

Chapter 11

Access, Traffic and Transport

11 Access, Traffic and Transport

Introduction

- 11.1 This chapter documents an assessment of the potential traffic and transport effects associated with the construction of the proposed development. The traffic that is likely to be generated during the construction phase of the proposed development is detailed, the effect upon the local road network is assessed, and measures to reduce network disruption are identified. Cumulative effects associated with construction of 'committed' projects which are likely to generate traffic that will utilise local public roads within the Study Area (as defined in paragraph 11.13 and illustrated in **Figure 11.1**) at the same time as the proposed development have also been assessed.
- 11.2 This chapter should be considered in conjunction with the following chapters which inform or have been informed by this assessment:
- **Chapter 4: Project Description and Construction, Operation and Maintenance** which provides details of the proposed development;
 - **Chapter 5: Planning Policy Context** which details the planning policies and guidance relevant to this assessment; and
 - **Chapter 10: Construction Noise** which considers the potential effects arising from noise produced by the proposed development construction traffic, which has been scoped out of detailed assessment.
- 11.3 The chapter is accompanied by **Appendix 11.1: Construction Traffic Management Plan**.

Scope of the Assessment

- 11.4 This section outlines the effects which have been considered likely to be significant under this assessment and the reasoning for excluding assessment of other effects from the study. This remained under review as the EIA progressed. As noted in **Chapter 2: Approach to the EIA**, a separate EIA scoping exercise was not undertaken for the proposed development therefore the scope of the assessment has been informed by the Scoping Opinion received for the KTR Project, specific consultation undertaken for the proposed development, and the professional judgement of the assessment team.

Effects Assessed in Full

- 11.5 The following categories of potential effects have been considered for route sections within the Study Area during the key construction phases¹, for the proposed development in isolation and cumulatively with committed developments which are likely to utilise local roads at the same time as the proposed development:
- driver delay;
 - community impacts (severance, pedestrian amenity/fear and intimidation and pedestrian delay); and
 - road safety.

Effects Scoped Out

- 11.6 The following effects have been scoped out of this assessment:
- Operational phase effects: once operational, substations typically generate very low levels of traffic. It is estimated that the substation extension will generate less than ten vehicle movements per day

for the purposes of operation, maintenance, repairs and servicing. Accordingly, the professional judgement of the EIA team is that effects arising from such low level of traffic will be negligible and therefore not significant.

- Decommissioning phase effects: a 40 years lifespan is estimated for the substation extension. Given the long duration between the present day and decommissioning it is difficult to determine an accurate baseline for this assessment. If after 40 years, or at any point in the future a decision was taken to decommission the substation extension, work would be undertaken following the procedures outlined for the proposed development as adjusted to reflect established best practice at that time. It should be noted that as no significant effects are predicted during the construction phase as detailed below, and given the additional scope to manage any effects through a Construction Traffic Management Plan (CTMP), it is reasonable to assume that no significant effects are considered likely for the decommissioning phase, subject to detailed assessment. This is detailed further in **Chapter 2: Approach to the EIA**.

Assessment Methodology

- 11.7 This assessment has been undertaken as a combination of desk-top study, field survey and consultation with statutory agencies in line with current good practice and policy advice and also the professional judgement of the EIA team. Predicted volumes of construction vehicle movements have been compared with baseline traffic flows to identify if there are likely to be periods where the increase in general traffic (or HGV traffic) exceeds standard thresholds. Likely effects arising as a result of the additional traffic (i.e. on driver delay, road safety and community effects) have been identified and their significance assessed.

Legislation and Guidance

Legislation

- 11.8 This assessment is carried out in accordance with the principles contained within the following legislation:

- The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017 ('the EIA Regulations').

Guidance

- 11.9 This assessment is carried out in accordance with the principles contained within the following documents:

- Institution of Highways and Transportation (IHT) (1994), Guidelines for Traffic Impact Assessment;
- Institute of Environmental Assessment (now the Institute of Environmental Management and Assessment / IEMA) (1993), Guidelines for the Environmental Assessment of Road Traffic, Guidance Notes No. 1 [referred to as the IEMA Guidelines];
- Transport Scotland (2012), Transport Assessment Guidance;
- Scottish Government (2005), NESA Manual, DMRB, Volume 15, Economic Assessment of Road Schemes in Scotland; and
- ROSPA Road Safety Engineering Manual, 1995.

- 11.10 The IEMA Guidelines are intended for the assessment of the effect of road traffic associated with major new developments. It is common and established practice that they are applied to energy related developments and as such these guidelines are defined as suitable to assess the construction phase of a substation extension.

Consultation

- 11.11 Consultation was undertaken with Ayrshire Roads Alliance and D&GC Roads Department to ascertain their views on the assessment methodology, environmental impacts relating to access, traffic and transport, and any particular concerns they may have and any proposed road works.
- 11.12 A meeting with officers from D&GC Roads Department and D&GC Planning Department was held at D&GC offices in Dumfries on 16th May 2018 to discuss the proposed development, proposed

¹ The construction period of the proposed development is currently planned to finish at the end of 2024, however from June 2022 onwards, the proposed development will generate low levels of traffic and professional judgement suggest that effects arising from such low level of traffic will be negligible and therefore not significant. As such, the assessment of the likely significant traffic and transport effects with the construction of the proposed development has focused on the key construction phases up until June 2022.

infrastructure upgrades on the A762 and U2s near Glenlee as well as the creation of a Framework CTMP in advance of the planning application submission. Subsequently, further work was undertaken to develop the Framework CTMP² and the proposed infrastructure upgrades on the A762 and U2s. A second meeting with officers from D&GC Roads Department was held on the 10th December 2018. A summary of the consultation is provided in **Table 11.1**.

Table 11.1: Consultation Responses

Consultee	Type and Date	Issue Raised	Response/Action Taken
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that any permanent accommodation works on the public road will require formal Roads Construction Consent, however temporary accommodation works contained within the public road boundary can be managed under Road Opening Permits (i.e. Section 56).	Proposed accommodation works will only be temporary with all works reinstated to their original condition post construction. Road Opening Permits will be applied for by the contractor as detailed in Section 3.1 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that a 'wear and tear' agreement must be agreed with the Council under a Section 96 agreement. At the start and end of each phase of works before and after condition video surveys of the proposed delivery and construction traffic routes should be undertaken jointly and a copy of the survey provided to D&GC.	Proposed methodology for before and after surveys detailed in Section 3.4 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that construction traffic should not wait or stack on the public roads.	This is acknowledged and noted in Section 4.6 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that construction vehicles will require to display a unique identification number shown on a plate clearly visible.	This is acknowledged and noted in Section 4.6 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that SPEN will need to appoint a community liaison officer.	This is acknowledged and noted in Section 4.7 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC advised that drivers must adhere/comply to the code of conduct and that an indication of the consequences for non-compliance should be provided.	This is acknowledged and noted in Section 4.9 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 16 th May 2018	D&GC highlighted the presence of public footpaths crossing the road (Southern Upland Way and core path 30) and also the fact that the A762 and U2s are part of the National Byway cycling route. D&GC advised that risk should be assessed and mitigated against.	Non-motorised user surveys have been undertaken with analysis of the data. Proposed mitigation measures indicated in Section 3.3 of the Framework CTMP.
Dumfries and Galloway Council	Consultation Meeting held 10 th December 2018	D&GC highlighted the presence of both the Primary and Secondary School in St John's Town of Dalry and indicated that if practicable, deliveries should be scheduled outwith school opening and closing times.	This is acknowledged and noted in Section 4.2 of the Framework CTMP.

Study Area

11.13 The Study Area for access, traffic and transport has been defined as the local public road network which will most commonly be used for access by traffic generated by the proposed development. It is

anticipated that the majority of general construction traffic bound for the site of the proposed development will access via the A713 which runs broadly north-south between Ayr and Castle Douglas linking with the A77 trunk road to the north and the A75 trunk road to the south. From the A713, traffic will then access the A762 followed by the U2s. A small proportion of traffic is estimated to originate from the south-east of the proposed development and as such the A712 (between the A75 and the A713) has been included within the Study Area.

11.14 The Study Area has therefore been defined as:

- A713 between Dalmellington and the A75;
- A712 between the A75 and A713;
- A762 between the A713 and U2s; and
- U2s between the A762 and Glenlee Substation.

11.15 The public road network considered in this assessment is shown in **Figure 11.1**.

11.16 Trunk roads form strategic routes designed to accommodate the long distance transportation of freight traffic, and professional judgement suggests that proposed development traffic will have an insignificant impact upon trunk road route sections. As such, it was not considered necessary to assess the proposed development impacts upon the A77, A76 and A75 trunk roads.

11.17 As vehicles travel away from the proposed development, they disperse across the wider road network. As such, beyond the defined Study Area, professional judgement suggests that effects relating to access, traffic and transport are unlikely to be significant.

Desk Based Research and Data Sources

11.18 A preliminary desktop study was undertaken to review the site access routes. Constraints and sensitive road sections were identified (i.e. locations which are likely to be more vulnerable to change in traffic flow or profile, e.g. crash cluster sites ('accident blackspots'), high footfall areas, or areas in close proximity to a school).

11.19 Recorded Personal Injury Collision (PIC) data was obtained from publicly available PIC information from the Crashmap website³ which utilises information sourced from the Department for Transport (DfT) database.

11.20 SPEN provided information in relation to construction traffic generation, based on their knowledge and experience of the construction traffic requirements of similar projects. In addition, the following data sources have been used in this assessment:

- Traffic flow information for roads within the defined study area, sourced from the DfT website (where available).
- Automatic traffic counts undertaken by Streetwise on behalf of Mott MacDonald to supplement traffic flow information obtained from the DfT, dated October 2018.
- Peak and off-peak sample traffic counts, undertaken by Mott MacDonald, on minor local routes to supplement traffic flow information obtained from the DfT, dated October 2017.
- Non-motorised user (NMU) surveys undertaken by Streetwise on behalf of Mott MacDonald to quantify pedestrian, equestrian and pedal cycle activity, dated August 2018.

Field Survey

11.21 In addition to the traffic surveys undertaken as listed above, field surveys were undertaken on 10th October 2017, 31st July 2018 and 12th September 2018 by experienced Mott MacDonald staff. This involved a drive-through of the public road sections within the study area to identify potential constraints and upgrades necessary to accommodate the safe movements of proposed development generated construction traffic and review sensitive route sections as defined above.

² It is anticipated that a condition will be attached to any grant of planning permission requiring that a CTMP (based on the Framework CTMP) be submitted for the written approval of D&GC in consultation with the relevant roads authorities and the Police.

³ <https://www.crashmap.co.uk/>

Assessing Significance

- 11.22 A Transport Assessment (TA) has not been undertaken as a TA is not generally considered to be required for temporary construction works and the traffic movements associated with the operational phase of the proposed development are not high enough to warrant a formal TA.
- 11.23 An assessment of traffic and transport effects has been undertaken as significant effects associated with construction traffic were considered likely. As noted above, the following effects are considered:
- driver delay;
 - road safety; and
 - community effects (pedestrian and cyclist amenity, fear and intimidation, and severance).

Sensitivity

- 11.24 Under IEMA Guidelines, road links may be categorised as ‘specifically sensitive’, meaning that these sections are considered to be more vulnerable to changes to the volume or profile of traffic flows. Such locations could include ‘accident blackspots’, hospitals, links with high pedestrian flows etc.

Magnitude

- 11.25 The magnitude of change has been calculated as the proportional change in traffic volume anticipated on each route section within the Study Area. This calculation compares the forecast development traffic generation against the anticipated traffic baseline during the assumed construction year.

Significance

- 11.26 The IEMA Guidelines suggest that two broad rules can be used as a screening process to delimit the scale and extent of the assessment of road traffic. These are:
- Rule 1 – Include highway links where traffic flows would increase by more 30% (or the number of HGVs would increase by more than 30%).
 - Rule 2 – Include any other specifically sensitive areas where traffic flows would increase by 10% or more.
- 11.27 Where the predicted increase in traffic volume (general traffic or HGV only) is lower than these thresholds, the significance of the effects can be stated to be not significant meaning that further detailed assessments are not warranted. Consequently, where the predicted increase in traffic volume is greater than these thresholds, the effects are considered to be potentially significant and are assessed in greater detail.
- 11.28 The assessment has clearly identified transport routes which are to be used by the proposed development. Quantitative assessments have been undertaken alongside the application of professional judgement to determine whether or not the effects are considered to be of significance. Based on the Rule 1 and 2 of the IEMA Guidelines (IEMA, 1993), the predicted significance of the effect was determined considering both the sensitivity of the receiving environment and the magnitude of change against the baseline. As a guide to inform the assessment, but not as a substitute for professional judgement, criteria for determining the significance of traffic related effects are set out in **Table 11.2** below⁴. It should be noted that the assessment considers the effects of the % increase in general traffic (HGV + LGV) and also % increase in HGV traffic only based on related baseline traffic flows e.g. % increase in HGVs from existing HGV baseline flow.
- 11.29 Given the rural nature and proximity of the Study Area to the Galloway Forest, all routes have been treated as specifically sensitive areas, and therefore the 10% significance threshold will apply as per Rule 2 of the IEMA Guidelines (IEMA, 1993) and thus ensuring a robust assessment.

Table 11.2: Significance Criteria

Significance of Effect	% Increase in general traffic (HGV + LGV) volume % Increase in HGV traffic volume
Major (Significant)	Greater than or equal to 60%

⁴ It should be noted that the term ‘significance’ is used here both to identify where the % change in traffic should be assessed in greater detail, and also to establish the level of effect on driver delay, community impacts, and road safety.

Significance of Effect	% Increase in general traffic (HGV + LGV) volume % Increase in HGV traffic volume
Moderate (Significant)	Greater than or equal to 10% and less than 60%
Minor (Not Significant)	Greater than or equal to 5% and less than 10%
None (Not Significant)	Less than 5%

- 11.30 These thresholds have been developed based upon the Rule 2 criteria above, with ‘Major’ and ‘Moderate’ effects considered to be significant within the context of the EIA Regulations.
- 11.31 As such, where traffic is expected to increase by less than 10%, the potential effects have not been considered as ‘significant’ under this assessment. Therefore, any effect described as ‘Minor’ or ‘None’ has not been assessed in further detail.
- 11.32 The significance of all effects under consideration is linked to the volume of traffic generated by the proposed development, and so it is considered appropriate to link significance criteria to the magnitude of forecast traffic increase. However, the IEMA Guidelines (IEMA, 1993) also state that:
- "For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed-up by data or quantified information wherever possible."*
- 11.33 As such, professional judgement (led by good practice guidance) has also been applied in the assessment of effects so as to provide more meaningful conclusions, particularly in relation to the assessment of community (pedestrian delay, pedestrian amenity / fear and intimidation) and road safety effects which require local area knowledge. Information gathered during site visits, advice provided in the IEMA Guidelines (IEMA, 1993) and the DMRB Volume 15 (Scottish Government, 2005) has been used.
- 11.34 Also, where baseline traffic flows are very low, it is possible to derive unrealistic determinations of significance when considered against purely numerical assessment criteria. For example, when traffic flow is very low, it is possible to show large traffic increases and for the road to operate well below capacity. Under the numerical criteria defined above, a 60% increase in traffic volume would represent a major effect, but in reality, the effect is likely to be less significant, given the spare capacity of the road.

Design Considerations

- 11.35 The design of the proposed development includes passing places at strategic sections of the A762 (between the A713 and the U2s). These have been designed to achieve a minimum width of 6.75m and are assumed to be in place for the purposes of the assessment.

Assessment Limitations

- 11.36 Given the proposed development is still at the planning phase, it is not possible to confirm detailed final information on the construction programme or the locations of suppliers and staff journey origins. As such, a number of assumptions, based on the construction of other substation schemes have been made and are detailed below.
- A six day working week has been assumed for assessment purposes. Construction activities will be undertaken during daytime periods only, between approximately 07:00 and 19:00 on weekdays, and between 07:00 and 13:00 on Saturdays (or as daylight allows within these hours). Should working outwith these hours be required then this would be discussed with local residents before being agreed with D&GC planning through the Construction Environmental Management Plan (CEMP).
 - Construction-related activities for the proposed development comprise all activities relating to the enabling works, the construction/upgrading of access tracks, earthworks (including spoil removal), base construction and commissioning.
 - All concrete deliveries will be sourced from concrete batching plants, located predominantly to the north, south and east of the proposed development. These delivery vehicles will be routed via the Trunk Road network (A75 and A77) and access the proposed development from the A713 north (33%), the A713 south (33%) and the A712 west (33%).
 - All electrical equipment deliveries are assumed to originate from the north, south and east of the proposed development. These delivery vehicles will be routed via the Trunk Road network (A75 and

A77) and access the proposed development from the A713 north (33%), the A713 south (33%) and the A712 west (33%).

- All stone deliveries will be sourced from local quarries, located predominantly to the north and south of the proposed development. Similarly, it has been assumed that the spoil resulting from excavations will be taken offsite and returned to local quarries located to the north and/or south of the proposed development. These delivery vehicles will be routed via the Trunk Road network (A75, A76 and A77) and access the proposed development from the A713 north (50%) and the A713 south (50%).
- It is assumed that site personnel, during the construction and operational phases, will be transported to and from the site by car, mini-bus or van; all classed as Light Goods Vehicle (LGV). It is not intended that these vehicles will be restricted to specific site access routes. For the purpose of the assessment it has been assumed that site personnel will approach the proposed development from the A713 north (50%) and A713 south (50%).

- 11.37 Confirmation of the routes selected will be agreed with the appropriate road authorities when a contractor has been appointed as an integral part of the CTMP as approved by D&GC (in consultation with other relevant roads authorities) and adopted by the contractor.
- 11.38 Whilst a number of assumptions based on similar construction schemes have necessarily been required to have been made at this stage, 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 traffic and transport effects.

Existing Conditions

Existing Conditions

Tourist and Leisure Use

- 11.39 There are several local communities present in the Study Area, including: Dalmellington, Carsphairn, St. John’s Town of Dalry, New Galloway, Glenlee, Crossmichael and Parton. There are also smaller residential clusters, hamlets and farm buildings in the locality.
- 11.40 The locality is popular for leisure and tourist trips, focusing on outdoors activities, with road cycling being a common pursuit. Key recreational routes which can potentially be affected by the increased traffic volume include:
- the National Byway Cycle Route which is a national cycle route network which utilises predominantly rural lanes. The route approaches St. John’s Town of Dalry from the north along the B7000, cuts west through the town via the A702, before joining the A713 heading north. After crossing west over the Water of Ken, the route then follows the A762 south and the U2s west, briefly, before continuing off to the south-west to join the A712 to Blackcraig.
 - the Southern Upland Way which is a long-distance coast-to-coast footpath in southern Scotland. The route links Portpatrick in the west and Cockburnspath in the east via the hills of the Southern Uplands. The route approaches St. John’s Town of Dalry from the north, cuts west through the town via the A702, before crossing the A713 heading north. It then crosses the A762 just south of the Earlstoun hydro power station, before continuing west (it should be noted that this section of the Southern Upland Way at St John’s Town of Dalry is also designated as Core Path 504).
 - a number of additional core paths which intersect with or overlap with proposed construction routes for the proposed development, including:
 - the Glenlee path (Core Path 30);
 - the Mulloch Hill path (Core Path 224); and
 - the Dalry to New Galloway path (Core Path 21).

- 11.41 The recreational routes as described above are shown in Figure 6.3.

Non-Motorised User Surveys

- 11.42 To determine the level of pedestrian, equestrian and pedal cycle activity, Non-Motorised User (NMU) surveys were carried out at two distinct sites for full 24-hour periods over seven days, from Wednesday 1st August 2018 to Tuesday 7th 2018:

- Site 1: Intersection of the Southern Upland Way and the A762;
- Site 2: Intersection of the Glenlee Path (Core Path 30) and the A762.

- 11.43 Table 11.3 summarises NMU movements at Sites 1 and 2.

Table 11.3: NMU Movements Summary (Sites 1 and 2)

Date / Location	Site 1			Site 2		
	Pedestrian	Pedal Cycle	Equestrian	Pedestrian	Pedal Cycle	Equestrian
Wed 1 st August 2018	10	0	0	8	0	0
Thu 2 nd August 2018	24	1	0	6	0	0
Fri 3 rd August 2018	12	1	0	6	1	0
Sat 4 th August 2018	17	1	0	7	0	0
Sun 5 th August 2018	24	0	0	7	0	0
Mon 6 th August 2018	13	1	0	10	0	0
Tue 7 th August 2018	17	1	0	6	0	0
TOTAL	117	5	0	50	1	0

- 11.44 In addition, pedal cyclist counts were carried out at two sites situated on the National Byway Cycling Route, for full 24-hour periods over seven days, from Wednesday 1st August 2018 to Tuesday 7th 2018:
- Site 3: A762 south of Earlstoun Power Station Bridge; and
 - Site 4: U2s at its intersection with the U3s.

- 11.45 Table 11.4 summarises pedal cycle counts at Sites 3 and 4.

Table 11.4: Pedal Cycle Counts Summary (Sites 3 and 4)

Date / Location	Site 3	Site 4
Wed 1 st August 2018	10	2
Thu 2 nd August 2018	6	2
Fri 3 rd August 2018	6	3
Sat 4 th August 2018	11	0
Sun 5 th August 2018	2	0
Mon 6 th August 2018	4	2
Tue 7 th August 2018	10	2
TOTAL	49	11

- 11.46 Locations of the NMU survey sites are shown on Figure 11.1.

Road Network and Route Profiles

- 11.47 The road network included in the Study Area was identified on the basis of likely construction traffic access routes. Confirmation of the routes selected will be agreed with the appropriate road authorities when a contractor has been appointed as an integral part of the CTMP as approved by D&GC (in consultation with other relevant roads authorities) and adopted by the contractor.
- 11.48 A concise profile setting out key characteristics of the local public road sections within the study area is provided as follows. These are shown graphically on Figure 11.1.
- 11.49 **A713 (between Dalmellington and Carsphairn):** The A713 throughout this section is a single carriageway road. The route passes through the town of Dalmellington and the hamlet of Waterside where the speed limit reduces to 30mph, elsewhere in this route section the national speed limit applies. Dalmellington is a small town with residential and commercial properties fronting the A713. Doon Academy Secondary School and Dalmellington Primary School are situated approximately 100m from the A713. There are traffic management features implemented locally to encourage low speeds including

'slow' road markings, illuminated 20mph signs (which operate at the beginning and end of the school day) and speed humps. There is footway provision in Dalmellington.

- 11.50 **A713 (between Carsphairn and A762):** The A713 throughout these sections is a single carriageway road. The route passes through the village of Carsphairn where the speed limit reduces to 30mph, elsewhere in this route section the national speed limit applies. In Carsphairn, residential and commercial properties front the A713. Carsphairn Primary School is situated approximately 50m from the A713. There are a number of traffic management features implemented locally to encourage low speeds including 30mph speed roundels and 'slow' road markings and illuminated 20mph signs (which operate at the beginning and end of the school day). There is local footway provision in Carsphairn.
- 11.51 **A713 (between A762 and A702) and A713 (between A702 and A712):** The A713 throughout these sections is a single carriageway road. The route passes through the town of St John's Town of Dalry where the speed limit reduces to 30mph, elsewhere in this route section the national speed limit applies. St John's Town of Dalry is a small town with several residential and commercial properties including public amenities fronting the A713. Dalry Primary and Secondary Schools are situated approximately 100m from the A713. There are traffic management features implemented locally to encourage low speeds including 30mph speed roundels and 'slow' road markings. There is local footway provision in Dalry.
- 11.52 **A713 (between A712 and B795) and A713 (between B795 and A75):** The A713 throughout these sections is a single carriageway road. The route passes through the hamlet of Parton and the village of Crossmichael where the speed limit reduces to 30mph, elsewhere in this route section the national speed limit applies. In Crossmichael, residential and commercial properties front the A713. Crossmichael Primary School is situated approximately 100m from the A713. There are traffic management features implemented locally to encourage low speeds including 30mph speed roundels and 'slow' road markings. There is local footway provision in Crossmichael.
- 11.53 **A712 (between A713 and Corsock) and A712 (between Corsock and A75):** The A712 throughout this section is a single carriageway road. The route passes through the villages of Corsock and Crocketford where the speed limit reduces to 30mph, elsewhere in this route section the national speed limit applies. With the exception of Corsock and Crocketford (where residential properties front the A712), there is minimal frontage development.
- 11.54 **A762 (between A713 and U2s):** The A762 throughout this section is a single carriageway road. The route provides access to residential properties and the Earlston hydro power station. The national speed limit applies throughout.
- 11.55 **U2s (between Glenlee Mains and the A762):** The U2s is a single-track road. The road is used for access to a small number of residential and agricultural properties and the Glenlee hydro power station. The route passes through the Hamlet of Glenlee. The national speed limit applies on this section of road.

Bridges and Other Structures

- 11.56 There are several bridges and culverts on the existing road network, however no evidence of signed weight restrictions was observed during field study nor identified during consultation.
- 11.57 Coom Bridge is a category C listed structure, located on the A762 in Dumfries and Galloway (OS Grid reference: 261148, 580431), which spans over Coom Burn near Glenlee House. No remedial works are proposed to Coom Bridge to accommodate construction traffic relating to the proposed development.

Existing Traffic Flows

- 11.58 Typical capacities for a variety of road types are provided within the Design Manual for Roads and Bridges (DMRB), Volume 15, Table 5/3/1. These capacities, which are quoted as two way flows in vehicles per hour (vph), have been extracted for the road sections considered likely to be utilised by development related traffic and are summarised in **Table 11.5**.
- 11.59 To supplement and verify the traffic count data sourced from the DfT website, Mott MacDonald undertook the following actions at strategic locations:
 - Carried out peak and off-peak sample traffic counts, these were factored to provide Annual Average Daily Traffic (AADT) values, consistent with the process as set out in The Design Manual for Roads and Bridges (DMRB), Volume 13, Chapter 9, Part 4.
 - Commissioned automatic traffic counts.

11.60 **Table 11.5** details the existing baseline traffic flows and capacities on the routes within the Study Area considered in the assessment.

Table 11.5: Route Capacities and Existing Baseline Traffic Count Data

Route Section	Description [Speed limit (mph)]	Width	AADT { % HGV } [Source]	Capacity vph (two-way hourly flow)	Typical peak flow vph (two-way peak hour flow) from the determination of baselines conditions
A713 (between Dalmellington and Carsphairn)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	1,469 { 11.5% } [a]	1,800	<200
A713 (between Carsphairn and A762)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	1,344 { 11.3% } [b]	1,800	<200
A713 (between A762 and A702)	Urban typical single carriageway [30 typical]	Varies; 6m (typically)	1,303 { 8.5% } [a]	1,600	<200
A713 (between A702 and A712)	Urban typical single carriageway [30 typical]	Varies; 6m (typically)	2,152 { 8.5% } [a]	1,600	<200
A713 (between A712 and B795)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	1,781 { 10% } [a]	1,800	<200
A713 (between B795 and A75)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	3,647 { 5% } [a]	1,800	<200
A712 (between A713 and Corsock)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	932 { 7.5% } [a]	1,800	<200
A712 (between Corsock and A75)	Rural typical single carriageway [60 typical]	Varies; 6m (typically)	724 { 10% } [a]	1,800	<200
A762 (between A713 and U2s)	Rural poor single carriageway [60]	Varies; 4.5m to 5m (typically)	336 { 7% } [c]	280	<50
U2s	Rural typical single-track [60]	Varies; 4m to 4.3m	192 { 6% } [c]	n/a*	<50

* DMRB does not define theoretical capacities for single track roads.

[a] Source: Department for Transport (DfT) database (2017)

[b] Source: Automatic Traffic Counts (October 2018)

[c] Source: Mott MacDonald Sample Traffic Counts (October 2017) - factored flows derived from peak and inter-peak sample counts.

[d] Source: Estimated traffic volume

Personal Injury Collisions (PIC)

- 11.61 No concerns were raised during the consultations regarding road safety or accident 'blackspots' on the local road network.
- 11.62 Nevertheless, a road traffic collision analysis has been undertaken to appraise road safety in the Study Area. Personal Injury Collision (PIC) records have been obtained from Crashmap for a three-year period ending in June 2018.
- 11.63 The data has been examined with due reference to the ROSPA Road Safety Engineering Manual, 1995 (to identify any clusters and trends in the pattern and location of the collisions) and Road Casualties Great Britain, 2017 (RCGB) to evaluate against national statistics for roads of similar classification. Where collision rates exceed the national average, these have been subject to more detailed consideration. Results of the road traffic collision analysis are summarised in **Table 11.6**.

Table 11.6: Summary of Collision Assessment for Public Roads within the Study Area

Route Section	No. of collisions in three-year period [Crash rate per billion vehicle miles]	RCGB Crash rate per billion vehicle miles (Comparison %)	Assessment
A713 (between Dalmellington and Carsphairn) [Road Length = 10 miles]	14 [870]	384 [227%]	<ul style="list-style-type: none">There were 14 recorded PICs during the three-year period ending in June 2018.HGVs were involved in 14% of the 14 collisions. Of the total 17 vehicles which were in some way involved in the 14 collisions, two involved an HGV; comprising 12% of the total vehicles involved in collisions. HGVs comprise 11.5% of the overall traffic composition locally and thus they are not over-represented in the overall collision statistics.Of the 14 collisions recorded, three resulted in serious injuries and one in fatal injuries.Of the two collisions where HGVs were involved, one resulted in fatal injuries and the other one resulted in serious injuries.No collisions involved pedestrians, cyclists or motorcyclists.
A713 (between Carsphairn and A762) [Road Length = 8.6 miles]	4 [342]	384 [89%]	<ul style="list-style-type: none">There were four recorded PICs during the three-year period ending in June 2018.No HGV was involved in any collision.Of the four collisions recorded, none resulted in serious or fatal severity injury.No collisions involved pedestrians or cyclists and one collision involved motorcyclists.
A713 (between A762 and A702) [Route Length = 0.8 miles]	0 [0]	384 [0%]	<ul style="list-style-type: none">No collisions were recorded during the three-year period ending in June 2018.
A713 (between A702 and A712) [Road Length = 2.5 miles]	1 [170]	384 [44%]	<ul style="list-style-type: none">There was one recorded PIC during the three-year period ending in June 2018.No HGVs were involved in the recorded collision.The recorded collision resulted in fatal injuries.No pedestrians, cyclists or motorcyclists were involved in the collision.
A713 (between A712 and B795) [Road Length =	3	384	<ul style="list-style-type: none">There were three recorded PICs during the three-year period ending in June 2018.Of the total three vehicles which were in some way

Route Section	No. of collisions in three-year period [Crash rate per billion vehicle miles]	RCGB Crash rate per billion vehicle miles (Comparison %)	Assessment
11 miles]	[139]	[36%]	<ul style="list-style-type: none">involved in the four collisions, there was one HGV involved.No collisions involved pedestrians or cyclists.Two collisions involved motorcyclists.
A713 (between B795 and A75) [Road Length = 1.5 miles]	4 [626]	384 [163%]	<ul style="list-style-type: none">There were four recorded PICs during the three-year period ending in June 2018.Of the total six vehicles which were in some way involved in the four collisions, there was one HGV involved.No collisions involved pedestrians, cyclists or motorcyclists.
A712 (between A713 and Corsock) [Road Length = 8.5 miles]	3 [320]	384 [83%]	<ul style="list-style-type: none">There were three recorded PICs within the route section during the three-year period ending in June 2018.No HGVs was involved in any collision.Of the three collisions recorded, one resulted in serious injuries.No collisions involved pedestrians or cyclists.One collision involved motorcyclist.
A712 (between Corsock and A75) [Road Length = 6 miles]	3 [1051]	384 [274%]	<ul style="list-style-type: none">There were three recorded PICs within the route section during the three-year period ending in June 2018.Of the total eight vehicles which were in some way involved in the three collisions, there was one HGV involved.No collisions involved pedestrians, cyclists or motorcyclists.
A762 (between A713 and U2s) [Route Length = 1.2 miles]	1 [2455]	384 [639%]	<ul style="list-style-type: none">There was one recorded PIC during the three-year period ending in June 2018.No HGVs were involved in the recorded collision.No pedestrians, cyclists or motorcyclists were involved in the collision.
U2s [Road Length = 0.6 miles]	0 [0]	599 [0%]	<ul style="list-style-type: none">No collisions were recorded during the three-year period ending in June 2018.

- 11.64 From the descriptions provided it appears that for both of the collisions resulting in a fatality that driver error played a notable part.
- 11.65 It can be reasonably concluded from the review of the collision history that although some sections of some routes exceed national average collision rates for roads in their respective categories, there are no **notable crash clusters (accident 'blackspots')** and there is no apparent safety problem relating to vulnerable road users.

The 'Do Nothing' Scenario

- 11.66 This section outlines traffic conditions anticipated within the study area in the absence of the proposed development.

Planned Changes to the Road Network

11.67 Routine periodic route maintenance is likely to occur at a variety of locations, however nothing notable is proposed in the study area at the time of writing and no planned changes to the road network were identified during consultation undertaken for the KTR Project.

Future Baseline Traffic Flow

11.68 This assessment has considered the effects of traffic generated during the main construction phase, which is scheduled to commence in August 2020 and be completed by July 2022.

11.69 In the absence of the proposed development, it has been assumed that traffic flows on the local road network would increase broadly in line with National Road Traffic Forecasts (NRTF). The level of increase within the local road network is assessed to be 'Low'. This equates to a 1.036% increase in background traffic between 2017 and 2020 and 1.024% between 2018 and 2020. Low growth was selected on the basis that the proposed development is situated in a sparsely populated area. High or medium levels of traffic growth would only be likely if there is to be a significant increase in population and car ownership in the area, which is not foreseen. Beyond 2022, it is assumed that road traffic will continue to increase in line with NRTF low forecasts. **Table 11.7** details forecast 2020 future baseline traffic flows.

Table 11.7: Future Baseline Traffic Count Data (2020)

Route Section	2020 AADT	
	Total Traffic Movements	HGV Traffic Movements
A713 (between Dalmellington and Carsphairn)	1,522	176
A713 (between Carsphairn and A762)	1,376	154
A713 (between A762 and A702)	1,350	113
A713 (between A702 and A712)	2,230	190
A713 (between A712 and B795)	1,846	181
A713 (between B795 and A75)	3,780	196
A712 (between A713 and Corsock)	965	71
A712 (between Corsock and A75)	750	74
A762 (between A713 and U2s)	348	24
U2s	199	12

Planned Local Developments

11.70 Committed developments⁵ were identified through consultation with D&GC and for the purpose of the cumulative assessment, the following development were considered:

- Knockman Hill Wind Farm;
- Mochrum Fell Wind Farm;
- Little Sypland Wind Turbine;
- Margree Wind Farm;
- Shepherds Rig Wind Farm; and
- Troston Loch Wind Farm.

11.71 Construction of the KTR Project is anticipated to begin in March 2022 and therefore has also been considered in the cumulative assessment.

Implications of Climate Change

11.72 Qualitatively, the UKCP18⁶ projects the following for Dumfries and Galloway:

- an increase in summer and winter temperatures;

- an increase in dry spells, particularly in summer months;
- an increase in winter rainfall; and
- an increase in wind speeds, including an increase in the frequency of winter storms.

11.73 These changes suggest that there may be an increase in travel disruptions due to increased flood risk and an increase in travel discomfort due to higher summer temperatures.

11.74 The assessment of the potential traffic and transport effects associated with the proposed development has focused on the key construction period starting in August 2020 and finishing in June 2022. The implications of climate change on the baseline conditions during that period and over the lifetime of the proposed development are unlikely to alter the predicted effects set out in this assessment.

Micrositing

11.75 The proposed development has been designed to avoid effects on access, traffic and transport as far as possible, but it is possible that further micrositing of temporary works may be necessary. The design of the substation extension is considered to be sufficiently progressed that micrositing of the permanent infrastructure is unlikely to be required. Any minor (non-material) changes would be within the site boundary, and would be agreed with D&GC. Micrositing of infrastructure would not affect the findings of the assessment.

Good Practice Measures

Construction Traffic Management Plan

11.76 The temporary effects of construction (whether assessed as significant or otherwise) will be mitigated through adoption of a regulated and approved CTMP. A Framework CTMP is provided as **Appendix 11.1**. SPEN will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with D&GC Roads Department(s), Ayrshire Roads Alliance, Transport Scotland and/or their Agent and the Police as appropriate. Vehicles associated with construction activity (with the exception of site personnel in cars and vans) will travel on pre-defined routes to and from the site to reduce effects on existing local traffic.

11.77 Timing and frequency of vehicle movements will be managed to ensure, wherever practical, that vehicle movements are spaced adequately to reduce disruption and coincide (if/where applicable) with existing/current local forestry operations.

11.78 The Framework CTMP has been developed in consultation with relevant Roads Authorities and will be further developed as necessary in consultation with the Police prior to commencement onsite. This document outlines measures to promote the efficient transportation of components and materials to site, whilst reducing congestion and disruption which might impact negatively on local communities or general traffic and in particular the emergency services. The CTMP should be considered a 'live' document that includes:

- a programme of delivery types/numbers by month;
- a statement of which public roads are to be used by construction traffic;
- a statement of which public roads are not to be used by construction traffic;
- a statement of which local towns and villages are to be avoided (completely or on stated days and times);
- details of all proposed mitigation measures, list of contacts, and details of measures that will be implemented to limit the potential of vehicle stacking on any part of the public road network;
- if appropriate, details of speed restrictions through sensitive areas and procedures to ensure pedestrian safety adjacent to worksites; and
- details of temporary signage to be installed at defined locations.

11.79 As far as reasonably practicable, deliveries will be scheduled outwith school opening and closing times.

⁵ Those developments which have permission, are under construction, or are the subject of an application for planning permission.

⁶ UK Climate Projections (2019) [online], available at: <http://www.metoffice.gov.uk/research/collaboration/ukcp>

- 11.80 In partnership with SPEN, the appointed contractors will be required to maintain close liaison with local community representatives, landowners and statutory consultees throughout the construction period. This is likely to include circulation of information about ongoing activities, particularly those that could potentially cause disturbance, including due to traffic. A telephone number will be provided and persons with appropriate authority to respond to calls and resolve any problems made available.
- 11.81 It will be mandated through the CTMP that HGV traffic:
- Shall not travel through New Galloway via the A762; this is to reduce the impact of construction traffic on New Galloway;
 - Must not travel through Moniaive via the A702; this is to reduce the impact of construction traffic on Moniaive; and
 - Shall not travel through central Dalmellington; this is to reduce impact of construction traffic on the Dalmellington historic centre.

Infrastructure Upgrades

- 11.82 In order to safely accommodate development construction traffic, it is proposed to locally widen strategic sections of the A762 (between the A713 and U2s) and the U2s to provide passing places; achieving a minimum width of 6.75m. Details and locations of proposed widening to accommodate passing places are included in the Framework CTMP (**Technical Appendix 11.1**).
- 11.83 As stated in **Section 11.56**, although there are several bridges and culverts on the existing road network, no evidence of signed weight restrictions was observed during field study nor identified during consultation. As such, no works to culverts and bridges are anticipated as part of the proposed development works and accordingly consultation and agreement with the Scottish Environment Protection Agency (SEPA) is not anticipated⁷.

Assessment of Effects

Overview

- 11.84 This section presents the detailed assessment of potential traffic and transport effects associated with the construction of the proposed development.
- Access Arrangements
- 11.85 Transportation, including deliveries to and from the site will be taken from the existing trunk and local road network. The local area road network included in the Study Area is shown on **Figure 11.1**.
- 11.86 SPEN has identified two separate accesses on the U2s to be used during the construction phase of the proposed development. The existing access at the Glenlee substation is expected to be maintained with an additional access proposed approximately 200m north of the power station. This second access will be used exclusively as access to the construction site compound.
- 11.87 HGV traffic travelling to the proposed development will all approach from the north from the A762.

Construction Programme and Associated Traffic Assessment

- 11.88 As stated in **Chapter 4: Project Description and Construction, Operation and Maintenance**, the overall key construction period duration for the proposed development is 23 months, although construction will likely continue for over 50 months in total. Sections of the A713, A712, A762, and U2s public roads will be used by construction vehicles. The assessed number of traffic movements generated by construction activity are summarised in **Table 11.8** (note: one trip = two movements; i.e. one delivery and one return journey).

Error! Reference source not found.: **Vehicle Movements Generated by Construction Activity for the Proposed Development**

Activity/Item Being Transported	Type of Vehicle	Total Vehicle Movements
Enabling Works	Lorry (20 tonne capacity)	420
Access Road Construction	Lorry (20 tonne capacity)	2,940
Earthworks	Lorry (20 tonne capacity)	4,500
Base Construction	Lorry (20 tonne capacity) and concrete ready-mix trucks with a 6m ³ capacity	1,460
Commissioning	Lorry (20 tonne capacity) and light vans	1,140
TOTAL HGV TRAFFIC MOVEMENTS (Sum of above)		10,460
TOTAL LGV TRAFFIC MOVEMENTS		23,000
TOTAL ALL TRAFFIC MOVEMENTS		33,460

Predicted Construction Effects

- 11.89 As indicated in **Table 11.8** , the total construction traffic generated by the proposed development is estimated at 33,460 movements; of which, 10,460 movements are expected to be HGV movements over the 23-month key construction period.
- 11.90 Estimated daily and monthly movements generated by the proposed development against the programme along with predicted percentages increases on relevant trunk and local roads are shown in **Table 11.9**.
- 11.91 Construction traffic is estimated at an average of 74 vehicle movements a day over the entire construction period, with a maximum of 94 vehicle movements occurring per day between April 2021 and August 2021 (this coincides with the start and end of the earthworks activity). The 'peak' period for the purpose of this assessment is therefore considered to be April 2021 to August 2021 inclusive. **Table 11.10** presents a summary of this information by route section.
- 11.92 The A712 currently operates within its respective capacities (see **Table 11.5**). The increase in traffic volume on this road throughout the construction phase of the proposed development is assessed to be less than 5% in terms of general traffic (HGV+LGV) and specifically HGV traffic. Since the 10% traffic increase threshold has not been exceeded on the A712 route sections, no detailed assessment has been undertaken.
- 11.93 For the purpose of the detailed assessment, it has been assumed that mitigation measures and operational procedures as proposed in the Framework CTMP (**Appendix 11.1**) will be in place during construction of the proposed development and therefore have been used to inform the judgement of significance of effects.

⁷ The exception to this is the culvert within the site boundary that is to be realigned as part of the proposed development. Further details on this are provided in **Chapter 7: Hydrology and Water Resources**.

Table 11.8: Outline Construction Programme and Associated Traffic Assessment for Glenlee Substation Extension

Programme	Aug-20	Sep-20	Oct-20	Nov-20	Dec-20	Jan-21	Feb-21	Mar-21	Apr-21	May-21	Jun-21	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Total
Enabling Works	1470	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1470
Access Road Construction	0	1470	1470	1470	1470	1470	1470	1470	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10290
Earthworks	0	0	0	0	0	0	0	0	1950	1950	1950	1950	1950	0	0	0	0	0	0	0	0	0	0	9750
Base Construction	0	0	0	0	0	0	0	0	0	0	0	0	0	1470	1470	1470	700	0	0	0	0	0	0	5110
Commissioning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1260	1260	1260	1260	1260	540	6840
Total no. Vehicle Movements (HGV + LGV)	1470	1470	1470	1470	1470	1470	1470	1470	1950	1950	1950	1950	1950	1470	1470	1470	700	1260	1260	1260	1260	1260	540	33460
Total no. Vehicle Movements / Day (HGV + LGV)	70	70	70	70	70	70	70	70	94	94	94	94	94	70	70	70	70	60	60	60	60	60	60	-
Total no. Vehicle Movements (HGV)	420	420	420	420	420	420	420	420	900	900	900	900	900	420	420	420	200	210	210	210	210	210	90	10460
Total no. Vehicle Movements / Day (HGV)	20	20	20	20	20	20	20	20	44	44	44	44	44	20	20	20	20	10	10	10	10	10	10	-
Total no. Vehicle Movements (LGV)	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	1050	500	1050	1050	1050	1050	1050	450	23000
Total no. Vehicle Movements / Day (LGV)	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	-
A713 (between Dalmellington and Carsphairn) % Increase in ALL TRAFFIC	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	-
A713 (between Dalmellington and Carsphairn) % Increase in HGV Traffic	6%	6%	6%	6%	6%	6%	6%	6%	12%	12%	12%	12%	12%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%	-
A713 (between Carsphairn and A762) % Increase in ALL TRAFFIC	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	-
A713 (between Carsphairn and A762) % Increase in HGV Traffic	6%	6%	6%	6%	6%	6%	6%	6%	14%	14%	14%	14%	14%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%	-
A713 North of Dalry (between A762 and A702) % Increase in ALL TRAFFIC	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	-
A713 North of Dalry (between A762 and A702) % Increase in HGV Traffic	9%	9%	9%	9%	9%	9%	9%	9%	19%	19%	19%	19%	19%	12%	12%	12%	12%	6%	6%	6%	6%	6%	6%	-
A713 South of Dalry (between A702 and A712) % Increase in ALL TRAFFIC	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%	-
A713 South of Dalry (between A702 and A712) % Increase in HGV Traffic	5%	5%	5%	5%	5%	5%	5%	5%	11%	11%	11%	11%	11%	7%	7%	7%	7%	4%	4%	4%	4%	4%	4%	-
A713 (between A712 and B795) % Increase in ALL TRAFFIC	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	-
A713 (between A712 and B795) % Increase in HGV Traffic	6%	6%	6%	6%	6%	6%	6%	6%	12%	12%	12%	12%	12%	4%	4%	4%	4%	2%	2%	2%	2%	2%	2%	-
A713 (between B795 and A75) % Increase in ALL TRAFFIC	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	1%	1%	1%	1%	1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	-
A713 (between B795 and A75) % Increase in HGV Traffic	5%	5%	5%	5%	5%	5%	5%	5%	11%	11%	11%	11%	11%	3%	3%	3%	3%	2%	2%	2%	2%	2%	2%	-
A712 (between A713 and Corsock) % Increase in ALL TRAFFIC	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	-
A712 (between A713 and Corsock) % Increase in HGV Traffic	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	9%	9%	9%	9%	5%	5%	5%	5%	5%	5%	-
A712 (between Corsock and A75) % Increase in ALL TRAFFIC	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	-
A712 (between Corsock and A75) % Increase in HGV Traffic	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	<1%	9%	9%	9%	9%	5%	5%	5%	5%	5%	5%	-
A762 (between A712 and U2s) % Increase in ALL TRAFFIC	20%	20%	20%	20%	20%	20%	20%	20%	27%	27%	27%	27%	27%	20%	20%	20%	20%	17%	17%	17%	17%	17%	17%	-
A762 (between A712 and U2s) % Increase in HGV Traffic	83%	83%	83%	83%	83%	83%	83%	83%	179%	179%	179%	179%	179%	83%	83%	83%	83%	42%	42%	42%	42%	42%	42%	-
U2s % Increase in ALL TRAFFIC	35%	35%	35%	35%	35%	35%	35%	35%	47%	47%	47%	47%	47%	35%	35%	35%	35%	30%	30%	30%	30%	30%	30%	-
U2s % Increase in HGV Traffic	167%	167%	167%	167%	167%	167%	167%	167%	357%	357%	357%	357%	357%	167%	167%	167%	167%	83%	83%	83%	83%	83%	83%	-

Table 11.9: Summary of Construction Traffic by Route Section

Route Section	Construction Traffic over the 23-Month Key Construction Period by Route Section			
	Average Vehicle Movements per day over key construction period [% Increase] {Significance}		Average Vehicle Movements per day during the period of peak construction activity [% Increase] {Significance}	
	HGV + LGV	HGV	HGV + LGV	HGV
A713 (between Dalmellington and Carsphairn) [AADT = 1,522]	36 [2%] { none, not significant }	10 [6%] { minor, not significant }	46 [3%] { none, not significant }	22 [12%] { moderate , significant }
A713 (between Carsphairn and A762) [AADT = 1,288]	36 [3%] { none, not significant }	10 [7%] { minor, not significant }	46 [3%] { none, not significant }	22 [14%] { moderate , significant }
A713 (between A762 and A702) [AADT = 1,350]	38 [3%] { none, not significant }	12 [11%] { moderate , significant }	46 [3%] { none, not significant }	22 [19%] { moderate , significant }
A713 (between A702 and A712) [AADT = 2,230]	38 [2%] { none, not significant }	12 [6%] { minor, not significant }	46 [2%] { none, not significant }	22 [11%] { moderate , significant }
A713 (between A712 and B795) [AADT = 1,846]	36 [2%] { none, not significant }	10 [6%] { minor, not significant }	46 [3%] { none, not significant }	22 [12%] { moderate , significant }
A713 (between B795 and A75) [AADT = 3,780]	36 [1%] { none, not significant }	10 [5%] { none, not significant }	46 [1%] { none, not significant }	22 [11%] { moderate , significant }
A712 (between A713 and Corsock) [AADT = 965]	2 [<1%] { none, not significant }	2 [3%] { none, not significant }	2 [<1%] { none, not significant }	2 [<1%] { none, not significant }
A712 (between Corsock and A75) [AADT = 750]	2 [<1%] { none, not significant }	2 [3%] { none, not significant }	2 [<1%] { none, not significant }	2 [<1%] { none, not significant }
A762 (between A713 and U2s) [AADT = 326]	74 [21%] { moderate , significant }	22 [93%] { major , significant }	94 [27%] { moderate , significant }	44 [183%] { major , significant }
U2s [AADT = 190]	74 [36%] { moderate , significant }	22 [186%] { major , significant }	94 [47%] { moderate , significant }	44 [367%] { major , significant }

Driver Delay

11.94 All public route sections where the 10% threshold significance criterion has been exceeded operate notably below their theoretical capacity, and also carry low HGV flows. **Table 11.11** provides a comparison of forecast traffic flows on roads during the Peak Period and associated theoretical road capacities.

Table 11.10: Baseline Traffic + Traffic Generated by the Proposed Development

Route Section	Two-way peak hour movements (2020 Baseline Traffic + Traffic Generated by Glenlee Substation Extension) Total Traffic Movements	Capacity vph (two-way hourly flow)
A713 (between Dalmellington and Carsphairn)	204	1,800
A713 (between Carsphairn and A762)	204	1,800
A713 (between A762 and A702)	204	1,600
A713 (between A702 and A712)	204	1,600
A713 (between A712 and B795)	204	1,800
A713 (between B795 and A75)	204	1,800
A762 (between A713 and U2s)	58	280
U2s	58	Not Specified

- 11.95 From a review of **Table 11.10**, it is evident that the threshold for significance criteria has been exceeded **on the A713, A762 and U2s either throughout the whole project duration or during the ‘peak period’ of construction activity.**
- 11.96 The A713 has the residual capacity to readily accommodate the expected additional traffic flow. On this basis, the significance of effect of driver delay for users of the A713 is considered to be **minor** and accordingly not considered to be significant in the context of the EIA Regulations.
- 11.97 As indicated in the Good Practice Measures section, the CTMP will promote interventions that will ensure the safe and efficient transportation of materials to site to reduce the likelihood of driver delay. Furthermore, it is proposed to locally widen strategic sections of the A762 (between the A713 and U2s) and the U2s to provide passing places; achieving a minimum width of 6.75m as part of the design of the proposed development. These passing places are assumed to be in place in advance of the expected additional traffic flow. On this basis, the significance of effect of driver delay for users of the A762 and U2s is considered to be **minor** and accordingly not considered to be significant in the context of the EIA Regulations.

Road Safety

- 11.98 The NESa Manual suggests that where traffic flow doubles, it can be expected that road traffic collisions will double (i.e. the increase in collisions is likely to be roughly proportional to the increase in traffic). Accordingly therefore, if the number of collisions were to increase proportionally with the increase in traffic volume, then the impact of the construction traffic on road safety per route section can be forecast. The results of this analysis are summarised in **Table 11.12**.

Table 11.11: Projected Collisions

Route Section	Average No. of collisions (2020 Average Baseline)	Average No. of collisions (2020 Average Baseline + Traffic Generated by Glenlee Substation Extension)
A713 (between Dalmellington and Carsphairn)	4.7	4.8

Route Section	Average No. of collisions (2020 Average Baseline)	Average No. of collisions (2020 Average Baseline + Traffic Generated by Glenlee Substation Extension)
A713 (between Carsphairn and A762)	1.3	1.4
A713 (between A762 and A702)	0	0
A713 (between A702 and A712)	0.3	0.3
A713 (between A712 and B795)	1	1
A713 (between B795 and A75)	1.3	1.4
A762 (between A713 and U2s)	0.3	0.37
U2s	0	0

- 11.99 Using this basis of assessment, there would be a negligible (not significant) increase in PICs in the route sections within the Study Area as a consequence of the increased traffic generated by the proposed development and the significance of the effect would be **none**.

Community Impacts (severance, pedestrian amenity / fear and intimidation, and pedestrian delay)

- 11.100 The IEMA Guidelines define severance as *“the perceived division that can occur within a community when it becomes separated by a major traffic artery”*. Severance may result from a road carrying large traffic flows or a physical barrier created by the road itself, and the IEMA guidelines suggest that consideration is given to the severity of existing severance and how this might be exacerbated by proposed construction traffic generated by a development. As shown in **Table 11.11**, the roads within the Study Area will continue to operate below capacity, even with the addition of traffic generated during the construction phase. Severance should not occur when there is such a high degree of spare road capacity and traffic generated by the proposed development in the study area will be relatively low.
- 11.101 For similar reasoning, pedestrian delay is not considered to be an existing problem on any of the route sections within the Study Area, nor one that shall be created by the addition of proposed construction traffic to these routes.
- 11.102 **Pedestrian amenity is broadly defined by the IEMA as the ‘relative pleasantness of a journey’, and this definition also considers ‘fear and intimidation’. The IEMA Guidelines suggest that “a tentative threshold for judging the significance of changes in pedestrian amenity would be where traffic flows (or its lorry component) is halved or doubled”**. The construction of the proposed development is predicted to generate less than double HGV flows on all route sections within the Study Area with the exception of the U2s **during the ‘peak period’ of construction activity**. As such, pedestrian amenity across the wider Study Area is not considered to be adversely affected.
- 11.103 Although HGV flows are not expected to double on the A762, the increase is still predicted to be **considerable during the ‘peak period’ of construction activity**. The stretch of the A762 between the A713 and U2s overlaps with Core Path 504 (the Southern Upland Way) and Core Path 30 and also the National Byway cycling Route. As such, the CTMP will include a commitment to provide signage to warn drivers to the presence of public paths and cycling routes and appropriate signage advising of dates and hours of working will be installed on **the ‘core path network’** in advance of road crossing points to warn users of construction traffic. On this basis, the significance of the effect on pedestrian amenity, specifically on the amenity of users of the Southern Upland Way, Core Path 30 and the National Byway cycling Route is considered to be **minor** and accordingly not considered to be significant.
- 11.104 **Construction routes traverse St John’s Town of Dalry, where pedestrian activity can be notable**, especially at the beginning and end of the school day. There is already pedestrian infrastructure provision in place, including footways and traffic management features. Based on professional judgement the existing provision is considered adequate to accommodate any potential pedestrian effects as a result of Development generated construction traffic.
- 11.105 Overall, based on professional judgement, the construction traffic generated by the proposed development is assessed to have a **minor** and therefore not significant effect upon community impacts.
- Proposed Mitigation*
- 11.106 No further mitigation is proposed in addition to the pre-mitigation measures and operational procedures as proposed in the framework CTMP.

Residual Construction Effects

11.107 Overall, due to the implementation of both the preventative maintenance infrastructure improvements to the A762 (between the A713 and the U2s) and the U2s, in conjunction with the mitigation measures and operational procedures as proposed in the Framework CTMP, the significance of the residual effects associated with the levels of traffic anticipated during the construction of the proposed development is considered to be **minor** and accordingly not considered to be significant.

Assessment of Cumulative Effects

11.108 An assessment of the likely construction effects of the Glenlee substation extension and other committed developments has been undertaken to take account of the likely interrelation of overlapping construction programmes and the resultant cumulative effect upon the local road network.

11.109 The overall approach for the cumulative assessments, including a list of developments considered, is outlined in **Chapter 2: Approach to the EIA**. In accordance with the assessment of effects methodology, this section considers ‘**Total Cumulative Construction Effects**’ followed by the ‘**Contribution** of the proposed development to the Total Cumulative Effects’.

11.110 The following developments have been included alongside the Glenlee substation extension for the cumulative traffic and transport assessment⁸:

- Knockman Hill Wind Farm (reference: Proposed Wind Turbine Project at Knockman Hill, Milnmark Farm Dumfries and Galloway Environmental Statement (ES) 2009);
- Mochrum Fell Wind Farm (reference: Mochrum Fell Wind Farm ES, 2009);
- Margree Wind Farm (reference: Margree Wind Farm ES 2006);
- Shepherds Rig Wind Farm (Shepherds Rig Wind Farm ES, 2018); and
- Troston Loch Wind Farm (Troston Loch Wind Farm EIA Report, 2019).

11.111 In addition to the above wind farms, construction of the proposed development will overlap with the construction phase of the KTR Project between March 2022 and June 2022 inclusive.

KTR Access Arrangements

11.112 For the purpose of the assessment, it has been assumed that:

- Construction traffic associated with the KTR Project will do so from the south via the A713 (50%) and the north via the A713 (50%).

Wind Farm Access Arrangements

11.113 The following assumptions have been made to inform the assessment, informed by the relevant supporting ESs/EIA Reports for the schemes:

- Construction traffic accessing the proposed Knockman Hill Wind Farm will do so from the north via the A713.
- Construction traffic accessing the proposed Mochrum Fell Wind Farm site will predominantly do so from the south via the A713 (75%) although a proportion would come from the north via the A713 (25%).
- All construction traffic accessing the proposed Magree Wind Farm site will do so from the north via the A713.
- All construction traffic accessing the proposed Shepherds Rig Wind Farm site will do so from the north via the A713.
- All construction traffic accessing the proposed Troston Loch Wind Farm site will do so from the north via the A713.

⁸ All of the schemes are shown on Figure 2.1 with the exception of Mochrum Fell Wind Farm (consented) and Shepherds Rig Wind Farm (application submitted) which are approximately 12km south-east and 12km north of the proposed development respectively. Both would use some of the same access roads as the proposed development and so have been included in the assessment of cumulative effects.

Total Cumulative Construction Effects

11.114 This section assesses the maximum development case assuming that all the developments being considered as part of the cumulative assessment will proceed to construction and that the cumulative effects are the total likely effects created by the construction of the proposed development in combination with the other wind farms and the KTR Project.

11.115 It is uncertain if and when the construction phases of the wind farms and the proposed development might overlap. To robustly assess cumulative traffic generation, cumulative assessment has been undertaken on the basis of summing the average traffic generation of the respective wind farms and the proposed development peak traffic generation, however it is considered unlikely that peak traffic generation at all developments will align.

11.116 **Table 11.13** presents a summary of predicted traffic volume increases for:

- the total cumulative of the wind farms and the proposed development during the ‘**peak**’ period of construction activity (April 2021 to August 2021 inclusive) and the proportional increase traffic as a result; and
- the total cumulative of the KTR Project and the proposed development during the overlap period (March 2022 to June 2022 inclusive) and the proportional increase traffic as a result.

Table 11.12: Summary of Predicted Traffic Volume Increase – Total Likely Cumulative Impact

Route Section	Average Vehicle Movements per day during the period of peak construction activity		Average Vehicle Movements per day during the overlap construction period	
	Glenlee Substation Extension + Committed Developments		Glenlee Substation Extension + KTR Project	
	[% Increase] {Significance}		[% Increase] {Significance}	
	Total Traffic Movements	HGV Traffic Movements	Total Traffic Movements	HGV Traffic Movements
A713 (between Dalmellington and Carsphairn) [AADT = 1,522]	116 [8%] { minor, not significant}	50 [28%] { moderate , significant}	132 [9%] { minor, significant}	94 [53%] { moderate , significant}
A713 (between Carsphairn and A762) [AADT = 1,376]	114 [8%] { minor, not significant}	56 [36%] { moderate , significant}	154 [11%] { moderate , significant}	98 [64%] { major , significant}
A713 (between A762 and A702) [AADT = 1,350]	114 [8%] { minor, not significant}	56 [50%] { moderate , significant}	80 [6%] { minor, not significant}	46 [41%] { moderate , significant}
A713 (between A702 and A712) [AADT = 2,230]	72 [3%] { none, not significant}	32 [17%] { moderate , significant}	80 [4%] { none, not significant}	46 [24%] { moderate , significant}
A713 (between A712 and B795) [AADT = 1,846]	120 [7%] { minor, not significant}	50 [28%] { moderate , significant}	46 [2%] { none, not significant}	30 [17%] { moderate , significant}
A713 (between B795 and A75) [AADT = 3,780]	120 [3%] { none, not significant}	50 [26%] { moderate , significant}	50 [1%] { none, not significant}	32 [16%] { moderate , significant}

Route Section	Average Vehicle Movements per day during the period of peak construction activity		Average Vehicle Movements per day during the overlap construction period	
	Glenlee Substation Extension + Committed Developments		Glenlee Substation Extension + KTR Project	
	[% Increase]		[% Increase]	
	{Significance}		{Significance}	
A712 (between A713 and Corsock) [AADT = 965]	2 [<1%] { none, not significant}	2 [<1%] { none, not significant}	16 [2%] { none, not significant}	4 [5%] { minor, not significant}
A712 (between Corsock and A75) [AADT = 750]	2 [<1%] { none, not significant}	2 [<1%] { none, not significant}	16 [2%] { none, not significant}	4 [5%] { minor, not significant}
A762 (between A713 and U2s) [AADT = 348]	94 [27%] { moderate , significant}	44 [183%] { major , significant}	102 [29%] { moderate , significant}	78 [325%] { major , significant}
U2s [AADT = 199]	94 [47%] { moderate , significant}	44 [367%] { major , significant}	68 [34%] { moderate , significant}	52 [433%] { major , significant}

Predicted Cumulative Effects during Construction

Driver Delay

- 11.117 From review of **Table 11.13**, it is evident that the threshold for significance criteria has been exceeded on the A713, A762 and U2s both during the ‘peak period’ of construction activity and during the overlap with the KTR Project construction phase.
- 11.118 The A713 has the residual capacity (see **Table 11.11**) to readily accommodate the expected additional traffic flow. Furthermore, the CTMP will promote interventions that will ensure the safe and efficient transportation of materials to site to reduce the likelihood of driver delay. On this basis, the significance of effect of driver delay for users of the A713 is considered to be **minor** and accordingly considered to be not significant in the context of the EIA Regulations.
- 11.119 As indicated in the Good Practice Measures section, the CTMP will promote interventions that will ensure the safe and efficient transportation of materials to site to reduce the likelihood of driver delay. Furthermore, to safely accommodate construction traffic for the Glenlee Substation Extension it is proposed to locally widen strategic sections of the A762 (between the A713 and U2s) and the U2s to provide passing places; achieving a minimum width of 6.75m. On this basis, the significance of effect of driver delay for users of the A762 and U2s is considered to be **minor** and accordingly not considered to be significant in the context of the EIA Regulations.

Road Safety

- 11.120 The NESa Manual suggests that where traffic flow doubles, it can be expected that road traffic collisions will double (i.e. the increase in collisions is likely to be roughly proportional to the increase in traffic). Accordingly therefore, if the number of collisions were to increase proportionally with the increase in traffic volume, then the impact of the construction traffic on road safety per route section can be forecast. The results of this analysis are summarised in **Table11.14**.

Table 11.13: Projected Collisions – Total Likely Cumulative Impact

Route Section	Average No. of collisions	
	(2020 Average Baseline)	(2020 Average Baseline + Traffic Generated by Glenlee Substation Extension +Committed Developments)
A713 (between Dalmellington and Carsphairn)	4.7	4.9
A713 (between Carsphairn and A762)	1.3	1.4
A713 (between A762 and A702)	0	0
A713 (between A702 and A712)	0.3	0.3
A713 (between A712 and B795)	1	1.03
A713 (between B795 and A75)	1.3	1.4
A762 (between A713 and U2s)	0.3	0.37
U2s	0	0

- 11.121 Using this basis of assessment, there would be a small increase (less than 1 collision) in PICs for the A713 (between Dalmellington and the A762) and for the A762 as a consequence of the increased traffic cumulatively generated. Professional judgment suggests that the peak cumulative traffic, which would be temporary (five months duration), would result in a **minor** effect (not significant) upon road safety if unmitigated.
- 11.122 On the other route sections within the Study Area, there would be a negligible (not significant) increase in PICs as a consequence of the increased traffic cumulatively generated by the developments and the significance of the effect would be **none**.
- Community Impacts (severance, pedestrian amenity / fear and intimidation, and pedestrian delay)*
- 11.123 In the Total Cumulative scenario, all roads within the Study Area will continue to operate well within their theoretical capacity. Increased severance should not occur when there is such residual capacity.
- 11.124 For similar reasoning to severance, pedestrian delay is not considered to be an existing problem on any of the route section within the Study Area, nor one that shall be created by the cumulative addition of traffic to these routes.
- 11.125 The construction of the developments is predicted to generate less than double HGV flows on all route sections within the Study Area with the exception of the A762 and U2s during the ‘peak period’ of construction activity. As such, pedestrian amenity across the wider Study Area is not considered to be adversely affected.
- 11.126 With regards to the A762 and U2s (i.e. the two final sections of the construction route), HGV traffic is predicted to increase considerably. The stretch of the A762 between the A713 and U2s overlaps with Core Path 504 (the Southern Upland Way) and Core Path 30 and also the National Byway cycling Route. The CTMP for the Glenlee substation extension will include a commitment to provide signage to warn drivers to the presence of public paths and cycling routes and appropriate signage advising of dates and hours of working will be installed on the ‘core path network’ in advance of road crossing points to warn users of construction traffic. On this basis, the significance of the effect on pedestrian amenity, specifically on the amenity of users of the Southern Upland Way, Core Path 30 and the National Byway cycling Route is considered to be **minor** and accordingly not considered to be significant.
- 11.127 Construction routes traverse St John’s Town of Dalry, where pedestrian activity can be notable, especially at the beginning and end of the school day. There is already pedestrian infrastructure provision in place, including footways and traffic management features. Based on professional

judgement, the existing provision is considered adequate to accommodate any potential pedestrian effects as a result of construction traffic generated by the developments.

11.128 Overall, based on professional judgement the construction traffic generated by the developments is assessed to have a **minor** and therefore not significant effect upon community impacts.

Proposed Mitigation

11.129 If another development, such as the wind farms considered in the cumulative assessment appears likely to undergo construction at the same time as the proposed Development, SPEN will liaise with the other developer regarding the scheduling of deliveries and potential means of reducing the impact of combined construction.

Residual Cumulative Effects during Construction

11.130 The CTMP will promote interventions that will assist the safe and efficient transportation of components and materials to site in order to reduce the likelihood of driver delay and adverse impacts upon the communities identified within the study area. The Police and relevant roads authorities will be consulted on the CTMP. Therefore, assuming correct implementation of the CTMP, the residual effects associated with the levels of traffic anticipated during the construction of the proposed development are considered to be minor and therefore not significant.

Contribution of the Proposed Development to Total Cumulative Effects

11.131 Since no residual significant effects were identified for the Total Cumulative Scenario, the subsequent assessment of the contribution of the proposed development to cumulative effects has not been undertaken.

Interrelationship between Effects

- 11.132 The additional traffic assessed to be generated on public roads throughout the Study Area during the construction phase may trigger environmental effects associated with related study disciplines.
- 11.133 These include, but are not limited to, the following:
- effects associated with socio-economic, tourism and recreation; and
 - effects associated with noise and dust.
- 11.134 Effects outlined above related to traffic and transport associated with the proposed Development have been assessed by individual study disciplines to gain a full understanding of the inter-relationship of effects and documented accordingly in **Chapter 2: Approach to the EIA**, **Chapter 4: Development Description and Construction, Operation and Maintenance** and **Chapter 10: Construction Noise**.

Further Survey Requirements and Monitoring

11.135 The requirement for construction monitoring will be agreed with SPEN, Roads Authority representatives and other relevant stakeholders prior to commencement of works.

Summary of Effects

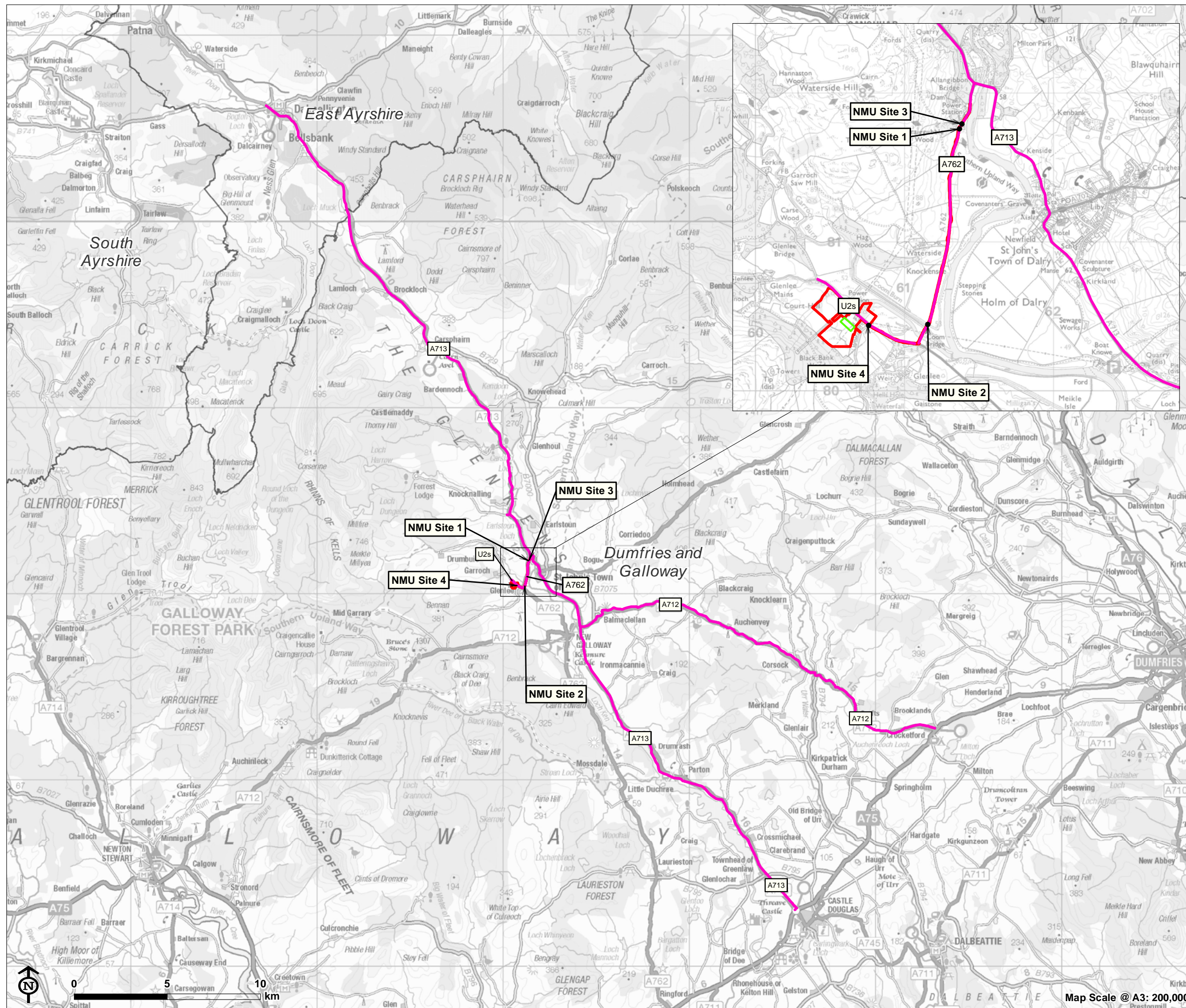
11.136 A summary of effects before and after proposed mitigation measures for the Development Study Area is provided in **Table 11.15**.

Table 11.14: Summary of Effects

Predicted Effect	Significance	Mitigation	Significance of Residual Effect
Construction Effects			
Driver Delay	Minor	No further mitigation is	Minor

Predicted Effect	Significance	Mitigation	Significance of Residual Effect
Road Safety	Minor	proposed in addition to the pre-mitigation measures and operational procedures as proposed as good practice in the framework CTMP.	Minor
Community Impacts	Minor		Minor
Cumulative Effects			
Driver Delay	Minor	If the construction phase of notably sized developments, e.g. wind farms (as considered in the cumulative assessment) appear likely to overlap with that of the proposed development, SPEN will liaise with the appropriate developer organisation regarding the scheduling of deliveries and potential means of reducing the impact of combined construction.	Minor
Road Safety	Minor		Minor
Community Impacts	Minor		Minor

11.137 Based on the assessment summary in **Table 11.14**, the additional traffic predicted to be generated on public roads throughout the Study Area during the construction phase is anticipated to result in minor effects which are therefore not considered to be significant.



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**Figure 11.1: Proposed Construction
Access Routes**

- Planning application boundary
- Substation extension
- Proposed construction access routes**
- Route sections within the study area

