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Introduction

6.1 This Chapter assesses the potential environmental impacts associated with the movement of vehicles associated with the proposed development.

6.2 A Transport Statement (TS) has also been produced and submitted to support the planning application. The TS has been referenced throughout this Traffic Chapter.

Methodology

6.3 The assessment refers to guidance provided by the Institute of Environmental Management and Assessment (IEMA) in 'Guidelines for the Environmental Assessment of Road Traffic' (the 'IEMA guidelines').

Proposals Summary

6.4 Acorn Bioenergy Limited are seeking to develop land at Spring Grove, Horseheath to provide a new Anaerobic Digestion (AD) Facility. The proposed AD Facility would process c. 92,000tpa of agricultural feedstock, likely to comprise the following:

- silage (rye, maize, oats and grass);
- straw;
- farmyard manure; and
- poultry litter

6.5 The feedstock would be transported to site in HGVs (tractor-trailers and lorries). The feedstock material would undergo a process of controlled decomposition (anaerobic digestion) within the proposed facility. The process produces biogas which would be upgraded to biomethane on site before being transported by tanker to a central gas injection point.

6.6 The gas upgrading process would also result in the production of CO_2 as a natural by-product. All of Acorn's AD facilities are fitted with the equipment required to capture the clean CO_2 to a food grade level standard which makes it suitable for almost all industrial and commercial applications in the UK. Purified CO_2 would be liquefied and transported by road to end users, ideally located locally. A further output of the anaerobic digestion process is digestate, which would be used on local farms in place of raw manures and artificial fertilisers.

Baseline Conditions

Application Site

6.7 The site comprises two adjoining arable fields which are part of the Spring Grove Farm, which is located approximately 3.1km northwest from the centre of Haverhill, a market town and civil parish in Suffolk; the site lies approximately 21km southwest from central Cambridge.

6.8 In broader terms the application site is located approximately 21km southeast of central Cambridge, 52km west of Ipswich, and circa 75km north from Central London; links to the M11 can be found within 15km (by road) from the application site.

6.9 Vehicular access to the application site can be gained via the south across a bridge and through a cutting in the railway embankment via private tracks which route through and adjacent to an estate property forming two existing access junctions with the A1307.

Highway Conditions

6.10 The following sub-section discusses the highways infrastructure surrounding the application site.

A1307 Cambridge Road

6.11 The A1307 Cambridge Road comprises a typical A classified road which runs for approximately 24km between Haverhill and Cambridge.

6.12 In the vicinity of the application site the A1307 Cambridge Road measures circa 8.0 metres in width and is of a typical construction and layout with central markings interspersed with cats eye markers. The road comprises a single carriageway operating one lane in either direction and is subject to the National Speed Limit (60mph). The highway is street-lit but there is no footway provision, just grassed verges.

6.13 To the east of the existing site access junction there is a cycle route which follows the historic road alignment, linking up with the A1307 to the east. The route has bollards but does not appear to be used frequently by cyclists.

6.14 To the west of the existing site access and estate property is a layby which is predominantly used for eastbound lorry driver daytime breaks. There is also a westbound layby on the A1307 located approximately 250 metres to the west.

Silver Street

6.15 Located on the A1307 approximately 700 metres to the west of the existing site access is a junction with Silver Street.

6.16 The junction is arranged as a simple priority junction with wide parameters capable of accommodating HGV swept-path requirements.

6.17 Silver Street itself is part of a 2.2km road link, between the A1307 (west of the site) and Queen Street (to the northeast), which has various names. Between these junctions the road is known as (west-to-east): Silver Street, Horseheath Road, Hollow Hill, and Church Street. The junction with Skippers Lane is located on the Horseheath Road section, and at the Queen Street terminus it is known as Church Street.

6.18 Silver Street comprises a narrow rural road circa 5.5 metres in width and subject to the National Speed Limit. The Silver Street carriageway is unmarked beyond the vicinity of its junction with the A1307 Cambridge Road as it bears north; however, central markings are present over a short distance approaching a bend in the road bearing northeast toward Withersfield.

6.19 On route toward Withersfield it is renamed as Horseheath Road in the vicinity of a junction with Skippers Lane. Also, in this vicinity the speed restriction is lowered to 30mph.

6.20 Silver Street is lined with trees and hedgerow with little or no grassed verge; no pedestrian infrastructure or lighting present.

6.21 The road is a typical rural road and is therefore used by a mix of traffic serving the local villages and local agricultural operations.

Internal Farm Tracks

6.22 The Thurlow Estate farming operation extends to the north, beyond the application site, covering a wide area. The Estate as a whole comprises numerous agricultural fields which are interconnected by a network of tracks which have historically supported all types of agricultural traffic; it is considered that these tracks are suitable for use in context of the proposals, where practical. Much of the existing Thurlow Estate is currently accessed via these tracks.

Wider Strategic Road Network

6.23 The A11 runs for approximately 57km between Thetford and a junction with the M11 circa 16km south of central Cambridge; it is accessible from the application site via the A1307 Cambridge Road.

6.24 The A131/A134 runs for approximately 80km between Thetford and Chelmsford and represents the most relevant A class strategic route in the vicinity east of the application site; it is accessible via the A1017 and A1092.

6.25 The M11 runs north to south between Cambridge and Greater London; it is accessible from the application site via the A11.

Accessibility

6.26 The non-car accessibility merits of the site should be viewed in the context of the proposed development type, small workforce and rural location.

6.27 The application site is located in a rural setting on the outskirts of Haverhill, the town centre of which is approximately 3.8km away by road.

6.28 The proposed facility would be staffed by up to five full time equivalent (FTE) members of staff.

6.29 Those living in the nearest residential catchments of Haverhill could access the application site on foot using existing pavements and the now disused section of the realigned A1307; a sizeable residential catchment exists within 2.0 miles of the site access.

6.30 Travel by cycle is less constricted by distance, and there are cycle routes which allow cyclists to avoid travelling on some sections of the main carriageway of the A1307.

6.31 There is no public transport option in terms of commuting directly to the application site from Haverhill, or from any other settlement in the wider vicinity; buses do stop along the A1307 within 850 metres of the site access, however, concerns remain in terms of onward travel to site.

Traffic Survey Data

6.32 SLR commissioned Auto Surveys Limited to install an Automatic Traffic Count (ATC) at an agreed location for a period of one calendar week. Using pneumatic tubes positioned across the carriageway the ATC measures directional traffic flow and vehicle speed, and also classifies vehicles into various groups including cars, motorcycles, and heavy goods vehicles (HGVs).

6.33 Data was recorded between Wednesday 20th and Tuesday 26th April 2022 in order to reflect typical traffic flow conditions on the local highway network (i.e. non-school holiday periods). The traffic count data 'as received' is included within the Transport Statement.

6.34 Analysis of the data confirms that across the surveyed weekdays the daily peaks were as follows:

- the AM peak was observed between 07:00 & 08:00hrs; and
- the PM peak was observed between 17:00 & 18:00hrs.

6.35 Table 6-1 provides a summary of the 24 hour Average Annual Weekday Traffic (AADT) flows along the A1307, as recorded by the ATC.

Table 6-1
A1307 Traffic Flows (AADT)

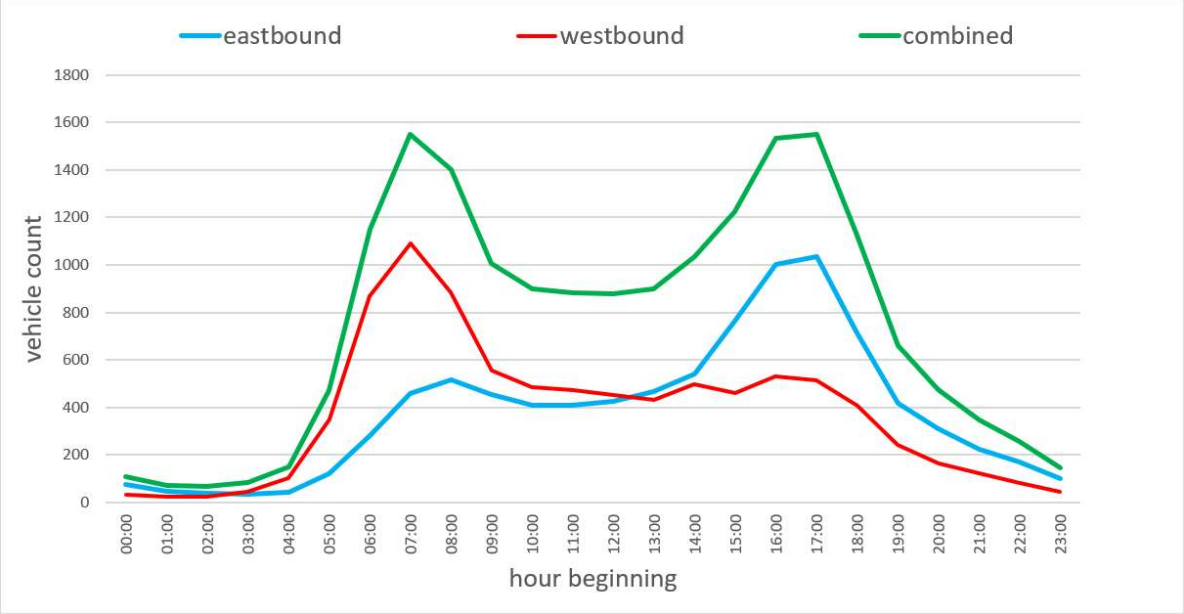
	Eastbound		Westbound		**Combined**	
	Total	*HGV*	*Total*	*HGV*	*Total*	*HGV*
AM Network Peak 07:00 - 08:00hrs	460	25	1,091	55	1,551	80
PM Network Peak 17:00 - 18:00hrs	1,035	21	515	9	1,550	30
24hr 00:00 - 24:00hrs	9,076	469	8,897	392	17,973	861

6.36 Table 6-1 indicates that the ATC recorded an average of 17,973 vehicle movements per weekday of which 861 were classified as HGV, equating to approximately 5% of the total traffic volume.

6.37 The summary shows that during the AM peak period, determined as 07:00 – 08:00hrs, a total of 1,551 movements occurred of which 80 were classified as HGV, equating to approximately 5% of the total traffic volume; during the PM peak period, determined as 17:00 – 18:00hrs, a total of 1,550 movements occurred of which 30 were classified as HGV, equating to approximately 2% of the total traffic volume.

6.38 The data in Table 6-1 is presented graphically within the traffic profile graph below within Figure 6-1. Within the graph eastbound traffic values are represented by the blue series, westbound by the red series, and the sum of those two values at any given time - 'combined' traffic - is represented by the green series.

Figure 6-1
Average Daily Traffic Profile for A1307



6.39 The above Figure 6-1 shows clearly defined AM and PM peak periods recorded by the ATC installed on the A1307 Cambridge Road.

6.40 It can be observed that the levels of traffic moving in either direction are similar. The AM peak of 1,551 movements occurs within the hour starting at 07:00hrs with the swell concentrated across a period of approximately 3hrs. The PM peak of 1,550 movements occurs at 17:00hrs with a comparable volume (1,532, <1% below) recorded an hour earlier within the hour starting at 16:00hrs; the swell is concentrated across a period of approximately 5hrs.

Speed Summary

6.41 The A1307 Cambridge Road in the vicinity of the application site is subject to a 60mph speed restriction (National Speed Limit); a summary of the vehicle speeds recorded by the ATC are presented in Table 6-2.

Table 6-2
Average Speed Summary – A1307

Direction	Speed (MPH)	
	85th%ile	*Mean*
Eastbound	52.9	47.0
Westbound	52.3	46.2

6.42 Both 85th%ile and Mean speeds along the A1307 in the vicinity of the site access junction are well within the posted speed limit, and as such there is no cause for concern.

Forthcoming Highway Improvements

6.43 A new relief road is planned to the north of Haverhill as part of a multi-phased Persimmon Homes residential development, which includes up to 1,150 residential units, a primary school and local centre/retail (Outline Planning Permission SE/09/1283/OUT).

6.44 The alignment of the Relief Road from the A1307 to Wratting Road (A143) has been agreed following discussions with Suffolk County Highways Authority, St Edmundsbury Borough Council and the landowners.

6.45 The new road will serve the new residential development and ease congestion within central Haverhill by providing a bypass link between the A1307 to the west of Haverhill and the A143 to the north east.

6.46 The construction of the relief road is underway with the roundabout at the A143 having been completed and fully operational.

Accident History

6.47 It is noted that the A1307, particularly to the west towards the Cambridgeshire border, has a history of accidents and is signed as a high casualty route, with road safety a real concern for local stakeholders.

6.48 In order to conduct a comprehensive review SLR procured Road Traffic Collision data from Suffolk County Council to assess the accident history in the vicinity of the application site.

6.49 Details of recorded road traffic incidents within a specified study area were requested for the most recent five-year period at the time of request. The accident data 'as received' is included within the Transport Statement.

6.50 Following a thorough review of the data provided by Suffolk County Council including a detailed examination of each incident on an individual basis, it has been concluded that no incident occurring within the identified study area for the five-year period may be attributed to a highway deficiency of any kind, and that all recorded incidents are attributable to human error. It is therefore concluded that there is no safety issue in the immediate proximity of the proposals.

Proposed Operation

Overview

6.51 The proposed development would consist of approximately 11.2ha of developed area and approximately 130 metres of new access road to link the site to the A1307.

6.52 The proposed development would accept in the region of 92,000 tonnes per annum of feedstock from local farms and through the process of anaerobic digestion, would generate biogas which will be upgraded to biomethane before being removed from the site by tanker to a central facility where it will be injected into the national grid.

6.53 A further output of the anaerobic digestion process is digestate, which would be used on local farms in place of raw manures and artificial fertilisers.

6.54 The AD process would also result in the production of a CO_2-rich natural by product. This is normally vented by AD plant operators, where the main goal is the production of biomethane. However, Acorn sees this natural by-product as a precious resource, and all their AD plants will be fitted with equipment to upgrade the CO_2 to 99.9% purity, suitable for almost all industrial and commercial applications in the UK. Upgraded CO_2 will be liquefied and transported by road to end users, ideally located locally.

Site Layout

6.55 The layout has been designed to provide a safe and efficient working area. Due to the nature of the proposed development, the majority of the site will form a new impermeable area, predominantly formed of the hardstanding footprints of the digester tanks, the digestate lagoon, silage clamp area and circulation areas.

6.56 Access to the site would be gained via an upgraded access junction off the A1307 which provides a two-way access road capable of accommodating HGVs.

6.57 The proposed site access road has been designed as a two-way road to ensure that there is adequate capacity to accommodate the proposed worst case traffic flows, which is likely to be during the month of June. The proposed access road will have a 130 metre length and therefore plentiful internal capacity to ensure no stacking back onto the public highway occurs. The proposed access design is provided at Appendix 6-1.

6.58 There are also existing farm tracks to the north which could be utilised for local agricultural traffic associated with the Thurlow Estate farming operation.

6.59 The proposed site layout includes six car parking spaces for staff and visitors.

Operational Hours

6.60 The AD process involves a biological process that is continuous. The processing plant would therefore be operational 24/7. The facility would be staffed by up to five full time equivalent (FTE)

members of staff on-site during the hours of 07:00 – 19:00 Monday – Sunday, except during peak harvest periods when working hours would be extended as necessary. A supervisory control and data acquisition (SCADA) system would monitor the facility overnight when it is not manned.

6.61 Deliveries of crops to site would be determined by the harvest. Harvests are ordinarily completed on a campaign basis, therefore during the peak harvest periods, delivery hours would be in line with standard agricultural harvest-time activity.

6.62 Vehicle movements relating to delivery of agricultural by-products and export of digestate would generally be limited to the following hours:

- Monday – Friday: 07:00 – 18:00; and
- Saturday: 07:00 – 13:00.

6.63 Gas collection and export would take place approximately twice each 24-hour period. CO_2 would be subject to one offtake by road tanker a day, including Sundays.

Employment

6.64 The proposed facility would be staffed by up to five full time equivalent (FTE) members of staff.

Forecast Vehicular Trip Generation

Feedstock Imports

6.65 The proposed AD Facility would process c. 92,000tpa of agricultural feedstock. The following feedstock would be transported to site via HGV/tractor-trailers from surrounding farms:

- silage (rye, maize, oats and grass);
- straw;
- farmyard manure; and
- poultry litter.

6.66 Farmyard manure will be supplied from local farms via pipelines, but for the purposes of this robust assessment traffic forecasting assumes that this will be hauled by road.

Exports

6.67 The following would then be transported off the site via HGV/tractor-trailers:

- Biomethane which would be stored on site prior to being transported by tanker to a central gas injection point;
- CO_2 suitable for almost all industrial and commercial applications in the UK would also be produced and exported;
- solid digestate used as an agricultural fertiliser; and
- liquid digestate used as an agricultural fertiliser.

Traffic Movements

6.68 Acorn Bioenergy Limited have supplied feedstock forecasting based on land yield potential and calculated product outputs to inform a detailed traffic generation assessment.

6.69 The assessment provides a robust forecast which includes tankers for the transportation of liquid digestate. A dedicated pipeline for this would reduce the number of daily HGVs.

6.70 Table 6-3 provides a summary of the data and calculated annual movements.

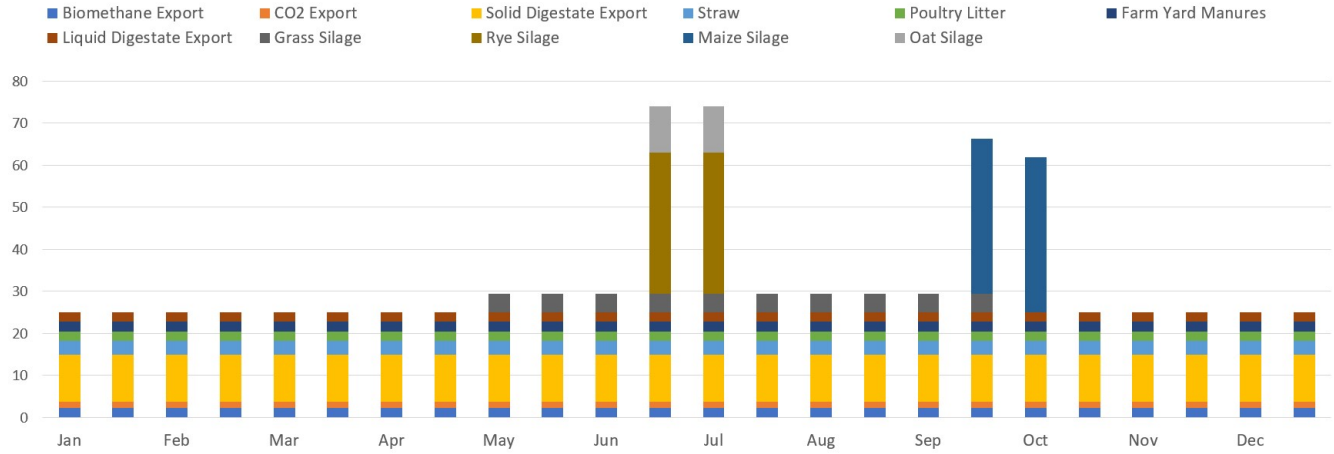
Table 6-3
HGV/Tractor Traffic Forecast

	Tonnes Per Annum	Vehicle Type	Payload (t/m3)	Annual HGV/ Tractor Trips on Highway	Delivery Range
IMPORTS					
Rye Silage	15,000	Tractor	16	938	Mid-June to mid-July
Maize Silage	16,500	Tractor	16	1,031	Mid-Sep to mid-Oct
Grass Silage	10,000	All	16	625	May to Sep
Oat Silage	5,000	All	16	313	June to July
Straw	20,500	HGV	24	855	All year
Poultry Litter	15,000	HGV	26	577	All year
Farmyard Manures	10,000	Tractor	16	625	All year
EXPORTS					
Biomethane	9,817,265m^3	HGV	12,500m^3	786	All year
CO2	13,297,000	HGV	24.89	535	All year
Digestate (Solid)	55,000	All	-	2,946	All year
	33,000	HGV	24	1,375	
	22,000	Tractor	14	1,571	
Digestate (Liquid)	15,000	All	27	556	All year
TOTAL	-	-	-	**9,786**	-

6.71 Due to the nature of some feedstock harvesting, some deliveries would follow seasonal patterns. Other imports would follow a more consistent pattern of delivery throughout the year. This is specified within the delivery range column above.

6.72 A daily traffic forecast based on the above feedstock predictions and delivery range is provided at Figure 6-2. For example, where imports or exports have an all-year delivery range the traffic has been spread evenly across 260 days. Harvest periods are based on 7 day week campaigns. The graph represents the maximum forecasted loads per day during each half month period.

Figure 6-2
Proposed Maximum Daily HGV/Tractor Load Forecast



6.73 The above graph provided at Figure 6-2 demonstrates how the proposals are likely to result in a varied HGV traffic generation across the year.

6.74 The traffic forecast graph indicates that for the majority of the year (10 months) the proposed development would generate 25-29 HGV/Tractor trips per day, which equates to 50 - 58 HGV/Tractor movements.

6.75 Site traffic generation levels would then peak with seasonal harvest periods. This would likely be restricted to two weeks in June and July (Rye/Oat Silage) and two weeks in September and October (Maize Silage). Predicted traffic levels would peak for two weeks in June/July with up to 74 HGV/Tractor trips per day, which equates to 148 HGV/Tractor movements.

Daily Traffic Profiles

6.76 Regular feedstock movements such as the delivery of straw, manures, and other organic wastes will typically take place during the standard working hours of 0800 – 1700hrs.

6.77 Agricultural import traffic will have the same diurnal variation as existing farm activity. All agricultural movements, including digestate, will therefore usually occur within daylight hours.

6.78 Peak harvests periods will be operated by local farmers and casual staff using a limited number of owned/hired vehicles, not a large fleet. As such, traffic profiles would naturally be spread throughout the day, thus avoiding any congestion issues.

Traffic Distribution

6.79 The application site benefits from good access to the local strategic road network via the A1307 whilst being in close proximity to the Thurlow Estate farming operations from which it will be primarily served.

6.80 HGVs relating to the haulage of gas products are likely to distribute to/from the west along the A1307 to the A11.

6.81 HGV traffic distribution associated with the importation of feedstock and export of digestate will vary each year subject to market conditions and crop rotation. However, there are broad assumptions which can be made based upon the site location and local land yield potential.

6.82 Table 6-4 provides a summary of local farms within the Thurlow Estate farming operation and the likely routeing requirements.

Table 6-4
Local Traffic Distribution Considerations

Farm Hub	Location in Relation to Proposed AD Facility	Likely Route	Comment
Weston Woods	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north
Great Bradley	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north *Could route via new Bypass*
Thurlow	North	**A1307 West** Silver Street Skippers Lane Common Road	Potential for estate traffic to use existing farm tracks to the north *Could route via new Bypass*
Great Wratting	North-east	**A1307 East** A143 B4061	*Could route via new Bypass*
Kedington	East	**A1307 East** A143	*Could route via new Bypass*
Rectory	North-west	**A1307 West** Haverhill Road West Wickham Road	-
Dotterel	North-west	**A1307 West** Haverhill Road West Wickham Road	-
Horseheath	West	**A1307 West**	-
Ashdon	South-west	**A1307 West** Dean Road	-

6.83 Table 6-4 above demonstrates that the application site is well located broadly at the centre of the Thurlow Estate farming operation whilst benefitting from direct access to the A1307.

6.84 Proposed HGV traffic associated with the local farms will distribute both east and west along the A1307, although it is noted that the largest area of farmland is located to the north/north-east of the application site.

6.85 This area of farmland, particularly during intense harvest periods, would benefit from some use of the internal farm tracks to the north of the application site.

6.86 It is also noted that HGVs serving farms to the east and north-east would be able to utilise the new bypass once completed.

Construction Consideration

6.87 The application site benefits from good access to the local strategic road network via the A1307.

6.88 It is expected that construction of the proposed development would take approximate 70 weeks.

6.89 It is anticipated that the construction process would generate less HGV traffic than the proposed development operational phase. However, there would be a higher number of staff operatives, with up to 50 people on site during the peak of construction activity.

6.90 It is expected that the construction process would generate approximately 3,000 HGV trips across the whole period. This equates to an average of 11 HGV trips per day (or 22 HGV movements, so 11 in and 11 out) across a 275 day year.

6.91 It is proposed that construction activities, including deliveries, would be limited to 7am to 7pm Monday to Friday, with reduced hours on Saturday for the duration of the construction period. There would be no construction activities undertaken on Sundays or bank holidays without prior approval, unless in the case of emergency.

6.92 In order to minimise traffic impacts on the A1307 Cambridge Road the construction site access junction will be constructed prior to the main construction phase commencing.

6.93 The construction phase must adhere to a Construction Traffic Management Plan (CTMP). The CTMP will ensure that site traffic is managed effectively during the construction process as to not result in any adverse impacts on the local highway.

6.94 The CTMP will ensure that all staff parking is accommodated within the site away from the public highway; and all lorry parking/loading will occur within the site, away from the public highway.

6.95 Subject to the implementation of a CTMP, the construction impacts are likely to be minimal, manageable, and therefore are acceptable in terms of highway operation and safety.

Safety and Capacity Impacts

6.96 The following section combines the determined existing highway conditions and proposed traffic forecast to assess the likely level of impact that the proposed development would bear on the local highway network.

6.97 The construction phase is a temporary operation which will be supported by a Construction Traffic Management Plan (CTMP) in order to minimise and mitigate any transport impacts. Therefore, the following considers the operation of the proposed development only.

General

6.98 Operational traffic associated with the movement of material would utilise the classified road network, where possible, using the 'B' classified roads, 'A' classified roads and motorways. Local imports would use the most practical roads which are likely to be via established agricultural routes.

6.99 The application site is served directly off the A1307 which links with the A11 to the west. The A1307 is a classified 'A' road which currently accommodates an Annual Average Weekday Traffic (AAWT) flow of approximately 18,000 vehicles. It has a consistent standard carriageway width suitable for HGV movements.

Access Operation

6.100 On the basis of a 10 hour working day and an even traffic profile, the proposed level of typical traffic would equate to an average of 2 - 3 loads in and 2 - 3 loads out per hour, or an average of 1 arrival and 1 departure every 20-30 minutes. This low level of traffic can comfortably be accommodated at the proposed site access junction.

6.101 The proposed site access road has been designed as a two-way road which ensures that there is adequate capacity to accommodate the proposed worst case traffic flows, which is likely to be during the month of June. The infrastructure between the site and the A1307 Cambridge Road has an abundance of capacity in context of potential queueing, and as such no stacking back onto the public highway can be expected to occur.

6.102 Peak harvests periods will be operated by local farmers and casual staff using a limited number of owned/hired vehicles, not a large fleet. As such, traffic profiles would naturally be spread throughout the day, thus avoiding any congestion issues.

6.103 It is clear that there would be no operational capacity concerns at the site access junction.

6.104 The network of farm tracks to the north may be used by Thurlow Estate related vehicles where practical, these offer direct access across private land using established routes.

6.105 Further to this an operational Traffic Management Plan (TMP) will be implemented to ensure that suitable measures are taken to further minimise any traffic impacts on the local highway network.

Highway Safety

6.106 The review of background conditions has identified no existing incident patterns in the proximity.

6.107 The proposed site access junction has been designed to meet modern standards with adequate junction visibility. The site access road has been designed as a two-way road to ensure that there is adequate capacity to accommodate the proposed worst case traffic flows, which is likely to be during the month of June. The proposed access road will have a 230 metre length and therefore adequate internal capacity to ensure no stacking back onto the public highway occurs.

6.108 Egressing vehicles will be restricted from turning right out of the site and would be expected to turn left (east) and then double-back around the roundabout if required to head west. This would be managed by means of signage and contract agreements. Additionally, the site access design has been developed to include a splitter-island as a physical barrier. The island could be developed during the detail design stages as a Trief kerb. A review of the U-turn capability of a maximum sized articulated lorry at the roundabout has been undertaken which demonstrates that the manoeuvre can comfortably be completed.

6.109 A Stage 1 Road Safety Audit has been undertaken which has not highlighted any road safety concerns.

6.110 On the basis of the above, it is concluded that the proposals are acceptable in terms of highway safety.

Environmental Impacts

6.111 This section assesses the environmental impact associated with the movement of vehicles associated with the development. The assessment refers to guidance provided by the Institute of Environmental Management and Assessment (IEMA) in 'Guidelines for the Environmental Assessment of Road Traffic' (the 'IEMA guidelines').

6.112 The IEMA guidelines provide two broad rules which can be used to determine the need for a full environmental assessment. The rules form a threshold, below which the predicted environmental impact is considered to be insignificant:

- highway links where traffic flows would increase by more than 30% (or where the number of HGVs would increase by more than 30%); or
- in sensitive areas where traffic flows increase by more than 10%.

6.113 Given the determined existing conditions of the local highway network, road classification, lack of sensitive receptors and its lack of accident history, for the purposes of this assessment the links studied are not considered to be sensitive. Based on this, the 30% threshold as defined in the IEMA Guidelines is deemed to apply for assessment purposes.

6.114 If the above thresholds are exceeded then a full environmental impact assessment must be undertaken to determine the level of transport related impact borne of the proposed development. The IEMA guidelines advise that traffic flow variations within +/-10% of baseline levels are indiscernible from the day-to-day fluctuations in traffic flow, creating no material environmental

impact. Therefore, increases in traffic of less than 10% are considered to have a negligible impact. Based on the guidance, the following criteria are used to determine the environmental impact of the proposed development:

- noise & vibration – a doubling of traffic flow leads to a 3dB(A) increase in noise level, below which is deemed imperceptible to change receptors;
- dust & dirt – the potential effects arising from dirt and detritus being brought onto the highway, assessment is required where the increase in traffic is above 10%;
- driver severance & delay – capacity assessments are required where traffic levels change by 10% or more, or where the links/junctions experience congestion in the baseline situation;
- community severance & delay – the existing level of community severance is determined and the relative impact of additional traffic assessed based on a sliding scale; and
- vulnerable road users and road safety – assessment is required where the increase in traffic is above 10%.

6.115 Based on the above, the assessment would determine the sensitivity and magnitude of transport related impacts according to the criteria established in Table 6-5 below.

Table 6-5
Transport Impact Criteria

Impact	Sensitivity			Magnitude			
	Low	Medium	High	Negligible	Minor	Moderate	Major
Noise & Vibration	No sensitive receptors	Presence of sensitive receptors	Presence of sensitive receptors adjacent to the road	<99% increase in traffic i.e. a doubling of traffic flow	Quantitative assessment based on predicted increase in traffic against measured baseline		
Dust & Dirt	Limited presence of sensitive receptors	Low to medium presence of sensitive receptors	High presence of sensitive receptors	No off-road vehicle movements /no loose material transport	Qualitative assessment based on type of traffic generated, materials transported and traffic speeds through sensitive areas		
Driver Severance & Delay	Road network not affected	Road network not experiencing congestion at peak times	Road network experiencing congestion at peak times	<10% increase in traffic	Quantitative assessment of road capacity based on existing traffic flows and predicted future traffic levels		
Community Severance & Delay	Moderate to high baseline traffic flows / presence of existing severance	Moderate baseline traffic flows / presence of existing severance	Low baseline traffic flows / no presence of existing severance	<10% increase in traffic	<30% increase in traffic	<60% increase in traffic	>60% increase in traffic
Vulnerable Road Users	N/A	Limited presence of vulnerable road users	Presence of vulnerable road users	<10% increase in traffic	Qualitative assessment of existing provision and future traffic levels		
Road Safety	N/A	No existing safety risk	Existing safety risk	<10% increase in traffic	Quantitative assessment of existing accident records and predicted increases in traffic		

6.116 The sensitivity and magnitude of each impact are combined to determine the significance, from which the need for mitigation can be identified. The significance definitions are detailed in Table 6-

6, overleaf. In terms of the EIA Regulations, an 'Moderate/substantial' and 'Substantial' effect are taken as being a 'significant' effect.

Table 6-6
Determination of Impact Significance

Magnitude	Sensitivity		
	Low	Medium	High
Negligible	Negligible	Slight	Slight/Moderate
Minor	Slight	Slight/Moderate	Moderate
Moderate	Slight/Moderate	Moderate	Moderate/Substantial
Major	Moderate	Moderate/Substantial	Substantial

Link Impact

6.117 The A1307 has been considered in terms of the link impact that would occur as a result of the traffic forecasted for the proposed application.

6.118 Table 6-7 considers the proposed traffic against the existing background traffic levels, to determine the level of increase.

6.119 This proposed traffic level represents the upper limits of the standard trip generation, rather than the temporary seasonal spikes associated with harvest times. Traffic distribution would vary daily and also be subject to local demand. For the purposes of this assessment all traffic forecasted to be generated by the site has been routed via the A1307 at the site access junction. This robust assessment also assumes that all traffic is new to the network, whereas much of the existing agricultural traffic is already on the network.

Table 6-7
Link Impact (Based on 2022 Surveyed traffic data)

Link	All Vehicles			HGVs		
	2022	Proposed Traffic	% Change	2022	Proposed Traffic	% Change
A1307	17,973	66	0.4	861	56	6.5

6.120 The link impact assessment shows that the proposed traffic forecasted would result in a maximum increase of 0.4% on the total existing traffic flow, and an increase of 6.5% on the existing HGV traffic flow. This is well within the determined 30% threshold specified within the IEMA guidelines.

6.121 Further to the above, the traffic impacts should also be considered against the existing baseline agricultural levels.

Comparable Existing Agricultural Traffic Forecast

6.122 The site is surrounded by agricultural land which is currently, and has historically, been worked which generates HGV and tractor traffic movements.

6.123 A key consideration when assessing the impacts of the scheme is that a large proportion of the proposed generated traffic movements would be from the Thurlow Estate and other local farms in the area where their trips are already operating on the local network.

6.124 Acorn Bioenergy Limited have supplied a forecast of farming activity based on expectant feedstock supplier's land yield potential. This has been calculated following a detailed assessment which has included liaising with local landowners and farm operators to forecast typical feedstock supplies. Table 6-8 provides a summary of the data calculating annual movements and seasonal delivery range.

Table 6-8
Existing HGV/Tractor Traffic Forecast

Farm Activity	Tonnes Per Annum	Vehicle Type	Payload (t/m3)	Annual Loads	Delivery Range
Wheat Grain Harvest	5,396	Tractor	14	386	Mid-June to mid-July
Wheat Grain to Market	5,396	HGV	24	225	All Year
Barley Grain Harvest	1,889	Tractor	14	135	Sep to Oct
Barley Grain to Market	1,889	HGV	24	79	All Year
Rape Harvest	944	Tractor	14	68	July to Aug
Rape to Processor	944	HGV	24	40	July to Sep
Barley Straw	5,857	HGV	20	293	Oct to Nov
Wheat Straw	11,714	HGV	20	586	July to Aug
Rape Straw	2,929	HGV	20	147	Aug to Sep
Poultry Litter to Farm	15,000	HGV	26	577	All Year
Poultry Litter Spreading	15,000	Tractor	10	1500	All Year
Farmyard Manures Spreading	10,000	Tractor	10	1000	All Year
Fertilisers + Spraying		Tractor/HGV	Various	564	Various
TOTAL	-	-	-	**5,600**	-

6.125 The above demonstrates that the existing farming operations generate traffic, the proposed development will predominantly result in a redistribution of this local agricultural traffic potential.

6.126 Whilst the above conclusions indicate that the proposed traffic increase would be well within the determined 30% threshold specified within the IEMA guidelines, as there is a degree of variability across the year, the wider traffic related environmental impacts have been considered.

Noise & Vibration

6.127 As stated in the IEMA Guidelines, variation of +/-3dB(A) represents the minimum perceptible change in noise to nearby receptors, which is typically produced by a doubling or halving of traffic flow. As demonstrated within the link impact assessment the proposals would not result in a doubling of background traffic levels.

6.128 Other than very occasional tankers, proposed development traffic would not travel outside of the typical operational hours, the assessment of traffic noise during the night-time is not required.

6.129 The above assessment confirms that the proposed development traffic would lead to no perceptible change in noise or vibration at the study link during hours of operation. The magnitude of the proposed development impact on noise and vibration would therefore be negligible, the sensitivity is low, therefore the overall impact significance is concluded as negligible.

Dust and Dirt

6.130 The sensitivity to the impact of dust and dirt is based upon the proximity of sensitive receptors to the roadside. The IEMA Guidelines state that '*…problems with dust and dirt are unlikely to occur at distances greater than 50m from the road*'. The site access is not located within 50 metres of any sensitive receptors, so the sensitivity is low.

6.131 The IEMA guidelines explain that the impact of dust and dirt will depend, to a large extent, upon the management practices undertaken on site. This includes the washing down of wheels and sheeting of material during transport on the public highway. This assessment determines the level of impact generated by the proposed development under the assumption that no management practices are undertaken.

6.132 The proposed site access is a two-way road with a bound surface, it will have a length of approximately 230 metres. However, the transportation of agricultural materials in uncovered containers could, in theory, lead to dust and dirt impacting the proposed access route network. Without sufficient mitigation measures, the magnitude of the impact of dust and dirt throughout the study area road network could be major.

6.133 Appropriate mitigation measures are therefore proposed to minimise any impact that is caused in terms of dust and dirt. Such mitigation measures follow best practice guidelines and are routinely used at similar operations throughout the UK. The effectiveness of the mitigation measures is therefore well understood.

6.134 The residual significance impact in terms of dust and dirt would therefore be concluded as slight.

Driver Severance and Delay

6.135 The link impact assessment has demonstrated that the maximum likely increase would be less than 1% in terms of total vehicles, which is well within the daily fluctuations in traffic levels experienced and the impacts are therefore unlikely to be perceptible away from the site access junction.

6.136 The impact significance to driver severance and delay would therefore be concluded as negligible.

Community Severance and Delay

6.137 The sensitivity of this impact is based upon the presence of communities around the local road network and the existing level of severance due to traffic flow.

6.138 The link impact assessment has demonstrated that the likely increase would be less than 1% in terms of total vehicles, which is well within the daily fluctuations in traffic levels experienced.

6.139 It has also been demonstrated that the proposed traffic would constitute a level of redistribution of existing background agriculture traffic already experienced within the local community.

6.140 The significance of impact on community severance would therefore be concluded as negligible.

Vulnerable Road Users

6.141 The A1307 is a classified rural road which does not have a high number of vulnerable road users. However, there is a cycle route which runs directly adjacent to the proposed site access following the historic road alignment to provide a traffic free route. The cycle route has been incorporated into the site access junction design to formalise the intersection and ensure cycle/vehicle conflicts are managed safely.

6.142 The review of local accident data has also demonstrated that there is currently no safety issue relating to vulnerable road users at the junction.

6.143 The significance of impact to driver vulnerable road users would therefore be concluded as negligible.

Road Safety

6.144 The accident data obtained has been considered in detail and it has been determined that there are no accident patterns that could be attributed to poor highway design. The incidents recorded are attributed to human error, typically poor judgement.

6.145 The proposed site access has been designed to the necessary standards and requirements to safely accommodate proposed operational traffic with significant internal capacity to ensure no stacking back onto the highway ever occurs.

6.146 It is therefore considered that the type and quantity of additional traffic generated by the proposed development would have a negligible impact on the safety of the local road network.

Mitigation

6.147 Mitigation measures are proposed to facilitate safe access to the site, whilst also offsetting the potential impact caused by additional HGV traffic on the surrounding road network.

Access Junction Design

6.148 The proposed site access has been designed to the necessary standards and requirements to safely accommodate proposed operational traffic, with significant internal capacity to ensure no stacking back onto the highway ever occurs.

Operational Traffic Management Plan

6.149 The operation of the site must adhere to a Traffic Management Plan (TMP) which is recommended to be secured as a Planning Condition. The TMP must be produced and approved in writing by the local highway authority and planning authority prior to operation of the site.

6.150 The TMP will pay particular focus to crop harvest periods when traffic generation levels peak, ensuring that access junction activity is managed appropriately.

6.151 The TMP will ensure that site traffic is managed effectively as to not result in any adverse impacts on the local highway. Measures may relate to HGV routeing, vehicle scheduling and other measures to prevent debris on the local highway.

6.152 All site users will be made aware of the TMP, which will be provided during the contract agreement process, and must follow the measures stated.

Construction Traffic Management Plan

6.153 The construction phase must adhere to a Construction Traffic Management Plan (CTMP) which is recommended to be secured as a Planning Condition. The CTMP must be produced and approved in writing by the local highway authority and planning authority prior to commencement of the construction phase.

6.154 The CTMP will ensure that site traffic is managed effectively during the construction process as to not result in any adverse impacts on the local highway.

6.155 The CTMP will include the following:

- detailed construction traffic forecast, including any abnormal load requirements;
- vehicle/plant/delivery scheduling;
- establish site access junction prior to main construction activities;
- staff parking to be accommodated within the site away from the public highway; and
- all lorry parking/loading will occur within the site, away from the public highway.

Residual Impacts

6.156 The sensitivity and magnitude of impacts associated with the additional traffic generated by the proposed development are combined according to the significance definitions provided in Table 6-5 above. Table 6-9 below summarises the significance of each impact pre-mitigation and post-mitigation, providing a number of suggested mitigation measures that could be employed to achieve the impact reduction.

Table 6-9
Significance of Traffic Impacts associated with the Proposals

Impact	Pre-Mitigation Significance	Suggested Mitigation	Residual Impact
Noise & Vibration	Negligible	N/A	Negligible
Dust & Dirt	Moderate	Access road constructed with a bound carriageway surface No overloading of HGVs/tractor/trailers Covering of materials in transit	Slight
Driver Severance & Delay	Negligible	Traffic Management Plan adhered to during seasonal harvest periods	Negligible
Community Severance & Delay	Negligible	N/A	Negligible
Road Safety	Negligible	Traffic Management Plan adhered to during seasonal harvest periods	Negligible
Vulnerable Road Users	Negligible	N/A	Negligible

Conclusions

6.157 This chapter has considered the traffic related impacts of the proposed development on the local environment.

6.158 The proposals have been assessed and it has been concluded that the proposals are acceptable in terms of operational capacity and highway safety.

6.159 A link impact assessment has been undertaken which demonstrates that the proposed traffic is likely to result in a maximum increase of 0.4% on the total existing traffic flow on the A1307, and an increase of 6.5% on the existing HGV traffic flow. This is well within the determined 30% threshold specified within the IEMA guidelines.

6.160 Further to this, the traffic impacts should also be considered against the existing baseline agricultural levels. Whilst it is difficult to compare the existing and proposed scenarios accurately prior to contractual agreements and with variables such as crop rotation, this chapter has demonstrated that the proposed development will predominantly result in a redistribution of existing local agricultural traffic.

6.161 Whilst the above conclusions indicate that the proposed traffic increase would be well within the determined 30% threshold specified within the IEMA guidelines, as there is a degree of variability across the year, the wider traffic related environmental impacts have been considered.

6.162 This assessment has concluded that the residual transport impacts are negligeable/slight in terms of Noise & Vibration, Dust & Dirt, Driver Severance & Delay, Community Severance & Delay, Vulnerable Road Users and Road Safety.

6.163 In view of the above the application proposal is deemed acceptable in traffic and highways terms.