Chapter 13: Sloy Pumped Hydro Storage Scheme: Traffic and Transport

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13. Traffic and Transport

13.1. Executive Summary

The Proposed Development will lead to increased traffic volumes on the study area road network during the construction phase. Traffic volumes would fall considerably outside the peak period of construction which is anticipated to be in months 14 to 16 of the programme. During these peak months, a total of 3,332 vehicle movements are predicted, comprising 1,320 Car / LGV movements and 2,012 HGV movements. This equates to an average of the following vehicle movements per day:

- Cars / LGV:60 vehicle movements (30 inbound trips and 30 outbound trips); and
- HGV: 92 vehicle movements (46 inbound trips and 46 outbound trips).

This increase will be temporary and will only occur during the construction phase.

An assessment of likely significant effects associated with increased traffic during construction using Institute of Environmental Management and Assessment (IEMA) guidelines has been undertaken. Prior to the implementation of mitigation, a **Moderate / Slight** and **significant effect** is predicted on users of the paths / Core Paths in the vicinity of the site.

With the implementation of a comprehensive CTMP, together with appropriate signage and path management plan (if required). The traffic effects would be transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts. No long-term detrimental transport or access issues would be associated with the construction phase of the Proposed Development.

No capacity issues are expected on any of the roads within the study area due to the additional construction traffic movements associated with the Proposed Development, as background traffic movements are low, the links are of a good standard and appropriate mitigation is proposed. The effects of construction traffic would be temporary in nature and would be transitory.

Traffic levels during the operational phase of the Proposed Development would be low, with two to three vehicles per day for maintenance purposes, which is comparable with the operational requirements of the existing Sloy Hydroelectric Power Station.

13.2. Introduction

This chapter considers the potential effects, of the Proposed Development on Traffic and Transport during construction and operation. As described in **Chapter 4: Description of Development**, with proper maintenance the Proposed Development should remain functional indefinitely. If the project were to be decommissioned, it is anticipated that the potential effects on Traffic and Transport would be equal to or lesser than the construction impacts. As such, a separate assessment of potential decommissioning effects on Traffic and Transport is not included in this chapter. Where likely significant effects are predicted during construction and operation, appropriate mitigation measures are proposed, and the significance of predicted residual effects are assessed.

This chapter is supported by the following figures and technical appendices:

- **Figure 13.1: Study Area Road Links;**
- **Figure 13.2: Traffic Count Locations;**
- **Figure 13.3: Accident Locations;** and
- **Appendix 13.1: Transport Assessment**.

The author of this chapter is Stephen Cochrane, an Associate Director within the Traffic and Transport team at Pell Frischmann. Stephen has over 21 years' experience in the traffic and transportation industry

and over 17 years' experience in the production of EIA transport chapters (and associated studies) for other energy generation and distribution projects in Scotland. Stephen is a Chartered Member of the Chartered Institute of Logistics and Transport (CMILT) and a Member of the Chartered Institution of Highways and Transportation (MCIHT).

The technical reviewer of the traffic and transport assessment is Gordon Buchan BEng (Hons), MSc, CEng, CMILT, FCIHT, Divisional Director of Pell Frischmann. He has over 27 years of undertaking transport assessments associated with new developments and has worked on renewable energy and energy distribution projects across the UK, Ireland and Northern Europe.

A table presenting relevant qualifications and experience of key staff involved in the preparation of this chapter is included in **Appendix 5.1: EIA Team**, contained within **Volume 4** of this **EIA Report.**

13.3. Scope Of Assessment

13.3.1. STUDY AREA

The study area encompasses the area over which all desk-based and field data were gathered to inform the assessment presented in this chapter.

The study area comprises roads that would be likely to experience increases in traffic flows resulting from the Proposed Development and is described in **Appendix 13.1: Transport Assessment**. The geographic scope was determined through a review of Ordnance Survey (OS) plans and an assessment of the potential origin locations of construction staff and supply locations for construction materials.

The study area for the assessment has therefore been assumed to be as follows:

- A82(T) between Tarbet and Crianlarich;
- A83(T) between Tarbet and Ardgartan; and
- A82(T) between Tarbet and Dumbarton.

The study area road links are shown in **Volume 2, Figure 13.1**.

Note the above relates to those roads likely to be subject to the biggest increase in construction traffic i.e. those closest to the site and does not include all roads used in the movement of construction materials.

Effects associated with construction traffic generated by the Proposed Development would be most pronounced in close proximity to the site entrance and on the final approaches to the site. As vehicles travel away from the Proposed Development, they would disperse across the wider road network, thus diluting any potential effects. It is therefore expected that the effects relating to construction traffic are unlikely to be significant beyond the study area identified above.

13.3.2. CONSULTATION RESPONSES

To inform the scope of the assessment for the Proposed Development, consultation was undertaken with statutory and non-statutory bodies. **Table 13.1** summarises the scoping and consultation responses relevant to the Traffic and Transport Assessment and provides information on where and / or how points raised have been addressed in this assessment.

Full details on the consultation responses and scoping opinion can be reviewed in **Chapter 6**: **Scoping and Consultation**, and associated appendices.

Table 13.1: Consultation Responses

Consultee	Consultation Type	Date	Issue Raised	Response / Action Taken
Loch Lomond & The Trossachs National Park (LLTNPA)	Scoping Opinion	4th August 2023	Traffic and Transport: The Loch Lomond and Trossachs National Park Authority (LLTNPA) notes that Transport Scotland has been consulted as part of this scoping request and would defer to their position.	Comment noted.
Transport Scotland (TS)	Scoping Opinion	1st August 2023	The Scoping Report (SR) states that consultation has begun with Transport Scotland regarding the temporary use of this northern junction, and this will continue through the EIA process. While this is considered appropriate, we would state that any proposed changes to the trunk road network must be discussed and approved (via a technical approval process) by the appropriate Area Manager for the A82(T), Neil MacFarlane, who can be contacted at neil.macfarlane@transport.gov.scot. We would also request that a layout drawing of the modified access junction be provided, along with a Stage 1 Road Safety Audit. This plan should be submitted at 1:500 scale and be accompanied by visibility splay plans.	Comment noted. Consultation with the Area Manager for Transport Scotland in relation to the site access junction works has been undertaken and the proposed junction arrangements have been subject to a Stage 1 Road Safety Audit which is included as **Annex B** within **Volume 4, Appendix 13.1: Transport Assessment**. Liaison with Transport Scotland and their network operators will continue throughout the planning process.
			The methodology is somewhat confused with the proposal to produce a Transport Assessment which would form an appendix to the EIA with an	Comment noted. The Transport Assessment provided as

			EIA chapter summarising the findings of the TA. The methodology then effectively sets out what would normally be undertaken for an EIA chapter. We would suggest that the inclusion of an EIA chapter covering access, traffic and transport would be a more simplified approach. The chapter would examine the potential environmental effects associated with increased traffic.	**Volume 4, Appendix 13.1: Transport Assessment** has been prepared to inform this chapter, to allow the relevant assessment to be undertaken.
			Section 6.7 of the SR presents the proposed methodology for the assessment of Traffic and Transport. We note that the thresholds as indicated within the Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic are to be used as a screening process for the assessment. Transport Scotland is in agreement with this approach.	Comment noted.
			The SR indicates that potential trunk road related environmental impacts such as driver delay, pedestrian amenity, severance, safety etc will be considered and assessed where appropriate (i.e. where IEMA Guidelines for further assessment are breached). These specify that road links should be taken forward for assessment if: • Traffic flows will increase by more than 30%, or • The number of HGVs will increase by more than 30%, or • Traffic flows will increase by 10% or more in sensitive areas. This approach is acceptable and we also note that a cumulative assessment will be included. Any required mitigation should be detailed, and the residual effects identified.	Comment noted and the chapter has been undertaken in line with these Guidelines.
			We note that the proposed study area for use in the traffic and transport assessment is based upon the likely origin points for materials, staff and components required during construction, as follows:	Due to insufficient data on ATC08104, an alternative count point has been utilised in the

			• The A82(T) between Tarbet and Crianlarich. • The A83(T) between Tarbet and Ardgartan. • The A82(T) between Tarbet and Dumbarton. With regards to base traffic data, we note that an Automatic Traffic Count (ATC) survey of the A82(T) at the existing northern access junction will be undertaken during a neutral month for a one-week period. In addition, traffic survey data will be obtained from the Traffic Scotland database for the following links: • A82(T) to the north of Tarbet (ref. ATCCS001); • A83(T) to the west of Tarbet (ref. ATC08104); and • A82(T) south of Tarbet (ref. ATC08119).	assessment, namely ATC08090.
			The SR indicates that construction of the project would take approximately 24 months, and that baseline traffic flows would be subject to Low National Road Traffic Growth factors to allow for the future year baseline. Transport Scotland is satisfied with this approach.	Comment noted. For information, the construction programme is now estimated to take up to 36 months.
			With regard to accident data, we note it is proposed to use Crashmap to obtain accident statistics. We would state that more up to date statistics can be obtained directly from Transport Scotland.	Comment noted, the accident data used in the assessment has been obtained from TS.
			The SR states that there will be no increase in operational trips when compared to the current power station, therefore, it is not proposed to undertake an operational assessment. This is considered acceptable.	Comment noted.
			We note that requirements for Abnormal Indivisible Loads (AIL) are not known at this time but will be determined during design development once the pump technology has been established. The SR states that should plant required for the construction be categorised as an AIL, an appropriate	AILs are not currently expected to be required to bring project specific components for the Proposed Development to site.

			assessment will be undertaken. While this is considered acceptable, we would add that Transport Scotland will require to be satisfied that the size of loads proposed can negotiate the selected route and that their transportation will not have any detrimental effect on structures within the trunk road route path. If Abnormal Loads are envisaged then a full Abnormal Loads Assessment report should be provided with the Environmental Impact Assessment Report (EIAR) that identifies key pinch points on the trunk road network. Swept path analysis should be undertaken and details provided with regard to any required changes to street furniture or structures along the route.	As such an AIL route survey report has not been undertaken. Should the current situation change and AILs are required as the proposals progress, a full route survey report for the AILs would be conducted post consent and secured through a planning condition. With regards to the G4 turbine deliveries, there are no AILs currently proposed in relation to transporting components to the site.

13.3.3. ISSUES SCOPED OUT OF ASSESSMENT

The traffic effects during the operational phase of the Proposed Development are likely to be insignificant as expected traffic flows would be less than three vehicle movements per day, far below the recognised thresholds for triggering a formal transport assessment. As such, the effects during the operational phase are scoped out of the assessment.

With proper maintenance, it is anticipated that the Proposed Development will remain functional indefinitely. Therefore, the effects of the decommissioning phase are scoped out of the assessment as outlined in **Chapter 4: Description of Development**.

13.4. Legislation, Policy and Guidance

13.4.1. LEGISLATION

The assessment has been undertaken in accordance with the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (hereafter referred to as the "EIA Regulations"). There is, however, no legislation which is specific to transport assessments, that is required to be considered as part of this assessment.

13.4.2. PLANNING POLICY

This assessment has been undertaken in accordance with policies outlined in the following plans:

- Scottish Government, *National Planning Framework 4 (NPF4) (2023)*; and
- Loch Lomond & Trossachs National Park, *Local Development Plan (2016)*.

13.4.3. GUIDANCE

Cognisance has been taken of the following best practice guidelines / guidance of relevance to this topic:

- Institute of Environmental Assessment, *Guidelines for the Environmental Assessment of Road Traffic* (1993);
- IEMA, *Environmental Assessment of Traffic and Movement (2023)*;
- IEMA, *Guidelines for Environmental Impact Assessment (2005)*;
- Design Manual for Roads and Bridges (DMRB), *LA 104 Environmental Assessment and Monitoring (Revision 1) (2020)*;
- Scottish Government, *Planning Advice Note (PAN) 75 (1995)*;
- Design Manual for Roads and Bridges, *Volume 15, Part 5 "The NESA Manual" (2013)*;
- Transport Scotland, *Transport Assessment Guidance (2012)*; and
- Loch Lomond & Trossachs National Park, *Renewable Energy Supplementary Guidance (2017)*.

13.5. Methodology

13.5.1. DESK STUDY

The desk study involved reviews and identification of the following:

- Relevant transport planning policy identified through LLTNPA webpages;
- Accident data from TS database and Crashmap webpage;

- Sensitive locations within the study area (as defined by IEMA such as settlements, schools, tourist attractions, etc.) identified using googlemaps.co.uk;
- Any other traffic sensitive receptors in the area (core paths, routes, communities, etc.);
- OS plans; and
- Potential origin locations of construction staff and supply locations for construction materials to inform extent of local area roads network to be included in the assessment identified using googlemaps.co.uk.

13.5.2. FIELD STUDY

A detailed site visit was undertaken in October 2023 to review the proposed access routes and potential constraints for general construction traffic in accessing the site.

The collection of traffic flows and speed data through an Automatic Traffic Count (ATC) survey undertaken for the Proposed Development was undertaken for the A82(T) in the vicinity of the northern site access (see **Volume 2, Figure 13.2**) to establish a traffic flow baseline at this point. This was undertaken over a seven-day period in November 2023.

13.5.3. ASSESSMENT METHODOLOGY

The methodology adopted in this assessment involved the following key stages:

- Determine baselines;
- Review development for impacts;
- Evaluate significance of effects on receptors;
- Identify mitigation; and
- Assess residual effects.

13.5.3.1. Criteria for Assessing the Sensitivity of Receptors

IEMA *Guidelines for Environmental Impact Assessment (2005)* notes that the topic specific IEMA Guidelines should be used for characterising the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. Recent guidance published by the IEMA, namely *Environmental Assessment of Traffic and Movement (2023)* provides an update to the previous guidance (*Guidelines for the Environmental Assessment of Road Traffic (1993)*), that should be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance of major new developments. The guidelines are intended to complement professional judgement and the experience of trained assessors.

In terms of traffic and transport impacts, receptors are the users of the roads within the study area and the locations through which those roads pass.

The IEMA Guidelines in relation to transport includes guidance on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in **Table 13.2**.

Table 13.2: Classification of Receptor Sensitivity

Receptor	Sensitivity			
	High	Medium	Low	Negligible
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.
Users / Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

Where a road passes through a location, road users (pedestrian, cyclists, drivers, etc.) are considered subject to the highest level of sensitivity defined by either the road or location characteristics.

13.5.3.2. Criteria for Assessing the Magnitude of Change

The following rules, also taken from the 1993 and 2023 IEMA Guidelines, were used as a screening tool to determine which links within the study area should be considered for detailed assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of heavy goods vehicles (HGVs) is predicted to increase by more than 30%).
- Rule 2: Include any other specifically sensitive areas where total traffic flows are predicted to increase by 10% or more.

Examples of sensitive areas are presented in the 1993 and 2023 IEMA Guidelines as hospitals, churches, schools and historical buildings. These locations are to be assessed in relation to “Rule 2”.

The IEMA Guidelines in relation to transport identify the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development: the impacts and levels of magnitude are discussed below:

- Severance – the 2023 IEMA Guidelines advises 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' [or minor, moderate and major] changes in severance respectively. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic."* (Para 3.16). The Guidelines acknowledge that changes in traffic flows should be used cautiously, stating that *"the assessment of severance should pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc."* (Para 3.17).
- Driver delay – the 2023 IEMA Guidelines note that these delays are only likely to be *"significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system"* (Para 3.20).
- Pedestrian delay (incorporating delay to all non-motorised users) – the 2023 IEMA Guidelines advises that *"pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development site."* (Para 3.24). Furthermore, the guidelines advise that *"…it is not considered wise to set down definitive thresholds. Instead it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect."* (Para 3.26).
- Non-motorised user amenity – the 2023 IEMA Guidelines advises that, *"The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled".* Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law." (Para 3.30).
- Fear and intimidation – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and substantial changes respectively as detailed in the 2023 IEMA Guidelines (Para 2.19). As such, this has been used to assess the potential impacts associated with construction activities around fear and intimidation on people in close proximity to the Proposed Development.
- Road safety – professional judgement would be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents. In line with the 2023 IEMA Guidelines, those areas of collision clusters would be subject to detailed review.
- Road safety audits – It would be proposed to undertake any necessary Road Safety Audits (RSA) post consent and it is considered that this can be secured via a planning condition.
- Large loads – There are no abnormal loads currently proposed in relation to transporting plant or components to the site. The largest predicted loads at this time, would be transported as oversized loads. Should this change, the movement of such loads would be considered in full, within a separate Route Survey Report, which will be provided post consent and will identify any physical mitigation measures required to accommodate the predicted loads.

While not specifically identified as more vulnerable road users, cyclists are considered in a similar way to pedestrians.

Table 3.7 of the *Design Manual for Roads and Bridges (DMRB) LA 104 Revision 1* sets out four levels against which the magnitude of these impacts should be assessed – major, moderate, minor and negligible. The impacts and levels of magnitude are discussed below in **Table 13.3**.

Table 13.3: Magnitude of Effect

Magnitude	Description
Major	These effects are considered to be material in the decision-making process.
Moderate	These effects may be important but are not likely to be material factors in decision making. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a receptor.
Minor	These effects may be raised as local factors. They are unlikely to be critical in the decision-making process but are important in improving the subsequent design of the project.
Negligible	No effects or those that are imperceptible.

13.5.3.3. Criteria for Assessing Significance

To determine the overall significance of effects, the results from the receptor sensitivity and magnitude of change assessments are correlated and classified using a scale set out in DMRB *LA 104 Environmental Assessment and Monitoring (Revision 1)* and summarised in **Table 13.4**.

Table 13.4: Classification of Receptor Sensitivity

Receptor	Magnitude of Effect			
	Major	Moderate	Minor	Negligible
High	Major	Major / Moderate	Moderate / Minor	Minor
Medium	Major / Moderate	Moderate	Minor	Minor / Negligible
Low	Moderate / Minor	Minor	Minor	Minor / Negligible
Negligible	Minor	Minor	Minor / Negligible	Negligible

Significance is categorised as Major, Moderate, Minor or Negligible. Effects judged to be of Major or Moderate significance will be considered to be significant in accordance with the EIA Regulations and require mitigation.

Where an effect could be one of Major / Moderate or Moderate / Minor significance, professional judgement will be used to determine which option should be applicable. Effects judged to be of Minor or Negligible significance will be considered not significant.

13.5.4. ASSESSMENT ASSUMPTIONS AND LIMITATIONS

The assessment is based upon average traffic flows in one month periods. During the month, activities at the site may fluctuate between one day and another and it is not possible to fully develop a day-by-day traffic flow estimate as no contractors have been appointed and external factors can impact upon activities on a day by day basis (weather conditions, availability of materials, time of year, etc).

Assumptions on the original points for materials have been made to provide a worst-case assessment scenario. Should these origin points change, the effects on the study area may alter to those presented in the assessment.

The proposed construction activities would result in a maximum of 40,000m^3 of excavated rock. The excavated rock would be used productively in the construction of the new works, where feasible. However, it is envisaged that there would be a surplus of excavated rock spoil, overall.

For the purposes of the assessment, it has been assumed that 12,000m^3 of excavated material would remain on-site, with 28,000m^3 transported off-site to be used on Forestry Land Scotland / RTS Forestry projects or similar. This is considered a worst case in terms of materials being taken off-site, with a number of alternatives being investigated to make use of the material on-site, thus reducing the number of vehicular movements.

Construction material estimates set out in **Volume 4, Appendix 13.1: Transport Assessment** are based on past experience and those proposed for the consented pumped hydro storage scheme. They are considered to be appropriate for enabling a robust assessment of potential effects to be made.

It is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on Traffic and Transport.

13.6. Baseline Conditions

13.6.1. EXISTING BASELINE

13.6.1.1. Pedestrian and Cycle Networks

Within the vicinity of the site access junctions, there is a section of the Three Lochs Way. There is a footway located along the western side of the A82(T) terminating in the vicinity of the northern access junction, where it continues on the opposite side of the carriageway for a short section, providing access to the Inveruglas Visitor Centre.

To the south of the southern access junction, the footway continues along the western side of the A82(T), narrowing and becoming a footpath. There are sections running parallel to the carriageway and sections segregated, taking account of the topography of roadside verges through this location. The footpath continues to the access junction for Loch Sloy, where it heads westbound past the switching station, before heading south towards Tarbet.

Further away from the Proposed Development in the wider study area, there are pedestrian facilities within the local settlements, including Tarbet, Crianlarich and Dumbarton, which are commensurate with the scale of the settlements.

A review of the LLTNPA map of the park and information from The Loch Lomond & Cowal Way organisation, shows a number of walking and cycling routes within the study area, the closest of which are which are summarised below and shown in **Volume 4, Appendix 13.1: Transport Assessment, Figure 4**.

- Three Lochs Way – Starting at Balloch, links Loch Lomond, The Gareloch and Loch Long and passes through Helensburgh, Garelochhead, Arrochar, and Tarbet before finishing at Inveruglas on Loch Lomondside;
- West Loch Lomond Cycle Path – Starting at the Visit Scotland Visitor Centre in Balloch running along the western side of Loch Lomond and its numerous facilities to the A82(T) in Tarbet; and
- The Loch Lomond & Cowal Way – Scotland's most diverse long distance footpath. It runs the length of the Cowal Peninsula, beginning at Portavadie in the south of Cowal and finishing at Inveruglas at Loch Lomond, passing through the communities of Tighnabruaich, Glendaruel, Strachur, Lochgoilhead and Arrochar.

Figure 4 in **Volume 4, Appendix 13.1: Transport Assessment** shows the above routes, within the vicinity of the site.

A review of Sustrans' National Cycle Network (NCN) map does not show any national cycle routes in the immediate vicinity of the Proposed Development. The closest route lies to the south in Balloch and Alexandria, where sections of NCN Route 7 pass. The NCN Route 7 runs between Sunderland and Inverness and comprises a combination of traffic free and on-road routes.

13.6.1.2. Study Area Road Network

The Proposed Development site is currently accessed via two simple priority junctions with the A82(T). The southern junction is used for the day-to-day operation of the existing Sloy Hydroelectric Power Station, while the northern junction acts as a secondary access and the gates are normally locked.

A82(T)

The A82(T) is part of the Scottish trunk road network and is managed and maintained by Amey between Balloch and the Erskine Bridge, and by Bear Scotland for the remainder of its length, on behalf of Transport Scotland. The A82(T) runs from Glasgow to Fort William and Inverness, passing along the shores of Loch Lomond and Loch Ness. The A82(T) is one of the principal north / south routes in Scotland providing a key link between the Central Belt and the Highlands.

The section of the A82(T) closest to the Proposed Development, is a single carriageway road with one lane operating in each direction. The speed limit on the A82(T) varies, however on the section that passes the Proposed Development Area (PDA), a 50 miles per hour (mph) limit is in place. There are sections to the north of the Proposed Development where this increases to the national speed limit and locations for example within Tarbet and other settlements where this reduces to 30 or 40mph.

The road is considered to be in good condition and maintained to a high standard by Bear Scotland and Amey.

A83(T)

The A83(T) is part of the Scottish trunk road network and is managed and maintained by Bear Scotland as part of the North West Unit. The A83(T) runs from Campbeltown to Tarbet. The speed limit on the A83(T) varies, however on the section within the study area, the national speed limit is in place, reducing to 30mph through Arrochar and Tarbet.

The road is considered to be in good condition and maintained to a high standard by Bear Scotland.

General Road Suitability

A number of the roads within the study area form part of the agreed route network used for the extraction of timber and are therefore regularly used by HGV traffic. This includes sections of the A82(T) and A83(T) which are 'Agreed Routes'.

The Agreed Timber Route Map has been developed by The Timber Transport Forum who are a partnership of the forestry and timber industries, local government, national government agencies, timber hauliers and road and freight associations. One of the key aims of the forum is to minimise the impact of timber transport on the public road network, on local communities and the environment and a way of achieving this is to categorise the roads leading to forest areas in terms of their capacity to sustain the likely level of timber haulage vehicles i.e., HGVs. The routes are categorised into four groups, namely; 'Agreed Routes', 'Consultation Routes', 'Severely Restricted Routes' and 'Excluded Routes'.

'Agreed Routes' are categorised as routes used for timber haulage without restriction as regulated by the Road Traffic Act 1988. A-roads are classified as 'Agreed Routes' by default unless covered by one of the other road classifications. Those links classed as 'Consultation Routes' are categorised as a route which is key to timber extraction, but which are not up to 'Agreed Route' standard. Consultation with the local authority is required, and it may be necessary to agree limits of timing, allowable tonnage etc. before the route can be used. B-roads are classified as 'Consultation Routes' by default unless covered by one of the other classifications. 'Severely Restricted Routes' are not normally to be used for timber transport in their present condition. These routes are close to being Excluded Routes. Consultation with the local authority is required prior to use. Finally, 'Excluded Routes' should not be used for timber transport in their present condition. These routes are either formally restricted, or are close to being formally restricted, to protect the network from damaging loads.

13.6.1.3. Existing Traffic Conditions

In order to assess the impact of development traffic on the study area, one ATC site was established in November 2023, in the vicinity of the northern site access junction. The ATC survey was conducted over a 7-day period, recording vehicle classifications, direction of travel and speeds. The count site was on the A82(T) in the vicinity of the northern site access junction to the power station.

In addition to the ATC data, further traffic count data was obtained from the Transport Scotland database and Department for Transport (DfT) database. With regards to the traffic data obtained from Transport Scotland and DfT databases, 2023 data has been used. The traffic data allows the traffic flows to be split into vehicle classes. The data was summarised into Cars/Light Goods Vehicles (LGVs) and HGVs (all goods vehicles >3.5tonnes gross maximum weight).

Traffic data has been used for the following locations:

1. A82(T) at Ardlui (ref. 30769);
2. A82(T) to the north of Tarbet (ref. ATCCS001);
3. A83(T) to the west of Tarbet (ref. ATC08090); and
4. A82(T) south of Tarbet (ref. ATC08119).

These sites were identified as being areas where sensitive receptors on the access routes would be located.

A National Road Traffic Forecast (NRTF) low growth factor was applied to the ATC, TS and DfT data, to bring the traffic data up to the base year of 2024. The NRTF low growth factor for 2023 to 2024 is 1.005.

The location of the ATC traffic surveys and TS / DfT traffic count points are presented in **Volume 2, Figure 13.2**.

Table 13.5 summarises the Annual Average Daily Traffic (AADT) traffic data estimated at the sites for 2024.

Table 13.5: 24-hour Average Traffic Data (2024)

Survey Location	Data Source	Cars / LGV	HGV	Total
A82(T), Ardlui	TS	4,243	227	4,470
A82(T), site frontage	ATC	2,582	777	3,359
A82(T), north of Tarbet	TS	4,149	366	4,514
A83(T), west of Tarbet	TS	3,842	919	4,761
A82(T), south of Tarbet	TS	7,337	1,666	9,003

It should be noted that the variation in data on the A82(T) between the project specific ATC data and the Transport Scotland data is due to the ATC data being based on a 7-day period survey, undertaken in November 2023, while the Transport Scotland survey data is based on AADT. Whilst the project specific ATC data is lower that the Transport Scotland data, it is considered that this will allow for a suitably robust assessment on the A82(T) at the site frontage to be undertaken, as the baseline flows will be lower, meaning that the potential impacts of construction traffic will not be diluted.

As noted above the ATC undertaken to inform the study also collected seven-day speed data and a summary of this can be seen in **Table 13.6**, together with the speed data from the TS database. Note DfT data does not include vehicle speed information.

Table 13.6: Speed Summary

Survey Location	Data Source	Mean Speed (mph)	85%tile Speed (mph)	Speed Limit (mph)
A82(T), site frontage	ATC	40.7	47.6	50
A82(T), north of Tarbet	TS	37.6	42.7	50
A83(T), west of Tarbet	TS	27.4	31.5	30
A82(T), south of Tarbet	TS	53.0	59.6	60

The speed survey data indicates that speed limits are broadly being adhered to within the study area, including along the A82(T) in the vicinity of the Proposed Development site access junctions. The 85th percentile speed to the west of Tarbet on the A83(T) in the vicinity of Arrochar is marginally over the posted speed limit of 30mph and as such, Police Scotland may wish to consider enforcement spot checks in these areas as part of their wider road policing measures.

13.6.1.4. Accident Review

Personal Injury Accident (PIA) data for the five-year period covering 2019 to 2023 for the A82(T) 1km north and south of the existing site access junctions, was obtained from Transport Scotland in line with the requirement set out in the Scoping Opinion.

Transport Assessment Guidance requires an analysis of the PIA on the road network in the vicinity of any development to be undertaken for at least the most recent 3-year period, or preferably a 5-year period, particularly if the site has been identified as being within a high accident area.

PIA statistics are typically categorised into three categories, namely “Slight”, “Serious” and “Fatal”, for those accidents that result in a death, however Transport Scotland allow for four categories within the “Serious” classification, namely “Serious”, “Very Serious”, “Moderately Serious” and “Less Serious”.

The locations and severity of the recorded accidents within 1km north and south of the site access junctions has been summarised in **Table 13.7**, while **Volume 2, Figure 13.3** shows their locations. Note, only those classifications which have been recorded have been included.

Table 13.7: Personal Injury Accident Summary

Survey Location	Slight	Serious	Very Serious	Fatal	HGV Incidents
A82(T) – 1km north of the site access junctions	2	1	1	1	1
A82(T) – 1km south of the site access junctions	-	-	-	-	-
Total	**2**	**1**	**1**	**1**	**1**
Percentage	**40.00%**	**20.00%**	**20.00%**	**20.00%**	**-**

A summary analysis of the incidents indicates that:

- A total of five PIAs were recorded within 1km north and south of the site access junctions within the last five-year period.
- Of those five PIAs, two were classified as “Slight” (40.0%), one was classified as “Serious” (20.0%), one was classed as “Very Serious” (20.0%) and there was one “Fatal” (20.0%).
- No PIAs recorded involved a cyclist or pedestrian.
- One PIAs recorded involved a motorcycle, which was classified as “Serious”. This was a two vehicle accident, with the other vehicle being a car. The accident occurred on a bend during daylight hours.
- One of the recorded PIAs involved an HGV, which was classified as “Fatal”. This was a two vehicle accident, with the other vehicle being a car. The accident occurred on a bend, in darkness, with no street lighting present.

In general, there are no clusters of PIAs at any location within 1km of the site access junctions or high numbers of accidents involving HGVs for example. Based on the information available, it has been established that there are no specific road safety issues within the immediate vicinity of the PDA that currently require to be addressed or would be exacerbated by the construction of the Proposed Development. The majority of recorded accidents occurred on or on approach to bends on the carriageway or in the vicinity of junctions, where there is an increased level of vehicle interaction.

13.6.1.5. Future Baseline

Construction of the Proposed Development could commence during 2027 if consent is granted and is anticipated to take approximately 36 months depending on weather conditions and ecological considerations.

To assess the likely effects during the construction, base year traffic flows were determined by applying a National Road Traffic Forecast (NRTF) low growth factor to the surveyed traffic flows. The NRTF low growth factor for 2024 to 2027 is 1.016. This growth factor has been applied to the survey data to estimate the 2027 base traffic flows, as shown in **Table 13.8**. This will be used in the Construction Peak Traffic Impact Assessment.

Table 13.8: 24-hour Base Traffic Flows (2027)

Survey Location	Source Data	Cars / LGV	HGV	Total
A82(T), Ardlui	TS	4,311	231	4,542
A82(T), site frontage	ATC	2,623	789	3,412
A82(T), north of Tarbet	TS	4,215	372	4,587
A83(T), west of Tarbet	TS	3,904	933	4,837
A82(T), south of Tarbet	TS	7,454	1,693	9,147

In the scenario that the Proposed Development did not proceed, traffic growth will still occur and the links within the study area will experience increased traffic flows resulting from other development pressures, tourism traffic and population flows.

13.6.1.6. Summary of Sensitive Receptors

A review of sensitive receptors has been undertaken within the study area. **Table 13.9** details the receptors and their sensitivities for use within the following assessment. A justification for the sensitivity has been provided, based upon the details contained in **Table 13.2: Classification of Receptor Sensitivity**.

Table 13.9: Receptor Sensitivity Summary

Receptor	Sensitivity	Justification
Users of A82(T)	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.
Users of A83(T)	Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition.

Receptor	Sensitivity	Justification
Residents along A82(T) (outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Residents along A83(T) (outwith towns and villages)	Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.
Dumbarton including Renton, Alexandria and Balloch Residents	High	Where a location is a large settlement / rural settlement containing a high number of community and public services and facilities.
Arden Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Luss Residents	Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Inverbeg Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Tarbet Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Arrochar and Succoth Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Ardgartan Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Inveruglas Residents, including Loch Lomond Holiday Park	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Ardlui Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.

Receptor	Sensitivity	Justification
Crianlarich Residents	Low	Where a location is a small rural settlement, containing few community or public facilities or services.
Path / Core Path Users in the immediate vicinity of the site	High	Minor path used by walkers and cyclists, not constructed to accommodate HGV traffic flows.

As previously noted in **Section 13.5.3.2: Criteria for Assessing Magnitude of Change**, examples of sensitive areas are presented in the 2023 IEMA Guidelines as locations which include hospitals, churches, schools, historical buildings, tourist attractions for example. Based on these indicators which are stated within the 2023 IEMA Guidelines, the following locations have been identified as sensitive receptors in this assessment:

- Residents of Dumbarton including Renton, Alexandria and Balloch;
- Residents of Luss;
- Residents of Tarbet;
- Residents of Arrochar and Succoth;
- Loch Lomond Holiday Park;
- Inveruglas Visitor Centre; and
- Path / Core Path Users in the immediate vicinity of the site.

These locations are therefore subject to 'Rule 2' of the IEMA Guidelines which requires a full assessment of effects if the locations are subject to a total traffic increase of 10% or more. All other locations within the study area are subject to 'Rule 1' and are assessed if total traffic flows (or HGV flows) on highway links increase by more than 30%.

13.7. Potential Construction Effects

The assessment is based upon the construction effects that may occur within the study area. In order to assess the effects, it is necessary to determine the likely traffic generation associated with the Proposed Development.

During the 36-month construction period, the following traffic will require access to the PDA:

- Staff transport, in either cars or staff minibuses;
- Site clearance / tree felling;
- Import of materials, including concrete and general building materials;
- M&E components;
- Removal of spoil material;
- Removal of felled timber;
- Import of fuel for construction plant;
- Daily movements associated with servicing a large construction site and compound; and
- Occasional delivery of larger items of plant.

In terms of major items of construction plant which will work on the site, these will include:

- Cranage;
- 'Moxy' 40 Tonne dumper trucks;

- Telehandlers;
- Small (4 Tonne to 6 Tonne) dumper trucks;
- Excavators (Back-actors and 360º tracked excavators);
- Low loaders (for plant and materials delivery);
- Ready mixed concrete trucks;
- Drilling rigs; and
- Rock crushing plant.

The existing Sloy Hydroelectric Power Station site is a working industrial site with daily activity / vehicle movement in and around the site. Activity associated with the Proposed Development will occur either within the existing Sloy Hydroelectric Power Station site itself, or immediately adjacent to it, to the north of the site, or in the secondary compound area located within the Inveruglas Visitor Centre overflow car park

Average daily traffic flow data were used to establish the construction trips associated with the Proposed Development based on the assumptions detailed in the following sections. The calculations assume that there are 50 working weeks per year, and work will take place six days per week.

Daily construction traffic estimates have been developed and are detailed in **Volume 4, Appendix 13.1**. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in months 14 to 16 of the programme. During these months, a total of 3,332 vehicle movements are predicted, comprising 1,320 Car / LGV movements and 2,012 HGV movements. The majority of trips associated with HGV movements during the peak relate to the movement of excavated materials off-site and the import of concrete materials. This equates to an average of the following vehicle movements per day:

- Cars / LGV: 60 vehicle movements (30 inbound trips and 30 outbound trips); and
- HGV: 92 vehicle movements (46 inbound trips and 46 outbound trips).

The distribution of development traffic on the network would vary depending on the types being transported. Full details of the access strategy and distribution of trips is provided in **Volume 4, Appendix 13.1**.

The estimated construction traffic was compared against the future baseline traffic (2027) to estimate the increase in traffic associated with this phase of the Proposed Development. **Table 13.10** illustrates the potential traffic impact at the peak of construction activity (months 14 to 16) across the study area.

Table 13.10: Peak Construction Traffic Network Impact (2027)

Survey Location	Cars / LGV	HGV	Total	Cars / LGV % Increase	HGV % Increase	Total % Increase
A82(T), Ardlui	4,317	231	4,548	0.1%	0.0%	0.1%
A82(T), site frontage	2,679	881	3,560	2.1%	11.7%	4.3%
A82(T), north of Tarbet	4,271	464	4,735	1.3%	24.8%	3.2%
A83(T), west of Tarbet	3,904	1,021	4,925	0.0%	9.4%	1.8%
A82(T), south of Tarbet	7,510	1,697	9,207	0.8%	0.2%	0.7%

The highest total traffic movement increase within the study area would be on the A82(T) along the site frontage, where it is predicted to increase by 4.3%. This is considered to be below daily traffic variation levels on the road network. On the rest of the public road network within the study area, the next highest total traffic increase (3.2%) would be on the A82(T) north of Tarbet.

The total HGV traffic movements would increase by 24.8% on the A82(T) between Tarbet and the PDA. This is not considered to be a significant increase, with only 92 HGV movements per day predicted, which equates to approximately eight two-way movements per hour over a typical 12 hour working day. On the rest of the public road network, the highest HGV traffic increase is 11.7%, which would be on the A82(T) along the site frontage.

It should be noted the construction phase would be transitory in nature and the peak of construction activities would be short lived, occurring over a relatively short timeframe when taking account of the whole construction programme.

A review of existing theoretical road capacity has been undertaken using the *NESA Manual*, formerly of the *Design Manual for Roads and Bridges, Volume 15, Part 5*. The theoretical road capacity has been estimated for each of the road links that make up the study area for a 12-hour period. The results are summarised in **Table 13.11**.

Table 13.11: Daily Traffic (12hr) Capacity Review Summary (2027)

Survey Location	2027 Baseline Flow (total traffic)	2027 Base + Development Flows (total traffic)	Theoretical Road Capacity (12hr)	Spare Road Capacity %
A82(T), Ardlui	4,542	4,548	28,800	84.2%
A82(T), site frontage	3,412	3,560	28,800	87.6%
A82(T), north of Tarbet	4,587	4,735	28,800	83.6%
A83(T), west of Tarbet	4,837	4,925	28,800	82.9%
A82(T), south of Tarbet	9,147	9,207	28,800	68.0%

The results indicate that there are no road capacity issues with the addition of construction traffic associated with the Proposed Development, and that spare capacity exists within the trunk road network to accommodate all construction phase traffic.

13.8. Mitigations by Design / Embedded Mitigation

Construction activities will result in rock excavations, with the final volume dependent on the type of pump selected at detail design stage, post consent. The excavated rock would be used productively in the construction of the new works, where feasible.

As discussed in **Chapter 3: Site Selection and Design Evolution**, in order to reduce the need for rock spoil to be transported off site, via the public road network, it is proposed a portion of the excavated rock would be spread over the area to the north of the existing power station. This would aid in the suppression and eradication of invasive non-native plant species. The area would be reprofiled, seeded, and planted and regenerated with suitable locally sourced soil, to ensure an improved habitat would be established.

13.9. Potential Significant Effects

13.9.1. CONSTRUCTION EFFECTS

In accordance with the 2023 IEMA Guidelines no receptors require detailed assessment specifically in relation to Rule 1, whereby total traffic flows (or HGV flows) on highway links would increase by more than 30%.

With regards to sensitive areas within the study area, which are subject to Rule 2, which requires a full assessment of effects if the locations would be subject to a total traffic increase of 10% or more, none of the previously identified areas or locations would be subject to an increase of this size. The largest total increase in total traffic flows within the study area where these are located would be 4.3%, which would occur on the A82(T) along the site frontage.

Notwithstanding the results highlighted above, given the proximity of some of the sensitive areas / locations to the Proposed Development, an assessment of the effect of construction traffic has been undertaken on the following receptors to ensure a robust assessment:

- Loch Lomond Holiday Park (Low Sensitivity);
- Inveruglas Visitor Centre (Low Sensitivity); and
- Path / Core Path Users in the immediate vicinity of the site (High Sensitivity).

The significance of the potential effects on the above receptors has been determined using the rules and thresholds previously outlined in the **Section 13.5.3.3 Criteria for Assessing Significance**. **Table 13.12** summarises the significance of the effect on the receptors for the construction phase.

Table 13.12: Construction Phase Effects Summary

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
Loch Lomond Holiday Park	Severance	Minor	Minor (Not Significant)	The increase in total traffic and HGV traffic is predicted to be 4.3% and 11.7% respectively at this location. As such the temporary increase in traffic flows will not result in community / resident severance. Given the use of this location by tourists and other recreational users, specific reference should be included within the CTMP to

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
				ensure potential impacts on vulnerable road users are appropriately mitigated. The effect is considered to be minor.
	Driver Delay	Minor	Minor (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the A82(T) at this location to accommodate construction traffic. This however does not take cognisance of the character of the road (i.e. long winding sections, with limited passing opportunities) and limited alternative route options. Road users could become frustrated at potential delays caused by construction vehicles, and as such, cognisance of HGV traffic would be included within the proposed mitigation measures. The effect is therefore considered to be minor.
	Pedestrian Delay	Minor	Minor (Not Significant)	With the addition of construction traffic at this location, spare road capacity would be at 87.6%. It is estimated that there would be 152 vehicle movements per day during the peak months. This equates to approximately 13 vehicles per hour over a typical working day. Whilst this is not considered significant, cognisance would be given to the presence of the holiday park within the CTMP to

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
				ensure that any potential delay to users are appropriately mitigated. The effect is therefore considered to be minor.
	Non-motorised User Amenity	Minor	Minor (Not Significant)	It is estimated that there would be 152 vehicle movements per day during the peak months. This equates to approximately 13 vehicles per hour over a typical working day. The increase would be unlikely to affect non-motorised user amenity. Nevertheless, cognisance would be given to the presence of the holiday park within the CTMP to ensure that any potential impacts to users are appropriately mitigated. The effect is therefore considered to be minor.
	Fear & Intimidation	Minor	Minor (Not Significant)	The increase in total traffic would be less than 5% at this location. Changes in flows less than 30% are considered minor. The effect is therefore considered to be minor.
	Road Safety	Minor	Minor (Not Significant)	Within the accident analysis period, there appears to be a low level of accidents occurring to the north of this location. The character of the road could lead to driver frustration, and as such, cognisance of HGV traffic and potential interaction with other vehicles at junctions would be included within the proposed mitigation measures.

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
				The accidents and safety effects are considered to be minor.
Inveruglas Visitor Centre	Severance	Minor	Minor (Not Significant)	The increase in total traffic and HGV traffic is predicted to be 4.3% and 11.7% respectively at this location. As such the temporary increase in traffic flows would not result in severance to the visitors to the centre. Given the use of this location by tourists and other recreational users, specific reference should be included within the CTMP to ensure potential impacts on vulnerable road users are appropriately mitigated. The effect is considered to be minor.
	Driver Delay	Minor	Minor (Not Significant)	When considering the effects purely in numerical terms based on the assessment criteria, there is ample spare capacity on the A82(T) at this location to accommodate construction traffic. This however does not take cognisance of the character of the road (i.e. long winding sections, with limited passing opportunities) and limited alternative route options. Road users could become frustrated at potential delays caused by construction vehicles, and as such, cognisance of HGV traffic would be included within the proposed mitigation measures. The effect is therefore considered to be minor.

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
	Pedestrian Delay	Minor	Minor (Not Significant)	With the addition of construction traffic at this location, spare road capacity would be at 87.6%. It is estimated that there would be 152 construction vehicles per day during the peak months. This equates to approximately 13 vehicles per hour over a typical working day. Whilst this is not considered significant, cognisance would be given to the presence of the visitor centre within the CTMP to ensure that any potential delay to users is appropriately mitigated. The effect is therefore considered to be minor.
	Non-motorised User Amenity	Minor	Minor (Not Significant)	It is estimated that there would be 152 construction vehicles per day during the peak months. This equates to approximately 13 vehicles per hour over a typical working day. The increase would be unlikely to affect non-motorised user amenity. Nevertheless, cognisance would be given to the presence of the visitor centre within the CTMP to ensure that any potential impacts to users are appropriately mitigated. The effect is therefore considered to be minor.
	Fear & Intimidation	Minor	Minor (Not Significant)	The increase in total traffic would be less than 5% at this location. Changes in flows less than 30% are considered minor.

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
				The effect is therefore considered to be minor.
	Road Safety	Minor	Minor (Not Significant)	Within the accident analysis period, there has been a small number (three) of accidents recorded in the vicinity of the access junction to the Visitor Centre. There does not however appear to be any specific trends or high number of accidents involving HGVs. The character of the road could lead to driver frustration however and the increase of vehicles turning at the site access junctions could lead to an increase in potential conflicts. As such, cognisance of HGV traffic would be included within the proposed mitigation measures. The accidents and safety effects are considered to be minor.
Path / Core Path Users in the immediate vicinity of the site	Severance	Minor	Moderate / Minor (Significant)	The presence of construction traffic associated with the Proposed Development, could lead to severance of the path network, in particular where people are required to cross the A82(T) on sections of the Three Lochs Way, for example at the Inveruglas Visitor Centre. The effect, without additional mitigation, is considered to be moderate.
	Driver Delay	Not Applicable	Not Applicable	Not Applicable

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
	Pedestrian Delay	Minor	Moderate / Minor (Significant)	Pedestrians could experience delays if their movements interact with construction traffic, for example at crossing points on the Three Lochs Way at the Inveruglas Visitor Centre. In addition the secondary construction compound / site establishment area would be located immediately to the north of the Visitor Centre in the overspill car park and vehicle movements between here and the main site could cause potential delays. The effect is therefore considered moderate.
	Non-motorised User Amenity	Minor	Moderate / Minor (Significant)	It is estimated that there would be 152 construction vehicles per day during the peak months. This equates to approximately 13 vehicles per hour over a typical working day. The increase would be unlikely to affect non-motorised user amenity. Nevertheless, cognisance would be given to the presence of the Visitor Centre within the CTMP to ensure that any potential impacts to users are appropriately mitigated. The effect is therefore considered to be moderate.
	Fear & Intimidation	Minor	Moderate / Minor (Not Significant)	The increase in total traffic would be less than 5% where the path crosses the A82(T) at the Visitor Centre. Changes in flows less than 30% are considered minor.

Receptor	Potential Effect	Magnitude of Effect	Significance of Effect	Comment
				The effect is therefore considered to be minor.
	Road Safety	Minor	Moderate / Minor (Significant)	There is potential to impact the safety of the path users interacting with construction delivery vehicles operating between the main site area and the construction compound. The impact is therefore considered moderate.

The assessment of significance suggests that the following receptors are likely to experience significant effects, prior to the application of mitigation measures:

- Path / Core Path Users in the immediate vicinity of the site.

It should be noted that the impacts assessed above relate solely to the peak of construction activities and that the construction period is short lived and the effects transitory in nature. Whilst it is acknowledged that other months within the construction programme may cause significant effects, these would be less than those assessed and for which mitigation measures have been proposed.

13.9.2. OPERATIONAL EFFECTS

It is predicted that during the operation of the site there would be up to two to three car / LGV trips per day, for maintenance purposes, which is comparable with the operational maintenance requirements of the existing Sloy Hydroelectric Power Station. Also, there would be very occasional AIL movements to remove and deliver components for scheduled maintenance or in the unlikely event of a significant component failure. As such, the operational phase has been scoped out of the assessment.

13.9.3. CUMULATIVE EFFECTS

As detailed in **Volume 4, Appendix 13.1: Transport Assessment**, the review of committed development schemes (developments with extant planning permission) did not identify any other significant traffic generating developments in the study area that may occur during the construction period associated with the Proposed Development. It is therefore considered that no cumulative assessment is required.

Should any projects currently going through planning be granted planning consent at the same time as the Proposed Development, the Applicant would welcome the opportunity to engage with other developers in consultation with LLTNPA, TS and other relevant bodies to ensure appropriate traffic management measures would be implemented to minimise any cumulative impacts. For example, should any construction activities be undertaken at the same time, it is suggested that this could be mitigated through the use of an overarching Traffic Management and Monitoring Plan (TMMP).

13.10. Mitigation

13.10.1. CONSTRUCTION TRAFFIC MANAGEMENT PLAN (CTMP)

The CTMP would be agreed with LLTNPA and TS prior to construction works commencing through the imposition of a planning condition, with proposed measures to be included provided below.

The following measures would be implemented during the construction phase through the CTMP:

- Where possible, the detailed design process would minimise the volume of material to be imported and exported to site to help reduce HGV numbers;
- A site worker transport and travel arrangement plan, including transport modes to and from the worksite (including pick up and drop off times);
- A Transport Management Plan for AIL deliveries; (if required);
- All materials delivery lorries (dry materials) should be sheeted to reduce dust and stop spillage on public roads;
- Specific training and disciplinary measures should be established to ensure the highest standards are maintained to prevent construction vehicles from carrying mud and debris onto the carriageway;
- Wheel cleaning facilities may be established at the site entrance, depending on the views of LLTNPA and TS;
- Normal site delivery hours would be limited to between 07:00 and 19:00 (Monday to Saturday) and 07:00 to 15:00 hours (Sundays), with some key periods within the programme requiring 24 hour working. In the event of work being required outwith standard hours, e.g., abnormal load deliveries, commissioning works or emergency mitigation works, the Local Authority would be notified prior to these works taking place, wherever possible;
- Appropriate traffic management measures would be put in place on the A82(T) to avoid conflict with general traffic, subject to the agreement of LLTNPA and TS. Typical measures would include HGV turning and crossing signs and / or banksmen at the site access and warning signs;
- Provide construction updates on the project website and / or a newsletter to be distributed to residents within an agreed distance of the site;
- Adoption of voluntary reduced speed limits at locations to be agreed with LLTNPA and TS;
- All drivers would be required to attend an induction to include:
  - a toolbox talk safety briefing;
  - the need for appropriate care and speed control;
  - a briefing on driver speed reduction agreements (to slow site traffic at sensitive locations through the villages); and
  - identification of the required access routes and the controls to ensure no departure from these routes.

Transport Scotland are likely to request that an agreement to cover the cost of abnormal wear on the A82(T) in the vicinity of the Proposed Development is put in place.

Video footage of the pre-construction phase condition of the construction vehicles route would be recorded to provide a baseline of the condition of the road prior to any construction work commencing. This baseline would provide evidence of any change in the road condition during the construction phase. Any necessary repairs would be coordinated with TS. Any damage caused by construction traffic associated with the Proposed Development, that would be hazardous to public traffic, would be repaired immediately.

Damage to road infrastructure caused directly by construction traffic would be remediated, and street furniture that is removed on a temporary basis would be fully reinstated.

There would be a regular road review, and any debris and mud would be removed from the carriageway using an on-site road sweeper to ensure road safety for all road users.

13.10.2. ABNORMAL LOAD TRANSPORT MANAGEMENT PLAN (IF REQUIRED)

There are a number of traffic management measures that could help reduce the effect of AIL convoys on the public road network should the current situation change and AILs are required. These measures would be enacted for example, should the proposed pump sections be classed as AILs.

All abnormal load deliveries would be undertaken at appropriate times (to be discussed and agreed with LLTNPA, TS and police) with the aim to minimise the effect on the local road network. It is likely that the abnormal load convoys would travel in the early morning periods before peak times.

The majority of potential conflicts between construction traffic and other road users would occur with abnormal load traffic. General construction traffic is not likely to come into conflict with other road users as the vehicles are smaller and road users are generally more accustomed to them.

Potential conflicts between the abnormal loads and other road users can occur at a variety of locations and circumstances. The main potential conflicts are likely to occur:

- At other locations where there are significant changes in the horizontal alignment of the carriageway, requiring the loads to use the full carriageway width;
- Where traffic turns at a road junctions, requiring other traffic to be restrained on other approach arms; and
- In locations where high speeds of general traffic are predicted.

Advance warning signs would be installed on the approaches to the affected road network. Information signage could be installed to help assist drivers. Flip up panels would be used to mask over days where convoys would not be operating. When no convoys are moving, the sign would be bagged over by the Traffic Management contractor.

This signage would assist in helping improve driver information and allow other road users to consider alternative routes or times for their journey (where such options exist).

The location and numbers of signs would be agreed post consent and would form part of the Traffic Management Proposal for the project.

The Abnormal Load Transport Management Plan would also include:

- Procedures for liaising with the emergency services to ensure that police, fire and ambulance vehicles would not be impeded by the loads. This is normally undertaken by informing the emergency services of delivery times and dates and agreeing communication protocols and lay over areas to allow overtaking;
- A diary of proposed delivery movements to liaise with the communities to avoid key dates such as local events;
- A protocol for working with local businesses to ensure the construction traffic does not interfere with deliveries or normal business traffic; and
- Proposals to establish a construction liaison group to ensure the smooth management of the project with the applicant, the construction contractors, the local community, and if appropriate, the police forming the committee. This committee would form a means of communicating and updating on forthcoming activities and dealing with any potential issues arising.

The Abnormal Load Transport Management Plan would be conducted post consent and would be secured through a planning condition.

13.10.2.1. Public Information (If Required)

Should AILs be required, information on the AIL convoys would be provided to local media outlets such as local papers and local radio to help assist the public if deemed necessary.

Information would relate to expected vehicle movements from the Port of Entry (POE) through to the site access junction. This will assist residents becoming aware of the convoy movements and may help reduce any potential conflicts.

The applicant would also ensure information was distributed through its communication team via the project website, local newsletters, and social media.

13.10.2.2. Convoy System (If Required)

A police escort would be required to facilitate the delivery of any AILs should the current situation change and they are required for the Proposed Development. The police escort would be further supplemented by a civilian pilot car to assist with the escort duty. It is proposed that an advance escort would warn oncoming vehicles ahead of the convoy, with one escort staying with the convoy at all times. The escorts and convoy would remain in radio contact at all times where possible.

The abnormal loads convoys would be no more than three AIL long, or as advised by the police, to permit safe transit along the delivery route and to allow limited overtaking opportunities for following traffic where it is safe to do so.

The times in which the convoys would travel would need to be agreed with Police Scotland who have sole discretion on when loads can be moved.

13.10.3. PATH MANAGEMENT PLAN (PMP) (If Required)

In the immediate vicinity of the site, consideration has been given to pedestrians and cyclists alike due to potential interactions between construction traffic and users of the paths and public roads. If required by LLTNP, a Path Planning Study can be conducted post consent and secured through a planning condition. Findings from the study would be used to formulate a set of measures into a Path Management Plan (PMP), which can be a standalone document or form part of the CTMP.

Appropriate *Traffic Signs Manual Chapter 8* compliant temporary road signage would be provided to assist at these crossing for the benefit of all users.

The principal contractor would ensure that speed limits are always adhered to by their drivers and associated subcontractors. This would be particularly important within close proximity to the paths, Core Paths and at crossing points. Advisory speed limit signage would also be installed on approaches to areas where path users may interact with construction traffic.

Signage would be installed on the site exit that makes drivers aware of local speed limits and reminding drivers of the potential presence of pedestrians and cyclists in the area. This would also be emphasised in the weekly toolbox talks.

13.10.4. STAFF TRAVEL PLAN

A Staff Travel Plan will be deployed where necessary, to manage the arrival and departure profile of staff and to encourage sustainable modes of transport, especially car-sharing. A package of measures could include:

- Appointment of a Travel Plan Coordinator (TPC);
- Provision of public transport information;
- Mini-bus service for transport of site staff;
- Promotion of a car sharing scheme; and
- Car parking management.

13.10.5. OPERATIONAL PHASE MITIGATION

Site entrance roads would be well maintained and monitored during the operational life of the Proposed Development. Regular maintenance would be undertaken to keep the site access drainage systems fully operation and to ensure there are no run-off issues onto the public road network.

13.11. Residual Effects

13.11.1. RESIDUAL CONSTRUCTION EFFECTS

The identification of residual construction effects considers the assessment of traffic effects following the incorporation of the identified mitigation measures above. An evaluation of the potential effects of the temporary increase in traffic on the study area roads used for the construction traffic has been undertaken, with the results provided below:

- Path / Core Path Users in the immediate vicinity of the site (Not Significant).

A summary of the assessment of residual effects, including the proposed mitigation measures is presented in **Table 13.13**.

The assessment confirms temporary construction phase effects would be minor in nature and they will be not significant, following the implementation of a comprehensive CTMP, together with appropriate signage and path management plan (if required). The traffic effects would be transitory in nature and appropriate mitigation measures are proposed to reduce the potential impacts. No long-term detrimental transport or access issues would be associated with the construction phase of the Proposed Development.

13.12. Summary And Conclusion

This chapter presents the findings of the potential effects of the Proposed Development on Traffic and Transport during the construction and operational phases.

The Proposed Development would lead to a temporary increase in traffic volumes within the study area during the construction phase. Traffic volumes would fall considerably outside the peak period of construction.

The construction traffic would result in a temporary increase in traffic flows on the road network surrounding the Proposed Development. The maximum traffic effect associated with construction of the Proposed Development is predicted to occur in months 14 to 16 of the programme. During these peak months, a total of 3,332 vehicle movements are predicted, comprising 1,320 Car / LGV movements and 2,012 HGV movements. This equates to an average of the following vehicle movements per day:

- Cars / LGV: 60 vehicle movements (30 inbound trips and 30 outbound trips); and
- HGV: 92 vehicle movements (46 inbound trips and 46 outbound trips).

No capacity issues would be expected on any of the roads within the study area due to the additional construction traffic movements associated with the Proposed Development, as background traffic

movements are low, the links are of a good standard and appropriate mitigation is proposed. The effects of construction traffic would be temporary in nature and would be transitory.

Traffic levels during the operational phase of the Proposed Development would be low, with two to three vehicles per day for maintenance purposes. Traffic levels during the decommissioning of the Proposed Development would be lower than those associated with the construction phase as some elements may be left in-situ and others broken up on-site.

Table 13.13: Summary of Residual Effects

Predicted Effect	Significance	Mitigation	Significance of Residual Effect
Construction			
Path / Core Path Users in the immediate vicinity of the site			
Severance	Moderate (Significant)	A CTMP and a PMP – would be secured through a planning condition and delivered by the Principal Contractor. An Abnormal Load Transport Management Plan (if required) – would be prepared and delivered by the Abnormal Load supplier if required. A Staff Travel Plan – would be delivered by the Principal Contractor.	Minor (Not Significant)
Driver Delay	N / A	N / A	N / A
Pedestrian Delay	Moderate (Significant)	A CTMP and a PMP – would be secured through a planning condition and delivered by the Principal Contractor. An Abnormal Load Transport Management Plan (if required) – would be prepared and delivered by the Abnormal Load supplier. A Staff Travel Plan – would be delivered by the Principal Contractor.	Minor (Not Significant)
Non-motorised User Amenity	Moderate (Significant)		Minor (Not Significant)
Fear & Intimidation	Minor (Not Significant)		Minor (Not Significant)
Road Safety	Moderate (Significant)		Minor (Not Significant)

References

Scottish Government (2023), *National Planning Framework 4.*

Loch Lomond and Trossachs National Park (2016), *Local Development Plan (2017-2021).*

Loch Lomond and Trossachs National Park (2017), *Renewable Energy Supplementary Guidance.*

Institute of Environmental Assessment (1993), *Guidelines for the Environmental Assessment of Road Traffic.*

Institute of Environmental Assessment (2023), *Environmental Assessment of Traffic and Movement.*

Institution of Environmental Management and Assessment (2005), *Guidelines for Environmental Impact Assessment.*

Highways England, Transport Scotland, Welsh Government and Department for Infrastructure Northern Ireland (2020), *Manual for Roads and Bridges (DMRB), LA 104 Environmental Assessment and Monitoring (Revision 1).*

Transport Scotland (2013), *Design Manual for Roads and Bridges, Volume 15, Part 5 "The NESA Manual"*

Scottish Government (2005), *Planning Advice Note (PAN) 75.*

Transport Scotland (2012), *Transport Assessment Guidance.*

Sustrans (2023). The National Cycle Network. Available at: https://www.sustrans.org.uk/national-cycle-network

Timber Transport Forum (2024) Available at: https://timbertf.maps.arcgis.com/apps/webappviewer/index.html?id=4a23d4910e604b71872956441113c83c

Department for Transport (2024). Available at: https://roadtraffic.dft.gov.uk/#6/55.254/-11.096/basemap-regions-countpoints

Transport Scotland (2024) https://ts.drakewell.com/multinodemap.asp

CrashMap (2024) Available at: https://www.crashmap.co.uk/

Department for Transport/Highways Agency, Department for Regional Development (Northern Ireland), Transport Scotland & Welsh Assembly Government (2009): Traffic Signs Manual, Chapter 8 – Traffic Safety Measures and Signs for Road Works and Temporary Situations

Scottish Government (2024). Energy Consents Unit. Available at: https://www.energyconsents.scot/ApplicationSearch.aspx?T=1

Loch Lomond and Trossachs National Park (2024) Planning Access Portal. Available at: https://eplanning.lochlomond-trossachs.org/OnlinePlanning/search.do?action=simple&searchType=Application

UK Government (2023) Available at: https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements