14 TRAFFIC AND TRANSPORT

14.1 INTRODUCTION

This Chapter of the Environmental Statement (ES) reports the outcome of the assessment of likely significant environmental effects, arising from the proposed Retford Circular Economy Project (the 'Proposed Development') on traffic and transportation.

The Proposed Development would involve the extraction and export of up to around 300,000 tonnes of pulverised fuel ash (PFA) per annum, for up to around 25 years. The extraction would be undertaken in phases and as such is likely to progressively increase up to full production over the first few years. Vehicle associated with the Proposed Development would primarily consist of heavy goods vehicles (HGV), light goods vehicles (LGV) and cars.

The 'Site' for the Proposed Development is located approximately 400m south of Lound, approximately 380m southwest of Sutton-cum-Lound, and 670m northwest of Retford (the 'Site').

This Chapter of the ES is supported by Technical **Appendix A14.1: Transport Statement** provided in **Volume 3: Technical Appendices**.

This Chapter includes the following elements:

- Legislation, Policy and Guidance;
- Assessment Methodology;
- Baseline Conditions;
- Assessment of Potential Effects;
- Mitigation;
- Cumulative Effect Assessment; and
- Conclusions

14.2 LEGISLATION, POLICY AND GUIDANCE

The following guidance, legislation and information sources have been considered in carrying out this assessment.

14.2.1 Legislation

The following legislation documents are of particular relevance to the assessment:

- The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017[1] (SI 2017/571).

14.2.2 Policy and Guidance

The following policy and guidance documents are of particular relevance to the assessment:

- Planning Practice Guidance on Travel Plan, Transport Assessment and Statements[2] (Ministry of Housing, Communities & Local Government, 2014);
- Department for Transport Circular 02/2013[3]: The Strategic Road Network and the Delivery of Sustainable Development;

[1] The Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2017. Available at: http://www.legislation.gov.uk/uksi/2017/571/contents/made. Accessed on 23/01/2023.
[2] https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements. Accessed on 23/01/23
[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/237412/dft-circular-strategic-road.pdf. Accessed on 23/01/23

- Institute of Environmental Management and Assessment ("IEMA 1993") Guidelines for the Environmental Assessment of Road Traffic[4]; and
- National Planning Policy Framework (NPPF 2021)[5].

14.3 CONSULTATION

Consultation was undertaken with statutory consultees to inform this chapter via a formal Scoping Opinion and **Table 14.1** below presents an excerpt from the scoping responses received in relation to traffic and transport and how each response has been or would be addressed by the Proposed Development.

Table 14.1: Consultation Responses

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
Nottinghamshire County Council (Highways Authority)	Scoping Response 04/11/2022	A Transport Statement rather than a Transport Assessment would be sufficient to support the Proposed Development, however this must include a detailed assessment of lorry movements and routing for both the construction and main operation of the Site.	This is included as Technical Appendix 14.1 of the ES.
		Use of Chainbridge Lane to access the Temporary Processing Site.	This is no longer the case. The sole access to serve the Proposed Development is the existing A638 North Road / Bellmoor Industrial Estate site access. Once the Main Processing Site is operational all staff, delivery, collection and visitor traffic would access the Proposed Development through Bellmoor Industrial Estate. This would be mandated via the Operational Traffic Management Plan (OTMP) and Staff Travel Plan which would include appropriate control measures and procedures during any foreseen and unforeseen temporary closures of the A638 over its operational lifetime

[4] Institute of Environmental Management and Assessment (1993). Guidelines for the Environmental Assessment of Road Traffic.
[5] https://www.gov.uk/government/publications/national-planning-policy-framework--2. Accessed on 23/01/2023

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
		The transport chapter will need to assess the suitability of utilising the Bellmoor Industrial Estate site access onto the A638 North Road, in terms of capacity -including sharing this with other commercial traffic and visitor traffic to the Idle Valley nature reserve- and geometry and visibility.	This is addressed in Technical Appendix 14.1 of the ES. Visibility Splay and Swept Path Analysis are contained in Appendix C and D of the Transport Statement.
		Transport Statement will need to consider sustainable transport options of employees and contractors	This is addressed in Technical Appendix 14.1 of the ES.

14.4 BASIS OF ASSESSMENT

14.4.1 Operation

The following elements were considered to have the potential to give rise to likely significant effects during the operational phase (including maintenance) of the Proposed Development:

- Operational Traffic – increases in HGV traffic associated with the export of PFA;
- Operational Traffic – increases in HGV traffic associated with the import of raw materials, liquid natural gas and maintenance; and
- Operational Staff Movements – increases in LGV traffic associated with the operational workforce.

14.4.2 Construction

The following elements are considered to have the potential to give rise to likely significant effects during the construction phase of the Proposed Development;

- Construction Traffic – temporary increases in HGV traffic associated with the import of construction materials;
- Construction Staff Movements – temporary increases in LGV traffic associated construction staff; and
- Abnormal Indivisible Loads (AIL) – the delivery of AIL and associated demand and traffic management.

Construction traffic associated with the Proposed Development are anticipated to generate approximately 20 two-way HGVs on average per day during the peak month of a relatively short main construction period (6–12 months). Construction traffic movements are therefore significantly less than those assessed during operation. Consequently, there is no potential for significant effects resulting from the traffic generated during the construction phase and it is not considered further in this chapter.

It is acknowledged that all AILs would be delivered to the Site under escort in accordance with permits issued by the appropriate authorities and an abnormal load route assessment study would be undertaken to support the permit application.

14.4.3 Elements Scoped of Assessment

The following environmental effects are scoped out of assessment based on professional judgement.

14.4.3.1 Visual Effects

No movements of AIL which could be considered visually intrusive are anticipated during the operational phase. In addition to this, the movements of HGVs are not considered visually intrusive as it is an everyday occurrence. The assessment of visual effects of operational traffic has therefore been scoped out of this assessment.

14.4.3.2 Hazardous Loads

Fuel would be regularly transported to the Site over the duration of the construction of the Proposed Development. All fuel would be transported by suitably qualified contractors, and all regulations for the transportation and storage of hazardous substances would be observed. Therefore, it is proposed that the assessment of the impact of transporting hazardous loads during the operational phase is scoped out of the assessment.

14.4.3.3 Noise and Vibration

Any likely significant effects in relation to noise and vibration are considered within Volume 1 Chapter 12: Noise and Vibration of the Environmental Statement.

14.4.3.4 Air Quality

Any likely significant effects in relation to air quality are considered within Volume 1, Chapter 13: Air Quality of the Environmental Statement.

14.5 ASSESSMENT METHODOLOGY

14.5.1 Study Area

The Study Area has been defined by the public road network in the vicinity of the Site and potential delivery corridors to be used by HGV for the export of PFA. Given the location and the number of weight restrictions (be it structural or for environmental reasons) on a number of routes in the vicinity of the Site, the main approach corridor considered in this assessment is the A638 on the assumption that it offers the most direct route to the Strategic Road Network (SRN) to and/from the A638.

Access to the Site would be taken from the existing purpose-built industrial access onto the A638, which previously served Bellmoor Quarry and now serves the Bellmoor Industrial Estate. This existing access junction is already well formed, with a right turn ghost island facility and has adequate visibility splays in either direction. Full details of the access arrangement, including routing to Site are presented in **Volume 3, Appendix 14.1: Transport Statement**.

14.5.2 Baseline Survey Methodology

Characteristics of the existing environment were informed by the following sources: traffic count data, desktop studies, and personal injury collision data. Full details of the baseline survey methodology are presented in **Volume 3, Appendix 14.1 Transport Statement**.

14.5.3 Methodology for the Assessment of Effects

The magnitude of the effect of increase in traffic flow is a function of the existing traffic volumes on routes and the percentage increase in flow as a result of the Proposed Development.

An initial screening exercise was undertaken to identify routes where an adverse effect could potentially occur. The IEMA Guidelines (1993) suggest two broad principles:

- Rule 1 – include road links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles is predicted to increase by more than 30%); and
- Rule 2 – include any other specifically sensitive areas where traffic flows (or HGV component) are predicted to increase by 10% or more.

Where the predicted increase in traffic flow is lower than these thresholds, the significance of the effects can be considered to be low or not significant with no further detailed assessments warranted. Consequently, where the predicted increase in traffic flow is greater than these thresholds, the potential effects are considered to be significant and are assessed in greater detail. It should be noted that further details on the framework for determining the magnitude of change in traffic flow is provided in Section 14.4.3 of this chapter.

Where existing traffic levels are generally low (e.g., rural roads and some unclassified roads), any increase in traffic flow may result in a predicted increase that would be higher than the IEMA Guidelines (1993) thresholds. In these situations, it is important to consider any increase in terms of overall traffic flow in relation to the capacity of the road, before making a conclusion on whether the effect is significant as defined under the EIA Regulations.

14.5.3.1 Sensitivity of Receptors

The sensitivity of the baseline conditions, including the importance of environmental features on or near to the Site or the sensitivity of potentially affected receptors, would be assessed in line with best practice guidance, legislation, statutory designations and/ or professional judgement.

Table 14.2 details the framework for determining the sensitivity of receptors.

Table 14.2: Framework for Determining Sensitivity of Receptors

Sensitivity	Description
Very High	Receptors with no ability to absorb change without profoundly altering their present character, which are of high strategic value, or of national importance, would include receptors such as populated urban areas where existing traffic levels are high and there is no capacity to absorb additional traffic flow on adjacent routes; and strategic nationally important routes with no capacity to absorb additional traffic flow
High	Receptors of greatest sensitivity to traffic flow: schools, colleges, playgrounds, retirement homes, residential roads without pedestrian or cyclist facilities, and accident hotspots.
Medium	Receptors with sensitivity, would include: People who pass through the area habitually, but whose livelihood is not wholly dependent on free access. Would also typically include: congested junctions, community services, parks, businesses with roadside frontage, and recreation facilities.
Low	Receptors with some sensitivity, would include: People who occasionally use the road network. Would also typically include: public open spaces, nature conservation areas, listed buildings, tourist attractions, residential roads with adequate footway provision and places of worship.
Negligible	Receptors with very low sensitivity, would include: People not sensitive to transport effects. Would also refer to receptors that are sufficiently distant from the affected roads and junctions.

14.5.3.2 Magnitude of Change

The magnitude of potential change is a function of the existing volumes of traffic and has been identified through consideration of the Proposed Development, the percentage increase and degree of change to baseline conditions predicted as a result of the Project, the duration and reversibility of an effect and professional judgement, best practice guidance (IEMA 1993), and legislation.

The magnitude of impact or potential change has been identified using the framework presented in **Table 14.3**.

Table 14.3: Framework for Determining Magnitude of Change

Type of Impact	Magnitude of Change			
	Negligible	**Low**	**Medium**	**High**
Severance	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flow of >90%
Pedestrian Amenity	Change in traffic flow (or HGV component) <50%	Change in traffic flow (or HGV component) of 50% to 100%	Change in traffic flow (or HGV component) of 100% to 150%	Change in traffic flow (or HGV component) of 150%
Fear and Intimidation	Change in total traffic flow of <30%	Change in total traffic flow of 30% to 60%	Change in total traffic flow of 60% to 90%	Change in total traffic flow of >90%
Highway Safety	Magnitude of impact derived using professional judgment informed by the frequency and severity of collisions within the study area and the forecast increase in traffic			
Driver Delay	Magnitude of impact derived using professional judgment informed by the increase in vehicle delay and whether a junction is at, or close to capacity.			

14.5.3.3 Significance of Effect

The sensitivity of the asset and the magnitude of the predicted effects would be used as a guide, in addition to professional judgement, to predict the significance of the likely effects. **Table 14.4** summarises guideline criteria for assessing the significance of effects.

Table 14.4: Significance Matrix

Magnitude of Effect	Sensitivity of Receptor			
	High	**Medium**	**Low**	**Negligible**
High	Major	Moderate	Moderate	Minor
Medium	Moderate	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Effects predicted to be of major or moderate significance are considered to be 'significant' in the context of the EIA Regulations and are shaded in light grey in Table 14.4**.**

14.5.4 Assumptions and Limitations of Assessment

A worst-case scenario has been assumed in which all traffic associated with the Proposed Development would pass each traffic count location identified in the study although the preferred route for HGV traffic would be to access the Strategic Road Network northbound via the A638. However, the choice of route would be determined by destination of the market and there may be the need to travel southbound on the A638. Therefore, the effect of increased traffic on the identified route is therefore likely to be lower than estimated in this assessment.

14.6 BASELINE CONDITIONS

14.6.1 Baseline Traffic Flow

Details of the baseline conditions including details of the local and strategic highway network providing access to the Site are set out in **Volume 3, Appendix 14.1 Transport Statement** whilst **Table 14.5** summarises baseline traffic flow data.

Table 14.5: Baseline Traffic Flows

Ref	Road Link/Description	Source/Year	Total Vehicles	HGV	% HGV
1	A638, between Scooby and Ranskill	2022 Traffic Counts	4,525	264	5.8
2	A638, near Torworth	2022 Traffic Counts	4,389	327	7.5
3	A638, South of Barnby Moor	2022 Traffic Counts	8,004	423	5.3
4	A638, Retford, DfT Point ID: 27413	DfT Traffic Counts (2021)	14,337	312	2.2
5	A638, Gamston, DFT Point ID: 77444	DfT Traffic Counts (2021)	7,969	275	3.5

14.6.2 Road Traffic Collision Assessment

A Road Traffic Collision Assessment has been undertaken and is set out in **Volume 3, Appendix 14.1: Transport Statement. Figures 3.1** to **3.4** in **Appendix A** of the Transport Statement shows the location of the collisions for key junctions along the routes within the Study Area.

From the analysis undertaken, it appears the vast majority of collisions occurred as a result of driver error and lack of awareness of other road users rather than highway design. No clear trends or strongly identifiable hotspots were apparent within the data and no RTCs were identified at the proposed site entrance location on the A638.

14.6.3 Sensitive Receptors

As per the Guidelines, particular groups of locations which may be sensitive to changes in traffic conditions should be identified. The Guidelines suggest, for example, that people, home, school and the elderly may be sensitive to changes in traffic conditions. A desktop search was undertaken for the route to Site within the Study Area for which the receptor is identified as highway users (i.e., both motorised and non-motorised users). On this basis and given that the receptor can be termed "people using the highway", it is considered that the receptor would be sensitive to changes in traffic flow as a result of the Proposed Development.

The A638 passes through a number of towns and villages before reaching the strategic road network (A1). There are a number of commercial and residential properties which front directly onto the A638 as it passes through these settlements, including Barnby Moor, Ranskill and Retford. The town centres include shops and services, and users may be required to use/cross the route when accessing the service. However, there are formal pedestrian crossing- points on the A638 including signalised pedestrian crossings as it passes through some of the towns such as Retford. However, this route is a major transport corridor constructed to accommodate significant HGV traffic and currently provides access to quarry activities in the area and so a certain level of traffic should be expected.

The receptor is therefore deemed to be of medium sensitivity for the purposes of this assessment.

14.7 EMBEDDED MITIGATION

14.7.1 Construction

It is anticipated that traffic movements would be controlled during the construction phase to minimise potential impacts on the surrounding road network. A range of best practice measures during the construction phase to minimise traffic impacts upon local highways would be applied through the implementation of a Construction Traffic Management Plan (CTMP), to be secured by a suitable planning condition.

14.7.2 Operation

The following avoidance measures would be considered in relation to the traffic forecasts and impacts during operation:

- Operational Traffic Management Plan (OTMP), to mitigate the impact of the operational phase and associated traffic.
- Staff Travel Plan to reduce the number of employees travelling to the Site by single occupancy car.
- The above would also be secured by a suitable planning condition. Note also that the Proposed Development includes a wheel wash and jet wash option. Please refer to ES Volume 1, Chapter 5 for more detail on mitigation measures.

14.8 FUTURE BASELINE SCENARIOS

It is currently anticipated that (subject to the necessary consents being granted) the Proposed Development would be in operation in 2024. Further details on traffic growth factors calculated for the relevant geographic area and applied to the baseline traffic flow as well as details of committed developments considered in the assessment are provided in **Volume 3, Appendix 14.1: Transport Assessment**. **Table 14.6** summarises the projected baseline traffic flow data including committed development.

Table 14.6: Projected Baseline Traffic flows, including Committed Development (2024)

Ref	Road Link / Description	Project Average Annual Daily Traffic	HGV	% HGV
1	A638, between Scooby and Ranskill	5,526	267	4.8
2	A638, near Torworth	5,388	332	6.2
3	A638, South of Barnby Moor	9,052	429	4.7

Ref	Road Link / Description	Project Average Annual Daily Traffic	HGV	% HGV
4	A638, Retford, DfT Point ID: 27413	16,081	318	2.0
5	A638, Gamston, DFT Point ID: 77444	9,542	281	2.9

14.9 ASSESSMENT OF POTENTIAL EFFECTS

The potential impacts arising from the construction of the Proposed Development have been assessed.

The identification of the traffic and transport environmental effects requires an assessment of the amount of traffic associated with operational activities and the significance of this additional traffic.

Details on the operational trip generation are set out in **Volume 3, Appendix 14.1: Transport Assessment**. In summary, it is estimated there would be up to 136 daily vehicle movements (96 HGVs and 40 car movements) as a result of the operation of the Proposed Development.

The percentage traffic impact on links within the Study Area as a result of the Proposed Development is shown below in **Table 14.7** below.

Table 14.7: Predicted Impact

Ref	Total Vehicle Movements			HGV Movements Only*		
	2024 Baseline	Baseline + Development	Increase (%)	2024 Baseline	Baseline + Development	Increase (%)
1	5,526	5,662	2	267	363	36
2	5,388	5,524	2	332	428	29
3	9,052	9,188	1	429	525	22
4	16,081	16,217	1	318	414	30
5	9,542	9,678	1	281	377	34

As detailed in the assessment methodology, a screening exercise was undertaken in order to determine which locations warrant detailed assessment. The lower threshold of significance was considered appropriate for those locations with identified sensitive receptors. **Table 14.7** demonstrates overall traffic is predicted to increase by a maximum of 2% which does not exceed the lower threshold of significance. However, HGV traffic is predicted to exceed the lower 10% threshold at all count locations within the Study Area and therefore further assessment is required.

As detailed in the assessment methodology, when considering increases in traffic on roads with a low baseline traffic flow, it is important to consider the overall and residual capacity of the road in question. The baseline HGV flows level on the A638 are low (circa 350 on average vehicles per day) and the magnitude of the predicted increase is low in absolute terms (total vehicles 136 movements made up of 96 HGV vehicles and 40 cars per day) and the HGV component accounts for 7.8% of total traffic on the A638 with traffic from the Proposed Development included. HGV traffic on rural A class-roads roughly makes up 10% of the total traffic; as such it is considered that the proportion of HGVs would remain below a typical 'A' Road.

Therefore, the effect of the Proposed Development on traffic generation would result in a negligible magnitude of change on a receptor of medium sensitivity. Thus, the effect of increased traffic on this route is negligible and **not significant** in EIA terms.

14.9.1 Severance

Severance is the perceived division that can occur within a community when it becomes separated from places and other people. The severance may be caused by a physical barrier created by a development or by the difficulty of crossing roads due to an increase in traffic flow.

Section 14.5.3.2 of this report identifies that although the HGV traffic increase is above the 10% threshold, the increase in overall total traffic volumes is significantly less than this threshold (up to 2%). Therefore, when considering the sensitivity of the receptor and magnitude of impact, the effect of the Proposed Development on severance results in a negligible magnitude of change on a receptor of medium sensitivity. Thus, the effect of increased traffic on severance is negligible and **not significant** in terms of the EIA Regulations.

14.9.2 Pedestrian Amenity

Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition, pavement width and separation between vehicles and pedestrians or cyclist. Guidance set out in Section 14.5.3.2 of this report identifies that doubling or halving of the total traffic or HGV traffic volumes could lead to perceptible change upon pedestrian or cyclist amenity. It is evident that the change in total traffic (or HGV component) associated with the Proposed Development is well below 50%.

Therefore, when considering the sensitivity of the receptor and magnitude of impact, the effect of the Proposed Development on pedestrian amenity results in a negligible magnitude of change on a receptor of medium sensitivity. Thus, the effect of increased traffic on pedestrian and cyclist amenity is negligible and **not significant** in terms of the EIA Regulations.

14.9.3 Accidents and Highway Safety

Highway safety is assessed by the frequency and severity of injury accidents that are attended by the police and recorded in official accident statistics. Intensification of use or changes in the composition of traffic has the potential to have an effect on collision rates.

As detailed in **Volume 3, Appendix 14.1: Transport Statement**, a Road Traffic Collision (RTC) assessment was undertaken for the key junctions/corridors within the Study Area to identify patterns of collision types that may be attributed to issues from existing highway design, layout, or construction.

The conclusion from the review was that these roads are operating within acceptable safety parameters at present and in the absence of identifiable trends in RTCs or known accident hotspots, the magnitude of the increase in overall traffic flow or HGV composition is not sufficient to effect a change in safe operation of the road network.

Therefore, when considering the sensitivity of the receptor and magnitude of impact, the effect of the Proposed Development on highway safety results in a negligible magnitude of change on a receptor of medium sensitivity. Thus, the effect of increased traffic on pedestrian and cyclist amenity is negligible and **not significant** in terms of the EIA Regulations.

14.9.4 Driver Delay

Delays mostly occur at junctions that operate close to capacity due to increase in traffic flows particularly during peak period or the passage of slower moving vehicles such as HGVs. However, as set out in **Volume 3, Appendix 14.1: Transport Statement**, the peak number of operational trips is below the industry recognised threshold upon which to undertake assessment, therefore the need for any junction capacity assessments is not warranted. On this basis, it is concluded that the temporary construction traffic would not create or materially impact upon any congestion that may occur during the weekday peak hours or any other hours during the day.

Junction modelling has been undertaken at the A638/ Bellmoor Industrial Estate (the results of which are provided in the **Volume 3, Appendix 14.1: Transport Statement** for the AM and PM peak hours. This demonstrates that the junction would operate well within its design capacity with the inclusion of the Proposed Development traffic including committed schemes with no notable queuing and delays.

In addition, the link capacity analysis undertaken in **Volume 3, Appendix 14.1: Transport Assessment**, has concluded that the A638 would still remain within capacity even with the committed scheme included with the operational traffic.

Therefore, when considering the sensitivity and magnitude of impact, the effect of the Proposed Development on driver delay results in a negligible magnitude of change on a receptor of medium sensitivity. Thus, the effect of increased traffic on driver delay is negligible and **not significant** in terms of the EIA Regulations.

14.10 MITIGATION AND RESIDUAL EFFECTS

No additional mitigation measures or enhancement measures other than those set out in Section 14.7 of this report are considered necessary.

14.11 CUMULATIVE EFFECT ASSESSMENT

Cumulative (Committed Development) traffic is already accounted for in the traffic flows stated in Section 14.8 of this report and therefore included in the overall assessment of this study.

14.12 CONCLUSION

This chapter has assessed the likely significance of the Proposed Development on traffic and transportation. The additional traffic due to the operational activities of the Proposed Development would result in small increases of traffic flows, including HGVs, on the surrounding highway network.

Environmental assessments have been undertaken and conclude that the effects on driver delay, severance, pedestrian delay, and highway safety would be negligible. As such based on the significance criteria outlined earlier in this chapter, the impacts of traffic generated by the Proposed Development on all road sections and junctions are considered to be negligible and not considered to be significant in terms of EIA regulations.

Traffic generation during the construction phase of the Proposed Development is minimal when compared to the operational phase. Therefore, traffic and transport effects for the construction phase of the Proposed Development are also considered to be negligible and thus not significant in terms of EIA regulations.

Whilst assessments have demonstrated that, for both the construction and operational phases, there would be no impacts of any significance to any of the road sections assessed, a number of impact avoidance measures in the form of a CTMP and OTMP,

along with a wheel wash and jet wash option, would be implemented to minimise traffic impacts during both phases of the Proposed Development.