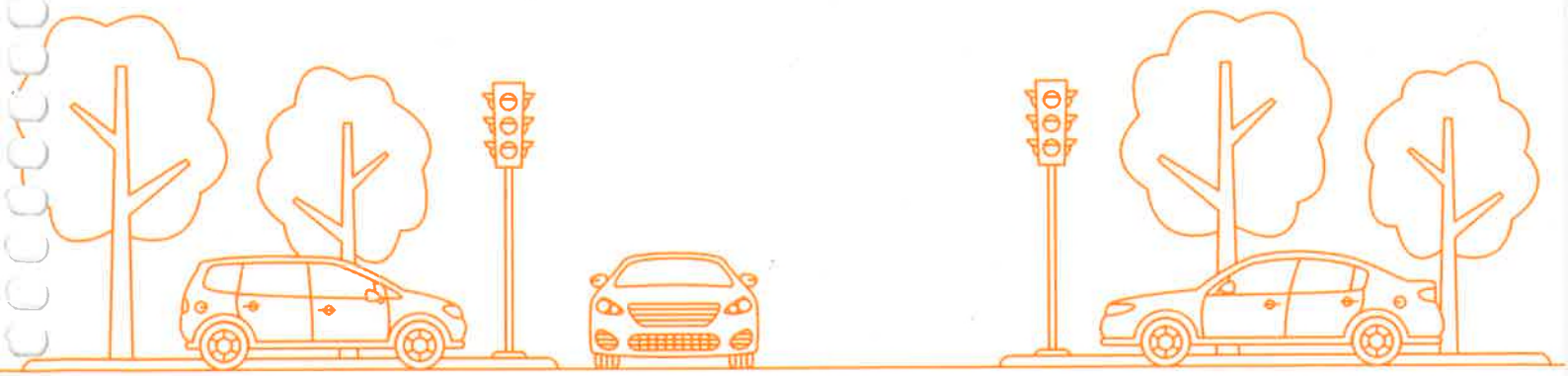
IEMA Transforming the world to sustainability

Institute of Environmental Management and Assessment (IEMA) Guidelines:

Environmental Assessment of Traffic and Movement



July 2023

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Executive summary

This publication provides a long-awaited update and replacement of one of IEMA's first published impact assessment guidance documents from 1993, the 'Guidelines for the Environmental Assessment of Road Traffic'. The purpose of these updated and replacement Guidelines remains unchanged from the 1993 Guidelines, i.e. to provide practitioners with good practice advice on how to carry out the assessment of traffic and movement of people as part of a statutory EIA or non-statutory environmental assessment.

The phrase 'seminal work' is often misused; however, the original 1993 Guidelines were written 30 years ago by an early working group of one of IEMA's founding bodies, the Institute of Environmental Assessment[1]. It has subsequently been used continuously in projects across the UK and internationally to help provide guidance on this area of impact assessment. The core tenets of the methodology provided in the 1993 Guidelines have been validated by cross-examination of expert witnesses in contested cases over the years and are therefore a testament to the original quality of the working group and their guidance written in the early days of the application of EIA in the UK.

These updated and replacement Guidelines on the Environmental Assessment of Traffic and Movement bring IEMA's advice up to date based on the lessons learned over the past 30 years of impact assessment practice in the field, and provide the basis for a systematic, consistent and comprehensive coverage for the assessment of traffic and movement impacts for a wide range of development projects. In addition to traffic and movement expert advice, guidance has been provided by competent experts leading related impact assessments that have interactions with traffic and movement on: air quality, noise, vibration, health, landscape and visual, biodiversity, cultural heritage, climate and GHGs.

These updated and replacement Guidelines are for the assessment of traffic and movement associated with all development projects subject to EIA and non-statutory environmental assessment, concentrated on impacts resulting from changes to the highway network to all modes of transport. These Guidelines are not intended to extend to the wider (multi-modal) transport movement impacts of development projects (e.g. public transport and pedestrian comfort levels and safety). Typically, non-motorised user impacts (both beneficial and negative) are assessed within a formal 'Transport Assessment' which would inform a traffic and movement (or equivalent) chapter of an environmental statement or EIA report. The aim should also be to identify where the project can reduce reliance on vehicles or vehicle impacts, e.g. though promoted active travel and public transport. This could result in significant beneficial effects that cascade through, for example, the air quality, noise and human health assessments.

These updated and replacement Guidelines are intended to complement professional judgement and the experience of trained and competent assessors. As the environmental impact of traffic and movement will vary on a case-by-case basis, the experience and expertise of the assessor will remain of primary importance, along with adequate consultation. Moreover, the process and practice of environmental assessment is evolving rapidly, as is legislation and guidance on the environmental impact of traffic and movement. There is, therefore, a continual requirement to monitor and update procedures.

The intended audience for these updated and replacement Guidelines is EIA practitioners, determining authorities and other stakeholders concerned with the assessment of traffic and movement impacts within the environmental assessment process. These updated and replacement Guidelines should be used by EIA practitioners working on projects in England, Wales, Scotland and Northern Ireland. Furthermore, the Guidelines will also be useful to many international practitioners, particularly those applying the EIA directive, such as in the Republic of Ireland, as many of the methods and advice provided are highly relevant and applicable to many international EIA regimes.

Acknowledgements

Original working group

The original 'Guidelines for the Environmental Assessment of Road Traffic', published in 1993, were commissioned by the Institute of Environmental Assessment and have been used as guidance for numerous impact assessments for 30 years. The original authorship was undertaken by a working group comprised of representatives from local planning authorities, universities, consultants and developers[2]. In alphabetical order, the original working group members were:

- Mr Alan Brooks, Fairhurst & Partners
- Ms Fiona Brown, Halcrow Fox and Associates
- Dr Tim Coles, Institute of Environmental Assessment
- Mr Colin Eastman, JMP Consultants Limited (Chairman)
- Mr Keith Hargest, Rendel Planning
- Mr John Hilton, Milton Transport Management Limited
- Dr Peter Hopkinson, Department of Environmental Science, University of Bradford
- Mr Alex Macaulay, Central Regional Council
- Professor Tony May, Institute for Transport Studies, University of Leeds
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Final thanks to the following IEMA Impact Assessment steering group members for the final peer review; Dr Jessica Salder and Mrs Juliette Callaghan (IEMA Impact Assessment Network chair).

Any views expressed in these updated and replacement Guidelines are the views of the reviewers and working group members and do not necessarily reflect the views of the organisation which they represent.

The suggested citation: Davis, S., Hoare, D., Howard, R., Ross, A. (2023) Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Road Traffic and Movement.

Endorsements

The Chartered Institution of Highways and Transportation (CIHT)

Transport affects all of our lives. Whether commuting to work, visiting friends and family or travelling for retail or leisure purposes, we all rely upon our transportation systems to function effectively, efficiently and contribute positively towards our environment. CIHT is the leading voice of the highways, transportation, infrastructure and services profession. We recognise that it is more important than ever to understand how new developments impact our environment, our biodiversity, and our health and, to that end, the Learned Society & Technical Strategy Board (LSTSB) of CIHT welcome and fully endorse the publication of this important update to the vital IEMA guidelines.

Darran Kitchener, CIHT LSTSB Chair

CIHT

The Institute of Air Quality Management (IAQM)

IAQM is the leading voice on air quality management, in particular in relation to planning and development control. We recognise that it is always important to understand how new developments impact our air quality and ultimately our biodiversity and our health. To that end, the IAQM committee welcomes and supports the publication of this update to the IEMA Guidelines, which highlights the importance of accounting for the needs of high-quality traffic data for use in air quality assessments and summarises some of the traffic data requirements for such assessments.

Chris Rush, IAQM Chair

IAQM Institute of Air Quality Management

List of abbreviations

AADT	Annual Average Daily Traffic
AQMA	Air Quality Management Area
ARCADY	Assessment of Roundabout Capacity and Delay
ARN	Affected Road Network
BNL	Basic Noise Level
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CRTN	Calculation of Road Traffic Noise
dB	Decibels
DMOY	'do-minimum' opening year
DMRB	Design Manual for Roads and Bridges
DSFY	'do-something' future year
DSOY	'do-something' opening year
EIA	Environmental Impact Assessment
EMP	Environmental Management Plans
EOR	Environmental Outcome Reports
EPUK	Environmental Protection UK

EqIA	Equality Impact Assessment (EqIA)
GHG	Greenhouse Gases
HDV	Heavy Duty Vehicle
HGV	Heavy Goods Vehicle
HV	Heavy Vehicle
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
iRAP	International Road Assessment Programme
JNCC	Joint Nature Conservation Committee
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
NTS	Non-Technical Summary
OSCADY	Optimised Signal Capacity and Delay
PICADY	Priority Intersection Capacity and Delay
SSSI	Site of Special Scientific Interest
TAG	Transport Analysis Guidance
TRL	Transport Research Laboratory
UK	United Kingdom

1. Introduction

Purpose and need

"We have a moral duty to look after our planet and hand it on in good order to future generations. That does not mean trying to halt economic growth. We need growth to give us the means to live better and healthier lives. But growth has to respect the environment. And it must be soundly based so that it can last. We must not sacrifice our future well-being for short-term gains, nor pile up environmental debts which will burden our children."

This Common Inheritance (DoE, 1990)

"The UK government has a role in protecting and improving the environment both at home and abroad. We will show leadership on conservation, climate change, land use, sustainable global food supplies and marine health. We will champion sustainable development, lead in environmental science, innovate to achieve clean growth and increase resource efficiency to provide benefits to both our environment and economy, and keep our pledge to hand over our planet to the next generation in a better condition than when we inherited it."

A Green Future: Our 25 Year Plan to Improve the Environment (HM Government, 2018)

1.1 The first quote comes from the Secretary of State's introduction to the government's White Paper on The Environment in September 1990. The paper was a reflection of the growing concern among the general public, businesses and government that the environment needed to be protected from many of the damaging practices that had occurred in the past. While consideration of sustainability issues has moved on a great deal since then, the relevance of the above statement remains.

1.2 The second quote above comes from the introduction to the 25 Year Plan to Improve the Environment. It reiterates the UK government's long-term commitment to environmental protection, but goes further than many earlier pledges, in seeking to enhance the environment. However, the ongoing and difficult challenge to reduce and minimise environmental and population impacts of new developments becomes even more challenging when we aim to actually leave the environment in a better condition than before.

1.3 Much has changed since the 'Guidelines for the Environmental Assessment of Road Traffic'[3] were first published in 1993, both in Environmental Impact Assessment (EIA) in general, but also in transport planning and assessment of development proposals and projects. This 2023 publication therefore updates and replaces the 1993 Guidelines to meet current regulations, processes and latest guidance in environmental assessment, while retaining elements of the 1993 Guidelines that are still considered relevant.

1.4 The requirement for EIA stems from the original 1985 EU EIA Directive, which has subsequently been amended three times, in 1997, 2003 and 2009. The initial EU Directive of 1985 and its three amendments were later codified in EIA Directive 2011/92/EU of 13 December 2011. The EIA Directive 2011/92/EU was then amended in 2014 by EIA Directive 2014/52/EU and is implemented in the UK through a range of EIA and planning regulations.

1.5 In January 2021, the UK formally left the EU and passed various regulations replacing EU derived legislation with minor amendments to enable the functional continuation of laws and regulations following the departure from the EU. The current EIA Regulations in England, Wales, Scotland and Northern Ireland are all still based on the 2014 version of the EU EIA Directive, which was transposed through various regulations into UK law in 2017 and remains the basis of the current regulations on EIA.

1.6 At the time of publishing, consultations are ongoing on significant planning reforms to replace EIA and Strategic Environmental Assessment legislation in England through the proposed Environmental Outcome Reports (EOR), set out within the Levelling Up and Regeneration Bill. However, these proposed reforms are not yet law. It is also likely that any new environmental assessment regime will require some form of traffic and movement impact assessment to inform planning decisions.

1.7 The current EIA Regulations contain specific requirements that need to be met. They set out the procedure for identifying which projects should be subject to EIA, as well as the key stages to the process and what information must be contained in the Environmental Statement/EIA Report[4]. While there are multiple EIA legislative frameworks nationally and internationally, these updated and replacement Guidelines take an overarching position, setting out an approach that can be adopted across England, Wales, Scotland and Northern Ireland. It is likely that these Guidelines will also be of use in other countries, particularly those following the EIA Directive.

1.8 Although there is some variation in terminology highlighted in this document, for avoidance of doubt, these updated and replacement Guidelines may refer to an 'EIA Report' as opposed to an 'Environmental Statement' (ES): these terms should be considered interchangeable.

1.9 The EIA Regulations have minor differences across the constituent countries in the UK; however, one thing that the EIA Regulations have in common is that they indicate the issues that are to be considered. Each of the EIA Regulations states that a description of the following factors likely to be significantly affected by the development must be included in ES/EIA Reports:

(a) Population and human health
(b) Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(1) and Directive 2009/147/EC(2)
(c) Land, soil, water, air and climate
(d) Material assets, cultural heritage and the landscape
(e) The interaction between the factors referred to in sub-paragraphs (a) to (d)

1.10 While not specifically referenced in the EIA Directives or Regulations, the potential of traffic and movement impacts to influence the factors referred to in the EIA Regulations is widely recognised, including by the Planning Inspectorate and Planning and Environment Decisions Wales, other relevant competent authorities, stakeholders and developers. It is therefore common for a scoping exercise to identify a requirement for a specific traffic and movement ES/EIA Report chapter to assess the interactions with other technical chapters and to act as a repository for traffic and movement metrics and data which other technical chapters rely on. These assessments also serve to provide early identification of issues, allowing mitigation to be embedded more effectively.

1.11 The purpose of these updated and replacement Guidelines remains unchanged from the 1993 Guidelines, i.e. to provide practitioners with good practice advice on how to carry out the assessment of traffic and movement of people as part of a statutory EIA or non-statutory environmental assessment.

Scope of these updated and replacement Guidelines

1.12 The scope of these updated and replacement Guidelines is to provide the basis for systematic, consistent and comprehensive coverage for the assessment of traffic and movement impacts for a wide range of development projects. These updated and replacement Guidelines are not intended to be exhaustive, nor a reference for the very detailed or specific problems that occur in assessing the environmental and population impact of traffic and movement.

1.13 These updated and replacement Guidelines are intended to complement professional judgement and the experience of trained and competent assessors. As the environmental impact of traffic and movement will vary on a case-by-case basis, the experience and expertise of the assessor will remain of primary importance, along with adequate consultation. Moreover, the process and practice of environmental assessment is evolving rapidly, as is legislation and guidance on the environmental impact of traffic and movement. There is, therefore, a continual requirement to monitor and update procedures.

1.14 These updated and replacement Guidelines are for the assessment of traffic and movement associated with all development projects subject to EIA and non-statutory environmental assessment, concentrated on impacts resulting from changes to the highway network to all modes of transport.

1.15 These updated and replacement Guidelines are not intended to extend to the wider (multi-modal) transport movement impacts of development projects (e.g. public transport and pedestrian comfort levels and safety). Typically, non-motorised impacts (both beneficial and negative) are assessed within a formal 'Transport Assessment', which would inform a traffic and movement (or equivalent) chapter of an ES/EIA Report. The aim should also be to identify where the project can reduce reliance on vehicles or vehicle impacts, e.g. though promoted active travel and public transport. This could result in significant beneficial effects that cascade through, for example, the air quality, noise and human health assessments. The scope of 'multi-modal' impact assessments will vary by region and for some impacts limited guidance exists; therefore, the approach should be agreed with local stakeholders. To assist the process, useful published reference material includes: Pedestrian Comfort Guidance (Transport for London), Station Public Realm Guidance (Transport Research Laboratory), Station Design Guidance (Network Rail), Cycle Infrastructure Design (Department for Transport), Designing for Walking (Chartered Institution of Highways and Transportation) and Guide to the Healthy Street Indicators (Transport for London).

Intended audience

1.16 The intended audience for these updated and replacement Guidelines is EIA practitioners, determining authorities and other stakeholders concerned with the assessment of traffic and movement impacts within the environmental assessment process. These updated and replacement Guidelines should be used by EIA practitioners working on projects in England, Wales, Scotland and Northern Ireland. Furthermore, the guidelines will be useful to many international practitioners, particularly those applying the EIA Directive, such as the Republic of Ireland, as many of the methods and advice provided are highly relevant and applicable to many international EIA regimes. These updated and replacement Guidelines also support or inform the approach taken by other stakeholders engaged in EIA and for EIA practice further afield.

1.17 It is recommended that, as part of applying these updated and replacement Guidelines, those who do not have a working knowledge of delivering EIAs and non-statutory environmental assessments, or who simply wish to refresh their understanding, undertake preliminary reading on the way in which the process is undertaken, particularly in relation to the application of EIA within the design process and the use of Environmental Management Plans (EMPs) or Construction Environmental Management Plans (CEMPs) as a control mechanism. Useful information can be found in the following IEMA documents:

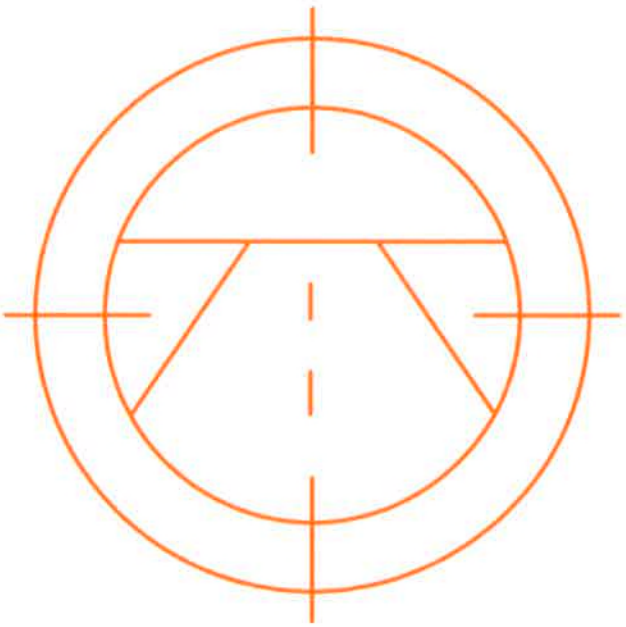
- Environmental Impact Assessment Guide to: Shaping Quality Development[5]
- Environmental Impact Assessment Guide to: Delivering Quality Development[6]
- Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice[7]

1.18 These sources of information should be used in conjunction with these updated and replacement Guidelines, but their technical content is not duplicated.

Relationship to Design Manual for Roads and Bridges (DMRB) and other guidance

1.19 Design Manual for Roads and Bridges (DMRB), published by National Highways, comprises a set of standards on the environmental assessment and design requirements for the delivery of National Highways' motorways and all-purpose trunk road projects. DMRB standards are typically adopted by local highway authorities when developing road projects on the local road network.

1.20 These updated and revised Guidelines are designed to provide advice on how to undertake an EIA or non-statutory environmental assessment for traffic and movement of people associated with non-highway/road projects. Notwithstanding, there are useful references within DMRB that can be used cautiously to augment the assessment methodologies outlined in these updated and replacement Guidelines. For example, DMRB LA 112 'Population and Human Health' provides guidance on the impact of journey length when an existing walking or cycling route is severed. Equally, the EIA suite of documents (DMRB LA 101 to LA 104 inclusive) set out a framework for EIA, some of which can be utilised for an assessment of non-highway/road projects.



Relationship to Transport Assessments

1.21 Planning Practice Guidance 'Travel Plans, Transport Assessments and Statements' (Department for Levelling Up, Housing & Communities, and Ministry of Housing, Communities & Local Government) contains guidance on the preparation of Transport Assessments (and the lighter touch variant, Transport Statements).

1.22 It is important that the different purposes of Transport Assessments and traffic and movement assessments for EIA and non-statutory environmental assessments submitted in support of development proposal applications is fully understood by practitioners, as follows:

- Transport Assessments report the overall transport strategy for development sites to maximise accessibility for non-car modes of transport, but also assess the traffic impact of the proposals based on an assessment of conditions on the highway network in peak periods.
- Traffic and movement assessments for EIA and non-statutory environmental assessments present the impact of traffic and movement on people and the environment – which are initially undertaken with reference to daily traffic flows prior to assessing the time period with the highest potential impact (i.e. degree of change from baseline conditions), which may not be the same as the time period with the highest baseline traffic flows.

1.23 Although commonly consulted upon with local planning authority transport officers, the content of Transport Assessments is not explicitly governed by statutory regulations such as those that apply to EIA and, with a few exceptions, the nature and depth of assessment undertaken within a Transport Assessment is incompatible for the purposes of an EIA or non-statutory environmental assessment. It is therefore important to ensure that the content of traffic and movement input to environmental assessment fully accords with the requirement of the relevant EIA Regulations.

The Rochdale envelope

1.24 There may be cases where the detail of a development proposal or scheme has not been confirmed at the time of undertaking the EIA or non-statutory environmental assessment. To ensure that the EIA or non-statutory environmental assessment for the development properly and fully assesses likely significant effects, it is necessary to define parameters that provide the maximum (and sometimes minimum) possible extent of development. When the detail is subsequently defined, the relevant parameters should be the same or lower than the maximum extents. This is commonly known as the 'Rochdale Envelope', from the court case in which this issue was first addressed in legal terms and the precedent set. Although it is important to define the parameter envelope sufficiently to ensure all potential future changes are addressed, it is also important not to over-estimate these impacts, nor assess a worst case that is unlikely to occur in practice, as this can affect the need for proportionality in assessment.

1.25 In a traffic and movement context, the Rochdale envelope, when applied to a project description, should ensure the maximum likely movement demand is assessed. It is incumbent on the competent traffic and movement expert to ensure that the project being assessed represents the realistic worst case in terms of traffic and movement demand.

Impacts and effects

1.26 It is important that the difference between impacts and effects are fully understood by practitioners undertaking EIA and non-statutory environmental assessment:

- Impacts are the changes resulting from an action
- Effects are the consequences of these impacts

1.27 As a general rule of thumb, environmental assessment practitioners should consider the forecast changes to baseline (magnitude of change/impact), the relative value/sensitivity/importance of the affected asset/receptor and the scale, nature and significance of the effect (consequence). The EIA Regulations also require consideration of whether the anticipated effect is short-term, medium-term or long-term and whether it is permanent or temporary. It is important to note here that while environmental assessment often focuses on identifying negative (adverse) effects, EIA and non-statutory environmental assessment is a fundamental tool for improving the design of projects and should aid in identifying opportunities for benefits and enhancements.

Affected parties/sensitive receptors

1.28 At an early stage, it is essential to identify particular population groups that may be sensitive to changes in traffic conditions. The following user groups should be considered:

- Non-motorised users
- Public right of way users
- Motorists and freight vehicles
- Public transport
- Emergency services

1.29 For projects that constitute EIA development, defining the list of receptors to be included in the environmental assessment, i.e. those which may be sensitive to changes in traffic conditions, should be informed by consultation with the local planning and highway authorities as part of the EIA scoping process.

1.30 The following list identifies special interests that should be considered when defining sensitive receptor geographic locations (others can be added if the relevant authorities considered it appropriate). The sensitive locations will inform the assessment of effect significance when the development traffic is assigned to the network.

- People at home
- People at work
- Sensitive and/or vulnerable groups (including young age; older age; income; health status; social disadvantage; and access and geographic factors)[8]
- Locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools)
- Retail areas
- Recreational areas
- Tourist attractions
- Collision clusters and routes with road safety concerns
- Junctions and highway links at (or over) capacity

1.31 The sensitive receptors within the agreed study area should be assigned to the nearest highway link, and the relationship with the highway environment examined to understand the sensitivity of those receptors to change. For example, pedestrians are less sensitive to changes in traffic if there are adequate footways and crossing facilities. However, links where there will be high concentrations of sensitive locations (such as hospitals, schools and tourist attractions) are likely to be highly sensitive to changes in traffic flow unless there is separation from traffic. Following this exercise, each highway link within the agreed study area can be assigned a sensitivity value.

1.32 For collision clusters and junctions/highway links at capacity, determination of sensitivity is discussed in Section 3.

Mitigation hierarchy, mitigation and monitoring

1.33 The most efficient and effective way to address environmental and social impacts is to remove them entirely through the application of the mitigation hierarchy. The mitigation hierarchy is an approach that advocates improving the environment as a first design goal. Failing improvement, the next priority should be to avoid environmental and social impacts in the first instance, before seeking to reduce, mitigate or compensate any adverse impacts. The proper application of the mitigation hierarchy, which should be applied from the concept and feasibility stage of a project onwards, including the consideration of alternatives, and throughout the iterative design process, is the best method for reducing impacts, the scope of the assessment and the cost of developing mitigations and monitoring.

1.34 The EIA Regulations allow applicants to consider at the EIA screening stage how primary, secondary and/or tertiary mitigation may reduce the effects of a Schedule 2 project[9] so that it may be determined that the development does not constitute EIA development. Furthermore, primary, secondary and/or tertiary mitigation can also be taken account of at the EIA Scoping stage to ensure an EIA is proportionate and focuses on the likely significant environmental effects. IEMA has a clear position on the use of mitigation and necessary control mechanisms in EIA in its 'EIA Guide to: Delivering Quality Development in EIA'[10] and this information is not repeated here.

1.35 For the purpose of traffic and movement, as with other assessments, it is critically important that EIA Screening Reports, EIA Scoping Reports and the final ES/EIA Report (with accompanying Non-Technical Summary (NTS)) provide the necessary details of any primary, secondary and/or tertiary mitigation relied upon in the assessment of significant environmental effects at each stage of the EIA process.

1.36 IEMA is currently drafting new guidance to assist practitioners with the effective delivery of mitigation throughout the planning process for both EIA and non-EIA developments into implementation in construction. The new guidance looks at how to prepare outline CEMPs/Code of Construction Practice, with the framework of mitigation for construction activities reported at the planning and post-planning (via condition) stages to ensure that the measures to mitigate construction effects identified in the EIA, non-statutory environmental assessment and other forms of assessment (including strategies and plans) are delivered.

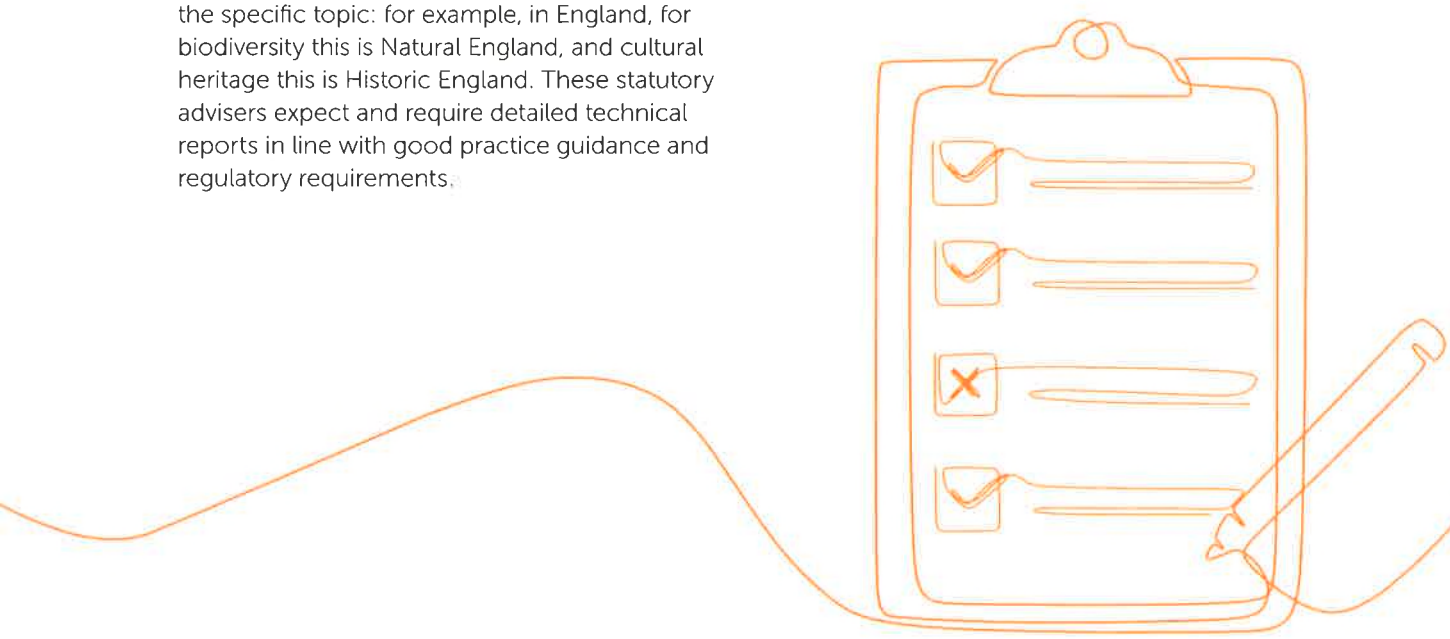
1.37 The new guidance on integrating CEMPs with EIAs will contain specific advice on the traffic and movement element of CEMPs and draft Traffic Management Plans.

Proportionality

1.38 In recent years, some ES/EIA Reports have become very lengthy, which has generated criticism from many stakeholders. However, with regard to the detailed technical reports produced in support of an EIA, these reports are largely dictated by the scoping requirements and are written for a technical audience, normally the expert statutory advisers for the specific topic: for example, in England, for biodiversity this is Natural England, and cultural heritage this is Historic England. These statutory advisers expect and require detailed technical reports in line with good practice guidance and regulatory requirements.

1.39 Criticisms that the main ES/EIA report is too long and too technical for the public misunderstand the intended audience of the EIA technical information, which to be clear is not written for a non-technical audience. To aid the public in this regard, an NTS is a legal requirement and should accompany the ES/EIA report to provide a short, accurate, concise and accessible summary of the EIA process in a manner that allows the public to understand all the key issues, without needing to engage with the detailed technical reports that support the environmental assessment.[11]

1.40 In addition to a high-quality and effective NTS, early stakeholder and public engagement is key, alongside effective scoping, in achieving proportionate outcomes. Perhaps the most critical element is the use of competent experts for carrying out the EIA, and for the competent authority to have access to sufficient expertise to engage with the EIA process. A final recommendation on proportionality is to make best use of digital techniques, as advocated in IEMA's digital primer.[12] For more information on the causes and remedies for proportionate assessment, refer to IEMA's 'Delivering Proportionate EIA' report.[13]



Use of competent experts

1.41 The EIA Regulations require that:

> 'In order to ensure the completeness and quality of the environmental statement... (a) the developer must ensure that the environmental statement is prepared by competent experts; and (b) the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.'

1.42 Therefore, the traffic and movement assessor is expected to be the primary competent expert for this subject matter. However, an EIA coordinator would also be expected to have a working understanding of the definitions, terminology and principles.

1.43 The competent traffic and movement expert's level of understanding should include (but not be limited to):

- A relevant degree, other professional qualifications, or relevant experience relating to the transport sector, traffic, and traffic management.
- A working knowledge and appreciation of UK traffic and transport modes, their properties and characteristics, and understanding of their management in accordance with the highest tiers of the mitigation hierarchy and sustainable transport hierarchy.
- Knowledge of the concepts, theories and application of traffic and movement assessment, as well as key links to other related assessments such as air quality, noise and human health.

1.44 As well as a sound knowledge of the key principles concerning traffic and movement, the competent traffic and movement expert must have a good understanding of EIA principles, including the ability to:

- Define the scope of an environmental assessment, including its temporal and spatial boundaries (to ensure a proportional approach).
- Determine potential environmental impacts and effects (whether positive or negative).
- Actively seek beneficial effects, enhancement and adverse effect minimisation as far as reasonably practicable.
- Understand the mechanisms established by legislation, policy and accepted practice, to adequately reduce potential impacts.
- Define significant environmental effects for consideration within EIA.

1.45 Within all core environmental assessment documentation, it is the responsibility of the competent traffic and movement expert to ensure that their competence, and the competence of those supporting the production of content, is clearly evidenced.

2. Screening and scoping

2.1 Schedule 1 of the EIA Regulations lists those types of projects where an EIA is required in every case – such as power stations, major railway lines and airports. Schedule 2 of the EIA Regulations lists those types of projects where the requirement to produce an EIA depends on the scale and nature of the project proposed and the environmental sensitivity of the land affected. Schedule 2 of the EIA Regulations sets out the screening criteria that apply to different types of development, and Regulation 2 lists the types of sensitive areas (e.g. Sites of Special Scientific Interest (SSSIs), Areas of Outstanding Natural Beauty, etc.) in which those screening thresholds do not apply. Should a development be of a type listed in Schedule 2, and meet the associated screening criteria or be within/adjoining a sensitive area, then the criteria presented in Schedule 3 of the EIA Regulations should be considered to determine if significant effects on the environment are likely as a result of the construction, operation and/or decommissioning of the development in question. This process is known as 'screening' and is undertaken by planning authorities either pre-application in response to a request from the developer or upon submission of a Schedule 2 project without an accompanying ES/EIA Report.

2.2 If a project is screened as constituting 'EIA development', and therefore an EIA is required, it is good practice to submit an EIA Scoping Report and obtain a 'Scoping Opinion' from the local planning authority, or the Planning Inspectorate[14] in the case of Nationally Significant Infrastructure Projects, or Planning and Environmental Decisions Wales[15] in the case of Developments of National Significance. The Scoping Opinion sets out which environmental factors and matters are to be assessed, the scope of the assessments and the methodology to be adopted. Although scoping is not mandatory under the EIA Regulations, if a Scoping Opinion is obtained, the EIA must be 'based on' the most recent Scoping Opinion.

2.3 When undertaking a scoping study and developing the EIA Scoping Report, the competent traffic and movement expert should liaise closely with the competent experts for several other factors including: landscape and visual impacts, cultural heritage, noise, air quality, climate/GHGs, biodiversity and human health. The assessment teams will need to collaborate and coordinate on a range of issues, such as receptor identification, baseline data collection (desk based, surveys and modelling requirements) and scheme design. Crucially, the competent traffic and movement expert, working with other discipline competent experts, may be able to identify early potential impacts. It is therefore critical that these engagements occur as early as possible in the scheme development to inform design and consideration of alternatives, to maximise the use of the mitigation hierarchy and identify opportunities for beneficial outcomes and enhancements.

2.4 Caution should be observed by the competent traffic and movement expert when choosing the appropriate assessment tool, as large established traffic models can lack the agility to assess periods outside of network peaks and can prove very difficult for stakeholders and interested parties to validate outputs. It is important, when proposing the use of an established traffic model, to set out the limitations to stakeholders to ensure a proportionate response to change and sensitivity testing.

2.5 For more detailed guidance on the interrelationship between traffic and movement and the other factor-specific assessments, see Section 3 below.

The impacts of traffic and movement

2.6 The impact of traffic and movement is dependent on a wide range of factors. These include:

- Current state traffic and movement environment
- Volume of development traffic
- Traffic speeds and network operational characteristics
- Traffic composition (e.g. percentage of Heavy Goods Vehicles (HGVs))
- Future cumulative development traffic

2.7 The perception, experience and health effects of changes in traffic by humans, and the impact of traffic changes on various ecological systems, will also vary according to such factors as:

- Existing traffic levels
- The location of traffic movements
- The time of day
- Temporal and seasonal variation of traffic
- Design and layout of the road and pavement
- Crossing points
- Landscape/townscape character, designated status, land use and activities adjacent to the route
- Ambient conditions of adjacent land uses

2.8 Different types of development will attract different levels and types of traffic and, hence, different impacts. The same type of development with the same traffic growth may, however, produce a different environmental impact in one location from another, dependent on traffic levels on the affected routes and the adjacent land uses. This makes the environmental assessment of traffic changes particularly complex, and the development of overly prescriptive methodologies of little use to assessors. However, assessment should still make explicit the methodologies used, and set out any difficulties and uncertainties of the assessment.

Determination of traffic and movement levels

2.9 It is not the intention of these updated and replacement Guidelines to set down procedures for the estimation of baseline traffic conditions or the changes in traffic flow that will arise from a new development. Guidance on such procedures is available in the Department for Transport's Transport Analysis Guidance (TAG).

2.10 The environmental assessment should produce estimates, not only of the traffic being attracted to or caused by the development, but also the projection of traffic volumes along key routes leading to the development site. Estimates of HGV movements should be provided separately. Surveys should typically be carried out during a 'neutral', or representative, month avoiding main and local holiday periods, local school holidays and half terms, and other abnormal traffic periods. However, there can be instances when a particular period (e.g. weekends or school holidays) is of interest, for example in regions with relatively high levels of seasonal tourism. When this is the case, care should be taken to only consider higher seasonal flows on impacts that are exacerbated by higher baseline flows.

2.11 As set out above with respect to the differences between a Transport Assessment and an EIA/non-statutory environmental assessment, the two assessments have different purposes and this should be clearly understood to avoid confusion among developers and stakeholders. The traffic data elements of an EIA/non-statutory environmental assessment may be typically informed by a separate Transport Assessment[16] and often serve as a repository for the traffic derivation necessary to inform the EIA/non-statutory environmental assessment. It should be noted, however, that a Transport Assessment will frequently concentrate on producing traffic estimates designed to test the ability of key highway intersections to accommodate additional traffic. This may involve the projection of peak hour traffic levels at some time well beyond the commencement of the project. Such values are likely to be insufficient for EIA/non-statutory environmental assessment, which has differing objectives, and where data in different formats will be required for various different assessments.

2.12 Therefore, it is strongly recommended that the EIA coordinator works with the competent traffic and movement expert to develop a detailed list of requirements for traffic projections at the earliest possible opportunity. This is best achieved by consulting directly with the factor assessment competent experts including landscape and visual impacts, cultural heritage, noise, air quality, climate/GHGs, biodiversity and human health, to establish their data requirements. See Section 4 below for a discussion on the different data needs and interrelationships with other specific assessments.

Determining the appropriate scope of an assessment

Geographic extent (spatial scope)

2.13 An important prerequisite of the environmental assessment is to determine the geographical boundaries of the assessment (the 'study area'). This is not an easy task, as projects tend to give rise to different levels of traffic growth and composition and vary in the geographical extent of their traffic and impact. Early engagement with relevant stakeholders is recommended to benefit from local knowledge and understand key sensitivities.

2.14 Judgements will inevitably be required to define the geographical boundaries of the environmental assessment. Such judgements will tend to be based on a combination of experience and assumptions that should be made explicit in the EIA/non-statutory environmental assessment reporting.

2.15 On occasion, there may be particularly sensitive environmental or population receptors in the vicinity of a development not immediately apparent to the traffic and movement expert (such as inclusion of a designated site for nature conservation), the impact of development traffic on which may need to be considered in order to demonstrate the effects of a development. Therefore, it is recommended that the traffic study area is discussed and agreed with the wider EIA team as early as possible in the assessment process to avoid any omissions and additional work at later stages.

2.16 Following the determination of a study area, it is recommended the competent traffic and movement expert applies two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

Rule 1 Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)

Rule 2 Include highway links of high sensitivity where traffic flows have increased by 10% or more

2.17 It should be noted that the Rule 1 and Rule 2 'criteria' process may not be appropriate for some impacts, and it is generally accepted by regulators and practitioners that it should not be applied to assessments of **air quality, noise, road safety and driver delay**. For these impacts, a separate study area and assessment criteria should be agreed with the relevant stakeholders. See data requirements below and Section 4 for factor specific advice.

Rule 1

2.18 Traffic forecasting is not an exact science, and the accuracy of projections is open to debate. It is generally accepted that accuracies greater than 10% are not achievable. It should also be noted that the day-to-day variation of traffic on a road is frequently at least + or -10%. At a basic level, it should therefore be assumed that projected changes in traffic of less than 10% create no discernible environmental impact. The cumulative effect of a number of developments attracting less than 10% of additional traffic may need to be assessed at a broader strategic or policy level.

2.19 Previous research has identified that the most discernible environmental and population impacts of traffic are noise, severance, pedestrian delay and intimidation (Hedges, 1978). At low flows, increases in traffic of around 30% can double the delay experienced by pedestrians attempting to cross a road. Whether this is significant in absolute terms requires further assessment. Severance and intimidation are, however, much more sensitive to traffic flow and the Department for Transport, historically, has assumed that 30%, 60% and 90% changes in traffic levels should be considered as 'slight', 'moderate' and 'substantial' impacts respectively.

2.20 In summary, it is recommended that, as a starting point, a 30% change in traffic flow represents a reasonable threshold for including a highway link within an environmental assessment. Where there are major changes in the composition of the traffic flow, say a much greater flow of HGVs, a lower threshold may be appropriate.

Rule 2

2.21 The competent traffic and movement expert should include any other link or location where it is felt specific environmental or population sensitivities may occur. If these updated and replacement Guidelines have been followed, the competent traffic and movement expert would already have compiled a list of potentially affected groups and special interests and this would be the starting point (see paragraph 1.30). Normally, it would not be appropriate to consider links where traffic flows have changed by less than 10%, unless there are significant changes in the composition of traffic, e.g. a large increase in the number of HGVs.

Year(s) of assessment

2.22 Some developments may pass through a number of stages in their lifetime, during which time the volume and type of traffic may be different, leading to different impacts. For example, traffic attracted during the construction phase is likely to be different from the operational phase and different again from the decommissioning phase (where this is necessary). An environmental assessment may, therefore, need to address each of these stages as a separate set of impacts.

2.23 Different traffic forecasts may have to be produced for each stage, which may also require the estimation of the changing patterns of general traffic levels in order to provide estimates of different baseline conditions. Use should be made of available datasets (e.g. Local Plan Traffic Models, Department for Transport Trip End Model Presentation Program (TEMPro) and National Traffic Model). It may also be necessary to make an assumption with regard to other existing and/or approved projects and forecasted changes in the highway network that could occur over the time period. These assumptions will need to be based on best judgement taken in consultation with the local planning authority. Any changes in ambient environmental characteristics should also be taken into account.

2.24 Transport Assessments are principally interested in evaluating a situation when traffic flows are at their greatest. This may involve looking at a period sometime in the future when traffic from the project is added to traffic flows on the surrounding network, which has itself increased due to natural traffic growth. Such a situation clearly presents the critical traffic pattern, but the natural increase of traffic will generally have the effect of diluting the environmental impact of a project. The greatest environmental change will generally be when the project traffic is at the largest proportion of the total flow. It is therefore recommended that the environmental assessment should be undertaken at the construction/decommissioning phase, year of opening of the project or the first full year of its operation. For a phased development, it may be necessary to consider the first year of each phase.

Relationship between the future baseline and the cumulative scenario

2.25 The EIA Regulations require consideration of the likely evolution of the current state of the environment (baseline scenario) in the absence of the development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge. This is commonly referred to as the 'future baseline'.

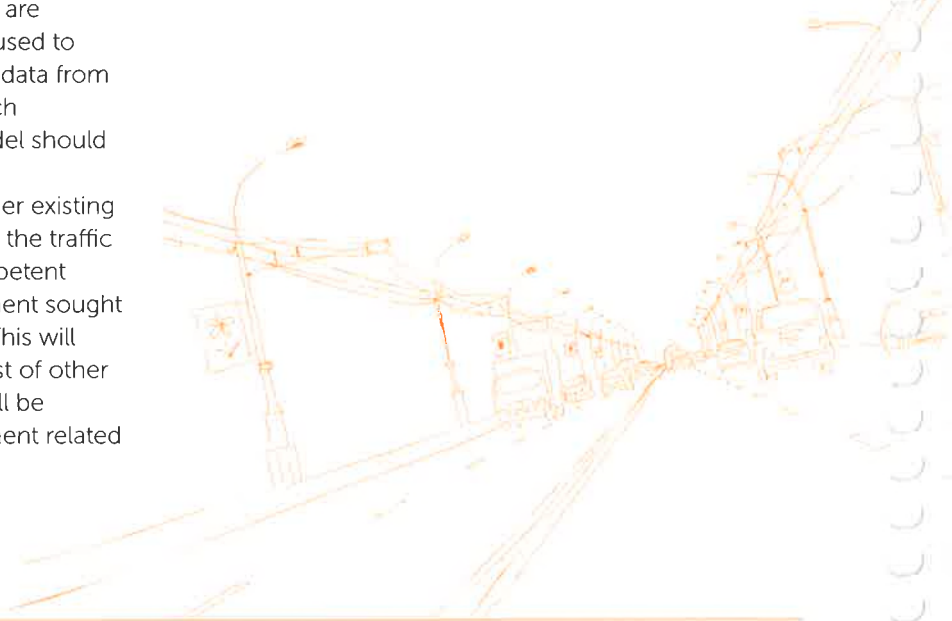
2.26 Although it could be argued that any change in traffic and movement is not a 'natural' change, any such changes should be considered, assessed and reported in the future baseline scenario. The reason being that traffic change will occur 'naturally', even though it is likely to be 'person-made'. The same can be said for climate change.

2.27 The EIA Regulations also require consideration of the likely significant effects of the development on the environment resulting from the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources.

2.28 Transport and movement assessments within EIA/ non-statutory environmental assessment are inherently cumulative, as the traffic data used to inform such assessments should include data from other relevant developments. A list of such developments included in the traffic model should be provided to the EIA coordinator and environmental assessment team. Any other existing and/or approved projects not included in the traffic model should be highlighted to the competent traffic and movement expert and agreement sought as to why they have not been included. This will allow confidence to be achieved in the list of other existing and/or approved projects that will be considered in the non-traffic and movement related environmental assessments.

2.29 Future baseline and cumulative assessment should not be confused. They are two different considerations within the environmental assessment process. Derived forecast traffic growth (e.g. TEMPro) should be utilised to derive future year baseline traffic conditions. However, discrete projects within the agreed study area that are existing, approved or likely to come forward (where sufficient certainty and relevant information about the project exists) should not be added to the baseline scenario and should be considered in the cumulative scenario. The competent traffic and movement expert should exercise care to ensure:

- 'Double counting' is avoided when applying growth factors to the baseline that may have been influenced by approved projects that are being considered in the cumulative scenario,
- The proposed transport model has adequate scope to model cumulative scenarios (as they may differ from those required in the Transport Assessment).



3. Assessment methodology

Introduction to assessment

3.1 The various EIA Regulations set out the EIA process and, despite minor variations, all require the identification and description of the direct and indirect significant effects on the following factors:

- Population and human health
- Biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC(a) and Directive 2009/147/EC(b)
- Land, soil, water, air and climate
- Material assets, cultural heritage and the landscape
- The interaction between these factors

3.2 The purpose of these updated and replacement Guidelines relates to assessing the environmental impacts arising from changes in traffic and movement. With reference to the requirements of the EIA Regulations as set out above, this relates primarily to potential impacts on population and human health, and biodiversity, typically through impacts on air quality, water and noise. However, depending on the nature of the project, there may be impacts on several other factors including land, soil, climate, material assets, cultural heritage and/or landscape.

3.3 On that basis, these updated and replacement Guidelines address specific traffic and movement related impacts, consistent with, but expanding upon, the categories identified in the 1993 Guidelines, including:

- Severance of communities
- Road vehicle driver and passenger delay
- Non-motorised user delay
- Non-motorised amenity
- Fear and intimidation on and by road users
- Road user and pedestrian safety
- Hazardous/large loads

3.4 This list is not exhaustive, however, and further specific aspects can be added to by the competent traffic and movement expert during EIA scoping, if appropriate.

3.5 These updated and replacement Guidelines do not therefore apply to the assessment of impact on biodiversity, land, soil, water, air, climate, material assets, cultural heritage and the landscape, which are subject to their own assessment methodologies and requirements.

3.6 These updated and replacement Guidelines do, however, also address the need to provide robust and consistent movement forecasts associated with major new developments and/or infrastructure, to support the environmental assessment of some of the other factors listed in the EIA Regulations such as air quality. This relates to demolition and decommissioning as well as the construction and operational stages of development.

3.7 As a result, although the EIA Regulations do not explicitly require a traffic and movement chapter to be produced within an ES/EIA Report, it is frequently scoped in by regulatory authorities. Should traffic and movement be scoped out of an EIA, it is recommended that a transport technical note/Transport Assessment is provided to supplement the ES/EIA Report to contain all movement-related forecasting and methodology upon which some of the other assessment chapters are based.

Traffic and movement assessments

3.8 Having identified which environmental and population impacts are to be considered, and the highway links that need to be included within the analysis, the next stage of the assessment is to quantify the magnitude of the impact and to identify the scale and nature of the effect to determine the level of significance that such change may have. This may have been partially undertaken as part of the process of identifying the geographic area of assessment, but this exercise will need to be completed in more detail. The process will require the determination of the change in the physical level of an impact, and estimation of the number of people exposed to the change and their relative sensitivity. This will require the definition of both baseline conditions and estimation of conditions for the appropriate year(s) of assessment.

3.9 The determining factors that need to be taken into account when assessing the impact of traffic and movement will vary for each type of impact. In the case of noise, for example, traffic volume, the percentage of HGVs and the distance from the road will be major factors. During night-time periods, peak noise events may also require careful consideration. In the case of pedestrian fear and intimidation, the speed and size of vehicles and width of pavement will be important. Key factors that are to be considered for each impact should be described at the initial stages of the assessment.

3.10 Noting that generally developments increase baseline traffic flows, inherently, the quantifying of impacts usually trends towards negative effects and the requirement for mitigation. However, the traffic and movement expert should also consider if there are beneficial effects to be accrued, particularly in the development of mitigation strategies to offset the negative impacts (e.g. footway improvements to address fear and intimidation impacts could have longer term legacy benefits).

3.11 Certain environmental impacts are easier to quantify and measure than others. Traffic noise, for example, has been researched extensively and reliable techniques have been developed for measuring and predicting noise levels from known traffic data. For other impacts such as severance, where the factors contributing to the impact are more subjective, there are currently no proven or reliable techniques. The assessment of certain impacts may therefore depend more on description and judgement than any commonly agreed method. However, even where impacts are well studied, the methods of assessment are in a state of evolution. There may be a number of alternative assessment methods, in which case the competent traffic and movement expert should provide reasons, simply stated, for the actual choice of method.

3.12 A critical feature of an environmental assessment is determining whether a given effect is significant. Having quantified the magnitude of the impact (i.e. the level of change), there are various ways of interpreting whether or not the resulting outcome is considered significant. There is no definition of a 'significant effect' in the EIA Regulations. Furthermore, for many effects, there are no simple rules or formulae that define appropriate assessment thresholds and therefore there is a need for interpretation and judgement on the part of the competent traffic and movement expert, backed up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing an impact and the sensitivity of those people, as well as the assessment of the damage to various natural or cultural resources. The competent traffic and movement expert will need to make it clear how they have defined whether a change (and the resultant effect) is considered significant or not.

Severance

3.13 In the context of a traffic and movement assessment, severance is the perceived division that can occur within a community when it becomes separated by major transport infrastructure. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by infrastructure.

3.14 The measurement and prediction of severance is extremely difficult. The correlation between the extent of severance and the physical barrier of a road is not clear and there are no predicative formulae that give simple relationships between traffic factors and levels of severance. Factors that need to be considered in determining whether severance is likely to be an important issue include road width, traffic flow and composition, traffic speeds, the availability of crossing facilities and the number of movements that are likely to cross the affected route.

3.15 Different groups in a community may be more affected by severance than others. Vulnerable groups (such as older age, younger age and health status[17]) may be more sensitive to traffic conditions than others. If an Equality Impact Assessment (EqIA) is also being carried out for the project, then liaison is recommended with the EqIA lead to discuss vulnerable groups. An assessment of severance should aim to estimate the current severance caused by traffic and related factors, and the extent to which additional traffic will exacerbate this problem. Where severance is thought likely to require more detailed investigation, it is recommended the assessment involves:

(a) Defining the facilities to which access is potentially impaired
(b) Defining facility catchment areas from which users may be drawn
(c) Estimating the populations within those areas, both in total and in vulnerable groups

3.16 The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic.

3.17 Thresholds are expressed as a starting point for any assessment and typically have been derived from studies of major changes in traffic flow and therefore should be used cautiously in any assessment. The assessment of severance should pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc.

3.18 There are useful resources to augment historic thresholds and assist the competent traffic and movement expert's judgement in determining the significance of severance effects. The Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021) includes guidance on assessing the hindrance of pedestrian movements and DMRB LA 112 'Population and Human Health' contains sensitivity values for walkers, cyclists and horse riders based on traffic flow thresholds.

Driver delay

3.19 Traffic delays to non-development traffic can occur at several points on the network surrounding a development site including:

- At the site entrance where there will be additional turning movements
- On the highways passing the development site where there is likely to be additional traffic and the flow might be affected by additional parked cars
- At other key intersections along the highway which might be affected by increased traffic
- At side roads where the ability to find gaps in the traffic may be reduced, thereby lengthening delays

3.20 These delays are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. Values for delay due to these elements can be determined by the use of proprietary software packages such as Transport Research Laboratory's Junctions 10 suite (e.g. ARCADY for roundabouts, PICADY for priority junctions and OSCADY for traffic signalised intersections), JCT's LinSig or other suitable programs. Each package produces estimates of vehicle time and delay through the junction and hence, by testing each intersection for the baseline condition and with the development, it is possible to estimate vehicle delays and determine the sensitivity to development traffic.

3.21 For highway link assessment and/or larger study areas it may be necessary to employ a micro simulation or a network assignment traffic model.

3.22 The assessment of driver delay will normally be based on the technical work reported within the Transport Assessment, which generally focuses on conditions in the network peak periods, with highway mitigation defined to ensure conditions with the development are not materially worse than would otherwise have been the case without the development and mitigation. The driver delay assessment should clearly present the 'with' and 'without' mitigation effects.

Pedestrian delay (incorporating delay to all non-motorised users)

3.23 The assessment of pedestrian delay serves as a proxy for the delay that other modes of non-motorised users may experience when crossing roads.

3.24 Pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development site.

3.25 A predictive method for determining the mean delay experienced by pedestrians for different types of crossing for different traffic flow can be found in the Transport and Road Research Laboratory Supplementary Report 356 (J Goldschmidt, 1977). This method provides a useful approximation for determining the likely levels of pedestrian delay at different traffic levels.

3.26 Given the range of local factors and conditions that can influence pedestrian delay (e.g. a discrete delay may have a lesser impact in an urban environment than a rural setting), it is not considered wise to set down definitive thresholds. Instead it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect.

3.27 There are useful reference resources to assist the competent traffic and movement expert's judgement in determining the significance of pedestrian delay. The Department for Transport TAG Unit A4-1 Social Impact Appraisal (2021) includes guidance on assessing the hindrance of pedestrian movements and DMRB LA 112 'Population and Human Health' contains sensitivity values for walkers, cyclists and horse riders based on traffic flow thresholds.

3.28 In densely populated areas with highly sensitive receptors, it may be necessary to quantify the number of pedestrians impacted. To determine the number of pedestrians crossing the road, or walking along pavements, it may be necessary to undertake sample counts, either using video or manual methods. The scale and scope of pedestrian surveys should be agreed in advance with the relevant highway authorities and should be proportional to the potential for significant effects.

Non-motorised user amenity

3.29 Pedestrian amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic. This definition also includes pedestrian fear and intimidation, and can be considered to be a much broader category including consideration of the exposure to noise and air pollution, and the overall relationship between pedestrians and traffic. Transport for London's 'Guide to the Healthy Streets Indicators: Delivering the healthy streets approach' provides details on the factors that influence non-motorised users' travel choices and therefore should be considered in the traffic and movement assessment.

3.30 The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. Thresholds are expressed as a starting point for any assessment and typically have been derived from studies of major changes in traffic flow and therefore should be used cautiously in any assessment. The assessment of amenity should pay full regard to specific local conditions.

3.31 Some authorities have developed similar guidance for their on-street spaces, but this is limited. Examples include the Pedestrian and Cycle Movement Design Guide by Essex County Council. Given most authorities have limited resources and expertise to develop their own guidance, often standards published by nationally recognised bodies are used. These include the Pedestrian Comfort Guidance for London (2019) by Transport for London which has an accompanying spreadsheet to undertake evaluating a new design or assessing an existing footway, or the walking and cycling infrastructure design guidance webpage by Sustrans, which is a collection of weblinks of various documents for designers and decision-makers planning and delivering walking and cycling infrastructure.

Fear and intimidation

3.32 A further environmental impact that affects people is the fear and intimidation created by all moving objects. While the traffic and movement assessment has to consider motorcycles, cars, lorries and buses, this scope of consideration is not exclusive – it also has to consider other modes of travel, including horses, cycles, mobility scooters, e-scooters and e-cycles, if appropriate.

3.33 The extent of fear and intimidation is dependent on:

- The total volume of traffic
- The heavy vehicle composition
- The speed these vehicles are passing
- The proximity of traffic to people – and/or the feeling of the inherent lack of protection created by factors such as a narrow pavement median, a narrow path or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles.

3.34 While this is recognised as an important environmental impact, there are no commonly agreed thresholds for estimating these levels of danger – hence of fear and intimidation – from known traffic and physical conditions.

3.35 In the absence of commonly agreed thresholds, previous work that put forward thresholds for fear and intimidation based on an earlier study (Crompton and Gilbert, 1976) can be useful. These thresholds define the degree of hazard to pedestrians by average traffic flow, 18-hour heavy vehicle flow and average speed over an 18-hour day in miles/hour.

3.36 While most of these factors can be quantified, there will be a need for judgement to be exercised in determining the degree of fear and intimidation. Special consideration should be given to areas where there are likely to be particular problems, such as high-speed sections of road, locations of turning points and accesses, and the inherent lack of protection created by factors such as a narrow pavement median, a narrow path or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles. In addition, locations where people may be unfamiliar with the locale (e.g. beauty spots or heritage/tourist attractions) need a judgement to be applied to determine the degree of impact. The movement of hazardous/large loads will heighten people's perception of fear and intimidation and, if this is likely to occur, it should be noted.

3.37 A weighting system has been defined within these updated and replacement Guidelines to help assessors provide a first approximation of the likelihood of pedestrian fear and intimidation.

3.38 The degree of hazard is assessed with reference to the established thresholds, and a score provided for each combination on a highway link under consideration. (Table 3.1 provides an example of a scoring system that can be adapted to reflect local conditions.)

Table 3.1: Fear and intimidation degree of hazard

Average traffic flow over 18-hour day – all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed[18] (c)	Degree of hazard score
+1,800	+3,000	->40	30
1,200–1,800	2,000–3,000	30–40	20
600–1,200	1,000–2,000	20–30	10
<600	<1,000	<20	0

3.39 The total score from all three elements is combined to provide a 'level' of fear and intimidation for all three elements. (Table 3.2 provides an example.)

Table 3.2: Levels of fear and intimidation

Level of fear and intimidation	Total hazard score (a) + (b) + (c)
Extreme	71+
Great	41–70
Moderate	21–40
Small	0–20

3.40 The magnitude of impact is approximated with reference to the changes in the level of fear and intimidation from baseline conditions (Table 3.3).

Table 3.3: Fear and intimidation magnitude of impact

Magnitude of impact	Change in step/traffic flows (AADT) from baseline conditions
High	Two step changes in level
Medium	**One step change in level, but with** • >400 veh increase in average 18hr AV two-way all vehicle flow; and/or • >500 HV increase in total 18hr HV flow
Low	**One step change in level, with** • <400 veh increase in average 18hr AV two-way all vehicle flow; and/or • <500 HV increase in total 18hr HV flow
Negligible	No change in step changes

Road safety

3.41 The 1993 Guidelines advocated the calculation of road accident rates (collision rates in modern terminology) as an approximation of the potential for road safety impacts stating: 'From knowing the expected increase in vehicle-km on different classes of road, it will be possible to make an initial simple statistical assessment of the likely increase or decrease in the number of accidents resulting from changes in traffic flows and composition.'

3.42 The calculation of collision rates is still considered a relevant approach to scale a road safety assessment; however, it is more common for stakeholders to request a 'collision cluster' assessment to identify potential impacts at a more detailed level.

3.43 Collision clusters are identified by a detailed review of the baseline characteristics to determine the road safety sensitivity of discrete areas of the highway network. The collision cluster criterion is typically based on a definition of number of personal injury collisions occurring within a defined period in a given spatial radius. Impacts are assessed by examining STATS19[19] collision data to identify any emerging patterns or factors that could be exacerbated by traffic or movement generation.

3.44 While the traditional approach to road safety serves to address collision rates and cluster sites to good effect, there are limits to the benefits that can be gained from retrospective assessment.

3.45 The 'Safe System' is considered to be international best practice in road safety by the World Health Organization and the Organisation for Economic Co-operation and Development. Both organisations recommend that all countries, regardless of their level of road safety performance, follow a Safe System approach. In line with this emerging road safety policy, a Safe System approach could be taken to the assessment of road safety impacts of a project. The Safe System approach broadly follows the staged approach set out below:

- Identify the study area using historic crash data.
- Undertake evidence-led, objective modelling techniques to establish a baseline road safety level for the roads within the study area on which the impact thresholds are exceeded in relation to either non-motorised users or motorised user traffic. This analysis can be carried out using tools such as the iRAP Star Ratings protocols[20] or similar tools produced by individual highways authorities.
- Assess the effects of additional development traffic for all users (including vulnerable groups[21]), across the whole width of the highway corridor. This model should also assess the effect of any changes to the baseline road network, such as the provision of access junctions.

3.46 The final impact assessment should present calculated changes in levels of the roads' intrinsic safety and the estimated annual reduction in fatal or serious injuries. The final impact assessment should be based on the proportionate changes in fatal and serious injuries and the proportionate change in roadside hazards, which can be calculated using iRAP Star Ratings scores or their equivalent from other models.

3.47 It is recommended that the traffic and movement expert engages with the relevant authorities to determine the best approach for determining the significance of road safety effects.

Road safety audits

3.48 The standard and prescribed Road Safety Audits (GG 119 – Road Safety Audit DMRB) should be used to review the road safety attributes of any proposed engineering changes in the adopted highway prior to submission.

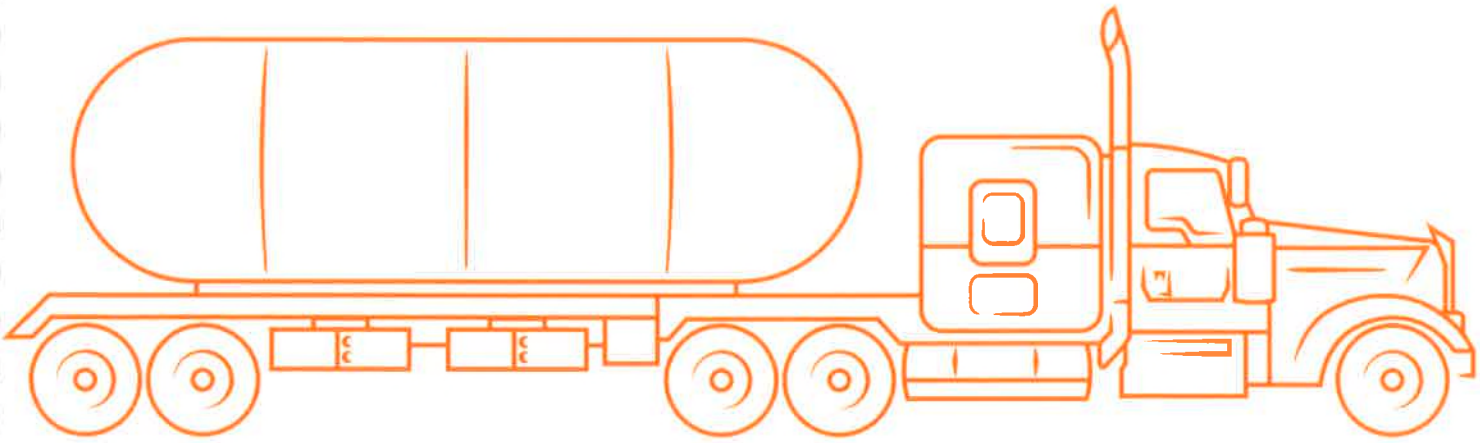
Hazardous loads/large loads

3.49 Some developments may involve the transportation of dangerous or hazardous loads by road and this should be recognised within any traffic and movement assessment. Such movements should include specialist loads that might be involved in the construction or decommissioning phases of the development, in addition to movements associated with the operation of the establishment. Regulation for transporting dangerous goods via road and rail in the UK is applied by The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended). Further information on regulation and enforcement is available on the Health and Safety Executive website.

3.50 The traffic and movement assessment needs to clearly outline the estimated number and composition of such loads. Where the number of movements is considered to be significant, the assessment should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event. The extent of such analysis should clearly reflect the nature of the load being transported. For instance, much more detail is required for a development that involves the transportation of nuclear products than for one that involves the delivery of petroleum.

3.51 Risk and catastrophe analysis was introduced into the EIA Regulations as a result of EU Directive 2014/52/EU which introduced the requirement for consideration of 'major accidents and/or disasters'. It is therefore best practice to include transport related hazard and accident assessment in a wider environmental assessment that contains a project-wide accident and disaster assessment. The IEMA publication 'Major Accidents and Disasters in EIA: A Primer' (2020) provides guidance on the process for identifying, assessing and mitigating hazards.

3.52 The movement of large (abnormal) loads is regulated by National Highways and will be subject to separate agreement with the relevant highway authorities and police through the Electronic Service Delivery for Abnormal Loads (ESDAL) system. The traffic and movement expert must consider appropriate routes for abnormal load movements and mitigation strategies to secure safe passage. If frequent abnormal load movements are anticipated (e.g. heavy plant movements), the traffic and transport expert should consider if other traffic impacts could be induced (e.g. fear and intimidation, driver delay, etc.).



4. Links to other assessments

4.1 As set out earlier in this guidance the traffic and movement assessment is a source of key information for the assessment of impacts on other environmental factors. Therefore, these updated and replacement Guidelines provide advice from other technical disciplines on how the competent traffic and movement expert should work with other competent environmental experts to assist in the assessment of these other factors.

4.2 It should be noted that these non-traffic and movement assessments have their own detailed guidance and methodologies and the following sections do not seek to replicate these. Instead, high level guidance is provided on the interlinkages between assessments to aid the competent transport and movement expert. The following list is not exhaustive, but focuses on some of the most common interactions with:

- Air quality
- Noise
- Vibration
- Landscape and visual
- Biodiversity
- Cultural heritage
- Climate and GHGs

4.3 Given that many environmental assessments (such as those for air quality and noise) are heavily reliant on the outputs of traffic assessments (e.g. for modelling purposes), it is essential that any such information provided by the competent traffic and movement expert, which is used to inform EIAs, is of suitably high quality. This is particularly important in those areas with the highest sensitivity to changes in traffic flows (such as Air Quality Management Areas or Noise Improvement Areas).

Air quality

Traffic screening criteria – **human health receptors**

4.4 The Institute of Air Quality Management (IAQM) and Environment Protection UK's 'Land-Use Planning & Development Control: Planning for Air Quality', (IAQM and EPUK, 2017), provides indicative screening criteria for changes in traffic flows as a result of a development. If the changes in traffic flows exceed these screening criteria, then an air quality assessment should be conducted to assess the potential impact on human health receptors. The guidance also provides other related criteria, e.g. for realignment of roads, new junctions and underground carparks.

4.5 The criteria for changes in Light Duty Vehicle (LDV)[22] flows are more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA), and more than 500 AADT elsewhere. For Heavy Duty Vehicle (HDV)[23] flows, the criteria are more than 25 AADT within or adjacent to an AQMA, and more than 100 AADT elsewhere.

4.6 The criteria becomes more stringent if the traffic impacts may arise on roads where air pollutant concentrations are close to or are exceeding air quality objectives,[24] which are typically indicated by the presence of an AQMA, but may also occur outside an AQMA. Where a whole local authority is declared an AQMA, and the affected roads have concentrations below 90% of the relevant air quality objective, the less stringent criteria may be more appropriate.

4.7 Similar to the IAQM and EPUK (2017) guidance, DMRB LA 105 'Air Quality' includes traffic screening criteria, which are based on traffic flow changes, including changes in AADT flows greater than or equal to 1,000 and changes in HDV flows greater than or equal to 200.

4.8 It is essential for the EIA coordinator, air quality and transport professionals to work together and engage early in the development process to identify any AQMAs, or other areas of poor air quality, that may be affected by development traffic. This will allow the most appropriate screening criteria to be applied and the identification of any potential air quality impacts.

Traffic screening criteria – **designated sites for nature conservation**

4.9 DMRB LA 105 considers the impacts on designated sites as well as human health, whereas the IAQM has separate guidance for designated sites. 'A guide to the assessment of air quality impacts on designated nature conservation sites' (IAQM, 2019) provides a method which involves considering the DMRB LA 105 screening criteria (see above). The 2019 IAQM guidance also highlights the importance of considering the combined impacts of a project with other projects and plans as required by legislation for the protection of habitats.

Impact assessment methodology

Road vehicle exhaust emissions

4.10 When assessing the impacts of changes in road traffic flows on air quality, study areas are typically determined based on an 'affected' road network (ARN), with the ARN defined as being those road links which exceed relevant traffic screening criteria. Traffic screening criteria relevant to the assessment of air quality impacts on human health receptors (e.g. residential properties, schools and hospitals) and ecological receptors (i.e. designated sites for nature conservation), respectively, are discussed below.

4.11 The air quality study area (within which selected sensitive receptors are identified and assessed) is typically defined as the area within 200m of the ARN (as beyond this distance changes in road traffic emissions are considered unlikely to have a substantial impact on pollutant concentrations at sensitive receptors).

4.12 Should traffic screening criteria be likely to be exceeded on any road link, it is important to ensure traffic data are available for these road links. Traffic data may also be required for other road links in the air quality study area, which may not necessarily be affected by the development itself, but which may contribute to pollutant concentrations at sensitive receptors adjacent to affected links, or may be adjacent to an air quality monitoring site. The data from these sites are used to verify the baseline air quality model.

4.13 The volume and composition of traffic, its speed and operating characteristics (e.g. stationary, accelerating) and distance from the source are major factors influencing air pollutant concentrations at sensitive receptors. It is important to consider these factors when assessing the potential impacts of changes in road traffic flows on air quality.

4.14 For assessing the impact of air quality on human health resulting from changes in traffic flows due to a development, either of DMRB LA 105 and IAQM and EPUK (2017) guidance can be considered. However, the IAQM and EPUK (2017) guidance is more focused on the planning process, whereas DMRB LA 105 is geared towards assessing the air quality impacts of motorways and all-purpose trunk road projects and it is used in the planning and design phases of such projects. The choice of which guidance to use, whether it's IAQM and EPUK (2017) or DMRB LA 105, will depend on the specific needs and requirements of the project, as well as the professional judgement and expertise of the competent air quality expert.

4.15 As part of the Local Air Quality Management (LAQM) process, local authorities are required to regularly review and assess air quality and declare AQMAs where air quality objectives are exceeded. LAQM reports (such as Annual Status Reports) can provide useful information regarding air quality in a particular area. An air quality professional is, however, best placed to obtain and interpret such information. Where AQMAs have been declared and relevant traffic screening criteria are exceeded, more detailed assessment is likely to be required. The absence of an AQMA does not, however, mean that no air quality assessment is required, although a simpler assessment may be appropriate.

Construction phase dust and fine particulate matter

4.16 Dust generated from construction sites and the operations of certain types of development, such as quarrying and the transport of quarried materials can be a problem, particularly as a consequence of trackout.[25] The impact of dust depends largely on the management practices undertaken on site, such as wheel washing and sheeting of goods vehicles. The IAQM's 'Guidance on the assessment of dust from demolition and construction, version 1.1' (2016) and 'Guidance on the Assessment of Mineral Dust Impacts for Planning' (2016) provide frameworks for assessing the potential risk of such impacts and mitigation measures to address potential impacts.

4.17 It is essential to identify the number of properties likely to be affected by dust, including the area of designated sites for nature conservation. The IAQM guidance provides a framework for estimating potential impacts and implementing measures to mitigate those impacts, such as dust suppression measures, site layout optimisation and construction scheduling.

Noise

4.18 For free flow conditions, the standard UK procedure is to estimate baseline and future traffic noise levels using the procedures set out in Calculation of Road Traffic Noise (CRTN). This approach uses the $L_{A10,18h}$ dB index, which corresponds to the arithmetic mean of the noise level exceeded for 10% of the time, for each hour from 06:00 to midnight.[26]

4.19 This index may be an unsuitable guide to determine the potential impact of some developments. For example, values expressed in terms of hourly levels for the peak condition, or the hour at which the greatest change occurs, may provide a more useful picture of the potential impacts. Further guidance on the additional factors that may need to be considered when assessing the noise impacts of a project is provided in the IEMA 'Guidelines for Environmental Noise Impact Assessment' (2014).

4.20 As a starting point, CRTN offers a helpful, widely used and generally reliable approach to the prediction of road traffic noise levels. Wherever the traffic flow is low or intermittent, such as may occur during night-time conditions or on some rural roads, the L_{10} index may not be a reliable indicator of community annoyance. Similarly, where traffic flows are congested, CRTN is generally not an accurate prediction of traffic noise levels.

4.21 CRTN is the traffic noise prediction methodology adopted by National Highways in DMRB LA 111 'Noise and Vibration'. The scoping section for the operational traffic noise assessment in DMRB LA 111 includes the following questions:

(1) Is the project likely to cause a change in the BNL [Basic Noise Level, defined in CRTN] of 1dB $L_{A10,18hr}$ in the 'do-minimum' opening year (DMOY) compared to the 'do-something' opening year (DSOY)?
(2) Is the project likely to cause a change in the BNL of 3dB $L_{A10,18hr}$ in the 'do-something' future year (DSFY) compared to the DMOY?
(3) Does the project involve the construction of new road links within 600m of noise sensitive receptors?
(4) Would there be a reasonable stakeholder expectation that an assessment would be undertaken?

4.22 If the answer to at least one of these questions is 'yes', a further assessment of operational traffic noise should be undertaken.

4.23 For a 1dB change to occur, traffic flows need to increase by 25% or decrease by 20%, assuming that road alignment, speed, road surface, gradient and %HGVs remain unchanged. Similarly, for a 3dB change, traffic flows need to increase by 100% or decrease by 50%

4.24 While DMRB LA 111 is not necessarily applicable to non-highways related projects, the scoping noise level criteria are based on scientific evidence regarding the minimum noise level changes generally considered perceptible, and are therefore used more widely in noise assessment than just motorways and all-purpose trunk road projects. For example, the Department for Transport TAG Unit A3 Environmental Impact Appraisal guidance recommends that, for noise assessment, the DMRB scoping process is used for schemes irrespective of transportation mode.

4.25 DMRB LA 111 and the IEMA 'Guidelines on Environmental Noise Impact Assessment' (2014) provide further details on classifying the magnitude of traffic noise changes and identifying significant effects. DMRB LA 111 specifies that a change in noise level ($L_{A10,18h}$) in the short-term (i.e. DMOY vs DSOY) of less than 1dB does not constitute a significant effect. Where the noise level change in the short-term is 1dB or greater, additional local circumstances must be considered.

4.26 To facilitate an assessment in accordance with current planning policy at the time of writing, DMRB LA 111 also specifies Lowest Observed Adverse Effect Levels (LOAELs) of 55dB $L_{A10,18hr}$ façade and 40dB $L_{night,\ outside}$ free-field, and Significant Observed Adverse Effect Levels (SOAELs) of 68dB $L_{A10,18hr}$ façade and 55dB $L_{night,\ outside}$ free-field. Where all predicted 'with scheme' noise levels are below the SOAEL, noise level changes in the short-term of less than 3dB do not constitute a significant effect.

4.27 At the time of writing, current guidance on the approach to the management of noise within the planning system in England is detailed in 'Professional Practice Guidance on Planning and Noise: New Residential Development' (2017) by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health (CIEH). The guidance applies to residential 'sites that are exposed predominantly to noise from transportation sources' and recommends using the following classification of indicative day and night-time noise levels on a site in terms of risk of adverse effect to residents:

- Noise levels of around 50dB $L_{Aeq,16hr}$ (daytime (0700 – 2300))/40dB $L_{Aeq,8hr}$ (night-time (2300 – 0700)) or less equate to a negligible risk
- Noise levels of around 50 to 60dB $L_{Aeq,16hr/40}$ to 50dB $L_{Aeq,8hr}$ equate to a low risk
- Noise levels of around 60 to 70dB $L_{Aeq,16hr/50}$ to 60dB $L_{Aeq,8hr}$ equate to a medium risk
- Noise levels of around 70dB $L_{Aeq,16hr}$/60dB $L_{Aeq,8hr}$ or above equate to a high risk

4.28 Noise levels in the 'Professional Practice Guidance on Planning and Noise: New Residential Development' are specified as free-field levels using the L_{Aeq} parameter in lieu of the $L_{10,18h}$ index. The Transport Research Laboratory publication PR/SE/451/02, 'Converting the UK traffic noise index $L_{A10,18h}$ to EU noise indices for noise mapping' (Abbott, P.G. and Nelson, P.M. (2002)) has published guidance for converting between the $L_{A10,18h}$ and L_{Aeq} over the day and night-time periods.

4.29 The 'Professional Practice Guidance on Planning and Noise: New Residential Development' also provides guidance on the risk associated with frequent instantaneous noisy events. If there may be more than 10 events at night with $L_{Amax,F}$ > 60dB, the site 'should not be regarded as negligible risk'.

4.30 Construction noise is typically assessed using the methodology set out in BS 5228-1[27] for both the calculation of construction noise and for the assessment of effects. Both example method 1 (the ABC method) and example method 2 (the dB change method) are used, although DMRB LA 111 prescribes the ABC method. Both methods involve the calculation of predicted L_{Aeq} noise levels at receptor locations over periods of one hour or more and apply both time of day and day of the week dependencies when assessing impact.

4.31 Mitigation should be considered wherever adverse effects would arise. These include procedural controls such as restricting the hours/days of construction activity or weight limits on some routes, noise control at source such as use of quiet machinery during construction and low noise surfacing, noise control in the path such as use of barriers to shield construction plant or road-side barriers or bunds to reduce traffic noise, and noise control at the receiver such as provision of double glazing. The benefit of such mitigation should be set out clearly to enable stakeholders to understand their potential benefit both to eliminate significant adverse effects and reduce adverse effects, but also their cost and ownership, as sustainability is likely to continue to be a factor in decision-making on mitigation.

Vibration

4.32 Construction vibration may affect people and, at very high levels, may affect structures such as buildings and pipelines, particularly in the vicinity of piling. Guidance on impact levels and simple calculation methods is provided in BS 5228-2.[28]

4.33 New developments that attract HGVs tend to create concern from local residents about the possible damage to property resulting from vibration. This concern may be heightened where the existing roads or local network are poorly maintained, and people hear and experience the effects of lorries passing over irregularities in the road surface.

4.34 There are numerous studies that have investigated this topic, and where concern about building damage from vibration is identified, these sources should be consulted (Transport and Road Research Laboratory 1990, British Research Establishment 1990). However, research studies have so far been unable to show that traffic-induced ground-borne vibration results in structural damage to buildings, although surface damage, such as cracking of plaster, may occur in buildings founded on soft ground, close to heavily trafficked roads with large surface irregularities.

4.35 Airborne vibration (infrasound) can lead to effects such as window rattling and floor movement, and this may concern people living adjacent to roads particularly where there is a large increase in HGVs. However, operational vibration is usually scoped out of the assessment of highways/road projects on the assumption that new road surfaces will be free of defects and will be maintained so that vibration does not arise. Exceptionally, traffic calming using speed bumps may lead to significant vibration, so this potential impact should be assessed where necessary.

4.36 Notwithstanding the lack of technical research to link vibration to structural damage, vibration can materially affect the quality of life of the occupant of such properties and as such may need to be examined.

4.37 Given the complex nature of the problem, expert advice should be obtained where such effects are likely to be seen as significant. Mitigation should be considered wherever adverse effects arise. These include procedural controls such as restricting the hours/days of construction activity and the type of machinery used, particularly for piling. Wherever possible, significant adverse effects should be eliminated, and adverse effects reduced.

Landscape and visual

4.38 Two types of changes may give rise to landscape and visual impacts that would require consideration in terms of design development and/or assessment, as set out within 'Guidelines for Landscape and Visual Impact Assessment, third edition' (Landscape Institute and IEMA, 2013):

- Physical changes to the road network, however minor, may have landscape and/or visual impacts. For example, the removal of vegetation, banks or walls to create visibility splays or for the localised widening or straightening of the carriageway may be of greater importance than is immediately apparent and the input of a competent landscape expert should be sought prior to making design decisions so that alternatives can be explored and the potential effects mitigated or removed. Narrow, winding roads are characteristic of some landscapes and changes may impact landscape character. New signage, barriers, lighting or other road infrastructure may affect landscape character and/or views in rural locations. In order to undertake an assessment, details of the design of the project are required, including vertical and horizontal alignments and vegetation to be retained and removed. An arboriculture impact assessment may also be required.
- Changes to the type or volume of traffic may give rise to effects on views and/or landscape character (particularly where there is an increase in larger vehicles). The perception of tranquillity, which is characteristic of some landscapes, may be affected by increased vehicle numbers, movement and noise, and the increased presence of lights at night may affect characteristically dark landscapes. These are less likely to give rise to significant effects than physical changes to the road network, but may require assessment, such as in areas within or close to nationally designated landscapes. In order to undertake an assessment, the competent landscape expert will not need detailed traffic data, but will require a clear description, readily understood by the non-expert reader, of what the changes to the traffic would include (for example type of vehicles, frequency, duration, traffic volume).

4.39 In urban areas, changes to the road network or traffic levels are less likely to require landscape advice or assessment.

Biodiversity

4.40 For the assessment of biodiversity impacts, the competent transport and movement expert should liaise directly with the competent biodiversity expert. It is likely that an ecological impact assessment will follow the Chartered Institute of Ecology and Environmental Management (CIEEM) 2018 'Guidelines for Ecological Impact Assessment (EcIA)'.[29]

4.41 In addition, to inform the biodiversity assessment, IAQM's 'A guide to the assessment of air quality impacts on designated nature conservation sites' (2019) and CIEEM's 'Advisory Note: Ecological Assessment of Air Quality Impacts' (2021) provide guidance on the assessment of the air quality impacts of development on designated sites for nature conservation, with inputs from both a competent air quality and biodiversity expert likely to be required. In addition, see the 'Air Quality' section above on transport screening criteria for designated sites for nature conservation.

4.42 Aside from air quality, sources of potential impacts on ecological receptors are likely to arise from habitat loss, pollution, noise and visual disturbance of sensitive species. Habitat loss may occur through direct and indirect impacts to hedgerows, verges and other habitats as a result of any highway modifications or improvements. The competent biodiversity expert should work closely with the highway and design teams at the earliest possible stage, following the mitigation hierarchy to input to the consideration of alternatives, siting and project design to avoid impacts on biodiversity and also to identify enhancement opportunities for beneficial improvements.

4.43 Regarding potential impacts on biodiversity from pollution, noise and visual disturbance, the mitigation hierarchy should again be applied with the application of good practice to avoid creating sources and pathways for pollutants and disturbance to impact on biodiversity. These aspects, and any other identified potential impacts on biodiversity, should be raised with the competent biodiversity expert at EIA scoping and throughout the environmental assessment. In particular, close liaison between the competent traffic and movement expert and the competent biodiversity expert during the EIA scoping stage will be essential, primarily to understand the geographical extent of study areas.

Cultural heritage

4.44 The IEMA 'Principles of Cultural Heritage Impact Assessment' (2021) provides specific direction on the definition of cultural heritage assets and the way change (such as that which may manifest from variations in traffic) could affect cultural heritage significance. Cultural heritage can include buildings and structures, monuments, parks and gardens, battlefields, townscapes, landscapes, seascapes, archaeological sites, myths, festivals and traditions, whether intangible, visible, buried or submerged.

4.45 In summary, a simple six stage assessment process is undertaken by a competent cultural heritage expert. This comprises:

(a) (Identifying and) describing the asset (what is it?)
(b) Ascribing cultural significance (why is it valued?)
(c) Attributing importance (is it designated? i.e. listed building)
(d) Understanding change (what is the proposal?)
(e) Assessing impact (how will the proposal change the cultural significance?)
(f) Weighting the effect (does the impact matter at a policy level?)

4.46 Thus, the key interface between those undertaking the Transport Assessment/transport and movement assessment and the cultural heritage assessment will take place at the 'understanding change' stage. In so far as the process feeds back in on itself, this understanding may also, in turn, result in a reappraisal of those assets identified for assessment (as study areas are refined).

4.47 In a similar vein to that presented above (e.g. landscape and visual impacts), the key considerations for cultural heritage assessment can be useful separated into two different component parts:

- The physical effects of change, i.e. where a project may have a direct impact on the fabric of the cultural heritage asset, whether that be a historic building, a designed landscape or buried archaeological remains. In the context of traffic and movement matters, this is most likely to be permanent and a negative impact. In some rare cases, this effect may be reversible.
- An effect that influences the experience of the cultural heritage asset, i.e. where change will take place within the setting of a cultural heritage asset. These experiential changes are more commonly visual, but the impacts could also relate to sound (traffic noise) or smells (or air quality in general). The impacts may be temporary (such as construction traffic) or permanent; and the effects may be positive (beneficial) or negative (adverse).

4.48 The identification of physical effects is usually straightforward. Some typical examples that would be relevant to the cultural heritage assessment are already described above (landscape and visual impacts), such as carriageway widening, fixed barriers and signage. These may change the physical properties of a cultural heritage asset and thus potentially impact cultural heritage significance. Technical specifications and detailed drawings are likely to be needed for the assessment. Photographs to demonstrate how similar schemes and/or mitigation methods have been implemented could also be of great assistance.

4.49 Getting to understand the way changes to traffic flows or other traffic and movement matters influence the experience (as part of its setting) of cultural heritage assets is more challenging. Again, the typical types of change relevant to cultural heritage assessment are referred to above (landscape and visual impacts), such as changes to views, soundscapes, lighting and noise. Change may not necessarily be harmful to cultural heritage significance, but the identification of these changes and the agreement of the study area will be critical to the assessment. Close liaison between the competent traffic and movement expert, the competent cultural heritage expert and the competent landscape expert during the EIA scoping stage will be essential, primarily to understand the geographical extent of study areas.

4.50 Therefore, the presentation of the proposed physical changes and the traffic data in an easily understood and relatable form will be of great assistance to those undertaking cultural heritage assessment. Regarding the data, this could take the form of a simple summary of the predicted increase in traffic flow as a numerical and percentage change, at pre-agreed sensitive locations.

Climate resilience, adaptation and GHGs

4.51 For methods for the assessment of greenhouse gases (GHGs) within EIA and the consideration of climate change mitigation and adaptation, the competent transport and movement expert should liaise directly with the competent experts leading these topics, alongside the EIA coordinator in the first instance.

4.52 For detailed guidance on climate resilience and adaptation, users should refer to IEMA's 'Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation'.[30] The resilience and adaptation guidelines explain how assessing the impacts of climate change on a scheme is fundamentally different to assessing impacts arising from the scheme in other EIA topics, since it focuses on the impact of an external factor (climate change) on the scheme, rather than the impact of the scheme on environmental receptors. This can lead to some difficulty in the language and style of the assessment used, which is explored further in the guidance.

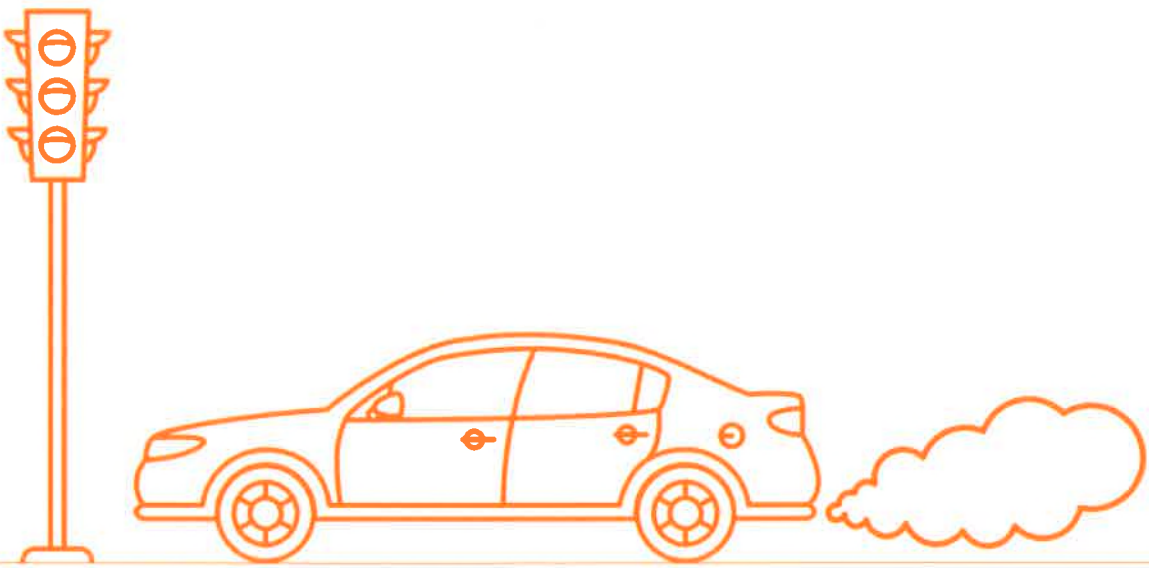
4.53 The resilience and adaptation guidelines are structured around eight key procedural steps. These steps set out what actions should be taken to integrate climate adaptation and resilience issues into the EIA process. These are broadly aligned to the statutory stages of EIA (but including pre-application and post-application activities). In addition to this, several appendices are included, which set out additional supporting guidance on suggested roles and responsibilities, technical guidance on the use of climate projections, experience of integrating adaptation and resilience issues into the EIA process, and policy context in the UK.

4.54 The key recommendation to bear in mind with respect to climate resilience and adaptation is to ensure that the project designers incorporate climate resilience into the design of the project at an early stage. This means evaluating what resilience measures may be appropriate to include in the design, and this should take place at all stages of design development – from optioneering through to detailed design, not just as part of the EIA process. If it is done before the start of EIA, building climate resilience into the project can be achieved by carrying out a Climate Change Risk Assessment.

4.55 For detailed guidance on assessing GHGs users should refer to IEMA's 'Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance'.[31] The aim of the GHG guidelines is to help GHG practitioners with addressing GHG emissions assessment, mitigation and reporting in statutory and non-statutory EIA. As with the resilience and adaptation guidelines, a key lesson from the GHG guidelines is the critical importance of early intervention.

4.56 It is important that project designers incorporate measures to reduce GHG emissions at an early stage. This means evaluating what GHG emissions reduction measures may be appropriate to include in the design. Mitigation should be considered at all stages of design development – from optioneering through to detailed design, not just as part of the EIA process. To successfully address GHG emissions at an early stage, it is good practice to ensure there is a 'carbon coordinator' within the design team, who focuses on promoting GHG saving opportunities and ensures GHG reduction is a focus of the design team.

4.57 The competent traffic and movement expert should, especially in the absence of a dedicated climate lead or carbon coordinator on the project, champion the incorporation of climate resilience and adaptation, and GHG reduction, when giving input into the consideration of alternatives, concept design, design review and design iteration from a transport and movement perspective.



Annex A: List of sources of other IEMA guidance

Since the original Guidelines for the Environmental Assessment of Road Traffic was first published in 1993, the undertaking of EIA has been facilitated by the publication of a series of guidance on "good current practice" by IEMA covering a range of topics of particular relevance, as follows:

- 1995 Guidelines for Landscape and Visual Impact Assessment
- 1995 Guidelines for Baseline Ecological Assessment
- 2002 Guidelines for Landscape and Visual Impact Assessment 2nd Edition
- 2004 Guidelines for Environmental Impact Assessment
- 2010 Climate Change Mitigation and Environmental Impact Assessment
- 2011 Special Report on the State of EIA in the UK
- 2012 Considering Ecosystem Services in Environmental Impact Assessment
- 2013 Guidelines for Landscape and Visual Impact Assessment 3rd Edition
- 2014 Guidelines for Environmental Noise Impact Assessment
- 2015 EIA Guide to Climate Change Resilience and Adaptation
- 2015 EIA Guide to Shaping Better Quality Development
- 2016 EIA Guide to Delivering Better Quality Development
- 2017 Health in Environmental Impact Assessment: A Primer for a Proportionate Approach
- 2017 EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance
- 2017 Delivering Proportionate EIA
- 2020 EIA Guide to Climate Change Resilience and Adaptation 2nd Edition
- 2020 IEMA Guide to: Materials and Waste in EIA
- 2020 Digital Impact Assessment: A Primer for Embracing Innovation and Digital Working
- 2020 Major Accidents and Disasters in EIA: A Primer
- 2021 Principles of Cultural Heritage Impact Assessment in the UK
- 2022 A New Perspective on Land and Soil in Environmental Impact Assessment
- 2022 EIA Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition
- 2022 Effective Scoping of Human Health in Environmental Impact Assessment
- 2022 Determining Significance For Human Health In Environmental Impact Assessment

Footnotes

[1] In 1999 the Institute of Environmental Assessment merged with The Institute of Environmental Management and the Environmental Auditor's Registration Association to form the Institute of Environmental Management and Assessment.

[2] The production of the 'Guidelines for the Environmental Assessment of Road Traffic' in 1993 was principally funded by the Rees Jeffreys Road Fund and this enabled Dr Peter Hopkinson, initially of the Institute for Transport Studies, University of Leeds, to prepare the original draft of the document.

[3] Guidelines for the Environmental Assessment of Road Traffic, Institute of Environmental Assessment 1993.

[4] The term 'EIA Report' is used in The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

[5] IEMA (2015) Environmental Impact Assessment Guide to: Shaping Quality Development.

[6] IEMA (2016) Environmental Impact Assessment Guide to: Delivering Quality Development.

[7] IEMA (2017) Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice.

[8] See Table 9.2 of the IEMA Guide to Effective Scoping of Human Health 2022, which elaborates on these vulnerabilities. Potential effects to these groups should be discussed with the competent human health expert at the EIA scoping stage and later throughout the assessment.

[9] The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

[10] IEMA (2016) Environmental Impact Assessment Guide to: Delivering Quality Development.

[11] See Effective Non-Technical Summaries for Environmental Impact Assessment, IEMA, 2nd Edition 2023.

[12] IEMA (2020) Digital Impact Assessment: A Primer for Embracing Innovation and Digital Working.

[13] IEMA (2017) Delivering Proportionate EIA: A Collaborative Strategy for Enhancing UK Environmental Impact Assessment Practice.

[14] In England

[15] In Wales

[16] Guidance: Travel Plans, Transport Assessments and Statements, Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government, GOV.UK.

[17] See Table 9.2 of the IEMA Guide to Effective Scoping of Human Health 2022, which elaborates on these vulnerabilities. Potential effects to these groups should be discussed with the competent human health expert at the EIA scoping stage and assessment stage.

[18] Interpolated with reference to the impact speed for the fatal pedestrian casualty severity reported in Figure 2.6 of Road Safety Web Publication No. 16 'Relationship between Speed and Risk of Fatal Injury: Pedestrians and Car Occupants' (September 2010).

[19] Collisions on the public highway which involve injury or death are recorded by the police on a STATS19 form and collated by the local highway authority. The data includes a wide variety of information about the collision, such as time, date, location, road conditions.

[20] https://irap.org/

[21] See Table 9.2 of the IEMA Guide to Effective Scoping of Human Health 2022.

[22] LDV = cars and small vans <3.5t gross vehicle weight

[23] HDV = goods vehicles + buses >3.5t gross vehicle weight

[24] The Air Quality Objectives are policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale. The Objectives are set out in the UK government's Air Quality Strategy for the key air pollutants..

[25] The transport of dust and dirt from the construction/ demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when Heavy Duty Vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.

[26] It should be noted that at the time of publication it is understood that CRTN is planning to be replaced with a new British Standard which will use LAeq.

[27] BS 5228-1 Code of practice for noise and vibration control on construction and open sites – Part 1 Noise. BSI Standards Publication.

[28] BS 5228-2 Code of practice for noise and vibration control on construction and open sites – Part 2 Vibration. BSI Standards Publication.

[29] https://cieem.net/resource/guidelines-for-ecological-impact-assessment-ecia/

[30] Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation, 2nd Edition, 2020, IEMA.

[31] Environmental Impact Assessment Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance. 2nd Edition, 2022, IEMA.