Glen Earrach Pumped Storage Hydro Scheme

Environmental Impact Assessment Report

Updated Cumulative Traffic and Transport Assessment

Glen Earrach Energy

09 March 2026

Delivering a better world

Quality information

Prepared by	Checked by	Verified by	Approved by
Luke Wisekal Consultant	Jamie Graham Senior Consultant	David Dewar Associate Director	Marcella Campbell Principal Project Manager

Revision History

Revision	Revision date	Details	Authorized	Name	Position

Distribution List

# Hard Copies	PDF Required	Association / Company Name
No	Yes	Glen Earrach Energy

Prepared for:

Prepared by:

Luke Wisekal
Consultant
E: luke.wisekal@aecom.com

AECOM Limited
1 Tanfield
Edinburgh EH3 5DA
United Kingdom

T: +44 (0)131 301 8600
aecom.com

© 2026 AECOM Limited. All Rights Reserved

This document has been prepared by AECOM Limited (“AECOM”) for sole use of our Client (**Glen Earrach Energy**) in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

Figures

Tables

1. Introduction

1.1 Background

1.1.1 The Proposed Development is the Glen Earrach Pumped Storage Hydro Scheme, a proposed pumped storage hydro development located to the west of Loch Ness between Drumnadrochit and Invermoriston in the Highland Council area.

1.1.2 AECOM has updated the cumulative assessment which formed part of the submitted Glen Earrach Pumped Storage Hydro Environmental Impact Assessment Report (EIAR) Chapter 13 Access, Traffic and Transport. The updated cumulative traffic assessment for Glen Earrach (hereafter known as the Proposed Development) includes the recently consented development at Bingally Substation and OHL tie-in, Cnoc Farasd Wind Farm and Chrathaich Wind Farm together with the inclusion of a revised start date for the construction of the Proposed Development.

1.2 Requirement for Updated Cumulative Assessment

1.2.1 Further to the **Chapter 13: Access, Traffic and Transport (Volume 2: Main Report)** document of March 2025, additional developments have now been identified that may affect the findings of the submitted cumulative traffic assessment. The local planning authority and relevant roads authorities have requested that an updated cumulative traffic assessment is carried out for the Proposed Development.

1.2.2 The principal update to the cumulative traffic assessment is the inclusion of Bingally 400kV Substation and OHL Tie-in (25/02301/S37) and the Cnoc Farasd Wind Farm (25/04604/FUL). Both these developments will be accessed from the A831 and have construction programmes that overlap with the Proposed Development. Chrathaich Wind Farm was included within the original cumulative traffic assessment presented in the submitted EIAR and remains included within the cumulative assessment undertaken as part of this update.

1.2.3 The Proposed Development's construction traffic forecast (number and type of vehicles) and construction duration (number of months) have not changed and remain the same as submitted in **Technical Appendix 13.1: Transport Assessment (Volume 5: Appendices)**. However, the Proposed Development has a revised construction start date. Construction of the Proposed Development will now start in October 2027 (previously November 2025) and is now scheduled for completion May 2035.

1.3 Cumulative Assessment Methodology

1.3.1 The updated cumulative traffic assessment is carried out in accordance with the Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement, July 2023 (the "IEMA Guidelines")[1].

1.3.2 This update establishes the significance of environmental effects potentially resulting from vehicular traffic generated by cumulative development. The assessment considers the sensitivity of Study Area roads, existing road users, and their surroundings, against forecast changes in traffic resulting from cumulative development. For the updated cumulative assessment, the sensitivity of study area roads remains unchanged from the previously submitted assessment. Environmental topics assessed include severance, fear and intimidation, road safety, non-motorised traffic, delays to vehicular traffic and large or hazardous loads.

1.3.3 The geographical extent of the updated cumulative assessment has been informed by IEMA Guidelines and remains the same as submitted in **Chapter 13: Access, Traffic and Transport (Volume 2: Main Report)**. Principal Study Area roads remain the A82, A831 and the A833. Traffic data

[1] IEMA rebranded The Institute of Sustainability and Environmental Professionals (ISEP) in July 2025. The IEMA Guidelines remain the valid guidance for environmental assessment of traffic and movement.

from surveys conducted on Study Area Roads in 2024, and used in the submitted traffic assessment, are also used for the updated cumulative assessment.

1.3.4 The A831 is the focus of the updated cumulative assessment. The addition of Bingally and Cnoc Farasd cumulative developments will put additional HGV construction traffic onto the A831 that was not considered in the previously submitted cumulative assessment.

1.3.5 **Figure 1.1: A831 Cumulative Development Traffic** shows an updated timeline for daily cumulative development HGV traffic on the A831. The updated cumulative traffic assessment has been carried out for two forecast years; 2027 and 2029.

1.3.6 October 2027 is taken as the cumulative peak for Proposed Development (orange bar) Pre-construction and Enabling Phase. This is the first month Proposed Development HGV traffic uses the A831. In October 2027, the Bingally Substation and OHL tie-in (dark blue bar) is effectively still at peak construction and peak HGV use. Chrathaich Wind Farm (green bar) is beyond its peak construction at this time but still putting HGV traffic on the A831.

1.3.7 June 2029 is taken as the cumulative peak for Proposed Development (orange bar) Construction Phase. At this time, Cnoc Farasd Wind Farm (light blue bar) is at peak construction and peak HGV. In June 2029, Bingally Substation and OHL tie-in (dark blue bar) is effectively winding down its construction programme with correspondingly low A831 HGV activity. Chrathaich Wind Farm (green bar) has completed the previous year and is no longer putting HGV traffic on the A831[2].

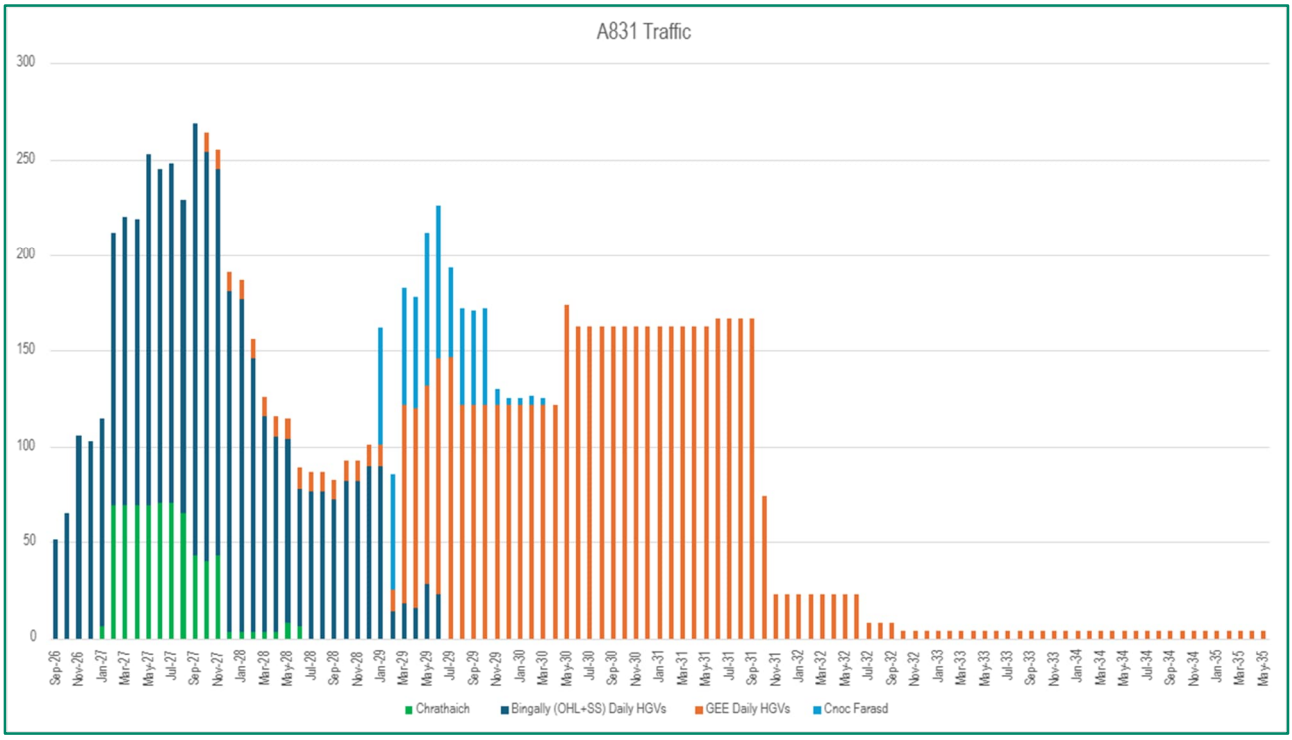


Figure 1.1: A831 Cumulative Development Traffic

[2] Data derived from submitted planning documents for cumulative development sites.

2. Assessment of Cumulative Effects

2.1 Assessment of Cumulative Effects 2027

2.1.1 Cumulative development sites included in this updated assessment, with their traffic forecasts, are contained in **Appendix A**. All cumulative development traffic from the previously submitted assessment is retained in the updated assessment. The updated assessment is differentiated by the addition of Bingally traffic for the revised assessment years of 2027.

2.1.2 A TEMPro growth factor of 1.0279 has been applied to 2024 surveyed traffic data to produce a 2027 baseline for cumulative assessment. Study Area Road flow diagrams for the 2027 cumulative assessment are provided at **Appendix B**.

2.1.3 **Table 1-1: 2027 Cumulative Assessment - Roads to be Assessed for Environmental Effects** compares 2027 forecast baseline traffic and 2027 cumulative development traffic to determine which Study Area roads require to be assessed for environmental effects in accordance with IEMA Guidelines Rule 1 and Rule 2 conditions.

Table 1-1: 2027 Cumulative Assessment - Roads to be Assessed for Environmental Effects

Study Area Road	2027 Daily Baseline Traffic (12-Hour)		2027 Daily Cumulative Development		2027 Daily Cumulative Development % Impact		Include in Assessment
	HGV	Total	HGV	Total	HGV	Total	(Yes / No)
A82 Inverness	165	3,976	335	776	203%	20%	**Yes**
A82 North Drumnadrochit	165	3,976	335	776	203%	20%	**Yes**
A82 Drumnadrochit	238	4,824	79	110	33%	2%	**Yes**
A82 Lewiston	202	4,085	79	110	39%	3%	**Yes**
A82 Urquhart Castle	310	2,756	79	110	25%	4%	**Yes**
A82 Grotaig	145	2,390	79	110	54%	5%	**Yes**
A82 Alltsigh	144	2,404	79	110	55%	5%	**Yes**
A82 Invermoriston	152	2,471	79	110	52%	4%	**Yes**
A82 Fort Augustus	121	1,917	172	318	143%	17%	**Yes**
A887 Invermoriston	66	1,053	78	120	119%	11%	**Yes**
A831 Milton	52	2,102	260	670	496%	32%	**Yes**
A831 Strathnacro	27	1,366	264	674	995%	49%	**Yes**
A831 Balnain	22	993	254	652	1177%	66%	**Yes**
A833	25	881	4	4	16%	0%	**No**

2.1.4 Table 1-1 shows that all Study Area road links except the A833 must be included in the 2027 cumulative assessment. The A833 does not meet IEMA Guidelines Rule 1 or Rule 2 requirements for environmental assessment primarily as only Proposed Development traffic within the cumulative assessment is assigned to use this road. And at 2027 Proposed Development traffic on the A833 is forecast to only be 4 HGV movements per day.

Severance of Communities 2027

2.1.5 **Table 1-2: 2027 Cumulative Development Severance of Communities** presents the significance of effects on the severance of communities as a result of cumulative development traffic. The significance of effects for severance are based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines 2023.

2.1.6 The IEMA Guidelines state that, *"The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance, respectively.*'

Table 1-2: 2027 Cumulative Development Severance of Communities

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	20%	Negligible	Minor
A82 North Drumnadrochit	High	20%	Negligible	Minor
A82 Drumnadrochit	High	2%	Negligible	Minor
A82 Lewiston	High	3%	Negligible	Minor
A82 Urquhart Castle	High	4%	Negligible	Minor
A82 Grotaig	Low	5%	Negligible	Negligible
A82 Alltsigh	Low	5%	Negligible	Negligible
A82 Invermoriston	High	4%	Negligible	Minor
A82 Fort Augustus	High	17%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	32%	Low	Minor
A831 Strathnacro	Low	49%	Low	Negligible
A831 Balnain	Medium	66%	Medium	Moderate

2.1.7 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on severance is a direct, temporary, **Moderate Adverse (Significant)** effect.

2.1.8 For severance only the A831 Balnain is forecast to experience significant environmental effects. All other study area roads are forecast to experience either minor or negligible (not significant) severance environmental effects from cumulative development traffic.

2.1.9 The Proposed Development does not put any cumulative traffic onto the A831 Balnain. Proposed Development traffic leaves the A831 before reaching Balnain. Bingally Substation and OHL tie-in and Chrathaich Wind Farm put the most significant element of cumulative development traffic onto the A831 Balnain in 2027. These two developments are forecast to put a total of 254 HGV movements and 398 Car movements per day onto the A831 Balnain in October 2027.

2.1.10 The A831 Balnain does have land-uses (residential and education) that can generate demand for crossing roads. There is a Pelican-style crossing on the A831 Balnain to cover the main desire line for crossing the road. Otherwise, the lack of footway and direct frontages on the A831 Balnain suggests demand for crossing the road is limited. The general lack of pedestrian infrastructure, and the existing Pelican crossing on the main desire line, could mean forecast adverse severance effects may not materialise on the A831 Balnain. The limited pedestrian demand for crossing the road is catered for by the existing Pelican crossing.

Fear and Intimidation 2027

2.1.11 **Table 1-3: 2027 Cumulative Development Fear and Intimidation** presents the significance of effects on the fear and intimidation on and by road users as a result of cumulative development traffic. The IEMA Guidelines state that the extent of fear and intimidation is dependent on:

- The total volume of traffic;
- The heavy vehicle composition;
- The speed of vehicles; and
- The proximity of traffic to people.

2.1.12 The fear and intimidation assessment has been conducted using the 'degree of hazard' methodology as set out in IEMA Guidelines 2023. The derivation of the fear and intimidation calculations are included at **Appendix C**.

2.1.13 The Fear and Intimidation assessment applies a TEMPro growth factor to summer 2024 traffic to form the 2027 baseline position, as the higher summer traffic flows make for a worst-case assessment.

Table 1-3: 2027 Cumulative Development Fear and Intimidation

Road	Sensitivity of Receptor	Degree of Hazard Step Change	Magnitude of Change	Significance of Effect
A82 Inverness	High	0	Negligible	Minor
A82 North Drumnadrochit	High	0	Negligible	Minor
A82 Drumnadrochit	High	0	Negligible	Minor
A82 Lewiston	High	0	Negligible	Minor
A82 Urquhart Castle	High	0	Negligible	Minor
A82 Grotaig	Low	0	Negligible	Negligible
A82 Alltsigh	Low	0	Negligible	Negligible
A82 Invermoriston	High	0	Negligible	Minor
A82 Fort Augustus	High	0	Negligible	Minor
A887 Invermoriston	Medium	0	Negligible	Negligible
A831 Milton	Medium	0	Negligible	Negligible
A831 Strathnacro	Low	0	Negligible	Negligible
A831 Balnain	Medium	0	Negligible	Negligible

2.1.14 Classifying the significance of effects prior to mitigation, the likely effect of 2027 cumulative development traffic on Fear and Intimidation is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.1.15 For fear and intimidation, the significance of effects on most of the assessed road links would be negligible. The A82 Inverness, A82 North Drumnadrochit, A82 Drumnadrochit, A82 Lewiston, A82 Urquhart Castle, A82 Invermoriston and A82 Fort Augustus are however, forecast to have Minor Adverse (Not Significant) effects.

Road User and Pedestrian Safety 2027

2.1.16 Road user and pedestrian safety assess environmental effects based on rate and severity of accidents relating to changes in traffic flows. Recorded injury accidents for the five-year period 2019-2023 were used to calculate an accident rate by severity (slight, serious, fatal) per million vehicle kilometres travelled on Study Area roads. Cumulative development traffic vehicle kilometres by Study Area road

are applied to the accident rates to produce a forecast of accidents by severity for October 2027. **Appendix D** details the forecast of accidents by severity.

2.1.17 **Table 1-4: 2027 Cumulative Development Road Safety** summarises forecast injury accidents and significance of environmental effects potentially resulting from cumulative development traffic on Study Area Roads in October 2027.

Table 1-4: 2027 Cumulative Development Road Safety

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Serious	Fatal		
A82 Inverness	High	0	0	0	Negligible	Minor
A82 North Drumnadrochit	High	0	0	0	Negligible	Minor
A82 Drumnadrochit	High	0	0	0	Negligible	Minor
A82 Lewiston	High	0	0	0	Negligible	Minor
A82 Urquhart Castle	High	0	0	0	Negligible	Minor
A82 Grotaig	Low	0	0	0	Negligible	Negligible
A82 Alltsigh	Low	0	0	0	Negligible	Negligible
A82 Invermoriston	High	0	0	0	Negligible	Minor
A82 Fort Augustus	High	0	0	0	Negligible	Minor
A887 Invermoriston	Medium	0	0	0	Negligible	Negligible
A831 Milton	Medium	0	0	0	Negligible	Negligible
A831 Strathnacro	Low	0	0	0	Negligible	Negligible
A831 Balnain	Medium	0	0	0	Negligible	Negligible

2.1.18 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on Road User and Pedestrian Safety in October 2027 is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.1.19 Cumulative development traffic during the month of October 2027 would be extremely unlikely, in terms of historic accident rates and vehicle kilometres travelled by development traffic, to be sufficient to generate injury accidents.

2.1.20 For comparison, if October 2027 peak month cumulative traffic were extrapolated across twelve-months to create a virtual peak year of 2027 results still indicate cumulative development traffic would be extremely unlikely to be sufficient to generate any injury accidents.

Non-Motorised Amenity 2027

2.1.21 **Table 1-5: 2027 Cumulative Development Non-Motorised Amenity** presents the forecast significance of effects on non-motorised amenity for 2027 cumulative development traffic. The significance of effects for non-motorised amenity are based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines.

2.1.22 IEMA Guidelines suggest that a threshold for judging the significance of changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment. For this cumulative assessment to establish a significance of effect for non-motorised amenity, the same 30%, 60%, 90% magnitude of change thresholds as applied to ‘severance’ assessment have been used.

Table 1-5: 2027 Cumulative Development Non-Motorised Amenity

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	20%	Negligible	Minor
A82 North Drumnadrochit	High	20%	Negligible	Minor
A82 Drumnadrochit	High	2%	Negligible	Minor
A82 Lewiston	High	3%	Negligible	Minor
A82 Urquhart Castle	High	4%	Negligible	Minor
A82 Grotaig	Low	5%	Negligible	Negligible
A82 Alltsigh	Low	5%	Negligible	Negligible
A82 Invermoriston	High	4%	Negligible	Minor
A82 Fort Augustus	High	17%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	32%	Low	Minor
A831 Strathnacro	Low	49%	Low	Negligible
A831 Balnain	Medium	66%	Medium	Moderate

2.1.23 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on non-motorised amenity is a direct, temporary, **Moderate Adverse (Significant)** effect.

2.1.24 For non-motorised amenity only the A831 Balnain is forecast to experience significant environmental effects. All other study area roads are forecast to experience either minor or negligible (not significant) non-motorised amenity environmental effects from cumulative development traffic.

2.1.25 The Proposed Development does not put any cumulative traffic onto the A831 Balnain. Proposed Development traffic leaves the A831 before reaching Balnain. Bingally Substation and OHL tie-in and Chrathaich Wind Farm put the most significant element of cumulative development traffic onto the A831 Balnain in 2027. These two developments are forecast to put a total of 254 HGV movements and 398 Car movements per day onto the A831 Balnain in October 2027.

2.1.26 The A831 Balnain does have land-uses (residential and education) that can generate non-motorised traffic. It is also noted that footway / cycleway provision on the A831 Balnain is very limited. The general lack of pedestrian / cycle infrastructure could mean the forecast adverse non-motorised amenity effects may not materialise on the A831 Balnain. In reality the limited pedestrian / cycle infrastructure limits the opportunity and demand for non-motorised traffic to interact and experience amenity with vehicle traffic on the A831 Balnain.

Non-Motorised User Delay 2027

2.1.27 **Table 1-6: 2027 Cumulative Development Non-Motorised User Delay** presents the forecast significance of effects on non-motorised user delay for 2027 cumulative development traffic. The significance of effects for non-motorised user delay are based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines.

2.1.28 IEMA Guidelines suggest that a threshold for judging the significance of changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment. For this cumulative assessment to establish a significance of effect for non-motorised user delay, the same 30%, 60%, 90% magnitude of change thresholds as applied to the ‘severance’ and ‘non-motorised amenity’ assessments has been used.

Table 1-6: 2027 Cumulative Development Non-Motorised User Delay

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	20%	Negligible	Minor
A82 North Drumnadrochit	High	20%	Negligible	Minor
A82 Drumnadrochit	High	2%	Negligible	Minor
A82 Lewiston	High	3%	Negligible	Minor
A82 Urquhart Castle	High	4%	Negligible	Minor
A82 Grotaig	Low	5%	Negligible	Negligible
A82 Alltsigh	Low	5%	Negligible	Negligible
A82 Invermoriston	High	4%	Negligible	Minor
A82 Fort Augustus	High	17%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	32%	Low	Minor
A831 Strathnacro	Low	49%	Low	Negligible
A831 Balnain	Medium	66%	Medium	Moderate

2.1.29 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on non-motorised user delay is a direct, temporary, **Moderate Adverse (Significant)** effect.

2.1.30 For non-motorised user delay only the A831 Balnain is forecast to experience significant environmental effects. All other study area roads are forecast to experience either minor or negligible (not significant) non-motorised user delay environmental effects from cumulative development traffic.

2.1.31 The Proposed Development does not put any cumulative traffic onto the A831 Balnain. Proposed Development traffic leaves the A831 before reaching Balnain. Bingally Substation and Chrathaich Wind Farm put the most significant element of cumulative development traffic onto the A831 Balnain in 2027. These two developments are forecast to put a total of 254 HGV movements and 398 Car movements per day onto the A831 Balnain in October 2027.

2.1.32 The A831 Balnain does have land-uses (residential and education) that can generate non-motorised traffic. It is also noted that footway / cycleway provision on the A831 Balnain is very limited. There is a Pelican-style crossing on the A831 Balnain to cover the main desire line for crossing the road. Otherwise, the lack of footway and direct frontages on the A831 Balnain suggests demand for crossing the road is limited. The general lack of pedestrian / cycle infrastructure, and the existing Pelican crossing on the main desire line, could mean forecast adverse non-motorised user delay effects may not materialise on the A831 Balnain. The limited pedestrian / cycle demand for crossing the road is catered for by the existing Pelican crossing.

Road Vehicle Driver and Passenger Delay 2027

2.1.33 **Table 1-7: 2027 Cumulative Development Road Vehicle Driver and Passenger Delay** presents the forecast effects on road vehicle driver and passenger delay for cumulative development traffic. The Congestion Reference Flow (CRF) for Study Area Roads is used to establish Magnitude of Change. CRF is the daily traffic flow at which a road is likely to become ‘congested’ in peak periods on an average day. CRF is calculated in accordance with CD100 DMRB Extract Volume 5 Section 1 (TA 46/97) which remains applicable to trunk roads in Scotland.

2.1.34 For driver delay cumulative development traffic is assessed against 30% CRF, 60% CRF and 90% CRF levels for Low, Medium and High Magnitude of Change, respectively. If cumulative development traffic does not produce a CRF level change for a study area road, the magnitude of change for that road is considered negligible.

Table 1-7: 2027 Cumulative Development Road Vehicle Driver and Passenger Delay

Road	Sensitivity of Receptor	Change in Congestion Reference Flow	Magnitude of Change	Significance of Effect
A82 Inverness	High	1 CRF Level Change (CRF 30%<>60%)	Low	Moderate
A82 North Drumnadrochit	High	No CRF Level Change	Negligible	Minor
A82 Drumnadrochit	High	No CRF Level Change	Negligible	Minor
A82 Lewiston	High	1 CRF Level Change (CRF 30%<>60%)	Low	Moderate
A82 Urquhart Castle	High	No CRF Level Change	Negligible	Minor
A82 Grotaig	Low	No CRF Level Change	Negligible	Negligible
A82 Alltsigh	Low	No CRF Level Change	Negligible	Negligible
A82 Invermoriston	High	No CRF Level Change	Negligible	Minor
A82 Fort Augustus	High	No CRF Level Change	Negligible	Minor
A887 Invermoriston	Medium	No CRF Level Change	Negligible	Negligible
A831 Milton	Medium	No CRF Level Change	Negligible	Negligible
A831 Strathnacro	Low	No CRF Level Change	Negligible	Negligible
A831 Balnain	Medium	No CRF Level Change	Negligible	Negligible

2.1.35 Classifying the significance of effects prior to mitigation, the likely effect of cumulative traffic on Road Vehicle Driver and Passenger Delay is a direct, temporary, **Moderate Adverse (Significant)** effect on the A82 Inverness and the A82 Lewiston. The likely effect on all other Study Area roads is either a direct, temporary, Minor Adverse (Not Significant) or direct, temporary, Negligible (Not Significant) effect.

2.1.36 The A82 Inverness is classified as a Moderate Adverse (Significant) effect in EIA terms. This classification arises from the road's high sensitivity rating, which reflects its injury accident record rather than any existing congestion or capacity constraint. In practical terms, cumulative development traffic is not forecast to generate congestion, queuing or measurable delay on this road. The significant classification is therefore a consequence of the receptor sensitivity methodology rather than an indicator of operational traffic impact and should be read in that context.

2.1.37 The A82 Lewiston is classified as a Moderate Adverse (Significant) effect in EIA terms. This classification arises from the road's high sensitivity rating, which reflects its status as a significant tourist route due to its proximity to Loch Ness rather than any existing congestion or capacity constraint. In practical terms, cumulative development traffic is not forecast to generate congestion, queuing or measurable delay on this road. The significant classification is therefore a consequence of the receptor sensitivity methodology applied to a tourist route rather than an indicator of operational traffic impact and should be read in that context.

Hazardous / Large Loads 2027

2.1.38 In October 2027, fuel is likely to be the main hazardous load being transported to the Proposed Development site. Blasting agents or other similar hazardous loads are likely to arrive on site later in the construction programme. Road transport of hazardous loads is strictly regulated, and HGV fuel tankers are commonplace on UK roads. The nature of the cumulative developments suggests that fuel is likely to be the main potentially hazardous load being delivered to sites in October 2027.

2.1.39 The previously submitted cumulative traffic assessment indicated developments at Fort Augustus, Loch Liath Wind Farm and Chrathaich Wind Farm would generate Abnormal Indivisible Load traffic (AIL). The updated cumulative assessment now includes Bingally Substation and OHL tie-in and Cnoc

Farasd Wind Farm both of which will put AIL traffic on the A831, although not until 2029 onwards in the case of Cnoc Farasd Wind Farm.

2.1.40 For the Proposed Development, the AIL deliveries will take place during the Pre-Construction and Enabling Phase of development in 2027. In October 2027, this will principally be construction plant being delivered. As such, Proposed Development AIL on the A831 during October 2027 are likely to be Special Types General Order (STGO) Cat 1 and Cat 2 AIL. Typically, these are low loader type HGV with a minimum of 6 axles that will deliver construction plant to site. Their general appearance and size is not dissimilar to other HGV traffic. They are mainly differentiated by their gross weight.

2.1.41 STGO legislation requires all AIL to provide advance notice of travel on public roads. For larger Cat 3 or Special Order Movements AIL (e.g. wind turbine components) the advance notice requirement means AIL movements can be managed through well-established protocols such as the Electronic Service Delivery for Abnormal Loads system (ESDAL). As all AIL can be managed on public roads through established protocols, and particularly the more onerous Cat 3 or Special Order Movements AIL, there is ample scope for AIL to be scheduled to avoid significant cumulative environmental effects. As such, the significance of effects prior to mitigation is forecast to be no worse than a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.2 Assessment of Cumulative Effects 2029

2.2.1 Cumulative development sites included in this updated assessment, with their traffic forecasts, are contained in **Appendix A**. All cumulative development traffic from the previously submitted assessment is retained in the updated assessment. The updated assessment is differentiated by the addition of Bingally Substation and OHL tie-in and Cnoc Farasd Wind Farm traffic for the revised assessment year of 2029.

2.2.2 A TEMPro growth factor of 1.040 has been applied to 2024 surveyed traffic data to produce a 2029 baseline for cumulative assessment. Study Area Road flow diagrams for the 2029 cumulative assessment are provided at **Appendix B**.

2.2.3 **Table 1-8: 2029 Cumulative Assessment - Roads to be Assessed for Environmental Effects** compares 2029 forecast baseline traffic and 2029 cumulative development traffic to determine which Study Area Roads require assessed for environmental effects in accordance with IEMA Guidelines Rule 1 and Rule 2 conditions.

Table 1-8: 2029 Cumulative Assessment - Roads to be Assessed for Environmental Effects

Road	2029 Daily Baseline Traffic (12-Hour)		2029 Daily Cumulative Development		2029 Daily Cumulative Development % Impact		Include in Assessment
	HGV	Total	HGV	Total	HGV	Total	(Yes / No)
A82 Inverness	167	4,023	216	469	130%	12%	**Yes**
A82 North Drumnadrochit	167	4,023	216	469	130%	12%	**Yes**
A82 Drumnadrochit	241	4,881	144	235	60%	5%	**Yes**
A82 Lewiston	204	4,133	144	235	70%	6%	**Yes**
A82 Urquhart Castle	314	2,788	144	235	46%	8%	**Yes**
A82 Grotaig	147	2,418	144	235	98%	10%	**Yes**
A82 Alltsigh	145	2,432	144	235	99%	10%	**Yes**
A82 Invermoriston	154	2,501	144	235	93%	9%	**Yes**
A82 Fort Augustus	122	1,939	173	319	142%	16%	**Yes**
A887 Invermoriston	66	1,065	78	120	118%	11%	**Yes**
A831 Milton	53	2,127	159	381	300%	18%	**Yes**
A831 Strathnacro	27	1,382	226	448	842%	32%	**Yes**
A831 Balnain	22	1,005	103	291	472%	29%	**Yes**
A833	25	891	75	81	298%	9%	**Yes**

2.2.4 Table 1-8 shows that all Study Area roads must be included in the 2029 cumulative assessment.

Severance of Communities 2029

2.2.5 **Table 1-9: 2029 Cumulative Development Severance of Communities** presents the significance of effects on the severance of communities as a result of cumulative development traffic. The significance of effects for severance is based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines 2023.

2.2.6 The IEMA Guidelines state that, *"The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance, respectively.'*

Table 1-9: 2029 Cumulative Development Severance of Communities

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	12%	Negligible	Minor
A82 North Drumnadrochit	High	12%	Negligible	Minor
A82 Drumnadrochit	High	5%	Negligible	Minor
A82 Lewiston	High	6%	Negligible	Minor
A82 Urquhart Castle	High	8%	Negligible	Minor
A82 Grotaig	Low	10%	Negligible	Negligible
A82 Alltsigh	Low	10%	Negligible	Negligible
A82 Invermoriston	High	9%	Negligible	Minor
A82 Fort Augustus	High	16%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	18%	Negligible	Negligible
A831 Strathnacro	Low	32%	Low	Negligible
A831 Balnain	Medium	29%	Low	Minor
A833	Low	9%	Negligible	Negligible

2.2.7 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on severance is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.2.8 For severance, the significance of effects on most study area roads would be negligible. The A82 Inverness, A82 North Drumnadrochit, A82 Drumnadrochit, A82 Lewiston, A82 Urquhart Castle, A82 Invermoriston, A82 Fort Augustus are forecast to have minor adverse not significant effects.

2.2.9 In 2029 the A831 Balnain cumulative assessment forecast environmental effect for severance is reduced from the 2027 moderate adverse significant effect to a minor adverse not significant effect. This is due to the reduced amount of Bingally Substation and OHL tie-in traffic routing along the A831 in 2029, given that site will be winding down its construction programme at that time.

Fear and Intimidation 2029

2.2.10 **Table 1-10: 2029 Cumulative Development Fear and Intimidation** below presents the significance of effects on the fear and intimidation on and by road users as a result of cumulative development traffic. The IEMA Guidelines state that the extent of fear and intimidation is dependent on:

- The total volume of traffic;
- The heavy vehicle composition;
- The speed of vehicles; and
- The proximity of traffic to people.

2.2.11 The fear and intimidation assessment has been conducted using the 'degree of hazard' methodology as set out in IEMA Guidelines 2023. The derivation of the fear and intimidation calculations are included in full within **Appendix C**.

2.2.12 The Fear and Intimidation assessment applies a TEMPro growth factor to summer 2024 traffic to form the 2029 baseline position, as the higher summer traffic flows make for a worst-case assessment.

Table 1-10: 2029 Cumulative Development Fear and Intimidation

Road	Sensitivity of Receptor	Step Change	Magnitude of Change	Significance of Effect
A82 Inverness	High	0	Negligible	Minor
A82 North Drumnadrochit	High	0	Negligible	Minor
A82 Drumnadrochit	High	0	Negligible	Minor
A82 Lewiston	High	0	Negligible	Minor
A82 Urquhart Castle	High	0	Negligible	Minor
A82 Grotaig	Low	0	Negligible	Negligible
A82 Alltsigh	Low	0	Negligible	Negligible
A82 Invermoriston	High	0	Negligible	Minor
A82 Fort Augustus	High	0	Negligible	Minor
A887 Invermoriston	Medium	0	Negligible	Negligible
A831 Milton	Medium	0	Negligible	Negligible
A831 Strathnacro	Low	0	Negligible	Negligible
A831 Balnain	Medium	0	Negligible	Negligible
A833	Low	0	Negligible	Negligible

2.2.13 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on Fear and Intimidation is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.2.14 For Fear and Intimidation, the significance of effects on most of the assessed road links would be negligible. The A82 Inverness, A82 North Drumnadrochit, A82 Drumnadrochit, A82 Lewiston, A82 Urquhart Castle, A82 Invermoriston and A82 Fort Augustus are however, forecast to have Minor Adverse (Not Significant) effects.

Road User and Pedestrian Safety 2029

2.2.15 Road user and pedestrian safety assess environmental effects based on rate and severity of accidents relating to changes in traffic flows. Recorded injury accidents for the five-year period 2019-2023 were used to calculate an accident rate by severity (slight, serious, fatal) per million vehicle kilometres travelled on Study Area roads. Cumulative development traffic vehicle kilometres by Study Area road are applied to the accident rates to produce a forecast of accidents by severity for June 2029. **Appendix D** details the forecast of accidents by severity.

2.2.16 **Table 1-11: 2029 Cumulative Development Road Safety** summarises forecast injury accidents and significance of environmental effects potentially resulting from cumulative development traffic on Study Area Roads in June 2029.

Table 1-11: 2029 Cumulative Development Road Safety

Road	Sensitivity of Receptor	Forecast Injury Accidents			Magnitude of Change	Significance of Effect
		Slight	Serious	Fatal		
A82 Inverness	High	0	0	0	Negligible	Minor
A82 North Drumnadrochit	High	0	0	0	Negligible	Minor
A82 Drumnadrochit	High	0	0	0	Negligible	Minor
A82 Lewiston	High	0	0	0	Negligible	Minor
A82 Urquhart Castle	High	0	0	0	Negligible	Minor
A82 Grotaig	Low	0	0	0	Negligible	Negligible
A82 Alltsigh	Low	0	0	0	Negligible	Negligible
A82 Invermoriston	High	0	0	0	Negligible	Minor
A82 Fort Augustus	High	0	0	0	Negligible	Minor
A887 Invermoriston	Medium	0	0	0	Negligible	Negligible
A831 Milton	Medium	0	0	0	Negligible	Negligible
A831 Strathnacro	Low	0	0	0	Negligible	Negligible
A831 Balnain	Medium	0	0	0	Negligible	Negligible
A833	Low	0	0	0	Negligible	Negligible

2.2.17 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on Road User and Pedestrian Safety in June 2029 is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.2.18 Cumulative development traffic during the month of June 2029 would be extremely unlikely, in terms of historic accident rates and vehicle kilometres travelled by development traffic, to be sufficient to generate injury accidents.

2.2.19 For comparison, if June 2029 peak month cumulative traffic were extrapolated across twelve-months to create a virtual peak year of 2029 results still indicate cumulative development traffic would be extremely unlikely to be sufficient to generate any injury accidents.

Non-Motorised Amenity 2029

2.2.20 **Table 1-12: 2029 Cumulative Development Non-Motorised Amenity** presents the forecast significance of effects on non-motorised amenity for 2029 cumulative development traffic. The significance of effects for non-motorised amenity are based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines.

2.2.21 IEMA Guidelines suggest that a threshold for judging the significance of changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment. For this cumulative assessment to establish a significance of effect for non-motorised amenity, the same 30%, 60% and 90% magnitude of change thresholds as applied to ‘severance’ assessment have been used.

Table 1-12: 2029 Cumulative Development Non-Motorised Amenity

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	12%	Negligible	Minor
A82 North Drumnadrochit	High	12%	Negligible	Minor
A82 Drumnadrochit	High	5%	Negligible	Minor
A82 Lewiston	High	6%	Negligible	Minor
A82 Urquhart Castle	High	8%	Negligible	Minor
A82 Grotaig	Low	10%	Negligible	Negligible
A82 Alltsigh	Low	10%	Negligible	Negligible
A82 Invermoriston	High	9%	Negligible	Minor
A82 Fort Augustus	High	16%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	18%	Negligible	Negligible
A831 Strathnacro	Low	32%	Low	Negligible
A831 Balnain	Medium	29%	Low	Minor
A833	Low	9%	Negligible	Negligible

2.2.22 Classifying the significance of effects: prior to mitigation, the likely effect of cumulative development traffic on non-motorised user amenity is a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.2.23 In terms of non-motorised user amenity, the significance of effects on most of the assessed road links would be negligible. The A82 Inverness, A82 North Drumnadrochit, A82 Drumnadrochit, A82 Lewiston, A82 Urquhart Castle, A82 Invermoriston, A82 Fort Augustus and A831 Balnain are however, forecast to **have Minor Adverse (Not Significant)** effects.

Non-Motorised User Delay 2029

2.2.24 **Table 1-13: 2029 Cumulative Development Non-Motorised User Delay** presents the forecast significance of effects on non-motorised user delay for 2029 cumulative development traffic. The significance of effects for non-motorised amenity are based on an assessment of all traffic (car and HGV) in accordance with the IEMA Guidelines.

2.2.25 IEMA Guidelines suggest that a threshold for judging the significance of changes in pedestrian amenity would be where traffic flow has halved or doubled. It also states that these thresholds are expressed as a starting point for any assessment. For this cumulative assessment to establish a significance of effect for non-motorised user delay, the same 30%, 60% and 90% magnitude of change thresholds as applied to the ‘severance’ and ‘non-motorised amenity’ assessments has been used.

Table 1-13: 2029 Cumulative Development Non-Motorised User Delay

Road	Sensitivity of Receptor	Traffic Increase (%)	Magnitude of Change	Significance of Effect
A82 Inverness	High	12%	Negligible	Minor
A82 North Drumnadrochit	High	12%	Negligible	Minor
A82 Drumnadrochit	High	5%	Negligible	Minor
A82 Lewiston	High	6%	Negligible	Minor
A82 Urquhart Castle	High	8%	Negligible	Minor
A82 Grotaig	Low	10%	Negligible	Negligible
A82 Alltsigh	Low	10%	Negligible	Negligible
A82 Invermoriston	High	9%	Negligible	Minor
A82 Fort Augustus	High	16%	Negligible	Minor
A887 Invermoriston	Medium	11%	Negligible	Negligible
A831 Milton	Medium	18%	Negligible	Negligible
A831 Strathnacro	Low	32%	Low	Negligible
A831 Balnain	Medium	29%	Low	Minor
A833	Low	9%	Negligible	Negligible

2.2.26 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on non-motorised user delay is a direct, temporary, **Minor Adverse (Not Significant)**.

2.2.27 In terms of non-motorised user delay, the significance of effects on most of the assessed road links would be negligible. The A82 Inverness, A82 North Drumnadrochit, A82 Drumnadrochit, A82 Lewiston, A82 Urquhart Castle, A82 Invermoriston, A82 Fort Augustus and A831 Balnain are however, forecast to have **Minor Adverse (Not Significant)** effects.

Road Vehicle Driver and Passenger Delay 2029

2.2.28 **Table 1-14: 2029 Cumulative Development Road Vehicle Driver and Passenger Delay** presents the forecast effects on road vehicle driver and passenger delay for cumulative development traffic. The Congestion Reference Flow (CRF) for Study Area Roads is used to establish Magnitude of Change. CRF is the daily traffic flow at which a road is likely to become ‘congested’ in peak periods on an average day. CRF is calculated in accordance with CD100 DMRB Extract Volume 5 Section 1 (TA 46/97) which remains applicable to trunk roads in Scotland.

2.2.29 For driver delay cumulative development traffic is assessed against 30% CRF, 60% CRF and 90% CRF levels for Low, Medium and High Magnitude of Change, respectively. If cumulative development traffic does not produce a CRF level change for a study area road, the magnitude of change for that road is considered negligible.

Table 1-14: 2029 Cumulative Development Road Vehicle Driver and Passenger Delay

Road	Sensitivity of Receptor	Change in Congestion Reference Flow	Magnitude of Change	Significance of Effect
A82 Inverness	High	1 Level Change plus CRF 30%<>60%	Low	Moderate
A82 North Drumnadrochit	High	No Step Change	Negligible	Minor
A82 Drumnadrochit	High	No Step Change	Negligible	Minor
A82 Lewiston	High	No Step Change	Negligible	Minor
A82 Urquhart Castle	High	No Step Change	Negligible	Minor
A82 Grotaig	Low	No Step Change	Negligible	Negligible
A82 Alltsigh	Low	No Step Change	Negligible	Negligible
A82 Invermoriston	High	No Step Change	Negligible	Minor
A82 Fort Augustus	High	No Step Change	Negligible	Minor
A887 Invermoriston	Medium	No Step Change	Negligible	Negligible
A831 Milton	Medium	No Step Change	Negligible	Negligible
A831 Strathnacro	Low	No Step Change	Negligible	Negligible
A831 Balnain	Medium	No Step Change	Negligible	Negligible
A833	Low	No Step Change	Negligible	Negligible

2.2.30 Classifying the significance of effects prior to mitigation, the likely effect of cumulative development traffic on Road Vehicle Driver and Passenger Delay is a direct, temporary, **Moderate Adverse (Significant)** effect on the A82 Inverness. The likely effect on all other Study Area roads is either a direct, temporary, Minor Adverse (Not Significant) or direct, temporary, Negligible (Not Significant) effect.

2.2.31 For the A82 Inverness the forecast significant environmental effect is a consequence of it being a high sensitivity receptor. This high sensitivity is due to the A82 Inverness's record of injury accidents rather than any congestion, queuing or delay occurring on this road. As such, the forecast significant effects on road vehicle driver and passenger delay may not materialise in reality on the A82 Inverness.

Hazardous / Large Loads 2029

2.2.32 In June 2029, fuel, blasting agents and chemical additives for the production of concrete are likely to be the main hazardous loads being transported to the Proposed Development Site. Road transport of hazardous loads is strictly regulated. HGV fuel tankers are commonplace on UK roads. UK law governing the transport of explosives is the Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (CDG 2009). Specifications for vehicles and the transport of hazardous and explosive materials by road to the Proposed Development site will accord with CDG 2009 requirements. It is a reasonable assumption that other cumulative developments would do the same if transporting hazardous materials to their respective sites.

2.2.33 The previously submitted cumulative traffic assessment indicated developments at Fort Augustus, Loch Liath Wind Farm and Chrathaich Wind Farm would generate AIL. The updated cumulative assessment now includes Bingally Substation and Cnoc Farasd Wind Farm both of which will put AIL traffic on the A831, and potentially significant AIL during 2029 in the case of Cnoc Farasd.

2.2.34 For the Proposed Development AIL deliveries may take place on the A831 during 2029, although they are likely to remain less onerous Special Types General Order (STGO) Cat 1 and Cat 2 AIL. Larger AIL that fall into STGO Cat 3 or Special Order Movements will likely occur later than 2029 in the Proposed Development construction programme, as these will be the M&E equipment associated with power generation.

2.2.35 STGO legislation requires all AIL to provide advance notice of travel on public roads. For larger Cat 3 or Special Order Movements AIL (e.g. wind turbine components) the advance notice requirement means AIL movements can be managed through well-established protocols such as the Electronic Service Delivery for Abnormal Loads system (ESDAL). As all AIL can be managed on public roads through established protocols, and particularly the more onerous Cat 3 or Special Order Movements AIL, there is ample scope for AIL to be scheduled to avoid significant cumulative environmental effects. As such, the significance of effects prior to mitigation is forecast to be no worse than a direct, temporary, **Minor Adverse (Not Significant)** effect.

2.3 Cumulative Development Mitigation

2.3.1 The construction programme for the Proposed Development has been deferred to start date of October 2027. This deferral avoids Proposed Development traffic being on the A831 during the majority of, and peak construction period for, the Bingally 400kV Substation and OHL tie-in project.

2.3.2 Proposed Development cumulative mitigation measures will encompass the Construction Traffic Management Plan (CTMP) described in Embedded Mitigation within the submitted **Chapter 13: Access, Traffic and Transport (Volume 2: Main Report)**.

2.3.3 A CTMP is a standard planning condition for major construction developments of this nature accessing the public road network. It is reasonable to expect that a CTMP will be conditioned for the Cnoc Farasd Wind Farm given that its construction traffic will use the A831 at the same time as the Proposed Development.

2.3.4 It is anticipated that Planning Conditions imposed with any consent for the Proposed Development will include a requirement to engage in effective CTMP liaison with other cumulative developments, particularly Cnoc Farasd Wind Farm, to minimise potential significant adverse environmental effects resulting from construction traffic.

2.4 Cumulative Development Residual Effects

2.4.1 Cumulative development mitigation would be implemented through the CTMP for the Proposed Development, together with CTMP liaison and coordination with other cumulative developments where practicable. The Framework CTMP sets out measures including delivery management, routing controls, HGV movement and timing restrictions, and monitoring and liaison with roads authorities. These measures are intended to manage construction traffic activity on the Study Area roads and minimise the magnitude of change at sensitive receptor locations. For the purposes of the cumulative assessment, residual effects have therefore been assessed on the basis that implementation of CTMP measures could reasonably reduce the magnitude of change by one step at affected receptors. **Table 1-15: Post-Mitigation Environmental Effects 2027 Cumulative Assessment** summarises residual cumulative significance of effects should a one-step reduction in magnitude of change be achieved.

Table 1-15: Post-Mitigation Environmental Effects 2027 Cumulative Assessment

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect (Post-Mitigation)
Severance	Pedestrian Traffic	Moderate	CTMP / CTMP Liaison with Cumulative Developments	Minor
Fear and Intimidation	Pedestrian & Cycle Traffic	Minor		Negligible
Road User and Pedestrian Safety	All Traffic	Minor		Negligible
Non-Motorised Amenity	Pedestrian & Cycle Traffic	Moderate		Minor
Non-Motorised User Delay	Pedestrian & Cycle Traffic	Moderate		Minor
Road Vehicle & Passenger Delay	Vehicle Traffic	Moderate		Minor
Hazardous / Large Loads	All Traffic	Minor		Negligible

2.4.2

2.4.3 **Table 1-16: Post-Mitigation Environmental Effects 2029 Cumulative** Assessment summarises residual cumulative significance of effects on the same basis, applying a one-step reduction in magnitude of change where CTMP measures and liaison with cumulative developments are successfully implemented.

Table 1-16: Post-Mitigation Environmental Effects 2029 Cumulative Assessment

Effect	Receptor	Significance of Effect (Prior to Mitigation)	Mitigation	Residual Effect (Post-Mitigation)
Severance	Pedestrian Traffic	Minor	CTMP / CTMP Liaison with Cumulative Developments	Negligible
Fear and Intimidation	Pedestrian & Cycle Traffic	Minor		Negligible
Road User and Pedestrian Safety	All Traffic	Minor		Negligible
Non-Motorised User Amenity	Pedestrian & Cycle Traffic	Minor		Negligible
Non-Motorised User Delay	Pedestrian & Cycle Traffic	Minor		Negligible
Road Vehicle & Passenger Delay	Vehicle Traffic	Moderate		Minor
Hazardous / Large Loads	All Traffic	Minor		Negligible

Appendix A - Cumulative Development Traffic

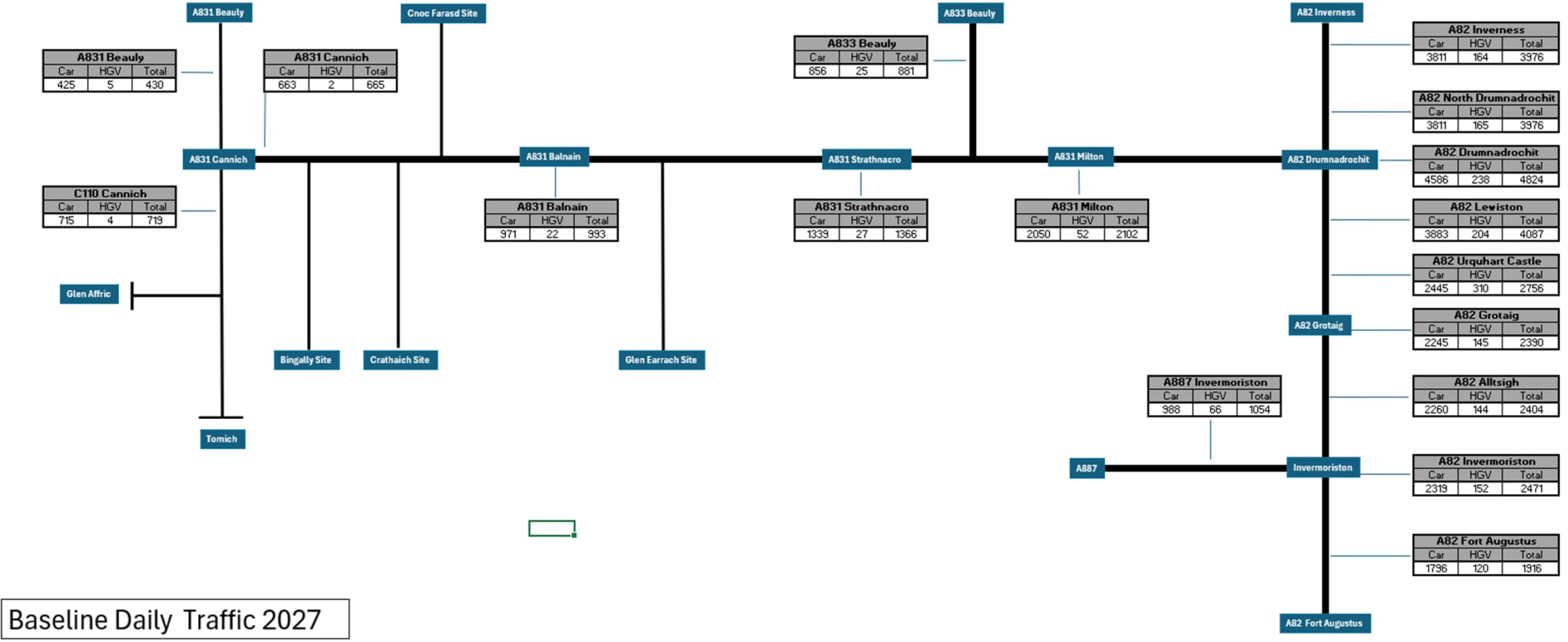
Study Area Roads			Cumulative Development Traffic - 2027					
Road	Between		Daily			Hourly		Hours
								10
			Car / LGV	HGV	Total	Car / LGV	HGV	Total
A82 Inverness	A82 / A8082 Junction	A82 Drumnadrochit welcome signage	441	335	776	44	34	78
A82 North Drumnadrochit	A82 Drumnadrochit welcome signage	A82 / A831 junction Drumnadrochit	441	335	776	44	34	78
A82 Drumnadrochit	A82 / A831 junction Drumnadrochit	A82 roundabout at Lewiston	31	79	110	3	8	11
A82 Lewiston	A82 roundabout at Lewiston	A82 Strone House	31	79	110	3	8	11
A82 Urquhart Castle	A82 Store House	A82 Grotaig	31	79	110	3	8	11
A82 Grotaig	A82 Grotaig	A82 Alltsigh	31	79	110	3	8	11
A82 Alltsigh	A82 Alltsigh	A82 Lodge on Loch Ness	31	79	110	3	8	11
A82 Invermoriston	A82 Lodge on Loch Ness	A82 / A887 junction	31	79	110	3	8	11
A82 Fort Augustus	A82 Invermoriston	Fort Augustus	146	172	318	15	17	32
A887 Invermoriston	Junction with A82 Invermoriston	Junction with A87	42	78	120	4	8	12
A831 Milton	A82 / A831 junction Drumnadrochit	A831 / A833 junction	410	260	670	41	26	67
A831 Strathnacro	A831 / A833 junction	A831 / Forest Car Park junction	410	264	674	41	26	67
A831 Balnain	A831 / Forest Car Park junction	A831 Bridge over River Glass	398	254	652	40	25	65
A833	A831 / A833 junction	A833 / A862 junction	0	4	4	0	0	0

Cumulative Development Sites	Planning Reference
Bingally 400kV Substation + OHL Tie-in	25/02301/S37
Cnoc Farasd Wind Farm	25/04604/FUL
Chrathaich Wind Farm	23/03311/S36
Loch Liath Wind Farm (orignial EIA Cumulative Site)	23/02462/S36
Fort Augustus (Auchterawe) Substation Extension (original EIA Cumulative Site)	24/03150/FUL
Melgarve Cluster Project (original EIA Cumulative Site)	24/01732/S37

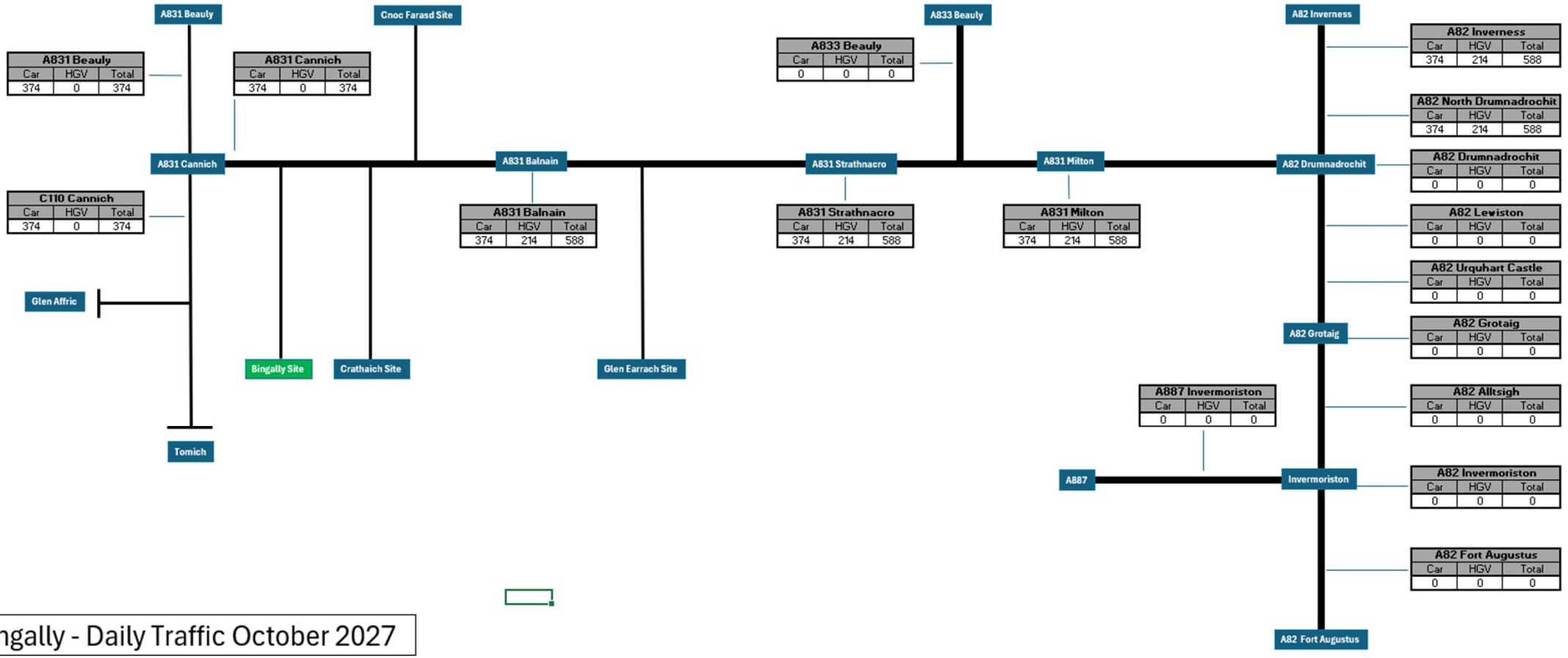
Study Area Roads			Cumulative Development Traffic - 2029					
Road	Between		Daily			Hourly		Hours
								10
			Car / LGV	HGV	Total	Car / LGV	HGV	Total
A82 Inverness	A82 / A8082 Junction	A82 Drumnadrochit welcome signage	253	216	469	25	22	47
A82 North Drumnadrochit	A82 Drumnadrochit welcome signage	A82 / A831 junction Drumnadrochit	253	216	469	25	22	47
A82 Drumnadrochit	A82 / A831 junction Drumnadrochit	A82 roundabout at Lewiston	91	144	235	9	14	24
A82 Lewiston	A82 roundabout at Lewiston	A82 Strone House	91	144	235	9	14	24
A82 Urquhart Castle	A82 Store House	A82 Grotaig	91	144	235	9	14	24
A82 Grotaig	A82 Grotaig	A82 Alltsigh	91	144	235	9	14	24
A82 Alltsigh	A82 Alltsigh	A82 Lodge on Loch Ness	91	144	235	9	14	24
A82 Invermoriston	A82 Lodge on Loch Ness	A82 / A887 junction	91	144	235	9	14	24
A82 Fort Augustus	A82 Invermoriston	Fort Augustus	146	173	319	15	17	32
A887 Invermoriston	Junction with A82 Invermoriston	Junction with A87	42	78	120	4	8	12
A831 Milton	A82 / A831 junction Drumnadrochit	A831 / A833 junction	222	159	381	22	16	38
A831 Strathnacro	A831 / A833 junction	A831 / Forest Car Park junction	222	226	448	22	23	45
A831 Balnain	A831 / Forest Car Park junction	A831 Bridge over River Glass	188	103	291	19	10	29
A833	A831 / A833 junction	A833 / A862 junction	6	75	81	1	8	8

Cumulative Development Sites	Planning Reference
Bingally 400kV Substation + OHL Tie-in	25/02301/S37
Cnoc Farasd Wind Farm	25/04604/FUL
Chrathaich Wind Farm	23/03311/S36
Loch Liath Wind Farm (orignial EIA Cumulative Site)	23/02462/S36
Fort Augustus (Auchterawe) Substation Extension (original EIA Cumulative Site)	24/03150/FUL
Melgarve Cluster Project (original EIA Cumulative Site)	24/01732/S37

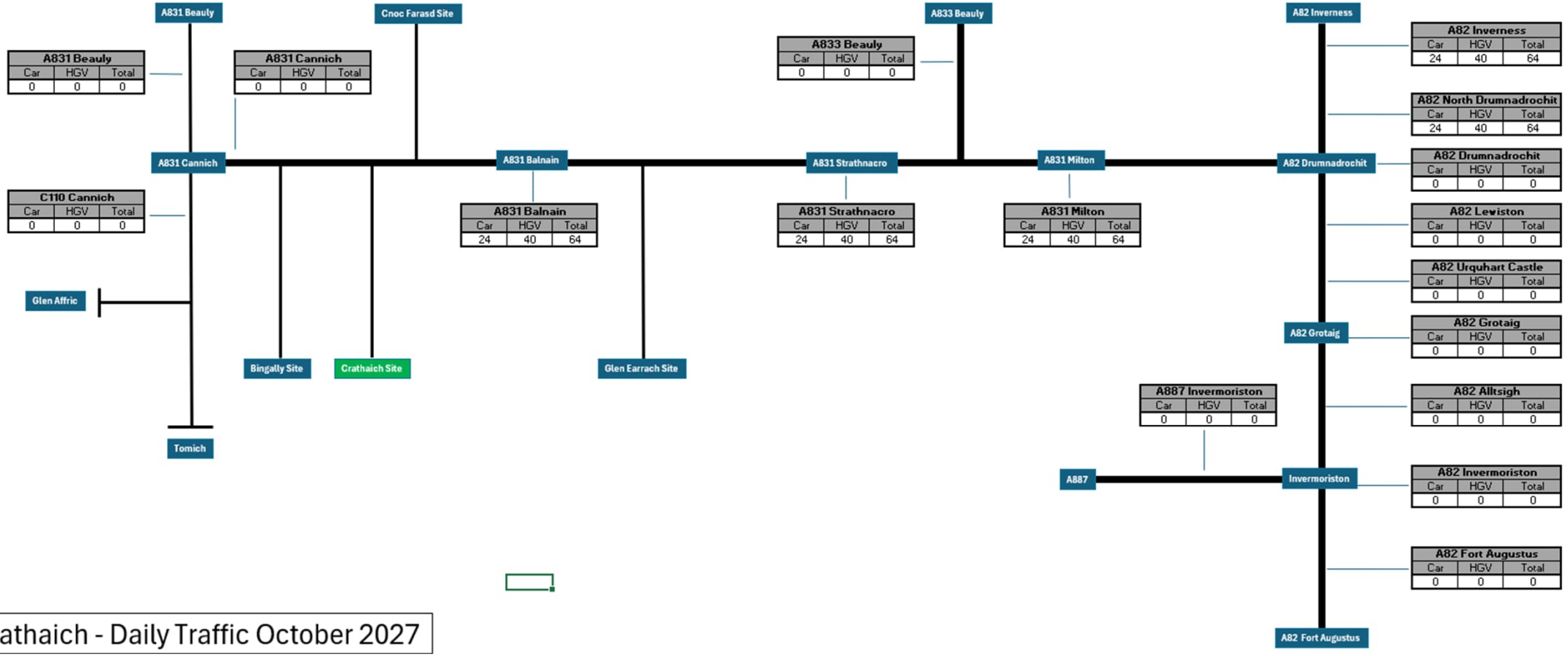
Appendix B – Cumulative Development Network Flow Diagrams



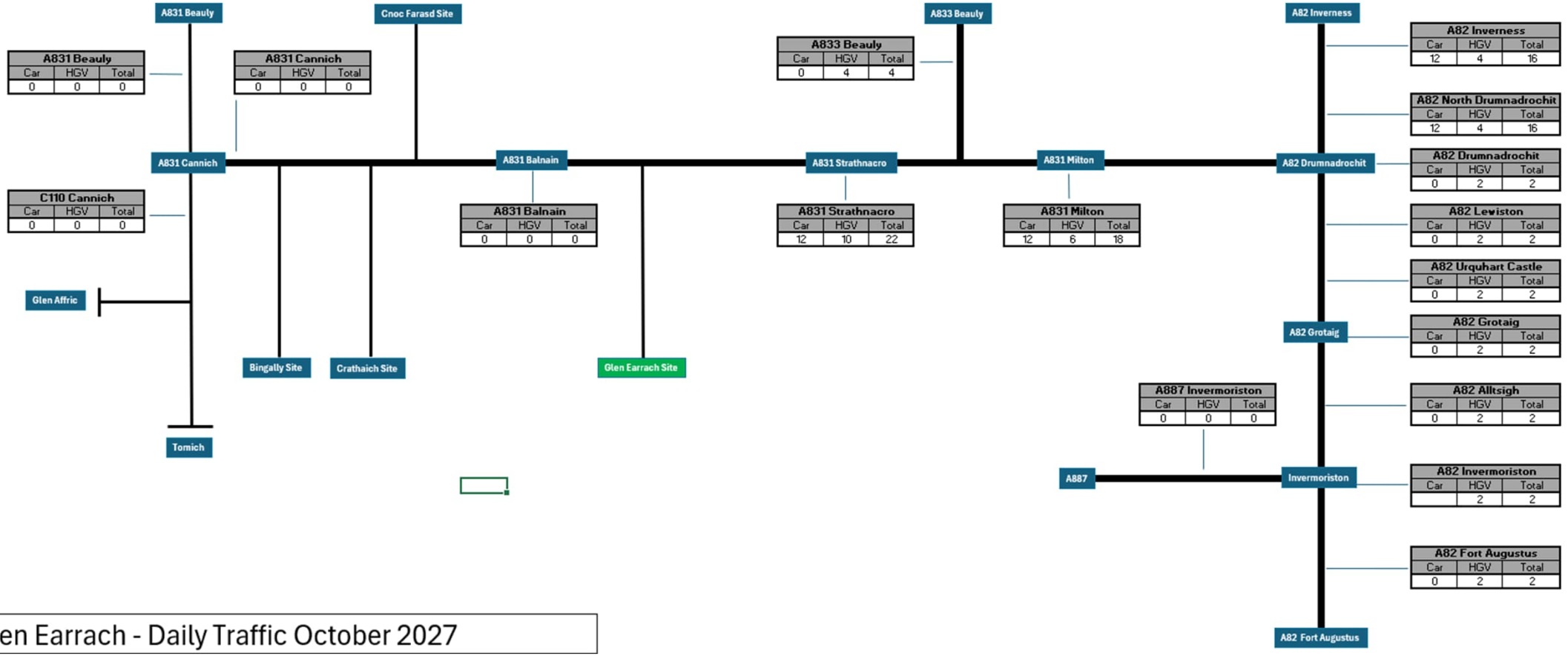
Baseline Daily Traffic 2027



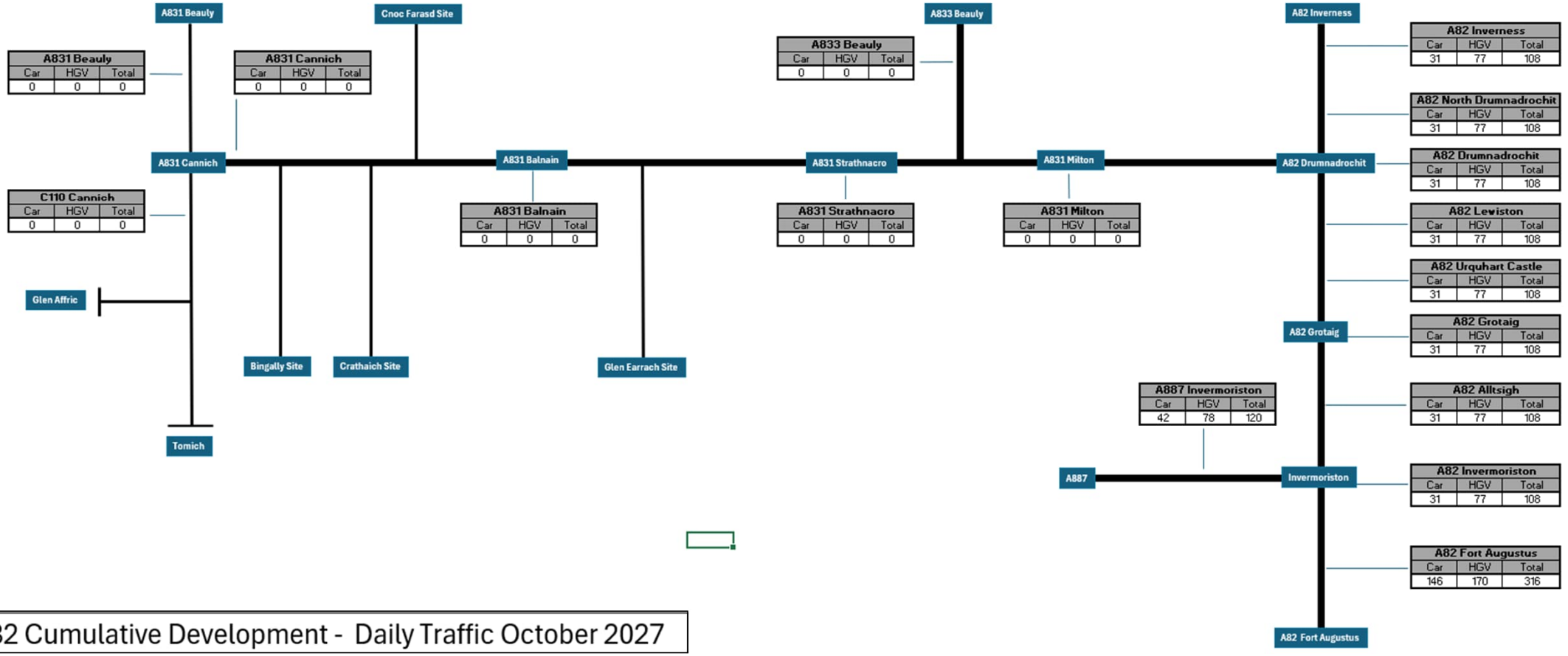
Bingally - Daily Traffic October 2027



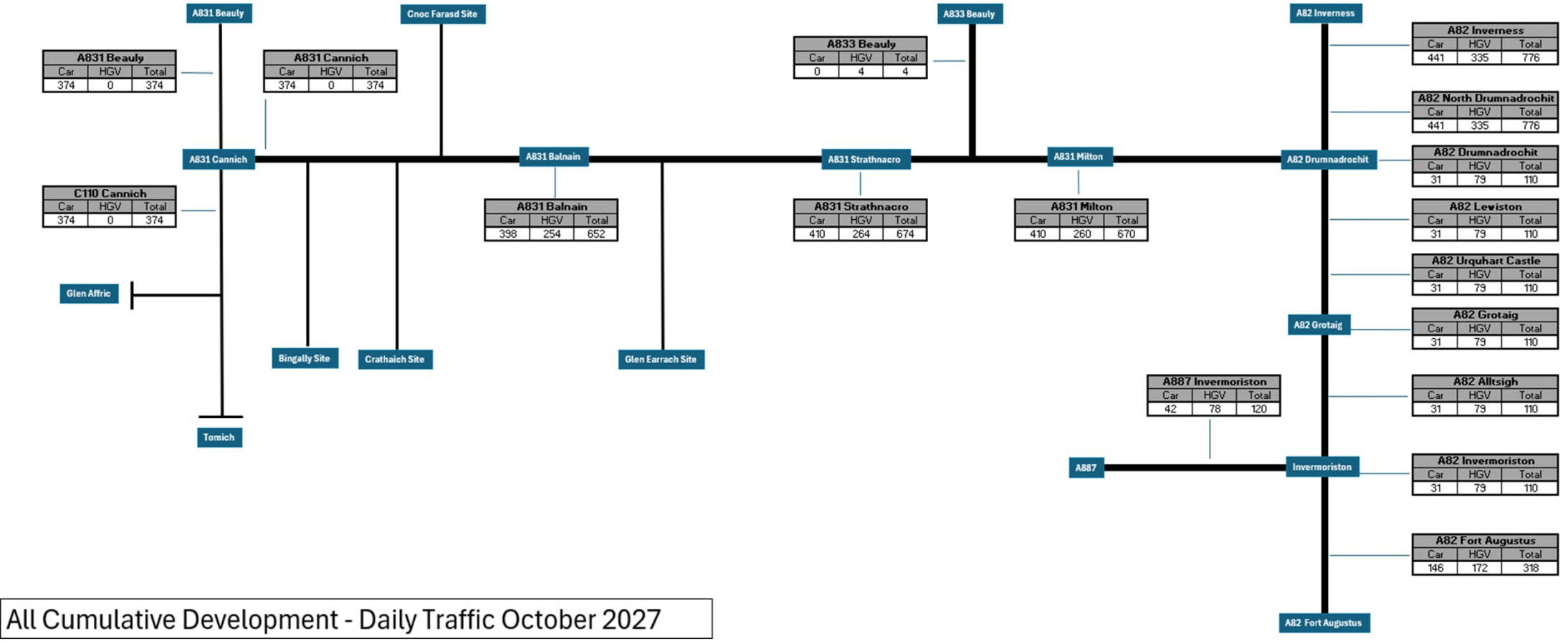
Crathaich - Daily Traffic October 2027



Glen Earrach - Daily Traffic October 2027



A82 Cumulative Development - Daily Traffic October 2027



All Cumulative Development - Daily Traffic October 2027

Appendix C - Fear and Intimidation Degree of Hazard Assessment

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation 2027 Assessment

Study Area Roads Existing Traffic						Existing Fear and Intimidation Level				
Road	Between		18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
A82 Inverness	A82 / A8082 junction	A82 Drumnadrochit welcome signage	409	204	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 North Drumnadrochit	A82 Drumnadrochit welcome signage	A82 / A831 junction Drumnadrochit	409	204	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Drumnadrochit	A82 / A831 junction Drumnadrochit	A82 roundabout at Lewiston	504	233	20	<600 0	<1,000 0	20-30 10	10	Small
A82 Lewiston	A82 roundabout at Lewiston	A82 Strone House	431	187	25	<600 0	<1,000 0	20-30 10	10	Small
A82 Urquhart Castle	A82 Strone House	A82 Grotaig	375	178	31	<600 0	<1,000 0	30-40 20	20	Small
A82 Grotaig	A82 Grotaig	A82 Alltsigh	289	173	44	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Alltsigh	A82 Alltsigh	A82 Lodge on Loch Ness	290	170	43	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Invermoriston	A82 Lodge on Loch Ness	A82 / A887 junction	285	188	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Fort Augustus	A82 / A887 junction	Fort Augustus	226	141	34	<600 0	<1,000 0	30-40 20	20	Small
A887 Invermoriston	Junction with A82 Invermoriston	Junction with A87	122	83	40	<600 0	<1,000 0	30-40 20	20	Small
A831 Milton	A82 / A831 junction Drumnadrochit	A831 / A833 junction	193	198	31	<600 0	<1,000 0	30-40 20	20	Small
A831 Strathnacro	A831 / A833 junction	A831 / Forest Car Park junction	106	37	47	<600 0	<1,000 0	40+ 30	30	Moderate
A831 Balnain	A831 / Forest Car Park junction	A831 Bridge over River Glass	93	24	37	<600 0	<1,000 0	30-40 20	20	Small
A833	A831 / A833 junction	A833 / A862 junction	89	40	31	<600 0	<1,000 0	30-40 20	20	Small

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation 2027 Assessment

Study Area Roads Existing Traffic + Development Traffic				Forecast Fear and Intimidation Level				
Road	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
A82 Inverness	487	539	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 North Drumnadrochit	487	539	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Drumnadrochit	515	312	20	<600 0	<1,000 0	20-30 10	10	Small
A82 Lewiston	442	266	25	<600 0	<1,000 0	20-30 10	10	Small
A82 Urquhart Castle	386	257	31	<600 0	<1,000 0	30-40 20	20	Small
A82 Grotaig	300	252	44	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Alltsigh	301	249	43	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Invermoriston	296	267	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Fort Augustus	258	313	34	<600 0	<1,000 0	30-40 20	20	Small
A887 Invermoriston	134	161	40	<600 0	<1,000 0	30-40 20	20	Small
A831 Milton	260	458	31	<600 0	<1,000 0	30-40 20	20	Small
A831 Strathnacro	173	301	47	<600 0	<1,000 0	40+ 30	30	Moderate
A831 Balnain	158	278	37	<600 0	<1,000 0	30-40 20	20	Small
A833	89	44	31	<600 0	<1,000 0	30-40 20	20	Small

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation Magnitude of Change

Road	Existing Fear and Intimidation Level	Forecast Fear and Intimidation Level	Step Change in Fear and Intimidation Level	Increase in Average Hourly Traffic (All Vehicles)	Increase in Daily HGV Traffic	Condition for Medium Increase in Magnitude of Change	Fear and Intimidation Magnitude of Change
A82 Inverness	Moderate	Moderate	0	78	335	FALSE	Negligible
A82 North Drumnadrochit	Moderate	Moderate	0	78	335	FALSE	Negligible
A82 Drumnadrochit	Small	Small	0	11	79	FALSE	Negligible
A82 Lewiston	Small	Small	0	11	79	FALSE	Negligible
A82 Urquhart Castle	Small	Small	0	11	79	FALSE	Negligible
A82 Grotaig	Moderate	Moderate	0	11	79	FALSE	Negligible
A82 Alltsigh	Moderate	Moderate	0	11	79	FALSE	Negligible
A82 Invermoriston	Moderate	Moderate	0	11	79	FALSE	Negligible
A82 Fort Augustus	Small	Small	0	32	172	FALSE	Negligible
A887 Invermoriston	Small	Small	0	12	78	FALSE	Negligible
A831 Milton	Small	Small	0	67	260	FALSE	Negligible
A831 Strathnacro	Moderate	Moderate	0	67	264	FALSE	Negligible
A831 Balnain	Small	Small	0	65	254	FALSE	Negligible
A833	Small	Small	0	0	4	FALSE	Negligible

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation 2029 Assessment

Study Area Roads Existing Traffic						Existing Fear and Intimidation Level				
Road	Between		18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
A82 Inverness	A82 / A8082 junction	A82 Drumnadrochit welcome signage	409	204	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 North Drumnadrochit	A82 Drumnadrochit welcome signage	A82 / A831 junction Drumnadrochit	409	204	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Drumnadrochit	A82 / A831 junction Drumnadrochit	A82 roundabout at Lewiston	504	233	20	<600 0	<1,000 0	20-30 10	10	Small
A82 Lewiston	A82 roundabout at Lewiston	A82 Strone House	431	187	25	<600 0	<1,000 0	20-30 10	10	Small
A82 Urquhart Castle	A82 Strone House	A82 Grotaig	375	178	31	<600 0	<1,000 0	30-40 20	20	Small
A82 Grotaig	A82 Grotaig	A82 Alltsigh	289	173	44	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Alltsigh	A82 Alltsigh	A82 Lodge on Loch Ness	290	170	43	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Invermoriston	A82 Lodge on Loch Ness	A82 / A887 junction	285	188	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Fort Augustus	A82 / A887 junction	Fort Augustus	226	141	34	<600 0	<1,000 0	30-40 20	20	Small
A887 Invermoriston	Junction with A82 Invermoriston	Junction with A87	122	83	40	<600 0	<1,000 0	30-40 20	20	Small
A831 Milton	A82 / A831 junction Drumnadrochit	A831 / A833 junction	193	198	31	<600 0	<1,000 0	30-40 20	20	Small
A831 Strathnacro	A831 / A833 junction	A831 / Forest Car Park junction	106	37	47	<600 0	<1,000 0	40+ 30	30	Moderate
A831 Balnain	A831 / Forest Car Park junction	A831 Bridge over River Glass	93	24	37	<600 0	<1,000 0	30-40 20	20	Small
A833	A831 / A833 junction	A833 / A862 junction	89	40	31	<600 0	<1,000 0	30-40 20	20	Small

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation 2029 Assessment

Study Area Roads Existing Traffic + Development Traffic				Forecast Fear and Intimidation Level				
Road	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	18-Hour Average Traffic (Vehs / Hour)	Total 18-Hour HGV Traffic	Average Vehicle Speed (mph)	Degree of Hazard Score	Fear and Intimidation Level
A82 Inverness	456	420	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 North Drumnadrochit	456	420	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Drumnadrochit	528	377	20	<600 0	<1,000 0	20-30 10	10	Small
A82 Lewiston	454	331	25	<600 0	<1,000 0	20-30 10	10	Small
A82 Urquhart Castle	399	322	31	<600 0	<1,000 0	30-40 20	20	Small
A82 Grotaig	313	317	44	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Alltsigh	313	314	43	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Invermoriston	308	332	41	<600 0	<1,000 0	40+ 30	30	Moderate
A82 Fort Augustus	258	314	34	<600 0	<1,000 0	30-40 20	20	Small
A887 Invermoriston	134	161	40	<600 0	<1,000 0	30-40 20	20	Small
A831 Milton	231	357	31	<600 0	<1,000 0	30-40 20	20	Small
A831 Strathnacro	151	263	47	<600 0	<1,000 0	40+ 30	30	Moderate
A831 Balnain	122	127	37	<600 0	<1,000 0	30-40 20	20	Small
A833	97	115	31	<600 0	<1,000 0	30-40 20	20	Small

IEMA Environmental Assessment of Traffic and Movement - Fear and Intimidation Magnitude of Change

Road	Existing Fear and Intimidation Level	Forecast Fear and Intimidation Level	Step Change in Fear and Intimidation Level	Increase in Average Hourly Traffic (All Vehicles)	Increase in Daily HGV Traffic	Condition for Medium Increase in Magnitude of Change	Fear and Intimidation Magnitude of Change
A82 Inverness	Moderate	Moderate	0	47	216	FALSE	Negligible
A82 North Drumnadrochit	Moderate	Moderate	0	47	216	FALSE	Negligible
A82 Drumnadrochit	Small	Small	0	24	144	FALSE	Negligible
A82 Lewiston	Small	Small	0	24	144	FALSE	Negligible
A82 Urquhart Castle	Small	Small	0	24	144	FALSE	Negligible
A82 Grotaig	Moderate	Moderate	0	24	144	FALSE	Negligible
A82 Alltsigh	Moderate	Moderate	0	24	144	FALSE	Negligible
A82 Invermoriston	Moderate	Moderate	0	24	144	FALSE	Negligible
A82 Fort Augustus	Small	Small	0	32	173	FALSE	Negligible
A887 Invermoriston	Small	Small	0	12	78	FALSE	Negligible
A831 Milton	Small	Small	0	38	159	FALSE	Negligible
A831 Strathnacro	Moderate	Moderate	0	45	226	FALSE	Negligible
A831 Balnain	Small	Small	0	29	103	FALSE	Negligible
A833	Small	Small	0	8	75	FALSE	Negligible

Appendix D – Road User and Pedestrian Safety Assessment

Study Area Roads	Accident Rates									Development Traffic Accident Forecast - October 2027								
	Length of Road (Km)	Accident Period Existing Traffic (Vehs)	Accident Period Total Vehicle Km	Total Injury Accidents			Injury Accidents (per 1 Million Vehicle Km)			Development Traffic (Vehs)	Development Traffic Vehicle Kilometres (per 1M vehicle Km)	Development Traffic Forecast Injury Accidents						
												Peak Month Development Traffic			Whole Accidents			
				Slight Accidents	Serious Accidents	Fatal Accidents	Slight	Serious	Fatal			Slight	Serious	Fatal	Slight	Serious	Fatal
A82 Inverness	21.0	12,561,625	263,794,115	5	3	4	0.019	0.011	0.015	17,072	0.36	0.01	0.00	0.01	0	0	0
A82 North Drumnadrochit	1.0	12,561,625	12,561,625	0	0	0	0.000	0.000	0.000	17,072	0.02	0.00	0.00	0.00	0	0	0
A82 Drumnadrochit	1.0	15,426,378	15,426,378	0	0	0	0.000	0.000	0.000	2,420	0.00	0.00	0.00	0.00	0	0	0
A82 Lewiston	2.0	13,199,740	26,399,479	0	0	1	0.000	0.000	0.038	2,420	0.00	0.00	0.00	0.00	0	0	0
A82 Urquhart Castle	6.0	11,675,103	70,050,617	1	1	0	0.014	0.014	0.000	2,420	0.01	0.00	0.00	0.00	0	0	0
A82 Grotaig	7.0	8,947,893	62,635,253	3	1	0	0.048	0.016	0.000	2,420	0.02	0.00	0.00	0.00	0	0	0
A82 Alltsigh	4.0	8,950,148	35,800,592	0	0	0	0.000	0.000	0.000	2,420	0.01	0.00	0.00	0.00	0	0	0
A82 Invermoriston	1.0	8,881,000	8,881,000	0	0	1	0.000	0.000	0.113	2,420	0.00	0.00	0.00	0.00	0	0	0
A82 Fort Augustus	10.0	7,043,319	70,433,186	3	3	0	0.043	0.043	0.000	6,996	0.07	0.00	0.00	0.00	0	0	0
A887 Invermoriston	24.0	3,724,593	89,390,243	2	2	1	0.022	0.022	0.011	2,640	0.06	0.00	0.00	0.00	0	0	0
A831 Milton	2.0	6,017,749	12,035,499	0	0	0	0.000	0.000	0.000	14,740	0.03	0.00	0.00	0.00	0	0	0
A831 Strathnacro	4.0	3,137,588	12,550,350	0	0	0	0.000	0.000	0.000	14,828	0.06	0.00	0.00	0.00	0	0	0
A831 Balnain	12.0	2,724,579	32,694,948	0	1	0	0.000	0.031	0.000	14,344	0.17	0.00	0.01	0.00	0	0	0
A833	16.0	2,765,542	44,248,666	3	4	0	0.068	0.090	0.000	88	0.00	0.00	0.00	0.00	0	0	0

Study Area Roads	Accident Rates									Development Traffic Accident Forecast								
	Length of Road (Km)	Accident Period Existing Traffic (Vehs)	Accident Period Total Vehicle Km	Total Injury Accidents			Injury Accidents (per 1 Million Vehicle Km)			Development Traffic (Vehs)	Development Traffic Vehicle Kilometres (per 1M vehicle Km)	Development Traffic Forecast Injury Accidents						
												Peak Month Development Traffic			Whole Accidents			
				Slight Accidents	Serious Accidents	Fatal Accidents	Slight	Serious	Fatal			Slight	Serious	Fatal	Slight	Serious	Fatal
A82 Inverness	21.0	12,688,510	266,458,702	5	3	4	0.019	0.011	0.015	10,318	0.22	0.00	0.00	0.00	0	0	0
A82 North Drumnadrochit	1.0	12,688,510	12,688,510	0	0	0	0.000	0.000	0.000	10,318	0.01	0.00	0.00	0.00	0	0	0
A82 Drumnadrochit	1.0	15,582,200	15,582,200	0	0	0	0.000	0.000	0.000	5,170	0.01	0.00	0.00	0.00	0	0	0
A82 Lewiston	2.0	13,333,070	26,666,141	0	0	1	0.000	0.000	0.038	5,170	0.01	0.00	0.00	0.00	0	0	0
A82 Urquhart Castle	6.0	11,793,033	70,758,199	1	1	0	0.014	0.014	0.000	5,170	0.03	0.00	0.00	0.00	0	0	0
A82 Grotaig	7.0	9,038,276	63,267,932	3	1	0	0.047	0.016	0.000	5,170	0.04	0.00	0.00	0.00	0	0	0
A82 Alltsigh	4.0	9,040,554	36,162,214	0	0	0	0.000	0.000	0.000	5,170	0.02	0.00	0.00	0.00	0	0	0
A82 Invermoriston	1.0	8,970,707	8,970,707	0	0	1	0.000	0.000	0.111	5,170	0.01	0.00	0.00	0.00	0	0	0
A82 Fort Augustus	10.0	7,114,463	71,144,632	3	3	0	0.042	0.042	0.000	7,018	0.07	0.00	0.00	0.00	0	0	0
A887 Invermoriston	24.0	3,762,216	90,293,174	2	2	1	0.022	0.022	0.011	2,640	0.06	0.00	0.00	0.00	0	0	0
A831 Milton	2.0	6,078,535	12,157,070	0	0	0	0.000	0.000	0.000	8,382	0.02	0.00	0.00	0.00	0	0	0
A831 Strathnacro	4.0	3,169,280	12,677,122	0	0	0	0.000	0.000	0.000	9,856	0.04	0.00	0.00	0.00	0	0	0
A831 Balnain	12.0	2,752,100	33,025,200	0	1	0	0.000	0.030	0.000	6,402	0.08	0.00	0.00	0.00	0	0	0
A833	16.0	2,793,476	44,695,622	3	4	0	0.067	0.089	0.000	1,782	0.03	0.00	0.00	0.00	0	0	0

Appendix E – Congestion Reference Flows

Road Link	Capacity	Number of Lanes	Width Factor	PkF	100/PkF	PkD	100/PkD	AADT	AAWT	AADT/AAWT	Congestion Reference Flows
A82 Inverness	1351.5	1	0.947	8.7	11.5	51	1.960784314	7,348	7,692	0.96	27555
A82 North Drumnadrochit	1351.5	1	0.776	8.7	11.5	51	1.960784314	7,348	7,692	0.96	22580
A82 Drumnadrochit	1351.5	1	0.776	8.7	11.5	53	1.886792453	9,098	9,433	0.96	21937
A82 Lewiston	1351.5	1	0.947	8.8	11.4	51	1.960784314	7,807	8,058	0.97	27629
A82 Urquhart Castle	1362.0	1	0.947	9.5	10.5	50	2	6,812	7,029	0.97	26316
A82 Grotaig	1348.5	1	0.947	9	11.1	56	1.785714286	5,260	5,468	0.96	24374
A82 Alltsigh	1344.0	1	0.776	8.7	11.5	56	1.785714286	5,262	5,475	0.96	20574
A82 Invermoriston	1348.5	1	0.776	9.1	11.0	56	1.785714286	5,208	5,405	0.96	19786
A82 Fort Augustus	1347.0	1	0.776	9.6	10.4	50	2	4,330	4,257	1.02	22150
A887 Invermoriston	1335.0	1	0.776	9.4	10.6	57	1.754385965	2,460	2,327	1.06	20440
A831 Milton	1312.5	1	0.776	8.6	11.6	60	1.666666667	3,598	3,716	0.97	19112
A831 Strathnacro	1308.0	1	0.776	8.7	11.5	58	1.724137931	1,893	1,964	0.96	19388
A831 Balnain	1369.5	1	0.776	9	11.1	57	1.754385965	1,653	1,709	0.97	20037
A833	1350.0	1	0.9983	9.1	11.0	61	1.639344262	1,616	1,652	0.98	23750

CRF = CAPACITY * NL * Wf * 100/PkF * 100/PkD * AADT/AAWT

where, CAPACITY is the maximum hourly lane throughput (see note 1);

NL is the Number of Lanes per direction;

Wf is a Width Factor (see note 2);

PkF is the proportion (percentage) of the total daily flow (2-way) that occurs in the peak hour;

PkD is the directional split (percentage) of the peak hour flow;

AADT is the Annual Average Daily Traffic flow on the link;

AAWT is the Annual Average Weekday Traffic flow on the link.

Note 1. CAPACITY - the maximum sustainable hourly lane throughput.

In reality this value varies day to day due to the prevailing conditions (for example, day/night, wet/dry, percentage heavy vehicles, regular/holiday traffic) and values used must be an average. For **new links** and **existing links not currently experiencing congestion** this can be estimated from the following relationship:

CAPACITY = [A - B * Pk%H]

where, Pk%H is the percentage of 'Heavy Vehicles' in the peak hour. The term 'Heavy Vehicles'

always includes the vehicle categories OGV1, OGV2 and PSV's according to the COBA definition;

A and B are parameters dependant on road standard;

	A	B
Single Carriageway	1380	15.0
Dual Carriageway	2100	20.0
Motorway	2300	25.0

Note 2. Carriageway Width Factor (Wf)

This factor is designed to adjust the CRF for all-purpose links, generally single carriageways, with non-standard lane widths. Carriageway width is defined as the total paved width of the carriageway less the width of ghost islands and hard strips.

Motorways - the width factor Wf should always be unity for motorways as there is no evidence to suggest that the maximum hourly throughput of motorway links is affected by minor changes in lane width.

All-purpose dual carriageways - to reflect the different standards of some dual carriageways. The width factor is given by:

Wf = Carriageway Width / (Number of Lanes * 3.65).

The majority of dual carriageways will have lane widths of 3.65 metres and hence a width factor of unity. Some will have reduced lane widths, generally those built to older design standards, and in these cases the width factor can be less than unity. Should the lane width be greater than 3.65 metres the width factor should be restricted to a maximum value of unity.

Single carriageways (2-lane) - the main purpose of the width factor is to differentiate between the different carriageway width standards of single carriageways. The width factor is given by:

Wf = (0.171 * Carriageway Width) - 0.25

Roads built to modern designs usually have 7.3 metre of 10 metre carriageways, that is, a width factor of unity or 1.46. The width of older roads can vary significantly but the width factor relationship is not valid for road widths less than 5.5 metres or greater than 11 metres. For roads with widths outside these limits the traffic analyst must use judgement to decide on the relevant value.

Study Area Roads	2027 Baseline					2027 Cumulative Assessment					Magnitude of Change	
	12hr Traffic (0700-1900)	12hr Traffic (1900-0700)	24 hr Traffic (0000-0000)	Congestion Reference Flow (CRF)	24 hr Traffic % of CRF	12hr Development Traffic + Cumulative Development Traffic (0700-1900)	12 hr Baseline Traffic (0700-1900)	12 hr Baseline Traffic (1900-0700)	24 hr Traffic (0000-0000)	24 hr Traffic % of CRF	Change in CRF Level	Magnitude of Change
A82 Inverness	6,872	1,035	7,907	27,555	28.7%	776	6,872	1,035	8,683	31.5%	1 Level Change plus CRF 30%<>60%	Low
A82 North Drumnadrochit	6,872	1,035	7,907	22,580	35.0%	776	6,872	1,035	8,683	38.5%	No Level Change	Negligible
A82 Drumnadrochit	8,440	1,257	9,697	21,937	44.2%	110	8,440	1,257	9,807	44.7%	No Level Change	Negligible
A82 Lewiston	7,221	1,063	8,285	27,629	30.0%	110	7,221	1,063	8,395	30.4%	1 Level Change plus CRF 30%<>60%	Low
A82 Urquhart Castle	6,387	838	7,226	26,316	27.5%	110	6,387	838	7,336	27.9%	No Level Change	Negligible
A82 Grotaig	4,895	726	5,621	24,374	23.1%	110	4,895	726	5,731	23.5%	No Level Change	Negligible
A82 Alltsigh	4,897	733	5,629	20,574	27.4%	110	4,897	733	5,739	27.9%	No Level Change	Negligible
A82 Invermoriston	4,859	697	5,555	19,786	28.1%	110	4,859	697	5,665	28.6%	No Level Change	Negligible
A82 Fort Augustus	3,853	523	4,376	22,150	19.8%	318	3,853	523	4,694	21.2%	No Level Change	Negligible
A887 Invermoriston	2,038	353	2,391	20,440	11.7%	120	2,038	353	2,511	12.3%	No Level Change	Negligible
A831 Milton	3,292	528	3,820	19,112	20.0%	670	3,292	528	4,490	23.5%	No Level Change	Negligible
A831 Strathnacro	1,717	301	2,018	19,388	10.4%	674	1,717	301	2,692	13.9%	No Level Change	Negligible
A831 Balnain	1,491	267	1,758	20,037	8.8%	652	1,491	267	2,410	12.0%	No Level Change	Negligible
A833	1,513	185	1,698	23,750	7.2%	4	1,513	185	1,702	7.2%	No Level Change	Negligible

Study Area Roads	2029 Baseline					2029 Cumulative Assessment					Magnitude of Change	
	12hr Traffic (0700-1900)	12hr Traffic (1900-0700)	24 hr Traffic (0000-0000)	Congestion Reference Flow (CRF)	24 hr Traffic % of CRF	12hr Development Traffic + Cumulative Development Traffic (0700-1900)	12 hr Baseline Traffic (0700-1900)	12 hr Baseline Traffic (1900-0700)	24 hr Traffic (0000-0000)	24 hr Traffic % of CRF	Change in CRF Level	Magnitude of Change
A82 Inverness	6,953	1,047	8,000	27,555	29.0%	469	6,953	1,047	8,469	30.7%	1 Level Change plus CRF 30%<>60%	Low
A82 North Drumnadrochit	6,953	1,047	8,000	22,580	35.4%	469	6,953	1,047	8,469	37.5%	No Level Change	Negligible
A82 Drumnadrochit	8,538	1,272	9,810	21,937	44.7%	235	8,538	1,272	10,045	45.8%	No Level Change	Negligible
A82 Lewiston	7,306	1,076	8,381	27,629	30.3%	235	7,306	1,076	8,616	31.2%	No Level Change	Negligible
A82 Urquhart Castle	6,462	848	7,310	26,316	27.8%	235	6,462	848	7,545	28.7%	No Level Change	Negligible
A82 Grotaig	4,952	734	5,687	24,374	23.3%	235	4,952	734	5,922	24.3%	No Level Change	Negligible
A82 Alltsigh	4,954	741	5,695	20,574	27.7%	235	4,954	741	5,930	28.8%	No Level Change	Negligible
A82 Invermoriston	4,915	705	5,620	19,786	28.4%	235	4,915	705	5,855	29.6%	No Level Change	Negligible
A82 Fort Augustus	3,898	529	4,427	22,150	20.0%	319	3,898	529	4,746	21.4%	No Level Change	Negligible
A887 Invermoriston	2,061	358	2,419	20,440	11.8%	120	2,061	358	2,539	12.4%	No Level Change	Negligible
A831 Milton	3,331	534	3,865	19,112	20.2%	381	3,331	534	4,246	22.2%	No Level Change	Negligible
A831 Strathnacro	1,737	305	2,042	19,388	10.5%	448	1,737	305	2,490	12.8%	No Level Change	Negligible
A831 Balnain	1,508	270	1,778	20,037	8.9%	291	1,508	270	2,069	10.3%	No Level Change	Negligible
A833	1,531	187	1,718	23,750	7.2%	81	1,531	187	1,799	7.6%	No Level Change	Negligible