September 2021 than in October 2019; and

c. Traffic flows on the B1137 Main Road were considerably higher during the network peak hours in September 2021 than in October 2019, whilst being comparable during the anticipated development peak hours.

13.6.17 The above findings for the B1137 Main Road indicate that traffic levels through the B1137 Main Road / Waltham Road junction are currently higher than would typically be expected due to ongoing works at the Boreham Interchange. Following discussions with ECC Highways, it is understood that this is also a result of traffic rat-running along Waltham Road and B1137 Main Road to avoid existing congestion on the A130. This has therefore been considered as part of the assessment of Driver Delay given that the above works will have been completed by the construction phase (2025), which has been informed by the local junction modelling carried out as part of ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Protected Lanes

13.6.18 The Chelmsford Local Plan 2013 – 2036 (Ref. 13.7) identifies a number of Protected Lanes and byways which are located near to the Order limits and have historic and landscape value. The Council intends to protect these lanes and byways by preserving, as far as possible, the trees and hedgerows, banks, ditches and verges which contribute to their character, and by resisting development proposals which have an adverse environmental impact upon them (such as a material increase in traffic) in line with Strategic Policy S3 (Conserving and Enhancing the Historic Environment) and Policy DM13 (Non-Designated Heritage Assets).

13.6.19 The following local routes have protected status as set out within the Chelmsford Local Plan 2013 – 2036 (Ref. 13.7), shown on the Adopted Policies Map for Chelmsford North (Map 1):

a. Boreham Road to the north of the junction with Cranham Road;

b. Braintree Road between the junctions with Boreham Road (west) and Fairstead Hall Road (east) including a short section which passes through the northern extents of the Solar Farm Site;

c. Terling Hall Road to the east of the Solar Farm Site; and

d. The following local roads which run through the centre of the Solar Farm Site:

- Noakes Lane which runs between the junctions with Boreham Road (west) and Terling Hall Road (east) and provides access to Noakes House, Hankins Farm and Little Weathers; and
- Birds Farm Lane which runs between the junctions with Boreham Road (west) and Noakes Lane (east) and provides access to Bird's Farm Cottage.

Walking Facilities

13.6.20 No footways are provided alongside Waltham Road, Boreham Road or Cranham Road in the immediate vicinity of the Order limits. A National Walking Trail (Essex Way) runs to the north of the Order limits, which ultimately runs from Epping in the south to Harwich in the north. Within the vicinity of the Order limits, the trail runs north along the River Ter, eastwards along the southern boundary of Sandy Woods before reaching Terling and then heading northwards.

13.6.21 There are a number of PRoW which pass through the Order limits or run adjacent to the Order limits which are summarised within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

13.6.22 The details of the existing PRoW within the Order limits have been obtained from ECC (Ref. 13.13). The locations of the PRoW, as well as National Cycle Network Regional Route 50 and Essex Way are shown within ***Figure 13-2***.

Cycling Facilities

13.6.23 National Cycle Network (NCN) Route 50 passes within 5km of the Order limits, running along Terling Hall Road to the east of the Order limits, before running through Terling and joining Braintree Road to run towards Great Leighs to the northwest. There are no on or off-road cycling facilities on Waltham Road, Boreham Road, or Cranham Road to the west of the Order limits.

13.6.24 Within a 2.5km distance, the Order limits can be accessed from Boreham to the south and Gamble's Green to the northeast. Within a 5km distance, the Order limits can also be accessed from Great Leighs to the north, Terling to the northeast, Hatfield Peverel to the southeast, parts of Springfield and Chelmer Village (within northeast Chelmsford) to the southwest and Little Waltham to the west.

Equestrian Facilities

13.6.25 An existing bridleway (PRoW 213_48) runs along the existing private road to/ from Bulls Lodge Substation for a distance of circa. 550m. In addition, an existing bridleway (PRoW 213_23) crosses the existing private road to/ from Bulls Lodge Substation approximately 200m to the northeast of the junction with the RDR. The locations of these PRoW are shown within ***Figure 13-2***.

Public Transport Facilities

Bus

13.6.26 The nearest bus stops are located on the B1137 Main Road in the village of Boreham to the south of the Order limits, which are served by bus routes 71 and 73. These routes serve Chelmsford and Colchester, as well as Witham, Maldon and Heybridge. During the AM peak, the journey time from Hatfield Peverel Railway Station to Main Road via bus route 73A is approximately five minutes. The route from Chelmsford Railway Station to the bus stop on Main Road via bus routes 71 and 73 is approximately 22 minutes.

13.6.27 There are no bus stops located on Waltham Road or Boreham Road to the west of the Solar Farm Site.

Rail

13.6.28 The nearest rail station to the Order limits is Hatfield Peverel Station which is located approximately 4km to the northeast of Boreham and is served by the Great Eastern Main Line (GEML) which runs east-west to the south of the Order limits. Chelmsford Station is located approximately 7km to the southwest of the Order limits which is also served by the GEML. These stations provide connections to Ipswich and Colchester (including Colchester Town) and Braintree to the north, as well as Chelmsford, Shenfield, Stratford and London Liverpool Street to the south.

Future Baseline (2025)

13.6.29 Projected background traffic growth has been applied to the traffic flows derived from the available traffic survey data to represent conditions during the future baseline scenario (2025) which forms the basis for the assessment of the construction phase. The future baseline flows also include trips associated with the Land North of Cranham Road committed development as well as some other local schemes which are documented further in Section 13.11.

13.6.30 The full methodology is included within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**. The future baseline traffic flows presented further below within Section 13.8.

13.6.31 The consideration of cumulative effects as a result of committed developments and highway improvements is set out within Section 13.11 of this report.

13.6.32 As previously mentioned, a review of future baseline conditions during the operational assessment year (2026) has been scoped out from this ES. In addition, future baseline conditions have not been considered for the decommissioning assessment year (not earlier than 2066) on the basis that this is too far into the future to be able to accurately predict background traffic flows or road / junction layouts at that time. The decommissioning effects of the Scheme are expected to be of a similar (or lesser) magnitude to the construction effects. The future baseline scenario for the construction phase (2025) has therefore been used to identify the likely impacts of the decommissioning phase including whether any mitigation will be required.

13.7 Embedded Design Mitigation

Construction and Decommissioning

13.7.1 The embedded design mitigation measures referred to below will be implemented during the construction and decommissioning phases. These measures would be secured through the DCO, primarily by the Framework CTMP and Outline PRoW MP (***Appendix 13B*** of the ES **[EN010118/APP/6.2]**), as well as via the Outline Construction Environmental Management Plan (CEMP) **[EN010118/APP/7.10]** or the Decommissioning Strategy **[EN010118/APP/7.12]** for the decommissioning phase. These measures include:

a. Delivering a north-south construction route through the Solar Farm Site, to allow vehicles to access all areas via a single point of access during the construction period;

b. Maintaining access to/ along PRoW during the construction phase, including minimum legal widths for PRoW users;

c. Providing temporary PRoW diversion routes where necessary e.g. when the Grid Connection Route is installed, to avoid any PRoW closures. Each diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with ECC, CCC and Braintree District Council (BDC) prior to construction;

d. Providing sufficient protection / separation between existing PRoW and the construction route where necessary;

e. Managing areas where the internal 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 (see ***Figure 13-4***) as well as two crossing points on Noakes Lane and the short section of PRoW 213_48 which runs along the private road to/ from Bulls Lodge Substation (see ***Appendix 13B: Framework CTMP*** of the ES **[EN010118/APP/6.2]**);

f. Restricting HGV movements to certain routes i.e. via Wheelers Hill and Cranham Road to the west, to prevent construction vehicles from using Protected Lanes, as well as the B1137 Main Road and passing through Hatfield Peverel and / or Boreham;

g. Reducing HGV movements during certain times of the day (e.g. between 07:00 and 09:00, as well as 17:00 and 19:00), to avoid increasing traffic levels on the surrounding highway network during the traditional weekday peak hours;

h. 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 (instructing all HGV drivers to avoid Waltham Road to the south of the proposed access for the Solar Farm Site and Boreham Road to the north of Cranham Road). In addition, adequate space will be made available along the proposed access road to ensure no queuing back onto the surrounding road network occurs;

i. Implementing a monitoring system to record the route of all HGVs travelling to and from the Order limits, to record any non-compliance with the agreed routing strategy/ delivery hours and to communicate any issues to the relevant suppliers to ensure the correct routes and times are followed. At this stage, it is envisaged that this would be based on vehicles turning at the site access on Waltham Road where any instances of non-compliance would be recorded by on-site security staff i.e. for any HGVs turning right in or left out (travelling to/ from the south);

j. Developing a communications strategy including regular meetings with contractors to review and address any issues associated with travel to / from the Order limits, as well as to relay information including any restrictions and requirements which should be followed;

k. Providing a suitable point of access on Waltham Road circa. 125m to the south of the junction with Cranham Road, with any supporting improvements (e.g. vegetation clearance) to take place within the highway boundary and the Order limits if required;

l. Implementing Temporary Traffic Management (TTM) on Waltham Road during the period when the Grid Connection Cables are installed to connect the Bulls Lodge Substation with the Solar Farm Site. It is envisaged that the TTM will be secured by the DCO through the TTM plans;

m. As set out within the Framework CTMP (see ***Appendix 13B*** of the ES **EN010118/APP/6.2**), the following arrangements are proposed to be implemented to safely manage the construction vehicle crossing point on Waltham Road, of which there are expected to be up to 30 vehicle crossing movements per day for a period of approximately 30 weeks during the construction phase:

- The construction access points will be located opposite each other on Waltham Road (both gated out-of-hours to prevent general access);
- All construction vehicles will access the western section via the eastern section, which will in turn be accessed from within the Solar Farm Site i.e. the crossing will accommodate straight-ahead vehicle movements only, with no vehicles turning to/ from Waltham Road;
- The construction access tracks will have a minimum width of 6m to accommodate two-way HGV movements movement along the construction access route;
- Forward visibility splays of at least 125m will be provided to the vehicle crossing point and associated Temporary Traffic Management (TTM) for traffic approaching the crossing point on the two Waltham Road approaches;
- Temporary traffic signals will be implemented at each arm of the crossing (this includes one on each side of the crossing on Waltham Road and one on each side of the crossing on the construction route i.e. four traffic signals in total); and
- The temporary traffic signals will be demand-based (i.e. on-call system for the two minor construction access arms, to ensure Waltham Road traffic is only impacted when construction vehicles need to cross Waltham Road).

n. 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. A 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;

o. Implementing a shuttle service to transfer non-local staff to / from local worker accommodation (assumed average occupancy of 25 workers per service), to reduce vehicle trips on the surrounding highway network. Whilst these locations are currently unknown, these are likely to be locally based in Chelmsford and Braintree (see ***Appendix 13B*** of the ES **[EN010118/APP/6.2]**);

p. Providing limited (but sufficient) on-site car parking to accommodate the expected parking demand of construction staff within the Order limits. Parking will be limited to 150 spaces at the Solar Farm Site

(within the main construction compound served by the proposed access on Waltham Road) and to 50 spaces at the Bulls Lodge Substation Site (within a construction compound served by the proposed eastern access), to encourage staff to travel together;

q. Implement local off-site highway improvements (verge clearance, hedge cutting and / or carriageway widening), where required along Wheelers Hill, Cranham Road and Waltham Road, to support HGV movements. Further details are provided below, and the proposed locations of any improvements are identified in ***Figure 13-5***, as well as within the TA and Framework CTMP;

r. Positioning of suitably qualified banksmen at the proposed access on Waltham Road for the Solar Farm Site, the two proposed accesses for Bulls Lodge Substation, the Waltham Road construction vehicle crossing point and at internal crossing points, to allow all vehicle arrivals and departures to be safely controlled during the construction period;

s. Vegetation clearance at proposed access on Waltham Road (visibility splays of 125m), the two crossing points on Noakes Lane (visibility splays of 90m) and the proposed Bulls Lodge Substation accesses from the private road (visibility splays of 90m) in order to achieve appropriate levels of visibility at these locations as agreed with ECC Highways. Drawings showing the proposed access and crossing points, visibility splays and swept paths are held within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**;

t. Avoiding the usage of Protected Lanes, unless required for emergency access

u. Providing sufficient cycle parking spaces within the Order limits to encourage construction staff to travel by bicycle where viable (50 cycle parking spaces to be provided);

v. Should it be necessary, access for emergency vehicles will also be achievable via several alternative existing access points (e.g. should the proposed access for the Solar Farm Site become blocked or unavailable). This includes existing access points on Waltham Road, Boreham Road to the west of the Solar Farm Site and Terling Hall Road to the east. For Bulls Lodge Substation, should there be any issues with one of the proposed access points then it will be possible to utilise the alternative access point to gain access. Further details are held within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**;

w. In terms of construction compounds, the main construction compound for the Solar Farm Site will served by the proposed access on Waltham Road and approximately ten smaller secondary compounds will be situated across the Solar Farm Site at strategic locations, served by the primary and secondary access routes. A construction compound will also be provided for Bulls Lodge Substation which will be accessed via the proposed eastern access on the private road. Further details are held within **Appendix 13B: Framework CTMP** of the ES **[EN010118/APP/6.2]**; and

x. A specialised haulage service will be employed to allow abnormal loads to transport components with the necessary escort, permits and traffic management, with the contractor consulting 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.

Local Off-Site Highway Improvements

13.7.2 As stated above, off-site highway improvements will be implemented to support construction HGVs travelling on the local highway network to / from the proposed Solar Farm Site access on Waltham Road. These improvements are expected to comprise relatively minor verge clearance, hedge cutting or carriageway widening, to achieve a minimum carriageway width of 6.0m (as agreed with ECC Highways) along Wheelers Hill, Cranham Road, and Waltham Road (i.e. the agreed construction vehicle route). The anticipated extents of the off-site highway improvements are identified on ***Figure 13-5***.

13.7.3 A summary of the proposed extents of carriageway widening, based on OS mapping and highway boundary information, is as follows:

a. Where the carriageway currently falls below 6.0m in width (based on the OS mapping), it will be possible to widen the carriageway to 6.0m within the highway boundary along the entire route except for a single pinch point at the western extent of the study area adjacent to Kingswood, where a reduced level of widening (to 5.5m) will be sought for a short section (within the highway boundary) to minimise works adjacent to this existing property as agreed with ECC;

b. Following a site visit, the OS mapping appears to underestimate existing carriageway widths at various locations and the extent of widening required may therefore be less than indicated by the plans (which therefore are considered to offer a worst-case assessment); and

c. A topographical survey will be carried out at the detailed design stage, to determine the true extents of widening at the identified locations to avoid any unnecessary works, e.g. in the instance that the carriageway is already 6.0m in width.

13.7.4 As identified above and on ***Figure 13-5***, there is one area along the corridor where, due to existing constraints, it will only be possible to widen the carriageway to 5.5m. This approach has been agreed with ECC Highways on the basis of the following:

a. The carriageway will only fall below 6.0m (but no less than 5.5m) for a short distance (pinch point) of circa. 40m, with good forward visibility in each direction at this location;

b. A carriageway width of 5.5m is sufficient for two large vehicles to pass based on Manual for Streets;

c. The existing carriageway exceeds 6.0m in width both to the east and west of the pinch point, allowing two large vehicles to easily pass; and

d. An existing access provides an additional opportunity for two large vehicles to pass to the west of the pinch point, if required.

13.7.5 It should be noted that if it is not possible to widen the carriageway to 6.0m as proposed at any given location e.g. due to unforeseen constraints , then the opportunity to widen the carriageway to 6.0m on the opposite side of the carriageway will be explored or a reduced level of widening to 5.5m will otherwise be sought. All proposed widening is expected to be achievable within the existing highway boundary based on the review carried out within the Transport Assessment.

Operation

13.7.6 The embedded design mitigation measures referred to below will be implemented during the operational phase and will be secured through the DCO such as through the Outline Operational Environmental Management Plan **[EN010118/APP/7.11]**:

a. Converting the north-south construction route to a green corridor and maintenance route, to improve connectivity for pedestrians and cyclists through the Solar Farm Site, as well as to allow operational vehicles to access all areas of the Solar Farm Site via a single point of access during the operational period;

b. Maintaining access to all existing PRoW within the Order limits, with no diversions or closures (any PRoW temporarily diverted during the construction phase will be reinstated during the operational phase);

c. Providing additional permissive paths within the Solar Farm Site to improve connections and desire lines for pedestrians and cyclists, including to / from existing PRoW, National Cycle Route 50, Essex Way and the Chelmsford Garden Community;

d. Providing a suitable point of access for operational vehicles on Waltham Road circa. 125m to the south of the junction with Cranham Road;

e. Controlling areas where the internal maintenance route crosses any existing PRoW or local access roads (such as by providing gates), permitting only operational traffic to utilise these internal routes within the Order limits. 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; and

f. Measures such as planting of hedgerows, maintained to a height of at least 3m, in order to conceal the solar reflections and to mitigate the overall impacts for road receptors (based on the Glint and Glare Assessment see (***Appendix 10G*** of the ES **[EN010118/APP/6.2]**).

13.8 Assessment of Likely Impacts and Effects

13.8.1 The impacts and effects associated with the construction of the Scheme are outlined in the section below. The assessment has been carried out following consideration of the embedded mitigation measures as described in Section 13.7 and has been informed by ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**. in terms of the forecast increase in vehicle trips on the surrounding highway network.

Construction (2024 – 2026)

Impact Assessment

13.8.2 The full traffic impact methodology is set out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, but the increase in two-way vehicle movements during the proposed development weekday peak hours, local highway network 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 Tables 13-9 to 13-11 below.

13.8.3 It should be noted that the assessment considers cumulative trips associated with both the Solar Farm Site and the Bulls Lodge Substation Site. The assessment focuses on both the strategic network, as well as the local network near the Solar Farm Site (i.e. Waltham Road, Main Road, Cranham Road and Wheelers Hill) given that the majority of trips will be to/ from the Solar Farm Site. A qualitative assessment has been carried out for the RDR given that this is due to be completed in May 2023 and therefore there is no existing traffic data for this part of the future highway network. Furthermore, and given the lower number of trips which are expected to use the private road to/ from the Bulls Lodge Substation (compared to the local highway network in the vicinity of the Solar Farm Site), a qualitative assessment has been carried out for the private road. Nonetheless, the number of additional trips which are expected to utilise these parts of the highway network (RDR and private road) as a result of the Scheme have been identified for the construction phase (see Table 13-9 and Table 13-10).

Table 13-9. 2025 Construction Traffic Impact Assessment – Strategic Highway Network – Link Flows (Two-Way)

Link	AM Dev Peak (07:00-08:00)			AM Network Peak (08:00-09:00)			PM Network Peak (17:00-18:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)		
	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase
A12(T) Northeast	6,089	26	0.4%	5,972	7	0.1%	4,184	7	0.2%	3,070	19	0.6%	63,081	161	0.3%
A12(T) South	5,140	51	1.0%	4,785	14	0.3%	4,733	13	0.3%	4,084	38	0.9%	66,154	251	0.4%
A130/ A131 Braintree Road	2,292	25	1.1%	1,866	6	0.3%	2,368	6	0.3%	1,589	19	1.2%	26,023	91	0.4%
A130 ERW (south of Wheelers Hill)	2,610	39	1.5%	2,471	10	0.4%	2,749	10	0.4%	2,129	29	1.4%	29,115	176	0.6%
A130 ERW (south of P&R)	2,610	39	1.5%	2,471	10	0.4%	2,749	10	0.4%	2,129	29	1.4%	29,115	176	0.6%
A130 ERW (south of RDR)	2,600	39	1.5%	2,462	10	0.4%	2,740	10	0.4%	2,119	29	1.4%	28,996	101	0.3%
RDR*	-	20	-	-	6	-	-	5	-	-	15	-	-	263	-

*RDR only expected to be used for Bulls Lodge Substation and by HGVs following agreed routing strategy, no baseline data available (as currently under construction)

Table 13-10. 2025 Construction Traffic Impact Assessment – Local Highway Network – Link Flows (Two-Way)

Link	AM Dev Peak (07:00-08:00)			AM Network Peak (08:00-09:00)			PM Network Peak (17:00-18:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)*		
	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase
Boreham Road (north of Cranham Road)	217	0	0.0%	286	0	0.0%	267	0	0.0%	172	0	0.0%	-	0	-
Waltham Road (north of site access)	678	64	9.5%	771	16	2.1%	743	16	2.2%	430	48	11.1%	7,780	267	3.4%
Waltham Road (south of site access)	678	62	9.1%	771	16	2.1%	743	16	2.1%	430	46	10.7%	7,780	163	2.1%
Waltham Road (north of Main Road)	767	62	8.1%	883	16	1.8%	841	16	1.9%	508	46	9.1%	8,383	163	1.9%
Cranham Road (west of Waltham Road)	482	64	13.3%	514	16	3.1%	499	16	3.2%	296	48	16.2%	4,228	267	6.3%

Link	AM Dev Peak (07:00-08:00)			AM Network Peak (08:00-09:00)			PM Network Peak (17:00-18:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)*		
	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase
Wheelers Hill	498	64	12.9%	530	16	3.0%	517	16	3.1%	314	48	15.3%	4,418	267	6.0%
Main Road (east of Waltham Road)	858	2	0.2%	909	0	0.0%	1,097	0	0.0%	674	1	0.2%	-	4	-
Main Road (west of Waltham Road)	721	60	8.3%	922	15	1.7%	1,022	15	1.5%	638	45	7.0%	8,267	158	1.9%
Private Road to/ from Bulls Lodge Substation**	-	20	-	-	6	-	-	5	-	-	15	-	-	188	-

*2021 survey data only covers the peak hours, and 24-hour data is not therefore available for all parts of the network
**construction staff vehicles only, all HGVs would travel outside of the development and network peak hours

Table 13-11. 2025 Construction Traffic Impact Assessment – Junction Entry Flows

Junction	AM Dev Peak (07:00-08:00)			AM Network Peak (08:00-09:00)			PM Network Peak (17:00-18:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)*		
	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase
Proposed Solar Farm Site Access Junction	678	126	18.6%	771	32	4.1%	743	32	4.3%	430	94	21.9%	7,780	430	5.5%
Waltham Road/ Cranham Road Junction	689	64	9.3%	786	16	2.1%	755	16	2.1%	449	48	10.7%	-	267	-
Main Road/ Waltham Road Junction	1,173	62	5.3%	1,357	16	1.2%	1,480	16	1.1%	910	46	5.1%	-	163	-
A130/ Wheelers Hill Roundabout	3,053	64	2.1%	2,473	16	0.7%	2,574	16	0.6%	1,996	48	2.4%	29,546	267	0.9%

Junction	AM Dev Peak (07:00-08:00)			AM Network Peak (08:00-09:00)			PM Network Peak (17:00-18:00)			PM Dev Peak (18:00-19:00)			Daily (24 Hours)*		
	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase	Base	Dev	Increase
A12 SB Off-Slip**[1]	1,725	26	1.5%	1,737	7	0.4%	995	0	0.0%	741	0	0.0%	14,614	81	0.6%
A12 NB Off-Slip**	1,441	51	3.5%	1,311	14	1.0%	1,164	0	0.0%	993	0	0.0%	16,282	126	0.8%

[1] **includes Scheme arrivals only i.e. exiting the A12(T) at the Boreham Interchange to access the Order limits

13.8.4 The results shown in Tables 13-9 to 13-11 indicate the following:

a. A total of 126 two-way vehicle trips are expected to utilise the proposed access on Waltham Road during the AM development peak hour (07:00-08:00), with 94 two-way vehicle trips during the PM development peak hour (18:00-19:00). This equates to around 2-3 vehicles per minute during the busiest times.

b. There are expected to be significantly fewer vehicle trips during the traditional weekday peak hours of 08:00-09:00 and 17:00-18:00, where 32 additional two-way trips will be expected during each of these hours.

c. The Scheme is expected to have the largest proportional increase in traffic flows on Cranham Road (increase of 16.2% during the PM development peak hour). Carriageway widening improvements will be implemented on Cranham Road (as discussed and agreed with ECC) to support the increase in HGV movements where necessary. This has been treated as embedded mitigation as part of the Scheme (see Section 13.7). It is possible that the majority of these highway improvements would not need to be implemented by the Applicant in the instance that these are undertaken by the developer of Land North of Cranham Road - see ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, as well as Section 13.11.

d. The Scheme is expected to result in a maximum traffic flow increase of 11.1% on Waltham Road (north of the proposed Solar Farm Site access) during the PM development peak hour (18:00-19:00), representing an increase of 48 vehicles at this time, which equates to less than one vehicle per minute.

e. The Scheme is expected to result in a maximum traffic flow increase of 8.3% on the B1137 Main Road during the AM development peak hour (07:00-08:00), representing an increase of 60 vehicles at this time, or an average of one vehicle per minute.

f. The Scheme is not expected to have a significant impact on any strategic routes as follows:

- Maximum increase of 39 two-way vehicles (+1.5%) on the A130 ERW during the AM development peak hour (07:00-08:00);
- Maximum increase of 26 two-way vehicles (+0.4%) on the A12(T) to the northeast of the Boreham Interchange during the AM development peak hour (07:00-08:00);
- Maximum increase of 51 two-way vehicles (+1.0%) on the A12(T) to the south of the Boreham Interchange during the AM development peak hour (07:00-08:00); and
- A total of 263 two-way vehicles on the RDR, via the Boreham Interchange and the A12(T), travelling to/ from the Order limits via the agreed routing strategy.

g. The total traffic flows (with the Scheme) during the AM development peak hour (07:00-08:00) are expected to fall below the future baseline traffic flows (without the Scheme) during the AM network peak hour (08:00-09:00) for Waltham Road and the B1137 Main Road. This

demonstrates that the Scheme is not expected to result in higher traffic levels on these parts of the network than will already be experienced at other times of the day;

h. The total traffic flows (with the Scheme) during the PM development peak hour (18:00-19:00) are expected to fall below the future baseline traffic flows (without the scheme) during the PM network peak hour (17:00-18:00) across the entire study area. This demonstrates that the Scheme is not expected to result in higher traffic levels across the surrounding highway network than will already be experienced at other times of the day

13.8.5 The extension to the existing Bulls Lodge Substation is expected to result in up to a maximum of 94 additional vehicles per day comprising 46 HGVs and 48 LGVs (including 22 private vehicles related to construction workers) during the peak period. It is not expected that any improvements will be required along the private road to/ from Bulls Lodge Substation to accommodate these additional trips, other than to accommodate the proposed eastern and western accesses.

13.8.6 It should be noted that the Grid Connection Route will require temporary traffic management on Waltham Road for a period of up to 30 weeks in order to allow this to be installed across Waltham Road and to allow construction vehicles to safely cross Waltham Road to access the section of the cable route to the west. Following discussions with ECC Highways, it is proposed to implement temporary traffic signals on Waltham Road which will only hold up mainline traffic when a construction vehicle needs to cross Waltham Road. There are expected to be up to 30 such vehicle crossing movements per day (equivalent to 3-4 crossing movements per hour) which will only hold up traffic momentarily (when construction vehicles cross Waltham Road). Waltham Road will remain free-flowing, with mainline traffic having priority under a green traffic signal, other than when construction vehicles need to cross Waltham Road. Therefore, the temporary traffic signals are not expected to have a material impact on journey times or driver delay along Waltham Road. In terms of the installation of the Grid Connection Route itself across Waltham Road, it is envisaged that this will be dealt with through a lane closure(s) rather than a whole road closure. The exact methodology for implementing the temporary traffic management will be determined by the contractor once appointed and designed to minimise any potential effects as far as possible. Further details will be provided within the detailed CTMPs once further details are known in due course.

13.8.7 The construction area for the Grid Connection Route will be accessed from two locations. The cable route works to the west of Boreham Brook will be accessed via the private road which serves Bulls Lodge Substation. The cable route works to the east of Waltham Road will be accessed from the Solar Farm Site. There will be a single crossing point on Waltham Road to allow vehicles to access the section of cable route to the west of Waltham Road up to the central crossing of Boreham Brook. Construction vehicles will not be permitted to travel along Waltham Road for the purposes of accessing the cable route, they will cross directly over Waltham Road between the works areas east and west of the site. These proposed routing arrangements are illustrated by the plan held in ***Figure 13-3***. Further details of the Grid Connection Route

including the proposed crossing point on Waltham Road are provided within ***Appendix 13B: Framework CTMP*** of the ES **[EN010118/APP/6.2]**.

13.8.8 Following the above, the anticipated impacts for each of the assessment criteria is set out as follows:

Severance

13.8.9 It is anticipated that as a worst case during the peak construction period, there would be up to 50 HGVs per day to/ from the Solar Farm Site representing 100 two-way movements and up to 46 HGVs per day to/ from Bulls Lodge Substation representing 92 two-way movements. In addition, there will be up to 213 cars/ LGVs per day associated with the Solar Farm Site and Bulls Lodge Substation, representing 426 two-way movements.

13.8.10 The following road link receptors have been examined for the assessment of severance:

a. Waltham Road;
b. Cranham Road and Wheelers Hill;
c. B1137 Main Road;
d. A130 ERW;
e. RDR; and
f. Private road to / from Bulls Lodge Substation.

13.8.11 The following PRoW receptors have been examined for the assessment of severance, on the basis that the proposed construction access roads would cross these PRoW within the Solar Farm Site (some requiring temporary PRoW diversion), or the proposed Grid Connection Route would result in a temporary PRoW diversion, and to include PRoW 213_48 which runs along part of the private road to/ from Bulls Lodge Substation (see ***Figure 13-4***):

a. PRoW 113_33 (1 x primary crossing point, 1 x secondary crossing point);
b. PRoW 221_53 (1 x secondary crossing point);
c. PRoW 113_25 (1 x primary crossing point);
d. PRoW 113_30 (1 x primary crossing and 2 x secondary crossing points);
e. PRoW 213_4 (1 x primary crossing point, temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 575m (circa. 75m additional length);
f. PRoW 213_5 (1 x primary crossing point);
g. PRoW 113_32 (2 x primary crossing points and 1 x secondary crossing point, temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 450m (no additional length);
h. PRoW 213_18 (1 x secondary crossing point);

i. PRoW 213_19 (1 x temporary diversion around Grid Connection Route for a length of circa. 20m);

j. PRoW 213_20 (1 x temporary diversion around Grid Connection Route for a length of circa. 30m);

k. PRoW 213_21 (1 x temporary diversion around Grid Connection Route for a length of circa. 45m); and

l. PRoW 213_48 (550m section along the private road to/ from Bulls Lodge substation, to be utilised by construction vehicles, signage proposed).

13.8.12 It should be noted that there will be no PRoW closures. In addition, National Cycle Route 50 and Essex Way have been excluded from the list of receptors on the basis that users of these routes will not be affected by the Scheme during the construction phase (both National Cycle Route 50 and Essex Way fall outside of the Order limits).

13.8.13 Details of receptor sensitivity are set out within **Table 13-12** below.

Table 13-12. Receptor Sensitivity (Severance)

Receptor	*Sensitivity*	*Justification*
Waltham Road	Very Low	Rural setting with no pedestrian / cycle facilities
Cranham Road and Wheelers Hill	Very Low	Rural setting with no pedestrian / cycle facilities
B1137 Main Road	Medium	Main vehicular route in a built-up area with ped / cycle facilities
A130 ERW	Low	Main vehicular route in a built-up area with limited ped / cycle facilities
RDR	Medium	Main vehicular route in a built-up area with ped / cycle facilities
Private road for Bulls Lodge Substation	Low	Rural setting with limited pedestrian / cycle facilities (PRoW 213_48*)
PRoW 113_33	Very Low	Non-trafficked route, with legal minimum width of 2.5m
PRoW 221_53	Low	Non-trafficked route, with legal minimum width of 2.0m
PRoW 113_25	Low	Non-trafficked route, with legal minimum width of 1.5m
PRoW 113_30	Low	Non-trafficked route, with legal minimum width of 2.0m
PRoW 213_4	Low	Non-trafficked route, with legal minimum width of 2.0m
PRoW 213_5	Very Low	Non-trafficked route, with legal minimum width of 3.0m
PRoW 113_32	Very Low	Non-trafficked route, with legal minimum width of 3.0m
PRoW 213_18	Low	Non-trafficked route, with legal minimum width of 2.0m
PRoW 213_19	Very Low	Non-trafficked route, with legal minimum width of 3.0m
PRoW 213_20	Low	Non-trafficked route, with legal minimum width of 1.5m
PRoW 213_21	Very Low	Non-trafficked route, with legal minimum width of 3.0m

*shares a 550m section of the private road to/ from Bulls Lodge Substation

13.8.14 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 impact assessment carried out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, there is expected to be a less than 30% increase in traffic flows across all of the road link receptors within the study area as a result of the Scheme during all periods, including each of the development peak hours of 07:00-08:00 and 18:00-19:00, as well as during each of the traditional network peak hours of 08:00-09:00 and 17:00-18:00, and across the day as a whole.

13.8.15 During the development and network peak hours, there is expected to be a maximum of 20 additional two-way vehicle movements on the private road to/ from Bulls Lodge substation, via the Boreham Interchange and the A12(T) as a result of the Scheme during the construction phase. This equates to a maximum of one additional vehicle movement every three minutes.

13.8.16 As such, the Scheme is expected to result in a very low magnitude of change with respect to severance across all road link receptors during the construction phase. Further details of the anticipated increases in vehicle trips (both in terms of real and proportional traffic flow changes) are set out above and are also detailed within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

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

a. Very Low: Temporary localised diversion around Grid Connection Route and/ or 1 x secondary crossing point;

b. Low: 1 x primary crossing point or 2-3 x secondary crossing points;

c. Medium: Temporary diversion within the Solar Farm Site (alongside construction route) and/ or 2 x primary crossing points or 4-5 x secondary crossing points; and

d. High: 3 or more primary crossing points or 6 or more secondary crossing points.

13.8.18 A summary of the results is set out in **Table 13-13** below.

Table 13-13. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Severance)

Receptor	*Sensitivity*	*Description of Impact*	*Magnitude of Impact*	*Effect Category*	*Significant Effect*
Waltham Road	Very Low	Severance	Very Low	Negligible	No
Cranham Road and Wheelers Hill	Very Low	Severance	Very Low	Negligible	No
B1137 Main Road	Medium	Severance	Very Low	Negligible	No
A130 ERW	Low	Severance	Very Low	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
RDR	Medium	Severance	Very Low	Negligible	No
Private road for Bulls Lodge Station (inc. PRoW 213_48)	Low	Severance	Very Low	Negligible	No
PRoW 113_33	Very Low	Severance	Low	Negligible	No
PRoW 221_53	Low	Severance	Very Low	Negligible	No
PRoW 113_25	Low	Severance	Low	Negligible	No
PRoW 113_30	Low	Severance	Low	Negligible	No
PRoW 213_4	Low	Severance	Medium	Minor	No
PRoW 213_5	Very Low	Severance	Low	Negligible	No
PRoW 113_32	Very Low	Severance	Medium	Negligible	No
PRoW 213_18	Low	Severance	Very Low	Negligible	No
PRoW 213_19	Very Low	Severance	Very Low	Negligible	No
PRoW 213_20	Low	Severance	Very Low	Negligible	No
PRoW 213_21	Very Low	Severance	Very Low	Negligible	No

13.8.19 The results show that the construction phase is not expected to result in any significant impacts with respect to severance, with temporary **minor adverse** effects for PRoW 213_4 and otherwise temporary **negligible** effects for the remaining receptors.

Driver Delay

13.8.20 To inform the assessment of driver delay and as requested by ECC Highways, junction modelling has been carried out as part of the TA for the following:

a. Proposed Solar Farm Site access junction on Waltham Road;

b. Waltham Road/ Cranham Road junction; and

c. B1137 Main Road/ Waltham Road junction.

13.8.21 The following road link receptors have therefore been examined for the assessment of driver delay:

a. Boreham Road (north of Cranham Road);

b. Cranham Road (west of Waltham Road);

c. Waltham Road (south of Cranham Road);

d. Waltham Road (north of site access);

e. Proposed Solar Farm Site Access;

f. Waltham Road (south of site access);

g. Waltham Road (north of B1137 Main Road);

h. B1137 Main Road (east of Waltham Road); and

i. B1137 Main Road (west of Waltham Road).

13.8.22 As set out previously, the Grid Connection Route will require temporary traffic management on Waltham Road for a period of up to 30 weeks. It is proposed to implement temporary traffic signals to accommodate up to 30 vehicle crossing movements per day (equivalent to 3-4 crossing movements per hour) which will only hold up mainline traffic momentarily (when construction vehicles cross Waltham Road). Waltham Road will remain free-flowing with mainline traffic having priority under a green traffic signal other than when construction vehicles need to cross Waltham Road. Therefore, the temporary traffic signals are not expected to have a material impact on driver delay along Waltham Road.

13.8.23 As set out previously, the Scheme is expected to have a negligible impact on driver delay for the remainder of the highway network. This is illustrated by the low percentage increases identified in Tables 13-9 to 13-11 for the strategic highway network.

13.8.24 It should be noted that the individual junction peaks have been examined for the Waltham Road / Cranham Road junction and the B1137 Main Road / Waltham Road junction, as well as for the development peak hours, to provide a worst-case assessment of each of these junctions. Further details are provided within the TA.

13.8.25 Details of receptor sensitivity are set out within **Table 13-14** below, which have been informed by the junction modelling results (worst-case period) for the 2025 baseline scenario, except for the proposed access on Waltham Road which reflects the 2025 baseline + development scenario (given the proposed access would not exist should the Scheme not come forward).

Table 13-14. Receptor Sensitivity (Driver Delay)

Receptor	*Sensitivity*	*Justification (2025 Baseline Scenario)*
Boreham Road	Low	RFC below 90%, max delay of 7 seconds (PM development peak hour, 18:00-19:00)
Cranham Road	Low	RFC below 90%, max delay of 39 seconds (PM junction peak hour, 16:15-17:15)
Waltham Road (south of Cranham Road)	Low	RFC below 90%, no delay expected
Waltham Road (north of Site Access)	Low	RFC below 90%, no delay expected (with development)
Proposed Solar Farm Site Access	Low	RFC below 90%, max delay of 23 seconds (AM development peak hour, 07:00-08:00, with development)
Waltham Road (south of Site Access)	Low	RFC below 90%, max delay of 9 seconds (PM development peak hour, 18:00-19:00, with development)

Receptor	Sensitivity	Justification (2025 Baseline Scenario)
Waltham Road (north of Main Road)	Medium	RFC above 95%, max delay of 209 seconds (AM junction peak hour, 07:45-08:45). However, sensitivity has been categorised as 'Medium' (rather than 'High') as the 2021 traffic count was carried out when temporary works were in place at the Boreham Interchange, resulting in higher traffic flows/ congestion on Waltham Road and the B1137 Main Road. Furthermore, the future baseline traffic flows (2025) are expected to be lower on this part of the network following the completion of the Boreham Interchange improvements and RDR, given that additional capacity will be available on the surrounding highway network.
Main Road (east of Waltham Road)	Low	RFC below 90%, max delay of 19 seconds (AM development peak hour, 07:00-08:00)
Main Road (west of Waltham Road)	Low	RFC below 90%, no delay expected

13.8.26 The magnitude of change with respect to driver delay across the above road link receptors during the construction phase, has been categorised as follows:

a. Very Low: Change in average delay per arriving vehicle is <15 seconds;

b. Low: Change in average delay per arriving vehicle is 15-30 seconds;

c. Medium: Change in average delay per arriving vehicle is 30-60 seconds; and

d. High: Change in average delay per arriving vehicle is > 60 seconds.

13.8.27 A summary of the results is set out in **Table 13-15** below.

Table 13-15. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Driver Delay)

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
Boreham Road	Low	Driver Delay	Very Low	Negligible	No
Cranham Road	Low	Driver Delay	Very Low	Negligible	No
Waltham Road (south of Cranham Road)	Low	Driver Delay	Very Low	Negligible	No
Waltham Road (north of Site Access)	Low	Driver Delay	Very Low	Negligible	No
Proposed Solar Farm Site Access	Low	Driver Delay	Very Low*	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
Waltham Road (south of Site Access)	Low	Driver Delay	Very Low	Negligible	No
Waltham Road (north of Main Road)	Medium	Driver Delay	Medium	Moderate Adverse	Yes
Main Road (east of Waltham Road)	Low	Driver Delay	Very Low	Negligible	No
Main Road (west of Waltham Road)	Low	Driver Delay	Very Low	Negligible	No

*max RFC of 13% during PM development peak hour (18:00-19:00)

13.8.28 The results show that, based on the 2021 survey data at the B1137 Main Road / Waltham Road junction, there is expected to be a significant impact on Waltham Road to the north of the junction with the B1137 Main Road with respect to driver delay during the construction phase, with temporary **moderate adverse** effects. It should however be noted that the Scheme is only expected to result in an additional 16 vehicular trips passing through the B1137 Main Road / Waltham Road junction during each of the network peak hours. This equates to just one additional vehicle every 3-4 minutes, representing a less than 1% increase in traffic flows through this junction when compared to the 2025 future baseline traffic flows, which is not considered to be significant.

13.8.29 In addition, the extent of driver delay at this junction is mainly attributed to baseline conditions (without the Scheme), where the junction was found to be operating over capacity in 2021 when temporary works were being carried out at the Boreham Interchange. As discussed with ECC Highways, there is expected to be a reduction in future baseline traffic flows (2025) on this part of the network following the completion of the Boreham Interchange improvements and RDR, given that additional capacity will be available on the surrounding highway network. This in turn would reduce the sensitivity of B1137 Main Road and Waltham Road to increases in traffic as a result of the Scheme (as reflected in Table **13-15** above).

13.8.30 Notwithstanding the above, additional mitigation has been explored below (see Section 13.9) to address the potential impact of the Scheme on driver delay at the B1137 Main Road / Waltham Road junction.

13.8.31 For the remainder of receptors, the construction phase is not expected to result in any significant impacts with respect to driver delay, with temporary **negligible** effects.

Pedestrian Delay

13.8.32 The road link and PRoW receptors and receptor sensitivities are determined using the same criteria as severance above (see Table 13-11).

13.8.33 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 impact assessment carried out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, and summarised above, there is expected to be a less than 30% hourly and daily increase in traffic flows across all of the links within the study area as a result of the Scheme.

13.8.34 Furthermore, the majority of vehicles will be cars (associated with construction staff) with up to 50 HGVs per day to/ from the Solar Farm Site and up to 46 HGVs per day to/ from Bulls Lodge Substation, with a peak of 15 two-way HGV movements per hour on any given link (excluding the A12(T) and the RDR). 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. It is possible that vehicle speeds may reduce due to additional driver delay (see assessment above) or should any temporary traffic management measures be required to support the Scheme e.g. in the vicinity of the proposed access on Waltham Road.

13.8.35 During the development and network peak hours, there is expected to be up to 20 additional two-way vehicle movements on the RDR and the private road to/ from Bulls Lodge substation, via the Boreham Interchange and the A12(T) as a result of the Scheme during the construction phase. This equates to a maximum of one additional vehicle movement every three minutes.

13.8.36 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 (based on temporary localised diversions, the number/ nature of any vehicle crossing points and for PRoW 213_48 which runs along part of the private road to/ from Bulls Lodge Substation). In view of the above, the Scheme is expected to have a very low magnitude of change with respect to pedestrian delay across the road link receptors during the construction phase.

13.8.37 A summary of the results is set out in **Table 13-16**.

Table 13-16. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Pedestrian Delay)

Receptor	*Sensitivity*	*Description of Impact*	*Magnitude of Impact*	*Effect Category*	*Significant effect*
Waltham Road	Very Low	Pedestrian Delay	Very Low	Negligible	No
Cranham Road and Wheelers Hill	Very Low	Pedestrian Delay	Very Low	Negligible	No
B1137 Main Road	Medium	Pedestrian Delay	Very Low	Negligible	No
A130 ERW	Low	Pedestrian Delay	Very Low	Negligible	No

RDR	Medium	Pedestrian Delay	Very Low	Negligible	No
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Low	Pedestrian Delay	Very Low	Negligible	No
PRoW 113_33	Very Low	Pedestrian Delay	Low	Negligible	No
PRoW 221_53	Low	Pedestrian Delay	Very Low	Negligible	No
PRoW 113_25	Low	Pedestrian Delay	Low	Negligible	No
PRoW 113_30	Low	Pedestrian Delay	Low	Negligible	No
PRoW 213_4	Low	Pedestrian Delay	Medium	Minor	No
PRoW 213_5	Very Low	Pedestrian Delay	Low	Negligible	No
PRoW 113_32	Very Low	Pedestrian Delay	Medium	Negligible	No
PRoW 213_18	Low	Pedestrian Delay	Very Low	Negligible	No
PRoW 213_19	Very Low	Pedestrian Delay	Very Low	Negligible	No
PRoW 213_20	Low	Pedestrian Delay	Very Low	Negligible	No
PRoW 213_21	Very Low	Pedestrian Delay	Very Low	Negligible	No

13.8.38 The construction phase is not expected to result in any significant impacts with respect to pedestrian delay, with temporary **minor adverse** effects for PRoW 213_4 and otherwise temporary **negligible** effects for the remaining receptors.

Pedestrian and Cyclist Amenity

13.8.39 The receptors and receptor sensitivities are determined using the same criteria as severance and pedestrian delay above.

13.8.40 The following PRoW receptors have been examined for the assessment of pedestrian and cyclist amenity for PRoW 213_48 which runs along the private road to/ from Bulls Lodge Substation, as well as areas where the proposed construction route would run parallel (but separate to) the PRoW, cross a PRoW, result in a temporary PRoW diversion, or where the proposed Grid

Connection Route would result in a temporary PRoW diversion (see ***Figure 13-4***):

a. PRoW 113_33 (1 x primary crossing point, 1 x secondary crossing point);

b. PRoW 221_53 (1 x secondary crossing point);

c. PRoW 113_25 (1 x primary crossing point, will run parallel but separate to the primary construction route for circa. 110m);

d. PRoW 113_30 (1 x primary crossing point and 2 x secondary crossing points);

e. PRoW 213_4 (1 x primary crossing point, temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 575m (circa. 75m additional length);

f. PRoW 213_5 (1 x primary crossing point);

g. PRoW 113_32 (2 x primary crossing points, 1 x secondary crossing point, temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 450m (no additional length);

h. PRoW 213_18 (1 x secondary crossing point);

i. PRoW 213_19 (1 x temporary diversion around Grid Connection Route for a length of circa. 20m);

j. PRoW 213_20 (1 x temporary diversion around Grid Connection Route for a length of circa. 30m);

k. PRoW 213_21 (1 x temporary diversion around Grid Connection Route for a length of circa. 45m); and

l. PRoW 213_48 (550m section along the private road to/ from Bulls Lodge substation, to be utilised by construction vehicles, signage proposed).

13.8.41 It should be noted that there will be no PRoW closures. In addition, National Cycle Route 50 and Essex Way have been excluded from the list of receptors on the basis that users of these routes will not be affected by the Scheme during the construction phase (both National Cycle Route 50 and Essex Way fall outside of the Order limits).

13.8.42 The guidance for pedestrian and cyclist amenity 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. As identified within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, 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. This includes the RDR and private road to/ from Bulls Lodge Substation given the limited number of additional trips as identified in earlier sections.

13.8.43 In terms of magnitude of change with respect to pedestrian and cyclist amenity across all PRoW receptors during the construction phase, this has been categorised as follows:

a. Very Low: Temporary diversion around Grid Connection Route and/ or 1 x secondary crossing point

b. Low: 1 x primary crossing point or 2-3 x secondary crossing points or will run parallel to the primary construction route for <500m

c. Medium: Temporary diversion within the Solar Farm Site (alongside construction route) and/ or 2 x primary crossing points or 4-5 x secondary crossing points or will run parallel to the primary construction route (or will be safely managed with construction traffic) for 500-1,000m

d. High: 3 or more primary crossing points or 6 or more secondary crossing points or will run parallel to the primary construction route (or will be safely managed with construction traffic) for >1,000m

13.8.44 A summary of the results is set out in **Table 13-17** below.

Table 13-17. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Pedestrian and Cyclist Amenity)

Receptor	*Sensitivity*	*Description of Impact*	*Magnitude of Impact*	*Effect Category*	*Significant Effect*
Waltham Road	Very Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
Cranham Road and Wheelers Hill	Very Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
B1137 Main Road	Medium	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
A130 ERW	Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
RDR	Medium	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Low	Pedestrian and Cyclist Amenity	Medium	Minor	No
PRoW 113_33	Very Low	Pedestrian and Cyclist Amenity	Low	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
PRoW 221_53	Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
PRoW 113_25	Low	Pedestrian and Cyclist Amenity	Low	Negligible	No
PRoW 113_30	Low	Pedestrian and Cyclist Amenity	Low	Negligible	No
PRoW 213_4	Low	Pedestrian and Cyclist Amenity	Medium	Minor	No
PRoW 213_5	Very Low	Pedestrian and Cyclist Amenity	Low	Negligible	No
PRoW 113_32	Very Low	Pedestrian and Cyclist Amenity	Medium	Negligible	No
PRoW 213_18	Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
PRoW 213_19	Very Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
PRoW 213_20	Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No
PRoW 213_21	Very Low	Pedestrian and Cyclist Amenity	Very Low	Negligible	No

13.8.45 The construction phase is not expected to result in any significant impacts with respect to pedestrian and cyclist amenity, with temporary **minor adverse** effects for PRoW 213_4 and PRoW 213_48 and otherwise temporary **negligible** effects for the remaining receptors.

Fear and Intimidation

13.8.46 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.

13.8.47 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 within the ***Appendix***

13A: Transport Assessment of the ES **[EN010118/APP/6.2]**, there is expected to be a less than 30% hourly and daily increase in traffic flows across all of the links within the study area as a result of the Scheme. The majority of vehicles will be cars (associated with construction staff) with up to 50 HGVs per day to/ from the Solar Farm Site and up to 46 HGVs per day to/ from Bulls Lodge Substation, with a peak of 15 two-way HGV movements per hour on any given link (excluding the A12(T) and the RDR). The Scheme is therefore expected to have a very low magnitude of change with respect to fear and intimidation across all road link receptors during the construction phase. This includes the private road to/ from Bulls Lodge Substation given the limited number of additional trips (no more than 20 vehicle trips for any given hour) as identified in earlier sections.

13.8.48 The magnitude of change with respect to fear and intimidation across the PRoW receptors during the construction phase has been categorised as for pedestrian and cycle amenity above. This takes into consideration any areas where PRoW will be crossed by the construction route, run parallel (but separate to) the construction route, will be managed with construction traffic (i.e. PRoW 213_48) or will be temporarily diverted around the Grid Connection Route.

13.8.49 A summary of the results is set out in **Table 13-18** below.

Table 13-18. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Fear and Intimidation)

Receptor	*Sensitivity*	*Description of Impact*	*Magnitude of Impact*	*Effect Category*	*Significant Effect*
Waltham Road	Very Low	Fear and Intimidation	Very Low	Negligible	No
Cranham Road and Wheelers Hill	Very Low	Fear and Intimidation	Very Low	Negligible	No
B1137 Main Road	Medium	Fear and Intimidation	Very Low	Negligible	No
A130 ERW	Low	Fear and Intimidation	Very Low	Negligible	No
RDR	Medium	Fear and Intimidation	Very Low	Negligible	No
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Low	Fear and Intimidation	Medium	Minor	No
PRoW 113_33	Very Low	Fear and Intimidation	Low	Negligible	No
PRoW 221_53	Low	Fear and Intimidation	Very Low	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
PRoW 113_25	Low	Fear and Intimidation	Low	Negligible	No
PRoW 113_30	Low	Fear and Intimidation	Low	Negligible	No
PRoW 213_4	Low	Fear and Intimidation	Medium	Minor	No
PRoW 213_5	Very Low	Fear and Intimidation	Low	Negligible	No
PRoW 113_32	Very Low	Fear and Intimidation	Medium	Negligible	No
PRoW 213_18	Low	Fear and Intimidation	Very Low	Negligible	No
PRoW 213_19	Very Low	Fear and Intimidation	Very Low	Negligible	No
PRoW 213_20	Low	Fear and Intimidation	Very Low	Negligible	No
PRoW 213_21	Very Low	Fear and Intimidation	Very Low	Negligible	No

13.8.50 The construction phase is not expected to result in any significant impacts with respect to fear and intimidation, with temporary **minor adverse** effects for PRoW 213_4 and PRoW 213_48 and otherwise temporary **negligible** effects for the remaining receptors.

Accidents and Safety

13.8.51 An assessment of accidents and safety has been carried out as part of the TA for the agreed study area (this was agreed with ECC Highways and National Highways, based on the existing highway network). The following receptors have been examined for the assessment of accidents and safety:

a. Waltham Road (south of Cranham Road, within 250m of the proposed Solar Farm Site access);

b. Wheelers Hill and Cranham Road;

c. Remainder of Waltham Road (more than 250m south of the proposed Solar Farm Site access);

d. A12(T) mainline carriageway;

e. Boreham Interchange;

f. A130 ERW and A130 White Hart Lane; and

g. B1137 Main Road.

13.8.52 The Scheme is expected to have a negligible impact on accidents and safety for the remainder of the highway network, including the RDR (there are no existing safety concerns/ issues given this part of the network is not currently operational) and the private road to / from Bulls Lodge Substation (no collision data is available for this part of the network given this is a private road, however, no existing safety concerns/ issues have been identified for this part of the network).

13.8.53 Details of receptor sensitivity are set out within **Table 13-19** below, which have been informed by the collision review carried out as part of the TA and reflect expected conditions during the future baseline scenario (2025) when several highway works/ improvements are expected to have been completed.

Table 13-19. Receptor Sensitivity (Accidents and Safety)

Receptor	*Sensitivity*	*Justification*
Waltham Road (within 250m of Site Access)	Medium	A total of three incidents (all slight) were recorded during the five-year study period. These all involved a single vehicle travelling northbound and a loss of control due to a slippery road surface or debris in the carriageway, resulting in a vehicle leaving the carriageway. The Waltham Road carriageway has however since been resurfaced (in May 2021) and it is considered that this would help to alleviate any concerns given that a 'slippery/ defective road surface' was cited as a contributory factor for each of these incidents. This has therefore been considered as part of the sensitivity level.
Wheelers Hill and Cranham Road	Very Low	Two collisions were recorded during the three-year study period which are not considered to constitute a cluster or pattern.
Waltham Road (>250m of Site Access)	Very Low	Two collisions were recorded during the three-year study period which are not considered to constitute a cluster or pattern.
A12(T) Mainline Carriageway	Very Low	Eight collisions were recorded during the three-year study period. There are not considered to be any collision clusters with fewer than three collisions (i.e. less than one collision per year) at any location. In addition, National Highways is seeking to implement improvements along the section of the A12 to the east of the Boreham Interchange as part of the A12 Chelmsford to A120 widening scheme (due to be completed by 2027).
Boreham Interchange	Medium	A total of 16 collisions were recorded on the A12 slip roads to / from Boreham Interchange or at one of the junction roundabouts during the three-year study period. There appears to be collision clusters at the A12 northbound off-slip, the A12 / A130 / Drovers Way/ Winsford Way roundabout, the A12 / A130 / A138 / Generals Lane roundabout and the A12/ B1137 Main Road roundabout. Of these, there doesn't appear to be a pattern for the collisions which occurred on the A12 northbound off-slip or the A12/ A130/ Drovers Way/ Winsford Way roundabout as these involved separate circumstances / contributory factors. However, the collisions at the A12 / A130 / A138/ Generals Lane roundabout and the A12/ B1137 Main Road roundabout all involved two vehicles on the roundabout itself. It should be noted that improvements are currently being carried out at the Boreham Interchange in support of the Beaulieu Park Development and delivery of the RDR which are due to be

Receptor	Sensitivity	Justification
		completed by spring/ May 2023. Therefore, these improvements have been considered as part of the sensitivity level, given that these improvements will be in place prior to and during the future baseline scenario (2025).
A130 Essex Regiment Way and A130 White Hart Lane	Medium	A total of 21 collisions were recorded during the three-year study period. There appear to be collision clusters at the A130 / Little Waltham Road junction, as well as along the A130 White Hart Lane to the east of the A130 / New Bowers Way roundabout and along the A130 Colchester Road to the east of the A130 / Colchester Road roundabout. It should be noted that the RDR (currently under construction) will provide a connection between the A130 ERW and the Boreham Interchange including via a new bridge over the railway line and A12 northbound on-slip. The existing A130 will be re-classified following the completion of the RDR and there is expected to be a reduction in traffic levels on this part of the network as strategic (non-local) traffic re-routes onto the RDR. These factors have therefore been considered as part of the sensitivity level, given that these works are expected to have been completed prior to the future baseline scenario (2025).
B1137 Main Road	Low	Five collisions were recorded during the three-year study period which occurred at different locations and appear to have involved separate circumstances/ contributory factors. These collisions are not therefore considered to constitute a cluster or pattern.

13.8.54 Based on the construction impact assessment carried out within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**, there is expected to be a less than 30% increase in traffic flows across all of the receptors within the study area as a result of the Scheme during all periods, including each of the development peak hours of 07:00-08:00 and 18:00-19:00, each of the traditional network peak hours of 08:00-09:00 and 17:00-18:00, as well as across the day. In addition, the majority of construction staff and all HGV traffic will travel outside of the network peak hours when the network is generally operating more at ease than under peak hour conditions. 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.

13.8.55 A summary of the results is set out in **Table 13-20** below.

Table 13-20. Summary of Magnitude of Impact and Significance of Effect (Construction Phase, Accidents and Safety)

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
Waltham Road (within 250m of Site Access)	Medium	Accidents and Safety	Very Low	Negligible	No

Receptor	Sensitivity	Description of Impact	Magnitude of Impact	Effect Category	Significant Effect
Wheelers Hill and Cranham Road	Very Low	Accidents and Safety	Very Low	Negligible	No
Waltham Road (>250m of Site Access)	Very Low	Accidents and Safety	Very Low	Negligible	No
A12(T) Mainline Carriageway	Very Low	Accidents and Safety	Very Low	Negligible	No
Boreham Interchange	Medium	Accidents and Safety	Very Low	Negligible	No
A130 Essex Regiment Way and A130 White Hart Lane	Medium	Accidents and Safety	Very Low	Negligible	No
B1137 Main Road	Low	Accidents and Safety	Very Low	Negligible	No

13.8.56 The results show that the construction phase is not expected to result in any significant impacts with respect to accidents and safety, with temporary **negligible** effects.

Operation (2026)

13.8.57 The Scheme is expected to attract a low level of vehicle trips during the operational phase i.e. up to 8 car/ van arrivals and 8 car/ van departures daily based on ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** and a detailed assessment of this scenario has therefore been excluded from this ES, as agreed in the Scoping Opinion ref ID.4.8.1.

13.8.58 Notwithstanding the above, ***Appendix 10G: Glint and Glare Assessment*** of the ES **[EN010118/APP/6.2]**), has been undertaken by Neo Environmental Ltd to consider the potential impacts of the Scheme on various receptors including the surrounding highway network. A 1km survey area was selected around the Order limits which included a total of 80 road receptors and eight rail receptors. Of these, 24 road receptors and five rail receptors were located within the no reflection zone and therefore discounted, whereas geometric analysis was conducted for the remaining 56 road receptors and three rail receptors which included the following roads:

a. A12(T);
b. Leighs Road;
c. Boreham Road;
d. Cranham Road;
e. Terling Hall Road; and
f. Waltham Road.

13.8.59 The assessment identified solar reflections to be theoretically possible for 53 of the 56 road receptors within the study area. However, upon further review, no actual glint and glare impact was identified for 45 of these receptors, whereas a potential impact was identified for the remaining eight receptors. Measures were therefore explored (e.g. planting of hedgerows, maintained to a height of at least 3m in order to conceal the solar reflections) to mitigate the overall impacts for these eight road receptors. This is incorporated into the Outline Landscape Environmental Management Plan of the ES **[EN010118/APP/7.13]**).

13.8.60 For the rail receptors, the assessment identified solar reflections to be theoretically possible for two of the three rail receptors within the study area. However, upon further review, existing verges were found to be sufficient to screen all views of the Scheme from these two receptors and no impacts were therefore identified.

13.8.61 In view of the above, it is considered that the overall glint and glare impacts of the Scheme will be **negligible** for the surrounding highway and rail networks with the proposed mitigation in place where required. Further details of the results are contained within ***Appendix 10G: Glint and Glare Assessment*** of the ES **[EN010118/APP/6.2]**.

Decommissioning (not earlier than 2066)

13.8.62 As set out previously, for the purposes of the EIA, the decommissioning assessment year is assumed to be no earlier than 2066. The decommissioning period is expected to be similar in duration and nature to the construction phase, albeit slightly shorter duration and fewer vehicle trips. It is therefore considered reasonable to assume that the impacts will be the same as, and not greater than, the construction phase. This may overestimate the actual impacts slightly but is considered to be broadly accurate. In addition, this scenario is considered to be too far into the future to be able to accurately predict future baseline traffic flows or junction forms at that time.

13.8.63 It should be noted that the above approach is consistent with ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** as well as the PEI Report which was submitted in May 2021.

13.9 Additional Monitoring, Mitigation and Enhancement Measures

Construction and Decommissioning

13.9.1 The following additional mitigation and enhancement measures are proposed for the construction and decommissioning phases to mitigate against the significant adverse effect identified for driver delay on Waltham Road (see Table 13-15):

a. Utilise the Chelmer Valley Park and Ride (P&R) site for construction worker parking during the peak construction (and decommissioning) periods of the Scheme, to reduce construction vehicle worker trips on the surrounding network including at the B1137 Main Road/ Waltham Road junction; and

13.9.2 The above measure has been explored in further detail below:

Chelmer Valley P&R

13.9.3 A meeting was held with ECC on 5 August 2021 to understand the potential viability of using the currently underutilised Chelmer Valley P&R site for construction worker parking during the construction period of the Scheme.

13.9.4 The key purpose of the meeting was to, subject to viability, understand the number of spaces which could be made available, the potential arrangements for worker shuttle services and the mechanism for securing these arrangements.

13.9.5 The following key points were discussed/ confirmed during the meeting:

a. ECC confirmed that it would be possible to utilise 200 spaces at the Chelmer Valley P&R if required during the construction phase. There is an overall capacity of circa. 1,000 spaces at Chelmer Valley P&R which was only around 50% utilised prior to COVID-19 pandemic/ restrictions;

b. The spaces could be utilised at a cost of £3.60 per space per day, and a discount would potentially be available for utilising a certain number of spaces (e.g. 50+ spaces) for a certain period (e.g. one month);

c. The arrangements could be flexible by utilising a greater number of spaces during the peak construction period and fewer spaces during quieter periods;

d. ECC has their own fleet of minibuses and could provide a service to transport workers between the P&R and the Solar Farm Site if required. Alternatively, a private shuttle service could be operated by the developer which would be easier to control in terms of service frequency and flexibility;

e. The proposed working hours at the Scheme during the summer construction phase (Monday-Friday 07:00-19:00) and winter construction phase (Monday-Friday 08:00-18:00) align with the opening hours of the P&R (open from 06:30 until 20:00 during the week). It is understood that the P&R opening hours could be extended to support the scheme if required;

f. The use of the P&R would offer a sustainable travel option for construction workers arriving to Chelmsford by rail, who could then use an existing P&R service to travel to/ from the Chelmer Valley P&R and then the Order limits via private shuttle;

g. The use of the P&R would reduce construction worker vehicle trips on local roads and is easily accessible with good connections to the SRN; and

h. The use of parking at the P&R would reduce the number of parking spaces required on the Solar Farm Site for construction workers, albeit a certain number of spaces would nonetheless need to be provided for operational reasons.

13.9.6 As identified within Table 13-3, a total of 143 construction worker vehicles are expected to travel to/ from the Solar Farm Site during the peak construction phase. There is therefore the potential to reduce construction worker vehicle trips by around 70% on the local highway network in the instance that 100 spaces are utilised within the P&R. This would have particular benefits at the

B1137 Main Road/ Waltham Road junction and along Wheelers Hill, Cranham Road and Waltham Road. The Scheme (construction phase) would only be expected to result in an additional five vehicular trips passing through the B1137 Main Road / Waltham Road junction during each of the network peak hours, with this mitigation in place.

13.9.7 In view of the above, the forecast magnitude of effect for Driver Delay has been reduced from 'Medium' to 'Very Low' for Waltham Road (north of Main Road) with this additional mitigation in place. The forecast magnitudes of effect remain unchanged for the remainder of the highway network and assessment criteria.

Additional Measures

13.9.8 The following additional mitigation and enhancement measures are proposed for the construction and decommissioning phases to provide added benefits rather than to resolve any adverse impacts:

a. Cut back vegetation at the Waltham Road / Cranham Road junction (within the highway boundary) to maximise visibility at this junction.

b. Conduct a Stage 1 Road Safety Audit on the preliminary design of access and crossing points and proposed carriageway widening post-submission (to be secured as part of the detailed CTMPs).

13.9.9 Further details of these are provided below.

Waltham Road/ Cranham Road junction

13.9.10 To further mitigate any potential road safety or capacity concerns at this junction, it is recommended that vegetation is cut back/ maintained at the Waltham Road/ Cranham Road junction (both within the highway boundary and the Order limits) throughout the construction and decommissioning phases to maximise visibility at this junction. This will benefit both existing vehicles as well as those associated with the Scheme, including HGVs, following the agreed routing strategy.

13.9.11 It is not anticipated that this would change the significance of effect assessed above for the Scheme.

Stage 1 Road Safety Audit

13.9.12 The preliminary design of the proposed Solar Farm Site access, Waltham Road crossing point (for the construction of the Grid Connection Route), proposed carriageway widening (on Wheelers Hill, Cranham Road and Waltham Road) and the proposed Noakes Lane crossing points will be subject to a Stage 1 Road Safety Audit post-submission (and 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 detailed design.

Operation

13.9.13 No additional mitigation and enhancement measures are proposed for the operation phase, above the embedded measures set out in Section 13.7, given that there are not expected to be any significant effects as a result of the Scheme.

Monitoring

13.9.14 The following monitoring will be carried out during the construction and decommissioning phases of the Scheme, and secured as part of the Framework CTMP, Outline PRoW MP, Outline CEMP or detailed CTMPs or DTMP when these are prepared in due course:

a. The collision record of Waltham Road will be monitored within the vicinity of the Solar Farm Site access including a 250m stretch to the southeast of the access and the 125m section to the northwest of the access up to the junction with Cranham Road;

b. Construction vehicles (HGVs) will be monitored to ensure HGV drivers are adhering to the agreed routing strategy (see ***Figure 13-3***), with all HGVs to turn left in and right out of the Solar Farm Site access on Waltham Road;

c. Road safety will be monitored within the Order limits including at the PRoW crossing points, temporary PRoW diversion points, and at the Noakes Lane crossing points; and

d. The TTM on Waltham Road will be monitored when this is required for the installation of the Grid Connection Route.

13.10 Residual Effects

13.10.1 This section summarises the residual significant effects of the Scheme on transport and access.

13.10.2 Significant residual effects are defined as either moderate or major, and **Table 13-21** summarises the residual effects for both construction and decommissioning. The operational phase effects are clearly negligible and were therefore not subject to assessment.

Table 13-21. Summary of Residual Effects (Construction and Decommissioning)

Receptor	*Description of impact*	*Significance of effect without additional mitigation*	*Additional Mitigation/Enhancement measure*	*Residual effect after additional mitigation*
Waltham Road	Severance	**Negligible**	None required	**Negligible**
Cranham Road and Wheelers Hill	Severance	**Negligible**	None required	**Negligible**
B1137 Main Road	Severance	**Negligible**	None required	**Negligible**
A130 ERW	Severance	**Negligible**	None required	**Negligible**
RDR	Severance	**Negligible**	None required	**Negligible**
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Severance	**Negligible**	None required	**Negligible**
PRoW 113_33	Severance	**Negligible**	None required	**Negligible**
PRoW 221_53	Severance	**Negligible**	None required	**Negligible**
PRoW 113_25	Severance	**Negligible**	None required	**Negligible**
PRoW 113_30	Severance	**Negligible**	None required	**Negligible**
PRoW 213_4	Severance	**Negligible**	None required	**Negligible**
PRoW 213_5	Severance	**Negligible**	None required	**Negligible**
PRoW 113_32	Severance	**Negligible**	None required	**Negligible**

Receptor	*Description of impact*	*Significance of effect without additional mitigation*	*Additional Mitigation/Enhancement measure*	*Residual effect after additional mitigation*
PRoW 213_18	Severance	**Negligible**	None required	**Negligible**
PRoW 213_19	Severance	**Negligible**	None required	**Negligible**
PRoW 213_20	Severance	**Negligible**	None required	**Negligible**
PRoW 213_21	Severance	**Negligible**	None required	**Negligible**
Boreham Road	Driver Delay	**Negligible**	None required	**Negligible**
Cranham Road	Driver Delay	**Negligible**	Local off-site highway improvements Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road (south of Cranham Road)	Driver Delay	**Negligible**	Local off-site highway improvements Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road (north of Site Access)	Driver Delay	**Negligible**	Local off-site highway improvements Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Proposed Solar Farm Site Access	Driver Delay	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road (south of Site Access)	Driver Delay	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road (north of Main Road)	Driver Delay	**Moderate Adverse**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**

Receptor	Description of impact	Significance of effect without additional mitigation	Additional Mitigation/Enhancement measure	Residual effect after additional mitigation
Main Road (east of Waltham Road)	Driver Delay	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Main Road (west of Waltham Road)	Driver Delay	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road	Pedestrian Delay	**Negligible**	None required	**Negligible**
Cranham Road and Wheelers Hill	Pedestrian Delay	**Negligible**	None required	**Negligible**
B1137 Main Road	Pedestrian Delay	**Negligible**	None required	**Negligible**
A130 ERW	Pedestrian Delay	**Negligible**	None required	**Negligible**
RDR	Pedestrian Delay	**Negligible**	None required	**Negligible**
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 113_33	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 221_53	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 113_25	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 113_30	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_4	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_5	Pedestrian Delay	**Negligible**	None required	**Negligible**

Receptor	*Description of impact*	*Significance of effect without additional mitigation*	*Additional Mitigation/Enhancement measure*	*Residual effect after additional mitigation*
PRoW 113_32	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_18	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_19	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_20	Pedestrian Delay	**Negligible**	None required	**Negligible**
PRoW 213_21	Pedestrian Delay	**Negligible**	None required	**Negligible**
Waltham Road	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
Cranham Road and Wheelers Hill	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
B1137 Main Road	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
A130 ERW	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
RDR	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 113_33	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**

Receptor	*Description of impact*	*Significance of effect without additional mitigation*	*Additional Mitigation/Enhancement measure*	*Residual effect after additional mitigation*
PRoW 221_53	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 113_25	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 113_30	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_4	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_5	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 113_32	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_18	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_19	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_20	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
PRoW 213_21	Pedestrian and Cyclist Amenity	**Negligible**	None required	**Negligible**
Waltham Road	Fear and Intimidation	**Negligible**	None required	**Negligible**

Receptor	Description of impact	Significance of effect without additional mitigation	Additional Mitigation/Enhancement measure	Residual effect after additional mitigation
Cranham Road and Wheelers Hill	Fear and Intimidation	**Negligible**	None required	**Negligible**
B1137 Main Road	Fear and Intimidation	**Negligible**	None required	**Negligible**
A130 ERW	Fear and Intimidation	**Negligible**	None required	**Negligible**
RDR	Fear and Intimidation	**Negligible**	None required	**Negligible**
Private road for Bulls Lodge Substation (inc. PRoW 213_48)	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 113_33	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 221_53	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 113_25	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 113_30	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 213_4	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 213_5	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 113_32	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 213_18	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 213_19	Fear and Intimidation	**Negligible**	None required	**Negligible**
PRoW 213_20	Fear and Intimidation	**Negligible**	None required	**Negligible**

Receptor	*Description of impact*	*Significance of effect without additional mitigation*	*Additional Mitigation/Enhancement measure*	*Residual effect after additional mitigation*
PRoW 213_21	Fear and Intimidation	**Negligible**	None required	**Negligible**
Waltham Road (within 250m of Site Access)	Accidents and Safety	**Negligible**	Local off-site highway improvements Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Wheelers Hill and Cranham Road	Accidents and Safety	**Negligible**	Local off-site highway improvements Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
Waltham Road (>250m of Site Access)	Accidents and Safety	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**
A12(T) Mainline Carriageway	Accidents and Safety	**Negligible**	None required	**Negligible**
Boreham Interchange	Accidents and Safety	**Negligible**	None required	**Negligible**
A130 Essex Regiment Way and A130 White Hart Lane	Accidents and Safety	**Negligible**	None required	**Negligible**
B1137 Main Road	Accidents and Safety	**Negligible**	Use of parking within Chelmer Valley P&R for construction workers	**Negligible**

13.10.3 The above shows that there are not expected to be any significant residual effects as a result of the Scheme.

13.10.4 This is supported by the following findings as set out earlier within Section 13.5:

a. The total traffic flows (with the Scheme) during the AM development peak hour (07:00-08:00) are expected to fall below the future baseline traffic flows (without the scheme) during the AM network peak hour (08:00-09:00) for Waltham Road and the B1137 Main Road; and

b. The total traffic flows (with the Scheme) during the PM development peak hour (18:00-19:00) are expected to fall below the future baseline traffic flows (without the scheme) during the PM network peak hour (17:00-18:00) across the entire study area.

13.11 Cumulative Effects

Introduction

13.11.1 The cumulative schemes for consideration have been agreed in consultation with ECC and National Highways.

13.11.2 The following highway improvement schemes are due to be completed ahead of the construction phase and are therefore considered to form part of the future baseline (2025) situation:

a. Boreham Interchange Improvements;

b. RDR; and

c. Phase 1 of the Chelmsford North East Bypass (CNEB).

13.11.3 The following highway improvement schemes are expected to be completed after or during the construction phase and are therefore considered to represent a cumulative scheme:

a. A12 Chelmsford to A120 Widening Scheme;

b. CNEB Phase 2; and

c. Outer Radial Distributor Road (RDR2).

13.11.4 Several of the highway improvements identified above in relation to the Order limits' indicative location are illustrated in Plate 13-3 below.

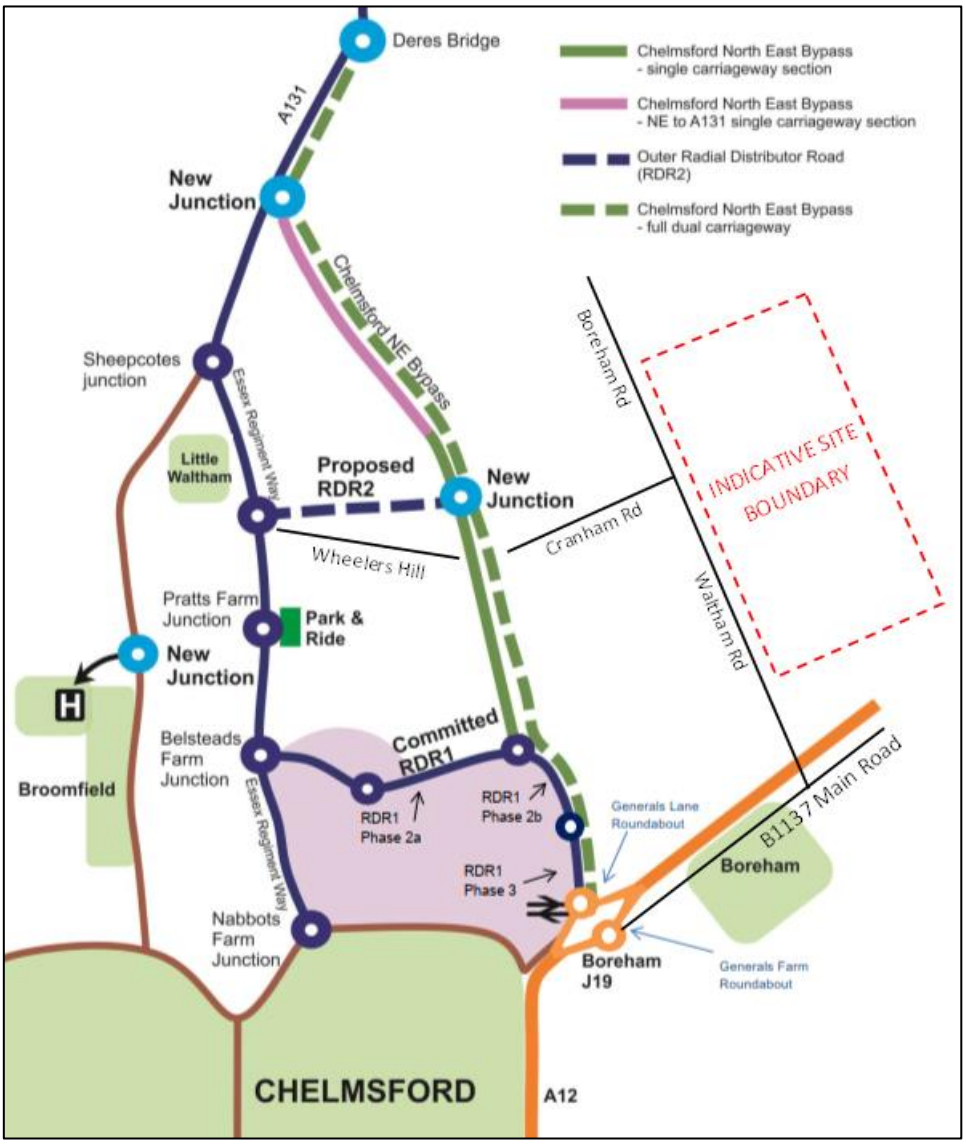

Plate 13-3. Highway Improvement Works in the vicinity of A12 Junction 19
Source: Chelmsford Local Plan, Statement of Common Ground 22 (November 2018) (Ref. 13.14)

13.11.5 Furthermore, there are a number of committed developments (with planning permission) within the area which have been considered as cumulative schemes including the Chelmsford Garden Community and a development on land to the north of Cranham Road.

13.11.6 A summary of the highway improvement schemes which are expected to be incorporated as part of the future baseline situation is set out below.

Future Baseline

Boreham Interchange Improvements and the RDR

13.11.7 The highway network during the construction phase will be different from current, having incorporated several changes as a result of ongoing highway schemes including the Boreham Interchange improvements, the RDR and the removal of the Generals Lane overbridge. The Boreham Interchange improvements and delivery of the RDR will allow development traffic to bypass parts of the A130 including White Hart Lane and improve the links to the Order limits from the strategic network. The following improvements are planned to

be delivered by spring/ May 2023 and are therefore expected to be in place prior to the construction phase for Longfield Solar Farm:

a. Completion of the RDR from A130 ERW to Boreham Interchange including a new bridge over the railway line and A12 northbound on-slip (currently under construction);

b. Construction of a new fully signalised Generals Lane roundabout, which includes for a new arm for the RDR;

c. The provision of a cut-through lane on the Generals Farm roundabout from the A12 southbound on-slip for traffic travelling towards Chelmsford and the A130 / A131;

d. Partially signalising the Drovers Way roundabout, with signals on the A12 northbound off-slip;

e. Improvements to the footway / cycleway that runs on the south side of the interchange which forms the route to Chelmsford; and

f. Provision of an improved route along the north side of the interchange to allow residents of Boreham to walk and cycle to the new station.

13.11.8 The existing access arrangements for Bulls Lodge Substation are due to change as a result of above:

a. The Generals Lane connection with the Boreham Interchange and A12(T) overbridge will be demolished as part of the works at the Boreham Interchange; and

b. The RDR will be completed, including the connection with the Boreham Interchange as well as the new roundabout with the private road to / from Bulls Lodge Substation.

Chelmsford North East Bypass (CNEB) (Phase 1)

13.11.9 The CNEB will provide an 8km bypass between the A12(T) and the current A131, which will ultimately extend through the Chelmsford Garden Community, whilst tying in with National Highways' proposed improvements to Junction 19 (Boreham Interchange) of the A12(T) which will be delivered as part of the A12 Chelmsford to A120 Widening Scheme.

13.11.10 The construction of the CNEB is set to start in early 2023 with Phase 1 planned to open in late 2024. It should be noted that the bypass will not provide a direct connection with Cranham Road, as an overbridge will be provided at this location. However, the delivery of the RDR will allow development traffic to bypass parts of the A130 including White Hart Lane, improving links to the Order limits from the SRN.

13.11.11 As set out above, the CNEB (Phase 1) will change the alignment of Cranham Road to accommodate the bypass and the provision of a combined Cranham Road/ Drakes Lanes overbridge. The new structure will be constructed offline to keep Cranham Road open for as long as possible. However, Cranham Road may need to be temporarily closed to permit the tie-in of this existing route with the new approaches to the overbridge (this cannot be confirmed at this stage however). Therefore, depending on the nature/ duration/ programme of the above closure (if required), an alternative route may need to be temporarily followed by construction vehicles travelling to/

from the Solar Farm Site which will be agreed with ECC Highways. Alternatively, it may be possible to reschedule HGVs to avoid any periods where there may be a closure. Further details will be provided as part of the Detailed CTMP for the Solar Farm Site once further details are known.

13.11.12 At this stage, it is expected that should a temporary diversion route be required, then this would be via the B1137 Main Road and Waltham Road as discussed with ECC Highways. There will be a maximum of 50 daily HGVs (100 two-way movements) associated with the Solar Farm Site. This would represent a 1.2% increase in daily traffic levels along the B1137 Main Road (see Table 13-10 for 2025 baseline flows) and a 1.2% increase in daily traffic levels along Waltham Road north of Main Road (see Table 13-10 for 2025 baseline flows) in the instance that these HGVs are temporarily diverted via the B1137 Main Road and Waltham Road due to a closure on Cranham Road. Both B1137 Main Road and Waltham Road currently accommodate and are therefore suitable for accommodating HGVs. Therefore, these temporary increases are considered to be immaterial and are not expected to result in any significant effects.

Cumulative Schemes

A12 Chelmsford to A120 Widening Scheme

13.11.13 The proposed A12 Chelmsford to A120 Widening Scheme comprises National Highways' plans to widen the section of the A12 between Chelmsford (Junction 19, Boreham Interchange) and the interchange with the A120 (Junction 25). The preferred route of the A12 widening in the vicinity of the Order limits is predominantly on-line (i.e. upgrading of existing carriageway) and comprises improvements to Junction 19 (Boreham Interchange) and the replacement of the existing Junction 20A and Junction 20B with a new Junction 21 to the east of Hatfield Peverel. The project is anticipated to commence construction in 2025, with completion estimated for 2027. The proposed A12 Chelmsford to A120 Widening Scheme will be supported by a CTMP.

Chelmsford Garden Community and Supporting Improvements

13.11.14 The new Chelmsford Garden Community is allocated in the Chelmsford Local Plan to the south-west of the Solar Farm Site, which will provide approximately 10,000 new homes and significant new employment. A new railway station (Beaulieu station) will also be delivered (set to be completed by 2025 / 2026), along with the future Chelmsford North East Bypass (CNEB); this is an 8km bypass between the A12(T) and the current A131, providing a connection with Boreham via a new link road, bridge and roundabout. It is understood that the following will also be delivered, as illustrated on Plate 13-3:

a. RDR from A130 ERW to Boreham Interchange including a new bridge over the railway line and A12 northbound on-slip (currently under construction); and

b. RDR2 which is included in the Chelmsford Local Plan for access to Chelmsford Garden Community, including a connection to the CNEB and the reconfiguration of the ERW / Wheelers Hill roundabout, as well as an amended link to Cranham Road.

Development on Land North of Cranham Road

13.11.15 Planning consent (16/01394/OUT) has been granted (at appeal) for a new flour and feed mill including storage, alterations to access, parking, landscaping and associated ancillary development on land to the north of Cranham Road, approximately 500m to the west of Waltham Road. The majority of vehicles associated with the development are expected to travel to / from the A130 to the west, to minimise the routing of HGVs through Boreham via the Boreham Interchange. To support the above, the corridor between the A130 and the development site was proposed to be widened by widening the road surface, verge clearance and hedge cutting along Wheelers Hill and Cranham Road. It should be noted that these improvements will be carried out in support of Longfield Solar Farm in the instance that this comes forward first.

13.11.16 It is anticipated that the Land North of Cranham Road development would take around 10 years to reach full operation, as operations are transferred from the current site in Chelmsford. The development has not yet commenced.

13.11.17 The future baseline scenario (2025) includes operational traffic associated with the Land North of Cranham Road committed development. Further details are contained within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Additional Cumulative Schemes

13.11.18 Several additional cumulative schemes have been reviewed from a transport and access perspective within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]** including the following:

a. Beaulieu Station Hub (19/01722/SCOPE);
b. Bulls Lodge Quarry (CHL/1890/87 and ESS/147/20/CHL);
c. Sheepcotes Farm Quarry (ESS/01/18/CHL);
d. North East Chelmsford urban extension (Beaulieu and Channels);
e. Land East of Plantation Road, Boreham (18/00682/MAT/1);
f. RDR Phase 3 (17/02165/OUT);
g. The Chelmsford Civic Amenity and Recycling Centre (ESS/42/11/CHL);
h. The Chelmsford Waste Transfer Station (ESS/19/20/CHL);
i. The Dunmow Waste Management site (ESS/17/17/CHL);
j. The Springfield Highways Depot (CC/CHL/01/17);
k. The Essex Regiment Way Stone Plant (08/00372/ FUL); and
l. Willows Green Solar Farm (UTT/22/0007/FUL).

13.11.19 Following the review of each of the above schemes, additional vehicle trips have been included on the surrounding highway network during the future baseline scenario (2025) where necessary. It should be noted that the remaining cumulative schemes identified for consideration as part of the ES have been excluded as these are either far removed from the study area or have yet to be consented (and are therefore not committed). Further details are provided within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Timescales

13.11.20 A summary of the anticipated timeframes for the main committed developments / schemes is set out within **Table 13-22** below.

Table 13-22. Committed Developments / Scheme Summary

Committed Development / Scheme	*Anticipated Date of Completion*
Boreham Interchange Improvements	Spring 2023
RDR	May 2023
CNEB (Phase 1)	Late 2024
Beaulieu Station	2025/ 2026
A12 Chelmsford to A120 Widening Scheme	2027
RDR2	2036
CNEB (Phase 2)	Post-2036
Chelmsford Garden Community	2044

13.11.21 The main construction phase for the Order limits is assessed as commencing during the first quarter of 2024 and to be completed during the first quarter of 2026. The above highway improvement schemes and cumulative schemes have therefore been considered as follows:

a. The RDR and associated Boreham Interchange improvements (which are currently under construction) are due to be complete prior to the construction phase of the project. As such, the proposed HGV routing strategy utilises the Boreham Interchange and RDR where appropriate.

b. The CNEB (Phase 1) will be under construction during the early part of the proposed construction period and is due to be complete in peak construction phase (2025). Vehicles travelling to/ from the Solar Farm Site will utilise the Cranham Road/ Drakes Lanes overbridge once this has been completed.

c. Beaulieu railway station, RDR2 and the A12 Chelmsford to 120 Widening Scheme will be under construction and therefore not in place to support the construction phase of the Scheme. Nonetheless, these committed schemes will be in place to support the operational and decommissioning phases of the Scheme.

d. The CNEB (Phase 2) and Chelmsford Garden Community are not expected to affect the proposed construction phase and will be completed during the operational phase of the project. The assessment of the construction phase therefore excludes these committed schemes/ developments.

e. The timeframes for the development on land to the north of Cranham Road are currently unknown. Nonetheless, the forecast operational

trips have been included on the network to provide a robust assessment of cumulative traffic movements during the construction phase. In terms of the proposed carriageway widening improvements on Wheelers Hill and Cranham Road, it is assumed that these would be implemented as part of Longfield Solar Farm.

13.11.22 Further details are contained within ***Appendix 13A: Transport Assessment*** of the ES **[EN010118/APP/6.2]**.

Potential Effects

13.11.23 It is anticipated that any cumulative effects arising from other developments would be focussed around the SRN, including the A12(T), Boreham Interchange and the A130. Given the proposed construction phase of the Scheme is expected to result in limited traffic increases on these parts of the network (see Table 13-9), it is expected that there would be no additional cumulative effects on these parts of the highway network additional to those already identified for the Scheme in isolation.

13.11.24 In terms of Bulls Lodge Substation, there is expected to be a maximum of 20 additional two-way vehicle movements on the RDR and the private road to/ from Bulls Lodge Substation, via the Boreham Interchange and the A12(T) as a result of the Bulls Lodge Substation extension during the construction phase. This equates to a maximum of one additional vehicle movement every three minutes. The construction of the Bulls Lodge Substation extension is not expected to have an adverse impact on any of the cumulative schemes listed above including Bulls Lodge Quarry.

13.11.25 The future baseline scenario (2025) includes operational traffic associated with the Land North of Cranham Road committed development. Therefore, the cumulative effects arising from this development and the Scheme have been considered as part of this ES.

13.11.26 In addition, the highway improvements to be implemented in support of the Chelmsford Garden Community as well as National Highways' A12 Chelmsford to A120 Widening Scheme are set to benefit the Scheme, by improving the surrounding highway network and offering alternative routes and / or additional capacity. As above, the RDR and Boreham Interchange improvements are currently under construction and have been incorporated as part of the future baseline (2025) situation as agreed with ECC Highways.

Summary

13.11.27 In conclusion, no cumulative impacts upon the highway network are envisaged based on the assessment in the ES. The cumulative effects are therefore expected to remain negligible.

13.11.28 In addition, the conclusions of this ES are considered to remain valid in the instance that there is a delay to the start of the construction phase of up to 5 years. For example, road improvement schemes in the cumulative assessments (e.g. A12 Chelmsford to A120 Widening Scheme and Phase 1 of the CNEB including the Cranham Road/ Drakes Lane overbridge) may have already been completed by the time the Scheme construction begins which would result in a better future baseline than that assessed. In addition, 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.

13.12 References

Ref. 13.1 Department of Energy and Climate Change (DECC) (2011) National Policy Statement for Energy (EN-1).
Ref. 13.2 DECC (2011) National Policy Statement for Renewable Energy Infrastructure (EN-3).
Ref. 13.3 Ministry of Housing, Communities and Local Government (MHCLG) (2021) National Planning Policy Framework (NPPF).
Ref. 13.4 MHCLG (2014) Planning Practice Guidance: Travel plans transport assessments and statements.
Ref. 13.5 Essex County Council (ECC) (2011) Essex Transport Strategy: The Local Transport Plan for Essex.
Ref. 13.6 ECC (2011) Development Management Policies.
Ref. 13.7 Chelmsford City Council (CCC) (2020) Chelmsford Local Plan 2013-2036.
Ref. 13.8 Braintree District Council (BDC) (2005) Local Plan Review.
Ref. 13.9 BDC (2011) Local Development Framework: Core Strategy.
Ref. 13.10 BDC (2017) Publication Draft Local Plan.
Ref. 13.11 Institute of Environmental Management and Assessment (IEMA) (1993) Guidelines for Environmental Assessment of Road Traffic. Lincoln: IEMA.
Ref. 13.12 Mott MacDonald (2016) Site Construction and Material Assessment PDD-31253-CIV-009.
Ref. 13.13 ECC (2021) PRoW Interactive Map
Ref. 13.14 CCC (2018) Chelmsford Local Plan, Statement of Common Ground (SoCG) 22 with Highways England[2], Essex County Council and Chelmsford City Council.

[2] Highways England is now referred to as National Highways.