Environmental Impact Assessment (EIA) Report

LT384 Tealing to Westfield Overhead Line (OHL) 400 kV Upgrade

November 2024

VOLUME 2: CHAPTER 12 - TRAFFIC AND TRANSPORT

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12. TRAFFIC AND TRANSPORT

12.1 Introduction

12.1.1 This chapter considers the environmental effects of traffic and movement 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, July2023 (the 'IEMA Guidelines').

12.1.2 The focus of this chapter is the environmental effects of construction traffic generated by the Proposed Development. Once operational, the Proposed Development will only generate occasional maintenance traffic and therefore is excluded from environmental assessment.

12.1.3 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.

12.1.4 Table 12-1 lists the figures and supporting documents referenced throughout this chapter.

Table 12-1 Figures and Supporting Documents

Title	Description
Figure 12.1 (Volume 3)	Study Area Roads
Figure 12.2 (Volume 3)	Traffic Survey Locations
Appendix 12.1 (Volume 4)	Transport and Movement

12.1.5 Scoping Responses from relevant authorities on roads related matters are provided in Part A of Appendix 12.1 (Volume 4).

Limitations and Assumptions

12.1.6 Traffic surveys commissioned by AECOM only cover twenty-nine of the thirty-eight study area roads eventually forecast to carry Proposed Development traffic. Department for Transport (DfT) and Traffic Scotland National Traffic Data System (NTDS) traffic counts are used for nine study area roads.

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

12.1.8 Some developments identified for inclusion in cumulative assessments are at an early stage in their respective planning processes and so no traffic forecasts are available for them.

12.2 Legislation and Policy

12.2.1 Relevant transport policy and legislation is listed below and summarised with regard to the Proposed Development in Part B of Appendix 12.1 (Volume 4).

- 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;
- Dundee Local Development Plan 2019[1]; and,
- Fife Local Development Plan 2017.

12.3 Assessment Methodology and Significance Criteria

12.3.1 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.

12.3.2 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.

12.3.3 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;

[1] Whilst the Proposed Development does not fall within the Dundee City Council area, roads within this will be used by the traffic generated by the Proposed Development

- Collision clusters and routes with road safety concerns; and,
- Junctions and highway links at (or over capacity).

12.3.4 For each road the result of the sensitivity of receptor assessment is classified in accordance with Table 12-2.

Table 12-2 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.

12.3.5 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.

12.3.6 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 Erom 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.

12.3.7 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 Scoping Report.

12.3.8 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 12-3 reflects IEMA Guidelines to quantify the magnitude of change for Proposed Development traffic.

Table 12-3 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.

12.3.9 The Table 12-3 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.

12.3.10 For Proposed Development traffic the significance of environmental effects is derived from a combination of magnitude of change and sensitivity of receptor. Table 12-4 summarises the derivation of significance of effects.

Table 12-4 Significance of Environmental Effects

Magnitude of Change	Sensitivity of Receptor				
	Very High	High	Medium	Low	Negligible
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

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

12.3.12 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- / medium- / 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.

12.4 Identification of Study Area Roads

12.4.1 The Proposed Development includes the uprating of an existing OHL, from Tower 182 (west of the existing Tealing Substation) to the shared boundary with SPEN (mid span of Towers 66 and 65), as well as access tracks and other associated development (see Chapter 3: Project Description (Volume 2)). Construction traffic will require access to 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 12.1 (Volume 3) shows the traffic and movement study area for the Proposed Development. Construction traffic will use the M90 Motorway and A90 trunk road for sub-regional access, then use the network of local roads to access the Proposed Development.

12.4.2 Sixty-two 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 to be used for the Proposed Development. Construction traffic will arrive in the study area via the M90 and A90. These are the nearest strategic roads to the Proposed Development and are appropriate for routing construction traffic into the study area. Construction traffic will then use local roads to route from the M90 and A90 to the 62 access points identified by Balfour Beatty. The traffic and movement study area includes the public roads listed in Table 12-5.

Table 12-5 List of Study Area Roads

Road	Road Type	Speed Limit (mph)	Road Capacity (veh / hr / direction)
A90 Dundee	Rural – Dual 2 Lanes	70	3,400
Emmock Road	Rural – Typical Single 6.0 m	60	900
Tealing Road	Rural – Typical Single 6.0 m	60	900
Bridgefoot	Rural – Poor Single 5.5 m	60	800
U324 Jeanfield	Rural – Poor Single 4.0 m	60	140
U333 Dronley	Rural – Poor Single 5.5 m	60	800
Dronley Burn	Rural – Poor Single 5.5 m	60	800
East Adamston	Rural – Poor Single 4.0 m	60	140
B954	Rural -Typical Single 7.3 m	60	1,200
A923 Coupar Angus	Rural – Good Single 7.3 m	60	1,200
A923 Piperdam	Rural -Typical Single 7.3 m	60	1,200
Benvie Road	Rural – Poor Single 5.5 m	60	800
Berryhill Road	Rural – Poor Single 5.5 m	60	800

Road	Road Type	Speed Limit (mph)	Road Capacity (veh / hr / direction)
Main Street	Rural -Typical Single 7.3 m	60	1,200
The Drive	Rural – Poor Single 4.0 m	60	140
U143 Castle Huntly	Rural – Poor Single 5.5 m	60	800
Moncur Road	Rural – Typical Single 6.0 m	60	900
Inchture Station	Urban – Single 7.3 m	30	800
Horn Road	Rural -Typical Single 7.3 m	60	1,200
Errol Station	Rural – Typical Single 6.0 m	60/ 40	900
U155 Inchcoonans	Rural – Poor Single 5.5 m	60	800
North Murie	Rural – Poor Single 5.5 m	60	800
U155 Glendoick	Rural – Poor Single 4.0 m	60	140
Ross Road	Rural – Poor Single 4.0 m	60	140
C484 St Madoes	Urban – Single 6.0 m	30	800
Cairnie Road	Urban – Single 6.0 m	30	800
Inchyra Road	Rural – Poor Single 4.0 m	60	140
A90 Kingsway	Urban – Dual 2	40	3,000
A90	Rural – Dual 2 Lanes	70	3,400
M90	Rural – Motorway – D2	70	3,800
A912 Bridge of Earn	Urban – Single 7.3 m	30	800
A912 Aberagie	Rural -Typical Single 7.3 m	60	1,200
A913	Rural -Typical Single 7.3 m	60	1,200
Easter Rhynd Road	Rural – Poor Single 5.5 m	60	800
Ferryfield Road	Rural – Poor Single 4.0 m	60	140
A91	Rural -Typical Single 7.3 m	60	1,200
B936 Burnside	Urban – Single 6.0 m	30	800
U093 Lochmill Loch	Rural – Poor Single 4.0 m	60	140

12.5 Sensitivity of Receptors

12.5.1 In accordance with IEMA Guidelines all study area roads are assessed for sensitivity of receptors. The results are summarised in Table 12-6. The sensitivity of receptor assessment for each study area road is provided in Part C of Appendix 12.1 (Volume 4).

Table 12-6 Road Link Sensitivity of Receptors

Road	Description	Sensitivity
A90 Dundee	Trunk road. No frontage. No active travel provision.	Low
Emmock Road	Rural. Limited frontage. Limited active travel provision.	Low
Tealing Road	Rural. Limited frontage. Limited active travel provision.	Low
Bridgefoot	Rural. No frontage. No active travel provision.	Low
U324 Jeanfield	Rural. No frontage. No active travel provision.	Low
U333 Dronley	Rural. No frontage. No active travel provision.	Low
Dronley Burn	Rural. No frontage. No active travel provision.	Low
East Adamston	Rural. No frontage. No active travel provision.	Negligible
B954	Rural. No frontage. No active travel provision.	Low
A923 Muirhead	Rural/Urban. Extensive frontage. Extensive active travel provision.	Medium
A923 Piperdam	Rural. Frontage and active travel provision at Newtyle.	Low
Benvie Road	Rural. Limited frontage. Limited active travel provision.	Low
Berryhill Road	Rural. Limited frontage. Limited active travel provision.	Low
Main Street	Rural. Limited frontage. Limited active travel provision.	Low
The Drive	Rural. Limited frontage. Limited active travel provision.	Low
U143 Castle Huntly	Rural. No frontage. No active travel provision.	Low
Moncur Road	Urban. Extensive frontage. Extensive active travel provision.	Medium
Inchture Station	Rural. Limited frontage. No active travel provision.	Low
Horn Road	Rural. Limited frontage. No active travel provision.	Low
Errol Station	Rural. Limited frontage. Limited active travel provision.	Low
U155 Inchcoonans	Rural. No frontage. No active travel provision.	Low
North Murie	Rural. No frontage. No active travel provision.	Low
U155 Glendoick	Rural. Limited frontage. No active travel provision.	Low
Ross Road	Rural. Limited frontage. No active travel provision.	Low
C484 St Madoes	Urban. Extensive frontage. Extensive active travel provision.	Medium
Cairnie Road	Urban. Extensive frontage. Extensive active travel provision.	Medium
Inchyra Road	Rural. Limited frontage. Limited active travel provision.	Low
A90 Kingsway	Urban. Extensive frontage. Extensive active travel provision.	Medium
A90	Rural. Limited frontage. Limited active travel provision.	Low
M90	Rural. No frontage. No active travel provision.	Low

Road	Description	Sensitivity
A912 Bridge of Earn	Rural/Urban. Extensive frontage. Extensive active travel provision.	Medium
A912 Aberagie	Rural. No frontage. No active travel provision.	Low
A913	Rural/Urban. Extensive frontage. Extensive active travel provision.	Medium
Easter Rhynd Road	Rural. Limited frontage. No active travel provision.	Low
Ferryfield Road	Rural. Limited frontage. No active travel provision.	Low
A91	Rural/Urban. Extensive frontage. Extensive active travel provision.	Medium
B936 Burnside	Rural/Urban. Extensive frontage. Extensive active travel provision.	Medium
U093 Lochmill Loch	Rural. Limited frontage. No active travel provision.	Low

12.6 Baseline Traffic

12.6.1 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.

12.6.2 Automatic Traffic Counter (ATC) surveys were undertaken on 29 study area roads during June 2024. Figure 12.2 (Volume 3) shows the location of the ATC surveys. Part D of Appendix 12.1 (Volume 4) contains the results of the ATC surveys.

12.6.3 Subsequent to the June 2024 ATC surveys, a requirement for an additional nine 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 12.2 (Volume 3) shows the roads where DfT and NTDS traffic data is used. Part E of Appendix 12.1 (Volume 4) contains information on the DfT and NTDS traffic data used in this assessment.

12.6.4 Construction traffic will appear on study area roads in 2026. This is the forecast year adopted for Baseline traffic conditions. A TEMPro[2] 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 12.1 (Volume 4).

12.6.5 Table 12-7 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.

[2] Trip End Model Presentation Program software

Table 12-7 2026 Baseline Traffic

Study Area Road	Source	Daily Car/ LGV	Daily HGV	Daily Vehicles
A90 Dundee	DfT	20,638	3,163	23,801
Emmock Road	AECOM	889	28	917
Tealing Road	AECOM	727	17	744
Bridgefoot	AECOM	480	7	487
U324 Jeanfield	AECOM	480	7	487
U333 Dronley	AECOM	161	3	164
Dronley Burn	AECOM	161	3	164
East Adamston	AECOM	161	3	164
B954	AECOM	3,853	52	3,905
A923 Muirhead	DfT	9,368	263	9,631
A923 Piperdam	AECOM	5,052	77	5,129
Benvie Road	AECOM	471	6	477
Berryhill Road	AECOM	131	5	136
Main Street	AECOM	1,380	34	1,414
The Drive	AECOM	694	5	699
U143 Castle Huntly	AECOM	694	5	699
Moncur Road	AECOM	1,199	46	1,245
Inchture Station	AECOM	1,199	46	1,245
Horn Road	AECOM	1,549	85	1,634
Errol Station	AECOM	1,549	85	1,634
U155 Inchcoonans	AECOM	832	26	858
North Murie	AECOM	124	4	128
U155 Glendoick	AECOM	832	26	858
Ross Road	AECOM	124	4	128
C484 St Madoes	NTDS	1,473	27	1,500
Cairnie Road	AECOM	1,349	81	1,430
Inchyra Road	AECOM	358	3	361
A90 Kingsway	NTDS	36,387	6,983	43,370
A90	NTDS	27,783	5,490	33,273
M90	NTDS	26,226	6,475	32,701
A912 Bridge of Earn	DfT	4,563	122	4,685

Study Area Road	Source	Daily Car/ LGV	Daily HGV	Daily Vehicles
A912 Aberagie	DfT	8,947	817	9,764
A913	AECOM	4,068	148	4,216
Easter Rhynd Road	AECOM	62	11	73
Ferryfield Road	AECOM	832	26	858
A91	DfT	6,496	432	6,928
B936 Burnside	AECOM	732	7	739
U093 Lochmill Loch	AECOM	57	1	58

12.7 Proposed Development Traffic

12.7.1 Proposed Development traffic is provided by Balfour Beatty. Part G of Appendix 12.1 (Volume 4) contains Balfour Beatty data for construction traffic assigned to each of the 38 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 M90 strategic routes and the 62 access points identified by Balfour Beatty. Table 12-8 summarises the Proposed Development traffic assigned to study area roads.

Table 12-8 Proposed Development Traffic

Study Area Road	Daily Car/ LGV	Daily HGV	Daily Vehicles
A90 Dundee	50	32	82
Emmock Road	48	32	80
Tealing Road	38	28	64
Bridgefoot	38	28	64
U324 Jeanfield	38	28	64
U333 Dronley	48	32	80
Dronley Burn	34	30	62
East Adamston	38	28	64
B954	48	32	80
A923 Muirhead	48	32	80
A923 Piperdam	38	28	64
Benvie Road	32	28	60
Berryhill Road	48	32	80
Main Street	48	32	80
The Drive	48	32	80
U143 Castle Huntly	48	32	80
Moncur Road	38	28	64

Study Area Road	Daily Car/ LGV	Daily HGV	Daily Vehicles
Inchture Station	38	28	64
Horn Road	44	32	76
Errol Station	44	32	76
U155 Inchcoonans	50	32	82
North Murie	50	32	82
U155 Glendoick	38	28	64
Ross Road	32	34	66
C484 St Madoes	50	34	84
Cairnie Road	38	32	70
Inchyra Road	38	32	70
A90 Kingsway	50	34	84
A90	50	34	84
M90	50	34	84
A912 Bridge of Earn	38	28	64
A912 Aberagie	48	32	80
A913	42	32	74
Easter Rhynd Road	38	28	64
Ferryfield Road	42	32	74
A91	48	32	80
B936 Burnside	48	32	80
U093 Lochmill Loch	48	32	80

12.8 Roads Included in Assessment

12.8.1 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 12-9 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 12-9 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 Dundee	3,163	23,801	32	82	1%	0%	No
Emmock Road	28	917	32	80	109%	9%	Yes

Study Area Road	Baseline		Development		% Increase		Include in Assessment
	HGV	All Veh	HGV	All Veh	HGV	All Veh	(Yes / No)
Tealing Road	17	744	28	64	157%	9%	Yes
Bridgefoot	7	487	28	64	381%	13%	Yes
U324 Jeanfield	7	487	28	64	381%	13%	Yes
U333 Dronley	3	164	32	80	1,020%	48%	Yes
Dronley Burn	3	164	30	62	954%	38%	Yes
East Adamston	3	164	28	64	888%	39%	Yes
B954	52	3,905	32	80	60%	2%	Yes
A923 Muirhead	263	9,631	32	80	12%	1%	Yes
A923 Piperdam	77	5,129	28	64	35%	1%	Yes
Benvie Road	6	477	28	60	461%	13%	Yes
Berryhill Road	5	136	32	80	612%	58%	Yes
Main Street	34	1,414	32	80	90%	6%	Yes
The Drive	5	699	32	80	612%	11%	Yes
U143 Castle Huntly	5	699	32	80	612%	11%	Yes
Moncur Road	46	1,245	28	64	59%	5%	Yes
Inchture Station	46	1,245	28	64	59%	5%	Yes
Horn Road	85	1,634	32	76	38%	5%	Yes
Errol Station	85	1,634	32	76	38%	5%	Yes
U155 Inchcoonans	26	858	32	82	121%	9%	Yes
North Murie	4	128	32	82	789%	63%	Yes
U155 Glendoick	26	858	28	64	102%	7%	Yes
Ross Road	4	128	34	66	814%	51%	Yes
C484 St Madoes	27	1,500	34	84	121%	6%	Yes
Cairnie Road	81	1,430	32	70	39%	5%	Yes
Inchyra Road	3	361	32	70	1,053%	19%	Yes
A90 Kingsway	6,983	43,370	34	84	0%	0%	No
A90	5,490	33,273	34	84	1%	0%	No
M90	6,475	32,701	34	84	1%	0%	No
A912 Bridge of Earn	122	4,685	28	64	22%	1%	Yes
A912 Aberagie	817	9,764	32	80	4%	1%	No

Study Area Road	Baseline		Development		% Increase		Include in Assessment
	HGV	All Veh	HGV	All Veh	HGV	All Veh	(Yes / No)
A913	148	4,216	32	74	21%	2%	Yes
Easter Rhynd Road	11	73	28	64	242%	88%	Yes
Ferryfield Road	26	858	32	74	118%	9%	Yes
A91	432	6,928	32	80	7%	1%	No
B936 Burnside	7	739	32	80	437%	11%	Yes
U093 Lochmill Loch	1	58	32	80	3,059%	137%	Yes

12.8.2 Table 12-9 shows that 32 study area roads are to be assessed for environmental effects. The six roads that do not meet Rule 1 and Rule 2 thresholds are not considered any further in terms of traffic and movement environmental effects resulting from the Proposed Development.

12.9 Effects Scoped Out

12.9.1 Of the IEMA Guidelines environmental effects listed in Paragraph 12.3.7, 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.

12.10 Assessment of Environmental Effects

Severance of Communities

12.10.1 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 12-3. Table 12-10 shows severance of communities significance of effects for study area roads.

Table 12-10 Severance of Communities

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
Emmock Road	Low	9%	Negligible	Negligible
Tealing Road	Low	9%	Negligible	Negligible
Bridgefoot	Low	13%	Negligible	Negligible
U324 Jeanfield	Low	13%	Negligible	Negligible
U333 Dronley	Low	48%	Low	Negligible
Dronley Burn	Low	38%	Low	Negligible

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
East Adamston	Negligible	39%	Low	Negligible
B954	Low	2%	Negligible	Negligible
A923 Muirhead	Medium	1%	Negligible	Negligible
A923 Piperdam	Low	1%	Negligible	Negligible
Benvie Road	Low	13%	Negligible	Negligible
Berryhill Road	Low	58%	Low	Negligible
Main Street	Low	6%	Negligible	Negligible
The Drive	Low	11%	Negligible	Negligible
U143 Castle Huntly	Low	11%	Negligible	Negligible
Moncur Road	Medium	5%	Negligible	Negligible
Inchture Station	Low	5%	Negligible	Negligible
Horn Road	Low	5%	Negligible	Negligible
Errol Station	Low	5%	Negligible	Negligible
U155 Inchcoonans	Low	9%	Negligible	Negligible
North Murie	Low	63%	Medium	Minor
U155 Glendoick	Low	7%	Negligible	Negligible
Ross Road	Low	51%	Low	Negligible
C484 St Madoes	Medium	6%	Negligible	Negligible
Cairnie Road	Medium	5%	Negligible	Negligible
Inchyra Road	Low	19%	Negligible	Negligible
A912 Bridge of Earn	Medium	1%	Negligible	Negligible
A913	Medium	2%	Negligible	Negligible
Easter Rhynd Road	Low	88%	Medium	Minor
Ferryfield Road	Low	9%	Negligible	Negligible
B936 Burnside	Medium	11%	Negligible	Negligible
U093 Lochmill Loch	Low	137%	High	Moderate

12.10.2 Table 12-10 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 the U093 Lochmill Loch. 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.

12.10.3 For all other roads Table 12-10 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

12.10.4 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 12.1 (Volume 4). Fear and intimidation on and by road users significance of effects for study area roads is shown in Table 12-11.

Table 12-11 Fear and Intimidation on and by Road Users

Road	Sensitivity of Receptor	Step Change	Magnitude of Change	Significance of Effect
Emmock Road	Low	No Change	Negligible	Negligible
Tealing Road	Low	No Change	Negligible	Negligible
Bridgefoot	Low	No Change	Negligible	Negligible
U324 Jeanfield	Low	No Change	Negligible	Negligible
U333 Dronley	Low	No Change	Negligible	Negligible
Dronley Burn	Low	No Change	Negligible	Negligible
East Adamston	Negligible	No Change	Negligible	Negligible
B954	Low	No Change	Negligible	Negligible
A923 Muirhead	Medium	No Change	Negligible	Negligible
A923 Piperdam	Low	No Change	Negligible	Negligible
Benvie Road	Low	No Change	Negligible	Negligible
Berryhill Road	Low	No Change	Negligible	Negligible
Main Street	Low	No Change	Negligible	Negligible
The Drive	Low	No Change	Negligible	Negligible
U143 Castle Huntly	Low	No Change	Negligible	Negligible
Moncur Road	Medium	No Change	Negligible	Negligible
Inchture Station	Low	No Change	Negligible	Negligible
Horn Road	Low	No Change	Negligible	Negligible
Errol Station	Low	No Change	Negligible	Negligible
U155 Inchcoonans	Low	No Change	Negligible	Negligible
North Murie	Low	No Change	Negligible	Negligible
U155 Glendoick	Low	No Change	Negligible	Negligible
Ross Road	Low	No Change	Negligible	Negligible
C484 St Madoes	Medium	No Change	Negligible	Negligible

Road	Sensitivity of Receptor	Step Change	Magnitude of Change	Significance of Effect
Cairnie Road	Medium	No Change	Negligible	Negligible
Inchyra Road	Low	No Change	Negligible	Negligible
A912 Bridge of Earn	Medium	No Change	Negligible	Negligible
A913	Medium	No Change	Negligible	Negligible
Easter Rhynd Road	Low	No Change	Negligible	Negligible
Ferryfield Road	Low	No Change	Negligible	Negligible
B936 Burnside	Medium	No Change	Negligible	Negligible
U093 Lochmill Loch	Low	No Change	Negligible	Negligible

12.10.5 Table 12-11 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

12.10.6 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 12.1 (Volume 4) details the forecast of accidents by severity calculation.

12.10.7 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 12-12.

Table 12-12 Road User and Pedestrian Safety

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Severe	Fatal		
Emmock Road	Low	0.00	0.00	0.00	Negligible	Negligible
Tealing Road	Low	0.00	0.00	0.00	Negligible	Negligible
Bridgefoot	Low	0.00	0.00	0.00	Negligible	Negligible
U324 Jeanfield	Low	0.00	0.00	0.00	Negligible	Negligible
U333 Dronley	Low	0.01	0.00	0.00	Low	Negligible
Dronley Burn	Low	0.00	0.00	0.00	Negligible	Negligible
East Adamston	Negligible	0.00	0.00	0.00	Negligible	Negligible

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Severe	Fatal		
B954	Low	0.00	0.00	0.00	Negligible	Negligible
A923 Muirhead	Medium	0.00	0.00	0.00	Negligible	Negligible
A923 Piperdam	Low	0.00	0.00	0.00	Negligible	Negligible
Benvie Road	Low	0.00	0.00	0.00	Negligible	Negligible
Berryhill Road	Low	0.00	0.00	0.00	Negligible	Negligible
Main Street	Low	0.00	0.00	0.00	Negligible	Negligible
The Drive	Low	0.00	0.00	0.00	Negligible	Negligible
U143 Castle Huntly	Low	0.00	0.00	0.00	Negligible	Negligible
Moncur Road	Medium	0.00	0.00	0.00	Negligible	Negligible
Inchture Station	Low	0.00	0.00	0.00	Negligible	Negligible
Horn Road	Low	0.00	0.00	0.00	Negligible	Negligible
Errol Station	Low	0.00	0.00	0.00	Negligible	Negligible
U155 Inchcoonans	Low	0.00	0.00	0.00	Negligible	Negligible
North Murie	Low	0.00	0.00	0.00	Negligible	Negligible
U155 Glendoick	Low	0.00	0.00	0.00	Negligible	Negligible
Ross Road	Low	0.00	0.00	0.00	Negligible	Negligible
C484 St Madoes	Medium	0.00	0.00	0.00	Negligible	Negligible
Cairnie Road	Medium	0.00	0.00	0.00	Negligible	Negligible
Inchyra Road	Low	0.00	0.00	0.00	Negligible	Negligible
A912 Bridge of Earn	Medium	0.00	0.00	0.00	Negligible	Negligible
A913	Medium	0.00	0.00	0.00	Negligible	Negligible
Easter Rhynd Road	Low	0.00	0.00	0.00	Negligible	Negligible
Ferryfield Road	Low	0.00	0.00	0.00	Negligible	Negligible
B936 Burnside	Medium	0.00	0.00	0.00	Negligible	Negligible
U093 Lochmill Loch	Low	0.00	0.00	0.00	Negligible	Negligible

12.10.8 Table 12-12 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 forecast across study area roads.

Non-motorised User Amenity

12.10.9 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.

12.10.10 Non-motorised user amenity magnitude of change is derived from traffic increases generated by the Proposed Development, classified in accordance with Table 12-3. Non-motorised user amenity significance of effects for study area roads is shown in Table 12-13.

Table 12-13 Non-motorised User Amenity

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
Emmock Road	Low	9%	Negligible	Negligible
Tealing Road	Low	9%	Negligible	Negligible
Bridgefoot	Low	13%	Negligible	Negligible
U324 Jeanfield	Low	13%	Negligible	Negligible
U333 Dronley	Low	48%	Low	Negligible
Dronley Burn	Low	38%	Low	Negligible
East Adamston	Negligible	39%	Low	Negligible
B954	Low	2%	Negligible	Negligible
A923 Muirhead	Medium	1%	Negligible	Negligible
A923 Piperdam	Low	1%	Negligible	Negligible
Benvie Road	Low	13%	Negligible	Negligible
Berryhill Road	Low	58%	Low	Negligible
Main Street	Low	6%	Negligible	Negligible
The Drive	Low	11%	Negligible	Negligible
U143 Castle Huntly	Low	11%	Negligible	Negligible
Moncur Road	Medium	5%	Negligible	Negligible
Inchture Station	Low	5%	Negligible	Negligible
Horn Road	Low	5%	Negligible	Negligible
Errol Station	Low	5%	Negligible	Negligible
U155 Inchcoonans	Low	9%	Negligible	Negligible
North Murie	Low	63%	Medium	Minor
U155 Glendoick	Low	7%	Negligible	Negligible
Ross Road	Low	51%	Low	Negligible
C484 St Madoes	Medium	6%	Negligible	Negligible
Cairnie Road	Medium	5%	Negligible	Negligible
Inchyra Road	Low	19%	Negligible	Negligible

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A912 Bridge of Earn	Medium	1%	Negligible	Negligible
A913	Medium	2%	Negligible	Negligible
Easter Rhynd Road	Low	88%	Medium	Minor
Ferryfield Road	Low	9%	Negligible	Negligible
B936 Burnside	Medium	11%	Negligible	Negligible
U093 Lochmill Loch	Low	137%	High	Moderate

12.10.11 Table 12-13 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 the U093 Lochmill Loch. 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.

12.10.12 For all other roads Table 12-13 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

12.10.13 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 12-3. Non-motorised user delay significance of effects for study area roads is shown in Table 12-14.

Table 12-14 Assessment of Non-motorised User Delay

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
Emmock Road	Low	9%	Negligible	Negligible
Tealing Road	Low	9%	Negligible	Negligible
Bridgefoot	Low	13%	Negligible	Negligible
U324 Jeanfield	Low	13%	Negligible	Negligible
U333 Dronley	Low	48%	Low	Negligible
Dronley Burn	Low	38%	Low	Negligible
East Adamston	Negligible	39%	Low	Negligible
B954	Low	2%	Negligible	Negligible
A923 Muirhead	Medium	1%	Negligible	Negligible
A923 Piperdam	Low	1%	Negligible	Negligible
Benvie Road	Low	13%	Negligible	Negligible

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
Berryhill Road	Low	58%	Low	Negligible
Main Street	Low	6%	Negligible	Negligible
The Drive	Low	11%	Negligible	Negligible
U143 Castle Huntly	Low	11%	Negligible	Negligible
Moncur Road	Medium	5%	Negligible	Negligible
Inchture Station	Low	5%	Negligible	Negligible
Horn Road	Low	5%	Negligible	Negligible
Errol Station	Low	5%	Negligible	Negligible
U155 Inchcoonans	Low	9%	Negligible	Negligible
North Murie	Low	63%	Medium	Minor
U155 Glendoick	Low	7%	Negligible	Negligible
Ross Road	Low	51%	Low	Negligible
C484 St Madoes	Medium	6%	Negligible	Negligible
Cairnie Road	Medium	5%	Negligible	Negligible
Inchyra Road	Low	19%	Negligible	Negligible
A912 Bridge of Earn	Medium	1%	Negligible	Negligible
A913	Medium	2%	Negligible	Negligible
Easter Rhynd Road	Low	88%	Medium	Minor
Ferryfield Road	Low	9%	Negligible	Negligible
B936 Burnside	Medium	11%	Negligible	Negligible
U093 Lochmill Loch	Low	137%	High	Moderate

12.10.14 Table 12-14 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 the U093 Lochmill Loch. 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.

12.10.15 For all other roads Table 12-14 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

12.10.16 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.

12.10.17 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.

12.10.18 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 12.1 (Volume 4). Road vehicle driver and passenger delay is then classified in accordance with Table 12-3 and the resulting significance of effects for study area roads is shown in Table 12-15.

Table 12-15 Road Vehicle Driver and Passenger Delay

Road	Sensitivity of Receptor	Increase in Utilisation of Daily Road Capacity	Magnitude of Change	Significance of Effect
Emmock Road	Low	0.4%	Negligible	Negligible
Tealing Road	Low	0.3%	Negligible	Negligible
Bridgefoot	Low	0.3%	Negligible	Negligible
U324 Jeanfield	Low	1.9%	Negligible	Negligible
U333 Dronley	Low	0.4%	Negligible	Negligible
Dronley Burn	Low	0.3%	Negligible	Negligible
East Adamston	Negligible	1.9%	Negligible	Negligible
B954	Low	0.3%	Negligible	Negligible
A923 Muirhead	Medium	0.3%	Negligible	Negligible
A923 Piperdam	Low	0.2%	Negligible	Negligible
Benvie Road	Low	0.3%	Negligible	Negligible
Berryhill Road	Low	0.4%	Negligible	Negligible
Main Street	Low	0.3%	Negligible	Negligible
The Drive	Low	2.4%	Negligible	Negligible
U143 Castle Huntly	Low	0.4%	Negligible	Negligible
Moncur Road	Medium	0.3%	Negligible	Negligible
Inchture Station	Low	0.3%	Negligible	Negligible
Horn Road	Low	0.3%	Negligible	Negligible
Errol Station	Low	0.4%	Negligible	Negligible
U155 Inchcoonans	Low	0.4%	Negligible	Negligible
North Murie	Low	0.4%	Negligible	Negligible

Road	Sensitivity of Receptor	Increase in Utilisation of Daily Road Capacity	Magnitude of Change	Significance of Effect
U155 Glendoick	Low	1.9%	Negligible	Negligible
Ross Road	Low	2.0%	Negligible	Negligible
C484 St Madoes	Medium	0.4%	Negligible	Negligible
Cairnie Road	Medium	0.4%	Negligible	Negligible
Inchyra Road	Low	2.1%	Negligible	Negligible
A912 Bridge of Earn	Medium	0.3%	Negligible	Negligible
A913	Medium	0.3%	Negligible	Negligible
Easter Rhynd Road	Low	0.3%	Negligible	Negligible
Ferryfield Road	Low	2.2%	Negligible	Negligible
B936 Burnside	Medium	0.4%	Negligible	Negligible
U093 Lochmill Loch	Low	2.4%	Negligible	Negligible

12.10.19 Table 12-15 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.

12.11 Mitigation and Residual Effects

Mitigation

12.11.1 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.

12.11.2 Figure 3.1 (Volume 3) shows the location of 62 access points on public roads encompassing:

- one existing access point where no bell mouth upgrade is required; and,
- sixty-one existing access points where bell mouth upgrades are proposed.

12.11.3 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.

12.11.4 A CTMP will operate throughout the duration of the construction programme. Part K of Appendix 12.1 (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

12.11.5 Severance of communities. 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 Paragraph 12.10.2 will be a shift to temporary, short-term, **Minor (Not Significant)** effect on the U093 Lochmill Loch.

12.11.6 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.

12.11.7 Road user and pedestrian safety. 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.

12.11.8 Non-motorised user amenity. 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 amenity effects reported at Paragraph 12.10.11 will be a shift to temporary, short-term, **Minor (Not Significant)** effect on the U093 Lochmill Loch.

12.11.9 Non-motorised user delay. 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 at Paragraph 12.10.14 will be a shift to temporary, short-term**, Minor (Not Significant)** effect on the U093 Lochmill Loch.

12.11.10 Road vehicle driver and passenger delay. 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.

12.12 Cumulative Assessment

12.12.1 Cumulative projects to be considered are listed in Chapter 5: EIA Approach and Methodology (Volume 2). The cumulative assessment first considers Intra-Development traffic, and then expands the assessment to consider Inter-Development traffic.

12.12.2 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.

12.12.3 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

12.12.4 Study area roads have been assessed for IEMA Guidelines Rule 1 and Rule 2 for Intra-Development cumulative traffic. Table 12-16 summarises the cumulative increase in traffic on study area roads resulting from the Proposed Development and Intra-Development sites. The assignment of Intra-Development traffic to study area roads, and the resulting percentage increases in road traffic, are included at Part L of Appendix 12.1 (Volume 4).

Table 12-16 Intra-Development Cumulative Assessment Roads to be Assessed

Road	Proposed Development		Proposed + Intra-Development		Include in Assessment
	Increase in HGV Traffic	Increase in Vehicle Traffic	Increase in HGV Traffic	Increase in Vehicle Traffic	(Yes / No)
A90 Dundee	1%	0%	6%	2%	No
Emmock Road	109%	9%	638%	54%	Yes
Tealing Road	157%	9%	157%	9%	Yes
Bridgefoot	381%	13%	381%	13%	Yes
U324 Jeanfield	381%	13%	381%	13%	Yes
U333 Dronley	1,020%	48%	1020%	48%	Yes
Dronley Burn	954%	38%	954%	38%	Yes
East Adamston	888%	39%	888%	39%	Yes
B954	60%	2%	60%	2%	Yes
A923 Muirhead	12%	1%	12%	1%	Yes
A923 Piperdam	35%	1%	35%	1%	Yes
Benvie Road	461%	13%	461%	13%	Yes
Berryhill Road	612%	58%	612%	58%	Yes
Main Street	90%	6%	90%	6%	Yes
The Drive	612%	11%	612%	11%	Yes
U143 Castle Huntly	612%	11%	612%	11%	Yes
Moncur Road	59%	5%	59%	5%	Yes
Inchture Station	59%	5%	59%	5%	Yes
Horn Road	38%	5%	38%	5%	Yes
Errol Station	38%	5%	38%	5%	Yes
U155 Inchcoonans	121%	9%	121%	9%	Yes

Road	Proposed Development		Proposed + Intra-Development		Include in Assessment
	Increase in HGV Traffic	Increase in Vehicle Traffic	Increase in HGV Traffic	Increase in Vehicle Traffic	(Yes / No)
North Murie	789%	63%	789%	63%	Yes
U155 Glendoick	102%	7%	102%	7%	Yes
Ross Road	814%	51%	814%	51%	Yes
C484 St Madoes	121%	6%	121%	6%	Yes
Cairnie Road	39%	5%	39%	5%	Yes
Inchyra Road	1,053%	19%	1053%	19%	Yes
A90 Kingsway	0%	0%	3%	1%	No
A90	1%	0%	3%	2%	No
M90	1%	0%	3%	2%	No
A912 Bridge of Earn	22%	1%	22%	1%	Yes
A912 Aberagie	4%	1%	4%	1%	No
A913	21%	2%	21%	2%	Yes
Easter Rhynd Road	242%	88%	242%	88%	Yes
Ferryfield Road	118%	9%	118%	9%	Yes
A91	7%	1%	7%	1%	No
B936 Burnside	437%	11%	437%	11%	Yes
U093 Lochmill Loch	3,059%	137%	3,059%	137%	Yes

12.12.5 Table 12-16 shows that 31 roads must be included in the Intra-Development cumulative assessment. Seven roads do not require to be included. Table 12-17 summarises the forecast significance of effects for cumulative Intra-Development prior to mitigation.

Table 12-17 Intra-Development Cumulative Assessment Significance Environmental Effects

Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
Emmock Road	Negligible	Negligible	Negligible	Negligible	Negligible
Tealing Road	Negligible	Negligible	Negligible	Negligible	Negligible
Bridgefoot	Negligible	Negligible	Negligible	Negligible	Negligible
U324 Jeanfield	Negligible	Negligible	Negligible	Negligible	Negligible
U333 Dronley	Negligible	Negligible	Negligible	Negligible	Negligible
Dronley Burn	Negligible	Negligible	Negligible	Negligible	Negligible

Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
East Adamston	Negligible	Negligible	Negligible	Negligible	Negligible
B954	Negligible	Negligible	Negligible	Negligible	Negligible
A923 Muirhead	Minor	Negligible	Negligible	Minor	Negligible
A923 Piperdam	Negligible	Negligible	Negligible	Negligible	Negligible
Benvie Road	Negligible	Negligible	Negligible	Negligible	Negligible
Berryhill Road	Negligible	Negligible	Negligible	Negligible	Negligible
Main Street	Negligible	Negligible	Negligible	Negligible	Negligible
The Drive	Negligible	Negligible	Negligible	Negligible	Negligible
U143 Castle Huntly	Negligible	Negligible	Negligible	Negligible	Negligible
Moncur Road	Minor	Negligible	Negligible	Minor	Negligible
Inchture Station	Negligible	Negligible	Negligible	Negligible	Negligible
Horn Road	Negligible	Negligible	Negligible	Negligible	Negligible
Errol Station	Negligible	Negligible	Negligible	Negligible	Negligible
U155 Inchcoonans	Negligible	Negligible	Negligible	Negligible	Negligible
North Murie	Minor	Negligible	Negligible	Minor	Negligible
U155 Glendoick	Negligible	Negligible	Negligible	Negligible	Negligible
Ross Road	Negligible	Negligible	Negligible	Negligible	Negligible
C484 St Madoes	Minor	Negligible	Negligible	Minor	Negligible
Cairnie Road	Minor	Negligible	Negligible	Minor	Negligible
Inchyra Road	Negligible	Negligible	Negligible	Negligible	Negligible
A912 Bridge of Earn	Minor	Negligible	Negligible	Minor	Negligible
A913	Negligible	Negligible	Negligible	Negligible	Negligible
Easter Rhynd Road	Moderate	Negligible	Negligible	Moderate	Negligible
Ferryfield Road	Negligible	Negligible	Negligible	Negligible	Negligible
B936 Burnside	Minor	Negligible	Negligible	Minor	Negligible
U093 Lochmill Loch	Moderate	Negligible	Negligible	Moderate	Negligible

12.12.6 Table 12-17 shows that Easter Rhynd Road and U093 Lochmill Loch are forecast to experience a temporary, short term, **Moderate Adverse (Significant)** effect in terms of severance of communities, non-motorised user amenity, and non-motorised user 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.

12.12.7 Mitigation of the significant effects shown in Table 12-17 will primarily be through co-ordination of construction traffic management plans. Co-ordination will endeavour to reduce any high magnitude of change to medium magnitude of change in the vicinity of sensitive receptors. The corresponding post mitigation change to significant effects reported at Paragraph 12.12.6 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Easter Rhynd Road and U093 Lochmill Loch.

Inter-Development Cumulative Assessment

12.12.8 Study area roads have been assessed for IEMA Guidelines Rule 1 and Rule 2 for Inter-Development cumulative traffic. Table 12-18 summarises the cumulative increase in traffic on study area roads resulting from the Proposed Development and Inter-Development sites. The assignment of Inter-Development traffic to study area roads, and the resulting percentage increases in road traffic, are included at Part M of Appendix 12.1 (Volume 4).

Table 12-18 Inter-Development Cumulative Assessment Roads to be Assessed

Road	Proposed Development		Proposed + Inter-Development		Include in Assessment
	Increase in HGV Traffic	Increase in Vehicle Traffic	Increase in HGV Traffic	Increase in Vehicle Traffic	(Yes / No)
A90 Dundee	1%	0%	13%	5%	No
Emmock Road	109%	9%	934%	81%	Yes
Tealing Road	157%	9%	157%	9%	Yes
Bridgefoot	381%	13%	381%	13%	Yes
U324 Jeanfield	381%	13%	381%	13%	Yes
U333 Dronley	1,020%	48%	1020%	48%	Yes
Dronley Burn	954%	38%	954%	38%	Yes
East Adamston	888%	39%	888%	39%	Yes
B954	60%	2%	60%	2%	Yes
A923 Muirhead	12%	1%	16%	1%	Yes
A923 Piperdam	35%	1%	35%	1%	Yes
Benvie Road	461%	13%	461%	13%	Yes
Berryhill Road	612%	58%	612%	58%	Yes
Main Street	90%	6%	90%	6%	Yes
The Drive	612%	11%	612%	11%	Yes
U143 Castle Huntly	612%	11%	612%	11%	Yes
Moncur Road	59%	5%	59%	5%	Yes
Inchture Station	59%	5%	59%	5%	Yes
Horn Road	38%	5%	38%	5%	Yes
Errol Station	38%	5%	38%	5%	Yes

Road	Proposed Development		Proposed + Inter-Development		Include in Assessment
	Increase in HGV Traffic	Increase in Vehicle Traffic	Increase in HGV Traffic	Increase in Vehicle Traffic	(Yes / No)
U155 Inchcoonans	121%	9%	121%	9%	Yes
North Murie	789%	63%	789%	63%	Yes
U155 Glendoick	102%	7%	102%	7%	Yes
Ross Road	814%	51%	814%	51%	Yes
C484 St Madoes	121%	6%	121%	6%	Yes
Cairnie Road	39%	5%	39%	5%	Yes
Inchyra Road	1,053%	19%	1053%	19%	Yes
A90 Kingsway	0%	0%	6%	3%	No
A90	1%	0%	8%	4%	No
M90	1%	0%	7%	4%	No
A912 Bridge of Earn	22%	1%	22%	1%	Yes
A912 Aberagie	4%	1%	7%	2%	No
A913	21%	2%	38%	4%	Yes
Easter Rhynd Road	242%	88%	242%	88%	Yes
Ferryfield Road	118%	9%	118%	9%	Yes
A91	7%	1%	7%	1%	No
B936 Burnside	437%	11%	437%	11%	Yes
U093 Lochmill Loch	3,059%	137%	3059%	137%	Yes

12.12.9 Table 12-18 shows that 32 roads must be included in the Inter-Development cumulative assessment. Six roads do not require to be included. Table 12-19 summarises the forecast significance of effects for cumulative Inter-Development prior to mitigation.

Table 12-19 Inter-Development Cumulative Assessment Significance of Effects

Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
Emmock Road	Negligible	Negligible	Negligible	Negligible	Negligible
Tealing Road	Negligible	Negligible	Negligible	Negligible	Negligible
Bridgefoot	Negligible	Negligible	Negligible	Negligible	Negligible
U324 Jeanfield	Negligible	Negligible	Negligible	Negligible	Negligible
U333 Dronley	Negligible	Negligible	Negligible	Negligible	Negligible
Dronley Burn	Negligible	Negligible	Negligible	Negligible	Negligible

Road	Severance of Communities	Fear and Intimidation	Road User and Pedestrian Safety	Non-motorised user Amenity and Delay	Road Vehicle Driver and Passenger Delay
East Adamston	Negligible	Negligible	Negligible	Negligible	Negligible
B954	Negligible	Negligible	Negligible	Negligible	Negligible
A923 Muirhead	Minor	Negligible	Negligible	Minor	Negligible
A923 Piperdam	Negligible	Negligible	Negligible	Negligible	Negligible
Benvie Road	Negligible	Negligible	Negligible	Negligible	Negligible
Berryhill Road	Negligible	Negligible	Negligible	Negligible	Negligible
Main Street	Negligible	Negligible	Negligible	Negligible	Negligible
The Drive	Negligible	Negligible	Negligible	Negligible	Negligible
U143 Castle Huntly	Negligible	Negligible	Negligible	Negligible	Negligible
Moncur Road	Minor	Negligible	Negligible	Minor	Negligible
Inchture Station	Negligible	Negligible	Negligible	Negligible	Negligible
Horn Road	Negligible	Negligible	Negligible	Negligible	Negligible
Errol Station	Negligible	Negligible	Negligible	Negligible	Negligible
U155 Inchcoonans	Negligible	Negligible	Negligible	Negligible	Negligible
North Murie	Minor	Negligible	Negligible	Minor	Negligible
U155 Glendoick	Negligible	Negligible	Negligible	Negligible	Negligible
Ross Road	Negligible	Negligible	Negligible	Negligible	Negligible
C484 St Madoes	Minor	Negligible	Negligible	Minor	Negligible
Cairnie Road	Minor	Negligible	Negligible	Minor	Negligible
Inchyra Road	Negligible	Negligible	Negligible	Negligible	Negligible
A912 Bridge of Earn	Minor	Negligible	Negligible	Minor	Negligible
A913	Minor	Negligible	Negligible	Minor	Negligible
Easter Rhynd Road	Moderate	Negligible	Negligible	Moderate	Negligible
Ferryfield Road	Negligible	Negligible	Negligible	Negligible	Negligible
B936 Burnside	Minor	Negligible	Negligible	Minor	Negligible
U093 Lochmill Loch	Moderate	Negligible	Negligible	Moderate	Negligible

12.12.10 Table 12-19 shows that Easter Rhynd Road and U093 Lochmill Loch are forecast to experience a temporary, short term, **Moderate Adverse (Significant)** effect in terms of severance of communities, non-motorised user amenity, and non-motorised user 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.

12.12.11 Mitigation of the significant effects shown in Table 12-19 will primarily be through co-ordination of construction traffic management plans. Co-ordination will endeavour to reduce any high magnitude of change to medium magnitude of change in the vicinity of sensitive receptors. The corresponding post mitigation change to significant effects reported at Paragraph 12.12.10 will be a shift to temporary, short-term, **Minor (Not Significant)** effects on Easter Rhynd Road and U093 Lochmill Loch.

12.13 Summary of Mitigation Measures

12.13.1 Table 12-20 summarises proposed mitigation measures for traffic and movement.

Table 12-20 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
CTMP	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.
Access Points	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.