

15 Interactions and Cumulative Effects

15.1 Introduction

15.1.1 The Environmental Impact Assessment regulations require the assessment of cumulative effects. This chapter considers interactions and cumulative effects in accordance with DMRB, Volume 11, Section 2, Part 5: Assessment and Management of Environmental Effects and Interim Advice Note 125/15 Supplementary guidance for users of DMRB Volume 11 'Environmental Assessment' (Ref 15.1).

15.1.2 Although the DMRB guidance was updated in July 2019, with Section 2, Part 5 being withdrawn and superseded by Volume 11, Part 4 LA104 Environmental assessment and monitoring, it was considered that the scheme had reached a point where the implementation of the new guidance was not feasible. The introduction of the DMRB GG101 Section 1.3 states:

Individual documents shall be implemented as soon as they are published in the DMRB except: 2. where the contract has reached a stage that, in the opinion of the Overseeing Organisation, use of a new or revised document would result in significant additional expense or delay...

15.1.3 In addition, section 1.4 states:

1.4. Where the contract has reached a stage that, in the opinion of the Overseeing Organisation, use of a new or revised document would result in significant additional expense or delay, the decision whether to use a new or revised document shall be recorded in accordance with the Overseeing Organisation's procedure.

15.1.4 In agreement with TS, it was determined that the old DMRB guidance was appropriate, given the progression of the scheme.

15.1.5 Cumulative effects comprise the combined effects of reasonably foreseeable human induced changes within a specific geographical area on receptors over a certain period of time and can be both direct and indirect. Assessment of the significance of cumulative effects needs to be undertaken in the context of the characteristics of the existing environment. Cumulative effects are:

- o cumulative effects from a single project (e.g. numerous different impacts affecting a single receptor), intra-project cumulative effects; and
- o cumulative effects from different projects (in combination with the project being assessed), which individually might be insignificant but when considered together could amount to a significant cumulative effect. These are classed as inter-project effects.

15.2 Methodology

- 15.2.1 DMRB suggests that cumulative effects on factors of moderate significance may influence decision making if they lead to an increase in the overall adverse effect on a particular resource or receptor. The significance of cumulative effects is determined based on Table 15-1, from DMRB Volume 11, Section 2, Part 5.

Table 15-1: Determining significance of cumulative effects

Significance	Effect
Severe	Effects that the decision maker must take into account as the receptor/resource is irretrievably compromised.
Major	Effects that may become a key decision-making issue.
Moderate	Effects that are unlikely to become issues on whether the project design should be selected, but where future work may be needed to improve on current performance.
Minor	Effects that are locally significant.
Not significant	Effects that are beyond the current forecasting ability or are within the ability of the receptor/resource to absorb such change.

Intra-project effects

- 15.2.2 The potential cumulative effects of the scheme have been determined by identifying any individual receptors, or categories of receptors that are affected by multiple impacts under more than one specialist topic.
- 15.2.3 The study area for intra-project cumulative effects is defined by the study areas for the specialist topics with the potential for interactions. For interactions, the smaller of the study areas was used, where relevant, as interactive effects would not occur beyond this.
- 15.2.4 There is potential for an individual receptor or group of receptors to be affected by adverse impacts under one or more topics, and beneficial impacts under others. In such cases, it is necessary to determine the balance between them. Professional judgement was used to determine if the beneficial impacts would outweigh the adverse impacts to determine an overall significance for a cumulative effect.

Inter-project cumulative effects

- 15.2.5 In order to identify inter-project effects, a review was undertaken to identify other relevant projects using the following selection criteria:
- approved or pending decision planning applications within 2km of the scheme.
 - approved planning applications between 1 January 2019 and 10 November 2019.
 - trunk road and motorway projects which have been confirmed (i.e. gone through the statutory processes).

- approved planning applications prior to 2019 that are related to the Opportunity Areas as identified within the Aberdeenshire Local Development Plan 2017.
- 15.2.6 These criteria were considered to be sufficient to identify any relevant applications that would have potential for cumulative effects with the junction improvement scheme.
- 15.2.7 Only those projects which have sufficient environmental data and assessments readily available were included in the cumulative assessment. If such information was not available, no consideration of cumulative effects would be possible with that particular development.
- 15.2.8 Those projects about which there can be a high degree of certainty that they will be implemented were included. Site allocations in the Local Development Plan that have not been progressed or for which there is no information, were not included on the basis that there is uncertainty around the nature and timeframes for development.
- 15.2.9 Consultation with Transport Scotland indicated that there are no trunk road or motorway processes within the study area that meet the criteria for cumulative assessment.
- 15.2.10 A search of the Aberdeenshire Council planning online (Ref 15.2) found planning applications that have been approved in the timescale as set out in 15.2.5 (Table 15.3) and approved planning applications that have the potential to impact the receptors in combination with the A90.
- 15.2.11 Those projects which have been included within the traffic modelling are not assessed again for air quality and noise as their traffic consequences are already accounted for in the future year Do-Minimum scenario of each assessment. The applications identified were cross checked against those in the traffic model to avoid double counting. The proposed developments identified in the inter-project section were included in the traffic model and therefore air quality and noise effects are inherently cumulative. Information was gained from the traffic modelling team to confirm which housing developments were included within the traffic model and these are shown in Table 15-2

Table 15-2: Summary of significant housing developments included in traffic model

Location	Number of houses in future years		
	2022	2032	2037
Laurencekirk, Conveth Mains	120	375	375
Laurencekirk, Blackimuir Avenue	130	210	226
Edzell Woods (former Edzell Airfield)	75	300	300
Chapelton of Elsick	971	2292	2292

15.2.12 The housing developments at Chapelton and Edzell Woods fall outside the 2km study area boundary of Laurencekirk and so are not considered in the cumulative assessment with the A90 Laurencekirk scheme.

15.2.13 Having identified relevant projects, the next step was to identify potential significant effects. These were identified on the following basis:

- Does the development or project present the potential for a source of impact that would affect an environmental receptor also affected by the scheme, e.g. a particularly visible structure or process that creates significant emissions or noise.
- Is there a potential pathway between the source and a receptor or group of receptors, e.g. line of sight to a viewpoint, distance for noise source or flow pathway for a contaminated discharge?

15.2.14 This 'source-pathway-receptor' model is used to identify cumulative effects.

15.2.15 Any identified cumulative effects are further defined as construction or operational effects, short- or long-term effects and beneficial or adverse. The significance of effects is then determined based on the criteria within Table 15-1.

15.3 Intra-project cumulative effects

15.3.1 In assessing the potential for intra-project cumulative effects, each topic has been reviewed in terms of the sensitive receptors it identifies and the likely effects. Effects reviewed are residual effects from each topic assessment, following the implementation of mitigation. Those topics with receptors in common and where individual impacts would be likely to result in cumulative effects on a receptor or group of receptors were considered in the assessment.

Construction

15.3.2 The effects included in the assessment are outlined below:

- visual, noise and dust effects from machinery and plant during the construction phase on adjacent receptors;
- changes in water quality and temporary habitat loss from construction compounds, culvert installation or pollution affecting wildlife.

15.3.3 Impacts on local residents from visual intrusion from machinery, increased noise due to construction and nuisance from dust, will be short term and temporary. The residential receptors affected will be those along Gardenston Street which will experience moderate adverse effects from visual intrusion. Combined with impacts from increased noise and dust nuisance, effects are considered to be minor adverse overall. Although the application of best practice measures

and implementation of the mitigation detailed within the CEMP will minimise noise and dust effects, and with mitigation planting along the junction, it is considered that the cumulative effects on residents will remain minor adverse, although temporary.

- 15.3.4 Construction impacts on water quality and aquatic wildlife such as sedimentation and pollution in Gaugers Burn will be managed through the application of the measures in the CEMP. With the application of the CEMP, impacts on water quality and aquatic wildlife are considered to be minor adverse, although short term and temporary. The removal of vegetation along a small section of the bank to facilitate the culvert construction has potential to result in sedimentation affecting the water quality, however pollution control measures will be adhered to, resulting in a minor adverse impact. Overall, the effect on Gaugers Burn is not considered to be significant.

Operation

- 15.3.5 The effects included within the assessment are outlined below:
- visual and noise effects on residential receptors; and
 - loss of agricultural land.
- 15.3.6 The properties within the study area, in particular Mains of Newton and those at Gardenston Street, will experience cumulative effects when the road is in operation, from increased noise and visual intrusion from the elevated grade separated roundabout, SuDS ponds and embankments. Operational noise impacts at these properties are minor adverse in the short term, reducing to negligible adverse in the long term. Visual effects will be mitigated through sensitive landscape design to provide screening to reduce the visual impact of the road, however it is considered that effects will remain moderate adverse. Overall it is assessed that the cumulative effects on these properties are locally significant and therefore of minor significance as defined in Table 15-1.
- 15.3.7 There will be additional cumulative effects on Mains of Newton as the majority of the farmland required for the scheme belongs to this property. As well as noise and visual impacts defined above, the productivity of the holding will be reduced through the loss of good quality agricultural land which is assessed to be of moderate significance. The combined effect from reduced amenity from noise (minor short term, negligible long term), loss of land (moderate) and visual intrusion (moderate) from the junction on the property is considered to be of moderate significance.

15.4 Inter-project cumulative effects

- 15.4.1 There are a number of small-scale approved planning developments in and around Laurencekirk which are detailed in Table 15-3.

Table 15-3: Planning applications approved since 1st January 2019

Reference	Address	Description	Date Approved
APP/2019/0916	236 High Street, Laurencekirk	Installation of roof light	18th June 2019
APP/2016/0483	Bunillidh Gardenston Street, Laurencekirk	Alterations and Extension to dwelling house (Renewal of Previously Approved APP/2016/0483)	10th April 2019
APP/2018/3015	2 Cairnview Place, Laurencekirk	Alterations and Extension to Existing Shed	30th January 2019
APP/2018/2798	111 High Street, Laurencekirk	Change of Use and Conversion and Alterations of Hair Salon to Domestic Use	22nd January 2019
APP/2018/1743	135 High Street, Laurencekirk	Change of Use of commercial to dwelling house (Class 9) including Alterations and Extension	28th March 2019
APP/2019/1872	24 Kirkburn, Laurencekirk	Alterations and extension to dwelling house	19th September 2019

15.4.2 Due to size and/or location of these planning applications, no significant cumulative effects are considered likely on surrounding receptors, either during construction or operation. Therefore, they have been scoped out of any further assessment.

15.4.3 A number of larger developments have been approved within the surrounding area and have not yet been constructed or construction is on-going. These projects are described further in the subsequent paragraphs and, therefore are included in the assessment. The location of these developments is shown in Figure 15.1.

In-combination effects with housing development at Blackiemuir Avenue

15.4.4 APP/2008/1644 – planning application for a residential development 210 houses on a site to the south of Blackiemuir Avenue, Laurencekirk. Planning permission for the full development site was approved in 2012. This site has subsequently changed hands and a different developer is taking it forward in a series of phased developments. Phase 1 is now complete, with phases 2, 3 and 4 to be completed. There is potential for some of these of these construction works to coincide with the junction works, although there is no freely available information on timescale of the proposed works.

15.4.5 A number of subsequent planning applications relating to APP/2008/1644 have been granted recent planning permission. These relate to a change in the originally proposed housing types and/or relate to different phases of the development. These are described more fully in Table 15.4.

Table 15-4: Recent applications relating to development at Blackiemuir Avenue

Application reference	Description	Date of approval
APP/2018/3108	Site to south of Blackiemuir Avenue, Laurencekirk. Erection of 27 dwelling houses and 8 flats (change of house types) to (Phase 2 Affordable) of Planning Permission APP/2008/1644 for Residential development (210 dwelling houses).	April 2019
APP/2017/0774	Site of the south of Blackiemuir Avenue, Laurencekirk. Erection of 6 dwelling houses (amendment to previously approved APP/2008/1644)	Jun 2017
APP/2015/2960	Phase 4B site to south of Blackiemuir Avenue, Laurencekirk. Erection of 10 dwelling house (change of house type) of previously approved APP/2008/1644	Feb 2016
APP/2015/2958	Site of the south of Blackiemuir Avenue. Erection of 34 dwelling houses (phase 4A) (Change of house types to planning permission ref APP/2008/1644)	Feb 2016
APP/2015/2917	Site of the south of Blackiemuir Avenue. Erection of 36 dwelling houses (Phase 3) (Change of house type to planning permission ref APP/2008/1644)	Feb 2016
APP/2015/2787	Site of the south of Blackiemuir Avenue. Erection of 14 dwelling houses and 4 flats (affordable units – phase 3) Change of house types to planning permission ref APP/2008/1644	Feb 2016
APP/2015/2599	Phase 2A Land adjacent to Blackiemuir Avenue. Erection of 26 dwelling houses (change of house types of previously approved APP/2008/1644)	March 2016
APP/2015/2596	Phase 2B land adjacent to Blackiemuir Avenue. Erection of 14 dwelling houses (change of house types of previously approved APP/2008/1644)	Feb 2016
APP/2015/1547	Phase 1 land adjacent to Blackiemuir Avenue. Erection of 40 dwelling houses (change of house types of previously approved APP/2008/1644)	Sep 2015

Construction effects

- 15.4.6 Although the original application for the full development site was not considered to be EIA development, some environmental information was submitted to support the application. This included a Construction Environmental Management Plan and landscaping proposals for the completed development.
- 15.4.7 Potential cumulative effects with the scheme during construction include pollution of Gaugers Burn affecting water quality, impacts from noise and dust on residents along Gardenston Street, disruption to recreational walkers using the core paths in Dunlethen Wood, and disruption to traffic from increased HGVs in the Laurencekirk area.
- 15.4.8 With the implementation of measures as set out in the CEMPs for the planned developments, it is considered that impacts from noise and dust on residents will be short term and temporary and not significant. Cumulative impacts on water quality may arise from increased sedimentation from site clearance and earthworks on the housing site in conjunction with the

earthworks for the junction. Pollution prevention measures and best practice will ensure there will be no significant effects on water quality in Gaugers Burn. With adherence to mitigation measures it is assessed that there will also be no significant effect on the aquatic ecology of the Burn.

- 15.4.9 The amenity for NMUs using the core paths in Dunlethen Wood will be adversely affected by increased noise and visual impact from machinery from both the junction works and the housing developments. The impacts will be short term and temporary and of minor significance.
- 15.4.10 No information was available on the proposed timescale for the phased developments at Blackimuir Avenue or on the amount or type of construction machinery required. However, it is considered that disruption to local residents in Laurencekirk from HGVs is likely to be short term and temporary and of minor significance.

Operational Effects

- 15.4.11 Cumulative operational impacts with the development at Blackiemuir Avenue and the scheme are restricted to loss of agricultural land and water quality impacts on Gaugers Burn.
- 15.4.12 No mitigation can be provided for the loss of agricultural land other than through compensation to landowners and although the surrounding area is predominantly farming, the loss of viable land is considered to have a moderate adverse impact on local farms, with a resulting significance of minor.
- 15.4.13 The drainage system incorporated into the scheme includes the use of SuDS to improve water quality from road runoff. The housing development also includes SuDS and use of drainage ditches to attenuate flow and water quality before discharge into Gaugers Burn. In accordance with the criteria in Table 15-1, it is considered that the Burn can absorb the combined changes from the schemes for both water quality and aquatic wildlife, and effects are not significant.

In-combination effects with development at Conveth Mains

- 15.4.14 APP/2014/4094 – land at Conveth Mains, north east of Laurencekirk. This development was approved in December 2016 and relates to the construction of 310 residential properties with associated infrastructure, access, landscaping, drainage, SuDS and pumping station. This site is located to the east of Fordoun Road and is approximately 2km from the junction scheme.
- 15.4.15 This application forms part of the wider Laurencekirk Development Site OP1 as identified within the Aberdeenshire LDP. A review of the planning portal in November 2019 indicates that planning decisions are pending on a number of dwellings within the plots associated with this development site.

- 15.4.16 This site was not considered to be EIA development, but some environmental information was supplied in support of the planning application.

Construction Effects

- 15.4.17 Although no information is available on the phasing of the housing scheme, there is potential that construction of the houses will coincide with the construction of the junction. Construction effects on residents within Laurencekirk will be limited to disruption from additional construction machinery and traffic management. These will be short term, temporary and not significant.

- 15.4.18 In-combination effects from noise and dust on residents within the study area are not considered to be significant due to the distance between the schemes and that there are no common residential receptors within 350m of the scheme footprint for the housing development and the footprint of the junction. Noise and dust impacts for both schemes will be managed through CEMPs and it is assessed that effects will be not significant.

Operational Effects

- 15.4.19 The housing development at Conveth Mains is located close to two watercourses, the Kirk Burn and Luther Water. Gaugers Burn flows into Luther Water as does Kirk Burn. Operational effects from the junction and the housing may affect water quality in Luther Water from runoff from hard surfacing. The housing development will incorporate SuDS as will the junction scheme. Drainage has been designed to accommodate additional runoff, and the drainage path between Gaugers Burn, Kirk Burn and Luther Water is such that any localised impacts from the two schemes are unlikely to significantly affect water quality. Overall effects on water quality are assessed to be not significant. No information was publically available on the aquatic ecology of Luther Water or Kirk Burn, so no cumulative assessment was possible on aquatic wildlife as a receptor.

- 15.4.20 The development will also result in the loss of agricultural land and in combination with the junction will have a moderate adverse impact on agriculture, of minor significance.

In-combination effects with development on land south of High Street

- 15.4.21 APP/2010/2823 – land south of High Street, Laurencekirk. This development was given planning permission in principle only in August 2016 and concerns a mixed-use development for residential, commercial, business units and retail, petrol station and associated roads, landscaping and public open space. This development site is located adjacent to the new northern section of the grade separated junction link road and is on lands between the new road and Gaugers Burn.

- 15.4.22 This development was not considered to be EIA development, but some environmental information was supplied in support of the planning application.

Construction Effects

- 15.4.23 There is no information available on the construction programme of this development, however it is likely that the development will not commence until the junction upgrade is completed as there is potential that the contractor for Laurencekirk may use part of this land for the temporary site compound. Construction in-combination effects have therefore been scoped out.

Operational Effects

- 15.4.24 There is potential for in-combination effects on residents of Gardounston Street from visual impacts from the additional housing and the views of the grade separated junction. However, the proposed development will include landscaping around the site boundary to minimise visual impacts. The existing screening along Gaugers Burn will be retained where possible and overall visual effects are considered to be not significant.
- 15.4.25 There is also potential for in-combination effects on Gaugers Burn due to increased runoff and changes to water quality. Both schemes include SuDS and new drainage designed to accommodate additional runoff. Overall, it is assessed that effects on the Burn will be not significant.
- 15.4.26 As with the housing developments around Laurencekirk, this development will result in the loss of agricultural land. This is assessed to have a moderate adverse impact, of minor significance, in combination with loss of land from the junction.