Scottish & Southern Electricity Networks

TRANSMISSION

Environmental Impact Assessment (EIA) Report

LT383 Alyth to Tealing Overhead Line (OHL) 400kV Upgrade

November 2024

VOLUME 2: CHAPTER 11 – TRAFFIC AND TRANSPORT

11. TRAFFIC AND TRANSPORT

11.1 Introduction

11.1.1 This chapter considers the environmental effects of traffic and transport for the Proposed Development. Environmental effects are assessed in accordance with the Institute of Environmental Management and Assessment (IEMA) Guidelines; Environmental Assessment of Traffic and Movement July, 2023 (the "IEMA Guidelines").

11.1.2 This chapter considers the environmental effects of construction traffic generated by the Proposed Development. Once operational, the Proposed Development will only generate occasional maintenance traffic that would not meet the IEMA rules for assessment, and therefore is excluded from environmental assessment.

11.1.3 The environmental effects of traffic and movement are established in accordance with IEMA Guidelines as follows:

- identify study area roads;
- identify Baseline traffic on study area roads;
- Forecast Proposed Development traffic on study area roads;
- identify sensitivity of receptors on study area roads in accordance with IEMA Guidelines;
- identify study area roads to be assessed for environmental effects in accordance with IEMA Guidelines;
- identify the significance of environmental effects on study area roads, based on sensitivity of receptor and magnitude of change;
- consider mitigation measures if necessary. Provide a summary and conclusion on potential residual environmental effects; and
- consider the traffic and movement environmental effects for cumulative development.

11.1.4 Table 11-1 lists the figures and supporting documents referenced throughout this chapter.

Table 11-1 Figures and Supporting Documents

Title	Description
Figure 11.1 (Volume 3)	Study Area Roads
Figure 11.2 (Volume 3)	Traffic Survey Locations
Appendix 11.1 (Volume 4)	Transport and Movement

11.1.5 Scoping Responses from relevant authorities on routes related matters are provided in Part A of Appendix 11.1 (Volume 4).

Limitations and Assumptions

11.1.6 Assessment effectively assumes all construction traffic appears on all study area roads as specific origins of construction traffic unknown at time of assessment. This is considered reasonable worst-case scenario in accordance with IEMA guidelines.

11.1.7 Traffic surveys commissioned by AECOM only cover 13 of the 17 study area roads ultimately forecast to carry Proposed Development traffic. Department for Transport (DfT) and Traffic Scotland National Traffic Data System (NTDS) traffic counts are used for four study area roads.

11.1.8 Proposed Development traffic is supplied by Balfour Beatty, acting as principal contractor. These are estimates of forecast construction traffic calculated on the basis on Proposed Development information available at the time of writing.

11.1.9 Some developments identified for inclusion in cumulative assessments are sufficiently early in their respective planning processes that no traffic forecasts are available for them.

11.2 Legislation and Policy

11.2.1 Relevant transport policy and legislation is listed below and summarised with regard to the Proposed Development in Part B of Appendix 11.1:

- National Transport Strategy 2020 (NTS2);
- National Planning Framework 4 (NPF4);
- Draft TACTRAN Regional Transport Strategy 2024-2034;
- Perth and Kinross Local Development Plan 2019;
- Angus Local Development Plan 2016; and
- Dundee Local Development Plan 2019.

11.3 Assessment Methodology and Significance Criteria

11.3.1 The assessment methodology for the environmental effects of traffic and movement follows IEMA Guidelines. This approach is typical and is endorsed by Transport Scotland in its 2024 scoping response.

11.3.2 Roads to be used by Proposed Development traffic are identified. This is a first-principal exercise made by a qualified and experienced practitioner. It is based on the type, location and extents of the Proposed Development, and the surrounding road network most likely to provide viable vehicle routes to site. Accordingly, study area roads are identified. For identified study area roads, appropriate traffic data is sourced. This data encompasses current road traffic, recorded injury accidents, and forecast Proposed Development traffic. The traffic information provides a dataset to which IEMA Guidelines are applied.

11.3.3 The environmental assessment must consider population groups that may be sensitive to changes in road traffic. IEMA Guidelines identify interests to be considered when defining sensitivity of receptors. All study area roads are subject to a sensitivity of receptor assessment for the following interests:

- people at home;
- people at work;
- sensitive and/ or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors);
- locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);
- retail areas;
- recreational areas;
- tourist attractions;
- collision clusters and routes with road safety concerns; and
- junctions and highway links at (or over capacity).

11.3.4 For each road the result of the sensitivity of receptor assessment is classified in accordance with Table 11-2**.**

Table 11-2 Sensitivity of Receptor

Classification	Description
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of international importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.

11.3.5 All study area roads are assessed against IEMA Guidelines Rule 1 and Rule 2. These rules represent a reasonable threshold for including a road within an environmental assessment:

- Rule 1: Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows have increased by 10% or more.

11.3.6 The Rule 1 and Rule 2 thresholds are based on research and experience of the environmental effects of traffic and movement. Less than a 30% increase generally results in imperceptible changes in the environmental effects of traffic apart from within specifically sensitive areas. The IEMA Guidelines consider that forecast changes in traffic of less than 10% in specifically sensitive areas creates no discernible environmental effect, hence the second threshold set out in Rule 2.

11.3.7 Study area roads are evaluated against the results of sensitivity of receptor, Rule 1 and Rule 2 assessments to identify the roads which require to be environmentally assessed. The assessment of these roads then considers the following environmental effects:

- severance of communities – the perceived division that can occur when it becomes separated by a major traffic route (existing or proposed);
- fear and intimidation on and by road users – the effect on the perceived vulnerability of pedestrian traffic relating to changes in traffic flows and or speed;
- road user and pedestrian safety – the potential for effects on rate and severity of accidents relating to changes in traffic flows;
- non-motorised amenity – broadly defined as the relative pleasantness of a pedestrian or cycle journey. The potential for effects relates to changes in traffic flows;
- non-motorised user delay – the effect on travel time. The potential for effects relates to changes in traffic flow;
- road vehicle driver and passenger delay - the effect on travel time. The potential for effects relates to changes in traffic flow, noting that road and junction vehicle capacity assessments are not part of this assessment; and
- Hazardous loads – scoped out of assessment in accordance with the 2024 Scoping Report (Appendix 6.2 (Volume 4)).

11.3.8 For each environmental effect a ‘magnitude of change’ resulting from Proposed Development traffic must be identified. The IEMA Guidelines describe changes in traffic of 30%, 60% and 90% as ‘slight’, ‘moderate’ and ‘substantial’ respectively. Table 11-3 reflects IEMA Guidelines to quantify the magnitude of change for Proposed Development traffic.

Table 11-3 Magnitude of Change

Magnitude of Change	Change in Traffic	Description
High	90%+	Alteration to baseline conditions such that post development character or composition of baseline condition fundamentally changed.
Medium	60-90%	Alteration to baseline conditions such that post development character or composition of baseline condition materially changed.
Low	30-60%	Minor shift from baseline conditions such that post development character or composition of baseline condition remains similar to baseline and not materially changed.
Negligible	0-30%	Very little change from baseline conditions. Change is barely distinguishable approximating to no-change situation.

11.3.9 The Table 11-3 magnitude of change is not applied to the 'Fear and Intimidation' or 'Road User and Pedestrian Safety' elements of the environmental assessment. IEMA Guidelines include separate advice on magnitude of change for these. Fear and intimidation magnitude of change is based on specific traffic flow and speed data for roads, and whether changes in traffic would be sufficient to trigger a step-change in fear and intimidation. Road user and pedestrian safety magnitude of change is based on analysis of recorded and forecast injury accidents by vehicle kilometres driven on study area roads.

11.3.10 For Proposed Development traffic, the significance of environmental effects is derived from a combination of magnitude of change and sensitivity of receptor. Table 11-4 summarises the derivation of significance of effects.

Table 11-4 Significance of Environmental Effects

		Sensitivity				
		Very High	**High**	**Medium**	**Low**	**Negligible**
Magnitude	**High**	**Major**	**Major**	**Moderate**	**Moderate**	Minor
	Medium	**Major**	**Moderate**	**Moderate**	Minor	Negligible
	Low	**Moderate**	**Moderate**	Minor	Negligible	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible

11.3.11 Major and Moderate effects are likely to be considered significant.

11.3.12 Significance of environmental effects are qualified by a number of other factors, including:

- temporary – where the effect occurs for a limited period of time and the change at a defined receptor can be reversed;
- permanent – where the effect represents a long-lasting change at a defined receptor which is not reversable;
- Short Term/ Medium Term/ Long Term;
- beneficial – an effect beneficial to one or more environmental receptors; and
- adverse – a detrimental, or negative, effect on one or more environmental receptors.

11.4 Identification of Study Area Roads

11.4.1 The Proposed Development consists of the upgrade of approximately 14.2 kilometres (km) of an existing 16 km 275 kilovolts (kV) overhead line (OHL) between Alyth Substation and Tower 685 north-west of Tealing Substation to enable operation at 400 kV. For a full project description, see Chapter 3 (Volume 2).

11.4.2 Construction traffic will effectively access the entire length of the Proposed Development. Given the location and route of the Proposed Development, it is not unreasonable to assume construction traffic will arrive in the sub-region via the trunk road network, then use local roads for site access. Figure 11.1 (Volume 3) shows the traffic and movement study area for the Proposed Development. Construction traffic will use the A90 trunk road for sub-regional access, then use the network of local roads west of the A90 to access the Proposed Development.

22 access points from public roads to the Proposed Development have been identified for construction traffic. Figure 3.1 (Volume 3) shows the location of construction traffic access points for each OHL tower. Construction traffic will arrive in the study area via the A90. This is the nearest trunk road to the Proposed Development and is an appropriate road to route construction traffic into the study area. Construction traffic will then use local roads to route between the A90 and the 22 access points identified by Balfour Beatty. The traffic and movement study area includes the public roads listed in Table 11-5.

Table 11-5 List of Study Area Roads

Road	Road Type	Speed Limit (mph)	Road Capacity (Vehicle/ Hr/ Direction)
A90 Brechin	Rural – Dual 2 Lanes	70	3,400
A90 Glamis	Rural – Dual 2 Lanes	70	3,400
A90 Dundee	Rural – Dual 2 Lanes	70	3,400
A94 Glamis	Rural – Good Single 7.3 m	60	1,200
A94 Meigle	Rural - Good Single 7.3 m	60	1,200
A928	Rural – Good Single 7.3 m	60	1,200
B954 Meigle	Rural - Typical Single 6.0 m	60	900
U100 Alyth	Rural – Poor Single 5.5 m	60	800
C11 Meigle	Rural – Poor Single 6.0 m	60	900
C445 Kirkinch	Rural – Poor Single 6.0 m	60	900
C16 Newtyle	Rural – Poor Single 6.0 m	60	900
B954 Dundee Road	Rural -Typical Single 7.3 m	60	1,200
Couston	Rural – Poor Single 4.0 m	60	140
Bonnyton Road	Rural – Poor Single 5.5 m	60	800
The Brae	Rural – Poor Single 5.5 m	60	800
Tealing Road	Rural – Poor Single 6.0 m	60	900
Emmock Road	Rural – Poor Single 6.0 m	60	900

11.5 Sensitivity of Receptors

11.5.1 In accordance with IEMA Guidelines, all study area roads are assessed for sensitivity of receptors. The results are summarised in Table 11-6. The sensitivity of receptor assessment for each study area road is provided in Part C of Appendix 11.1 (Volume 4).

Table 11-6 Study Area Roads - Sensitivity of Receptors

Road	Description	Sensitivity
A90 Brechin	Trunk road. Limited frontage or active travel provision.	Low

Road	Description	Sensitivity
A90 Glamis	Trunk road. Limited frontage or active travel provision.	Low
A90 Dundee	Trunk road. Limited frontage or active travel provision.	Low
A94 Glamis	Rural character. Limited frontage. Some active travel provision.	Low
A94 Meigle	Rural character. Frontages and active travel provision in environs of Meigle.	Medium
A928	Rural character. Limited frontage and active travel provision.	Low
B954 Meigle	Rural character. Limited frontage. Some active travel provision.	Low
U100 Alyth	Narrow road. Rural character. No frontages or active travel provision.	Low
C11 Meigle	Narrow road. Rural character. No frontages or active travel provision.	Low
C445 Kirkinch	Narrow road. Rural character. Limited frontage and active travel provision.	Low
C16 Newtyle	Narrow road. Rural character. No frontages or active travel provision.	Low
B954 Dundee Road	Rural character. Frontages and active travel provision in environs of Newtyle.	Medium
Couston	Narrow road. Rural character. No frontages or active travel provision.	Low
Bonnyton Road	Rural character. Frontages and active travel provision in Auchterhouse environs.	Low
The Brae	Rural character. Frontages and active travel provision in Auchterhouse environs.	Medium
Tealing Road	Rural character. Limited frontage and active travel provision.	Low
Emmock Road	Rural character. Limited frontage and active travel provision.	Low

11.6 Baseline Traffic

11.6.1 Baseline traffic for study area roads is derived from the following data sources:

- AECOM traffic surveys;
- Traffic Scotland National Traffic Data System (NTDS); and
- Department for Transport (DfT) traffic counts.

11.6.2 Automatic Traffic Counter (ATC) surveys were undertaken on 13 study area roads during June 2024. Figure 11.2 (Volume 3) shows the location of the ATC surveys. Part D of Appendix 11.1 (Volume 4) contains the results of the ATC surveys.

11.6.3 Subsequent to the June 2024 ATC surveys, a requirement for an additional four study area roads to be included in the environmental assessment was identified. Non-neutral months prevented additional ATC surveys being undertaken, therefore DfT and NTDS traffic data is used. Figure 11.2 (Volume 3) shows the roads where DfT and NTDS traffic data is used. Part E of Appendix 11.1 (Volume 4) contains information on the DfT and NTDS traffic data used in this assessment.

11.6.4 Construction traffic will appear on study area roads in 2026. This is the forecast year adopted for baseline traffic conditions. A TEMPro.[i] growth factor of 1.023 is applied to 2024 traffic data to produce a 2026 baseline. This TEMPro factor is effectively a 'low growth' scenario that replicates an NRTF Low Growth scenario. Appropriate TEMPro traffic growth factors are applied to DfT and NTDS traffic data to produce a 2026 Baseline. Traffic growth calculations are included within Part F of Appendix 11.1 (Volume 4).

11.6.5 Table 11-7 summarises 2026 baseline traffic for study area roads. This is total daily traffic on the road, so includes both directions of travel on two-way roads.

Table 11-7 2026 Baseline Traffic

Study Area Road	Source	Daily Car/ LGV	Daily HGV	Daily Vehicles
A90 Brechin	NTDS	19,575	3,319	22,895
A90 Glamis	DfT	22,545	2,645	25,190
A90 Dundee	DfT	20,835	3,192	24,027
A94 Glamis	AECOM	3,534	451	3,985
A94 Meigle	AECOM	3,803	288	4,091
A928	DfT	991	60	1,052
B954 Meigle	AECOM	3,369	75	3,444
U100 Alyth	AECOM	99	8	107
C11 Meigle	AECOM	711	23	733
C445 Kirkinch	AECOM	392	14	406
C16 Newtyle	AECOM	893	12	905
B954 Dundee Road	AECOM	3,355	45	3,400
Couston	AECOM	33	1	34
Bonnyton Road	AECOM	46	1	47
The Brae	AECOM	445	1	446
Tealing Road	AECOM	733	17	751
Emmock Road	AECOM	897	29	926

11.7 Proposed Development Traffic

11.7.1 Proposed Development traffic is provided by Balfour Beatty. Part G of Appendix 11.1 (Volume 4) contains Balfour Beatty data for construction traffic assigned to each of the twenty-two Proposed Development access points. Proposed Development traffic was assigned to study area roads on the basis of the most reasonable route for HGV traffic to take between the A90 and the 22 access points identified by Balfour Beatty. Table 11-8 summarises the Proposed Development traffic assigned to study area roads.

Table 11-8 Proposed Development Traffic

Study Area Road	Daily Car/ LGV	Daily HGV	Daily Vehicles
A90 Brechin	48	31	79
A90 Glamis	41	28	69
A90 Dundee	48	31	79
A94 Glamis	48	31	79
A94 Meigle	48	31	79
A928	42	25	67
B954 Meigle	42	25	67
U100 Alyth	42	25	67
C11 Meigle	38	28	66

Study Area Road	Daily Car/ LGV	Daily HGV	Daily Vehicles
C445 Kirkinch	38	28	66
C16 Newtyle	48	31	79
B954 Dundee Road	48	31	79
Couston	48	31	79
Bonnyton Road	48	31	79
The Brae	48	31	79
Tealing Road	48	31	79
Emmock Road	48	31	79

11.8 Roads Included in Assessment

11.8.1 IEMA Guidelines Rule 1 and Rule 2 are applied to study area roads to identify which roads are to be assessed for environmental effects. Table 11-9 summarises the Rule 1 and Rule 2 findings and identifies study area roads to be assessed for environmental effects (Yes) and the roads to be excluded (No).

Table 11-9 Study Area Roads to be Assessed for Environmental Effects

Study Area Road	Baseline		Development		% Increase		Include in Assessment
	HGV	All Veh	HGV	All Veh	HGV	All Veh	(Yes / No)
A90 Brechin	3,319	22,895	31	79	1%	0%	No
A90 Glamis	2,645	25,190	28	69	1%	0%	No
A90 Dundee	3,192	24,027	31	79	1%	0%	No
A94 Glamis	451	3,985	31	79	7%	2%	No
A94 Meigle	288	4,091	31	79	11%	2%	No
A928	60	1,052	25	67	41%	6%	Yes
B954 Meigle	75	3,444	25	67	33%	2%	Yes
U100 Alyth	8	107	25	67	306%	62%	Yes
C11 Meigle	23	733	28	66	124%	9%	Yes
C445 Kirkinch	14	406	28	66	196%	16%	Yes
C16 Newtyle	12	905	31	79	253%	9%	Yes
B954 Dundee Road	45	3,400	31	79	69%	2%	Yes
Couston	1	34	31	79	3,031%	234%	Yes
Bonnyton Road	1	47	31	79	3,031%	168%	Yes
The Brae	1	446	31	79	3,031%	18%	Yes
Tealing Road	17	751	31	79	178%	11%	Yes
Emmock Road	29	926	31	79	108%	9%	Yes

11.8.2 Table 11-9 shows that twelve study area roads are be assessed for environmental effects. The five Roads that do not meet Rule1 and Rule 2 thresholds are not considered any further in terms of traffic and movement environmental effects resulting from the Proposed Development.

11.9 Effects Scoped Out

11.9.1 Of the IEMA Guidelines environmental effects listed in Section 11.3.7 only Hazardous Loads are scoped out. For hazardous loads it is considered unlikely there will be material construction traffic whose loads would fall within the current classifications for carriage of dangerous goods (Class 1-9). Large loads (abnormal indivisible loads) are not specifically identified within the Balfour Beatty supplied construction traffic forecast, and as such are not considered in this assessment. It is likely that most HGV construction traffic accessing the Proposed Development will be road-legal vehicles in accordance with The Road Vehicles (Construction and Use) Regulations 1986.

11.10 Assessment of Environmental Effects

Severance of Communities

11.10.1 Severance of communities is the perceived division that can occur when they become separated by major existing or proposed traffic routes. Magnitude of change is derived from traffic increases generated by the Proposed Development, classified in accordance with Table 11-3. Table 11-10 shows severance of communities' significance of effects for study area roads.

Table 11-10 Severance of Communities

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A928	Low	6%	Negligible	Negligible
B954 Meigle	Low	2%	Negligible	Negligible
U100 Alyth	Low	62%	Medium	Minor
C11 Meigle	Low	9%	Negligible	Negligible
C445 Kirkinch	Low	16%	Negligible	Negligible
C16 Newtyle	Low	9%	Negligible	Negligible
B954 Dundee Road	Medium	2%	Negligible	Negligible
Couston	Low	234%	High	Moderate
Bonnyton Road	Low	168%	High	Moderate
The Brae	Medium	18%	Negligible	Negligible
Tealing Road	Low	11%	Negligible	Negligible
Emmock Road	Low	9%	Negligible	Negligible

11.10.2 Table 11-10 shows that prior to mitigation, the maximum effect of Proposed Development traffic on severance of communities is a temporary, short-term, **Moderate (Significant)** effect on Couston and Bonnyton Road. This is primarily due to the high magnitude of change (increase in traffic) that results from the very low baseline traffic carried by these roads. IEMA Guidelines caution that roads with very low baseline traffic flows are unlikely to experience environmental effects (on severance) even with high percentage changes in traffic.

11.10.3 For all other roads Table 11-10 shows the effect of Proposed Development traffic on severance of communities is temporary, short-term, **Negligible (Not Significant)** or temporary, short-term, **Minor (Not Significant)**.

Fear and Intimidation on and by Road Users

11.10.4 Fear and Intimidation on and by road users is the perceived vulnerability of pedestrian traffic relating to changes in traffic flows and or speed. The fear and intimidation assessment uses the IEMA Guidelines degree of hazard/

step-change methodology which is included at Part H of Appendix 11.1 Transport Assessment. Fear and intimidation on and by road users significance of effects for study area roads is shown in Table 11-11.

Table 11-11 Fear and Intimidation on and by Road Users

Road	Sensitivity of Receptor	Step Change	Magnitude of Change	Significance of Effect
A928	Low	No Change	Negligible	Negligible
B954 Meigle	Low	No Change	Negligible	Negligible
U100 Alyth	Low	No Change	Negligible	Negligible
C11 Meigle	Low	No Change	Negligible	Negligible
C445 Kirkinch	Low	No Change	Negligible	Negligible
C16 Newtyle	Low	No Change	Negligible	Negligible
B954 Dundee Road	Medium	No Change	Negligible	Negligible
Couston	Low	No Change	Negligible	Negligible
Bonnyton Road	Low	No Change	Negligible	Negligible
The Brae	Medium	No Change	Negligible	Negligible
Tealing Road	Low	No Change	Negligible	Negligible
Emmock Road	Low	No Change	Negligible	Negligible

11.10.5 Table 11-11 shows that prior to mitigation the effect of Proposed Development traffic on fear and intimidation is a temporary, short-term, **Negligible (Not Significant)** effect on study area roads. This is a result of there being no step change in traffic flows or associated levels of fear and intimidation as set out in IEMA Guidelines. With no step change IEMA Guidelines stipulate that fear and intimation magnitude of change is negligible. This results in the corresponding negligible effect on study area roads.

Road User and Pedestrian Safety

11.10.6 Road user and pedestrian safety assesses environmental effects based on rate and severity of accidents relating to changes in traffic flows. Recorded injury accidents for the four-year period 2020-2023 were used to calculate an accident rate by severity (slight, serious, fatal) per million vehicle kilometres travelled on study area roads. Proposed Development vehicle kilometres by study area road are applied to the accident rates to produce a forecast of accidents by severity. Part I of Appendix 11.1 (Volume 4) details the forecast of accidents by severity calculation.

11.10.7 Road user and pedestrian safety magnitude of change for each study area road is assessed as follows. Zero injury accidents correspond to negligible. One or less slight injury accident corresponds to Low. More than one slight injury accident corresponds to medium. Any serious or fatal injury accident corresponds to high. Road user and pedestrian safety significance of effects for study area roads is shown in Table 11-12.

Table 11-12 Road User and Pedestrian Safety

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Severe	Fatal		
A928	Low	0.1	0	0	Low	Negligible
B954 Meigle	Low	0	0	0	Negligible	Negligible
U100 Alyth	Low	0	0	0	Negligible	Negligible

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Severe	Fatal		
C11 Meigle	Low	0	0	0	Negligible	Negligible
C445 Kirkinch	Low	0	0	0	Negligible	Negligible
C16 Newtyle	Low	0	0	0	Negligible	Negligible
B954 Dundee Road	Medium	0	0	0	Negligible	Negligible
Couston	Low	0	0	0	Negligible	Negligible
Bonnyton Road	Low	0	0	0	Negligible	Negligible
The Brae	Medium	0	0	0	Negligible	Negligible
Tealing Road	Low	0.1	0	0	Low	Negligible
Emmock Road	Low	0.1	0	0	Low	Negligible

11.10.8 Table 11-12 shows that prior to mitigation the effect of Proposed Development traffic on road user and pedestrian safety is a temporary, short-term, **Negligible (Not Significant)** effect on study area roads. This is a result of zero serious or fatal injury accidents forecast from Proposed Development traffic, and substantially less than one slight injury accident only forecast across study area roads.

Non-motorised User Amenity

11.10.9 Non-motorised user amenity is broadly defined as the relative pleasantness of a pedestrian or cycle journey. The potential for environmental effects relates to changes in traffic flow and composition. IEMA Guidelines reference historic thresholds for judging changes in pedestrian amenity, namely where traffic flow (or HGV component) has halved or doubled. IEMA Guidelines also state these thresholds are expressed as a starting point for any assessment.

11.10.10 Non-motorised user amenity magnitude of change is derived from traffic increases generated by the Proposed Development, classified in accordance with Table 11-3. Non-motorised user amenity significance of effects for study area roads is shown in Table 11-13.

Table 11-13 Non-motorised User Amenity

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A928	Low	6%	Negligible	Negligible
B954 Meigle	Low	2%	Negligible	Negligible
U100 Alyth	Low	62%	Medium	Minor
C11 Meigle	Low	9%	Negligible	Negligible
C445 Kirkinch	Low	16%	Negligible	Negligible
C16 Newtyle	Low	9%	Negligible	Negligible
B954 Dundee Road	Medium	2%	Negligible	Negligible
Couston	Low	234%	High	Moderate
Bonnyton Road	Low	168%	High	Moderate
The Brae	Medium	18%	Negligible	Negligible
Tealing Road	Low	11%	Negligible	Negligible

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
Emmock Road	Low	9%	Negligible	Negligible

11.10.11 Table 11-13 shows that prior to mitigation the maximum effect of Proposed Development traffic on non-motorised user amenity is a temporary, short-term, **Moderate (Significant)** effect on Couston and Bonnyton Road. This is primarily due to the high magnitude of change (increase in traffic) that results from the very low Baseline traffic carried by these roads. IEMA Guidelines caution that roads with very low baseline traffic flows are unlikely to experience environmental effects (on non-motorised amenity) even with high percentage changes in traffic.

11.10.12 For all other roads Table 11-13 shows the effect of Proposed Development traffic on non-motorised user amenity is temporary, short-term, **Negligible (Not Significant)** or temporary, short-term, **Minor (Not Significant)**.

Non-motorised User Delay

11.10.13 Non-motorised user delay is broadly defined as the effect on travel time of a pedestrian or cycle journey. The potential for environmental effects relates to changes in traffic flow and composition. IEMA Guidelines state that pedestrian delay and severance are closely related effects and can be grouped together. As such, magnitude of change for non-motorised user delay is derived from traffic increases generated by the Proposed Development, classified in accordance with Table 11-3. Non-motorised user delay significance of effects for study area roads is shown in Table 11-14.

Table 11-14 Assessment of Non-motorised User Delay

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A928	Low	6%	Negligible	Negligible
B954 Meigle	Low	2%	Negligible	Negligible
U100 Alyth	Low	62%	Medium	Minor
C11 Meigle	Low	9%	Negligible	Negligible
C445 Kirkinch	Low	16%	Negligible	Negligible
C16 Newtyle	Low	9%	Negligible	Negligible
B954 Dundee Road	Medium	2%	Negligible	Negligible
Couston	Low	234%	High	Moderate
Bonnyton Road	Low	168%	High	Moderate
The Brae	Medium	18%	Negligible	Negligible
Tealing Road	Low	11%	Negligible	Negligible
Emmock Road	Low	9%	Negligible	Negligible

11.10.14 Table 11-14 shows that prior to mitigation the maximum effect of Proposed Development traffic on non-motorised user delay is a temporary, short-term, **Moderate (Significant)** effect on Couston and Bonnyton Road. This is primarily due to the high magnitude of change (increase in traffic) that results from the very low Baseline traffic carried by these roads. IEMA Guidelines caution that roads with very low baseline traffic flows are unlikely to experience environmental effects (on non-motorised delay) even with high percentage changes in traffic.

11.10.15 For all other roads Table 11-14 shows the effect of Proposed Development traffic on non-motorised user amenity is temporary, short-term, **Negligible (Not Significant)** or temporary, short-term, **Minor (Not Significant)**.

Road Vehicle Driver and Passenger Delay

11.10.16 Road vehicle driver and passenger delay is broadly defined as the effect on travel time of a vehicle journey. The potential for environmental effects relates to changes in traffic flow and composition, noting that detailed vehicle capacity evaluations of study area roads and junctions do not inform this assessment.

11.10.17 IEMA Guidelines mention that delays to non-development traffic can occur at many points on a network surrounding a development site. This can include site entrances, roads passing development sites, key junctions, and side roads where the ability to find gaps in traffic may be reduced due to the presence of development traffic. IEMA Guidelines note that delays are only likely to be significant when traffic on the network around the development site is already at, or close to capacity.

11.10.18 Detailed capacity assessments of study area roads or junctions has not been undertaken to inform this assessment. The predominantly rural nature of study area roads is an indicator that roads and junctions surrounding the Proposed Development are unlikely to be at, or close to, capacity. As such, magnitude of change for road vehicle driver and passenger delay is based on a simple percentage utilisation of study area roads daily capacity which is included at Part J of Appendix 11.1 (Volume 4). Road vehicle driver and passenger delay is then classified in accordance with Table 11-3 and the resulting significance of effects for study area roads is shown in Table 11-15.

Table 11-15 Road Vehicle Driver and Passenger Delay

Road	Sensitivity of Receptor	Increase in Utilisation of Daily Road Capacity	Magnitude of Change	Significance of Effect
A928	Low	0.2%	Negligible	Negligible
B954 Meigle	Low	0.3%	Negligible	Negligible
U100 Alyth	Low	0.3%	Negligible	Negligible
C11 Meigle	Low	0.3%	Negligible	Negligible
C445 Kirkinch	Low	0.3%	Negligible	Negligible
C16 Newtyle	Low	0.4%	Negligible	Negligible
B954 Dundee Road	Medium	0.3%	Negligible	Negligible
Couston	Low	2.4%	Negligible	Negligible
Bonnyton Road	Low	0.4%	Negligible	Negligible
The Brae	Medium	0.4%	Negligible	Negligible
Tealing Road	Low	0.4%	Negligible	Negligible
Emmock Road	Low	0.4%	Negligible	Negligible

11.10.19 Table 11-15 shows that prior to mitigation the effect of Proposed Development traffic on road vehicle driver and passenger delay is a temporary, short-term, **Negligible (Not Significant)** effect on study area roads. This is a result of the very small increases in utilisation of daily road capacity forecast to result from the presence of Proposed Development traffic.

11.11 Mitigation and Residual Effects

Mitigation

11.11.1 Mitigation measures for Proposed Development traffic will be focused on access to and from public roads, and a Construction Traffic Management Plan (CTMP) to control and minimise effects of vehicle movements to and from the Proposed Development.

11.11.2 Figure 3.1 (Volume 3) shows the location of 22 access points on public roads encompassing:

- five existing access points where no bell mouth upgrades required;
- 15 existing access points where bell mouth upgrades are proposed; and
- two new temporary access points where bell mouths will be provided.

11.11.3 All of the above access points will have road geometry to accommodate Proposed Development traffic safely and efficiently. This will include access junction layouts (bell mouths) suitable for HGV traffic. Temporary traffic management will operate at each access point to control the movement of Proposed Development traffic. This will include control measures to preclude development traffic standing on public roads in the vicinity of access points, and measures to control the safe release of development traffic from access points onto public roads.

11.11.4 A CTMP will operate throughout the duration of the construction programme. Part K of Appendix 5.1 (Volume 4) contains a Framework CTMP. A detailed CTMP is expected to be Conditioned and provided once a Principal Contractor is appointed. The detailed CTMP would encompass:

- site entry/ exit arrangements from public roads;
- traffic routing plans – defining the routes to be used by HGV traffic cognisant of sensitive receptors, and width, height, or weight restrictions on the public road network;
- construction traffic hours and delivery times, including timing restrictions if required;
- measures to protect public roads and public road users (e.g. wheel wash facilities);
- measures for monitoring the CTMP to ensure compliance and appropriate actions in the event of non-compliance; and
- mechanism for reporting and responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant road authorities.

Post Mitigation Residual Effects

Severance of Communities

11.11.5 Mitigation will seek to reduce any high magnitude of change to medium in the vicinity of sensitive receptors. The corresponding post mitigation change to significant severance of communities effects reported at Section 11.10.2 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Couston and Bonnyton Road.

Fear and Intimidation on and by Road Users

11.11.6 Fear and intimidation on and by road users. Mitigation will seek to reinforce the reported magnitudes of change in the vicinity of sensitive receptors. Post mitigation effects for fear and intimidation will continue to be temporary, short-term, **Negligible (Not Significant)** on study area roads.

Road User and Pedestrian Safety

11.11.7 Mitigation will seek to reinforce the reported magnitudes of change in the vicinity of sensitive receptors. Post mitigation effects for road user and pedestrian safety will continue to be temporary, short-term, **Negligible (Not Significant)** on study area roads.

Non-motorised User Amenity

11.11.8 Mitigation will seek to reduce any high magnitude of change to medium magnitude in the vicinity of sensitive receptors. The corresponding post-mitigation change to significant non-motorised user amenity effects reported in Section 11.10.11 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Couston and Bonnyton Road.

Non-motorised User Delay

11.11.9 Mitigation will seek to reduce any high magnitude of change to medium in the vicinity of sensitive receptors. The corresponding post mitigation change to significant non-motorised user delay effects reported in Section 11.10.14 will be a shift to temporary, short-term**, Minor (Not Significant)** effects on Couston and Bonnyton Road.

Road Vehicle Driver and Passenger Delay

11.11.10 Mitigation will seek to reinforce the reported magnitudes of change in the vicinity of sensitive receptors. Post mitigation effects for road vehicle driver and passenger delay will continue to be temporary, short-term, **Negligible (Not Significant)** on study area roads.

11.12 Cumulative Assessment

11.12.1 Cumulative projects to be considered are listed in Chapter 5: EIA Approach and Methodology (Volume 2) of this EIA Report. The cumulative assessment first considers intra-developments, and then expands the assessment to consider inter-developments.

11.12.2 A number of cumulative projects are in the early stages of their respective planning processes, and traffic forecasts are currently not available for some. Five cumulative projects without traffic forecasts are BESS developments. The traffic generation of these BESS developments is assumed to match the forecast daily traffic of the Tealing Battery Energy Storage Farm, a BESS site for which traffic data is available. Two other sites for which traffic data is not available are a substation and OHL tie-in. For these two developments daily traffic forecasts from similar projects are used in this cumulative assessment.

11.12.3 Unless a construction traffic route has been specified within published documents for a cumulative development, a reasonable assumption is made on which study area roads are likely to be used by cumulative development traffic.

Intra-Development Cumulative Assessment

11.12.4 Study area roads have been assessed for IEMA Guidelines Rule 1 and Rule 2 for intra-development cumulative traffic as shown in Table 11-16. The assignment of intra-development traffic to study area roads, and resulting percentage increases in traffic are included at Part L of Appendix 11.1 (Volume 4).

Table 11-16 Intra-Development Cumulative Assessment Roads to be Assessed

Study Area Road	Proposed Development		Intra-Development		Include in Assessment
	HGV	All Vehicles	HGV	All Vehicles	(Yes / No)
A90 Brechin	1%	0%	2%	1%	N
A90 Glamis	1%	0%	2%	1%	N
A90 Dundee	1%	0%	6%	2%	N
A94 Glamis	7%	2%	14%	4%	N

Study Area Road	Proposed Development		Intra-Development		Include in Assessment
	HGV	All Vehicles	HGV	All Vehicles	(Yes / No)
A94 Meigle	11%	2%	11%	2%	N
A928	41%	6%	93%	14%	Y
B954 Meigle	33%	2%	33%	2%	Y
U100 Alyth	306%	62%	306%	62%	Y
C11 Meigle	124%	9%	124%	9%	Y
C445 Kirkinch	196%	16%	196%	16%	Y
C16 Newtyle	253%	9%	253%	9%	Y
B954 Dundee Road	69%	2%	138%	5%	Y
Couston	3031%	234%	3031%	234%	Y
Bonnyton Road	3031%	168%	3031%	168%	Y
The Brae	3031%	18%	3031%	18%	Y
Tealing Road	178%	11%	535%	36%	Y
Emmock Road	108%	9%	632%	54%	Y

11.12.5 Table 11-16 shows that 12 roads must be included in the intra-development cumulative assessment. Table 11-17 summarises the forecast significance of effects for cumulative intra-development prior to mitigation.

Table 11-17 Intra-Development Cumulative Assessment Significance Environmental Effects

Study Area Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
A928	Negligible	Negligible	Negligible	Negligible	Negligible
B954 Meigle	Negligible	Negligible	Negligible	Negligible	Negligible
U100 Alyth	Minor	Negligible	Negligible	Minor	Minor
C11 Meigle	Negligible	Negligible	Negligible	Negligible	Negligible
C445 Kirkinch	Negligible	Negligible	Negligible	Negligible	Negligible
C16 Newtyle	Negligible	Negligible	Negligible	Negligible	Negligible
B954 Dundee Road	Negligible	Negligible	Negligible	Negligible	Negligible
Couston	Moderate	Negligible	Negligible	Moderate	Moderate
Bonnyton Road	Moderate	Negligible	Negligible	Moderate	Moderate
The Brae	Negligible	Negligible	Negligible	Negligible	Negligible
Tealing Road	Negligible	Negligible	Negligible	Negligible	Negligible
Emmock Road	Negligible	Negligible	Negligible	Negligible	Negligible

11.12.6 Table 11-17 shows that Couston and Bonnyton Road are forecast to experience a temporary, short term, **Moderate Adverse (Significant)** effect in terms of severance of communities, non-motorised user amenity, non-motorised user delay, and road vehicle driver and passenger delay. Other environmental effects across all study

area roads are forecast to be, temporary, short term, **Negligible (Not Significant)** or temporary, short term, **Minor Adverse (Not Significant)** effects.

11.12.7 Mitigation of the significant effects shown in Table 11-17 will primarily be through co-ordination of construction traffic management plans. Co-ordination will endeavour to reduce any high magnitude of change to medium in the vicinity of sensitive receptors. The corresponding post mitigation change to significant effects reported at Section 11.12.6 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Couston and Bonnyton Road.

Inter-Development Cumulative Assessment

11.12.8 Study area roads have been assessed for IEMA Guidelines Rule 1 and Rule 2 for inter-development cumulative traffic as shown in Table 11-18. The assignment of inter-development traffic to study area roads, and resulting percentage increases in traffic are included in Part L of Appendix 11.1 (Volume 4).

Table 11-18 Inter-Development Cumulative Assessment Roads to be Assessed

Study Area Road	Proposed Development		Inter-Development		Include in Assessment
	HGV	All Veh	HGV	All Veh	(Yes / No)
A90 Brechin	1%	0%	3%	1%	N
A90 Glamis	1%	0%	4%	1%	N
A90 Dundee	1%	0%	14%	5%	N
A94 Glamis	7%	2%	24%	6%	N
A94 Meigle	11%	2%	11%	2%	N
A928	41%	6%	172%	21%	Y
B954 Meigle	33%	2%	33%	2%	Y
U100 Alyth	306%	62%	306%	62%	Y
C11 Meigle	124%	9%	124%	9%	Y
C445 Kirkinch	196%	16%	196%	16%	Y
C16 Newtyle	253%	9%	253%	9%	Y
B954 Dundee Road	69%	2%	138%	5%	Y
Couston	3031%	234%	3031%	234%	Y
Bonnyton Road	3031%	168%	3031%	168%	Y
The Brae	3031%	18%	3031%	18%	Y
Tealing Road	178%	11%	535%	36%	Y
Emmock Road	108%	9%	1002%	89%	Y

11.12.9 Table 11-18 shows that 12 roads must be included in the inter-development cumulative assessment. Table 11-19 summarises the forecast significance of effects for intra-development cumulative development prior to mitigation.

Table 11-19 Inter-Development Cumulative Assessment Significance of Effects

Study Area Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
A928	Negligible	Negligible	Minor	Negligible	Negligible
B954 Meigle	Negligible	Negligible	Negligible	Negligible	Negligible
U100 Alyth	Minor	Negligible	Negligible	Minor	Minor
C11 Meigle	Negligible	Negligible	Negligible	Negligible	Negligible
C445 Kirkinch	Negligible	Negligible	Negligible	Negligible	Negligible
C16 Newtyle	Negligible	Negligible	Negligible	Negligible	Negligible
B954 Dundee Road	Negligible	Negligible	Negligible	Negligible	Negligible
Couston	Moderate	Negligible	Negligible	Moderate	Moderate
Bonnyton Road	Moderate	Negligible	Negligible	Moderate	Moderate
The Brae	Negligible	Negligible	Negligible	Negligible	Negligible
Tealing Road	Negligible	Negligible	Negligible	Negligible	Negligible
Emmock Road	Negligible	Negligible	Moderate	Negligible	Negligible

11.12.10 Table 11-19 shows that Couston and Bonnyton Road are forecast to experience a temporary, short term, **Moderate Adverse (Significant)** effect in terms of severance of communities, non-motorised user amenity, non-motorised user delay, and road vehicle driver and passenger delay. Other environmental effects across all study area roads are forecast to be, temporary, short term, **Negligible (Not Significant)** or temporary, short term, **Minor Adverse (Not Significant)** effects.

11.12.11 Mitigation of the significant effects shown in Table 11-19 will primarily be through co-ordination of construction traffic management plans and appropriate site access arrangements to/from public roads. Co-ordination will endeavour to reduce any high magnitude of change to medium in the vicinity of sensitive receptors by co-ordinating where possible the use of study area roads by construction vehicles to avoid spikes in daily HGV traffic resulting from cumulative development. The corresponding post mitigation change to significant effects reported at Section 11.12.10 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Couston and Bonnyton Road.

11.13 Summary of Mitigation Measures

11.13.1 Table 11-20 summarises proposed mitigation measures for traffic and movement.

Table 11-20 Summary of Traffic and Movement Mitigation Measures

Mitigation Item	Location	Timing of Measure	Description	Mitigation purpose/ Objective	Specific consultation or Approval Required	Potential Monitoring Requirements
T1	Study area roads	Duration of construction programme	Control of construction vehicle activities on public roads.	Reduce magnitude of change/ increase in traffic on study area roads.	Detailed CTMP to be approved by relevant roads authorities.	Reporting mechanism for construction traffic not adhering to CTMP routes or

						time restrictions.
T2	Study area roads	Enabling works	Provide upgraded or new bell mouths to form appropriate access to / from public roads.	Control movement of construction traffic to/ from public roads in safe and efficient manner.	Designs to be approved by relevant roads authorities.	Potential requirement for traffic management staff to manually control development traffic at access points.